APPENDIX F

National Register Nominations

Historic Districts and District Recommendations

1. National Register Nominations: Island of Kauai
2. National Register Nominations: Island of Oahu
3. National Register Nominations: Island of Maui
4. National Register Nominations: Island of Hawaii
5. Historic Districts and District Recommendations

NATIONAL REGISTER NOMINATIONS: ISLAND OF KAUAI

1. Hanapepe Road Bridge
2. Kauai Belt Road (North Shore Section) (Additional Documentation)
3. Kauai Belt Road (North Shore Section)
4. North Shore Route
    a. North Shore Route (Appendix B Hanalei, Waikoko, Hanalei)
5. Hanalei Bridge
6. Waipa Bridge – Kuhio Highway
7. Waioli Bridge – Kuhio Highway
8. Manoa Stream Ford – Kuhio Highway
9. Limahuli Stream Crossing – Kuhio Highway
10. Haena Bridge Number 1 – Kuhio Highway
11. Haena Bridge Number 2 – Kuhio Highway
12. Waikoko Bridge – Kuhio Highway
13. Wainiha Bridge #1, #2, #3 – Kuhio Highway
14. Puuopae Bridge
15. Puuopae Bridge Miscellaneous
16. Oaekaa Road Bridge
17. Kapaia Swinging Bridge (Updated)
18. Kapaia Swinging Bridge (Original)

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 Property

Historic name: Hanapepe Road Bridge
Other names/site number: _____
Name of related multiple property listing: N/A
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Hanapepe Road
City or town: Hanapepe State: Hawaii County: Kauai
Not For Publication: ☐ Vicinity: ☐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** _X_**statewide** _X_**local**

Applicable National Register Criteria:

_X_**A** ____**B** _X_**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**

Hanapepe Road Bridge
Name of Property

Kauai Hawaii
County and State

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	X
Public – State	☐
Public – Federal	☐

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☐
Site	☐
Structure	X
Object	☐

Hanapepe Road Bridge | Kauai Hawaii
Name of Property | County and State

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
		sites
1		structures
		objects
1		Total

Number of contributing resources previously listed in the National Register None

6. Function or Use Historic Functions
(Enter categories from instructions.)

Transportation/Road Related
Bridge

Current Functions
(Enter categories from instructions.)

Transportation/Road Related
Bridge

7. Description

Architectural Classification

(Enter categories from instructions.)
Other: Concrete Deck Girder

Materials: (Enter categories from instructions.)
Principal exterior materials of the property: concrete

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 Hanapepe Road Bridge traverses the Hanapepe River, connecting one side of the town of Hanapepe to the other. It is a single lane, concrete, deck girder bridge, which is 194' long and 18' wide from curb-to-curb. The four span bridge runs east-west over the river and has an elevated, concrete walkway on its *makai* (south) side. Although it is situated in a commercial area, it has a tranquil setting, as it is now on a secondary road, the result of the 1938 belt highway [now Kaumualii Highway], with its own historic bridge, bypassing Hanapepe and handling the majority of the traffic. On both the up and down stream sides of the bridge levees form the banks of the river to provide flood control. The bridge is in fair condition, and retains its historic integrity of design, materials, workmanship, setting, location, feeling and association.

Narrative Description

The Hanapepe Road Bridge carries Hanapepe Road over the Hanapepe River. This reinforced concrete, deck girder bridge has a four span concrete deck, which is 194' long with a curb to curb deck width of 18'. The deck has an asphalt overlay, and a 6" waterline mostly buried in fill and AC runs along the inside of the north parapet.

The superstructure consists of two concrete girders that support transverse, reinforced concrete floor beams, which are spaced 5' on center. The two girders also serve as the parapets. The 3' high parapets are solid, with the *mauka* parapet surmounted by an approximately 10" high, 2' - 3" wide, beveled cap and the *makai* by a concrete walkway. The date "1911" is incised at both ends and in the middle of the *mauka* parapet, and on the west end of the *makai* parapet.

Three concrete piers, approximately 48'- 6" apart, support the superstructure. The impressions from their wood formwork are readily apparent on the piers, as well as both faces of the parapets. All three piers are submerged in water from 1.5' to 10' deep. The bridge is also supported by concrete abutments with concrete rubble masonry wing walls on both the upstream and downstream sides.

A 4'-8" wide concrete sidewalk was added along the top of original downstream (*makai*) parapet in 1927. A steel frame supports the concrete sidewalk as it extends out over the water on the downstream side of the bridge. Steel knee braces support the frame and are bolted into the downstream parapet's fascia. The sidewalk is a 4" thick concrete slab, reinforced with square rebars spaced 4" on center in the transverse direction. A straight run of eight concrete steps access the walkway from the east and at the west end a set of nine concrete steps running perpendicular to the bridge serve a similar function. A 2.5" diameter pipe railing is mounted to both sides of the concrete sidewalk and its steps.

The east approach to the bridge features a low concrete approach wall on the *mauka* side, and a low masonry rubble wall on the *makai* side. A sidewalk runs up to the elevated walkway's steps. The levee's southeast concrete wall ties into the masonry rubble approach wall. The west approach to the bridge has no approach walls, and the Seto building, which is listed in the Hawaii Register of Historic Places, sits next to the bridge on its *mauka* side.

The Hanapepe Road Bridge retains its historic integrity. The elevated walkway was constructed in 1927 and is over fifty years of age, having achieved historic significance in its own right.

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.)

[X] 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.

[X] 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

Areas of Significance

(Enter categories from instructions.)

Transportation
Engineering

Hanapepe Road Bridge | Kauai Hawaii
Name of Property | County and State

Period of Significance
1911-1927

Significant Dates
1911, 1927

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation
N/A

Architect/Builder
Engineer: Joseph H. Moragne
Builder: George R. Ewart, Jr. and T. Brandt

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 Hanapepe Road Bridge is historically significant at the local level under criterion A for its associations with the development of land transportation on Kauai in the early twentieth century. It is also significant at the state level under criterion C as an excellent and rare example of a reinforced concrete deck girder bridge in Hawaii.

The 1911-1927 period of significance was chosen as this was when the bridge was completed and when the elevated walkway was added.

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

The Hanapepe Road Bridge is significant for its contributions to the development of Kauai's transportation system, and the inception of the Kauai Belt Road.

Following the annexation of Hawaii by the United States in 1898, the Organic Act of 1900 abolished the Islands' Department of the Interior, and charged the newly formed Office of the Superintendent of Public Works to oversee the expenditure of territorial funds for road and bridge work. In 1905, with the establishment of county governments, these local jurisdictions were granted the power to tax and spend, as well as the responsibility to build and maintain their roads and bridges. However, the counties still relied heavily upon the territorial, and in turn the federal, government for funding for internal improvements.

To aid such endeavors the 1911 Territorial Legislature passed Act 166 which allowed for the issuance of territorial bonds for the purpose of developing belt highways on each of the main islands. Loan Commissions, comprised of the County Superintendent of Public Works, the chair of the County Board of Supervisors, and three residents of an island, were formed for each of the counties and given the responsibility of overseeing the expenditure of the bond moneys allocated to the County. Prior to the establishment of the federal aid program for highways in 1925, bridges along the belt highways in Hawaii were designed by county engineers using moneys awarded by the Loan Commissions. Each County had its own bridge design capability within the County Engineer's Office.

The 1911 Territorial Legislature appropriated $100,000 for Kauai's Belt Road and bridges. The Hanapepe Road Bridge was the first erected on Kauai with these funds and contributed to the development of the county's belt road plan which connected the previously isolated communities on Kauai's west and east sides with a paved highway and a series of concrete bridges. The Hanapepe Road Bridge is one of five bridges constructed by this 1911 program to remain in operation, and the only one on Kauai's west side. Only two other bridges associated with the early expansion of the belt road up the island's west side remain standing, Wailana Bridges #3 and # 4, on Maluhia Road. Both of these bridges are simple concrete slab bridges which have been widened and were built with County funds in 1910. These two are the only bridges on Kauai older than the Hanapepe Road Bridge.

Prior to this concrete deck girder bridge a metal truss bridge spanned the Hanapepe River at this location. The County was in the process of replacing

this bridge, when the Territorial funding became available leading to the County using the Belt Road moneys to construct the bridge. The bridge was built on the former bridge's abutments. County Engineer J. H. Moragne prepared the plans and specifications for the bridge's reinforced concrete superstructure and piers. The contract was awarded to George R. Ewart, Jr. and T. Brandt for the low bid of $11,950 in August 1911, and the bridge was completed in March 1912. The *Garden Island* predicted the bridge would be "a handsome piece of concrete architecture," [*Garden Island*, July 25, 1911, p. 1] and upon its completion rightfully declared it was without equal on Kauai [*Garden Island*, March 5, 1912, p. 1]. The distinctive elevated 1927 sidewalk addition was designed by the County Engineer of that time, R. L. Garlinghouse at a cost of $2,600.42. It is the only known example of such a bridge walkway to remain in Hawaii.

The bridge is also significant as an excellent example of an early twentieth-century reinforced concrete deck girder bridge.

The first reinforced concrete girder bridges were built in France circa 1893, and the earliest known bridges of this type appeared in the United States during the opening decade of the twentieth century. In the 1910s, several state highway departments issued standardized plans for concrete girder bridges, with Maryland's State Roads Commission including a design for a through girder bridge in their state's first standard bridge plans in 1912. Although girder bridges were common from the 1910s through the 1930s, this form was usually employed on shorter bridges. The use of concrete girders faded during the 1940s and post-World War II period in favor of steel I-beam and pre-cast concrete spans due in part to the cost of scaffolding and formwork.

Reinforced concrete girder bridges generally consist of cast-in-place, monolithic decks and girder systems. The primary members of a girder bridge are the girders, the deck, and, in some cases, such as the Hanepepe Road Bridge, floor beams. The deck does not contribute to the strength of the girders and only serves to distribute live loads to the girders. If floor beams are used, they are part of the superstructure and not the deck. The girders extend above the deck, to form the bridge's parapets. This arrangement of members makes it virtually impossible to widen a girder bridge. As a result, most bridges built in this manner have been replaced because their roadway widths were too restrictive for the safety of modern traffic.

The Hanapepe Road Bridge is the oldest reinforced concrete deck girder bridge in the islands and also the longest bridge of its type in the state. With a maximum span of forty-eight feet and a total length of almost two hundred feet, the bridge was significantly larger and more technically complex than other bridges constructed during this period. The only other surviving concrete deck girder bridge on Kauai, and in the state, is the single span Nawiliwili Bridge with its dual travel ways, which was completed in 1920.

Designed by Joseph Hughes Moragne, Kauai's County Engineer, the Hanapepe

Road Bridge is an early example of the use of formal engineering expertise in bridge making in Hawaii Of all the early bridge engineers in Hawaii, Moragne is considered to have produced the most technologically innovative work for his time.

Moragne, was born and educated in Alabama. Prior to his arrival in Hawaii in 1898, he served in the U.S. 2nd Regiment, 5th Engineer Battalion during the Spanish-American War. He worked with the Territorial Survey Department on the island of Hawaii and the Territorial Department of Public Works before moving to Kauai to become the that islands' first County Engineer in 1907. Moragne introduced the use of reinforced concrete for bridges on Kauai beginning in 1909 with the Huleia Cane Haul Bridge, the earliest known reinforced concrete bridge in the territory. He also engineered the Kauai Belt Road, which was constructed from 1910-1920, and engineered the Kokee irrigation system. In addition to the Hanapepe Road Bridge, extant bridges designed by Moragne for the belt highway include: the Waioli Bridge (concrete through girder, 1912), the Waipa Stream Bridge (concrete T-Beam, 1912), Waikoko Stream Bridge (concrete through girder, 1913), and the Hanalei River Bridge (steel truss, 1912), all of which were part of the belt highway on Kauai's eastern shore. In 1919 this talented engineer left the County to work for Lihue Plantation. Under their employ he designed numerous irrigation ditch systems, as well as the Hanalei and Kaapoko Tunnels, which were 6,028 feet and 3,558 feet long, respectively. He retired from the plantation in 1937.

Thus the Hanapepe Road Bridge is significant not only as a rare west side reminder of the early efforts to construct a Belt Highway on Kauai, but also for its concrete deck girder design. It is the oldest and longest concrete deck girder bridge in the State and may possibly be one of the few bridges of this type and length to survive throughout the United States.

9. Major Bibliographical References

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

Garden Island, "Belt Road Commission Holds Preliminary Meet", May 16, 1911, page 1

Garden Island, "Supervisors Meet", June 13, 1911, pages 2 and 6

Garden Island, "Supervisors' Monthly Report", July 18, 1911, page 1

Garden Island, "Loan Commission", July 26, 1911, page 1

Garden Island, "County Fathers in Their Usual Meeet [sic]", August 8, 1911, page 1

Garden Island, "Tenders, Concrete Bridge", August 8, 1911, page 6

Garden Island, "Loan Fund Meets", September 26, 1911, page 6

Garden Island, "Loan Fund Men Praised", January 9, 1912, page 1

Garden Island, "New Bridge is Pau", March 5, 1912, page 1

Garden Island, "Civil Engineer Joseph H. Moragne," April 21, 2013.

Hawaii Heritage Center and School of Architecture, University of Hawaii, *State of Hawaii Historic Bridge Inventory and Evaluation*, Honolulu: Department of Transportation, 2008

KAI Hawaii, *Inspection Report, Bridge Inspection and Appraisal, Bridge Number 007190071119004 Hanapepe Bridge*, Lihue: County of Kauai Department of Public Works, 2007

Parsons Brinckerhoff and Engineering and Industrial Heritage, *A Context for Common Historic Bridge Types*, Washington D. C.: National Cooperative Highway Research Program, Transportation Research Council and National Research Council, 2005

MKE and Fung Associates, *State of Hawaii Historic Bridge Inventory and Evaluation*, Honolulu: Department of Transportation, 2013

Spencer Mason Architects, *Historic Bridge Inventory: Island of Kauai*, Honolulu: State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration, 1989.

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 # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

__X_ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
____ University
____ Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property ___less than one acre_____

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates
Datum if other than WGS84:_____Bing Maps_____
(enter coordinates to 6 decimal places)
Latitude: 21.910163 Longitude: 159.590084

Or
UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

1. Zone:	Easting:	Northing:
2. Zone:	Easting:	Northing:
3. Zone:	Easting:	Northing:
4. Zone:	Easting :	Northing:

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

The property being nominated includes all the property owned by the County of Kauai in 2017 as described by the portion of Tax Map Key (4)-1-9-011: 999 which extends over the Hanapepe River.

Boundary Justification (Explain why the boundaries were selected.)

This is the parcel of land associated with this bridge since its construction.

11. Form Prepared By

name/title: Fung Associates
organization:
street & number: 1833 Kalakaua Avenue, Suite 1008
city or town: Honolulu state: Hawaii zip code: 96815
e-mail: projects@funghawaii.com
telephone: (808)-941-3000
date: September 15, 2017

Additional Documentation

Submit the following items with the completed form:

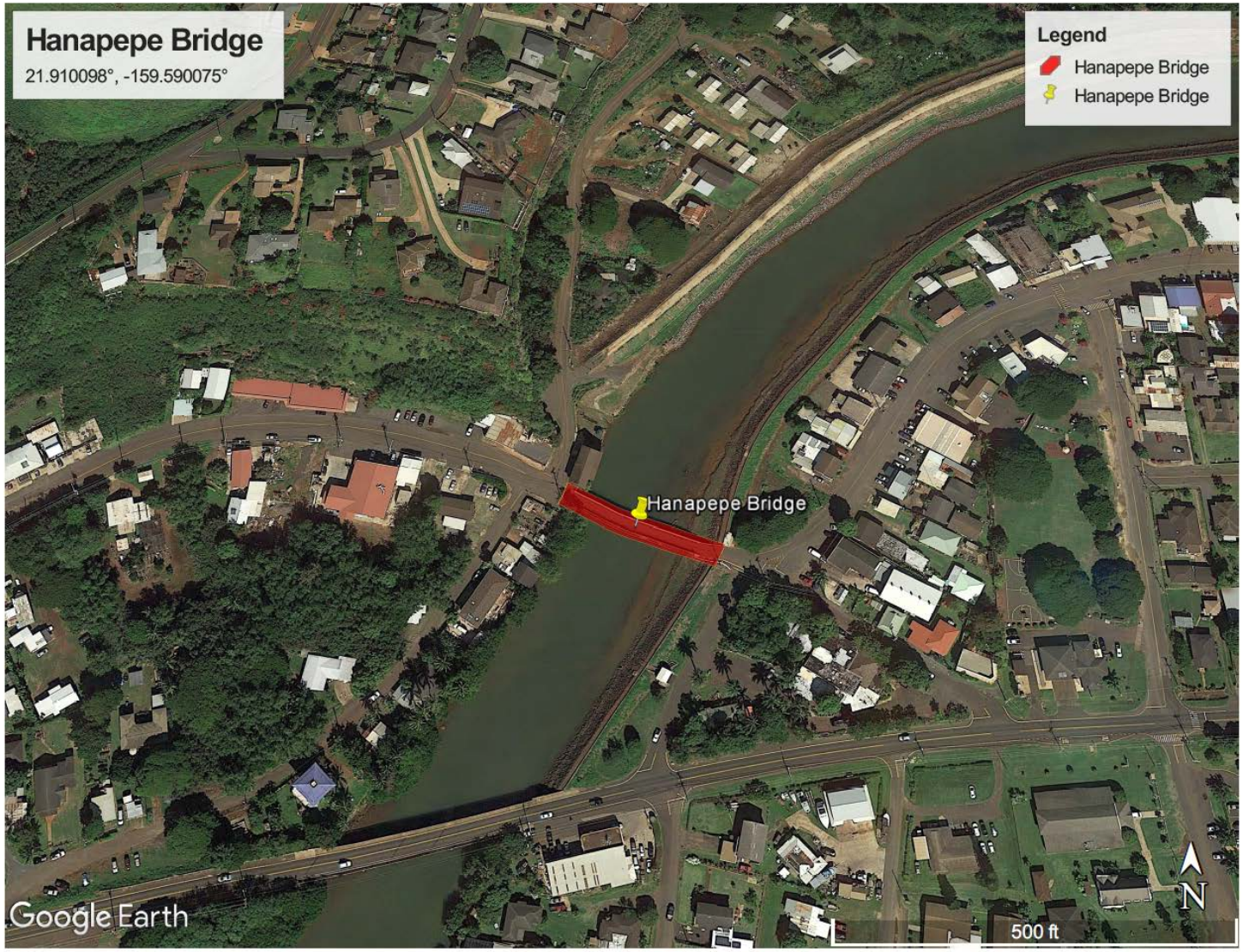
- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:**
- **Owner:** County of Kauai
  Department of Public Works
  4444 Rice Street, # 175
  Lihue, Hawaii 96766

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 100 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management. U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

USGS Map 1


Hanapepe Bridge
21.910098°, -159.590075°
Legend
Hanapepe Bridge
Hanapepe Bridge
Hanapepe Bridge
Google Earth
Image © 2017 DigitalGlobe
N
2000 ft

USGS Map 2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Legend
Hanapepe Bridge
Hanapepe Bridge
Hanapepe Bridge
Google Earth
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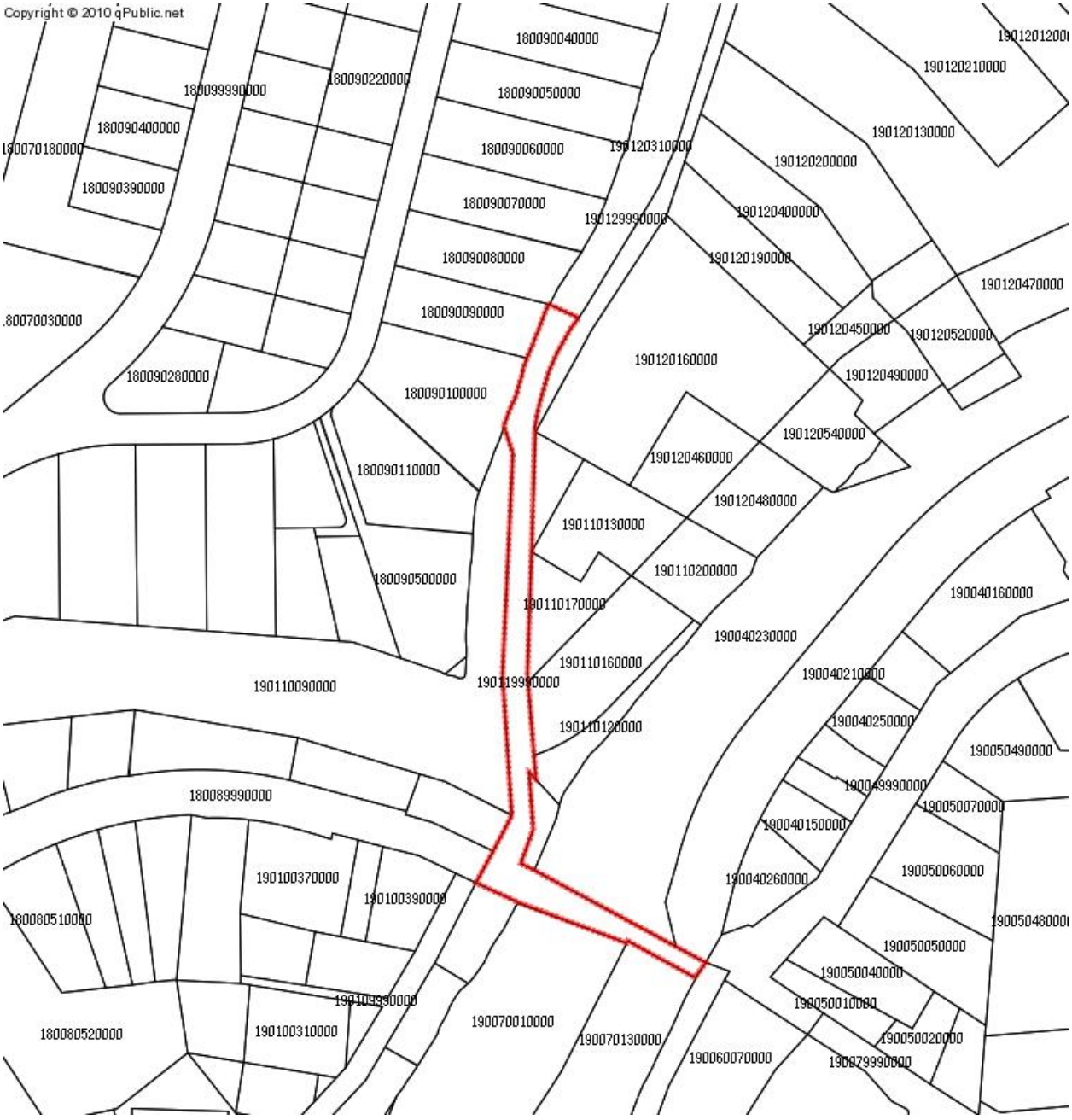
TMK Map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Elevations

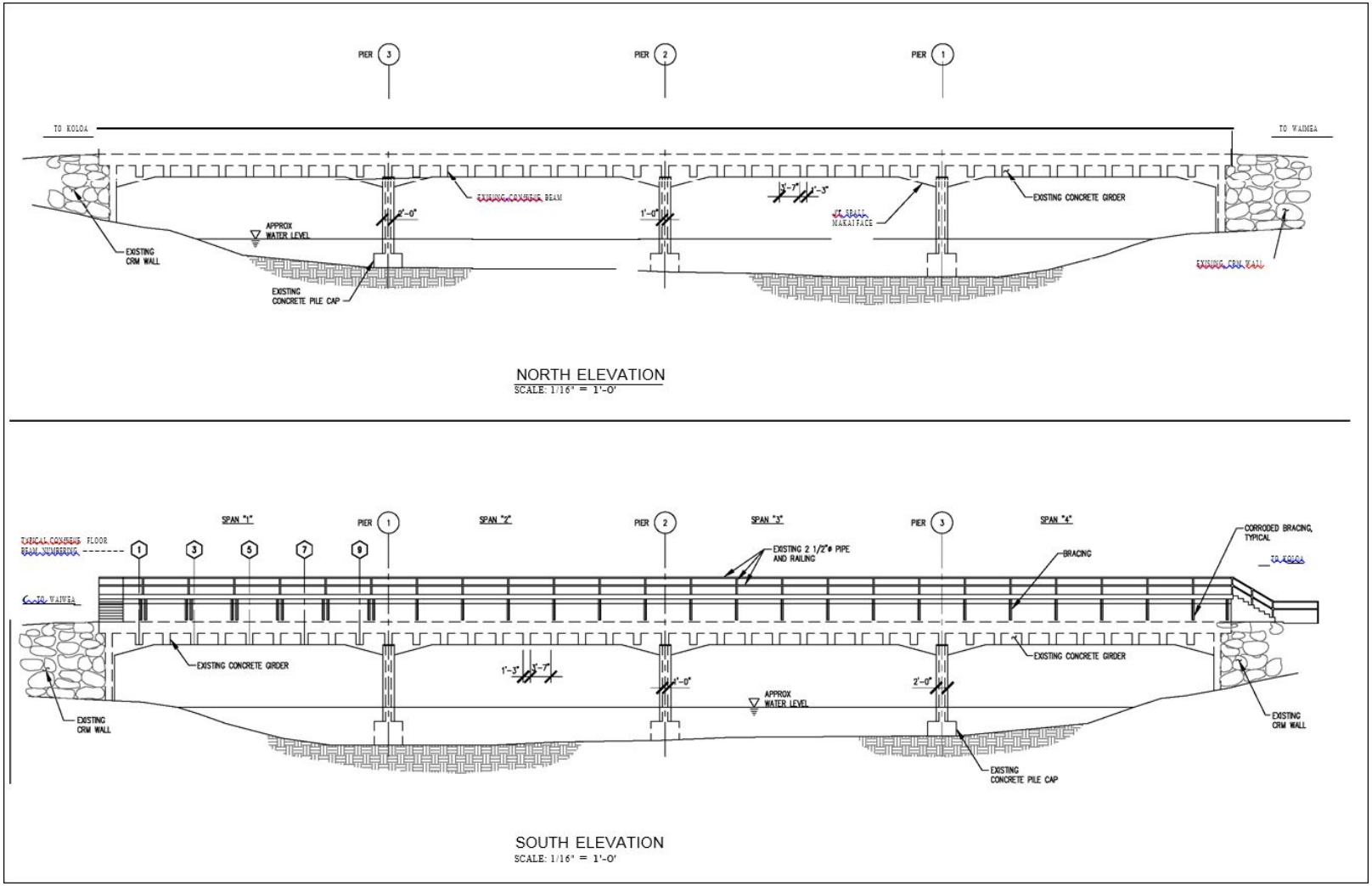
PIER 3
PIER 2
PIER 1
TO KOLOA
TO WAIMEA
EXISTING CONCRETE BEAM
EXISTING CONCRETE GIRDER
APPROX WATER LEVEL
EXISTING CRM WALL
EXISTING CONCRETE PILE CAP
NORTH ELEVATION
SCALE: 1/16" = 1'-0"
SPAN "1"
SPAN "2"
SPAN "3"
SPAN "4"
EXISTING 2 1/2"ø PIPE AND RAILING
BRACING
CORRODED BRACING, TYPICAL
TO WAIMEA
SOUTH ELEVATION
SCALE: 1/16" = 1'-0"

Photo Log

Name of Property: Hanapepe Road Bridge

City or Vicinity: Hanapepe

County: Kauai State: Hawaii

Photographer: Don Hibbard

Date Photographed: December 7, 2015

View of the downstream side from the south

1 of 5



Photo Log

Name of Property: Hanapepe Road Bridge

City or Vicinity: Hanapepe

County: Kauai State: Hawaii

Photographer: Don Hibbard

Date Photographed: December 7, 2015

View of the west approach from the west

2 of 5



Photo Log

Name of Property: Hanapepe Road Bridge

City or Vicinity: Hanapepe

County: Kauai State: Hawaii

Photographer: Don Hibbard

Date Photographed: December 7, 2015

View of the east approach from the east

3 of 5



Name of Property: Hanapepe Road Bridge

City or Vicinity: Hanapepe

Photo Log

County: Kauai State: Hawaii

Photographer: Don Hibbard

Date Photographed: December 7, 2015

View of the upstream parapet from the southeast

4 of 5



Photo Log

Name of Property: Hanapepe Road Bridge

City or Vicinity: Hanapepe

County: Kauai State: Hawaii

Photographer: Don Hibbard

Date Photographed: December 7, 2015

View of the downstream parapet and walkway from the northeast

5 of 5



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 Property

Historic name: _Kauaʻi Belt Road (North Shore Section) (Additional Documentation)
Other names/site number: _Kūhiō Highway, Hawaiʻi Route 560
Name of related multiple property listing**:**

_____
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Hawaiʻi Route 560
City or town: Princeville, Hanalei, Wainiha, Hāʻena_ State: Hawaiʻi_ County: Kauaʻi_____
Not 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 ___local
Applicable National Register Criteria:

___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**

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	X
Public – Federal	☐

Category of Property

(Check only **one** box.)

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

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
3		sites
11	5	structures
		objects
14	5	Total

Number of contributing resources previously listed in the National Register 15

6. Function or Use

Historic Functions

(Enter categories from instructions.)

Transportation: road-related

Current Functions
(Enter categories from instructions.)
Transportation: road-related

7. Description

Architectural Classification
(Enter categories from instructions.)
Other: Roadway
Other: Bridge, Pratt and Warren through truss
Other: Bridge, reinforced concrete/slab
Other: Culvert, pipe/box
Other: Ford (crossing)

Materials: (enter categories from instructions.)
Principal exterior materials of the property: Asphalt, Metal (steel), Concrete, Wood, Stone (lava rock)

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 Kauaʻi Belt Road (North Shore Section), constructed beginning in 1900, is an approximately 10-mile section of Hawaiʻi State Route 560 that traverses Kauaʻi's North Shore between Princeville and Hāʻena State Park. The two-lane road, named Kūhiō Highway, is generally characterized by a curvilinear path over an undulating landscape, narrow bridges and culverts that carry the roadway over water crossings, and numerous pull-offs and side roads that allow for access to scenic, historic, cultural, community, and agricultural areas. Importantly, the road

provides connectivity between communities on the North Shore as the primary transportation route along its east-west route. The roadway is paved with asphalt, marked with Hawaiʻi Department of Transportation (HDOT) standard signage, and features intermittent retaining walls, guardrails, or pylons to provide safety to users.

Following devastating storms in April 2018 that impacted local communities for months and severely damaged the road, HDOT, in coordination with the Federal Highway Administration (FHWA), proposed a series of repairs and improvements to Kūhiō Highway that included modifications to the National Register of Historic Places (NRHP)-listed Kauaʻi Belt Road (North Shore Section). A finding of adverse effect under Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) resulted in preparation of a memorandum of agreement to mitigate the adverse effect.[1]

This documentation was prepared in fulfillment of Stipulation V of the *Memorandum of Agreement among the Federal Highway Administration, the Hawai'i State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the Kaua'i Emergency Flood Repairs and Cleanup at Various Locations April 2018, Districts of Halelea and Wailua, Kaua'i, Hawai'i* (MOA).

The MOA states:

> Within 12 months of execution of this MOA, HDOT shall initiate an update to the Kauaʻi Belt Road National Register (NR) Nomination Form to address changes since the district was listed in the National Register of Historic Places. The NR update shall be completed by a preservation professional meeting the SOI Standards for Historian, Architectural Historian or Historic Architect. HDOT shall submit the draft update to SHPO within 18 months of initiating the update of the nomination form.

This documentation is intended to supplement the existing 2004 NRHP registration form for the Kauaʻi Belt Road (North Shore Section) by updating its contributing and noncontributing resources, describing a new area of significance, providing additional historic context, and consequently amending its period of significance. Furthermore, the narrative description offers a detailed discussion of the Kauaʻi Belt Road's setting and its importance to the North Shore communities.

Descriptions of the Kauaʻi Belt Road (North Shore Section) exist in prior documentation prepared to evaluate the roadway's NRHP eligibility in 1976 and eventual NRHP listing in 2004. Individual resources identified as contributing or noncontributing in the 2004 NRHP registration form are identified in bold within the narrative description provided below at their first mention.[2] As in prior documentation, physical descriptions of the Kauaʻi Belt Road and its environs provide a current assessment at the time of the documentation's preparation; a discussion of

[1] Implementing regulations for the Section 106 process are found at 36 C.F.R. § 800.
[2] While entered into the NRHP in 2004, the Kaua'i Belt Road (North Shore Section) NRHP registration form was completed April 8, 2002.

changes to the Kaua'i Belt Road that occurred after preparation of its existing NRHP registration form are also included in this documentation.

Narrative Description

Physical Description

The **Kaua'i Belt Road (North Shore Section)** begins in Princeville at Mile Post (MP) 0 where a HDOT sign notifies users of the end of Hawai'i State Route 56 and the beginning of State Route 560. At this point, the road width is reduced through the elimination of a central median and narrowing of shoulders. The road passes by the Princeville Center shopping center where standard HDOT signage notifies travelers in both directions of a "SCENIC AREA," namely the **Hanalei Valley Scenic Overlook (Hanalei Valley Lookout)**, which provides views mauka across Hanalei Valley and toward the Hanalei National Wildlife Refuge. The overlook includes a pull-off area and timber guardrails. Signs mark ADA accessible parking spaces and U.S. Fish and Wildlife Service informational signage describes aspects of the refuge.

As the road continues past the overlook, it remains narrow while tall grasses and low trees encroach the alignment. The belt road then begins a modest descent, passes several residences, and is lined by a continuous W-beam guardrail on its makai side as the road veers right before a sharp, hairpin turn to the left around a projecting ridge. At the turn, the roadway widens and features a pull-off on the makai side for the Hanalei Bay Overlook (Hanalei Bay Lookout) atop Hanalei Hill, which provides views makai toward Hanalei and Hanalei Bay. The overlook contains a parking area and is lined by a W-beam guardrail that continues downhill from the overlook as the roadway descends toward the Hanalei River along the Hanalei Grade. The ridge's exposed, steep-cut slopes form a constricted path for the roadway as it approaches the river.

At the base of the ridge, the road turns right to cross the **Hanalei Bridge** at approximately MP 1.2. The single-span truss bridge features timber decking that carries the roadway along the bridge. Modest coping lines the bridge abutments which extend along the roadway and turn toward the right to transition to a low, lava rock wall. The roadway then follows alongside the Hanalei River, winding its way through Hanalei Valley, while extensive taro fields fill the mauka side of the road. Hanalei Valley's relatively level landscape provides expansive views across the fields and toward mountains in the island's interior. Access into the valley's taro fields is provided by numerous unmarked openings from the road for agricultural equipment and farmers; many access points are not gated.

Between MP 1.2-2, the road passes over a series of culverts that include concrete or rubble masonry headwalls usually lined on the interior by W-beam guardrails. At MP 2, the road crosses **Culvert #1,** a box culvert with concrete headwalls and W-beam guardrails that line the roadway. The road then continues to follow the Hanalei River before curving left near MP 2.3 as it enters Hanalei town. In Hanalei, the roadway is characterized by numerous curb cuts that provide access to one- and two-story commercial and residential buildings lining the roadway.

Culvert #2 at MP 2.4 features concrete headwalls with a low rise above the roadway. **Culvert #3** at MP 2.6 features concrete headwalls with a similar low profile; a lava rock retaining wall defines the stream channel on the makai side of the roadway. Beyond Culvert #3, the road widens to include turning lanes for Aku Road and the Hanalei Center. Beyond the Hanalei Center, the road again narrows to two lanes.

Near MP 3, the road enters the Wai‘oli Mission District, which provides intermittent views of the Wai‘oli Valley. The road widens to include a turning lane for Hanalei Elementary School on the mauka side of the roadway before once again narrowing to two lanes. The road continues through the town before meeting the **Wai‘oli Bridge** at the western end of Hanalei near MP 3.4. Wai‘oli Bridge crosses Wai‘oli Stream as a single-span, single-lane concrete structure with concrete abutments and sidewalls topped with coping.

Beyond the bridge, the road curves toward the right around the Makaihuwa‘a ridge, which is flush with vegetation, before once again revealing agricultural views in the Waipā Valley. Low fences, some covered with climbing vines or hidden with shrubs and grasses, line the roadway’s mauka side. At MP 3.9 is the **Waipā Bridge**, a single-span, single-lane concrete structure with concrete abutments and sidewalls topped with coping. At this juncture, the belt road’s distance to the shore is reduced, affording a passing glimpse of Hanalei Bay while crossing Waipā Bridge. The shoreline comes into full view at MP 4, where a dirt pull-off area on the makai side of the roadway allows parking and access to a small beach on Hanalei Bay. At this location, the roadway rests only a few feet above the shoreline. From there, the road continues along the shore and crosses the **Waikoko Bridge** near MP 4.2. The bridge is a single-span, single-lane concrete structure with concrete abutments and sidewalls topped with coping and spanning Waikoko Stream.

Past the bridge, the road continues to wind around Pu‘u Kamanu’s steep ridge and alongside paved and unpaved shoulders that provide access to and views across Hanalei Bay. The road moves slightly inland from the shore to Makahoa Point. A partially paved pull-off near MP 4.7 serves as the Makahoa Point Lookout. Adjacent available roadway shoulders are utilized as a parking area for Waikoko Beach and Lumaha‘i Beach. Portions of the parking area are bordered by remnants from a lava rock wall. The roadway then turns sharply to the left and continues on a steady, serpentine incline above the beaches below. Additional paved pull-off areas provide views from the Lumaha‘i Beach (East) Lookout at MP 5.3 while mauka views comprise a rocky outcropping. This roadway section is constructed on a steep ridge where concrete walls with incised lines, intended to replicate lava rock stonework, help prevent erosion and add safety to the curvilinear road in this area. Further along this stretch, a lava rock stone wall segment has been incorporated into concrete drainage channels on the roadway’s makai side. The road continues to wind around the ridge, past two paved pull-offs lined with W-beam guardrails that comprise the Lumaha‘i Beach (West) Lookout at MP 5.4. Beyond the second pull-off, the roadway begins a winding descent with S-bends around exposed rock faces. After a turn to the right, the roadway straightens and vegetation clears to afford views mauka of the Lumaha‘i Valley. On the roadway’s makai side is the west end of Lumaha‘i Beach, which is now nearly level with the roadway and accessed via an unpaved parking area.

After the parking area at approximately MP 6 is **Lumaha‘i Bridge**, a curved, two-lane, multi-span bridge with concrete curbs and rounded steel railings. It features concrete abutments and a concrete deck that spans the Lumaha‘i River. Once over the bridge, the roadway passes Kolokolo Point and curves to continue following the shoreline along Wainiha Bay from a slightly elevated position. Gaps between trees on the roadway's makai side offer views toward the water. As Wainiha Beach comes into view, a paved pull-off and low lava rock wall line the roadway before it turns sharply to the left; concrete Jersey barriers line the curve. After the curve, the road descends into Wainiha and the Wainiha Valley. In the village at MP 6.5, the road passes over **Wainiha Bridge #1**, a single-lane, ACROW temporary modular steel truss bridge lined with W-beam guardrails. The bridge affords views of the Wainiha River and Wainiha Beach before residential and commercial buildings in Wainiha appear alongside the roadway. Wainiha is characterized by one- and two-story buildings near the roadway with a variety of fences used to delineate yards. Shrubs are often used as screening along the road, which bends slowly to the left through the village.

West of Wainiha, the road curves to the right to cross the Wainiha River at approximately MP 6.7 over **Wainiha Bridge #2** and **Wainiha Bridge #3**, each a single-lane, ACROW temporary modular steel truss bridge lined with W-beam guardrails. A thin strip of land in the Wainiha River provides a landing for Wainiha Bridge #2 prior to the beginning of Wainiha Bridge #3. After the river crossing, the roadway begins a slow right bend to return toward the shoreline. After passing Wainiha Beach Park, which is accessible via a dirt road, the road begins a modest ascent to maneuver around a ridge extending from Puunopili. A sharp left turn at MP 7 provides a small pull-off with views of Wainiha Bay. Around the curve, the road travels alongside a beach as it straightens toward Hā‘ena.

A left bend in the road at approximately MP 7.5 carries it over **Hā‘ena Bridge #1**, a single-lane, single-span concrete bridge with low concrete sidewalls and a concrete deck. After the bridge, the road continues through Hā‘ena. The village features one- and two-story residential and commercial buildings with varied setbacks. Many parcels feature dense landscaping along the road that provides additional privacy; others have fences to delineate property boundaries. In areas where roadside vegetation is sparse, views along the roadway provide glimpses of Makana rising in the distance. At approximately MP 8.6, the road bends left as it approaches the shoreline of Maniniholo Bay, passes the Tunnels Beach access road, and crosses **Hā‘ena Bridge #2**. The bridge is a narrow, single-span, two-lane bridge lined with W-beam guardrails.

Past the bridge, the road continues slightly inland from Maniniholo Bay, which is not visible from this roadway segment. The road continues toward a nearby ridge and bends toward the right to cross **Mānoa Ford** at MP 8.8. The ford crossing is a narrow, depressed, and paved roadway segment designed to allow Mānoa Stream to flow over the road. Beyond the ford is the Maniniholo Dry Cave beneath an exposed rock outcropping on the roadway's mauka side, while the makai side features Hā‘ena Beach Park and its wide, grassy lawn and unpaved parking area lined with lava rocks. The road follows the shoreline around the park, beginning a modest ascent near MP 9 before turning left around a low ridge. As the road straightens, it is lined with lava

rocks while providing views toward the beach and Maniniholo Bay. The roadway then makes a gradual left bend and begins a serpentine path through lush vegetation while moving inland from the shore and toward the Limahuli Valley.

As the road continues to wind, the pointed peak of Makana becomes highly visible and the vegetation gradually thins alongside the road. After passing the Limahuli Garden and Preserve, National Tropical Botanical Garden, the road crosses **Limahuli Culvert** at MP 9.6. The culvert comprises a single-lane, concrete slab over Limahuli Stream. Past the culvert, the roadway continues through a lush forest canopy to reach Hāʻena State Park and its Kēʻē Beach parking area. The road follows around a ridge and past a small taro farm and small concrete box culvert on its makai side. Just beyond the farm is a pull-off area for Waikapalae, a wet cave on the roadway's mauka side. From here, the roadway continues a winding path to another parking area within Hāʻena State Park and ends at MP 10, which includes informational signage, the start of the Kalalau Trail, and beach access.

Setting

Since its formation millions of years ago, Kauaʻi, the oldest of Hawaiʻi's major islands, has slowly been eroded by relentless storms and seas battering the island's porous lava-formed topography. Over time, this phenomenon created a North Shore coastline replete with wide valleys and crescent beaches framed by ridges and cliffs that dive into the ocean. Rivers and streams crisscrossing the landscape empty into a Pacific Ocean perpetually forming storms that inundate the island, a cyclic ritual that continues to shape Kauaʻi, its North Shore, and the communities and residents that call this area home. The Kauaʻi Belt Road, an early footpath-turned-roadway, navigates the North Shore along a narrow two-lane road that allowed for early agricultural expansion into these valleys, and importantly, connected communities to one another. But the Kauaʻi Belt Road achieves more than access to its users. Its serpentine movements, lush vegetation, formidable cliffs and slopes, and narrow bridges calm traffic and provide opportunities for users to absorb the naturalistic elements surrounding the road. By maintaining the road's general appearance since the early twentieth century, including its alignment and single-lane bridges, the road has also had a limiting effect on North Shore development in addition to preservation of its agricultural and rural traditions. The result is a ten-mile stretch with distinct sights and sounds and a feeling unique to this area of Kauaʻi.

Sensory Elements of the Kauaʻi Belt Road

As described in the 2004 NRHP registration form, the Kauaʻi Belt Road features a "rural coastal setting" with "scenic views throughout its course, including beaches, ocean, mountains, waterfalls, vernacular architecture, native and exotic vegetation, and traditional landscapes." These character-defining features are integral to the Kauaʻi Belt Road's setting. Setting is one of seven aspects of integrity used to assess a historic property's physical characteristics that existed during the period of significance. NRHP guidance explains:

> Setting is the physical environment of a historic property. Whereas location refers to the specific place where a property was built or an event occurred, setting refers to the character of the place in which the property played its historical role. It involves how, not just where, the property is situated and its relationship to surrounding features and open space.
>
> Setting often reflects the basic physical conditions under which a property was built and the functions it was intended to serve. In addition, the way in which a property is positioned in its environment can reflect the designer's concept of nature and aesthetic preferences.
>
> The physical features that constitute the setting of a historic property can be either natural or manmade, including such elements as: topographic features (a gorge or the crest of a hill); vegetation; simple manmade features (paths or fences); and relationships between buildings and other features or open space.
>
> These features and their relationships should be examined not only within the exact boundaries of the property, but also between the property and its surroundings. This is particularly important for districts.[3]

However, for the Kaua'i Belt Road, understanding its setting moves beyond mere physicality; additional sensory elements, including sounds and a dynamic landscape, are integral to understanding how setting informs its significance. This approach to significance requires evaluating a historic property like the Kaua'i Belt Road with an understanding that associative values, which help define a property's significance, are sometimes intangible and often require looking beyond the physical built elements comprising the historic property or its immediate surroundings.[4]

Although much of the Kaua'i Belt Road exhibits a seemingly static setting—replete with lush mountains, wide valleys, ocean views, and small towns—in reality, its setting is a sensory experience in a constantly evolving environment. Vantage points along the roadway allow communities' residents, including fishermen and surfers, the ability to gauge conditions on the water that constantly change due to tradewinds that blow in from the Pacific Ocean and bring passing showers or storms of varying magnitude. The impact of these continuous and unpredictable rainfall events led early Hawaiians to develop over 200 words for the different types of rain that fell across the islands. Because the rains themselves featured their own dynamism, some rain names are specific to Kaua'i and all are "descriptive and highly nuanced."[5] Determining the rain type is one way communities are able to discern whether flooding risks exist: community members will observe ridge and mountain sections near the Kaua'i Belt Road to seek out waterfalls, often harbingers of flooding intensity.[6] The Kaua'i Belt Road's numerous

[3] National Park Service, "How to Apply the National Register Criteria for Evaluation," National Register Bulletin, 1997.
[4] Susan West Montgomery, "Significance Is Always Intangible: An Interview with the Keepers of the National Register," Forum Journal, vol. 31, no. 1-2, Fall 2016/Winter 2017.
[5] Matthew Dekneef, "Hawaiians Have More Than 200 Words for Rain," Hawai'i Magazine, March 4, 2016.
[6] Dan Wheat, "Challenges in Paradise," Capital Press, November 15, 2013.

streams and rivers notoriously flood the roadway during times of heavy rain, making travel conditions difficult or impossible at times, and mudslides caused by intense rain events continue to shape the landscape, eroding cliff faces and ridges that sometimes destroy sections of the Kaua'i Belt Road.

Sounds along the Kaua'i Belt Road add to the setting's sensory experience. Sea breezes and crashing waves are interspersed by shallow streambeds or periodic waterfalls. Communities along the Kaua'i Belt Road vary between bustling and quiet depending on the day of the week. In agricultural areas, mooing cows in roadside fields or humming farm equipment emphasize the North Shore's rural nature. The roadway itself adds to the surrounding setting's auditory characteristics: tires moving across gravel roadside pull-offs, flanking grasses rustling from passersby, and queuing cars waiting for an opportunity to cross over Hanalei Bridge's audible timber planks. Combined, these elements create a setting that is anything but static to its communities and visitors.

Kaua'i Belt Road and the North Shore Cultural Landscape[7]

The 2004 NRHP registration form also alludes to the Kaua'i Belt Road featuring "one of Hawai'i's finest opportunities to view traditional cultural landscapes." The National Park Service defines a cultural landscape as "a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values."[8] This overarching term is further divided into four types of cultural landscapes, and a single cultural landscape may include one or several of these subtypes: historic designed landscape, historic vernacular landscape, historic site, and ethnographic landscape. Kaua'i's North Shore is both an ethnographic landscape, containing natural and cultural resources that represent the heritage of associated persons, as well as a historic vernacular landscape demonstrating the land's evolution through various uses and people who shaped the landscape.

The Kaua'i Belt Road is one character-defining feature within the North Shore cultural landscape and is a conduit for understanding its development and exploring its historic and cultural attributes that extend over hundreds of years. Significant areas reached by the road include archaeological sites such as the Hā'ena Archaeological Complex (NRHP No. 84000257), which is important for its prehistoric and historic Hawaiian features and connection to Hawaiian

[7] A full study of the North Shore cultural landscape is beyond the scope of this NRHP update. It is recommended that a Cultural Landscape Report be prepared to document the North Shore and all character-defining features as part of a greater land use management plan or update of the existing Kaua'i General Plan or North Shore Development Plan.

[8] National Park Service, "Defining Landscape Terminology," Guidelines for the Treatment of Cultural Landscapes, available at https://www.nps.gov/tps/standards/four-treatments/landscape-guidelines/terminology.htm; Charles A. Birnbaum, "Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes," National Park Service Technical Preservation Service, Preservation Brief 36, September 1994.

narratives involving Pele, Hiʻiaka, and Lohiʻau.[9] The district contains evidence of long-term Hawaiian coastal habitation and a transition to an agrarian livelihood. Agricultural expansion occurred within the Halaleʻa moku where loʻi (holding ponds) irrigated kalo (taro), a staple of the Hawaiian diet with significance in Hawaiian stories.[10] Although the post-contact period expanded agricultural production to a variety of crops in this area, notably rice, taro is still grown across the North Shore and is easily viewed from the Kauaʻi Belt Road in one of the State's premier taro growing regions.

Although modern incursions have occurred on the North Shore, the Kauaʻi Belt Road's relatively later construction, beginning in the early 1900s and not significantly improved until Hanalei Bridge's erection in 1912, had a limiting effect on development in the first decades of the twentieth century. As a result, the Kauaʻi Belt Road also provides access to the North Shore's largely unaltered landscape and previously identified historic properties that survive to the present. These include the Haraguchi Rice Mill (NRHP No. 83000252), Hanalei Pier (NRHP No. 79000757), and the Waiʻoli Mission District (NRHP No. 73000676), the site of an early post-contact permanent mission on Kauaʻi. The North Shore has the potential to yield still undiscovered historic or prehistoric period historic properties: as recently as 2021, a landslide near the Hanalei Bridge exposed tunnels that led to the site of a former mill near the Hanalei River.[11] These prehistoric and historic properties and landscape elements are inextricably tied to and are character-defining features of the North Shore's cultural landscape, within which lies the Kauaʻi Belt Road.

Collectively, these elements comprise the setting of the Kauaʻi Belt Road.

Contributing and Noncontributing Resources

The Kauaʻi Belt Road's contributing resources are those from the district's period of significance that relate to the road's significance and retain sufficient integrity, which is the ability of a property to convey significance. Additionally, NRHP guidance directs contributing and noncontributing counts to include resources of substantial size and scale. As a result, minor roadway elements including small pull-offs and minor culverts are not included in the resource count. Altered resources that are able to convey significance because they were repaired, rehabilitated, or replaced following the Secretary of the Interior's Standards for the Treatment of Historic Properties or the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan* are considered contributing. The following list of resources identifies their contributing and

"[9] Ka ʻimi Naʻauao O Hawaiʻi Nei Institute, "The Heiau Complex at Keʻe, Kauaʻi," available at https://kaimi.org/education/the-heiau/, 2003.
[10] Impact Assessment, Inc., Fishing, Seafood, and Community Research in the Main Hawaiian Islands: A Case Study of Hanalei Bay, Kauaʻi, State of Hawaiʻi Department of Land and Natural Resources, Division of Aquatic Resources, May 2012, 22; Ligaya Mishan, "On Hawaiʻi, the Fight for Taro's Revival," New York Times, November 8, 2019.
[11] ASM Affiliates, Archaeological Inspection and Assessment of Flood- and Landslide-Related Damage along a Portion of the Kauai Belt Road (North Shore Section) National Register of Historic Places (NRHP) Historic District, May 13, 2021.

noncontributing status and provides resource notes to assist in evaluating significance and integrity.

Kauaʻi Belt Road, Princeville to Hāʻena
Contributing
MP 0 – 10

The Kauaʻi Belt Road, Princeville to Hāʻena is one contributing site within the Kauaʻi Belt Road (North Shore Section) historic district. The narrow two-lane road winds along the North Shore on its original alignment, lacks shoulders, features intermittent small pull-offs, and connects communities along its route. Constructed beginning in 1900, the roadway was modified over the years to repair the travel surface; it was extended to reach its current termination at Kēʻē Beach by 1926.

Hanalei Valley Scenic Overlook
Contributing
MP 0

The Hanalei Valley Scenic Overlook is one contributing site within the historic district. It is a wide pull-off and overlook area that provides views of Hanalei Valley and the Hanalei National Wildlife Refuge. It is lined by a timber rail and features signage describing the overlook and its views. The overlook existed by the 1910s and was used as a vehicle pull-off prior to 1950.

Hanalei Bay Overlook
Contributing
MP 0.5

The Hanalei Bay Overlook is one contributing site within the historic district. It is a wide, paved pull-off lined with a W-beam guardrail that provides views toward Hanalei Bay. The overlook predates 1950.

Hanalei Grade
Contributing
MP 0.5 – 1

The Hanalei Grade is one contributing structure within the historic district. It is a modest grade down Hanalei Hill made possible due to a cut slope against the hill. The grade was constructed in approximately 1911-1912 and eliminated a series of road switchbacks that formerly led from Hanalei Hill to the Hanalei River. The Hanalei Grade is currently undergoing repairs following a landslide that occurred in March 2021; these repairs are expected to stabilize the hillside while maintaining the Hanalei Grade on its original alignment and at its current grade.

Hanalei Bridge
Contributing
MP 1.2

The Hanalei Bridge is one contributing structure within the historic district. The bridge is a 113-foot, single-span, single-lane bridge with a superstructure comprising a steel Pratt through truss and Warren truss. Its substructure features concrete abutments while timber decking carries the roadway along the bridge. The bridge was originally constructed in 1912 and upgraded in 1934; the Warren truss was added in 1967. Often viewed as the gateway to the North Shore, the bridge underwent repairs in 1973 and was determined individually eligible for listing in the NRHP in 1978. It again was repaired in 1980 and rehabilitated in 1988. In 2002-2003, the bridge underwent an extensive rehabilitation in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties.

Culvert #1
Contributing
MP 2

Culvert #1 is one contributing structure within the historic district. It is a large, concrete box culvert approximately 15 feet long that was constructed prior to 1950.

Culvert #2
Contributing
MP 2.4

Culvert #2 is one contributing structure within the historic district. It is a large, concrete box culvert approximately 17 feet long with concrete headwalls that modestly rise above the roadbed. It was constructed prior to 1950.

Culvert #3
Contributing
MP 2.6

Culvert #3 is one contributing structure within the historic district. It is a large, concrete box culvert approximately 17 feet long with concrete headwalls that modestly rise above the roadbed. Its stream channel is lined with lava rocks. The culvert was constructed prior to 1950.

Wai‘oli Bridge
Contributing
MP 3.4

Wai‘oli Bridge is one contributing structure within the historic district. The bridge is a three-span, single-lane concrete bridge that extends 90 feet across Wai‘oli Stream atop concrete bents and abutments. It is lined with concrete sidewalls covered with concrete coping. An original

timber bridge was built at this location in 1904 and replaced in 1912 by the existing concrete bridge. It was determined eligible for listing in the NRHP in 1978. In 2019, the bridge was rehabilitated following the Secretary of the Interior's Standards for the Treatment of Historic Properties using a reinforced fiberglass wrap to provide additional strength to the bridge and increase its load limit while preserving its historic, concrete appearance.

Waipā Bridge
Contributing
MP 3.9

The Waipā Bridge is one contributing structure within the historic district. The bridge is a single-lane, three-span reinforced concrete bridge with concrete bents and abutments that extends approximately 140 feet across Waipā Stream. The original timber bridge at this location was constructed in 1904, replaced in 1912 with a concrete bridge that collapsed in 1919, and modified through an extension in 1925. The bridge's design and replacement in 2019 followed consultation with Section 106 consulting parties and adherence to the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*, which balances user safety with historic preservation interests. The result is a new bridge that reflects design considerations of its predecessor, maintains the Kauaʻi Belt Road location over Waipā Stream, and retains the feeling and association of the Kauaʻi Belt Road within the North Shore.

Waikoko Bridge
Contributing
MP 4.2

The Waikoko Bridge is one contributing structure within the historic district. The bridge is a single-lane, single-span reinforced concrete bridge on concrete abutments that extends approximately 70 feet across Waikoko Stream. The original bridge at this location was built in 1904, replaced in 1912 with a concrete bridge, and repaired in 1946 after partially collapsing. Like the Waipā Bridge, the Waikoko Bridge's design and replacement in 2019 followed consultation with Section 106 consulting parties and adherence to the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*, which balances user safety with historic preservation interests. The result is a new bridge that reflects design considerations of its predecessor, maintains the Kauaʻi Belt Road location over Waikoko Stream, and retains the feeling and association of the Kauaʻi Belt Road within the North Shore.

Lumahaʻi Bridge
Noncontributing
MP 6

The Lumahaʻi Bridge is one noncontributing structure. It is an eight-span, two-lane, reinforced concrete bridge with concrete bents and steel railings that extends 535 feet across the Lumahaʻi River. The original steel bridge over the river was built in 1905, reinforced in the 1920s, and collapsed in 1967. The replacement bridge, the existing Lumahaʻi Bridge, was constructed off

the original Kauaʻi Belt Road alignment and with two lanes. Because it does not follow the original design characteristics of the Kauaʻi Belt Road, it is noncontributing.

Wainiha Bridge #1
Noncontributing
MP 6.5

Wainiha Bridge #1 is one noncontributing structure. It is a single-span, single-lane, temporary, modular steel truss ACROW bridge approximately 40 feet long. The original timber bridge at this location was constructed in 1904 and destroyed and replaced twice: in 1946 and 1957. The 1957 bridge was replaced in 2007 with the existing temporary ACROW bridge. Because the bridge is temporary, it is noncontributing.

Wainiha Bridge #2
Noncontributing
MP 6.7

Wainiha Bridge #2 is one noncontributing structure. It is a single-span, single-lane, temporary, modular steel truss ACROW bridge approximately 80 feet long. The original bridge at this location was constructed after 1922 and later destroyed and replaced in 1957. The 1957 bridge was replaced in 2004 with the existing temporary ACROW bridge. Because the bridge is temporary, it is noncontributing.

Wainiha Bridge #3
Noncontributing
MP 6.7

Wainiha Bridge #3 is one noncontributing structure. It is a single-span, single-lane, temporary, modular steel truss ACROW bridge approximately 150 feet long. The original timber bridge at this location was constructed in 1904 and later replaced in 1918. It was repaired in 1946 and partially destroyed in 1957, leading to replacement of one of its spans that year; the span was eventually replaced in 1966. The existing ACROW bridge replaced the 1957-1966 bridge in 2007 along with Wainiha Bridge #1. Because the bridge is temporary, it is noncontributing.

Hāʻena Bridge #1
Contributing
MP 7.5

Hāʻena Bridge #1 is one contributing structure. The 1926 bridge is a single-lane, single-span concrete bridge on concrete abutments featuring low concrete sidewalls. It is approximately 11 feet long and crosses over a small stream.

Hāʻena Bridge #2
Noncontributing
MP 8.6

Hāʻena Bridge #2 is one noncontributing structure. The 1926 bridge is a two-lane, single-span concrete bridge on concrete abutments and rubble masonry wingwalls. The bridge was altered in the 1980s and features W-beam guardrails that replaced its original concrete sidewalls. Due to these alterations, the bridge no longer retains the design characteristics of the Kauaʻi Belt Road and is therefore noncontributing.

Mānoa Ford
Contributing
MP 8.8

Mānoa Ford is one contributing structure. The concrete ford crossing, which allows Mānoa Stream to flow over the roadway, was constructed c. 1928 as part of improvements undertaken to extend the road to Kēʻē Beach. It was repaired in-kind following the April 2018 storm and flood event.

Limahuli Culvert
Contributing
MP 9.6

Limahuli Culvert is one contributing structure. It is a single-lane, two-span, concrete slab culvert with rubble masonry wingwalls and pier. The culvert was repaired in-kind following the April 2018 storm and flood event.

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.)

- [x] 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

Areas of Significance
(Enter categories from instructions.)
Conservation

Period of Significance
1900-2019

Significant Dates

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder

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 Kauaʻi Belt Road's 2004 NRHP registration form identifies significance under Criteria A and C at the state and local levels in the areas of engineering, transportation, social history, and commerce. A review conducted as part of this update concludes that the Kauaʻi Belt Road retains sufficient integrity to still include those areas of significance despite roadway modifications occurring after 2002. The 2004 NRHP registration form should be referenced for justification of the initial period of significance, levels and areas of significance, and historic context.

An additional area of significance at the State and local level, conservation, is described in this documentation as a result of substantial historic preservation efforts occurring since the 1970s. Because these efforts have continued to the present, the period of significance for the Kauaʻi Belt Road extends from 1900, the year the Territorial Public Works Department commenced roadway improvements, through 2019, the most recent year significant construction occurred on the roadway. Evaluation under Criteria Consideration G is not required because a majority of district resources are more than 50 years of age and able to convey significance during the property's period of significance. Information provided here is intended to supplement the 2004 NRHP registration form.

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

Conservation

Conservation is defined by the NRHP as "the preservation, maintenance, and management of natural or manmade resources." Following proposals to replace the Hanalei Bridge and modify the Kauaʻi Belt Road in the 1970s, community advocacy for the Kauaʻi Belt Road's unique design has continued through the present. Major improvement projects to contributing resources along the road, including bridge replacements, have been and are currently being conducted with a preservation-minded approach and reliance on the Secretary of the Interior's Standards for the Treatment of Historic Properties. Continued documentation of the roadway and implementation of the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan* have given the State, county, and local communities important historical information and has resulted in a context-sensitive design approach to protecting and maintaining the Kauaʻi Belt Road's character-defining features. Threats to the Kauaʻi Belt Road's preservation are unambiguous: major weather events in recent years, including a devastating storm event in April 2018, highlight one of several potential future problems this historic roadway will likely encounter as the planet's climate continues to change and local communities continue to rely heavily on this historic property.

Integrity Evaluation

The Kauaʻi Belt Road (North Shore Section) retains integrity of location, design, setting, feeling, and association. Importantly, the road maintains its historic alignment and integrity of *location* through Kauaʻi's North Shore communities. Since the 1970s, North Shore residents and advocacy organizations have prioritized retention of specific roadways elements, particularly single-lane bridges, a narrow road width, and various pull-offs to retain its integrity of *design*. The Kauaʻi Belt Road's integrity of design is further sustained by the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*, a planning document crafted by HDOT and community members to provide user safety while preserving the roadway's unique design characteristics. As the Kauaʻi Belt Road traverses the North Shore, it travels through communities; over and around ridges and streams; into agricultural, historic, and cultural areas; and around bends that afford users ocean, valley, and mountain views. This landscape has been preserved despite a century of development along the North Shore, retaining the roadway's integrity of *setting*, an important aspect in understanding and interpreting the roadway's significance. The roadway retains important features to convey its significance within the greater North Shore cultural landscape, and therefore retains its integrity of *feeling* and *association* as a vital rural and historic roadway that connects communities between Princeville and Hāʻena.

Historic Context

Tourism and the Kauaʻi Belt Road

Following World War II, Kauaʻi's economy began a steady transition away from historic crops, notably sugar, that played an important role on the island. Tourism began to fill the void left by sugar plantations: air travel beginning in the 1950s brought more visitors to Hawaiʻi than ever before, and by 1960, the Kauaʻi Surf Hotel opened at Kalapaki Beach in Lihue to become the first major hotel constructed on the island.[12] Tourism continued to increase as movies like Elvis Presley's Blue Hawaiʻi and other films further invited visitors to Hawaiʻi with idyllic images of sandy beaches and swaying palms.

Tourism also drew those wishing an escape from the mainland. In the late 1960s, young people from the mainland came to Kauaʻi's North Shore and established a small outpost called Taylor Camp on a beach near Limahuli Stream at present-day Hāʻena State Park. The land was owned at the time by Howard Taylor, the brother of actress Elizabeth Taylor, and he invited these anti-war protestors to the land where they built treehouses and other facilities at the site. This group attracted numerous like-minded individuals who flocked to the free-spirit and free-love vibe that permeated through Taylor Camp and eventually reached a population of around 100. The State of Hawaiʻi condemned Howard Taylor's land by 1972 though the community persisted until 1977.[13] Many descendants from Taylor Camp still live on the North Shore.

[12] Christine Hitt, "The Rise and Fall of the Legendary Coco Palms Hotel," Hawaiʻi Magazine, June 24, 2016; Hank Soboleski, "Old Kalapaki Recalled at the Opening of the Kauaʻi Surf Hotel," Garden Island, June 4, 2017.
[13] Susan Span, "Flower Children on the North Shore of Kauaʻi," Smithsonian Magazine, July 9, 2012.

The 1970s saw further tourism as pressure to grow the industry increased following sugar plantation closures across Kauaʻi. The number of visitors to the island increased by 400,000 over the span of a decade to reach approximately 800,000 per year. The growing interest in Kauaʻi and the North Shore both as a tourist destination and as a place to live prompted new development on Kauaʻi and strained its rural roadways; protests soon followed.[14]

Early Preservation Efforts and the Hanalei Roads Committee

In the mid-1970s, HDOT proposed a two-lane replacement of the Hanalei Bridge at a location 500 feet from the original bridge. Public hearings held in 1974 and 1975 as part of the environmental review process for the National Environmental Policy Act (NEPA) allowed residents of nearby communities an opportunity to share thoughts and concerns with HDOT's proposal. A pressing concern frequently shared was future growth and development on the North Shore spurred by a new and widened Hanalei Bridge that could result in a further influx of tourists and tour buses. These concerns and challenges to HDOT's environmental process resulted in the agency studying wider project impacts for the entire North Shore and proposed replacements for the Kauaʻi Belt Road's single-lane bridges. Once again, public outcry against substantial alterations to the Kauaʻi Belt Road and its bridges came from the community amid an effort to preserve the rural nature of the road. Concurrently, the Kauaʻi Historical Society prepared NRHP nomination forms for all of the North Shore bridges including the Hanalei Bridge. FHWA requested a formal eligibility determination from the Keeper of the National Register who determined that the Hanalei, Waiʻoli, and Waipā Bridges were eligible for listing in the NRHP. As a result, FHWA and DOT proceeded to only repair the single-lane bridges and instead widen the Kūhiō Highway from Princeville to Kalihiwai.[15]

An important voice in these early preservation advocacy efforts was the North Shore Belt Road Citizens Advisory Committee. Formed in the mid-1970s with 86 Kauaʻi residents and originally chaired by founding member Carol Wilcox, the group formed to oppose tour buses on the North Shore and protest plans to demolish the Hanalei Bridge. After learning more about the Kauaʻi Belt Road, the group's emphasis shifted to the roadway and efforts to maintain its look and feel.[16] Consequently, the advocacy group renamed itself the Hanalei Roads Committee.[17] According to one scholar, the Hanalei Roads Committee was the first such group in Hawaiʻi that advocated for preservation of historic roadway corridors and scenic byways.[18] The Hanalei Roads Committee, and communities along the North Shore, viewed the Hanalei Bridge as a "gateway to the North Shore, a cultural resource that helped define their district and distinguish it

[14] Christopher Leland Cook, "Kauaʻi in History: A Guide to the Resources (Excerpt, Kauaʻi: An Historical Overview)" (Honolulu: History and Humanities Program of the State Foundation on Culture and the Arts/Kauaʻi Historical Society, 2000), xvi; Laurent Canalejas, "Hanalei Bridge Turns 100," Garden Island, August 24, 2012.
[15] Wilson Okamoto & Associates, Inc., Final Environmental Assessment, Kūhiō Highway, Remove/Repair/Replace Metal Members, Hanalei District, Kauaʻi, Hawaiʻi, January 2020.
[16] Anthony Sommer, "North Shore Highway on Kauaʻi Gains Protection," Honolulu Star-Bulletin, April 23, 2004.
[17] Meeting Minutes, Kauaʻi Planning Commission, November 12, 2019.
[18] Dawn E. Duensing, Hawaiʻi's Scenic Roads: Paving the Way for Tourism in the Islands (Honolulu: University of Hawaiʻi Press, 2015), 256.

from other places in Hawai'i." The organization is committed to maintaining the roadway's rural characteristics, its single-lane bridges, historic features, and "perpetuate Hanalei's 'slow pace of life and friendliness.'"[19]

The Kaua'i Belt Road's historic preservation victories of the 1970s were once again challenged in the 1980s. HDOT again began preparations to replace Hanalei Bridge, and after years of public consultation and efforts by the Hanalei Roads Committee, HDOT in 1988 agreed to repair rather than replace Hanalei Bridge. Repair work included strengthening bridge members comprising the trusses and separating floor beam connections in order to transfer loads to the bridge's Warren trusses. These consultation efforts resulted in another major historic preservation victory in 1989 when HDOT restored the Hanalei Bridge rather than replacing it.[20]

Following the repairs, a bridge inspection and load test determined the bridge safe; however, the Pratt trusses suffered from years of deterioration and could no longer carry loads as originally intended. A public meeting held in 1999, where HDOT shared various alternatives for bridge repair or replacement, garnered support for preserving the look of the Hanalei Bridge because it acted as a "'gateway' to the rural lifestyle characteristic of the North Shore" important to its residents and visitors.[21]

By the 2000s, HDOT undertook an extensive rehabilitation of the Hanalei Bridge, the first major repairs to the structure since the 1980s rehabilitation project. The 1912 bridge, a Pratt truss with a Warren truss section dating from the 1960s, received replacement members to replicate the early Pratt truss section while repairing the 1960s Warren truss. The push to replace members in-kind and preserve the Hanalei Bridge came again from the Hanalei Roads Committee, who received the Historic Hawai'i Foundation Preservation Honor Award for their efforts.[22] Wilson Okamoto Corporation completed the engineering for the 2002-2003 Hanalei Bridge reconstruction; the firm's ability to respond to historic considerations while providing a modern and structurally sound bridge earned the firm an FHWA and FTA 2004 Transportation Planning Excellence Awards Honorable Mention.[23] At the local level, the project was also viewed as a success: in-kind repairs made to the Hanalei Bridge's Pratt trusses allowed the single-lane bridge to retain its position as a historic and important community landmark. Residents viewed preserving the one-lane truss bridge as a means to prevent unnecessary traffic and overdevelopment of the North Shore and maintain its idyllic, naturalistic, and serene characteristics.[24]

[19] Ibid., 256.
[20] Meeting Minutes, Kaua'i Planning Commission, November 12, 2019.
[21] Wilson Okamoto & Associates, Inc., Final Environmental Assessment, Kūhiō Highway, Remove/Repair/Replace Metal Members, Hanalei District, Kaua'i, Hawai'i, January 2020; Duensing, Hawai'i's Scenic Roads, xi.
[22] Chris Cook, "Robeson, Wilcox Honored for Preserving Hanalei Bridge," Garden Island, May 15, 2003.
[23] "Good Old Hanalei Bridge," Garden Island, October 3, 2004.
[24] Laurent Canalejas, "Hanalei Bridge Turns 100," Garden Island, August 24, 2012.

In May 2012, Historic Hawai'i Foundation once again awarded the Hanalei Roads Committee with the Preservation Honor Award for their advocacy efforts in preserving the Kaua'i Belt Road's single-lane bridges.[25]

Listing in the National Register of Historic Places

When enacted on October 15, 1966, the National Historic Preservation Act (NHPA) (Public Law 89-665; now codified at 54 U.S.C. § 300101, et seq.) established a national register (National Register of Historic Places or NRHP) to document districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture. Additionally, Section 106 of the NHPA requires federal agencies to take into account the effect of their actions on properties listed in the NRHP; later amendments to the NHPA included properties eligible for listing in the NRHP. The Section 106 review process and its implementing regulations 36 C.F.R. § 800, provide for public oversight and consulting party input on federal projects that may affect historic properties. As a result, State Historic Preservation Offices (SHPO), advocacy organizations, and members of the public have pursued NRHP listing or eligibility determinations for properties nationwide, leading to over one million listed properties. Efforts in the 1970s to recognize the Kaua'i Belt Road as historic helped advance its eventual listing in the NRHP.

The Hanalei Roads Committee pursued formal NRHP listing as a means to protect and maintain the Kaua'i Belt Road and prevent efforts to widen or alter the road. The NRHP registration form for Kaua'i Belt Road (North Shore Section) was completed in April 2002 and entered into the State Register of Historic Places (SRHP) on March 29, 2003 and the NRHP on February 11, 2004. The documentation created the Kaua'i Belt Road (North Shore Section) historic district, which is the only intact example of Hawai'i's belt road system on Kaua'i. Its historic property boundaries include HDOT right-of-way along Kūhiō Highway (Route 560) from mile marker 0 in Princeville to mile marker 10 at Hā'ena State Park and has a documented period of significance from 1900 to 1957. The registration form identifies two contributing sites, thirteen contributing structures, and historic significance under Criteria A and C and Criteria Consideration G for its association with transportation, commerce, social history, and engineering significance. Its listing in the NRHP in 2004 was the culmination of a 28-year effort by the Hanalei Roads Committee and local advocacy groups for formal recognition and documentation of the Kaua'i Belt Road.[26]

Kūhiō Highway (Route 560) Historic Roadway Corridor Plan

Another important document created to preserve the Kaua'i Belt Road was the *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*. The planning document was developed among HDOT and community members to maintain the Kūhiō Highway's rural and historic character-defining features using context sensitive design and input from public outreach initiatives while

[25] Historic Hawai'i Foundation, "Emergency Repairs to Kaua'i Belt Road Will Retain and Strengthen Wai'oli Bridge, Demolish Two Other Historic Bridges," August 17, 2018.
[26] Anthony Sommer, "North Shore Highway on Kaua'i Gains Protection," Honolulu Star-Bulletin, April 23, 2004.

applying safety standards for users. Importantly, the plan recognizes the Kūhiō Highway as a rural-historic road, and as a result, provides design guidelines and consultation procedures for HDOT to follow.[27]

By this time, North Shore communities recognized the Kaua'i Belt Road as more than a historic roadway; preserving its existing single-lane bridges and narrow width became integral to maintaining their lifestyle by limiting overuse and overdevelopment. The Hanalei Roads Committee too noted that "the one-lane bridges…create a sense of friendliness and slowness on the North Shore."[28] However, despite proposals to further limit tourists, such as banning tourists from driving on the North Shore and requiring they use a system of shuttle buses, tourism continued to cause strife between the local community and visitors.

Alterations to the Kaua'i Belt Road, 2002-2017

The 2004 NRHP registration form for the Kaua'i Belt Road describes alterations to the roadway and its contributing and noncontributing resources from 1900 through 2002, the year when the existing NRHP registration form was completed. While the documentation notes that "the road itself no longer features original construction materials," it importantly offers that "other aspects of the route, especially the original alignment, location, rural coastal setting, and narrow width are important features that contribute to the road's integrity." While this broad recognition of character-defining features allows for some design flexibility, alterations have continued to occur to the roadway that sometimes cause challenging balances between user safety and historic preservation.

Guardrails and Walls

In 2002, HDOT proposed $2.4 million in road maintenance activities for the Kaua'i Belt Road segment between Princeville and Hā'ena State Park. Initial plans proposed extensive guardrail replacement, including replacement of wood rails with metal w-beam guardrails totaling 17,000 feet. Although metal guardrails eventually were installed in some locations, HDOT reduced the extent to which these railings would line the roadway to 7,200 feet. The Hanalei Roads Committee led efforts to limit the changes to the road.[29] Additional intermittent sections of guardrail have been added along the Kaua'i Belt Road since 2002. Notably, the guardrails are colored brown to help obscure their appearance.

[27] The Kūhiō Highway (Route 560) Historic Roadway Corridor Plan, as written, expires in 2030 ("The HDOT Kaua'i District office will specifically use this document as a working plan to provide the necessary direction for current and long-term actions regarding preservation, rehabilitation, restoration, reconstruction and improvement, and repair and maintenance work on Route 560 over the next 25 years"). Its continued use is vital to continuing the positive working relationship between HDOT and local communities, implementing context-specific user safety measures along the roadway, and encouraging positive historic preservation outcomes for the roadway.
[28] Anthony Sommer, "North Shore Highway on Kaua'i Gains Protection," Honolulu Star-Bulletin, April 23, 2004.
[29] Jan TenBruggencate, "Road Guardrail Issue Galvanizes Hanalei," Honolulu Advertiser, August 8, 2002; Lester Chang, "Hanalei Roads Committee against DOT Plan for North Shore Road," Garden Island, November 5, 2002.

In 2011, HDOT constructed a section of concrete wall on the makai side of the roadway near Lumahaʻi Beach. The low wall borders a pull-off area and was designed to give the appearance of rocks. Construction of the wall resulted in a loss of timber railings in this area.

Wainiha Bridges

When the 2004 NRHP registration form was completed, the three 1957 Wainiha Stream bridges, provided numerical designations of #1, #2, and #3, comprised unique steel-and-wood through-truss structural systems. Shortly thereafter, Wainiha Bridge #2's structural system began deteriorating, resulting in a downgrade to a 6-ton limit. HDOT engineers identified buckling on the deck later that year, which necessitated plans to replace the bridge. By this time, HDOT had also downgraded Wainiha Bridges #1 and #3 to 8- and 6-ton limits, respectively. The major cause identified for the damage to these bridges was likely trucks carrying construction equipment that exceeded the posted load limits.[30]

HDOT installed a temporary ACROW panel bridge, which is a type of modular steel truss bridge, over the existing Wainiha Bridge #2 to allow continued access along Kūhiō Highway and over this portion of Wainiha Stream. The Wainiha Bridge #2 was removed in 2008. Hawaiʻi Dredging Co. assembled and set in place the ACROW bridge.

In 2007, Wainiha Bridge #3 also received severe damage likely caused by an oversized truck that exceeded the weight limits for the bridge. Load tests performed by HDOT on it as well as Wainiha Bridge #1 resulted in a reduced load limit of 3 tons. That same year, Governor Linda Lingle issued a proclamation that allowed for ACROW bridge installation for Wainiha Bridges #1 and #3. Prior to all three bridges' demolitions, Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) documented the three bridges. Original abutments and piers remained.[31]

In 2017, HDOT prepared a Final Environmental Assessment for a project to replace the temporary Wainiha Bridges and rehabilitate the Kauaʻi Belt Road. The project proposed to replace the three modular steel ACROW panel bridges spanning Wainiha Stream with single-lane bridges on the existing alignment similar to bridges that predated the ACROW bridges. This project was determined to have no adverse effect on historic properties, including the Kauaʻi Belt Road. The Federal Highway Administration issued a Finding of No Significant Impact on January 12, 2018.[32] The proposed bridge replacements received much attention from the community, and many opposed the project unless it adhered to the design of the 1957 Wainiha

[30] Anthony Sommer, "State Will Replace Rickety Bridge," Honolulu Star-Bulletin, September 23, 2004; "Nathan Eagle, "Dangerous Bridges to be Replaced," Garden Island, November 2, 2007.
[31] AECOM Technical Services, Inc., Engineering Design Report for Kūhiō Highway, Rehabilitation of Wainiha Bridges, October 2012, pp 6-25.
[32] HDOT, "Final Environmental Assessment/Finding of No Significant Impact, Project to Replace Temporary Wainiha Bridges (Replacement of the Temporary Wainiha Bridges and Rehabilitation of Kauaʻi Belt Road, Kūhiō Highway, Halele'a District, Kaua'i Island, Hawai'i," Project No. HI STP SR560(1), December 2017. https://highways.dot.gov/federal-lands/projects/hi/wainiha

Stream bridges. However, project proponents aimed for a "context-sensitive approach" for the replacement Wainiha Stream's bridges that considered size, materials, and aesthetics.[33] As of Spring 2021, three temporary ACROW bridges still span the Wainiha Stream.

Storm and Flood Event, April 13-16, 2018

Extreme weather is not uncommon on Kaua'i. Since 2002, numerous small- and large-scale weather events have caused damage across the island, including portions of the North Shore. These episodes range from hurricanes that wreak havoc and cause severe flooding, winds, and dangerous surf, to sometimes unexpected rainfall events with devasting consequences. Hawai'i's unique position in the Pacific Ocean poses challenges to forecasting, making predictions for smaller-scale and isolated events extremely difficult and oftentimes resulting in no warnings for residents.[34]

In early 2018, weather patterns that favored increased rainfall led to a prolonged wet season on Kaua'i. Heavy rain fell throughout February and March and included major storms on February 22 and March 14-15 that led to an overflowing Hanalei River and Kūhiō Highway's closure due to landslides. Although heavy rainfall in Kaua'i typically subsides by the end of the wet season in April, storms continued to inundate Kaua'i that month and led to the largest single-day rain event in United States history.[35]

Beginning on April 11, an upper level low pressure system west of Kaua'i weakened and gave way to a weak, surface-based low-pressure trough that impacted the island chain beginning on April 13, leading to heavy rains on Oahu that day. A second and stronger upper level low pressure system then formed west of the initial system and impacted Kaua'i with a similar surface-based trough. National Weather Service data from the storm event indicates these troughs drew from tradewinds moisture and caused the torrential rainfall along Kaua'i's North Shore. Additionally, radar imagery showed that the Kaua'i storm clung to the North Shore's lower elevations and coast, unlike typical rainfall events on Kaua'i which impact the island's higher elevations.[36]

Late on April 13, the first of several significant rain events occurred on Kaua'i's North Shore. Over the course of several hours, the rainfall led to closure of Kūhiō Highway at the Hanalei Bridge; however, the storms continued to move, and by 8:00 a.m. on April 14, Kūhiō Highway reopened at Hanalei Bridge. Approximately four hours later, rain once again fell, this time unrelenting and over the North Shore's lower elevations. Landslides near Wainiha again closed Kūhiō Highway, flooding destroyed two residences, and rushing waters washed out Wainiha

[33] Bethany Freudenthal, "Over 100 Oppose Wainiha Bridges Project," Garden Island, February 16, 2018.
[34] John Hill, "Here's Why the Weather Experts Didn't See the Kaua'i Storm Coming," Honolulu Civil Beat, April 19, 2018.
[35] Jessica Else, "The Flood – One Year Later," Garden Island, April 19, 2019; "Flash Flood Warning Issued for Kaua'i," Garden Island, March 14, 2018.
[36] National Weather Service, "Record Kaua'i and Oahu Rainfall and Flooding – April 2018," https://www.weather.gov/hfo/RecordKaua'iandOahuRainfallAndFlooding-April2018.

Powerhouse Road. It was not until 7:00 p.m. that evening when the downpour began to subside.[37]

At approximately midnight on April 15, a second powerful storm began dumping 5 to 7 inches of rain per hour over a wide area from Kaua'i's higher elevations to the coast. The constant battering and idling storm caused a flash flood in the Hanalei River and buried sections of Kūhiō Highway beneath up to 8 feet of water.[38] Properties near the Wainiha River flooded due to extreme rising waters. By morning, the storm shifted slightly east and away from the North Shore; at around 8:00 a.m., most of the rainfall across northern and northeast Kaua'i subsided.[39]

A third intense rainfall event began after 10:00 a.m. when rain bands intensified and centered over Kaua'i's North Shore, again extending from higher elevations to the coast. Kūhiō Highway flooded as the stationary rain band inundated the already saturated Hanalei River valley. By 1:00 p.m., the storms spread east and inundated other parts of Kaua'i, and around sunset, the storms finally dissipated.[40] Flood waters continued to rage and rise.

For the 48-hour period beginning April 13 at 6:00pm and ending April 15 at 6:00pm, 53.57 inches of rain fell at a gauge located at the Waipā Foundation in Hanalei. The gauge measured 49.69 inches of rain in the 24-hour period beginning just after noon on April 14 and ending at the same time on April 15. During that period, rain consistently fell at a rate of over 4 inches per hour, peaking at a rate of over 7 inches per hour. As a result, the 24-hour rainfall event at the Waipā Foundation gauge is currently the United States recordholder for wettest 24-hour period, breaking a 39-year record.[41] According to United States Geological Survey (USGS) flood gauge data, the Hanalei River level rose to approximately 15 feet and discharged over 32,700 cubic feet of water per second at the gauge location before gauge transmissions to the USGS failed due to bank erosion.[42] The days-long storm profoundly affected the island and its communities, residents, and the Kaua'i Belt Road.

State and Community Response

The multi-day storm proved devastating. Flood waters saturated numerous homes and destroyed many others; a house on Powerhouse Road in Wainiha completely lifted off its foundation and was washed downhill by the rushing waters. Cars were submerged, including overturned vehicles at Black Pot Beach and the Hanalei Pier. Escaped buffalo from a nearby ranch were found on the beach in Hanalei, pushed to the coast due to flood waters that engulfed the town. Extensive damage to Kūhiō Highway forced its closure, making rescue operations extremely challenging. The U.S. Coast Guard conducted helicopter evacuation operations with the Hawai'i National Guard and extensive local support to make between 15 and 20 land rescues for those trapped by

[37] Ibid.
[38] Else, "The Flood – One Year Later."
[39] National Weather Service, "Record Kaua'i and Oahu Rainfall and Flooding – April 2018."
[40] Ibid.
[41] Else, "The Flood – One Year Later."
[42] National Weather Service, "Record Kaua'i and Oahu Rainfall and Flooding – April 2018."

rising waters. The fire department conducted rescues by jet ski and were seen by residents crossing through yards due to the high water level. Widespread power outages occurred across the North Shore and Wainiha lost its running water; many areas were under a "do not drink" order.[43]

Residents rallied together to help those stranded by the flooding and landslides. Volunteers brought water and supplies by boat to areas inaccessible by road and helped evacuate people, and the Kaua'i Red Cross provided additional assistance and support to those evacuated or rescued. By Sunday morning April 15, over 40 people had sought shelter at the Hanalei School. Others who sought shelter at the Church of the Pacific were welcomed into parishioners' homes. Water donations came from Walmart and Big Save in Hanalei.[44]

HDOT and the Kaua'i County Department of Public Works cleared landslides and debris throughout the storm; however, crews working to clear roads following the initial round of storms were forced to stop when the third storm arrived Sunday. Numerous sections of Kūhiō Highway closed due to landslides and flooding, including sections between Waikoko and Wainiha, between Princeville and the Hanalei Bridge, and at the Kalihiwai Bridge.[45]

Governor Daniel Ige issued a state of emergency for Kaua'i which authorized state funds and provided resources for recovery efforts. Ige stated, "…we're coordinating help from around the state. Based on the county's needs, we may also bring in other state agencies like [the Department of Land and Natural Resources] to provide specialized skills and personnel. I especially want to recognize our Department of Transportation personnel." Kaua'i Mayor Bernard Carvalho, Jr., who also signed an emergency proclamation, mobilized local efforts led by the Kaua'i Emergency Management Agency. Adjutant General and Hawai'i Emergency Management Agency Director Arthur "Joe" Logan committed the Hawai'i National Guard to assist Kaua'i first responders while Hawai'i Emergency Management Agency Administrator Thomas L. Travis worked to have Oahu Emergency Management Agency provide additional assistance.[46]

On Monday April 16, both Mayor Carvalho and Governor Ige toured the affected areas by helicopter, and the extent of the storm's damage became clear. In total, at least 220 people were evacuated by helicopter, 121 by bus, and others by boat. The Hawai'i National Guard deployed two UH-60 Black Hawk helicopters, two CH-47 Chinooks, eight zodiacs, and 45 soldiers and airmen to aid rescue efforts and deliver supplies. At least two houses were moved off foundations, four were completely destroyed, and countless others were damaged. Along Kūhiō

[43] Allan Parachini, "Kaua'i Storm: 28 Inches of Rain Brings Landslides, Floods and Wrecked Homes," Honolulu Civil Beat, April 16, 2018; "Home Destroyed, Highway Closed, North Shore Flooded," Garden Island, April 14, 2018 (with updates); Anthony Quintano, "Firsthand Accounts of Kaua'i North Shore Flooding Devastation," Honolulu Civil Beat, April 17, 2018.
[44] "Flooding of Epic Proportions: Homes Destroyed, Roads Closed, Many Rescued," Garden Island, April 16, 2018.
[45] "Home Destroyed, Highway Closed, North Shore Flooded," Garden Island, April 14, 2018 (with updates).
[46] "Flooding of Epic Proportions: Homes Destroyed, Roads Closed, Many Rescued," Garden Island, April 16, 2018. A federal disaster declaration occurred 3 weeks later.

Highway, multiple landslides destroyed large sections of the roadway leaving entire communities isolated.[47]

Emergency Repairs

In addition to clearing mudslides and debris, HDOT also designed plans to temporarily repair the roadway and allow passage through damaged sections, including areas that required slope stabilization in Wainiha and Waikoko. Due to the number of load-restricted bridges along Kūhiō Highway, use of smaller trucks was required for the initial road repairs.[48] A few days after the storm, a large segment of Kūhiō Highway between Waikoko and Wainiha was still closed on April 20 as bridges continued to be inspected.[49]

Repair options varied in the days immediately following the storm. HDOT considered expediting previously planned bridge replacement projects for the three Wainiha Stream bridges. To facilitate bridge construction and Kūhiō Highway repairs, HDOT proposed constructing temporary bridges over or adjacent to the Wai'oli, Waikoko, and Waipā Bridges in order to handle a 25-ton load capacity and help facilitate roadway repairs. Proposed slope repairs would utilize mesh or concrete facing with anchors to stabilize vulnerable areas, with the mesh-covered areas allowing plantings; less visible areas or those that required reinforcing would utilize concrete.[50]

Kūhiō Highway reopened for single-lane emergency access only on April 28, and the stretch from Waikoko to Wainiha reopened to residents and local traffic on May 4. However, Governor Ige and Mayor Carvalho urged visitors to avoid the North Shore and Kūhiō Highway due to ongoing repairs and recovery efforts. HDOT set road weight restrictions at 10,000 pounds and limited access using a set schedule and escort vehicles that would maintain low speeds and control traffic due to the ongoing repairs. Residents using the road were required to obtain placards to identify themselves as residents. Assistance for residents was made available through the Federal Emergency Management Agency.[51]

FHWA provided an initial $8 million for emergency repairs to the stretch of Kūhiō Highway from Waikoko to Wainiha; however, initial costs were estimated at $40 million and HDOT sought emergency relief funding for roadway repairs caused by the natural disaster.[52] By early May, HDOT identified repairs for 26 locations along the Kūhiō Highway, including 17 slope areas, and needs for stabilizations, wall repairs, and debris cleanup. At mile 6.5, a substantial

[47] Allan Parachini, "Kaua'i: The Path to Recovery in Hanalei Will Be a Long One," Honolulu Civil Beat, April 17, 2018.
[48] "State Assesses Flood-Damaged Areas," Garden Island, April 19, 2018.
[49] "Hanalei Bridge Open Again; Flash Flood Watch Remains in Effect," Garden Island, April 20, 2018.
[50] Brittany Lyte, "Lifeline to Kaua'i's North Shore Must Be Rebuilt Now, Relocated Later," Honolulu Civil Beat, April 20, 2018.
[51] "Kūhiō Highway from Waikoko to Wainiha to open to local traffic beginning Friday," Garden Island, May 3, 2018; "Federal Flooding Assistance Applications Invited to Kauai, Oahu Briefings," Garden Island, May 19, 2018.
[52] Costs to repair Kūhiō Highway ultimately reached approximately $80 million. Audrey Cleo Yap, "One Year after Historic Floods, Kaua'i Residents Cautiously Rebuild," NBC News, April 7, 2019.

repair effort was required, however, bridge load limits prevented HDOT's repair equipment access the location. As a result, bridge replacements were identified as necessary solutions for accommodating HDOT's equipment to repair the road; full reopening of Kūhiō Highway would not be expected to occur until the Waiʻoli, Waipā, and Waikoko Bridges were improved.[53] On May 3, recognizing the extent of repairs needed to the historic Kauaʻi Belt Road, HDOT held the first of several Section 106 coordination meetings.[54]

Section 106 Process

Because of the emergency nature of the required repairs, NHPA Section 106 consultation occurred quickly over the summer of 2018. Section 106 consulting parties included Hanalei Roads Committee, Historic Hawaiʻi Foundation, Hanalei Watershed Hui, Waikoko ʻOhana, Hui Hoʻomalu I Ka ʻĀina, and the Konohiki Restoration Project. Early plans proposed by HDOT included a replacement Waiʻoli Bridge, but through consultation with consulting parties, revised its plans to instead rehabilitate the bridge with a fiberglass reinforced plastic wrap that would strengthen its bents and allow for maintenance of the existing span's deck and railings. The wrap would appear similar to concrete and not visually add any massing to the bridge, meeting the Secretary of the Interior's Standards for the Treatment of Historic Properties.[55] However, for Waipā and Waikoko Bridges, the proposed fiberglass wrap was not able to be used for repairs, despite concerns by consulting parties and community members regarding the proposed loss of the bridges. In order to maintain the road's feeling, the replacement bridges were instead proposed to be single-lane bridges on the existing alignment that would be designed to incorporate the rural-historic standards set forth in the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*.[56]

Due to a FHWA Section 106 finding of adverse effect, parties to the Section 106 process entered into a memorandum of agreement entitled *Memorandum of Agreement among the Federal Highway Administration, the Hawai'i State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the Kaua'i Emergency Flood Repairs and Cleanup at Various Locations April 2018, Districts of Halelea and Wailua, Kaua'i, Hawai'i* (MOA). Executed on October 17, 2018, the agreement stipulated HAER documentation for Waikoko and Waipā Bridge. Other stipulations of the MOA (Stipulations I, II and VII) concern utilizing the Secretary of the Interior's Treatment Standards and Guidelines and 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan* for replacement, rehabilitation, and maintenance of other

[53] Historic Hawai'i Foundation, "Emergency Repairs to Kaua'i Belt Road Will Retain and Strength Wai'oli Bridge, Demolish Two Other Historic Bridges," August 17, 2018.
[54] HDOT, "North Kaua'i Emergency Flood Repairs, Section 106 Coordination Meeting," PowerPoint, May 3, 2018.
[55] The Secretary of the Interior's Standards for the Treatment of Historic Properties are codified at 36 C.F.R. § 68 and address the four recognized treatments to historic properties: preservation, rehabilitation, restoration, and reconstruction. Guidelines have been developed to assist practitioners in applying the standards. The choice of which treatment applies to a particular historic property is dependent upon "the property's significance, existing physical condition, the extent of documentation available and interpretive goals, when applicable. The standards will be applied taking into consideration the economic and technical feasibility of each project." 36 C.F.R. § 68.3.
[56] Historic Hawai'i Foundation, "Emergency Repairs to Kaua'i Belt Road Will Retain and Strength Wai'oli Bridge, Demolish Two Other Historic Bridges," August 17, 2018.

bridges and features of the belt road. In addition to the bridge rehabilitation and two bridge replacements, other contributing resources of the Kaua'i Belt Road received in-kind repairs including Limahuli Culvert and Mānoa Ford. The MOA's Exhibit A included a list of emergency repairs to the Kaua'i Belt Road needed as a result of the 2018 storm event, while Exhibit B included the proposed bridge plans for the Waipā Bridge and Waikoko Bridge replacements and the Wai'oli rehabilitation.

Threats to Future Preservation of the Kaua'i Belt Road

The Kaua'i Belt Road (North Shore Section) portion of Kūhiō Highway fully reopened in June 2018 following delays caused by Hurricane Lane in 2018 and other weather-related events. Still, some local residents did not feel the North Shore was yet ready to receive an influx of visitors.[57] Just as tourists played a role in the initial threats to maintaining the historic road's narrow alignment and single-lane bridges, increased tourism and the popularity of Kaua'i's North Shore will continue to play a major role in the road's future.

The steady increase in tourism has drawn criticism from residents that overtourism is altering the communities' ways of life and the qualities that make the island unique. Just as interest in Kaua'i increased with aviation, the 2000s ushered in a new wave of visitors seeking an accessible escape, drawn to the North Shore through numerous internet and social media posts. Decades of increased visitors and vivid descriptions of the North Shore's slow pace and idyllic landscapes continue to draw mainlanders and international visitors. The Kaua'i Belt Road's closure to the public presented the North Shore's local communities with a sense of life without tourists and allowed residents to think strategically about the ever increasing number of visitors.[58]

In 2018, the Kaua'i Visitors Bureau and Hawai'i Lodging and Tourism Association-Kaua'i acknowledged that the island had reached its capacity in terms of number of visitors. The groups' joint effort resulted in the Kaua'i Tourism Strategic Plan 2019-2021, which described changes to the tourism industry with the rise of private rentals and ride-sharing services.[59] One major improvement to limit overtourism was through restricting the number of visitors at Hā'enaState Park, aimed to limit North Shore traffic and eliminate parking at Kē'ē Beach. The State implemented a new reservation system, reserved spaces for locals, and constructed a new parking area at the state park that will require visitors to walk to Kē'ē Beach at the end of the

[57] Tanner Haworth, "Kauai's North Shore Prepares to Reopen Flood-Damaged Kūhiō Highway," Hawai'i News Now, June 7, 2019; "Protestors Briefly Block Kūhiō Highway," Garden Island, June 18, 2019.
[58] For example, see Meredith Bryan, "A Guide to Kaua'i's Magical North Shore," Conde Nast Traveler, June 9, 2016; Christopher Reynolds, "On Kaua'i's North Shore, Mother Nature Paints with Green," Los Angeles Times, April 18, 2014; "Paradise Found: The North Shore in Kaua'i," Frommer's, 2020.
[59] "'Overtourism' on Kaua'i," Garden Island, September 16, 2018.

Kaua'i Belt Road.[60] Further calls have been made to adhere to the "Aloha Pledge," a set of guidelines for residents and visitors to allow for an amicable and enjoyable coexistence.[61]

Increased visitors to the North Shore also increased the burden of the island's disaster response capabilities. The Hanalei-Hā'ena community's loss of permanent residents, replaced instead by short-term rentals, made development of a clearer plan a necessity due to the sheer volume of visitors to the area. In response, the North Shore communities hired a consultant to develop a Hanalei-Hā'ena disaster response and recovery plan modeled on the Hawai'i Hazards Awareness and Resilience Program used elsewhere in the state. Led by Hanalei Watershed Hui and the Hanalei-Hā'ena Community Association, it builds upon an early plan from 2008 and furthers the area's resilience objectives during disaster events, such as hurricanes or tsunamis, and also considers discrete weather events like the April 2018 storm.[62] New facilities aimed at responding to natural disasters or emergencies on the North Shore would be built at the site of the former Hā'ena School. The Wainiha Community Resilience Center would be used as a base for storing emergency supplies as well as a meeting space for community groups.[63]

Related to these disasters are the effects of climate change on Hawai'i, which include more intense storms, noticeable changes to reefs such as coral bleaching, and beach erosion with sea level rise.[64] The State responded to this threat in 2021 and declared a climate emergency, the first state in the United States to do so. The resolution directs the State to take actions that would recognize the importance of considering effects on the climate and collaborate with organizations that aim to reduce climate change impacts.[65]

Regarding the Kaua'i Belt Road (North Shore Section), HDOT set a resiliency goal for the 10-mile stretch of Kūhiō Highway to continue operating in its current location for the next two to three decades; however, the extent of erosion and sea level rise leave the long-term prospects of Kūhiō Highway's current alignment in an uncertain position. HDOT is considering a variety of options including relocation mauka of the current alignment that may including cutting through ridges and tunneling. All options would be considered with community and environmental impacts.[66] However, such a major change to the Kaua'i Belt Road could require later updates to its NRHP documentation to assess the roadway's historic integrity.

[60] Kuuwehi Hirashi, "Reopening the Road to Hā'ena," Hawai'i Public Radio, December 31, 2018, available at https://www.hpr2.org/post/reopening-road-h-ena#stream/0.
[61] "Our View: Now Is the Time to Revisit the Aloha Pledge," Garden Island, April 14, 2021; See also AlohaPledge.com.
[62] Allan Parachini, "Kaua'i: Picking up the Pieces after Big Disasters," Honolulu Civil Beat, February 9, 2019.
[63] Allan Parachini, "Groups Look to Fortify North Shore Disaster Resilience," Garden Island, February 20, 2020.
[64] Kristin Lam, "There's 'No Place on the Planet' – Not Even Hawai'i – to Escape Climate Change, Experts Say," USA Today, February 12, 2019.
[65] Alexandra Kelley, "Hawai'i to Become the First State to Declare Climate Emergency," The Hill, April 29, 2021.
[66] Brittany Lyte, "Lifeline to Kaua'i's North Shore Must Be Rebuilt Now, Relocated Later," Honolulu Civil Beat, April 20, 2018.

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Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested
_X_ 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 # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

_X_ State Historic Preservation Office
_X_ Other State agency
____ Federal agency
____ Local government
____ University
____ Other
Name of repository: _____

Kaua'i Belt Road (North Shore Section) (Additional Documentation) Kaua'i, Hawai'i
Name of Property County and State

Historic Resources Survey Number (if assigned): _____

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10. Geographical Data

Acreage of Property 54

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:

Or
UTM References
Datum (indicated on USGS map):

[ ] NAD 1927 or [X] NAD 1983

1. Zone: 04	Easting:	451000	Northing:	2456460
2. Zone: 04	Easting:	450980	Northing:	2456220
3. Zone: 04	Easting:	449820	Northing:	2456220
4. Zone: 04	Easting :	449280	Northing:	2455500
5. Zone: 04	Easting:	448980	Northing:	2455410
6. Zone: 04	Easting :	447720	Northing:	2455110

7. Zone: 04	Easting:	447030	Northing:	2455480
8. Zone: 04	Easting :	446760	Northing:	2455820
9. Zone: 04	Easting:	444420	Northing:	2456410
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11. Zone: 04	Easting:	443680	Northing:	2456880
12. Zone: 04	Easting :	443480	Northing:	2457730
13. Zone: 04	Easting:	441450	Northing:	2457600
14. Zone: 04	Easting :	440310	Northing:	2457770
15. Zone: 04	Easting:	439640	Northing:	2457710

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

The boundary for the Kaua'i Belt Road (North Shore Section) is unchanged from the 2004 NRHP registration form. It extends along and includes Kūhiō Highway, Route 560, between MP 0 in Princeville and MP 10 in Hā'ena. Its width is variable and coterminous with the HDOT right-of-way along this alignment.

Boundary Justification (Explain why the boundaries were selected.)

The boundary includes the portion of the Kaua'i Belt Road determined in the 2004 NRHP registration form to retain integrity and convey the historic property's significance in transportation, engineering, commerce, and social history. A review of that boundary completed for this 2021 NRHP update confirms that these boundaries are appropriate and includes an additional area of significance, conservation, to document efforts by local residents and advocacy groups to maintain, manage, and preserve the Kaua'i Belt Road between MP 0 and MP 10.

11. Form Prepared By

name/title: Guy V. Blanchard, Lead Architectural Historian
organization: WSP
street & number: 1001 Bishop Street, ASB Tower, Suite 2400

Kaua'i Belt Road (North Shore Section) (Additional Documentation) Kaua'i, Hawai'i
Name of Property County and State

city or town: Honolulu state: Hawai'i zip code: 96813
e-mail guy.blanchard@wsp.com
telephone: 207-438-8619
date: July 2021

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.)

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: Kaua'i Belt Road (North Shore Section)

City or Vicinity: Hanalei and Vicinity

County: Kaua'i State: Hawai'i

Photographer: Malie McClellan

Date Photographed: April 14, 2021

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

1 of 16. View from Hanalei Valley Scenic Overlook, taro fields, view to the south.

2 of 16. View from Hanalei Bay Overlook, view to the west.

3 of 16. Hanalei Grade, view to the west.

4 of 16. Hanalei Bridge, view to the southwest.

5 of 16. Wai‘oli Bridge, view to the east.

6 of 16. Wai‘oli Bridge inscription, view to the north.

7 of 16. Waipā Bridge, view to the west.

8 of 16. Waipā Bridge inscription, view to the northeast.

9 of 16. Waikoko Bridge, view to the southeast.

10 of 16. Kaua‘i Belt Road near Waikoko Bridge, view to the north.

11 of 16. Lumaha‘i Beach (West) Lookout, view to the northwest.

12 of 16. Lumaha‘i Valley, view to the south.

13 of 16. Wainiha Bridge #1, view to the west.

14 of 16. Wainiha Bridge #2 (foreground) and Wainiha Bridge #3, view to the west.

15 of 16. Mānoa Ford, view to the southwest.

16 of 16. Limahuli Culvert, view to the west.

Kaua'i Belt Road (North Shore Section) (Additional Documentation) | Kaua'i, Hawai'i
Name of Property | County and State

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.


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Princeville
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Pu'uuahia
Wainiha
Lumaha33
Palikea
Kealawela
Kaooa
Kamani
Waipa Stream
Paepae
Kamoo Koleaka
'Aikanaka
Pali'ele'ele
Waiokihi
Kauka'ōpua
Hono'onāpali
Kolopua
Kapalikea
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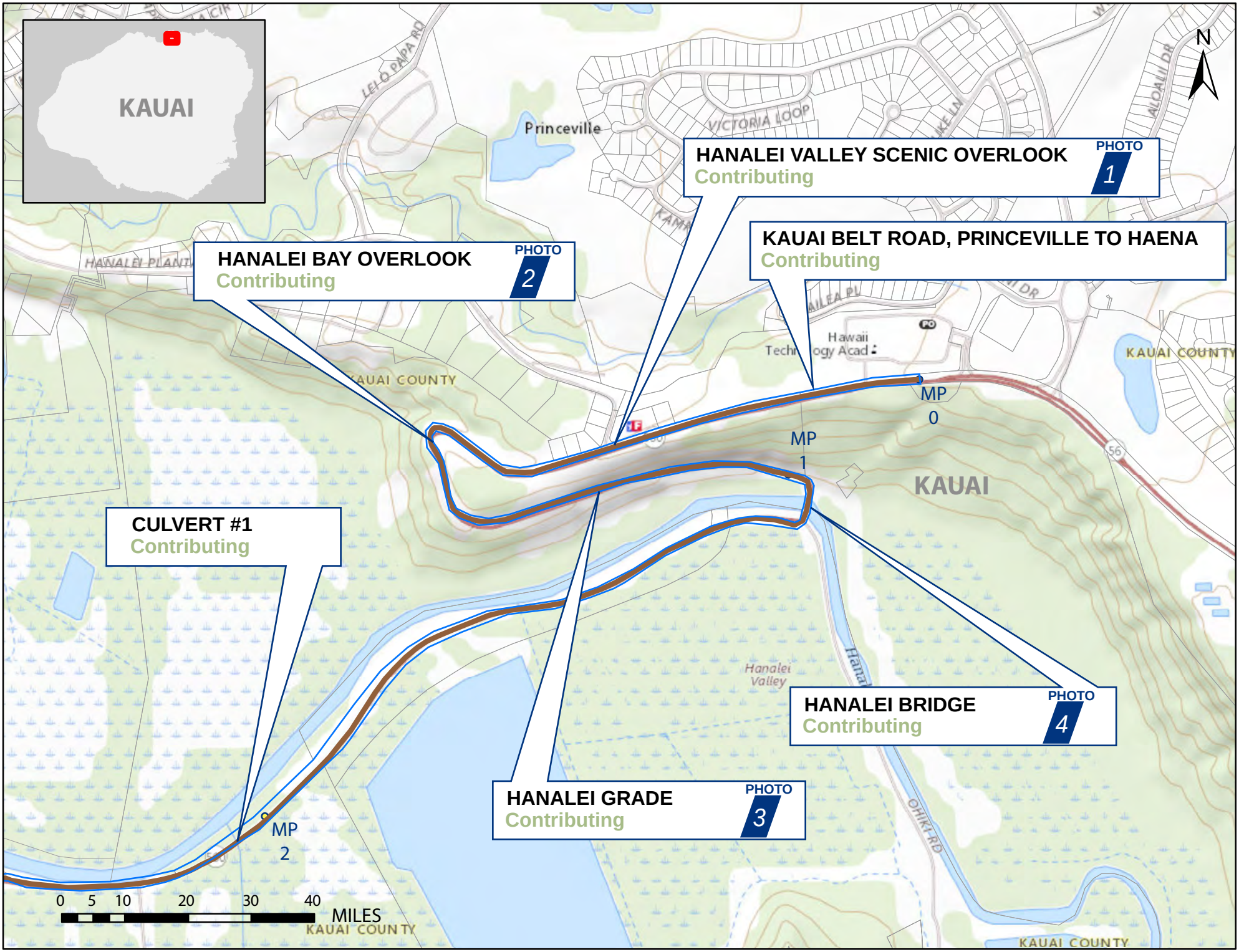
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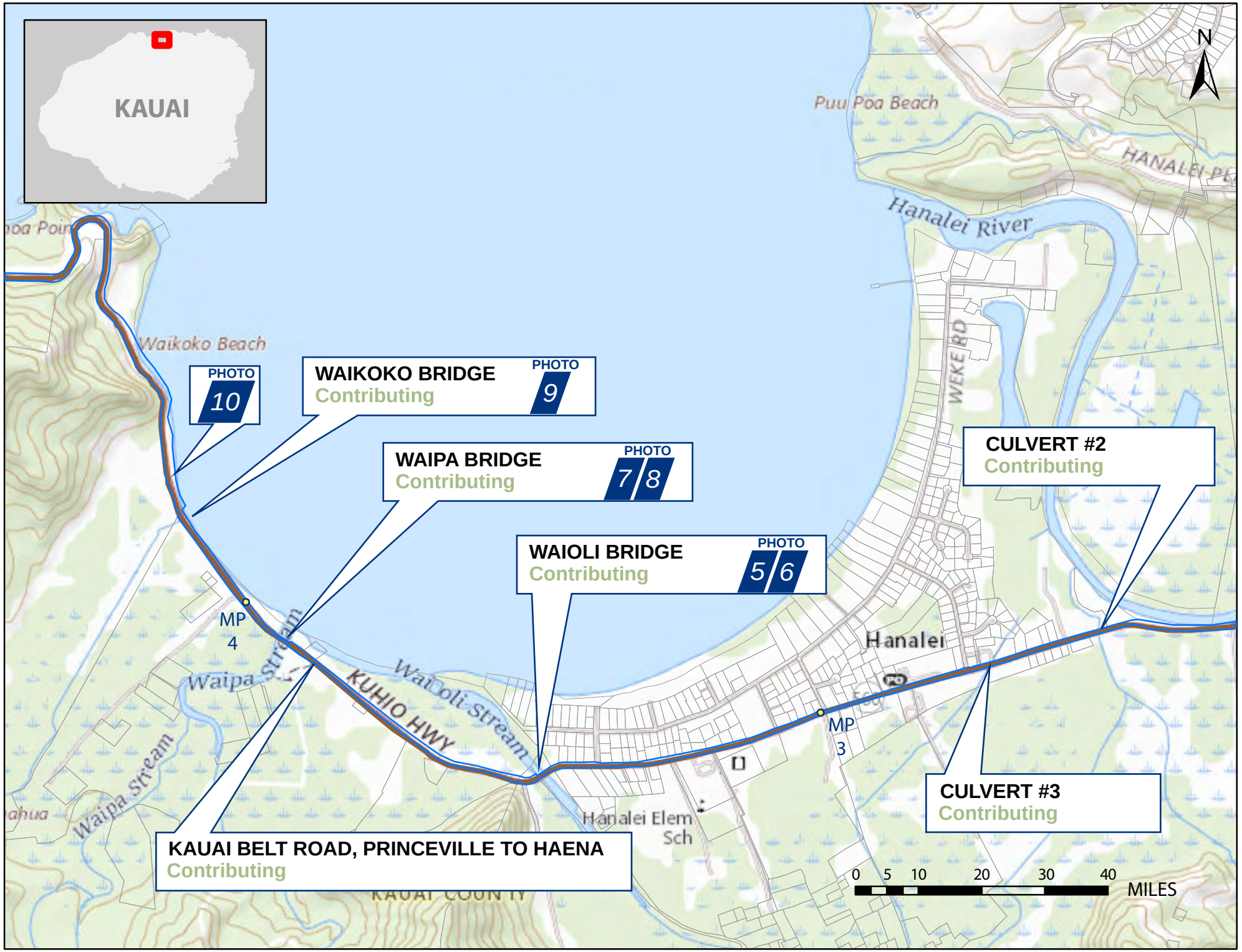
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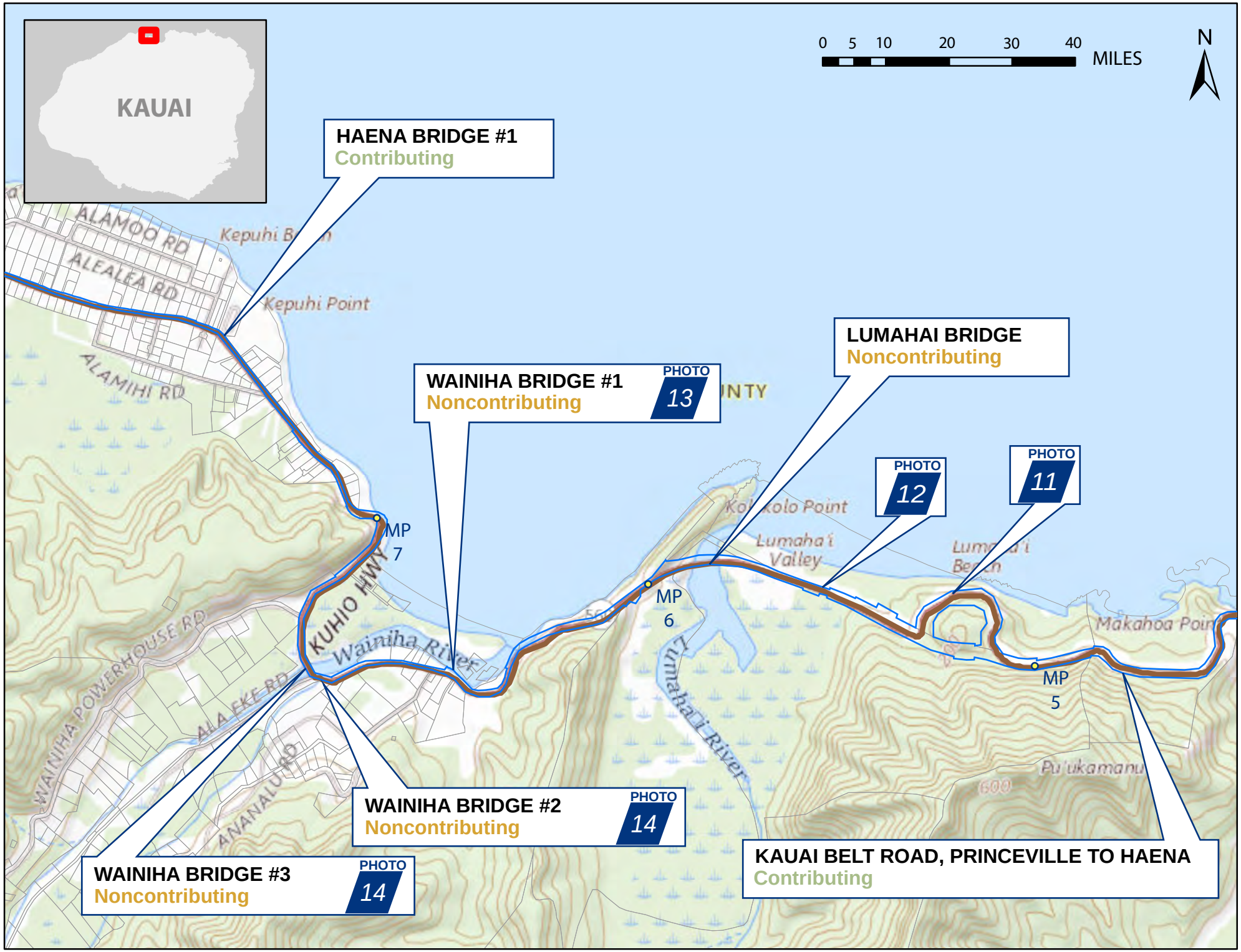
HANALEI PL
WEKE RD
Waikoko Beach
PHOTO 10
WAIKOKO BRIDGE
Contributing
PHOTO 9
WAIPA BRIDGE
Contributing
PHOTO 7 8
WAIOLI BRIDGE
Contributing
PHOTO 5 6
CULVERT #2
Contributing
MP 4
Waipa Stream
KUHIO HWY
Waioli Stream
Hanalei
MP 3
CULVERT #3
Contributing
Hanalei Elem Sch
KAUAI BELT ROAD, PRINCEVILLE TO HAENA
Contributing
0 5 10 20 30 40
MILES


KAUAI
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HAENA BRIDGE #1
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PHOTO 12
PHOTO 11
WAINIHA BRIDGE #2
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PHOTO 14
WAINIHA BRIDGE #3
Noncontributing
PHOTO 14
KAUAI BELT ROAD, PRINCEVILLE TO HAENA
Contributing
ALAMOO RD
ALEALEA RD
ALAMIHI RD
Kepuhi Point
KUHIO HWY
MP 7
MP 6
MP 5
Wainiha River
Lumahaʻi Valley
Lumahaʻi River
Makahoa Point
WAINIHA POWERHOUSE RD
ALAEKE RD
ANANALU RD
Puʻukamanu
600

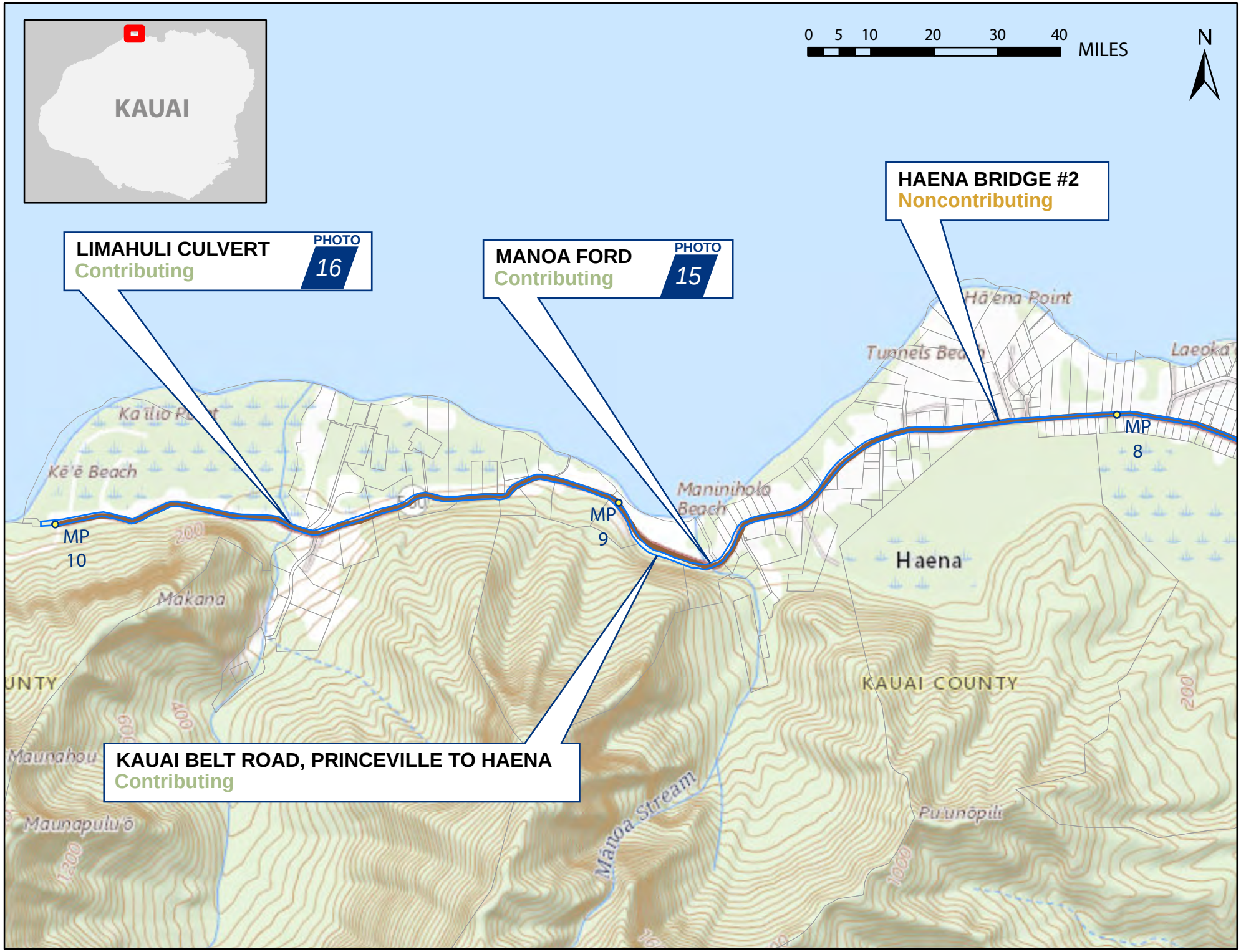
KAUAI
0 5 10 20 30 40
MILES
N
HAENA BRIDGE #2
Noncontributing
LIMAHULI CULVERT
Contributing
PHOTO 16
MANOA FORD
Contributing
PHOTO 15
Hā'ena Point
Tunnels Beach
Laeoka
Kē'ē Beach
MP 10
MP 9
MP 8
Maninihole Beach
Haena
Makana
KAUAI COUNTY
KAUAI BELT ROAD, PRINCEVILLE TO HAENA
Contributing
Maunahou
Maunapulu'ō
Mānoa Stream
Puʻunōpili



Photo 1.



Photo 2.



Photo 3.



Photo 4.



Photo 5.



Photo 6.



Photo 7.



Photo 8.



Photo 9.



Photo 10.



Photo 11.



Photo 12.



Photo 13.



Photo 14.


WALK BIKES
ACROSS
STREAM
DANGER
CROSSING
HAZARDOUS
DURING
HIGH WATER
Photo 15.



Photo 16.

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

RECEIVED 2280
SEP - 5 2003
NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

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 How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Kaua'i Belt Road (North Shore section)
other names/site number Kūhiō Highway, Hawai'i Route 560

2. Location

street & number Hawai'i Route 560 not for publication __
city or town _____
vicinity Princeville, Hanalei, Wainiha, Hā'ena
state Hawai'i code HI county Kaua'i code 007 zip code __

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this X 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 X meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ___ nationally X statewide ___ locally. (___ See continuation sheet for additional comments.)

_____ 7/30/2003
Signature of certifying official Date

_____
State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

_____
Signature of commenting or other official Date

_____
State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is: Signature of Keeper Date of Action

✓ entered in the National Register Beth Boland 2/11/04
__ See continuation sheet.

___ determined eligible for the National Register
__ See continuation sheet.

___ determined not eligible for the National Register

___ removed from the National Register

____ other (explain): _____

5. Classification
Ownership of Property
(Check as many boxes as apply)

___ private

___ public-local

_X_ public-State

___ public-Federal

Category of Property
(Check only one box)

___ building(s)

_X_ district

___ site

___ structure

___ object

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of Resources within Property

Contributing	Noncontributing	
____	____	buildings
2	____	sites
13	2	structures (bridges and culverts)
____	____	objects
15	2	Total

Number of contributing resources previously listed in the

National Register N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

Current Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

7. Description

Architectural Classification
(Enter categories from instructions)

Other: roadways; bridges: steel, reinforced concrete, girder, flat slab, wood, masonry (basalt or lava rock)

Materials
(Enter categories from instructions)

foundation _____

roof _____

walls _____

_____

other asphalt, concrete, steel, wood, masonry (basalt or lava rock)

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)

__X__ 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.

__X__ 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.)

Property is:

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

__X__ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Engineering _____

Social History _____

Transportation _____

Commerce _____

Period of Significance

1900 to 1957

Significant Dates

1900 to 1957

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder

Designers and builders were County Engineers, including J. H. Moragne and R. L. Garlinghouse. Builders were county employees and private contractors, including George Mahikoa. Designers also included Hamilton and Chambers of New York.

9. Major Bibliographical References Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)

___ preliminary determination of individual listing (36 CFR 67) has been requested

___ previously listed in the National Register

_X_ previously determined eligible by the National Register
1978: Hanalei Bridge, Wai'oli Bridge, Waipā Bridge

___ designated a National Historic Landmark

___ recorded by Historic American Buildings Survey

_____

___ recorded by Historic American Engineering Record

_____

Primary Location of Additional Data

___ State Historic Preservation Office

_X_ Other State agency

___ Federal agency

_X_ Local government

___ University

___ Other

Name of repository:

State of Hawai'i Department of Transportation; County of Kaua'i Department of Public Works.

10. Geographical Data Acreage of Property _ 54

UTM References
(Place additional UTM references on a continuation sheet)

Zone	Easting	Northing	Zone	Easting	Northing
1	04 451000	2456460	3	04 449820	2456220
2	04 450980	2456220	4	04 449280	2455500

_X_ See continuation sheet.

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)
The boundaries of the nominated district are delineated by the course of Route 560, the Kaua'i Belt Road. The right-of-way is variable along the entire length of the road. The boundaries are coterminus with the road's historic right-of-way. The historic district begins at Mile Marker 0 on Route 560 and continues to its termination at Mile Marker 10 at Hā'ena State Park.

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)
The beginning and end points were selected to encompass the portion of the Kaua'i Belt Road that retains the greatest historic integrity and character. This section of roadway is relatively unaltered and is the most spectacular portion of Kaua'i's historic belt road system, both in its historic character and its scenery. It is the only portion of the Kaua'i Belt Road that retains historic integrity. Elsewhere, the Kaua'i Belt Road has been significantly altered with new alignments and widened roadways and bridges. The boundaries of the proposed historic district include thirteen contributing historic bridges and culverts that date to 1912.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 10 Geographical Data Page _____

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

UTMs continued:

	zone/easting	northing
5	04 448980	2455410
6	04 447720	2455110
7	04 447030	2455480
8	04 446760	2455820
9	04 444420	2456410
10	04 443700	2456840
11	04 443680	2456880
12	04 443480	2457730
13	04 441450	2457600
14	04 440310	2457770
15	04 439640	2457710

11. Form Prepared By

name/title Dawn E. Duensing, historian
organization on behalf of the Hanalei Roads Committee date 4/8/02
street & number P.O. Box 888 telephone 808)572-6583
city or town Makawao state HI zip code 96768

Additional Documentation. Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner(Complete this item at the request of the SHPO or FPO.)

name State of Hawai'i, Department of Transportation
street & number 869 Punchbowl Street telephone (808)587-2150
city or town Honolulu state Hawai'i zip code 96813

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 1

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

The Kaua'i Belt Road between Princeville and Hā'ena traverses ten miles along the island's north shore and is coterminous with its historic right-of-way. This portion of Kaua'i's "belt road" was part of Kaua'i's original belt-road system, which extended from Hā'ena on the north shore to Mānā on Kaua'i's west shore. Although belt-road systems in the Hawaiian Islands were intended to circumvent each island, Kaua'i's road, like the Hawai'i Belt Road, never completely encircled the island due to the rugged topography of Nā Pali Coast. The north shore section of the Kaua'i Belt Road begins at State Route 560's Mile Marker 0 at Princeville and passes through the communities of Hanalei, Wainiha and Hā'ena, ending at Mile Marker 10 at Hā'ena State Park.

The proposed historic district includes the road, the Hanalei Valley Scenic Overlook, and thirteen historic bridges and culverts. The period of significance for the north shore section of the Kaua'i Belt Road is from 1900 when the Territory of Hawai'i Superintendent of Public Works began roadway improvements until 1957 when the Wainiha Bridges were rebuilt after a tidal wave.

The Kaua'i Belt Road between Princeville and Hā'ena retains historic significance and character in its location, alignment, design, setting, and association. The Kaua'i Belt Road between Princeville and Wainiha was built during the 1910s, and from Wainiha to Hā'ena circa 1928. Most of the roadway alignment is unaltered and predates the road's construction. The road passes through rural areas along Kaua'i's North Shore, connecting communities much as it did in the early twentieth century when it was built. In many areas, the road was built over a trail used by Hawaiians and nineteenth-century travelers. There is no shoulder along most of the roadway, except near Princeville. The road has been widened since its construction, but is still narrow in many locations. The roadbed varies between 18' and 20' wide, being narrower as it hugs the sea cliffs and wider as it passes through valleys and residential communities. Near Princeville and Hanalei, the road is 22' wide. For most of the road's length, there are no guardrails, which contributes to the road's historic feeling. Lava-rock guardwalls, some dating to the 1920s, remain along the road in many locations, although many have been undermined by soil erosion. In a few locations, timber guardrails remain along the road. Only a few steel w-beam guardrails have been installed along the road in recent years.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 2

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)
The Hanalei Valley Scenic Overlook has been a feature on the Kaua'i Belt Road since the early 1900s. This scenic site, located near Mile Marker 0 in Princeville, provides a stunning view of the Hanalei Valley and its *kalo lo'i* (taro patches) approximately 160' below. Photographer Alonzo Gartley documented this scenic view in 1912, and R. J. Baker photographed the site in 1915.

Most of the bridges and culverts on the Kaua'i Belt Road are one-lane wide and date to the early 1900s. The bridges represent two popular types of construction in early twentieth century Hawai'i: steel truss and reinforced-concrete flat slab. The reinforced concrete bridges feature solid concrete parapets. In addition, there are also several pipe culverts with masonry rock headwalls that were probably constructed in the first half of the twentieth century.

Physical description: The Kaua'i Belt Road, State Route 560, begins near Princeville at Mile Marker 0. The Hanalei Valley scenic overlook is located at the east end of State Route 560 near Mile Marker 0. Just west of Mile Marker 0 at Princeville, the Kaua'i Belt Road winds around a large hairpin curve and then begins its descent (approximately 6 percent grade) to the Hanalei Bridge. After crossing the Hanalei Bridge, the road follows the Hanalei River west to Hanalei town. The road traverses through the commercial district and historic heart of Hanalei, then continues through residential areas between Wai'oli Bridge and Waipā Bridge. After crossing Waipā Bridge, the road follows the beach along the west shore of Hanalei Bay. The road then winds up and around the mountain ridge as it proceeds to Lumaha'i Valley. As it winds over the ridge, the road reaches an elevation of nearly 160' above sea level. Descending into Lumaha'i Valley, the road again follows the beach before crossing Lumaha'i Bridge and leaving the valley. Another mountain ridge is traversed before entering Wainiha Valley, where the road crosses the three Wainiha Bridges and passes through the small village of Wainiha. From Wainiha, the thoroughfare traverses a level plain between the mountains and ocean as it proceeds through the residential district of Hā'ena. Just east of Mānoa Stream, the road again follows a beach, passing the landmark Hā'ena "Dry Cave" before a slight ascent up the mountain ridge as it follows a narrow strip of coast. The road follows along the narrow base of the mountains until it ends at Kē'ē Beach in Hā'ena State Park at Mile Marker 10.

EARLY TRANSPORTATION ALONG KAUA'I'S NORTH SHORE

With extensively cultivated *kalo* (taro) regions and fishing areas that provided an abundant food supply, the North Shore of Kaua'i was well populated in ancient times.[1] Traditionally, Hawaiians relied on their well-developed navigational skills and would have traveled along the coast by canoe. The Hawaiian population living in the north shore valleys may have also traveled along an ancient foot trail that connected communities between Hanalei and Hā'ena.

Foreigners, among them American missionaries, were the first to travel primarily by land and introduced horses to the Hawaiian Islands in 1803.[2] The journal of William DeWitt Alexander provides an early written account of a day-long excursion along Kaua'i's North Shore in 1849. Alexander's destination was Hā'ena and its "celebrated caves." His party departed from Wai'oli near Hanalei, "all mounted on good horses and in high spirits." Their six-mile journey was through beautiful scenery and crossed three river valleys. Rivers were crossed by canoes or by fording.[3]

In 1865, William T. Brigham's account of his sightseeing journey to Hā'ena noted several improvements in river crossings, including scows on the Hanalei and Lumaha'i rivers. Other rivers still had to be forded and were difficult to cross. The trip to Hā'ena took the entire day, much as it had for Alexander in 1849.[4]

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[1] E. S. Craighill Handy and Elizabeth Green Handy, *Native Planters in Old Hawai'i: Their Life, Lore, and Environment.* (Honolulu: Bishop Museum Press, 1972), 269.
[2] Ralph Kuykendall, *The Hawaiian Kingdom, 1854-1874.* V. 2 (Honolulu: University of Hawai'i Press, 1953), 23.
[3] Kaua'i Historical Society, *The Kaua'i Papers.* (Līhu'e, Hawai'i: Kaua'i Historical Society, 1991), 126-127.
[4] *The Kaua'i Papers*, 138.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 4

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)

By 1893, a number of transportation improvements had been built in the Hanalei District, including a bridge across the Hanalei River. Traveler Eric Knudsen detailed his 1895 trip, describing the road and hill above the Hanalei River, "The road in those early days almost dived straight down to the bridge. It was steep and in wet weather very slippery. No wonder that when any one took a trip in a carriage they had to be escorted by a couple of cowboys on strong horses to help pull the carriage up the steep grades or hold them back while descending."[5] An 1893 Hawaiian Government Survey map illustrated this section of road as a series of switchbacks descending the hill.[6]

Knudsen's journal is valuable for its description of the historical alignment of the trail/road from Hanalei Hill (above the Hanalei Bridge) to Kē'ē Landing at the end of the road in Hā'ena. After crossing the Hanalei Bridge, Knudson reported that the road followed the winding course of the Hanalei River for "quite a distance." He noted that the wagon road ended after Hanalei, and travelers followed the beach in order to ford the rivers where they entered the ocean. West of Waikoko Stream, Knudsen related that the trail climbed over the bluff and then descended straight down to the ocean before turning back and running along the beach again. After the valley, the winding trail proceeded "up and out and over" the narrow hogback into Lumaha'i Valley, where there was no difficulty fording the stream. Knudsen did not describe how travelers crossed the next ridge into Wainiha Valley. The trail then proceeded over the flat lands of Wainiha and Hā'ena, passing both the dry and wet caves before reaching Kē'ē Landing.[7]

According to historian Ralph Kuykendall, nineteenth century Hawai'i roads, "or what were called roads," came into existence by a familiar historical process, "the trail became a road." Many roads, especially in the rural districts like Kaua'i's North Shore, were little more than cleared rights-of-way.[8]

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[5] *The Kaua'i Papers*, 153-154.
[6] W. A. Wall, Map of Hanalei, Makai, Kaua'i. (Honolulu: Hawaiian Government Survey Registered Map No. 1833, 1893).
[7] *The Kaua'i Papers*, 154-155.
[8] Kuykendall, *The Hawaiian Kingdom, 1854-1874*. V. 2, 25-26.

Narrative Description (continued)

Early Transportation Improvements on Kaua'i's North Shore

The earliest bridges on Kaua'i were constructed of wood and steel. Wood was a prevailing construction material throughout the Hawaiian Islands during the nineteenth century; it was widely available, relatively inexpensive, and fairly durable. By the end of the nineteenth century, steel represented the latest in industrial technology and was a preferred construction material for its strength. Although steel bridges had to be imported from the United States or Great Britain, the strength of steel provided a feasible solution for spanning Kaua'i's wide rivers. Steel was also used throughout the islands to erect the substantial bridges required to carry railroads over Hawai'i's rivers and rugged gulches.

During its first year of operation in 1900, the territorial public works department purchased a steel bridge for the Hanalei River from the Wilson & Whitehouse firm. Built by the Missouri River Bridge Company, the steel bridge had a span of 110' with a 14'-wide roadbed constructed of wood. The bridge probably replaced the structure mentioned in Knudsen's journal, which most likely was built of wood and had washed away in a storm. The Territory of Hawai'i Superintendent of Public Works' (SPW) annual report noted that the new steel bridge for Hanalei was to be built on stone abutments at an elevation above the river's flood stage.[9] Building bridges to withstand floods was an important consideration in areas like Kaua'i's North Shore, which was prone to storms and flash floods.

By 1904 timber bridges spanned the rivers at Wainiha, Waikoko, and Waipā, and plans were made for a steel bridge over the Lumaha'i River. The Department of Public Works probably built both the Wainiha and Waipā bridges in 1904. The Waipā Bridge was a simple wood structure, and the Wainiha a wood through-truss bridge.[10] A. A. Wilson finally began construction on the

[9] Superintendent of Public Works, *Report for 1900*, 209.
[10] Photograph Album 43, "Public Works Projects, 1904-1905," 24, 26; Superintendent of Public Works, *Report for 1904*, 38.

new steel bridge at Lumaha'i in 1905.[11] Other public works projects along the North Shore provided for relocating and reconstructing the road between Hā'ena and Hanalei.[12]

In its 1904 annual report, the SPW emphatically advised against the construction of steel bridges. He observed that steel bridges were inappropriate for Hawai'i's coastal areas and expensive to maintain. The SPW noted that several steel bridges, including Wailua Bridge on Kaua'i, were in "exceedingly bad condition" with corrosion that materially affected the strength of the bridge components. He strongly advocated that concrete-arch rather than steel bridges be built wherever the span was not too great.[13] Despite the strong recommendations to use concrete or wood, Kaua'i's wide rivers required long spans, and the steel bridge over the Lumaha'i River was completed as planned.[14] Other improvements were also made, which included relocating some portions of the road and removing excessive grades. The assistant superintendent commented that the trip to Hā'ena would "be made easy and much more enjoyable than at present."[15]

Building Kaua'i's Belt Road

By the end of the nineteenth century, each of the major Hawaiian Islands dreamed of building a "belt" road system. The idea for belt roads dated to the early Hawaiians, who had built such roads on the islands of Maui and O'ahu. Belt roads that circumvented the islands played an important role in Hawai'i's transportation history, connecting isolated communities to their island's economic, political and social centers. In 1911, the territorial legislature established a "loan fund," which provided the bonding needed for each island to build its belt roads and bridges. A Loan Fund Commission (LFC) was appointed for each island, and Kauai's board wasted no time in getting down to business. During its first five years, it engaged in a number of construction projects that quickly improved the north shore portion of the belt road as far as the

[11] Superintendent of Public Works, *Report for 1905*, 31.
[12] Superintendent of Public Works, *Report for 1904*, 66.
[13] Superintendent of Public Works, *Report for 1904*, 3-5.
[14] Superintendent of Public Works, *Report for 1905*, 79, 65, 75.
[15] Superintendent of Public Works, *Report for 1906*, 23.

distant community of Hā'ena. By 1917, Kaua'i considered its belt road complete, a feat that was accomplished earlier than any other island.[16]

In 1911 the Loan Fund Commission initiated several major projects for Hanalei, including a new steel bridge over the Hanalei River and improvements to "Hanalei Hill".[17] A major goal in advancing overland travel on Kaua'i was to eliminate sharp curves and steep grades. The new grades replaced steep inclines that had been suitable for carriage roads, but could not be easily negotiated by the automobiles that were introduced to island roads in the early 1900s. Although newspaper accounts provide only a general description of the "Hanalei Grade," the project probably realigned the road by replacing the steep switchbacks that descended to the Hanalei River (as described by Knudsen in 1895) with a new section of road built on an easier grade. Construction of the new Hanalei Hill grade most likely realigned the road to its current route between the Hanalei Bridge and Princeville. The Hanalei Grade was constructed in two sections, the first of which was completed by December 1911.[18] The second section was expected to be ready by March 1912 if the weather cooperated.[19]

Concurrent with the construction of the new grade descending to the Hanalei River was the plan to build a new steel bridge at Hanalei. Although the SPW had strongly recommended that concrete be used in new construction, the LFC authorized $3,500 for a steel bridge over the Hanalei River.[20] Commissioners had approved funding for a number of concrete bridges for Kaua'i, but did not explain why the new bridge at Hanalei would be constructed of steel. In all likelihood, a steel bridge was chosen due to the long span required to cross the Hanalei river. In addition, the bridge was built on high abutments in order to keep the structure above the flood stage. A concrete bridge over the Hanalei River would have required the construction of high piers, which would have been more expensive and more technically difficult.

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[16] "A Happy Day In Sight," *Garden Island,* July 10, 1917.
[17] "County Fathers in Busy Meeting," *Garden Island,* June 13, 1911.
[18] "Loan Fund Meets," *Garden Island,* December 11, 1911.
[19] "Loan Fund Members Hold Monthly Meet," *Garden Island,* January 16, 1912.
[20] "Loan Commission Holds Meeting," *Garden Island,* July 25, 1911.

Narrative Description (continued)

The advertisement for bids on the Hanalei Bridge called for a Pratt truss steel bridge with "all necessary bolts and rivets for erecting." The 16'-wide structure was to have a floor system of steel beams, wooden stringers, and a wooden floor. The bridge was designed to carry a "16-ton traction engine trailing three 10 ton wagon [sic] on 10 foot wheel bases." The commission demanded that the bridge be delivered "entirely free of rust."[21] The LFC purchased the bridge, which was prefabricated in New York by Hamilton and Chambers, from the Honolulu Iron Works Company.[22] Records do not indicate who installed the bridge; it may have been constructed by LFC or territorial laborers. The new Hanalei Bridge was 113'-feet long with a span of 106' and a horizontal clearance of 17'.[23] The bridge opened to traffic at the end of 1912.[24]

Kaua'i's bridge-building program was extensive in 1912. During a special meeting in May, the LFC decided to build "a number of bridges" near Hanalei, including Waikoko, Waipā, and Wai'oli. The LFC instructed Moragne to prepare plans and specifications for concrete structures, and he designed three flat-slab bridges with solid concrete parapets.[25] Within months of Moragne's assignment, contracts were authorized for George Mahikoa to build the Wai'oli and Waikoko bridges; and George Ewart to build Waipā Bridge.[26] Work on the new bridges began almost immediately and was none too soon. In August 1912, three of the timber bridges that were to be replaced collapsed under the strain of wagons delivering crushed rock for the new concrete bridges.[27]

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[21] "Tenders, Steel Bridge," *Garden Island,* August 8, 1911.

[22] "Meeting of the Loan Fund Commission," *Garden Island,* September 12, 1911; "Loan Com. In Busy Meeting," *Garden Island,* September 26, 1911; original bridge plaque notes Hamilton & Chambers as designers.

[23] "Loan Com. In Busy Meeting," *Garden Island,* September 26, 1911; "Hamilton and Chambers" noted on plaque on Hanalei Bridge.

[24] "Kaua'i Loan Fund Meets," *Garden Island,* January 21, 1913.

[25] "Loan Fund Commission," *Garden Island,* May 29, 1912.

[26] "Loan Fund Meets," *Garden Island,* July 16, 1912.

[27] "Bridges Collapse," *Garden Island,* August 6, 1912.

Narrative Description (continued)

In November 1912, Moragne reported that bridge construction in the Hanalei District was progressing satisfactorily. Waipā Bridge was completed. Wai'oli and Waikoko, along with the Hanalei Bridge, were expected to be completed by the end of the year.[28] With the completion of another bridge at Kīlauea, the Hanalei District had five new bridges in 1912. The local newspaper, the *Garden Island,* remarked that Hanalei's new concrete bridges stood out in comparison to the unsatisfactory roads in the area.[29]

Despite the charge of bad roads in the Hanalei area, the LFC had also appropriated small sums to do road work between Hanalei and Hā'ena. In 1911 the commission instructed Moragne to prepare plans for straightening the road.[30] By early 1912 "considerable" repair work had been accomplished with "telling results," including the correction of two "disagreeable" curves.[31] With Moragne's $1,000 budget for road work spent, the LFC added another $2,000 to continue work between Hanalei and Hā'ena.[32]

Completion of the Kaua'i Belt Road entered its final phase in early 1915 when Supervisor Menefoglio proposed a $100,000 bond to complete the road from Mānā (Barking Sands) to Hā'ena. He estimated that by immediately funding the road work through bonds, Kaua'i could finish the belt road in two years. He noted that if the LFC continued to rely on funding from the territorial legislature, finishing the belt road would take another eight years. He emphasized that Kaua'i would immediately benefit from a good road, as it would increase property values and provide a "great advertisement" for the island. Moragne also favored building the road immediately, agreeing that a two-year project would save money in the long run.[33]

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[28] "County Work is progressing," *Garden Island,* November 19, 1912.
[29] "Hanalei's Bridges," *Garden Island,* January 7, 1913.
[30] "Minutes of a Special Meeting of the Members of the Kaua'i Loan Fund Commission Held at Līhu'e, Kaua'i, August 17, 1911," *Garden Island,* August 22, 1911.
[31] "County Roads Are Getting Into Shape," *Garden Island,* February 6, 1912.
[32] "Loan Fund Commissioners in Meet," *Garden Island,* May 14, 1912.
[33] "Chamber of Commerce," *Garden Island,* February 9, 1915.

Narrative Description (continued)

Instead of completing work on the belt road with bonds, Moragne apparently "plugged away" at the reconstruction and macadamizing of the belt road using money from his regular budget. By August 1916, the final section of the Hanalei portion of the belt road, a stretch of road popularly known as the "Hanalei Road," was ready to be paved from Moloa'a to Hā'ena. Moragne was quite pleased with the county's excellent progress. A year later, work was proceeding rapidly and the belt road that connected Wahiawa in west Kaua'i to Wainiha on the North Shore was nearly completed. The *Garden Island* noted that Kaua'i was the first island in Hawai'i to complete its belt road, even though the road only went about halfway around the island.[34]

Continuing Progress and Completing the Road to Hā'ena

After the concentrated efforts to complete the Kaua'i Belt Road, Moragne and his successor, R. L. Garlinghouse, continued the program of bridge construction and maintenance. Bridges were built at Wainiha and Hā'ena, the Waipā Bridge was extended, and the Lumaha'i Bridge was reinforced. In addition, the belt road was improved and extended to Hā'ena.

By 1921, three bridges were required to carry the road over the Wainiha River. At least one bridge crossed the Wainiha River between 1904 and 1918, a two-span timber truss structure located on the site of what is today known as Wainiha Bridge #3.[35] In 1918, county financial records indicated that $4,188 was disbursed for the Wainiha Bridge from the "permanent improvement fund."[36] That year, J. H. Moragne prepared plans for a two-span Wainiha Bridge, which indicated that the circa 1904 bridge was completely replaced. Moragne's plans provided for new concrete abutments and included a detailed list of lumber, iron, and nails required for construction. The 1918 plans specified a taller truss and larger members than the earlier bridge,

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[34] "Final Stretch of the Hanalei Road," *Garden Island,* August 15, 1916; "A Happy Day In Sight," Garden Island, July 10, 1917.

[35] Photograph Album 43, "Public Works Projects, 1904-1905," 26. There is also a 1907 Wainiha Bridge plan by J. H. Moragne, County Road Supervisor that postdates construction and may have been drawn to facilitate bridge maintenance and/or repairs.

[36] "Receipts and Disbursements, 1918, County of Kaua'i," *Garden Island,* January 21, 1919.

which provided a greater load capacity.[37] The 1918 plans indicated two 75'-6" spans, which were quite close to the current bridge's length of 146'.

In January 1921 the Wainiha River cut a new channel during a storm, which necessitated another bridge, as flooding had carved a "long slim island out of the agricultural land of the valley." The *Garden Island* reported that the new bridge would "make three bridges in the valley, in within [sic] a distance of about 500 yards."[38] This third structure at Wainiha became known as Wainiha Bridge #2. Plans for a new single-span bridge of 75' were drawn in 1922. The design was a timber-truss structure that complemented the adjacent timber-truss bridge (Wainiha #3).[39] Even though the plans were drawn in February 1922, a construction date was not determined. The Territorial Highway Department records state that the bridge was constructed in 1931.[40] No information was located to indicate when the original Wainiha Bridge #2 was built, although it may have been built as early as the first decade of the twentieth century.

In 1925, the Kaua'i Board of Supervisors decided to extend the Belt Road from the end of its pavement at Wainiha to the Dry Cave at Hā'ena. The Superintendent of Public Works expected to obtain additional funding to extend the road to the Wet Caves. Since a road already ran to Hā'ena and there was an existing trail from Hā'ena to Kē'ē Beach,[41] the "Hā'ena Road Extension" project probably improved the existing road to Hā'ena and built a new road from Hā'ena to Kē'ē Beach. The road was macadamized in 1926.[42] Almost $3,000 in additional funding was

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[37] J. H. Moragne, "Wainiha Bridge, Two Spans, County of Kaua'i" plans, January 21, 1918; J. H. Moragne, "Wainiha Bridge" plans, 1907.

[38] "Destruction at Wainiha," *Garden Island*, January 25, 1921.

[39] County of Kaua'i, District of Hanalei. "75 Ft. Bridge for Wainiha" plans, February 1922.

[40] Territory of Hawai'i, Territorial Highway Department, Hawai'i Highway Planning Survey, *Bridge Inventory for the Island of Kaua'i.* In cooperation with the U.S. Department of Commerce, Bureau of Public Roads. 1950. Bridge Data Sheets for Wainiha Bridge #1, #2, and #3.

[41] United States Geological Survey. Topographic Map of the Island of Kaua'i, Kaua'i County, Hawai'i. (Washington, D.C.: USGS, 1912.)

[42] Kaua'i County Clerk, Index File: Kaua'i Board of Supervisors, Resolution No. 2, Approved January 6, 1926.

appropriated for the extension in 1927,[43] and land was taken in mid 1928.[44] This additional appropriation and land may have provided for the road to be extended to the Wet Caves/Kē'ē Beach.

The road improvements near Hā'ena included two small concrete-frame bridges with solid concrete parapets constructed in 1926. County appropriations funded the structures, one of which was near the Hā'ena School and the other near the Dry Cave. The Hā'ena bridges were designed by County Engineer R. L. Garlinghouse[45] and built by contractor George W. Mahikoa.[46] The structures may have been the first concrete-frame bridges built on Kaua'i.[47] The Hā'ena bridges reflected the trend towards wider roads and were built approximately 18' wide, significantly wider than most of the other bridges on the North Shore. When Kaua'i began its road-building program in the early 1900s, the average road width was 12', and nearly all the North Shore bridges were less than 14' wide. To meet the needs of increasing traffic, Kaua'i began widening its major roads and bridges to approximately 20' in 1926.

According to Territorial Highway Department reports, the Waipā Bridge was modified and assumed its unusual design of two different bridges in 1925.[48] The original design plans for the Waipā Bridge indicated there was an existing "old" timber bridge over the river in 1912.[49] In

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[43] "Supervisors Hold Regular Meeting," *Garden Island,* January 18, 1927.
[44] "Supervisors Hold Regular Meeting," *Garden Island,* May 15, 1928.
[45] R. L. Garlinghouse, plans for "County of Kaua'i, Hā'ena Road Bridge No. 1," March 1926; plans for "County of Kaua'i, Hā'ena Road Bridge No. 2," March 1926.
[46] Kaua'i County Clerk, Index File: Hā'ena Road Bridges No. 1 & No. 2, Contract for Construction, Geo. W. Mahikoa, n.d.
[47] R. L. Garlinghouse, plans for Ka'awaloa Bridge, October 1926; Kapāhili Gulch Bridge, May 1927; and Kalāheo Bridges Nos. 1 and 2, March 1928.
[48] Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i,* 1950. Bridge Data Sheet for Waipā Bridge. No construction plans or other information was located to confirm the 1925 construction date.
[49] J. H. Moragne, plans for "Waipā Culvert, District of Hanalei," 1912.

addition, a photograph shows that the 1912 concrete bridge served as an extension of the timber bridge and was probably built to span a widened river channel. The photograph shows that one of the timber bridge spans had collapsed, so the second concrete bridge at Waipā apparently became a replacement for the timber bridge.[50] The Waipā Bridge collapsed in 1919 and a temporary trestle of "light construction" was built to span the washout.[51] No plans were found for the new concrete bridge extension, although County Engineer R. L. Garlinghouse drew a similar concrete-slab bridge design for another structure in 1925.[52] The Waipā extension bridge had five spans for a total length of 90'.[53] It was an unusual structure as it did not match the original bridge's width, wall design, or wall height.

Disasters Strike the North Shore Bridges

Various disasters struck some of the North Shore bridges between 1946 and 1968, necessitating repairs and replacements of the structures. In 1946 and 1957 tidal waves destroyed or damaged bridges at Wainiha and Waikoko. In 1966 and 1968 old age affected bridges at Wainiha and Lumaha'i, causing them to collapse.

Hawai'i's well-known April Fool's Day tidal wave of 1946 inflicted Kaua'i's most severe damage in the Hanalei region. At Wainiha, the tidal wave inundated shoreline areas up to the 27' elevation and destroyed both spans of the highway bridge.[54] Waikoko Bridge was also damaged when the tidal wave undermined its eastern abutment, which caused the bridge to sink on one

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[50] McKay, Helen, Photograph Album #47b, ca. 1912-1930.
[51] "Meeting of Supervisors," *Garden Island*, April 8, 1919.
[52] R. L. Garlinghouse, plans for "Ma'ulili Bridge Reinforced Concrete Slab, District of Kōloa," February 1925.
[53] Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i*, 1950. Bridge Data Sheet for Waipā Bridge.
[54] Department of the Army, Corps of Engineers, Pacific Ocean Division. *Flood Hazard Information, Island of Kaua'i, Report R49.* (Honolulu: U.S. Army Corps of Engineers, 1973), 12.

side.[55] The bridge settled to rest at an angle of nearly 30 degrees. Several days after the tidal wave, the County Board of Supervisors instructed the county engineer to make plans to rebuild the Wainiha and Waikoko bridges.[56] The Board of Supervisors minutes noted that repairs on the damaged "main" Wainiha Bridge (#3) had begun by mid April.[57] Plans drawn in April 1946 illustrated the Wainiha Bridge #1 replacement. The new timber bridge was 38'-6" long and built on two concrete pile bents and new concrete abutments. The bridge was built of 4" x 14" timber stringers and featured wood railings constructed of 6" x 6" posts and 4" x 6" rails braced to the flooring with 3" x 4" lumber.[58] Waikoko Bridge was repaired by filling the collapsed end of the bridge to a level grade and laying a new roadbed on the bridge. The original bridge still rests on an angle, resulting in a quite unusual looking structure. Rocks were used to rebuild the sunken eastern half of the parapet walls at some point after 1950.[59]

Natural disasters struck the Wainiha bridges on two occasions in 1957. On March 9, three tidal waves struck Wainiha Valley, destroying the west span and small approach span of Wainiha Bridge #3 as well as Wainiha Bridges #1 and #2. The only span that remained after the tidal wave was the east (Hanalei side) span of Wainiha #3.[60] In December, flooding from Hurricane Nina damaged Wainiha Bridge #3 again, making it impassable to traffic until it was repaired.[61]

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[55] Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i*, 1950. Bridge Data Sheet for Waikoko Bridge.

[56] Kaua'i County Clerk, Index File: Wainiha Bridge (and Waikoko Bridge), April 3, 1946

[57] Kaua'i County Clerk, Index File: Wainiha Bridge, April 17, 1946.

[58] County of Kaua'i, Department of Public Works, plans for "Construction of Wainiha Bridge, Wainiha Stream Crossing, Wainiha, District of Hanalei, April 1946."

[59] Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i*, 1950. Bridge Data Sheet for Waikoko Bridge.

[60] Corps of Engineers, *Flood Hazard Information*, 12.

[61] "Wainiha Bridge May Take Six Weeks for Repair Job, Cost Figured at $20,000," *Garden Island*, December 4, 1957.

Narrative Description (continued)

Kaua'i Department of Public Works plans provided details regarding the replacement bridges erected after the March 1957 tsunami. The new bridges were constructed on existing concrete abutments and piers. The concrete pile bents from the 1946 Wainiha Bridge #1, however, were removed during the 1957 reconstruction. The standard design for each new structure used steel I-beams and 4" x 4" x 1/4" iron-L bracing forming an inverted truss. The bridges had 4" x 12" timber floor joists and 4" x 12" and/or 2" x 12" wood flooring. Each bridge featured 2" x 4" wood railings and "wheel guards" or curbs constructed of 4"-wide lumber. Bridges #2 and #3 were 8'-10" wide, and Bridge #1 was 8'-3" wide. Wainiha Bridge #2 was built on a skew. The Wainiha Bridge #3 plans revealed that the structure, while always referred to as having two spans, was a three-span bridge constructed on two concrete piers. The west pier was only 22' from the west abutment and supported the bridge approach from the Hā'ena side. This short span was also rebuilt in 1957. Several plans noted that the bridges built in 1957 were "temporary."[62]

CULVERTS

Numerous reinforced-concrete pipe culverts are located between Mile Marker 8.9 near Hā'ena Beach County Park and the end of the road at Mile Marker 10. Although unable to date the structures' construction, the culverts appear to be of historic significance. The structures are simple in construction and feature a small concrete headwall on both sides of the road (see photograph #20). In addition, several pipe culverts (near Mile Marker 1.3 and 1.4) along the Hanalei River feature headwalls constructed of rubble masonry (photograph #21).

[62] County of Kaua'i, Department of Public Works, "Location Map Showing Wainiha Stream Crossing, Wainiha, Hanalei, Kaua'i"; the following plans also illustrated the work completed at Wainiha: "Temporary Bridge No. 3B for Wainiha;" "Temporary Bridge No. 2 for Wainiha;" "Wainiha [#3], Hanalei Side;" "Wainiha Bridge No. 3C Hā'ena Side Approach;" "Dimension Diagram Bridge No. 1A & Bridge #2."

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 16

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)

VISTAS and VIEWS

The Kaua'i Belt Road between Princeville and Hā'ena rewards motorists with a variety of scenic views throughout its course, including beaches, ocean, mountains, waterfalls, vernacular architecture, native and exotic vegetation, and traditional landscapes. Many of these views are unchanged since the 1920s when the road was completed.

Viewpoints and pullouts are scattered throughout the Kaua'i Belt Road corridor. Motorists can also stop at beaches to enjoy the views. Many of the pullouts are recent additions to the roadway, for example, the pullout on the hairpin curve descending from Princeville to the Hanalei Bridge that provides a view of Hanalei Bay and the North Shore. The most impressive view from the Kaua'i Belt Road between Princeville and Hā'ena is that from the Hanalei Valley Scenic Overlook, which is considered a contributing resource and located near Mile Marker 0. The overlook provides a stunning view of the Hanalei Valley approximately 160' below. Travelers have enjoyed this view throughout twentieth century. In 1912, Alonzo Gartley photographed the expansive Hanalei Valley from this point. Ray Jerome Baker photographed the valley in 1915.

The Kaua'i Belt Road along the island's north shore provides one of Hawai'i's finest opportunities to view traditional cultural landscapes. *Kalo lo'i* (taro patches) are visible in Hanalei Valley, Wainiha Valley, and near Hā'ena State Park. Each of the North Shore's river valleys has numerous *kalo lo'i*. Hanalei Valley, now a National Wildlife Refuge, is considered to be Hawai'i's major producer of *kalo*.

Native vegetation along the Kaua'i Belt Road includes hala, coconut, and naupaka. For the most part, the roadside vegetation is dominated by exotics, including the abundant ironwood trees.

Narrative Description (continued)

Alterations

In September 1966, the east span of Wainiha Bridge #3 collapsed. The 1918 truss bridge that survived two tidal waves and flooding had outlived its expected twenty to thirty year operational life. A new span was built using the same plan as the 1957 Wainiha bridges.

In 1967, the 1905 Lumaha'i Bridge fell into the river. The Hawaiian Dredging and Construction Company was already working on a new reinforced-concrete bridge a short distance upstream of the old bridge. The work had been underway for three months and was expected to take another seven months to complete.[63] The new eight-span Lumaha'i Bridge was super-elevated and built on a 60 degree skew. The two-lane structure was 535' long and 28' wide. Construction included a realignment of the bridge approaches, relocating the bridge and road away from the beach and on a wide curve. The new alignment replaced a sharp 45-degree turn on the west approach of the old bridge.[64] The massive new bridge was a sharp contrast to the small-scale early twentieth century bridges built on Kaua'i's North Shore. The road realignment appears to be the only change to the historic alignment since the Hanalei Grade replaced the switchbacks in 1913. A large abutment from the old Lumaha'i Bridge is on the beach east of the river.

In order to strengthen the aging Hanalei Bridge, a new steel Warren truss was added to the existing Pratt truss in 1967. Transverse floor beams were also added below the existing floor beams. Additional plates and welds were installed on the Hanalei Bridge in 1973.[65] In 1988 the Hanalei Bridge was restored, which included strengthening the Warren trusses and adjusting the Pratt trusses; cleaning and painting the structural steel; replacing the timber deck and stringers; installing reinforcing plates and angles; and adjusting the tensioning rods under the floor beams.[66]

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[63] "Old bridge collapses at Hanalei," *Honolulu Star-Bulletin*, October 20, 1967.
[64] State of Hawai'i, Department of Transportation, plans for "Lumaha'i Bridge," 1967.
[65] State Department of Transportation, "Kaua'i Belt Road Kalihiwai to Hā'ena: Preliminary Case Report, Hanalei, Wai'oli & Waipā Bridges," 2-3.
[66] State of Hawai'i, Department of Transportation, "As-Built" Plans for Kūhiō Highway Rehabilitation of the Hanalei Bridge, Project No. 56D-01-87M, 1988.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 18

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)

In the early 1980s, Hā'ena Bridge #2 was substantially modified when the existing concrete parapets were removed and w-beam guardrails and rub rails were installed to serve as bridge walls. The abutments were rebuilt and at some point a new concrete flat slab was added. The bridge retains no historic integrity and is considered a non-contributing structure. Other minor alterations on the Kaua'i Belt Road over the years include the addition of left-turn lanes and curbs in Hanalei. Near Princeville, the road is wider and has shoulders. Reflectors have been added in many areas along the road.

With the exception of the 1968 Lumaha'i Bridge and the rebuilt Hā'ena Bridge #2, the Kaua'i Belt Road from Princeville to Hā'ena maintains a great measure of historic integrity. The remaining bridges are unaltered. Although most historic bridges in Hawai'i have been altered with the addition of w-beam guardrail approaches, the bridges on Kaua'i's North Shore have not been marred by guardrails. The road's construction materials have changed over the decades, with the original roadbed being dirt. Sections of the road near Hanalei were first paved with macadam circa 1916. In recent decades the road was repaved with asphalt. Although the road itself no longer features original construction materials, other aspects of the route, especially the original alignment, location, rural coastal setting, and narrow width are important features that contribute to the road's integrity as a historic site. For most of the length of the road, there are no guardrails. A few concrete-post and timber-beam guardrails remain, most notably at the Hanalei Valley Scenic Overlook and near Mile Marker 5.6. The road also retains many historic lava-rock walls built to protect motorists along the road's precipitous drop-offs. Many of these rock walls have been undermined by collapsing soil or through the additional layers of asphalt that reduce the wall height. In early 2002, the state DOT installed w-beam guardrails in a few areas. In several locations, several grated drop inlets and concrete gutters have also been installed

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 19

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)

Inventory of Contributing and Non-contributing Overlooks, Bridges, and Significant Culverts
Listed in geographical order west from Mile Marker 0 at Princeville:

Kaua'i Belt Road, Princeville to Hā'ena, Mile Marker 0 - 10. A contributing site, the road maintains historic integrity in its original location and alignment, rural coastal setting and feeling. The road is still narrow in many locations and has no shoulder (except near Princeville.)

Hanalei Valley Scenic Overlook: A contributing site, the Hanalei Valley Scenic Overlook has been an established viewpoint since at least the early twentieth century. In 1912, Alonzo Gartley photographed Hanalei Valley from this point. Ray Jerome Baker photographed from this site in 1915. The site features timber guardrails.

Hanalei Bridge. built 1912, steel through truss (Pratt truss); timber deck and stringers; reinforced concrete abutments; one span; 106'; total bridge length 113'; bridge width 17'; minimum overhead clearance 15'. Designer: Pratt truss by Hamilton and Chambers, New York. Altered: Warren truss added to original Pratt truss in 1967. Restored 1989. Determined eligible for the National Register in 1978.

Culvert #1: concrete-frame with solid concrete parapet; one span 10'; total length 15'; culvert width 28'. (Located near Mile Marker 2.0.)

Culvert #2: flat-slab concrete on CRM abutments, solid concrete parapet with square concrete rail cap; one span 15'; total length 17'; culvert width 23'. (Located near Mile Marker 2.4.)

Culvert #3: concrete-frame with solid concrete parapet; one span, 12'; total length 17'; culvert width 30'. (Located near Mile Marker 2.6.)

Wai'oli Bridge. built 1912; concrete flat slab; solid concrete parapet with square concrete rail cap; three spans, 28'; total length 90'; bridge width 13'. Designer: J. H. Moragne, County Engineer. Builder: George W. Mahikoa. Determined eligible for the National Register in 1978.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 20

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Description (continued)

Waipā Bridge: built 1912; concrete flat slab; three spans, 16'; total length 45'; bridge width 13'. Designer: J. H. Moragne, County Engineer. Builder: George R. Ewart, Jr. Extension bridge: built circa 1925; concrete flat slab; five spans, 16'; total extension length 90'; bridge width 16'. Both bridge parapets are solid concrete with rail caps. Bridges are different widths and parapets are different heights. Determined eligible for the National Register in 1978.

Waikoko Bridge: built 1912; concrete flat slab; solid concrete parapet with rail cap; one span, 43'; total length 45'; bridge width 13'. Designer: J. H. Moragne, County Engineer. Builder: George W. Mahikoa. East abutment undermined in 1946 tidal wave; parapets rebuilt with lava rock.

Lumaha'i Bridge: built 1967, two lanes, eight spans.

Wainiha Bridge #1: built 1957 on existing reinforced concrete abutments (1946); steel truss with timber deck; timber railings; one span, 39'; total length 42'; bridge width approximately 11'.

Wainiha Bridge #2: built 1957 on existing reinforced concrete abutments (circa 1922-1930); steel truss with timber deck; timber railings; one span, 74'; total length 78'; bridge width approx. 10'.

Wainiha Bridge #3: west span built 1957, east span built 1966; reinforced concrete abutments built 1918; steel truss with timber deck; timber railings; two spans, 73'; total length 146'; bridge width approximately 11'.

Hā'ena Bridge #1: built 1926; concrete frame; concrete parapet with rail cap; one span, 11'; total length 22'; bridge width 18'. Designer: R. L. Garlinghouse, County Engineer. Contractor: George W. Mahikoa. Bridge has settled to one side and rests at a slight angle.

Hā'ena Bridge #2: built 1926. Lost historic integrity in early 1980s when concrete parapets were removed and w-beam guardrails and rubrails were installed as bridge walls.

Mānoa Ford: construction probably dates to circa 1928 when "Hā'ena Extension" road was built. Ford width approximately 18'.

Limahuli Culvert: construction probably dates to circa 1928 when "Hā'ena Extension" road was built. Flat slab on CRM pier and abutments. Culvert width is 16'-8". No parapets.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 1

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

The Kaua'i Belt Road achieves state and local significance in the areas of engineering, transportation, and social history under criteria A and C. The construction of bridges and a road from 1900 to 1957 was a major transportation achievement, as the County of Kaua'i and private contractors improved an old trail/road system and built bridges to span the North Shore's wide rivers. Thirteen bridges and culverts built between 1912 and 1957 remain along the route as an example of bridge engineering and construction in Hawai'i during the early twentieth century. The completion of an automobile route to Hā'ena circa 1928 provided modern, convenient transportation to the North Shore and its scenic and natural features. The road connected north shore residents with the rest of Kaua'i and provided an overland transportation for agricultural enterprises. The Kaua'i Belt Road is the only remaining intact example of the old belt road system on the island of Kaua'i. The Kaua'i Belt Road from Princeville to Hā'ena retains historic integrity in its original road alignment, narrow lanes, bridges, and spectacular setting along Kaua'i's north coast.

Engineering

Several segments of the north shore section of the Kaua'i Belt Road were impressive engineering feats for early twentieth-century Hawai'i. Although there was an existing trail over the ridges that separated the river valleys, improved roads across those ridges had to be blasted out of the mountainsides. One of the most notable construction projects was the "Hanalei Grade" or "Hanalei Hill," built in 1912 and 1913. The Hanalei Grade was one of the Kaua'i Loan Fund Commission's earliest projects, reflecting the commission's efforts to eliminate sharp curves and steep grades on the island's belt road. The "Hanalei Grade" replaced the steep switchbacks that descended the Hanalei Hill from Princeville to the Hanalei Bridge. This type of road improvement transformed old carriageways into roads that could be easily negotiated by the automobiles that were introduced to the islands in the early 1900s. Although maps to confirm the 1913 realignment of the road descending Hanalei Hill have not been located, there is no physical evidence of other nearby road alignments, indicating that the road alignment descending to the Hanalei Bridge from Princeville dates to 1913. (The old switchback road is still evident.) Building this section of road from 1911 to 1913 was not an easy task. Only one

contractor, George Mahikoa, bid on the project. The work was dangerous, and one worker almost died when he was buried in an excavated section that had collapsed.[67]

The majority of bridges on Kaua'i's North Shore were built using construction methods and materials typical in Hawai'i during the early twentieth century. The steel bridges at Lumaha'i and Hanalei reflected a popular technology at the end of the nineteenth century and early twentieth century. Numerous steel bridges were built throughout the Hawaiian Islands, as builders favored the material's strength over long spans. Today, only a handful of steel bridges remain in the Hawaiian Islands, including the Hanalei Bridge, which is one of two remaining Pratt-truss structures in the state. The Hanalei Bridge is a quite unusual structure because of the addition of a Warren truss in 1967. One bridge engineer deemed the added truss as an "ingenious solution" for strengthening the bridge.[68]

By the 1910s, reinforced concrete became the favored construction material for bridges in Hawai'i due to the corrosive nature of the Pacific Ocean's salt air and the presence of wood-boring insects that made the use of steel and timber bridges less practical in Hawai'i than in the mainland United States. Engineers and the Loan Fund Commissions observed that although concrete was more expensive to build, the increased cost was justified due to concrete's durability as well as lower maintenance and repair costs. Three north shore bridges built in 1912, Wai'oli, Waipā, and Waikoko, were flat-slab reinforced concrete construction. Designed by the County Engineer J. H. Moragne and built by local contractors, these bridges were simple in appearance, but functional. The bridges are a fine representation of engineering technology and design in the early twentieth century. The use of reinforced concrete indicated that the Territory of Hawai'i and the County of Kaua'i were committed to building permanent public works improvements.

The Wainiha Bridges (#1, #2, and #3) are unique in Hawai'i. Designed to be built quickly and inexpensively, the bridges were an expedient response to the destructive 1957 tidal wave that stranded residents on the west side of the Wainiha River. The county Department of Public

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[67] "Hanalei Road-Hand Buried Under Cave-In," *Garden Island*, September 5, 1911.
[68] Jan TenBruggencate, "This Bridge Breathes," *Garden Island*, April 22, 1986.

Narrative Statement of Significance (continued)

Works wasted no time designing new bridges to reconnect the north shore communities, and plans were ready within weeks. The designers used materials that were readily available and had been traditionally used on Kaua'i: steel I- beams, 12" lumber for decks, and 2" x 4"s for railings. Almost fifty years later, the bridges are an important feature of the North Shore's rural landscape and an integral part of its historic belt road.

Talented local engineers were responsible for the design and construction of the belt road and its bridges. The *Garden Island* newspaper credited County Engineer J. H. Moragne with designing and building the Kaua'i Belt Road. Moragne was a road supervisor in 1911 when the Kaua'i Loan Fund Commission appointed him to the position of County Engineer. He had a civil engineering degree from Auburn Technical Institute and came to Hawai'i in 1898. Although his major accomplishment as a public employee was the completion of the Kaua'i Belt Road, Moragne was also associated with numerous other engineering projects on Kaua'i. He had considerable experience as a plantation engineer, designing and building irrigation systems, tunnels, bridges, and reservoirs. He also designed and installed the water-collection system for the Wainiha Power Plant.[69] Little is known about Moragne's successor, R. L. Garlinghouse. His name appears on numerous 1920s bridge plans for the island of Kaua'i, including the concrete-frame Hā'ena Bridges #1 and #2, built in 1926.

Transportation, Commerce, and Social History

Belt road projects were a significant element in the transportation history of the Hawaiian Islands. The roads served to connect isolated communities to their island's economic, political, and social centers. Kaua'i congratulated itself on being the first island to achieve the completion of its belt road system. Although its belt road only stretched between Wahiawa and Wainiha by 1917, not Mānā to Hā'ena as expected, Kaua'i boasted that no other island had achieved such an accomplishment. By the late 1920s, the road was extended and improved to Hā'ena. Jealousy from other islands was apparent, with one Maui legislator complaining that Maui was "the only

[69] Carol Wilcox, *Sugar Water: Hawai'i's Plantation Ditches.* (Honolulu: University of Hawai'i Press, 1996), 70.

island on which you cannot traverse by road around it."[70] Although Maui's belt road to Hāna was opened in 1926, the entire belt road around east Maui was not completed until the 1950s. Like Kaua'i, the island of Hawai'i, due to its rugged topography, never achieved a belt road that completely encircled the island.

The completion of the belt road along Kaua'i's North Shore was a significant achievement for area residents. One Hanalei citizen reported that the road between Wainiha and Kalihiwai was in good condition, which was valuable because the weekly steamer no longer served the area. The belt road was essential for local merchants who had to haul their goods to Hanalei.[71]

The Kaua'i Belt Road was a testament to civic pride on Kaua'i during the early twentieth century. Although the road did not cover as much territory as Supervisor Menefoglio had envisioned, civic pride in Kaua'i's belt road achievement was abundant. The *Garden Island* bragged that Kaua'i would "have the finest road system on the Islands" and "a blessing that no other island enjoys." The writer expected the other islands would try to belittle Kaua'i's accomplishment by pointing out that the island was small and the belt road went only halfway around it. He was not discouraged, however, pointing out, "We've got our road and are enjoying it . . . we would advise you to put your energy in your own roads."[72] Kaua'i was making tremendous progress even if its belt road did not completely encircle the island. The island began macadamizing its roads in 1906, and by 1917 planned to have all the main roads paved.[73] It also adopted a policy of oiling all macadamized roads "in the interest of travel comfort" and to improve the life of the roads. Parapet rock walls were built to protect drivers along more dangerous areas.[74]

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[70] "Roads First Need View of Fassoth," *The Maui News*, February 11, 1921.

[71] "Hanalei Notes," *Garden Island*, May 20, 1919.

[72] "A Happy Day In Sight," *Garden Island*, July 10, 1917.

[73] "Road Maintenance on Kaua'i," *Garden Island*, September 25, 1917. In contrast to Kaua'i's early paving achievements, Maui's Belt Road to Hāna was completed in 1926 but not completely paved until the 1960s.

[74] "Road Progress," *Garden Island*, July 24, 1917.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 5

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

Narrative Statement of Significance (continued)

Kaua'i residents enthusiastically noted that their roads were the best in the Territory of Hawai'i. Most of the road between Līhu'e and Waimea was supposedly as "smooth as a parlor floor." A *Garden Island* writer noted that elsewhere in Hawai'i, particularly on the Big Island, the roads were so rough and rocky that automobile tires were worn out every few hundred miles. He mentioned a car that recently drove around the Big Island and consumed eight new tires in the process. The writer observed, "It pays to construct the best and most durable roads that can be made. . . Kaua'i is prety [sic] well up to date."[75] Some considered good roads a community's most valuable asset, especially on Kaua'i where a variety of scenic roads appealed to tourists.[76] With the belt road completed, a 1918 Hawai'i Tourist Bureau guide to Kaua'i was already promoting activities in the Hanalei area, including "splendid sea bathing," driving and riding trips to the surf at Lumaha'i Beach, the interesting caves at Hā'ena, and even the Wainiha Power House. During the summer, a trip by outrigger canoe was "guaranteed to thrill even the most unimaginative."[77]

Today, a trip along the north shore section of the Kaua'i Belt Road provides an opportunity for motorists to view much of what excursionists would have seen in the late 1920s. The road provides spectacular scenery, with views of Kaua'i's natural beauty: beaches, ocean, and verdant mountains. It provides access to the same activities that attracted tourists in 1918, including beaches, kayaking/canoeing, and the caves at Hā'ena. The rural thoroughfare also affords an important glimpse into Hawai'i's past. Motorists passing through Hanalei may visit the Wai'oli Mission Historic District, which dates to the mid-nineteenth century missionary era. Driving the Kaua'i Belt Road corridor provides a look into Hawai'i's ancient past, as motorists view the *kalo lo'i* and traditional cultural landscapes. The Kaua'i Belt Road along the north shore, with its curvilinear alignment that gently follows the topography, continues to provide motorists a pleasing, scenic journey much as it did in the early twentieth century.

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[75] "Kaua'i's Good Roads, *Garden Island,* January 15, 1918.

[76] "Kaua'i Has the Best Roads in the Territory," *Garden Island,* June 18, 1918.

[77] H. E. Newton. *Kaua'i, Hawaiian Islands.* ([Honolulu]: Hawai'i Tourist Bureau, 1919).

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 9 Page 1

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

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United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 1

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

All photographs were taken by Dawn E. Duensing, who also has all negatives.

1. Kaua'i Belt Road (North Shore section)
2. Kaua'i County, Hawai'i
3. Dawn E. Duensing
4. February 9, 2002
5. Dawn E. Duensing
6. Hanalei Bridge, view looking east
7. Photograph #1

4. March 27, 2002
6. Culvert #1, view looking mauka (towards the mountains)
7. Photograph #2

4. March 27, 2002
6. Culvert #2, view looking mauka
7. Photograph #3

4. March 27, 2002
6. Culvert #3, view looking makai (towards the ocean)
7. Photograph #4

4. February 9, 2002
6. Wai'oli Bridge, view looking makai (toward the ocean)
7. Photograph #5

4. February 9, 2002
6. Waipā Bridge, view looking west
7. Photograph #6

4. February 9, 2002
6. Waikoko Bridge, view looking mauka (toward the mountains)
7. Photograph #7

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 2

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

4. October 15, 2001
6. Wainiha Bridge #1, view looking west
7. Photograph #8

4. October 15, 2001
6. Wainiha Bridge #2, view looking east/makai
7. Photograph #9

4. October 15, 2001
6. Wainiha Bridge #3, view looking makai
7. Photograph #10

4. October 15, 2001
6. Hā'ena Bridge #2, view looking mauka
7. Photograph #11

4. February 9, 2002
6. Mānoa Ford, view looking east
7. Photograph #12

4. March 27, 2002
6. Limahuli Culvert, view looking mauka
7. Photograph #13

4. February 9, 2002
6. road along Hanalei Bay, view looking west at Waikoko Bridge
7. Photograph #14

4. March 27, 2002
6. Hanalei Valley scenic overlook with historic timber guardrails, view looking mauka
7. Photograph #15

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 3

Name of property Kaua'i Belt Road
County and State Kaua'i County, Hawai'i

4. October 15, 2001
6. serpentine road with lava rock parapets, vicinity Mile Marker 6, view looking east
7. Photograph #16

4. October 15, 2001
6. pullout, historic timber guardrails, vicinity Mile Marker 5.2, looking west
7. Photograph #17

4. October 15, 2001
6. serpentine road descending to beach, vicinity Mile Marker 4.5, native hala trees alongside road; looking east towards Waikoko Beach
7. Photograph #18

4. February 9, 2002
6. road ascending mountain ridge west of Waikoko Bridge, view looking west
7. Photograph #19

4. October 15, 2001
6. typical concrete culvert and headwall located in Hā'ena area, this culvert near Mile Marker 9.
7. Photograph #20

4. March 27, 2002
6. CRM headwall, one of two located along Hanalei River near Mile Marker 1.3.
7. Photograph #21

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC North Shore Route

AND/OR COMMON

2 LOCATION

STREET & NUMBER from Hanalei Bridge to Haena — __NOT FOR PUBLICATION

CITY, TOWN Hanalei District — __ VICINITY OF — CONGRESSIONAL DISTRICT

STATE Kauai — CODE — COUNTY — CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
X DISTRICT	X PUBLIC	__OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	PUBLIC ACQUISITION	ACCESSIBLE	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME State of Hawaii

STREET & NUMBER Department of Transportation — Hawaii — STATE

CITY, TOWN Lihue, Kauai 96766 — __ VICINITY OF

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Department of Transportation

STREET & NUMBER Lihue, Kauai — Hawaii — STATE

CITY, TOWN

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Bridge Data Sheet — Environmental Impact Statement (to be released by DOT)

DATE October 20, 1950 — __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS Department of Transportation

CITY, TOWN Lihue, Kauai, Hawaii 96766 — STATE

SCANNED 2009

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	X DETERIORATED	X UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	__ALTERED	__MOVED DATE_____
X FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

see attached architectural description of bridges and photographs

SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION	
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE	
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE	
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN	
__1700-1799	__ART	__ENGINEERING	__MUSIC	__THEATER	
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION	
__1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)	
		__INVENTION			

SPECIFIC DATES 1912-1920 BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

see attachement B

The road that skirts Kauai's North Shore gives access to historic buildings, topographical landmarks associated with legendary and historical events and some of the most photographed vistas of Hawaiian life and landscape.

The road itself includes one of the few remaining one-lane-wood and steel truss bridges in the state, and other one-lane stone, cast-in-place concrete, and wood bridges, and a shallow ford.

The integrity of the winding route is threatened by impending pavement widenings, replacement of all of the one-lane bridges and the ford, a new airport and a proposed shopping center.

It is our intention to preserve this route as one of Kauai's historic and economic resources. The historic and economic value of this route merit public recognition and protection by law.

The route gives access to the following structures as noted on the Kauai Historical Society's Historic Buildings list:

1. Hanalei Huleia Church
2. Waioli Mission Church and Belfry
3. Waioli Pastor's House
4. Waioli Mission House
5. Hanalei School
6. Hanalei Fire Station
7. Dr. Bell's Beach House
8. Gaylord Wilcox Beach House
9. Malolo Road House Complex
10. Lily-Pond House
11. Ching Young Store
12. Japanese School
13. Hanalei Museum
14. Taro Shack
15. Wainiha Power House
16. Waihiha Valley House
17. Wainiha Taro Schack
18. Waimiha Store

The Garden Island Newspaper

File of the County Clerk, Lihue, Kauai

Department of Transportation Bridge Descriptions
File of the Kauai Historical Society

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

A	ZONE	EASTING	NORTHING	B	ZONE	EASTING	NORTHING
C				D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
Julia Neal, Director, Historic Buildings Kauai, Project Nov. 10, 1976

ORGANIZATION
Kauai Historical Society Box 248

DATE
245-6931

STREET & NUMBER

TELEPHONE

Lihue, Kauai, Hi. 96766

CITY OR TOWN

STATE

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 897

ATTACHMENT A-1

ARCHITECTURAL DESCRIPTION AND MERIT

(Also, see Attachment B)

The North Shore Route bridges are interesting architecturally in that they are unobtrusive structures that permit the motorist and pedestrian full view of the environment.

The most ostentacious is the Hanalei Bridge, a simple steel truss structure that provides a gateway to Hanalei Valley and the Na Pali Coast. The majority of the bridges are of stone and concrete and that has been weathered into textures that are contiguous with the rocky streams that they cross.

They are the only one lane bridges in Hawaii that remain in tact, in a series, and in an environment that is harmonious with their design.

WET AND DRY CAVES BRIDGE :

The Wet and Dry Caves Bridge is constructed of an indiginous rock foundation, mounted by a concrete slab. The absence of rails, and other barriers allows the driver and pedestrian an unobstructed view of the stream. The bridge was built close enough to the water so that crossing simulates driving through the stream bed.

HAENA FORD:

The Haena Ford is a shallow crossing made of concrete agregate, that is easily traversed by cars and pedestrians. Floods occuring once in every few years prevent crossing for a few hours.

SHIFTED BRIDGE:

The shifted Bridge is a cast-in-place concrete bridge with a paved deck. It has low, unornamented rails that slant approximately four inches from one end of the bridge to the other. The bridge remains structurally sound.

WAIKOKO BRIDGE:

The Waikoko Bridge is a cast-in-place concrete structure, modified by indigenous rock construction that was added when the bridge fell during the

tidal wave of 1946. The indigenous rock su pports the road built up to meet one end of the fallen concrete bridge and provides low rock wall railings.

WAIPA BRIDGES:

The Waipa Bridges consist of a cast-in place bridge built in 1912 with pointed cap railings and cast-in-place structure with square-topped railings that was added when the 1946 tidal wave changed the course of the stream. The older part of the structure is double-span. The railings have a beveled trim and the bridge shows less wear then the newer, multispan section.

WAIOLI BRIDGE

The Waioli Bridge is a multi-span, cast-in-place concrete bridge with pointed cap railings, built in 1917. It reamins in good condition.

The significance of the North Shore Route was recognized by the Assistant Director of the West Coast Office of the National Trust for Historic Preservation, in a trip report made on July 9, 1976.

In the report, Carol Galbraeth stated: "The road is indeed an exceptionally scenic one and its present character worthy of preservation. Several bridges, especially the Hanalei Bridge and the Wainiha Bridges are worthy of recognition.

She suggested that forms be submitted to the Naltional Register and that the State Office of Historic Preservation request a determination from the Secretary of the Interior concerning their eligibility.

Local concern about the route was shown at a public hearing in the Fall of 1975, which was attended by many Hanalei District residents who stated that they prefer to maintain the integrity of the road. As a result of that hearing the DOT is rewriting the Environmental Impact Statement and will hold another hearing in 1977.

Historical Notes:

The route along Kauai's North Shore has been significant since the prewestern days. Taro, grown in the valleys, was traded for fish caught along the coast, and it was along the coastal route that Hawaiians travelled to Haena to see the fireworks that were thrown off the Na Pali cliffs.

Heiaus remain near the route today and may be affected by any road realignment. Archaeological Research Center Hawaii is reviewing the possible effects of a new highway widening and will submit comments on the heiaus after the DOT releases their new plans.

Westerners began to use the route in the early 1800s. In 1816, Anton Scheffer, a doctor working for the Russian American

Company befriended Kamaulii and made a deal to control the sandalwood business on Kauai. In late September or early October, he raised a Russian flag over Hanalei Valley and called it Schafferthal. He built a Russian Fort approxiamatly one mile from the North Shore Route.

In the 1820's the roadway became an occasional trade artery for bananas, coconuts, breadfruits, sweet potatoes, chickens and pigs, which were exchanged for nails, cloth and other goods brought on ships.

In the 1830's, Hawaiians traded with the missionaries for soap, cloth and household implements. Near the route, some 2,000 local people constructed a grass meeting house as the first structure at Waioli Mission. Today, the remaining buildings at Waioli Mission are listed on the National Register of Historic Places.

The North Shore Route soon became the road that serviced many agricultural experiments that were new to Hawaii. In the 1840s, cattle and sugar were raised and shipped from Hanalei Port. Charles Titcomb started a silk worm venture and Godfrey Rhodes and John Bernart started the first commercial coffee venture in the islands. The September, 1847 issue of Polynesia states that coffee was flourishing in Hanalei.

In the 1850s the road serviced the first commercial tobacco industry in Hawaii. Joseph Gardener began cotton and wool processing. The route became increasingly travelled by visitors.

Queen Emma visited the area in 1856 and mainlanders that were connected with the Gold Rush came to Hanalei by ship in the winters. Many Hawaiians from Haena and the Na Pali Coast travelled down the route to Hanalei to join whaling ships.

In the late 1800s the rice industry began and by 1885, 300 Chinese lived in rice camps in Hanalei District. Hanalei

grew to become the largest area under rice cultivation in Hawaii and its two rice mills were serviced by the North Shore Route.

The exact date of the building of the first bridges along the road is unknown. Early tour guides refer to barges that carried travellers and goods across Hanalei and Lumahai Rivers. According to the island's newspaper, The Garden Island, there were bridges by the early 1900s and by 1912 they were ready for replacement:

The Garden Island, August 6, 1912:

"A telephone message was received from Hanalei at noon today to the effect that three bridges in the Hanalei District which are to be replaced with new ones, had collapsed. One bridge had been but fairly cleared by a loaded wagon, when it fell and crashed into the stream, while a second bridge went down carrying part of the wagon with it. Fortunately, the team had secured sound footing and were able to withstand the strain. A third bridge collapsed with no great loss, as the timbers were useless."

"The cause of this wholesale collapsing of bridges is attributed to the constant strain on the old timbers during the last week when wagons, loaded with crushed rock have passed over them."

The bridges that are listed on the North Shore Route in this proposal are those that replaced the ones that were mentioned in the 1912 telephone message. The records of their construction have been lost by the County of Kauai, and are not to be found with the DOT which now has them under its jurisdiction.

A Garden Island article in the first issue of 1913 describes the Hanalei Bridges:

"Standing out in contrast to the present unsatisfactory conditions of the roads as does the diamond outstrip its bed

of mucky surroundings, new concrete bridges now under construction are assuming a finished appearance. A new steel bridge has also replaced the old structure across the Hanalei River."

The bridges have been repaired and some of them have been slightly modified to increase their strengths. Two of the bridges stand as monuments to the 1946 tidal wave.

The Waikokos Bridge fell in the tidal wave, but was modified by indigenous rock which was added to one side to build it up to a level roadway. From the beach, the bridge is an interesting spectacle that looks as though it is fallen and unuseable, when in fact, it remains sturdy.

The Waipa Bridge was elongated in 1946 with an additonal span, after the tidal wave changed the course of the stream that it crosses.

Since the bridges were built, the North Shore Route has become and increasingly significant scenic and historic attraction, and a destination for low key tourism by car and by both persons from off the island and residents from other places on Kauai.

TERRITORIAL HIGHWAY DEPARTMENT
HONOLULU, T. H.

BRIDGE DATA SHEET

Date of Original Inventory: October 20, 1950

Island: Kauai

Bridge Number: 40

Name of Bridge: Hanalei

Location

General Location: Hanalei

Name of Road: Kauai Belt Road

Route Number: FAS 243

Name of Road Project:

Project Number:

Name of Stream: Hanalei River

Name of Railroad:

Number of Tracks:

Map Location: Map - U.S.G.S.

Latitude N

Quadrangle: Kapaa

Longitude W

Scale: 1/62,500

Coordinates: 833280-2783480

Description (See sketch on reverse side)

Kind of Crossing: Bridge over River

Type of Bridge: Steel Through Truss

Number of Spans:	Length of Spans:	Type:
1	106 ft.	Pratt Truss

Total Length of Center Line of Road: 113 ft.

Materials Used

Substructure:	Superstructure:	Pavement:
Abutments: Reinf. Conc.	Steel	Timber

Construction Data

Date of Construction: 1912; repaired in 1934

Load Limits; Design: Estimated: Posted: 10 Tons

Plans on File with: File No.:

Approach Roadway;

	Width:	Grade:	Alignment:	Surface:
NE	17 ft.			Bit. Surface Tre...
SW	17 ft.			" "

Bridge Roadway Width: 17 ft.

Sidewalk Widths; Right: 0 Left: 0

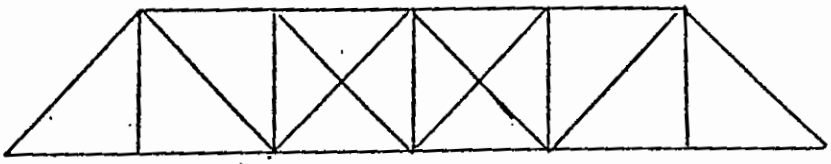
Surface of road to stream bed: 25.5 ft.

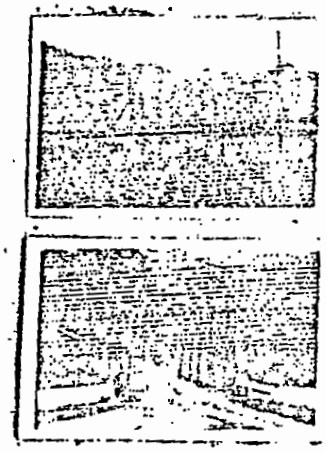
Clear distance of opening above stream bed: 22 ft.

Surface of road to bottom of portal - Minimum overhead clearance 15 ft.

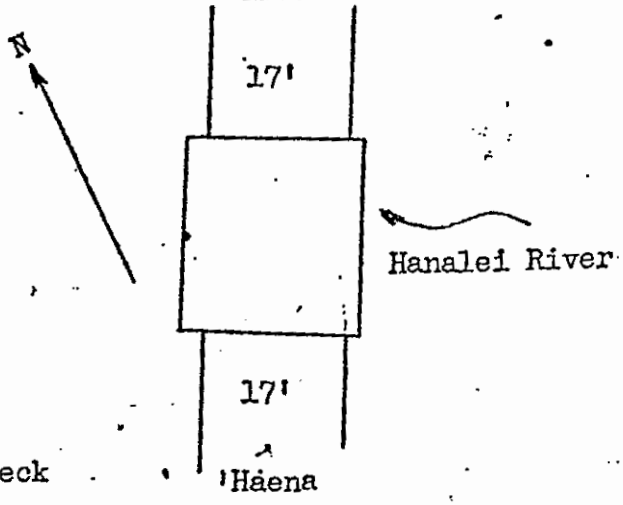
SKETCH

Elevation

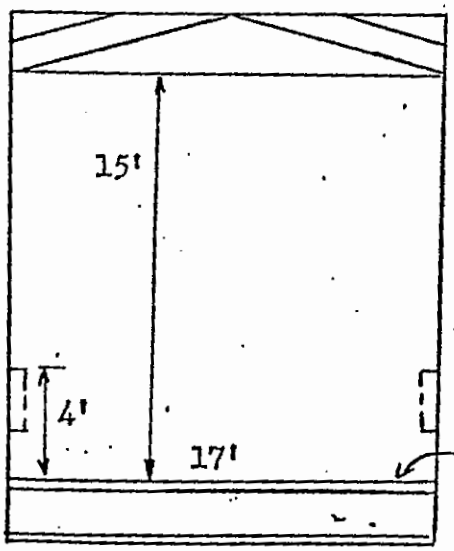




Plan



Cross-section



eneral Condition of Bridge

Date of Inspection: Oct. 20, 1950

Superstructure: Fair

Floor: Poor

Substructure: Fair

Paint:

Steel beginning to corrode - Railings badly corroded

HONOLULU, T. H.

BRIDGE DATA SHEET

Date of Original Inventory: October 20, 1950

Island: Kauai

Bridge Number: 41

Name of Bridge: Waioli

Location

General Location: Henalei

Name of Road: Kauai Belt Road

Route Number: FAS 243

Name of Road Project: County

Project Number: County

Name of Stream: Waioli Stream

Name of Railroad:

Number of Tracks:

Map Location: Map - U.S.G.S.

Latitude N

Quadrangle: Na Pali

Longitude W

Scale: 1/62,500

Coordinates: 829750-2782330

Description (See sketch on reverse side)

Kind of Crossing: Bridge over Stream

Type of Bridge: Reinforced Concrete

Number of Spans:	Length of Spans:	Type:
3	28 ft.	Flat Slab

Total Length of Center Line of Road: 90.5 ft.

Materials Used

Substructure:	Superstructure:	Pavement:
Abutments: Reinf. Conc. Piers: Reinf. Conc.	Reinf. Conc.	Bit. Surface Treatment

Construction Data

Date of Construction: 1912

Load Limits; Design: Estimated: H 15 Posted: None

Plans on File with: File No.:

Clearances

Approach Roadway;

	Width:	Grade:	Alignment:	Surface:
NE	10 ft.			Bit. Surface Treatment
SW	10 ft.			" " "

Bridge Roadway Width: 13 ft.

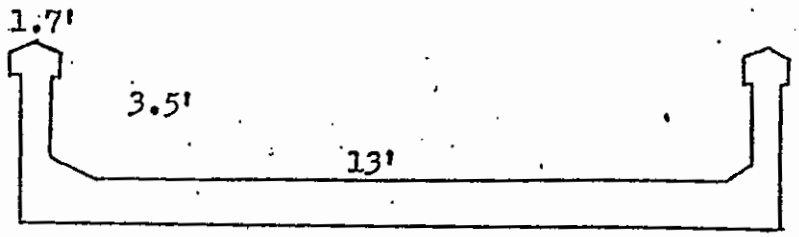
Sidewalk Widths; Right: 0 Left: 0

Surface of road to stream bed: 11 ft.

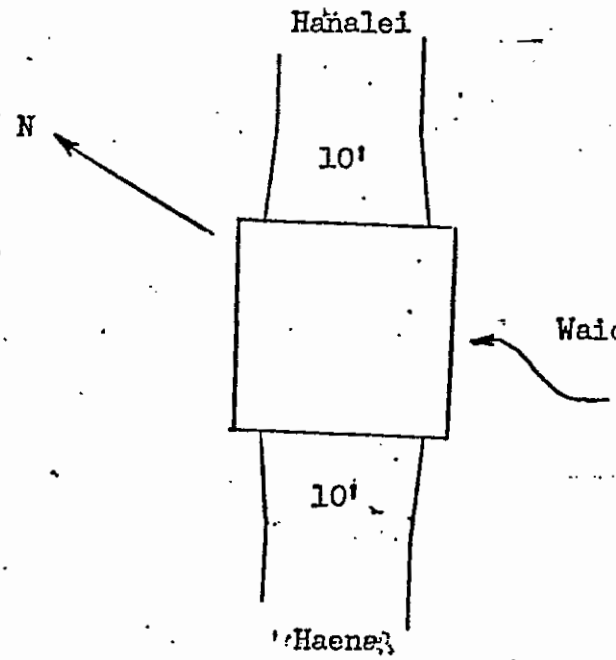
Clear distance of opening above stream bed: 9 ft.

SKETCH

Cross-section



Plan



General Condition of Bridge

Date of Inspection: Oct. 20, 1950

Superstructure: Good

Floor: Poor

Substructure: Good

Paint:

HONOLULU, T. H.

BRIDGE DATA SHEET

Date of Original Inventory: October 20, 1950 — Island: Kauai

Bridge Number: 42

Name of Bridge: Waipa

Location

General Location: Hanalei

Name of Road: Kauai Belt Road — Route Number: FAS 243

Name of Road Project: County — Project Number: County

Name of Stream: Waipa Stream

Name of Railroad: — Number of Tracks:

Map Location: Map - U.S.G.S. — Latitude N

Quadrangle: Na Pali — Longitude W

Scale: 1/62,500 — Coordinates: 828950-2782750

Description (See sketch on reverse side)

Kind of Crossing: Bridge over Stream

Type of Bridge: Reinforced Concrete

Number of Spans:	Length of Spans:	Type:
8	16 ft.	Flat Slab

Total Length of Center Line of Road: 138.5 ft.

Materials Used

Substructure:	Superstructure:	Pavement:
Abutments: Reinf. Conc.	Reinf. Conc.	Bit. Surface Treatment
Piers: Reinf. Conc.		

Construction Data

Date of Construction: Original Bridge Built in 1912 Extended in 1925

Load Limits; Design: — Estimated: H 15 — Posted: None

Plans on File with: County — File No.:

Clearances

Approach Roadway;

	Width:	Grade:	Alignment:	Surface:
NW	14 ft.			Bit. Surface Treatment
SE	14 ft.			" " "

Bridge Roadway Width: 13.5 ft. 16 ft.

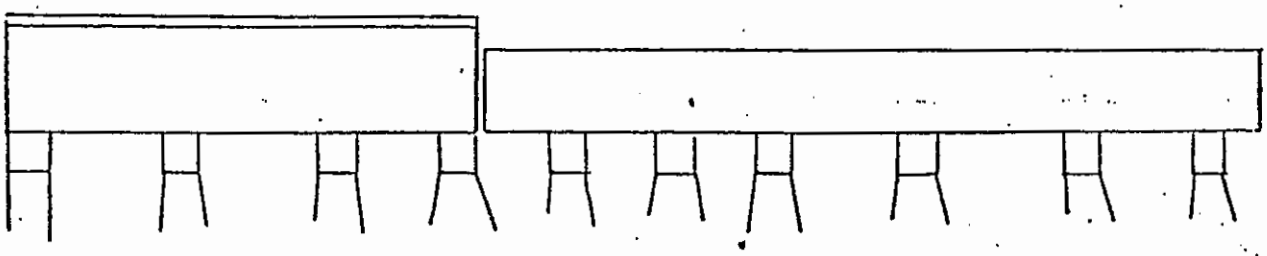
Sidewalk Widths; Right: 0 Left: 0

Surface of road to stream bed: 14 ft.

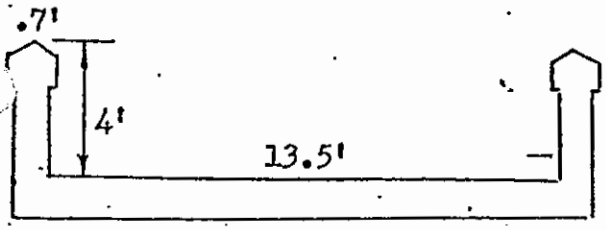
Clear distance of opening above stream bed: 11 ft.

SKETCH

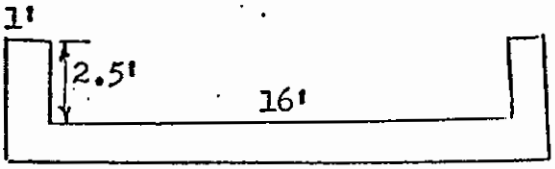
Elevation



Cross-section

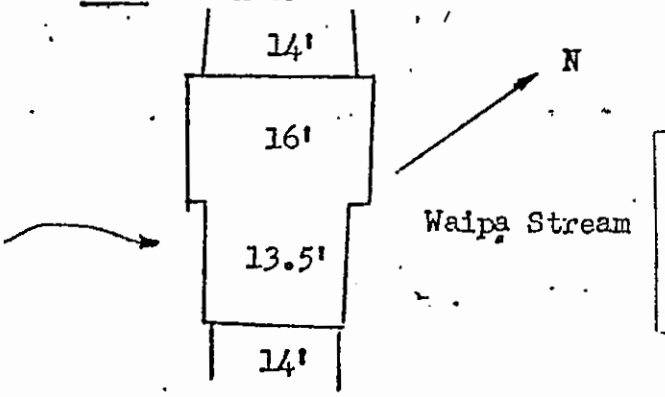


3 spans on pier for 45' length

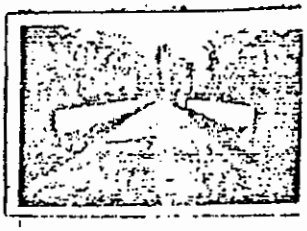


5 spans for 90 ft.

Plan







General Condition of Bridge

Date of Inspection: Oct. 20, 1950

Superstructure: Fair - Railing Chipped Floor: Fair

Substructure: Fair Paint:

TERRITORIAL HIGHWAY DEPARTMENT
HONOLULU, T. H.

BRIDGE DATA SHEET

Date of Original Inventory: October 20, 1950

Island: Kauai

Bridge Number: 43

Name of Bridge: Waikoko

Location

General Location: Hanalei

Name of Road: Kauai Belt Road

Route Number: FAS 243

Name of Road Project: County

Project Number: County

Name of Stream: Waikoko Stream

Name of Railroad:

Number of Tracks:

Map Location: Map - U.S.G.S.

Quadrangle: Na Pali

Scale: 1/62,500

Latitude N

Longitude W

Coordinates: 828670-2783100

Description (See sketch on reverse side)

Kind of Crossing: Bridge over Stream

Type of Bridge: Reinforced Concrete

Number of Spans:	Length of Spans:	Type:
1	43 ft.	Flat Slab

Total Length of Center Line of Road: 45 ft.

Materials Used

Substructure:	Superstructure:	Pavement:
Abutments: Reinf. Conc.	Reinf. Conc.	Bit. Surface Treatment

Construction Data

Date of Construction: 1913

Load Limits; Design: Estimated: H 10 Posted: None

Plans on File with: County File No.:

Approach Roadway;

	Width:	Grade:	Alignment:	Surface:
NW	14 ft.		Tangent	Bit. Surface Treatment
SE	14 ft.		Tangent	" "

Bridge Roadway Width: 13 ft.

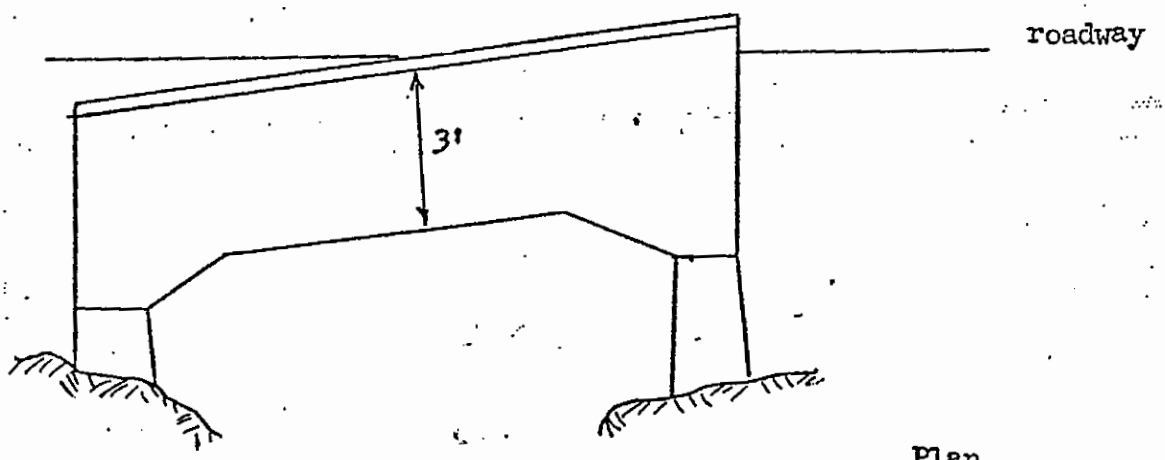
Sidewalk Widths; Right: 0 Left: 0

Surface of road to stream bed: 11 ft.

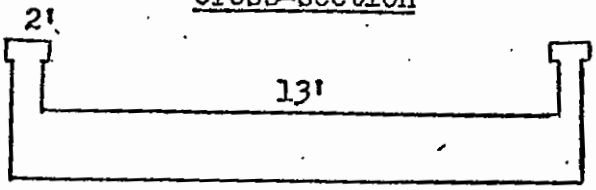
Clear distance of opening above stream bed: 8 ft.

SKETCH

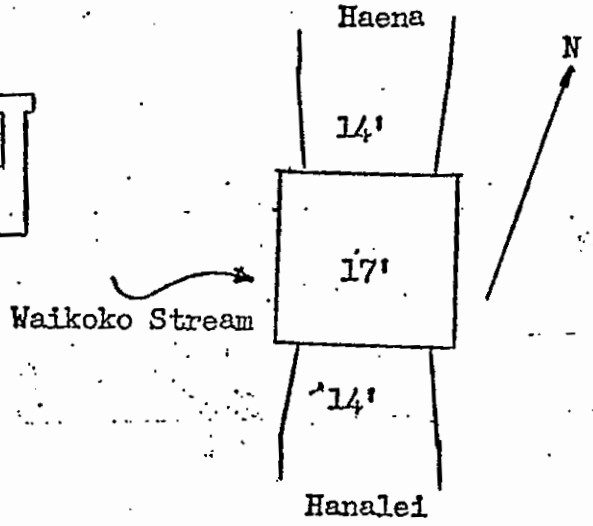
Elevation



Cross-section



Plan



General Condition of Bridge

Date of Inspection: Oct. 20, 1950

Superstructure: Poor - Structure sunk on one side due to Tidal Wave

Floor: Fair

Substructure: Fair

Paint:

DOCUMENTATION FOR DETERMINATION OF ELIGIBILITY FOR INCLUSION IN THE NATIONAL REGISTER

HANALEI BRIDGE

I. DETERMINATION OF ELIGIBILITY - Requested by: Federal Highway Administration.

II. PROPERTY NAME

A. Historic Name - Hanalei Bridge

1. Original Owner - County of Kauai

2. Significant persons or events - Hamilton and Chambers of New York.

3. Unusual characteristics - None

4. Professional, scientific, technical, or traditional name - Pratt Truss Bridge

B. Common Name - Hanalei Bridge

C. Archaeological Site Name - None

III. LOCATION

Kuhio Highway (Kauai Belt Road), Federal-Aid Primary Route 56, Milepost 29.275, Hanalei District, Island of Kauai, State of Hawaii. Crossing of Hanalei River.

IV. CLASSIFICATION

A. Category - Structure

B. Ownership - Public

C. Status - Occupied (in service)

D. Access - Unrestricted

E. Present Use - Transportation

V. OWNER OF PROPERTY

County of Kauai, Department of Public Works, Lihue, Kauai, Hawaii 96766.
Note: State of Hawaii has maintenance jurisdiction.

VI. REPRESENTATION IN EXISTING SURVEYS

A. NPS Form No. 10-300 (No SHPO Certification), 11/10/76, Kauai Historical Society.

B. "Kauai Belt Road, Kalihiwai to Haena Section (FAP Route 56, Kauai, Hawaii), Administrative Action, Draft Environmental Impact Statement", Federal Highway Administration, February 23, 1977.

C. "Hawaii Bridges on Kauai Route 56, Kalihiwai to Haena", FHWA memo dated August 29, 1977, HBR-09. (Physical condition survey only).

VII. DESCRIPTION

The structure is a single span, steel through-truss (Pratt Truss) bridge with a total length of 113 feet and a maximum span length of 106 feet. The abutments are of reinforced concrete. The deck has a 17-foot horizontal clearance and is made of timber planks. Design load rating is H-15. Posted capacity is 12 tons.

The structure was prefabricated in New York by Hamilton and Chambers and erected in 1912 at the present location. In 1934, maintenance repairs were made. In 1967, a new steel Warren truss was added to each side of the existing truss and transverse floor beams were added below the existing floor beams. The new truss is laterally supported by the original truss and was designed to carry a portion of the load. Both the old and new structures must be maintained to preserve the structural integrity of the bridge. Repairs were made again in 1973 by strengthening the members and connections through the addition of plates and more welds. The severely corroded joints on the Pratt Truss were tied by welding. The timber stringers were added at that time.

The bridge was not repainted since the required sand blasting would have been detrimental to the existing members which, in many cases, have reduced effective cross sections due to natural deterioration.

The original truss is badly deteriorated. The State DOT estimates that some of the members have only 20% of their original cross sectional areas remaining. The trusses added in 1967 are in fairly good condition but are dependent on the original truss for its load carrying capacity. The condition of the original truss members has deteriorated to the point that it is improbable that any new members can be welded to them.

Refer to Appendix G for additional information on the recent condition of Hanalei Bridge.

VIII. SIGNIFICANCE

Period - After 1900

Area of Significance - Engineering and Transportation

Specific Dates - Original time of erection is 1912

Builder - Prefabrication by Hamilton and Chambers of New York. (The FHWA New York office was not able to locate this firm, it appears they are no longer in business).

Statement:

The 1912 Hanalei Bridge is one of the early examples of the progressive Territorial highway system in Hawaii, on Kauai's North Shore. It is an example of one of the first use of formal engineering expertise in bridge making by the new Territorial Government, shortly after United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1910-1913, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the Island.

Steel bridges for Hawaii were ordered as early as 1890. At Wailua, Kauai, a steel bridge was erected in 1894. In 1900, a steel bridge, made by the Missouri River Bridge Company, was erected at Hanalei River.

IX. BIBLIOGRAPHY

Historic Buildings Task Force, Old Honolulu - A Guide to Oahu's Historic Buildings, Honolulu, 1969.

Minister of the Interior Reports, 1845-1862. Honolulu, Hawaii: State Archives.

Minister of the Interior Reports, 1878-1886 Honolulu, Hawaii: State Archives.

Minister of the Interior Reports 1887-1892 Honolulu, Hawaii: State Archives

Minister of the Interior Reports 1893-1899
Honolulu, Hawaii: State Archives

Superintendent of Public Works Reports, 1900-1904
Honolulu, Hawaii: State Archives

Superintendent of Public Works Reports, 1905-1910
Honolulu, Hawaii: State Archives

X. GEOGRAPHICAL DATA, MAPS AND ACREAGE

UTM Reference 04E450682N2456624

orm No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC Hanalei Bridge - Kuhio Highway (Bridge Number: 40)

AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN Hanalei __ VICINITY OF

CONGRESSIONAL DISTRICT

STATE	CODE	COUNTY	CODE
Hawaii	96714	Kauai	

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME State of Hawaii, Department of Transportation

STREET & NUMBER 869 Punchbowl Street

CITY, TOWN Honolulu __ VICINITY OF STATE Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Bridge Data Sheet — Environmental Impact Statement released February 23, 1977

DATE October 20, 1950 __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS Department of Transportation

CITY, TOWN Lihue STATE Hawaii

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	X ALTERED	__MOVED DATE_____
X FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Hanalei Bridge is a 106-foot, single span, steel through-truss(Pratt Truss) bridge built on reinforced concrete abutments, with a 17-foot roadway deck made of timber planks. The bridge was constructed by the Territory of Hawaii in 1912, built by Hamilton & Chambers of New York. The bridge has been continuously used and maintained since 1912, with repairs in 1934 that strengthened the superstructure.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper
Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Descriptions of Bridges
State Building, Lihue, Kauai, Hi.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	04	450682	2415624
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Julia Neal, Director, Historic Buildings Kauai, Project — Nov. 10, 1976
ORGANIZATION — DATE

Kauai Historical Society
STREET & NUMBER — TELEPHONE

P. O. Box 1778 — 245-6931
CITY OR TOWN — STATE

Lihue, — Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE — DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION	
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE	
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE	
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN	
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER	
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION	
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)	
		__INVENTION			

SPECIFIC DATES 1912 BUILDER/ARCHITECT Hamilton & Chambers, New York

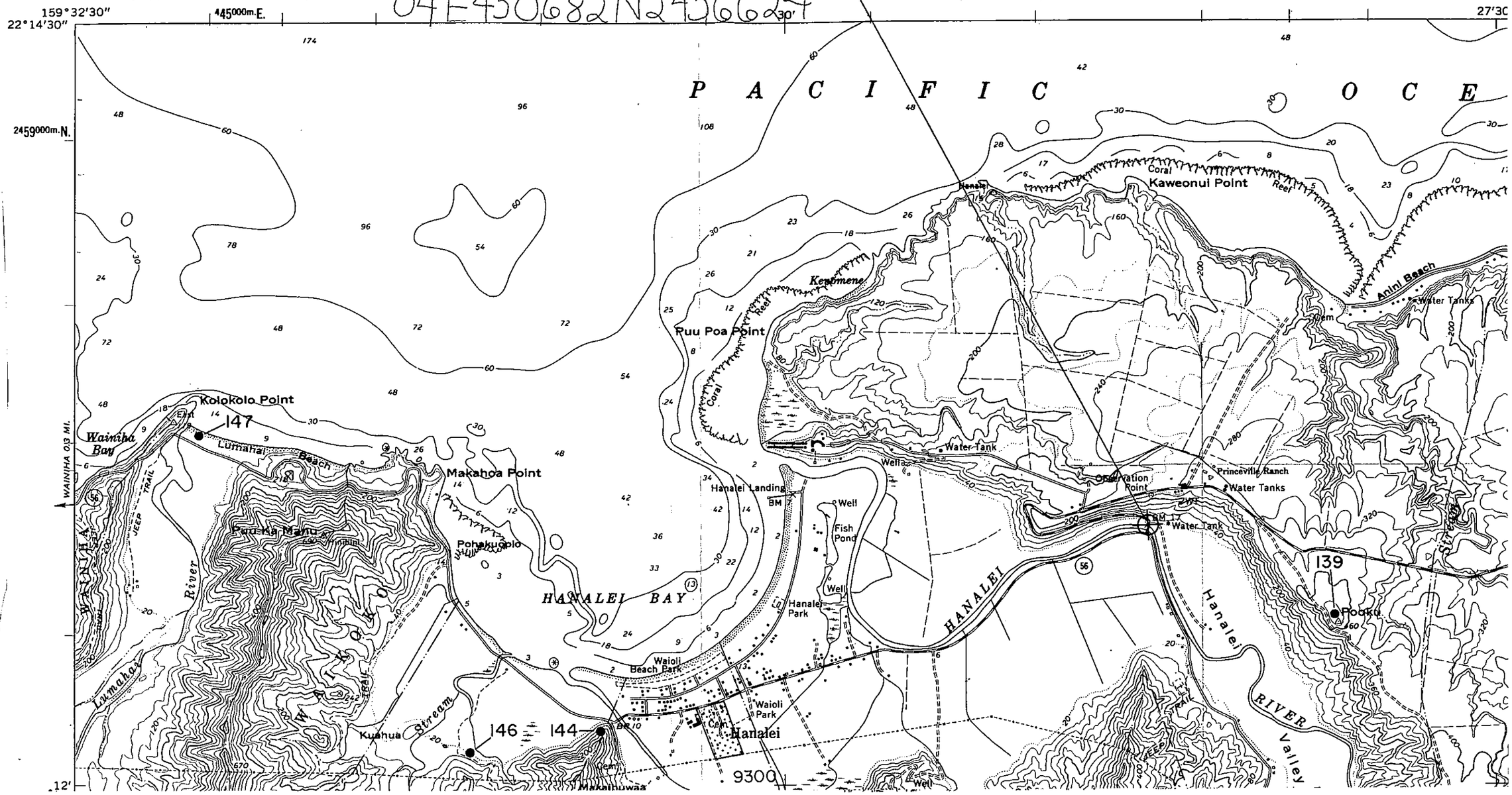
STATEMENT OF SIGNIFICANCE

The 1912 Hanalei Bridge is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911 - 1912, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HANALEI BRIDGE
04E450682N2456624



orm No. 10-300 (Rev. 10-74)

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1 NAME

HISTORIC
Waipa Bridge - Kuhio Highway (Bridge Number: 42)
AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN
Hanalei
__ VICINITY OF

CONGRESSIONAL DISTRICT

STATE	CODE	COUNTY	CODE
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CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
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__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

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STREET & NUMBER
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Honolulu
__ VICINITY OF
STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Bridge Data Sheet
Environmental Impact Statement released February 23, 1977
DATE
October 20, 1950
__FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

In 1912, the Waipa bridge was constructed as a 45-foot triple span reinforced concrete bridge built on reinforced concrete piers and abutments, with a 13½-foot roadway deck made of bitumens surface treatment. This section also featured 4-foot high pointed cap railings.

The bridge was extended in 1925 with the addition of a 90-foot five span cast-in-place reinforced concrete structure with 2½-foot hight square topped railings. This section has a 16-foot roadway deck of bitumens surface treatment. The bridges were constructed by the Territory of Hawaii and have been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
_PREHISTORIC	_ARCHEOLOGY-PREHISTORIC	_COMMUNITY PLANNING	_LANDSCAPE ARCHITECTURE	_RELIGION
_1400-1499	_ARCHEOLOGY-HISTORIC	_CONSERVATION	_LAW	_SCIENCE
_1500-1599	_AGRICULTURE	_ECONOMICS	_LITERATURE	_SCULPTURE
_1600-1699	_ARCHITECTURE	_EDUCATION	_MILITARY	_SOCIAL/HUMANITARIAN
_1700-1799	_ART	X ENGINEERING	_MUSIC	_THEATER
_1800-1899	_COMMERCE	_EXPLORATION/SETTLEMENT	_PHILOSOPHY	X TRANSPORTATION
X 1900-	_COMMUNICATIONS	_INDUSTRY	_POLITICS/GOVERNMENT	_OTHER (SPECIFY)
		_INVENTION		

SPECIFIC DATES 1912 and 1925 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The Waipa Bridge is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

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B			
C			
D			

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STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Julia Neal, Director, Historic Buildings, Kauai, Project — Nov. 10, 1976
ORGANIZATION — DATE

Kauai Historical Society
STREET & NUMBER — TELEPHONE

P. O. Box 1778 — 245-6931
CITY OR TOWN — STATE

Lihue, Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE — DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

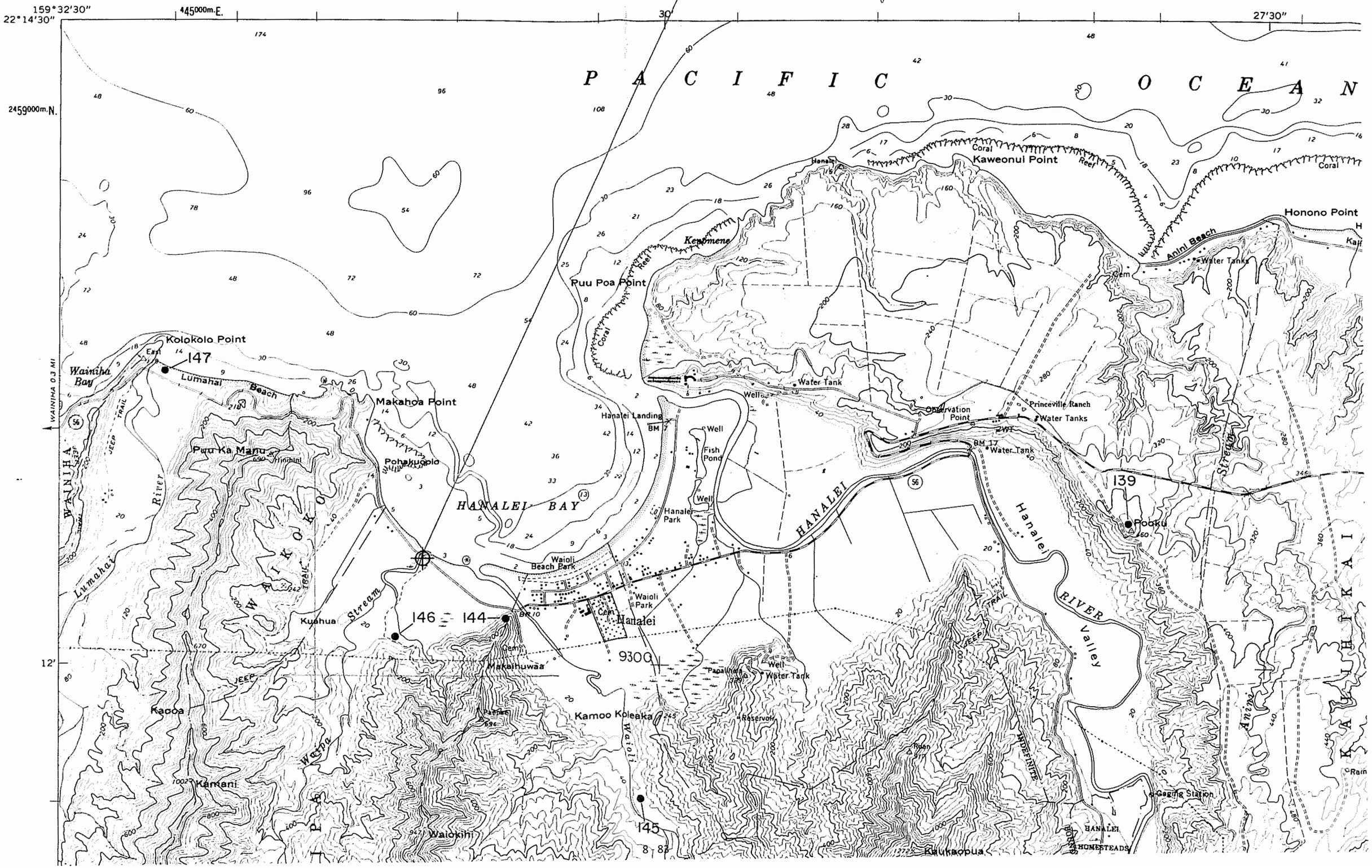
ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WAIPA STREAM
04 E446765 N2455840



Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

Waioli Bridge - Kuhio Highway (Bridge Number: 41)

AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN

Hanalei __ VICINITY OF

CONGRESSIONAL DISTRICT

STATE	CODE	COUNTY	CODE
Hawaii	96714	Kauai	

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME

State of Hawaii, Department of Transportation

STREET & NUMBER

869 Punchbowl Street

CITY, TOWN

Honolulu, __ VICINITY OF

STATE

Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

Bridge Data Sheet

Environmental Impact Statement ~~released February 23, 1977~~

DATE

October 20, 1950

__FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS

Department of Transportation

CITY, TOWN

Lihue

STATE

Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Waioli Bridge is a 28-foot triple span, reinforced concrete bridge built on reinforced concrete piers and abutments, with a 13-foot roadway deck made of bitumens surface treatment. The bridge was constructed by the Territory of Hawaii in 1912 and has been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1912 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The 1912 Waioli Bridge is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911-1912, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Descriptions of Bridges
State Building, Lihue, Kauai, Hi.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A	04	444,468	2,455,482	B			
C				D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Julia Neal, Director, Historic Buildings, Kauai, Project Nov. 10, 1976
ORGANIZATION DATE

Kauai Historical Society
STREET & NUMBER TELEPHONE

P. O. Box 1778 245-6931
CITY OR TOWN STATE

Lihue, Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

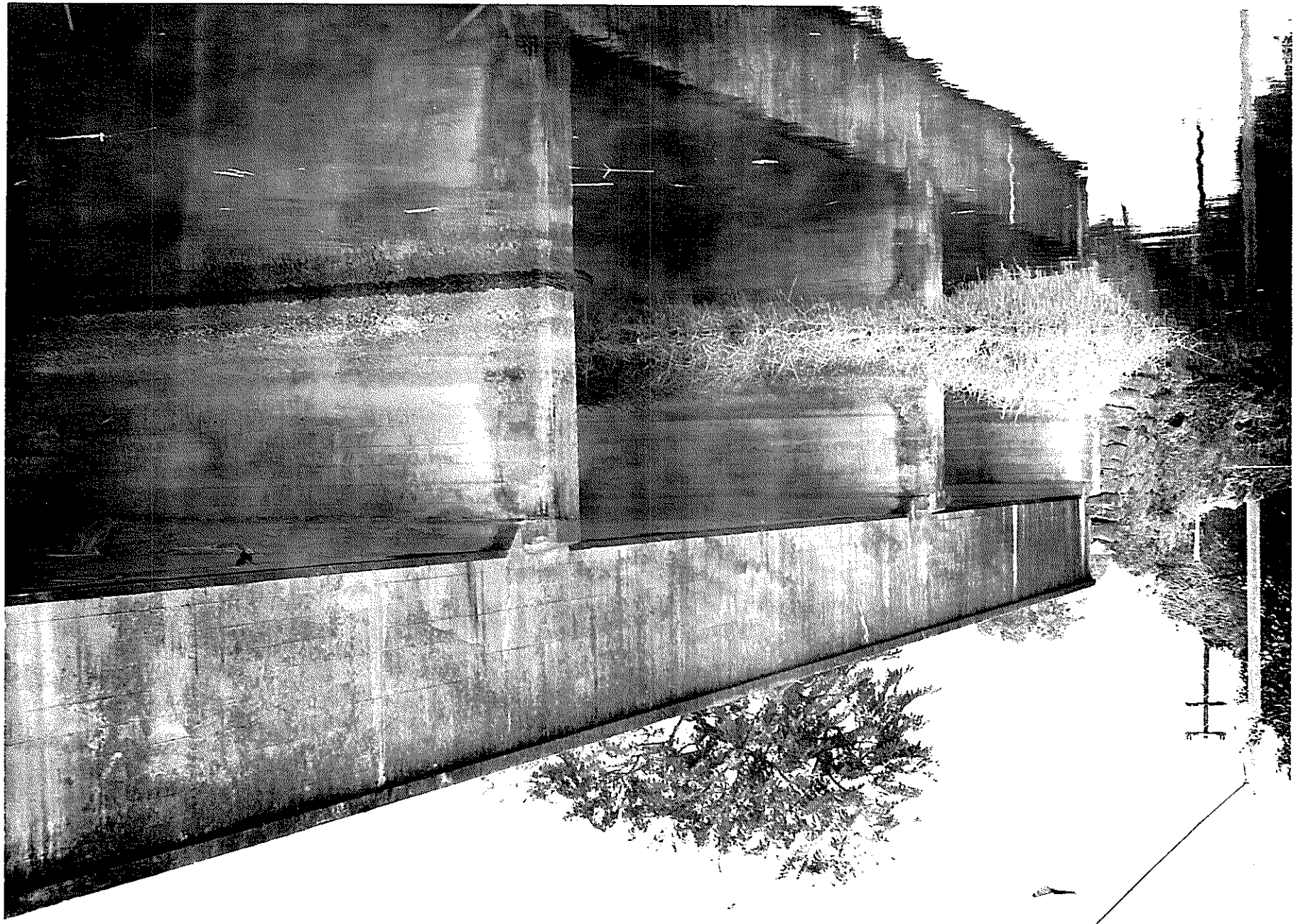
DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

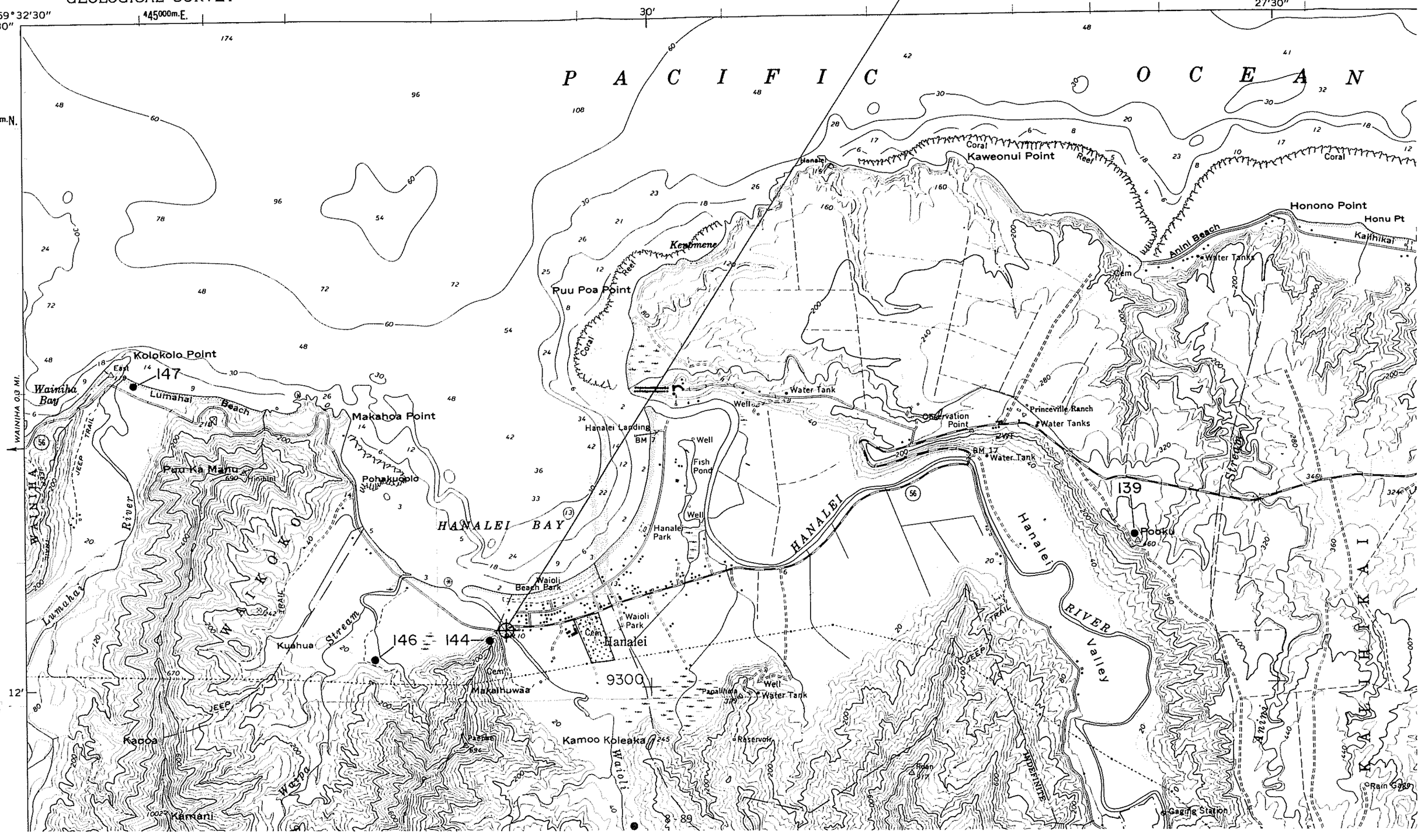
GPO 892-453



04 E447468 N2455482

WAIOLI BRIDGE

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



rm No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

Manoa Stream Ford - Kuhio Highway

AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN

Hanalei

CONGRESSIONAL DISTRICT

__ VICINITY OF

STATE

Hawaii

CODE

96714

COUNTY

Kauai

CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME

State of Hawaii, Department of Transportation

STREET & NUMBER

869 Punchbowl Street

CITY, TOWN

Honolulu

__ VICINITY OF

STATE

Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

Environmental Impact Statement

DATE

February 23, 1977

__FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR
SURVEY RECORDS

Department of Transportation

CITY, TOWN

Lihue

STATE

Hawaii

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	XUNALTERED	XORIGINAL SITE
XGOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Manoa Stream Ford is a 15-foot shallow crossing of concrete agregate cast on boulders, with a 22-foot roadway deck. The ford was constructed by the Territory of Hawaii in 1912 and has been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1912 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The Manoa Stream Ford was an integral part of the 1912 Kuhio Highway construction by the Territorial Government.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper Kauai Historical Society

File of the County Clerk, County Building, Kauai

Department of Transportation Description of Bridges
Environmental Impact Statement

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
A	4	4 4 1 4 4 5	2 4 1 5 7 5 7 8	B			
C				D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Robert J. Schleck, President

ORGANIZATION — DATE

Kauai Historical Society — April 1, 1977

STREET & NUMBER — TELEPHONE

P. O. Box 1778 — 245-6931

CITY OR TOWN — STATE

Lihue — Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE — DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453



8-94

MANOA STREAM FORD

0444144 5 N2457578

HAENA QUADRANGLE
HAWAII—ISLAND AND COUNTY OF KAUAI
7.5 MINUTE SERIES (TOPOGRAPHIC)

37'30" 35' 480 000 FEET 159°32'30" 22°14'30"

OCEAN

CIFIC

Kailiu Point
Corral Reef
Haena Point
Lae o Kaonohi
Hale Homaha
Kepuhi Point
Coral Reef
Haena County Park
Haena Dry Cave
Waikapalae Wet Cave
Ka Ulu a Paoa Heiau
Lilauis House (Site)
Waikanaloa Wet Cave
Makana
Pohakukaua
Maunahou
Maunapuhio
Puu Nopili
Wainiha Bay
Wainiha
Hanakapiai Beach
Kuianailiia
Hanakoa Stream
Manoa Stream
Limakuli Falls
Puu Kahia
TRAIL
Hoolulu
River
HANALEI 3 MI.
140 000 FEET

154 155 156 157 148 149 150 151

orm No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Limahuli Stream Crossing - Kuhio Highway

AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN
Hanalei __ VICINITY OF

CONGRESSIONAL DISTRICT

STATE
Hawaii

CODE
96714

COUNTY
Kauai

CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation

STREET & NUMBER
869 Punchbowl Street

CITY, TOWN
Honolulu __ VICINITY OF

STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN

STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Environmental Impact Statement

DATE
February 23, 1977 __FEDERAL X STATE __COUNTY __LOCAL

DEPOSITORY FOR
SURVEY RECORDS
Department of Transportation

CITY, TOWN
Lihue

STATE
Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
X EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Limahuli Stream Crossing is a 15-foot double span reinforced concrete flat slab with indigenous rock and concrete abutments and pier. The concrete roadway deck is 17 feet wide. The bridge was constructed by the Territory of Hawaii in 1912 and has been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1912 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The 1912 Lumahuli Stream Crossing is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911-12, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper — Kauai Historical Society Files

File of the County Clerk, County Building, Kauai

Department of Transportation. Descriptions of Bridges
Environmental Impact Statement

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	04	440320	2457000
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Robert J. Schleck, President

ORGANIZATION — DATE

Kauai Historical Society — April 1, 1977

STREET & NUMBER — TELEPHONE

P. O. Box 1778 — 245-6931

CITY OR TOWN — STATE

Lihue, Hawaii — Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE — DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

LIMAHULI STREAM CROSSING

04E440320 N2457700

HAENA QUADRANGLE
HAWAII—ISLAND AND COUNTY OF KAUAI
7.5 MINUTE SERIES (TOPOGRAPHIC)

37'30" 35' 480 000 FEET 159°32'30" 22°14'30"

140 000 FEET

OCEAN

PACIFIC

Kailiu Point
Corral Reef
Kee Beach
Waikapalae Wet Cave
Ka Ulu a Paoa Heiau
Lailaus House (Site)
Waikanaloa Wet Cave
Makana
Haena Point
Lae o Kaonohi
Coral Reef
Hale Homaha
Kepuhi Point
Haena County Park
Haena Dry Cave
Waimina Bay
Maunahou
Pohakukaua
Maunapuhio
Puu Nopili
Wainiha
Hanakapiai Beach
Hanakapiai Stream
Kulanailiia
Limakuli Falls
Limahuli Stream
Manoa
Puu Kahia
TRAIL
HANALEI 3 MI.

154 155 156 157 148 149 150 151

orm No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Haena Bridge Number 1 - Kuhio Highway
AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION
CITY, TOWN
Hanalei __ VICINITY OF
CONGRESSIONAL DISTRICT

STATE	CODE	COUNTY	CODE
Hawaii	96714	Kauai	

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu __ VICINITY OF
STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.
STREET & NUMBER
CITY, TOWN
STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Environmental Impact Statement
DATE
February 23, 1977 __FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Haena Bridge #1 is a 22-foot single span reinforced concrete box culvert with a 20-foot roadway deck of bitumens surface treat. The bridge was constructed by the Territory of Hawaii in 1912 and has been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1912 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The 1912 Haena Bridge #1 is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911-1912, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper
Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Descriptions of Bridges
Environmental Impact Statement

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	04	443410	2457789
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Robert J. Schleck, President — April 1, 1977

ORGANIZATION — DATE

Kauai Historical Society — 245-6931

STREET & NUMBER — TELEPHONE

P. O. Box 1778

CITY OR TOWN — STATE

Lihue, — Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE — DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

HAENA BRIDGE #1

04 E443410 N2457789

HAENA QUADRANGLE
HAWAII—ISLAND AND COUNTY OF KAUAI
7.5 MINUTE SERIES (TOPOGRAPHIC)

37'30" 35' 480 000 FEET 159°32'30" 22°14'30"

140 000 FEET

OCEAN

PACIFIC

Kailiu Point
Kee Beach
Corral Reef
Haena Point
Lae o Kaonohi
Hale Homaha
Kepuhi Point
Waikapalae Wet Cave
Haena
County Park
Haena Dry Cave
Ka Ulu a Paoa Heiau
Lehiaus House (Site)
Waikanaloa Wet Cave
Makana
Maunahou
Pohakukane
Maunapuhio
Puu Nopili
Wainiha Bay
Wainiha
Hanakapiai Beach
Stream
Kulanailiia
Limahuli Falls
Mamae
Puu Lahia
River
TRAIL
JEEP
HANALEI 3 MI.

154 155 156 157 148 149 150 151

Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Haena Bridge Number 2 - Kuhio Highway
AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION
CITY, TOWN
Hanalei __ VICINITY OF
CONGRESSIONAL DISTRICT

STATE	CODE	COUNTY	CODE
Hawaii	96714	Kauai	

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu __ VICINITY OF
STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN
STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Environmental Impact Statement
DATE
February 23, 1977
__FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR
SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
X GOOD	__RUINS	__ALTERED	__MOVED DATE_____
__FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Haena Bridge #2 is a 24-foot single span reinforced concrete box culvert with a 20-foot roadway deck of bitumens surface treatment. The bridge was constructed by the Territory of Hawaii in 1912 and has been continuously used and maintained since that time.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1912 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The 1912 Haena Bridge #2 is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911-12, expecially the up-to-date repalcement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Description of Bridges
Environmental Impact Statement

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	04	442064	2,415,710
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
Robert J. Schleck, President

ORGANIZATION
Kauai Historical Society

DATE
April 1, 1977

STREET & NUMBER
P. O. Box 1778

TELEPHONE
245-6931

CITY OR TOWN
Hanalei

STATE
Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE DATE

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

HAENA BRIDGE #2
04 E442064 N2457910

HAENA QUADRANGLE
HAWAII—ISLAND AND COUNTY OF KAUAI
7.5 MINUTE SERIES (TOPOGRAPHIC)

37'30" 35' 480 000 FEET 159°32'30" 22°14'30"

OCEAN

PACIFIC

Kailiu Point
Corral Reef
Kee Beach
156
154
155
Ka Ulu a Paoa Heiau
Waikapalae Wet Cave
Waikanaloa Wet Cave
Makana
Haena Point
Lae o Kaonoulu
Coral Reef
Hale Homaha
Kepuhi Point
Haena County Park
Haena Dry Cave
Naunahou
Pohakukaa
Maunapuhio
Puu Nopili
Wainiha Bay
Wainiha
148
149
150
151
157
Hanakapiai Beach
Hanakapiai Stream
Kulanailiia
Hanakapiai Falls
Puu Lahia
TRAIL
River
HANALEI 3 MI.
140 000 FEET
58

rm No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Waikoko Bridge - Kuhio Highway (Bridge Number: 43)
AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION

CITY, TOWN
Hanalei __ VICINITY OF
CONGRESSIONAL DISTRICT

STATE
Hawaii
CODE
96714
COUNTY
Kauai
CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu __ VICINITY OF
STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

STREET & NUMBER

CITY, TOWN
STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Bridge Data Sheet
Environmental Impact Statement released February 23,1977
DATE
October 20, 1950
__FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii 96766

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	__UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	X ALTERED	__MOVED DATE_____
X FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Waikoko Bridge is a 43-foot, single span reinforced concrete bridge built on reinforced concrete abutments, with a 13-foot roadway deck of bitumens surface treatment. The bridge was constructed by the Territory of Hawaii in 1913 and has been continuously used and maintained since that time. One major alteration to the structure occured during the 1946 tidal wave, at which time the east abutment dropped below the original road level. This was remedied by building up the fallen section with indigenous rock construction.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER
__1800-1899	__COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION
X 1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)
		__INVENTION		

SPECIFIC DATES 1913 BUILDER/ARCHITECT Territory of Hawaii

STATEMENT OF SIGNIFICANCE

The 1913 Waikoko Bridge is one of the first examples of the progressive American highway system at work in Hawaii, on Kauai's North Shore. It is also one of the last remaining examples of the first use of formal engineering expertise and industrial-technological experience in American bridge making by the new Territorial Government, in the first decade following United States annexation of Hawaii.

The construction of improved, modern vehicular roads on Kauai in 1911-1913, especially the up-to-date replacement of older, weak, timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of the then relatively isolated North Shore of the island.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Descriptions of Bridges
State Building, Lihue, Kauai, Hi.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	04	4[illegible]2[illegible]	2[illegible]5,6[illegible]8,0[illegible]
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Julia Neal, Director, Historic Buildings, Kauai, Project Nov. 10,1977
ORGANIZATION DATE

Kauai Historical Society
STREET & NUMBER TELEPHONE

P. O. Box 1778 245-6931
CITY OR TOWN STATE

Lihue Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

WAIKOKO BRIDGE
04 E446481 N2456180

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

159°32'30" 445000m.E. 30' 27'30"
22°14'30" 2459000m.N.

P A C I F I C O C E A

Kolokolo Point
147
Wainiha Bay
Lumahai Beach
Makahoa Point
Puu Ka Manu
Pohakupolo
WAINIHA 0.3 MI.
JEEP TRAIL
Wainiha River
Lumahai
HANALEI BAY
Waioli Beach Park
Waioli
Puu Poa Point
Kenmene
Reef
Coral
Kaweonui Point
Reef
Hanalei Landing
BM
Well
Fish Pond
Hanalei Park
Water Tank
Observation Point
Princeville Ranch
Water Tanks
BM 17
Water Tank
HANALEI
Hanalei
Anini Beach
Water Tanks
Honono
139
Hoolu
56

m No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED
DATE ENTERED

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Wainiha Bridge # 1, #2, #3 - Kuhio Highway
AND/OR COMMON

2 LOCATION

STREET & NUMBER

__NOT FOR PUBLICATION
CITY, TOWN
Hanalei __ VICINITY OF
CONGRESSIONAL DISTRICT

STATE | CODE | COUNTY | CODE
Hawaii | 96714 | Kauai

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	X OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	PUBLIC ACQUISITION	ACCESSIBLE	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu __ VICINITY OF
STATE
Hawaii

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.
STREET & NUMBER
CITY, TOWN
STATE

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Environmental Impact Statement
DATE
February 23, 1977
__FEDERAL X STATE __COUNTY __LOCAL
DEPOSITORY FOR
SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	__ALTERED	__MOVED DATE_____
X FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Wainiha Bridge is a 42-foot single span steel bridge with a 12-foot timber deck and wood rails.

The Wainiha Bridge #2 is a 78-foot single span steel bridge with a 12-foot wide timber deck and wood rails.

The Wainiha Bridge #3 is a 146-foot single span steel bridge with a 12-foot wide timber deck and wood rails.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
PREHISTORIC	ARCHEOLOGY-PREHISTORIC	COMMUNITY PLANNING	LANDSCAPE ARCHITECTURE	RELIGION
1000-1499	ARCHEOLOGY-HISTORIC	CONSERVATION	LAW	SCIENCE
1500-1599	AGRICULTURE	ECONOMICS	LITERATURE	SCULPTURE
1600-1699	ARCHITECTURE	EDUCATION	MILITARY	SOCIAL/HUMANITARIAN
1700-1799	ART	X ENGINEERING	MUSIC	THEATER
1800-1899	COMMERCE	EXPLORATION/SETTLEMENT	PHILOSOPHY	X TRANSPORTATION
X 1900-	COMMUNICATIONS	INDUSTRY	POLITICS/GOVERNMENT	OTHER (SPECIFY)
		INVENTION		

SPECIFIC DATES 1957 BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

The Wainiha Bridges #1, 2, 3 were constructed following the 1957 Tsunami. Although Temporary then, they were built in character with the other spans of the North Shore's Kuhio Highway. The Wainiha Bridges replaced three spans (Stringer Span on Pile, Timber Thru Truss, and Timber & Reinforced Concrete Thru Truss) built, respectively in 1922 (#1), 1931 (#2) & 1931 (#3)

9 MAJOR BIBLIOGRAPHICAL REFERENCES

The Garden Island Newspaper Kauai Historical Society Files
File of the County Clerk, County Building, Kauai
Department of Transportation Descriptions of Bridges
Environmental Impact Statement

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY _____

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	6,4	4,4,3,7,2,2	2,4,5,6,8,6,5
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

FORM PREPARED BY

NAME / TITLE
Robert J. Schleck, President

ORGANIZATION
Kauai Historical Society

DATE
April 1, 1977

STREET & NUMBER
P. O. Box 1778

TELEPHONE
245-6931

CITY OR TOWN
Lihue,

STATE
Hawaii 96766

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ___ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE DATE

FOR NPS USE ONLY
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST: DATE

KEEPER OF THE NATIONAL REGISTER

GPO 892-453

WAINIHA BRIDGES #1 #2 #3

04-E 443722 N2456865

HAENA QUADRANGLE
HAWAII—ISLAND AND COUNTY OF KAUAI
7.5 MINUTE SERIES (TOPOGRAPHIC)

37'30" 35' 480 000 FEET 159°32'30" 22°14'30"

OCEAN

PACIFIC

Kailiu Point
Kailiu Beach
Corral Reef
Haena Point
Lae o Kaononi
Coral Reef
Hale Homaha
Kepuhi Point
Waikapalae Wet Cave
Haena County Park
Haena Dry Cave
Ka Ulu a Paoa Heiau
Lolilaus House (Site)
Waikanaloa Wet Cave
Makana
Waiaka Bay
Waiaka River
Maunahoui
Pohakuka
Maunapuuo
Puu Nopili
Wainiha
Hanakapiai Beach
Kulanailia
Hihiwai Stream
Waiaka Stream
Limakuli Falls
Puu Kahia
Hoolulu Stream
KALALAU TRAIL
Penstock
BM 109
Powerhouse
Kealawela
Paikea
HANALEI 3 MI.

140 000 FEET
12'

NPS FORM 10-900
(REV. AUG. 2002)

OMB NO. 1024-0018
(EXPIRES JAN. 2005)

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 How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Pu'u'ōpae Bridge

other names/site number Kalama Stream Bridge, Kapaa Homesteads Bridge #2

2. Location

street & number Pu'u'ōpae Rd., between Kalama & Kīpapa Rds. ☐ not for publication

city or town Kapa'a ☐ vicinity

state Hawai'i code HI county Kaua'i code 007 zip code 96746

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 ☐ nationally ☐ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

Signature of certifying official — Date 4/7/05

State or Federal Agency or Tribal government

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional comments.)

Signature of certifying official — Date

State or Federal Agency or Tribal government

4. National Park Service Certification

I hereby certify that this property is:
- ☑ entered in the National Register
  - ☐ See continuation sheet.
- ☐ determined eligible for the National Register
  - ☐ See continuation sheet.
- ☐ determined not eligible for the National Register
- ☐ removed from the National Register
- ☐ other (explain): _____

Signature of Keeper — Date of Action 5/25/05

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

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
		buildings
		sites
One bridge		structures
		objects
		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions)

Transportation: road-related

Current Functions
(Enter categories from instructions)

Transportation: road-related

7. Description

Architectural Classification
(Enter categories from instructions)

No style

Materials
(Enter categories from instructions)

foundation Concrete-encased steel
walls
roof
other Masonry (abutments)

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

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)

- [X] **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 a grave.
- [ ] **D** a cemetery.
- [ ] **E** a reconstructed building, object, or structure.
- [ ] **F** a commemorative property.
- [ ] **G** less than 50 years of age or achieved significance within the past 50 years.

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

Areas of Significance
(Enter categories from instructions)

___ Social history
___ Exploration/settlement
___ Community planning and development
___ Transportation
___ Commerce

Period of Significance

___ 1915–1936

Significant Dates

___ N/A

Significant Person
(Complete if Criterion B is marked above)

___ N/A

Cultural Affiliation

___ Undefined

Architect/Builder

_ Moragne, Joseph H., County Engineer and
_ Road Supervisor

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

See Continuation Sheets, page 14.

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 Natl Register
- [ ] designated a National Historic Landmark
- [ ] recorded by Historic American Buildings Survey # _____
- [ ] recorded by Historic American Engineering Record # _____

Primary Location of Additional Data

- [ ] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [X] Local government Kaua'i County
- [X] University *Garden Island* microfilm
- [ ] Other

Name of repository:

County Clerk's office; Kaua'i Community College

10. Geographical Data

Acreage of Property ___ Less than one acre _____

UTM References
(Place additional UTM references on a continuation sheet) North American Datum, 1983; USGS Kapaa Quadrangle, 1996

	Zone	Easting	Northing		Zone	Easting	Northing
1	/4/N/	/4/6/1/5/1/1/	/2/4/4/0/4/3/9/	3	/__/__/	/__/__/__/__/__/	/__/__/__/__/__/
2	/__/__/	/__/__/__/__/__/	/__/__/__/__/__/	4	/__/__/	/__/__/__/__/__/	/__/__/__/__/__/

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title _____ Patricia L Griffin _____

organization _____ date _____August 9, 2004 _____

street & number _____ 6524 Kalama Rd. _____ telephone _____ 808.639.1019 _____

city or town _____ Kapa'a _____ state __ HI __ zip code _____ 96746 _____

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white** photographs of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name _____ County of Kaua'i, ATTN: The Honorable Bryan Baptiste, Mayor _____

street & number _____ 4444 Rice St., Suite 235 _____ telephone _____ 808.241.6300 _____

city or town _____ Līhu'e_____ state __ HI __ zip code _____ 96766 _____

Paperwork Reduction Act Statement: This information is being collected for applications 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. 470 et seq.). A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to Keeper, National Register of Historic Places, 1849 "C" Street NW, Washington, DC 20240.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 1 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

Pu'u'ōpae Bridge is a one lane, 48-foot long, single span structure that carries Pu'u'ōpae Road over Kalama Stream (a small stream approximately three feet deep and 12 feet wide) in the Kapa'a Homesteads 2nd Series. The height of the soffit of the bridge over the stream is about 11 feet. Built in 1915, it is the earliest bridge included in the *Historic Bridge Inventory: Island of Kauai* to be constructed beyond the island's circumferential Belt Road, in Kaua'i's homesteading lands.

Location. The bridge is in its original location. The placement of Pu'u'ōpae Road is shown on the Hawai'i Territory Survey map of "Kapaa Homesteads 2nd Series: Kapaa–Waipouli–Olohena, Island of Kauai," created in 1912 when the tract was subdivided in preparation for its settlement the following year. (See detail on Continuation Sheet, Section 10, Page 3.)

Design. Pu'u'ōpae Bridge was originally trussed, as evidenced by a small sketch included in correspondence regarding the construction of the bridge in 1915. The truss was removed in 1958, but the bridge's original, concrete-encased steel floor remains in place. According to the Spencer Mason *Historic Bridge Inventory: Island of Kauai,* "only this bridge and the 'Ele'ele Pedestrian Overpass [on the West side of Kaua'i] are classified as having steel girder floor systems on the State Bridge Inventory,"[1] and the Pu'u'ōpae Bridge predates 'Ele'ele by almost a quarter of a century. Pu'u'ōpae Bridge has been neither widened nor extended.

Setting. The setting has not changed substantially. Three houses have been built in the vicinity, on Kalama Road southwest of the bridge, but they have not altered the rural character of the area, which is defined by pastoral and agricultural lands sweeping from the east side of the bridge to the foot of Nounou (Sleeping Giant) Mountain in the distance.

Materials. The concrete deck, steel girder floor system and sections of the abutments are original materials. The endposts may be recycled parts of the nineteenth century Wailua River Bridge that was dismantled in 1919 and used for roads and bridges in the area. (See "Age," below.)

An archæological survey of the bridge in 1996 provided the following description:

> Remnants of a wooden form, probably used in the building of the deck were visible. The decks and steel girders were both encased in concrete and on the underside of the bridge, the concrete deck was imprinted with the grain of wood, left by the wooden form. A few of the original wood

Narrative Description, Continued

pieces used in the form were found on both ends of the bridge adjacent to the abutments still attached to the underside of the deck. The steel soffits, railing supports and railing all seem to be part of one pre-engineered unit. At either end of the bridge on both sides of the abutments and adjacent to the railing are large pieces of steel which have been cut...[2]

Workmanship. The bridge is not in its original condition. Repair data located in the Kaua'i County Engineering office indicates that in 1958, two 48 foot I-beams were installed beneath the concrete and steel girder floor system for structural support. In order to imbed the I-beams, the headwalls above the stone abutments were broken and then repaired with concrete. While the plans indicate that the truss was still in place at the start of the project, it was probably removed after the I-beam support system was in place. (See detail on Continuation Sheet, Section 7, Page 5.) The railings were replaced in 2000, and galvanized W guardrails were substituted for the previous wood guardrails.

Feeling. There is a historic feeling to this bridge because of its narrow width, as well as its location in the back-country, still-agricultural/pastoral lands of Kapaa Homesteads 2nd Series.

Age. Written correspondence between the Territory of Hawai'i's Superintendent of Public Works, Charles R. Forbes, and Kauai County's Road Supervisor and Engineer, Joseph H. Moragne, establishes the bridge's period of construction as being between March and July 1915. An agreement for the Territory to pay the county $800 to construct the bridge and the county to build it was approved by the Kauai Board of Supervisors on April 7, 1915.[3] At the June 8, 1915 meeting of the Board of Supervisors, Moragne reported that construction was in progress; it had been completed by the time of the August report.[4] (See Continuation Sheet, Section 7, pages 6-10.)

2. The end posts have the same dimensions and riveted construction as the top chords and western end posts of the 'Ōpaeka'a Road Bridge.[5] It is known that when the 1890, Scottish-made Wailua Bridge was replaced in 1919, parts of the old bridge were "disposed along the side of the road awaiting removal to some needy spot where they may serve for small bridge trusses, coverings for culverts, etc. Some of them will probably be used on the homestead roads."[6] 'Ōpaeka'a Road Bridge, one mile from the Pu'u'ōpae Bridge, was constructed from parts of the dismantled bridge. The County Road Supervisor's activities report of May 1920, eight months

Narrative Description, Continued

after Wailua Bridge was dismantled, notes that small bridge repairs had been completed in the area: Since the end posts on Pu'u'ōpae Bridge are so similar to the 'Ōpaeka'a Road Bridge top chords and western end posts, they may also have come from the old Wailua Bridge.[7] (Usable parts from the old bridge were still available as late as 1925, when chords from it were put into use as stringers in construction of the Kalama Bridge on Kamalu Rd., near the border between Wailua and Kapa'a Homesteads.)

Artistic Value. The *Historic Bridge Inventory: Island of Kauai* characterizes the bridge as "functional," with little in the way of artistic details. However, it notes, the pattern formed by the rivets is unusual: "It is one of only three bridges on Kaua'i where riveted metal construction is visible."[8] The other two are 'Ōpaeka'a Road Bridge (National Register of Historic Places Site No. 30-08-9377) and the Hanalei River Bridge (National Register of Historic Places Site No. 30-03-736).

Narrative Description, Continued

NOTES

1. Spencer Mason Architects, *Historic Bridge Inventory: Island of Kauai,* (Honolulu: Prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U. S. Department of Transportation Federal Highway Administration, 1989), p. 217.

2. Tina Bushnell and Hallett H. Hammatt, "Archaeological Investigation of Pu'uopae (Kalama) Bridge in Wailua Homesteads, South Olohena, Ahupua'a Puna District, Kauai, Hawaii," (Study prepared by Cultural Surveys Hawaii, Inc. for Belt Collins and Associates, December 1996), p. 5.

3. "Blueprints showing data of the proposed Kapaa Homesteads Bridge #2 (Puuopae Rd) + com. Regarding agreement same to be constructed by Kauai County," records of the Kauai County Board of Supervisors, P.1150, April 7, 1915.

4. Some of the road names in the homesteads—including Pu'u'ōpae, Pu'upilo and Kalama—have, confusingly, changed since they were constructed. Pu'u'ōpae Rd. was originally U-shaped. It led south from Olohena then, after Kalama stream, climbed uphill on what is now called Kalama Rd. The section to the southwest that is now the continuation of Pu'u'ōpae was originally named Pu'upilo. In the two Board of Supervisors reports, Moragne mis-located the bridge on Pu'upilo, which intersected with the Pu'u'ōpae U about 40 yards from the bridge.

5. Spencer Mason Architects, p. 216.

6. "Wailua Bridge Finished," *The Garden Island,* September 23, 1919, p 1.

7. "Board of Supervisors Meet," *The Garden Island,* July 8, 1920, p. 4.

8. Spencer Mason Architects, p. 217.

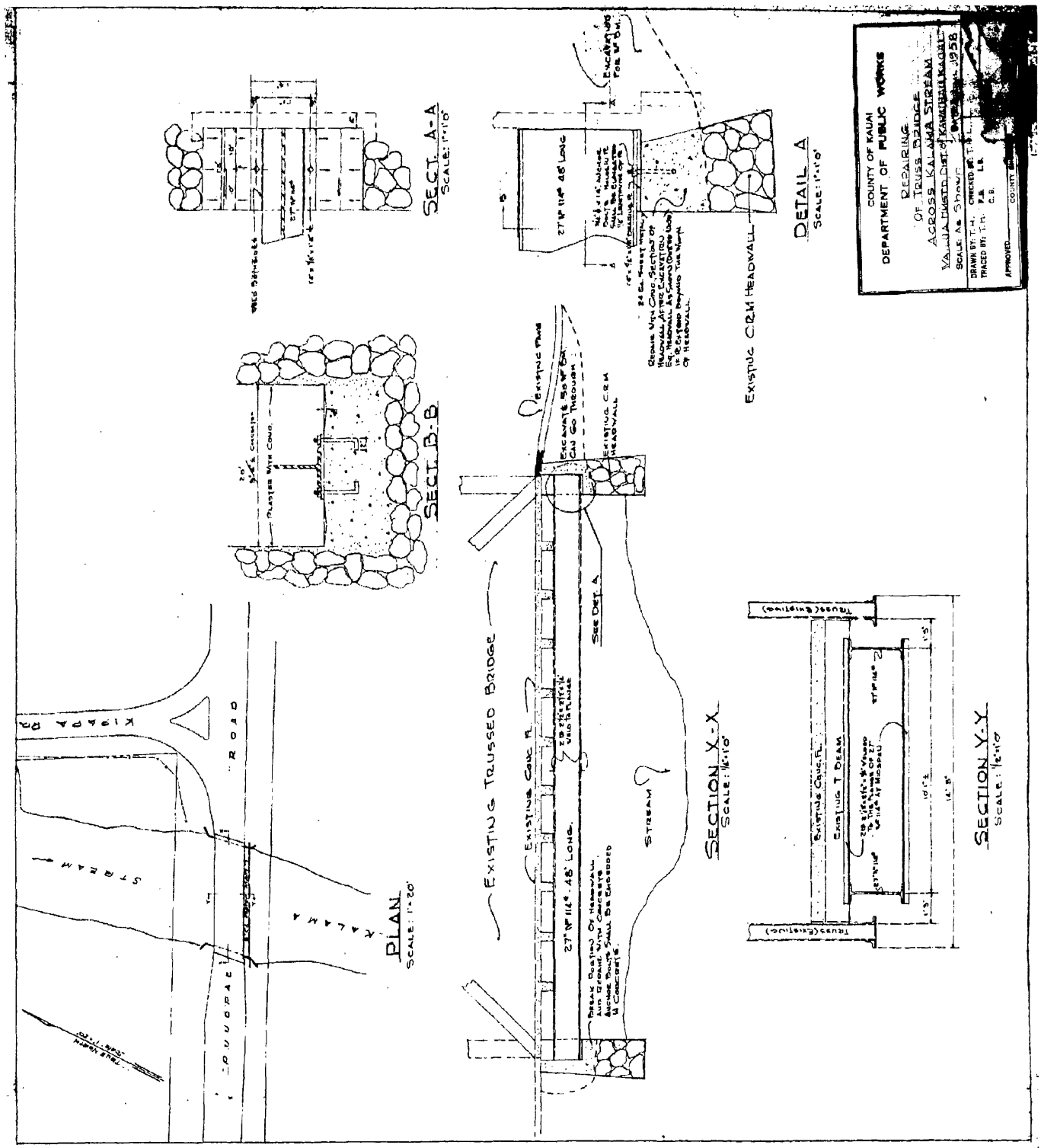
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 5 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Description, Continued

Kaua'i County Department of Public Works. "Repairing of Truss Bridge Across Kalama Stream, Wailua Hmstd, Dist. of Kawaihau, Kauai." 1958.



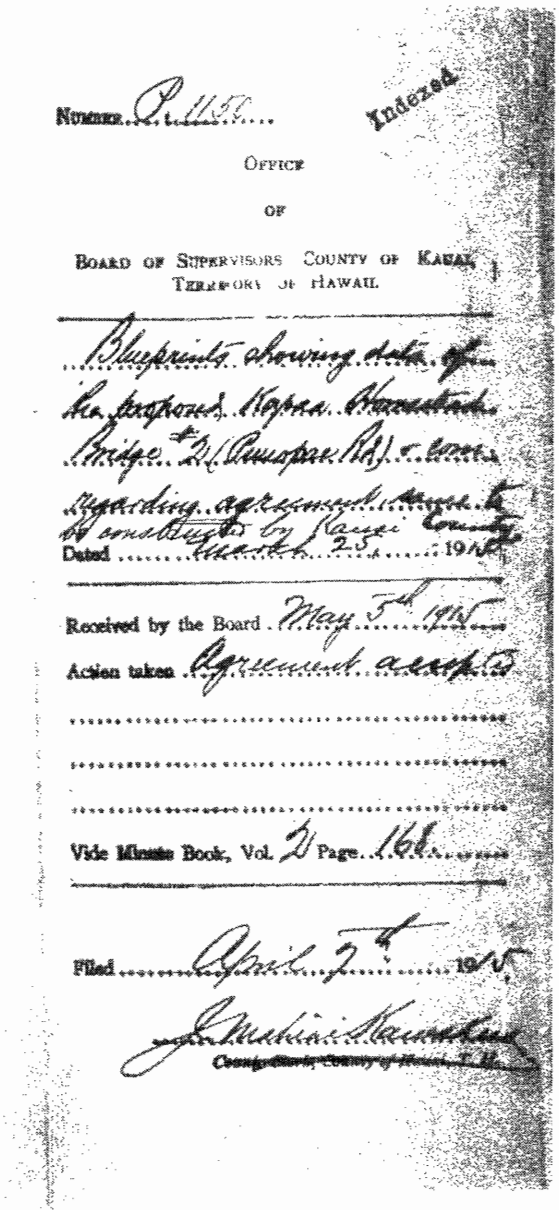
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 6 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Description, Continued

Kaua'i County Board of Supervisors records, P1150



Number P. 1150 Indexed

Office

of

Board of Supervisors County of Kauai
Territory of Hawaii

Blueprints showing data of the proposed Kapaa Homestead Bridge #2 (Puuopae Rd) & com. regarding agreement same to be constructed by Kauai County

Dated March 25 1915

Received by the Board May 5th 1915

Action taken Agreement accepted

Vide Minute Book, Vol. 2 Page 168

Filed April 7th 1915

J. Mahini Kaumakaa
County Clerk, County of Hawaii, T. H.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 7 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Description, Continued

Kaua'i County Board of Supervisors records, P1150

CHAS. R. FORBES
~~J. W. CALDWELL~~
ASSOCIATE MEMBER A.S.C.E.
SUPERINTENDENT

Transcribed

TERRITORY OF HAWAII
DEPARTMENT OF PUBLIC WORKS
HONOLULU, T. H.

March 25, 1915

Mr. J. H. Moragne,
Lihue, Kauai.

Dear Sir:

KAPAA HOMESTEAD BRIDGE, NO. 2.

Replying to your letter of March 19th, I beg to submit herewith two blueprints of Plan No. 2219, showing some data regarding this proposed bridge. I also inclose an agreement showing that the Land Commissioner has set aside the sum of $800.00; the work to be done under my direction.

I therefore turn over to you the expenditure of this fund, such expenditure to be made in connection with the county work on this bridge. This amount will be turned over to the County on the final completion and acceptance of the work.

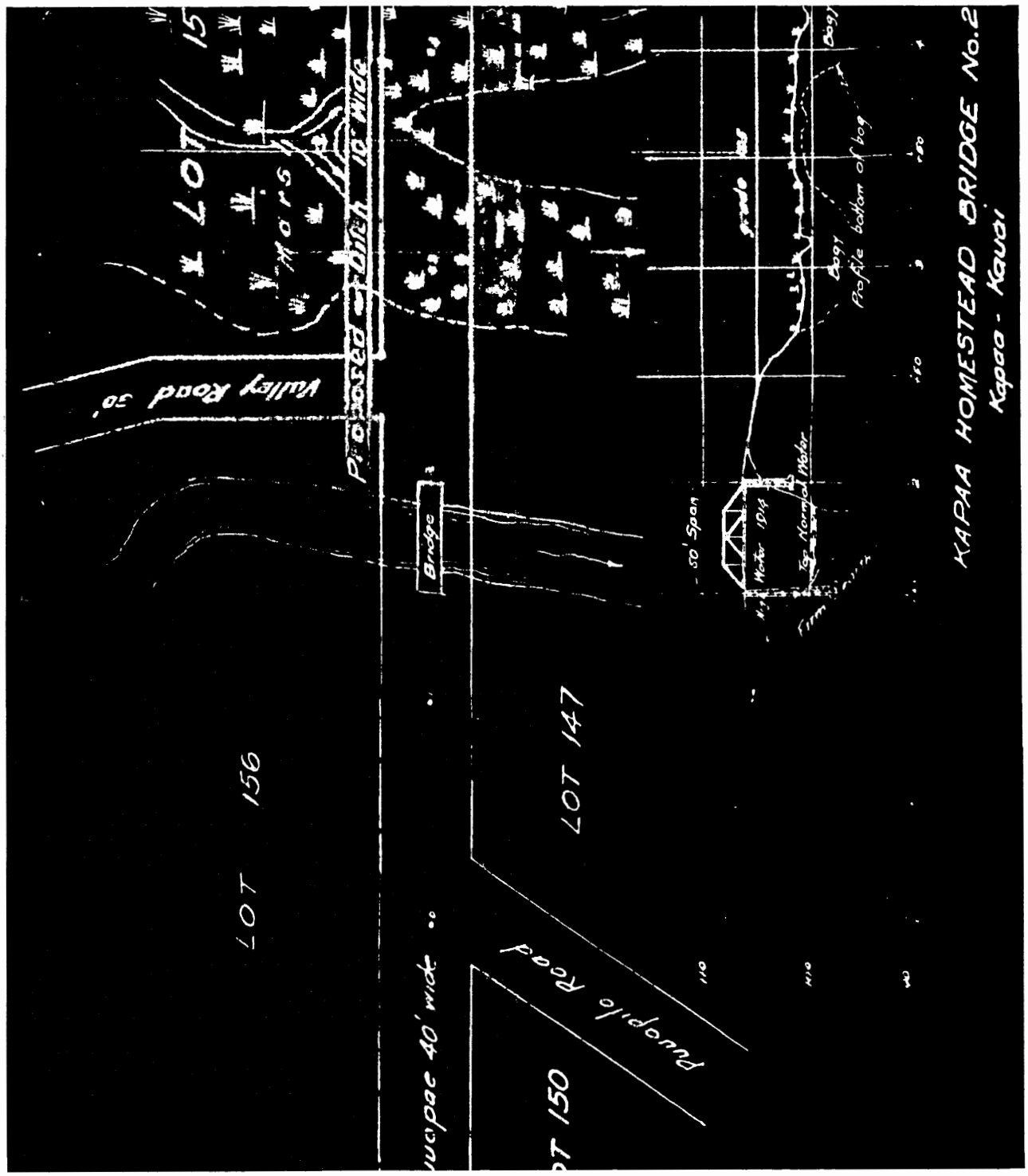
Very truly yours,
Charles R. Forbes [signature]
Superintendent of Public Works

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Narrative Description, Continued

Kaua'i County Board of Supervisors records, P1150



United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 9 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Description, Continued

Kaua'i County Board of Supervisors records, P1150

Transcribed

A G R E E M E N T

By the authority vested in me by Section 376, Revised Laws, 1915, I hereby agree to set aside the sum of Eight Hundred Dollars ($800.00) to be paid to the County of Kauai for the construction of a Bridge over the Puuopae Road and just above the junction of this road with Valley Road, providing this work is performed under the direction of the Superintendent of Public Works and is finally accepted by him.

Joshua D. Tucker [signature]

Commissioner of Public Lands.

.....March 25.....1915.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 7 _ Page _ 10 of 10 _ Name of property _ Pu'u'ōpae Bridge _ County and State_ Kaua'i, Hawai'i

Narrative Description, Concluded

Kaua'i County Board of Supervisors records, P1150

OFFICE OF
COUNTY CLERK, COUNTY OF KAUAI.
TERRITORY OF HAWAII.

Transcribed

Lihue, April 10, 1915

Charles R. Forbes, Esq.,
Superintendent, Public Works,
Honolulu, Hawaii.

Dear Sir :-

I beg to notify you that your offer under date of March 25th.last addressed to Mr. J.H. Morange [sic] our County Road Supervisor, of Eight Hundred Dollars ($800.00) for the construction by the County of Kauai of a bridge, known as the Kapaa Homestead Bridge No. 2, the work to be performed under your direction, was duly received by the Honorable Board of Supervisors of the County of Kauai at its last regular monthly business meeting held here on the 7th inst., and that the same has been accepted by the said Board.

Very respectfully yours,

[unsigned]

County Clerk, County of Kauai.
By

Clerk.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 8 _ Page _ 1 of 6 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

The construction of Pu'u'ōpae Bridge in 1915, two years after the Kapa'a Homesteads 2nd Series was opened, provided an important transportation conduit that contributed to the successful development of the homesteading lands on the east side of Kauai.

When Hawai'i became a territory of the United States in 1900, land ownership beyond that of the government's significant holdings was highly concentrated in the hands of a few large business interests and the individuals who controlled them. To encourage further settlement of family farmers in the islands, the government opened tracts of territorial land in Kapa'a, Kalāheo and elsewhere in Hawai'i.

The sale of public land as a strategy to increase Hawai'i's population of small, independent farmers was controversial. Most of the early territorial governors supported big sugar interests and showed "little faith in homesteading,"[9] Some governors were openly hostile to the movement: Lucius Pinkham (governor from November 29, 1913 to June 22, 1918) was reported as stating that he was "against the government lands being taken up by homesteaders. Homesteading is not a success; will never be a success and you know it damned well....All the cane lands of the government should remain in the ownership of the government and be leased to the sugar plantation."[10] Critics charged that the government had diminished the chances for homesteading success after it traded its fertile lands to plantations in exchange for unproductive tracts not viable for farming and transferred vital water rights to them as well.[11]

The dominant planter and business interests of the time were less than supportive of the homesteading philosophy themselves. Skeptics of their motives toward homesteaders accused the special interests of a land-grabbing scheme by which they advanced money to "marginal homesteaders" with the goal of becoming "the ultimate owners of every homestead the owner of which is so unfortunate as to be so easily gulled into the trap."[12] The possibility of gaining title to homesteaders' lands aside, sugar plantations were in a position to profit from cane-growing homesteaders through their monopoly of the milling and marketing processes, occasionally setting fees "so onesided and inequitable" that homesteaders across the territory protested.[13]

Despite the formidable opposition, some of Kaua'i's homesteading tracts began to show promise. In 1917 the chairman of the Chamber of Commerce Homestead Committee, E. W. Broadbent, reported that "the wisdom of the Homestead policy had been abundantly justified. On the Olohena-Waipouli tract there are ninety Homesteaders with 3140 acres who harvested this season 31,500 tons of cane, worth $197,000, besides a considerable value in pines." [14]

The Olohena-Waipouli tract that Broadbent referenced was also known as Kapa'a Homesteads 2nd Series. It included 81 lots ranging in size from 17.27 acres to 41.32 acres. The lots were sold by

Narrative Statement of Significance, Continued

lottery at the court house in Līhu'e on Saturday, June 28, 1913. Lottery winners were allowed up to three adjoining parcels, with a maximum of 80 acres. In an attempt to prevent abuse of the program by unscrupulous land speculators, winners were required to live on their property for given percentages of the first 10 years and to actively cultivate their lands. To sell or lease their property was restricted.

Although roads were indicated on the 1912 territorial survey map of the tract, they did not, in fact, exist when the Kapa'a lottery winners sought to move onto and begin farming their land. But the homesteaders were not a group to wait passively in the face of government inactivity. In August 1913, barely a month after the lottery, several of the new homesteaders petitioned the county for roads to "be constructed as soon as practicable for, unless the said roads, particularly 'Olohena', 'Puuopae', and 'Puupilo', are built, leveled, or ruts filled, it will be as it is now hard work for the homesteaders to bring their lumber for building purposes and their effects to their lands."[15] The Board of Supervisors referred the matter to County Engineer and Road Supervisor Joseph H. Moragne for action, but a letter to *The Garden Island* six months later indicated that no discernable progress had been made: "As for roads, there are none, there are cattle trails all over this country and these were followed by oxcarts in hauling firewood from the mountains and there is nothing else in the way of roads there today." [16]

Water, too, was unavailable in Kapa'a Homesteads. In December 1913 the homesteaders petitioned the Supervisors "for water pipes to be laid for their use."[17] The same *Garden Island* letter that complained of the lack of roads described the situation:

> It is true that some of the lots have streams passing through them, but the water all belongs to the Makee Sugar Co., the Governor having sold the water rights to the Company before the tract was opened, the settlers having no right to use the water in any stream, even for household purposes, and they have been so notified by the company, unless they pay a monthly rate. [18]

Makee was in a potentially advantageous position with regard to the Kapa'a homesteaders for other reasons as well. Although many envisioned pineapple as the primary crop for the area, others championed sugar cane (ultimately both would be grown). Both Makee and Lihue Plantation competed to build a railroad into the homesteads—a struggle that Makee eventually won—to collect the farmers' cane and mill it at the company's factory.[19]

The Kapa'a homesteaders continued their efforts throughout the 1910s to advance their positions. One or more of them appeared several times before the Board of Supervisors to urge the county to build or repair roads in the area, especially Olohena Rd., which provided the lifeline between the homesteads and the Belt Road. Several joined to form an association in 1918 to

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 8 _ Page _ 3 of 6 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Statement of Significance, Continued

"further the interests of the Kapaa homesteaders," and the group successfully secured water for irrigation after sending a delegation to meet with territorial officials in Honolulu. Some homesteaders became active in the Kauai Chamber of Commerce as another forum in which they could seek to redress grievances.

Their achievement in convincing the local and territorial governments to build and maintain roads and bridges in the area was significant. The experience with Kapa'a undoubtedly helped convince officials that roads should be put in place before new homesteading lands in the adjoining Wailua 1st series were lotteried "so that homesteaders may drive up to their prospective front doors just as soon as they have selected the lots."[20]

Kapa'a Homesteads roads and bridges increased in importance after the Wailua Homesteads were opened, because Wailua roads did not flow towards the ocean. Instead, they were connected to the Kapa'a Homesteads roads—Pu'upilo, Pu'u'ōpae and Kamalu (which ran parallel to Pu'u'ōpae along the foot of Nounou Mountain). Olohena funneled both sets of homesteaders from their *mauka* lands to the Belt Road. Wailua Homesteads was not directly linked to the Belt Road until 1936, when Depression-era federal funding constructed the 'Ōpaeka'a Stream Bridge and extended Kuamo'o Road to the ocean. As a result, this network—including Pu'u'ōpae Bridge—remained important throughout the homesteading era.[21]

By the time the 31 lots in adjacent Wailua Homesteads 1st Series were lotteried in December 1919, at least some of the Kapa'a Homesteaders were farming successfully: *The Garden Island* reported in January of that year that Kapa'a homesteader E. M. Cheatham was employing 40 men to harvest his cane and that of his neighbors. But those were the glory days. During the next decade the dropping prices paid for sugar made small-scale cane growing increasingly unprofitable. By 1945 the Land Laws Revision Commission review of homesteading in Hawai'i reported that lot owners had "become landlords to corporate agricultural operators."[22] Its final report to the governor on December 31, 1946 declared that

> in Honolaa, the majority of the homesteads patented suitable for cane are cultivated to cane by the adjoining plantation, either under lease or planting contract....A similar situation exists at Kapaa, Kauai, where the majority of the homesteads patented suitable for pineapples are cultivated to pineapples by the Hawaiian Fruit Packers, Ltd., or Hawaiian Canneries Co.[23]

Many of the Kapa'a homesteaders turned to occupations other than farming. To name but three examples, Elmer Cheatham moved to Makaweli to run a store; his brother-in-law Rolland Israel (who had been optimistic enough about the future of homesteading that he added to his Kapa'a holdings by buying a lot in the Wailua tract when it was opened in 1919) became Game Warden;

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Narrative Statement of Significance, Continued

C. K. Amalu served as a judge. Gradually, much of the Wailua and Kapa'a Homesteads was rezoned for residential use. Today, the "bowl" of land adjacent to Pu'u'ōpae Bridge, bordered by Pu'u'ōpae, 'Ōpaeka'a, Kamalu and Olohena roads contains some of the only remaining area of significant agricultural acreage (nearly 400 acres) in the region.

Persons. In the early territorial period, homesteading lands were released by the government in an attempt to increase settlement opportunities for small, independent farmers, especially Hawaiians "who kept up constant pressure through their political leaders to recapture Hawaii's lands for themselves," and recruits whom "Americanizers," hoped would increase the percentage of Anglo Saxons in Hawai'i and strengthen the psychological bonds with the United States.[24] One of the requirements of the lottery winners in Kapa'a Homesteads 2nd Series was that they be American citizens or declare their intention of becoming one.

An example of the Americanizers' intent is evidenced by the reception E. M. Cheatham received when he moved to the Homesteads. Cheatham, who had been employed as manager of B. F. Ehlers & Company (predecessor to Liberty House department store, now Macy's) before acquiring his homesteading lands in Kapa'a, was described by the *Garden Island* as "a real good citizen of the capital city...a live-wire of the Honolulu Ad. Club and an important figure in other organizations at Honolulu."[25] Three months later, under the headline "Homesteaders of the Right Kind," he was described as a man with "business ability, capital and those things that make for good citizenship."[26]

The history of the Kapa'a Homesteads, however, is not the product of a single Great Man who shaped the area but the collective story of a group of settlers who struggled to make a life as independent farmers for themselves and their families. The names of the 1913 Kapa'a Homesteads lottery winners hints at a predominance of the Hawaiian and Caucasian settlers who bought into the homesteading idea, but people from other backgrounds were represented as well: Lino, Contrades, Kauai, Hanohano, Kaui, Kainoa, Kelekoma, Booge, French, Miyashi, Souza, Reis, Wilson, Tracy, Johonnot, Silva, Konda, Nasahiga, Hepa, Reichelt, Soto, Cummings, Louis, Achuck, Cheatham, Livesey, Israel, Cook, Jensen, Ferreira, Victorino, Barreta, Rapoza, Aroong, Ohai, Waiwaiole, Mailehuna, Rodrigues, Amalu, Kaiu, Ventura, Kikaahu.[27]

The actual designer of the bridge has not been established, although Joseph Moragne, who was responsible for much of the early territorial roadwork and bridge design, is definitely associated with its erection through his position as county road supervisor and engineer as well as his correspondence with Charles Forbes about the construction of the bridge.

Narrative Statement of Significance, Continued

Summary. The Pu'u'ōpae Bridge is unusual because of its historical links to the development of the Kapa'a Homesteads, and the direct involvement of that community in pressuring the government to provide adequate stream crossings and roads in the area; its concrete-encased steel girder floor system; and its probable use of recycled parts from the 19th century Wailua Bridge. It remains a valuable historical resource for interpreting the too-little understood, non-plantation-related development of Territorial Hawai'i.

NOTES

9. Robert H. Horwitz et al., *Public Land Policy in Hawaii: An Historical Analysis* (Honolulu: Legislative Reference Bureau, University of Hawaii, 1969), p. 26.

10. "Mr. Pinkham and Homesteading," *The Garden Island*, April 4, 1917, p. 1.

11. "The People Heard at Meeting of the Chamber of Commerce," *The Garden Island*, October 9, 1917, p 1.

12. "Land Law Question," *The Garden Island*, February 25, 1913, p 1.

13. "Some Difference of Opinion Between Homesteaders and Planters," *The Garden Island*, August 13, 1918, p 1. Also, "Homesteaders to Get Consessions," *The Garden Island*, August 27, 1918.

14. "The People Heard at Meeting of the Chamber of Commerce," *The Garden Island*, October 9, 1917, p 1.

15. "Petition from Kapaa for construction of homestead roads in Kapaa mauka," records of the Kauai County Board of Supervisors, P895, August 6, 1913.

16. "Public Lands Question," *The Garden Island*, January 20, 1914, p 4.

17. "Petition from Kapaa homesteaders for pipes to be laid at the homestead for their use," records of the Kauai County Board of Supervisors, P940 and 940a, December 10, 1913.

18. "Public Lands Question," *The Garden Island*, January 20, 1914, p 4.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 8 _ Page _ 6 of 6 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Narrative Statement of Significance, Concluded

19. Several articles and editorials between 1914 and 1916 in *The Garden Island* address the two plantations' competition to build a railroad in the homesteads. They include: "Right of Way at Waipouli Tract, April 14, 1914, p. 1; "Makee Sugar Co. Will Build Road to Waipouli," November 17, 1914, p. 1; "Waipouli R. R. Is Now Assured," February 16, 1915, p. 1; "Mr. Forbes Over Proposed Road," March 9, 1915, p. 1; "Kauai Homesteading Threatened," April 4, 1916, p. 8.

20. "The Wailua Homesteads," *The Garden Island*, September 23, 1919, p. 1.

21. Spencer Mason Architects, *Historic Bridge Inventory: Island of Kauai,* p. 128.

22. George W. Luter, *Report on Homesteading in Hawaii: 1839-1961,* (Honolulu, Department of Land and Natural Resources, 1961), p. 20.

23. Ibid, p. 21.

24. Lawrence H. Fuchs, *Hawaii Pono: A Social History* (New York: Harcourt Brace Jovanovich, 1961), p. 251ff.

25. "To Settle On Kauai," *The Garden Island*, January 13, 1914, p. 1.

26. "Homesteaders of the Right Kind," *The Garden Island*, March 31, 1914, p. 1.

27. The names of the lot owners are included on the map of the "Hawaii Territory Survey, Walter E. Wall Surveyor, Kapaa Homesteads 2nd Series, Kapaa–Waipouli–Olohena, Island of Kauai, HTS Plat 3016, Surveyed by S. W. Tay, March–June, 1912," which is located in the Kaua'i Historical Society archives.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _ 9 _ Page _ 1 of 1 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Major Bibliographical References

Baker, Ray Stannard. "Human Nature in Hawaii." *The American Magazine*, January, 1912. pp. 328-339.

_____. "Wonderful Hawaii: A World Experiment Station; I. How King Sugar Rules in Hawaii." *The American Magazine*, November, 1911, pp. 201-214.

_____. "Wonderful Hawaii: A World Experiment Station; II. The Land and the Landless." *The American Magazine*, December, 1911, pp. 201-214.

Bushnell, Tina and Hammatt, Hallett. "Archaeological Investigation of Pu'uopae (Kalama) Bridge in Wailua Homesteads, South Olohena, Ahupua'a Puna District, Kauai, Hawaii." Study prepared by Cultural Suverys Hawaii, Inc. for Belt Collins and Associates, December 1996.

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Garden Island newspaper. Līhu'e. 1911-1928. Microfilm records at Kaua'i Community College.

Horwitz, Robert; Vargha, Louis; Finn, Judith; Ceaser, James W. *Public Land Policy in Hawaii: An Historical Analysis*. Honolulu: Legislative Reference Bureau, University of Hawaii, 1969.

Kaua'i County Department of Public Works. "Repairing of Truss Bridge Across Kalama Stream, Wailua Hmstd, Dist. of Kawaihau, Kauai." Plan. 1958.

Kaua'i County Board of Supervisors Minutes Books and Miscellaneous Documents. 1911-1929. Office of the Kaua'i County Clerk, Līhu'e.

Luter, George W. *Report on Homesteading in Hawaii: 1839-1961*. Honolulu: Department of Land and Natural Resources, 1961.

Spencer Mason Architects. *Historic Bridge Inventory: Island of Kauai*. Prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U. S. Department of Transportation Federal Highway Administration. Honolulu: 1989.

Wall, Walter E. "Hawaii Territory Survey: Kapaa Homesteads 2nd Series." HTS Plat 3016. 1912.

_____. "Hawaii Territory Survey: Kapaa Section." HTS Plat 3014. 1914.

_____. "Hawaii Territory Survey: Wailua Govt. Land." HTS Plat 3042. 1923.

_____. "Hawaii Territory Survey: Wailua Homesteads 1st Series." HTS Plat 3033. 1919.

United States Department of the Interior
National Park Service

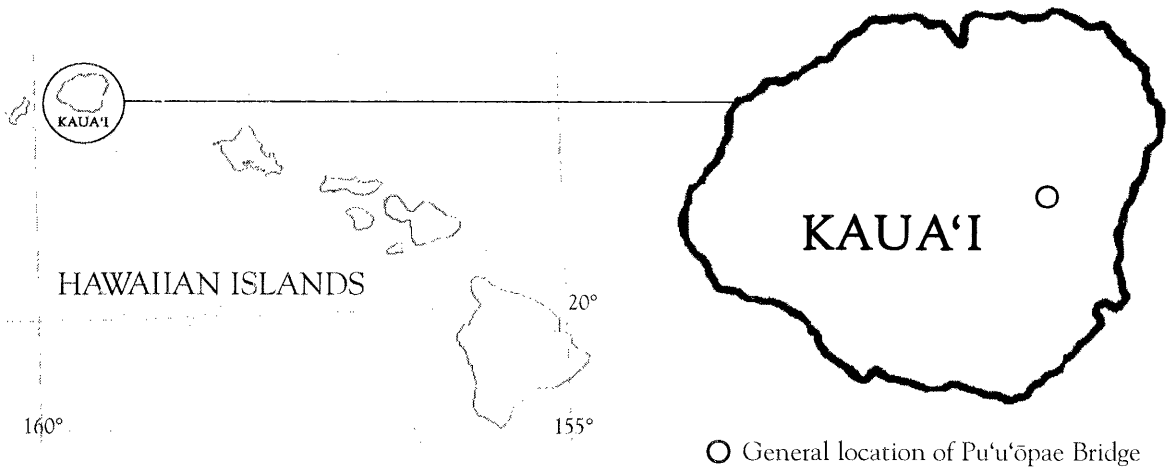
National Register of Historic Places Continuation Sheet

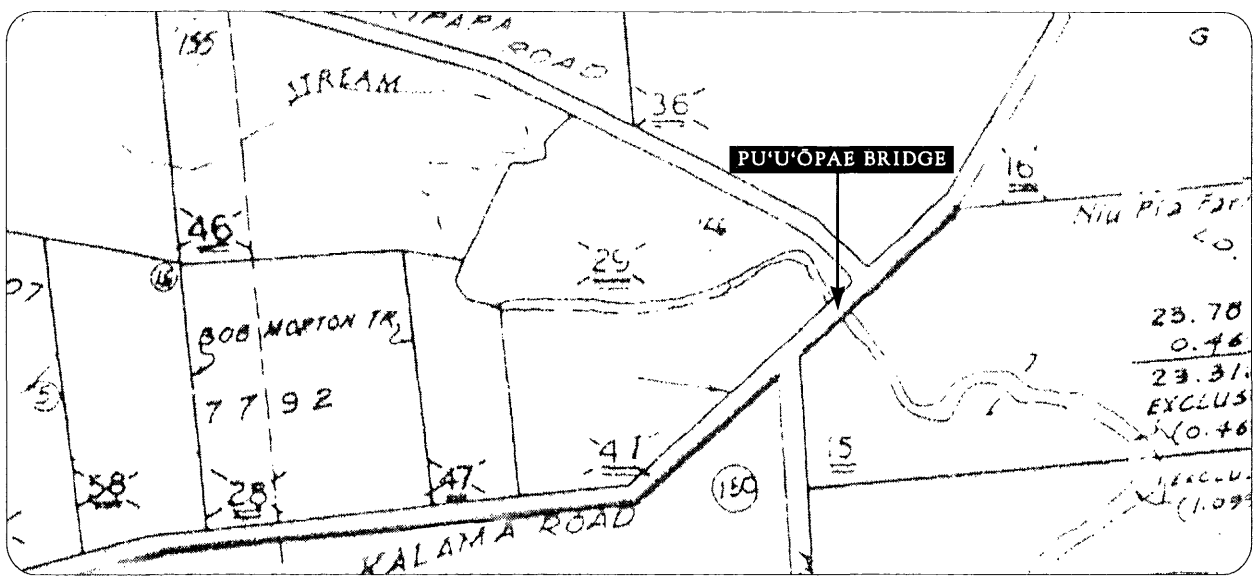
Section _10_ Page ___ 1 of 4 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Geographical Data

Verbal Boundary Description. Pu'u'ōpae Bridge is located in the *ahupua'a* of South Olohena in the Kawaihau District on the East side of the island of Kaua'i, Tax Map Key 4-4-002. The nominated property boundary encompasses only the bridge, its abutments and the ground upon which they stand, approximately 49 feet in length from endpost to endpost and 25.5 feet in width.

Boundary Justification. The nominated property consists exclusively of the bridge.





Above: Tax Maps Branch, State of Hawaii, Tax Map, Fourth District, 4-4-02 detail, Scale: 1" - 200'

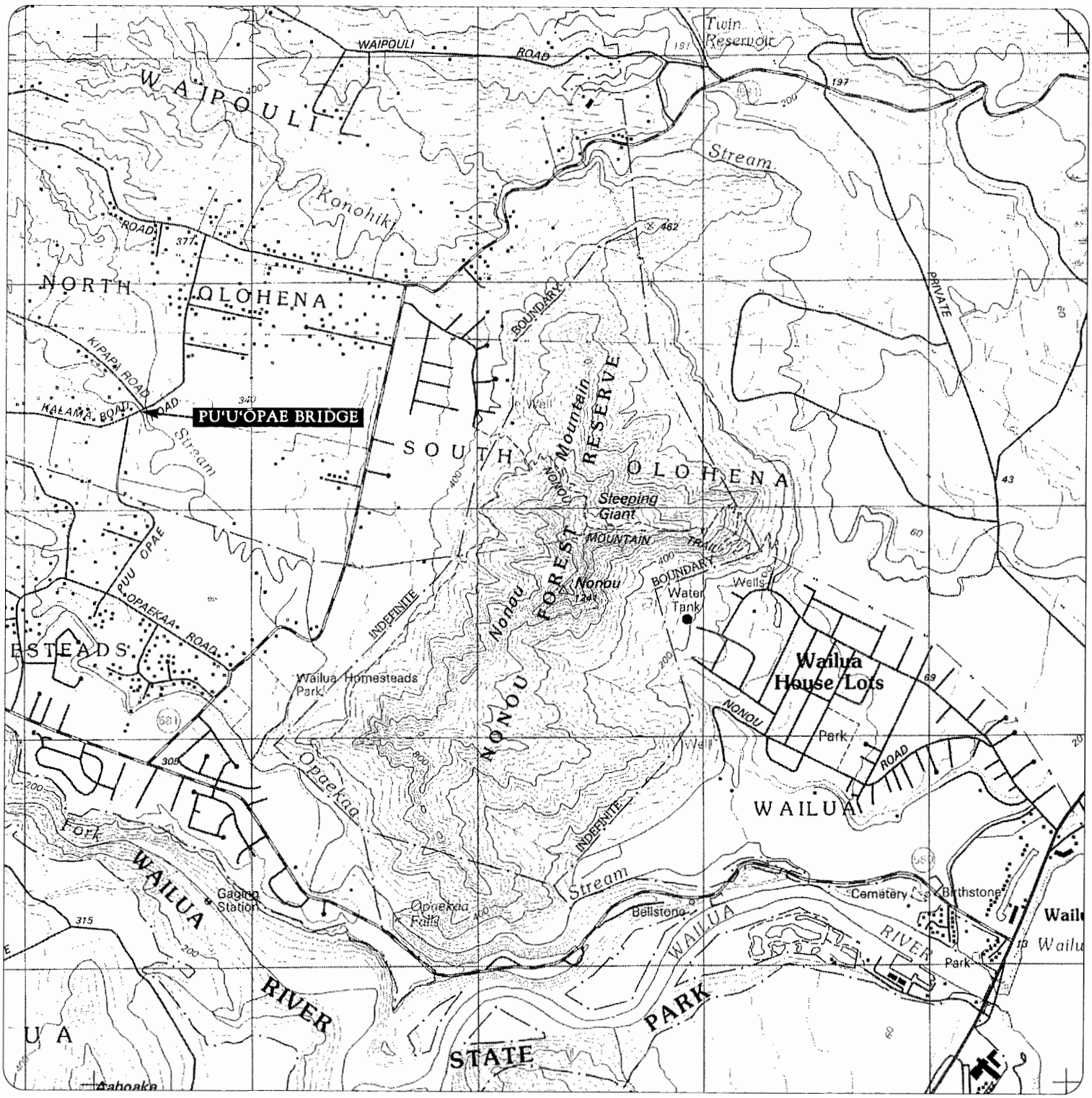
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _10_ Page __ 2 of 4 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Geographical Data

Detail of USGS Map, Kapaa Quandrangle, Hawaii-Kauai Co., 7.5-Minute Series (full map is enclosed).



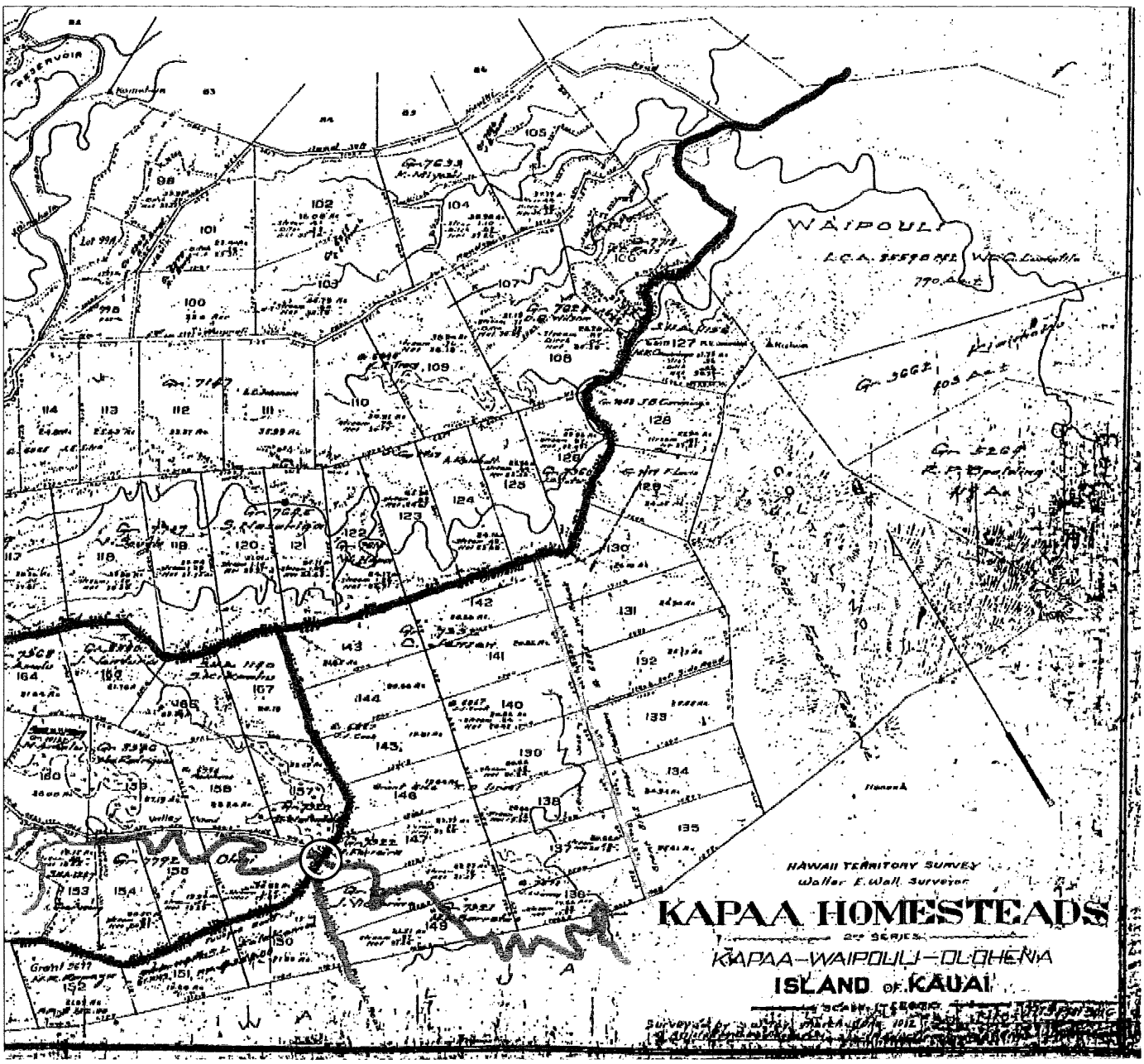
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _10_ Page __ 3 of 4 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Geographical Data

Map detail: Hawaii Territory Survey: Kapaa Homesteads 2nd Series. HTS Plat 3016. 1912



Pu'u'ōpae Bridge ◯ Olohena Rd. ——— Pu'u'ōpae Rd. ———
Kalama Stream ——— Kamalu Rd. ——— Pu'upilo Rd. ———

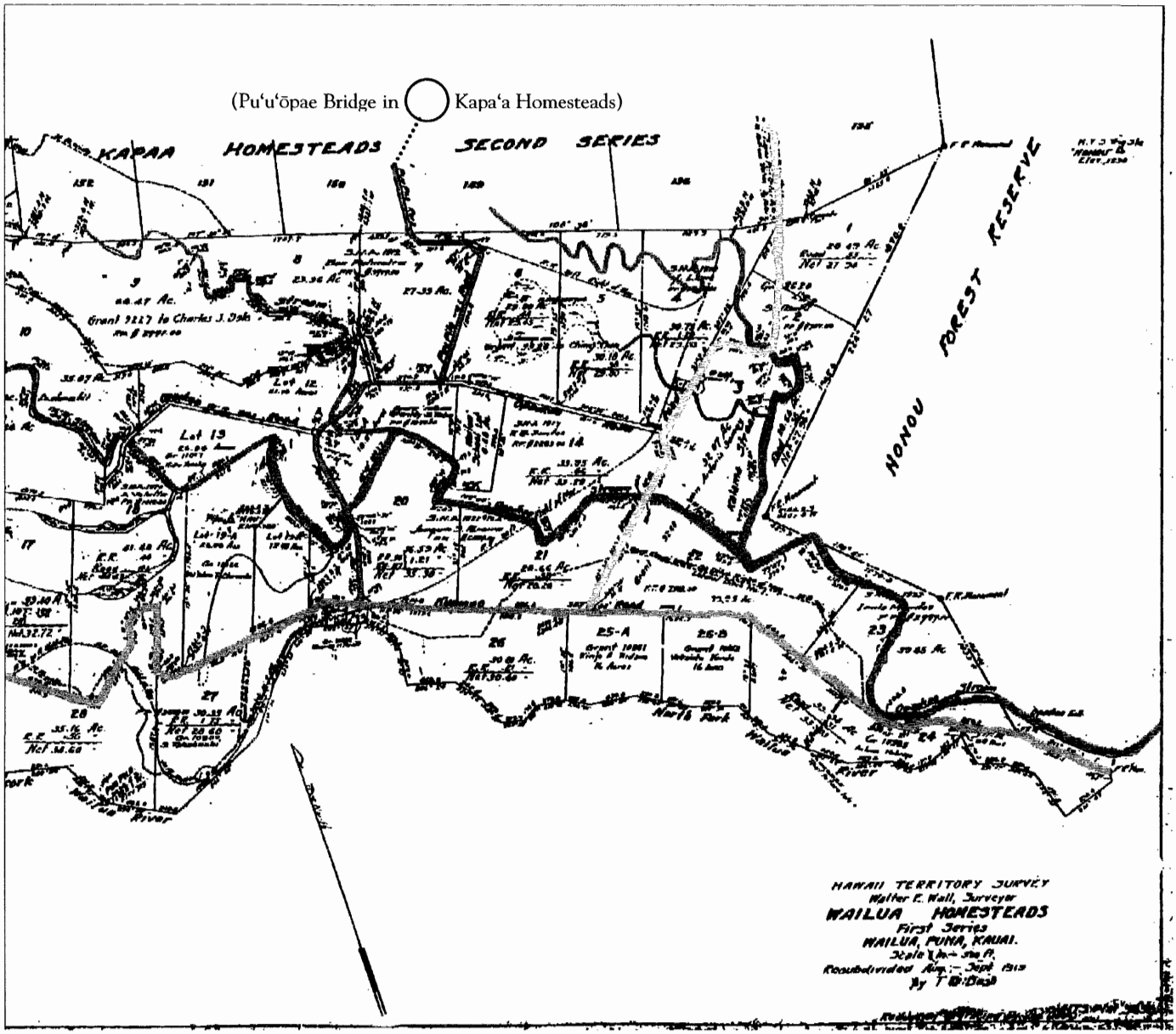
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section _10_ Page ___ 4 of 4 _ Name of property _ Pu'u'ōpae Bridge _ County and State _ Kaua'i, Hawai'i

Geographical Data

Map detail: Hawaii Territory Survey: Wailua Homesteads First Series, HTS Plat 3033. 1919



Pu'u'ōpae Bridge ◯ Kuamo'o Rd. ▬▬ 'Ōpaeka'a Stream ▬▬
Kalama Stream ▬▬ Kamalu Rd. ▬▬ Pu'upilo Rd. ▬▬

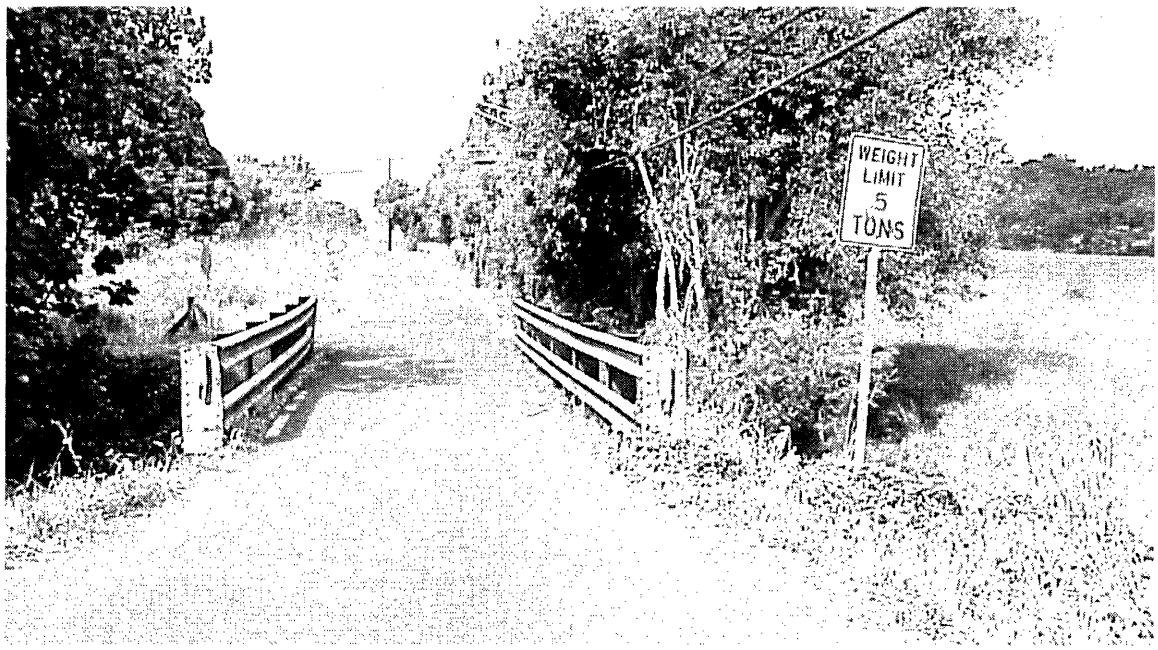
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Additional Documentation Pg _ 1 of 3 _ Name of property Pu'u'ōpae Bridge _ County /State _ Kaua'i, Hawai'i

Photographs

Digital photos have been electronically transmitted to Hawai'i SHPD at its request.
All digital image data and negatives are located at the office of the nomination preparer.



PAT L GRIFFIN

Approach to Pu'u'ōpae Bridge from Southwest



THOMAS NOYES

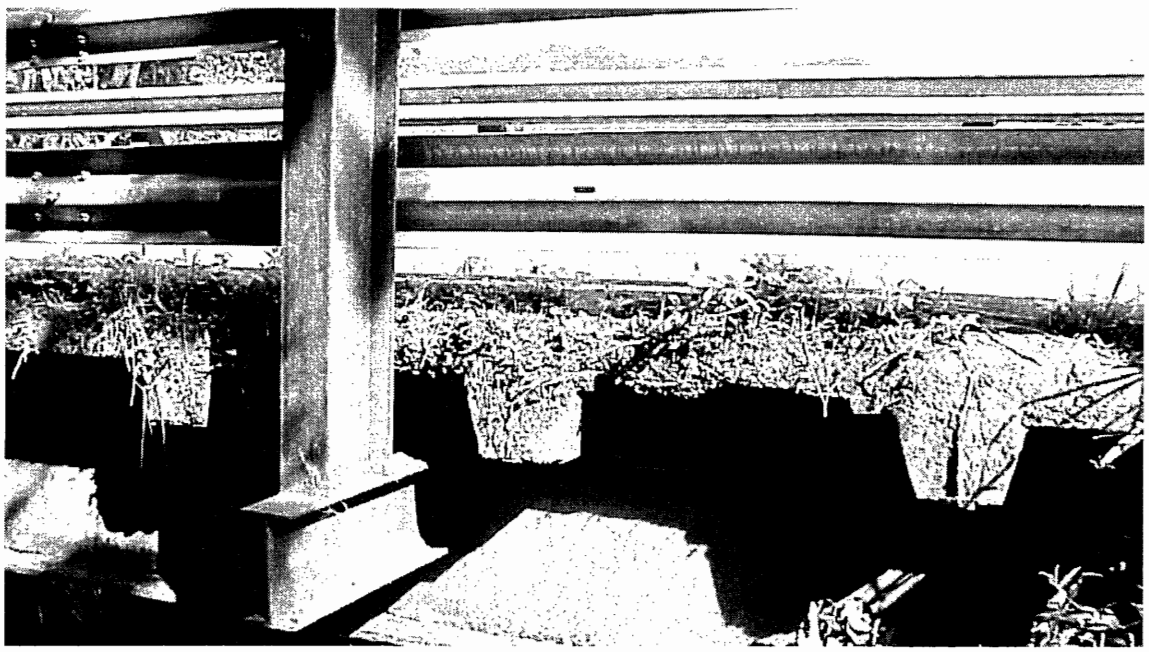
View of the bridge from Northwest side

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

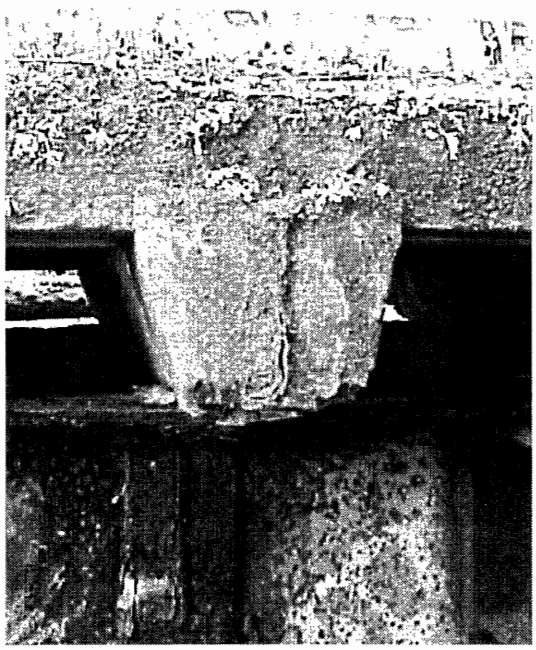
Additional Documentation Pg _ 2 of 3 _ Name of property Pu'u'ōpae Bridge _ County /State _ Kaua'i, Hawai'i

Photographs



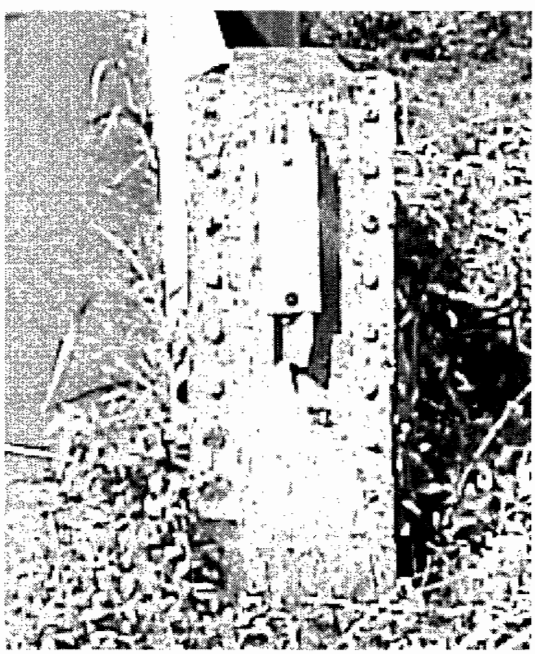
THOMAS NOYES

View from side, showing girder floor system



THOMAS NOYES

Detail: Girder



THOMAS NOYES

Detail: Endpost

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

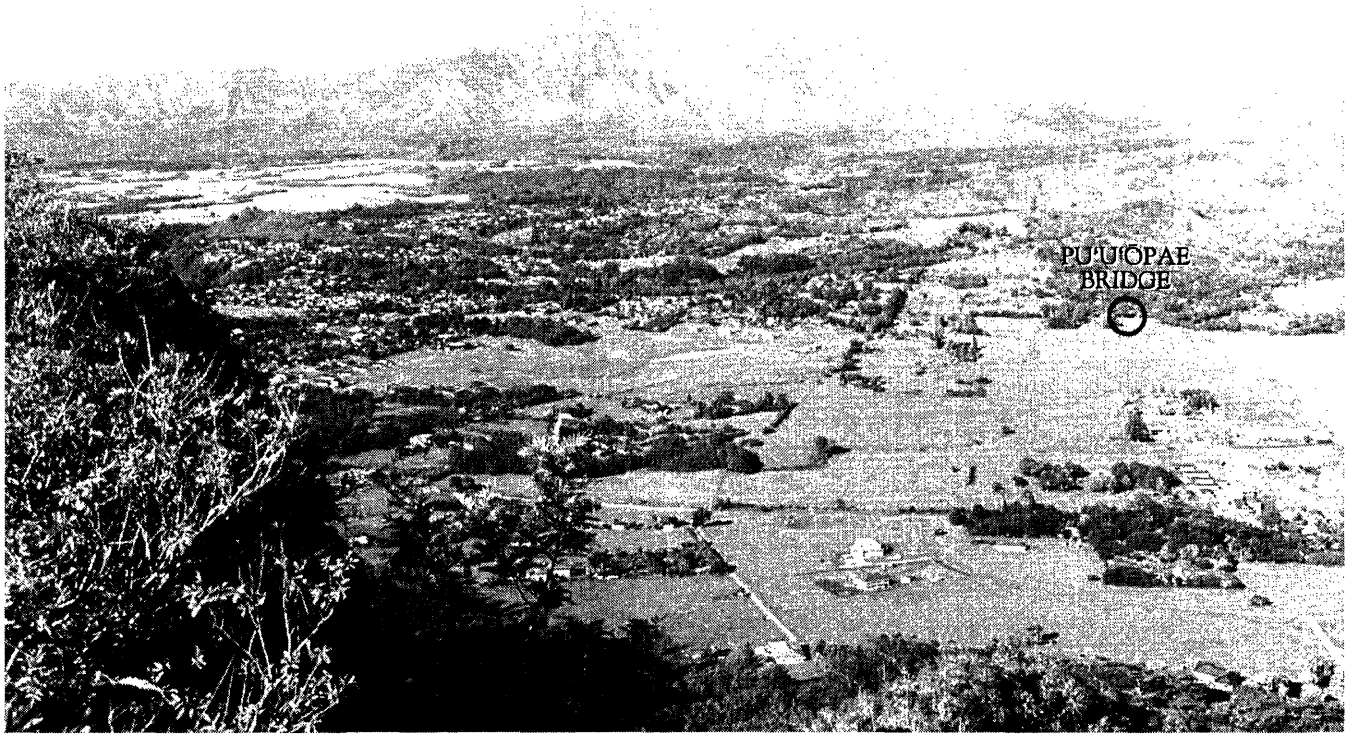
Additional Documentation Pg _ 3 of 3 _ Name of property Pu'u'ōpae Bridge _ County /State _ Kaua'i, Hawai'i

Photographs



PAT L GRIFFIN

View East, towards Nounou, from bridge



PAT L GRIFFIN

View West, of Kapa'a and Wailua Homesteads from Nounou Mountain (Mt. Wai'ale'ale in distance)

NPS Form 10-900
(7-81)

OMB NO. 1024-0018
EXP. 10/31/84

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received
date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic Opaekaa Road Bridge

and/or common

2. Location

street & number Opaekaa Road over Opaekaa Stream ___ not for publication

city, town Kapaa X vicinity of ~~congressional district~~

state Hawaii code 15 county Kauai code 07

3. Classification

Category	Ownership	Status	Present Use	
___ district	X public	X occupied	___ agriculture	___ museum
___ building(s)	___ private	___ unoccupied	___ commercial	___ park
X structure	___ both	___ work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
___ object	___ in process	___ yes: restricted	___ government	___ scientific
	___ being considered	X yes: unrestricted	___ industrial	X transportation
	N/A	___ no	___ military	___ other:

4. Owner of Property

name County of Kauai

street & number 4396 Rice Street

city, town Lihue ___ vicinity of state Hawaii

5. Location of Legal Description

courthouse, registry of deeds, etc. Bureau of Conveyances

street & number 1151 Punchbowl

city, town Honolulu state Hawaii

6. Representation in Existing Surveys

title Hawaii Historic Places Inventory has this property been determined eligible? ___ yes X no

date 1982 ___ federal X state ___ county ___ local

depository for survey records Department of Land & Natural Resources

city, town Honolulu state Hawaii

7. Description

Condition		Check one	Check one
___ excellent	___ deteriorated	___ unaltered	___ original site
___ good	___ ruins	_X_ altered	_X_ moved date 1919
_X_ fair	___ unexposed		

Describe the present and original (if known) physical appearance

The Opaekaa Road Bridge is a single lane, wrought-iron, Warren truss bridge which terminates with vertical end posts. The bridge is 73 feet long and its trusses consist of 7 panels, each approximately 10 feet in length and 9 feet 8 inches tall. The trusses are 13 feet 4 inches apart, center to center, and the panels form the outline of a slightly elongated equilateral triangle.

The width of the top chords, bottom chords and end posts is 16 inches, and the diagonal web members are 6 inches wide. The bottom chords of the trusses were strengthened in 1919 when 5 rolled steel I-beams were welded to them. These I-beams run perpendicular to the two trusses and serve to connect them structurally. They also support 2 steel I-beams which run parallel to the trusses and assist in supporting the reinforced concrete roadway deck. The 5 perpendicular I-beams extend beyond the edges of the trusses and 3 of them are connected to the top chords by small welded steel members which provide lateral bracing. The end posts at one end of the bridge are reinforced concrete and at the other end are steel boxes welded to the original trusses.

A reinforced concrete deck, which is at least 5 inches thick, rests on top of the trusses' bottom chords and the I-beams. The entire structure rests upon two lava rock masonry abutments and one lava rock masonry pier.

The trusses are formed of simple rolled plates, angles and channels. They were more than likely riveted together in the iron works and apparently employ drilled rivet holes. A wrought-iron plate near one end of the bridge reads,

> Alex. Findlay & Co.
> Bridge Builders
> Motherwell
> near
> Glasgow 1890

Originally the Opaekaa Road Bridge was part of a longer three-span bridge which crossed the mouth of the Wailua river. The end posts,deck, I-beams and lateral braces all date from the moving of this section of the Wailua Bridge to the Opaekaa Road location.

Since 1919 the bridge has not been altered or moved.

8. Significance

Period	Areas of Significance—Check and justify below				
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion
___ 1400–1499	___ archeology-historic	___ conservation	___ law	___ science
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture
___ 1600–1699	___ architecture	___ education	___ military	___ social/ humanitarian
___ 1700–1799	___ art	X engineering	___ music	___ theater
X 1800–1899	X commerce	X exploration/settlement	___ philosophy	___ transportation
X ___ 1900–	___ communications	X industry	___ politics/government	___ other (specify)
		___ invention		

Specific dates 1890, 1919 **Builder/Architect** Alexander Findlay - Joseph H. Moragne

Statement of Significance (in one paragraph)

The Opaekaa Road Bridge is significant as the only known British-made iron bridge in the United States, and one of the few surviving iron bridges in the state of Hawaii. Also, the bridge is significant because of its associations with the development of the Wailua Homesteads.

In 1888 the Hawaiian legislature approved a bridge for the Wailua river, a major impediment to travel between Lihue and settlements on the northwest coast of Kauai. The bridge was fabricated by Alexander Findlay & Co. of Motherwell, near Glasgow, and was delivered in pre-fabricated sections. Due to insufficient funds the bridge was not immediately erected, but in 1894-1895 was finally set in place, following a loan from G.N. Wilcox to the Provisional government for this purpose.

In 1919 the County of Kauai replaced this iron bridge with a reinforced concrete arch bridge. Joseph H. Moragne, the County's Engineer and Road Superviser, designed and built the new bridge and also was responsible for retaining a part of the former Scottish-made bridge for use over Opaekaa stream.

The Opaekaa Road Bridge is the only known British-made bridge in the United States. It typifies British bridge manufacture of the late nineteenth century with its factory riveted trusses, use of drilled rivet holes, lack of lateral bracing, short height, and use of the bottom chords to support the road deck. This bridge also is one of the few major Nineteenth century, British-manufactured products to still exist in Hawaii, and as such serves as a reminder of the once-strong British presence in the Islands.

The bridge is also one of the few metal truss bridges remaining in the State. Others include the Karsten Thot bridge (Wahiawa, Oahu-1934) and the Hanalei Bridge (Hanalei, Kauai- 1912).

The bridge has further significance for its associations with the opening of the Wailua Homesteads first series. When the United States annexed Hawaii much of the crown lands came under the jurisdiction of the territorial government.

When existing leases on these parcels expired a number of them were subdivided into homesteads, which were sold to people for a modest price.

The Wailua Homesteads first series were opened in December 1919. 908 people applied for the 31 lots, which were distributed by way of a lottery. The roads were constructed prior to the lottery, and the Opaekaa Road bridge was part of this initial government improvement. The Garden Isle of September 23, 1919, applauded the putting in of the roads in advance. The editors found it to be,

> A great improvement over anything we have had heretofore, where in many cases a sure-footed pack mule, or a light-landing aeroplane was the only means of getting near some of them (the homestead lots).[1]

The area serviced by Opaekaa Road still reflects the agricultural orientation associated with the homestead movement, although many more modern residences now dot the landscape. The bridge stands as one of the few man-made reminders of the period when the homesteads were opened.

1. Garden Isle September 23, 1919, p. 1

9. Major Bibliographical References

Donald C. Jackson & Barnes Riznic, "Kauai's Opaekaa Bridge: The Only Known British Truss Bridge in the United States" Industrial Archaeology, vol.13 (Summer 1978) no. 2

10. Geographical Data

Acreage of nominated property less than a quarter acre

Quadrangle name Kapaa **Quadrangle scale** 1:24000

UMT References

	Zone	Easting	Northing		Zone	Easting	Northing
A	04	460700	2439780	B			
C				D			
E				F			
G				H			

Verbal boundary description and justification

This nomination includes the bridge, its footings and the land & water they stand upon and span.

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
state	code	county	code

11. Form Prepared By

name/title	Don Hibbard architectural historian		
organization	DLNR	**date**	August 31, 1982
street & number	1151 Punchbowl Street	**telephone**	548-6408
city or town	Honolulu	**state**	Hawaii

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

__X__ national ____ state ____ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature [signature]

title State Historic Preservation Officer **date** February 15, 1983

For NPS use only

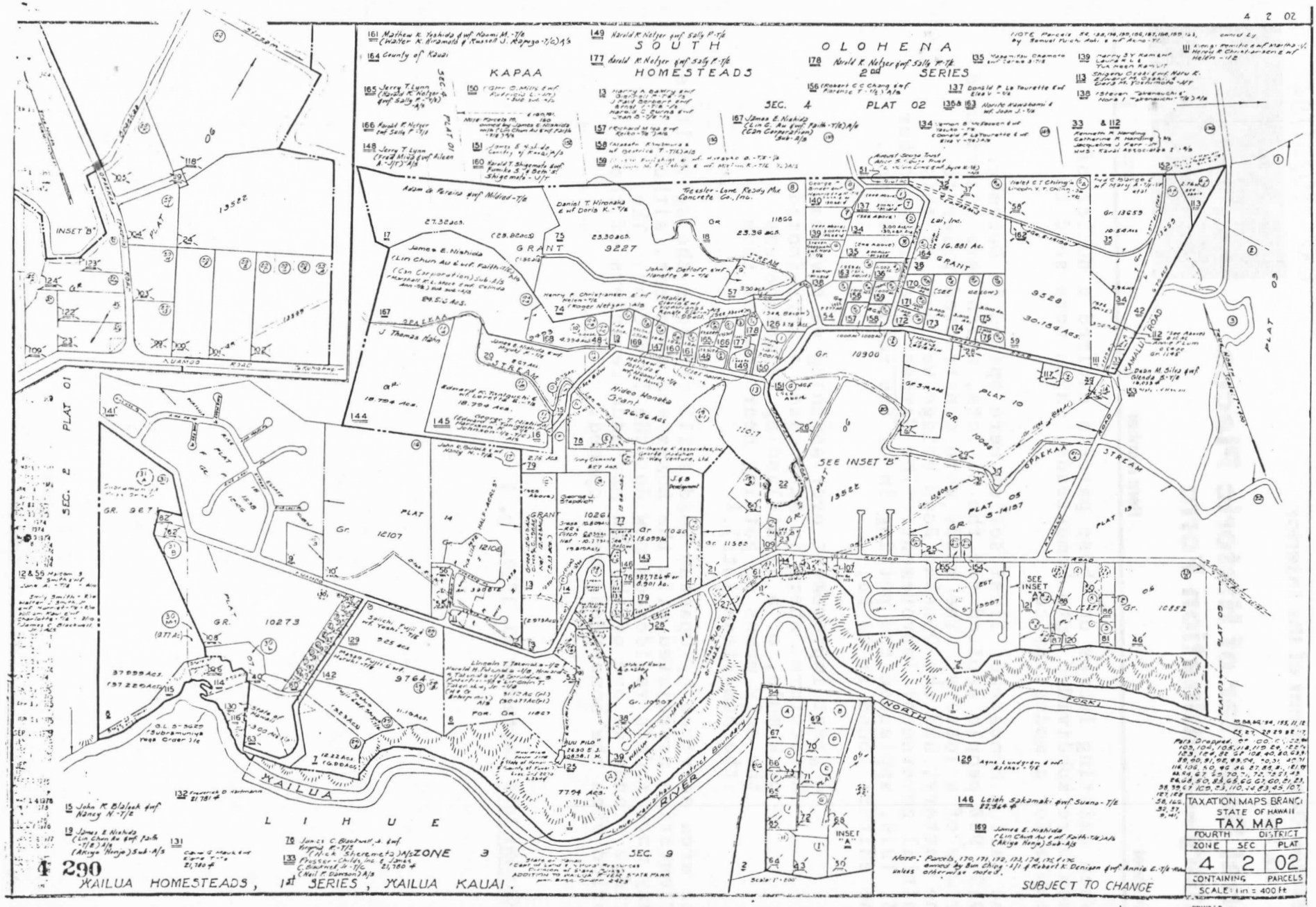
I hereby certify that this property is included in the National Register

date

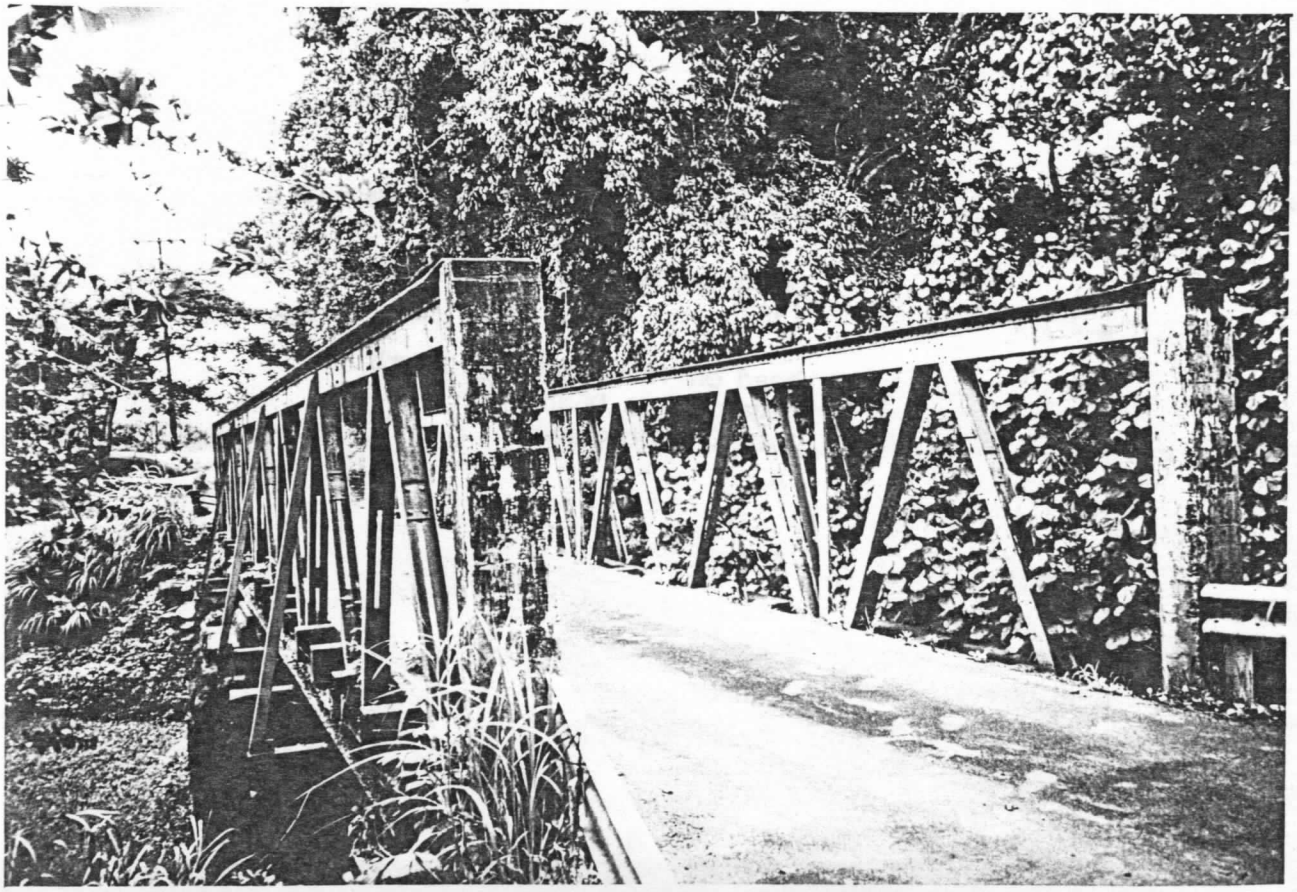
Keeper of the National Register

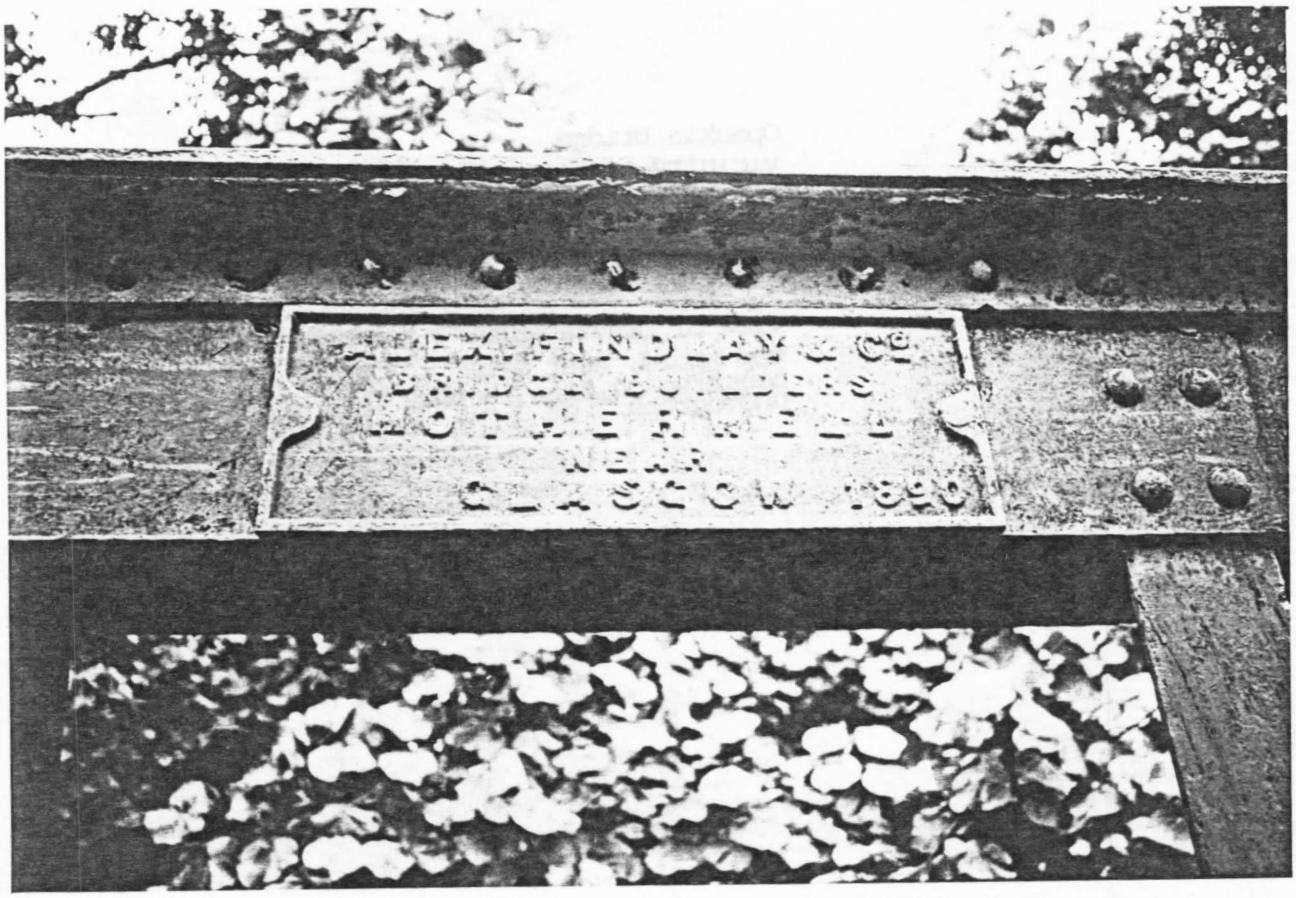
Attest: **date**

Chief of Registration


4 2 02
SOUTH HOMESTEADS
OLOHENA 2nd SERIES
KAPAA
SEC. 4 PLAT 02
GRANT 9227
GRANT 9528
GRANT 10261
Hideo Honoka Grant 26.56 Acs
SEE INSET "B"
SEE INSET "A"
INSET "B"
INSET "A"
PLAT 01
PLAT 03
PLAT 05
PLAT 10
PLAT 13
PLAT 14
SEC. 2
SEC. 9
KUAMOO ROAD
KAMALU ROAD
OPAEKAA STREAM
NORTH FORK
WAILUA RIVER
WAILUA
LIHUE
ZONE 3
4 290
WAILUA HOMESTEADS, 1st SERIES, WAILUA KAUAI.
SUBJECT TO CHANGE
TAXATION MAPS BRANCH
STATE OF HAWAII
TAX MAP
FOURTH DISTRICT
ZONE 4
SEC 2
PLAT 02
CONTAINING PARCELS
SCALE: 1 in = 400 ft
PRINTED






ALEX FINDLAY & Co
BRIDGE BUILDERS
MOTHERWELL
NEAR
GLASGOW 1899

* Use your own favorite word processor to add the following
* standard header on all but the first page of this form.
* Insert the property name, county and state, and use a
* running page number.
*
*
USDI/NPS NRHP Registration Form
Kapaia Swinging Bridge
Kauai, HI (Page #)

****

****

* The complete text from sections 3 (if applicable), 7, 8, and
* the bibliography from section 9 should be printed on continuation
* sheets. Use the header shown on the sample continuation
* sheet at the end of this file, filling in the property
* name and section number, and using a running page number.
****

NPS Form 10-900 OMB No. 1024-0018
(Rev. 10-90)

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 How to Complete the National Register of Historic Places Registration Form (National Register
Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information
requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a).
Use a typewriter, word processor, or computer, to complete all items.

==========

1. Name of Property

==========

historic: Kapaia Swinging Bridge

other names/site number: Kapaia Valley Swinging Bridge; Kapaia Suspension Bridge

==========

2. Location

==========

street & number: end of Laukini Road , across Kapaia Stream to Kapaia Road NAnot for publication

city or town: Kapaia (Lihue) NAvicinity

state: HI code ____ county: Kauai code ____ zip code: 96766

==========

3. State/Federal Agency Certification

==========

As the designated authority under the National Historic Preservation Act of 1986, 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 ___ nationally ___ statewide ___locally. (___ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official Date

State or Federal agency and bureau

==========

4. National Park Service Certification

==========

I, hereby certify that this property is:
____ entered in the National Register _____ See continuation sheet.

____ determined eligible for the _____ See continuation sheet.
National Register

____ determined not eligible for the _____
National Register

____ removed from the National Register _____

____ other (explain): _____

Signature of Keeper Date of Action

==========

5. Classification

==========

Ownership of Property (Check as many boxes as apply)

X private
X public-local
___public-State
___public-Federal

Category of Property (Check only one box)

___ building(s)
___ district
___ site
X structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
NA	NA	buildings
NA	NA	sites
1	2	structures
		objects
1	2	Total

Number of contributing resources previously listed in the National Register

0

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.)

N/A

==========

6. Function or Use

==========

Historic Functions

Cat: TRANSPORTATION
Sub: PEDESTRIAN RELATED=FOOT BRIDGE

Current Functions

Cat: TRANSPORTATION
Sub: PEDESTRIAN RELATED=FOOT BRIDGE

==========

7. Description

==========

Architectural Classification

Other: Suspension Bridge

Materials

foundation: Concrete/Rock
walls: N/A
roof:N/A
other: Wood/Metal/Steel

Narrative Description (Describe the historic and current condition of the property on one or more continuation
sheets.)

Kapaia Swinging Bridge is nestled in the heart of Kapaia Valley, where only remnants of a once flourishing community existed.

The Immaculate Conception Catholic Church occupied the east side of the Kapaia Stream. Rice fields, a Filipino "camp", taro patches, Hawaiian and Japanese families lived on the inner valley side.

On the west side of the bridge stood the Lihue Hongwanji Buddhist Temple, Korean Methodits Church and Chinese Church. Naganuma Store, Ogata Store, Moriwake and Ah Chock's store lined the road leading up to the main Kuhio Highway.

Most of the immigrant villagers traveled by foot so used the bridge connecting both sides of the Kapaia Stream was a convenient necessity. Often, heavy rains swept through the Kapaia Stream, washing away the low foot bridge, creating a huge inconvenience for the villagers. Archaeological remnants show that at least 2 attempts were made to rebuild the bridge with cement footings. Finally, in 1948, a suspension bridge was constructed by the County of Kauai .

With the emergence of automobiles as a major form of transportation, and with the closing of sugar plantations, the swinging bridge became less important as a mode of transportation, but very important as a historic symbol of an era in Hawaiian history that permeates every facet of local culture today.

In September, 2006, the Kapaia Swinging Bridge was declared unsafe for use and was closed. Concerned citizens petitioned the county to repair the bridge. The Kauai Council, recognizing its fuctional and historical value, unanimously supported the citizen's desire and promptly appropriated $200,000.00 for repairing the bridge.

==========

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)

X **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

X **B** Property is associated with the lives of persons significant in our past.

X **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 a grave.
____ D a cemetery.
____ E a reconstructed building, object, or structure.
____ F a commemorative property.
____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)

Transportation
Engineering
Ethnic Heritage

Period of Significance

1948

Significant Dates

1948 Construction of Kapaia Swinging Bridge completed

Significant Person
N/A

Cultural Affiliation

Sugar Plantation immigrants to Hawaii. Multicultural

Architect/Builder

County of Kauai, Department of Public Works. Draftsman: Shibao, Harutsuno;
Engineer: Omori, Kunji
Contractor: Maeda, I.

==========

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)
==========

==========

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

1. County of Kauai Engineer's Report 11/ 1947, 3/1948
2. Department of Public Works Communication June 18, 1947; 1/7/1948; 4/7/1948; 11/5/1947
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   Kimiyo Takemoto Fujimoto
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Exhibits:

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Map illustration from Tales of O

4. ld Kapaia page XIII

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 # _____

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Primary Location of Additional Data
___ State Historic Preservation Office
___ Other State agency
___ Federal agency
X Local government
X University
X Other
Name of repository: _____

==========

10. Geographical Data

==========

Acreage of Property: Less than 1 acre

UTM References (Place additiona__ l UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	4	_____	_____	3	__	_____	_____
2	__	_____	_____	4	__	_____	_____

___ See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

The boundary includes the essential components of the bridge's structure.

==========

11. Form Prepared By

==========

name/title: Laraine Moriguchi
organization: Save Kapaia Swinging Bridge date: 2/8/2008

street & number: 4453 Laukini Road telephone: 808 246-6812
city or town: Lihue state: HI zip code: 96766

==========

Additional Documentation

==========

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

==========

Property Owner

==========

(Complete this item at the request of the SHPO or FPO.)
name _____

street & number_____
telephone_____

city or town_____ state_____ zip code _____

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Paperwork Reduction Act Statement: This information is being collected for applications to the National Register

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Services Division, National Park Service, P.0. Box 37127, Washington, DC 20013-7127; and the Office of
Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.

The Kapaia Swinging Bridge is nestled in the heart of Kapaia Valley. Built first as a low foot crossing, it bridged upper Kapaia to the lower valley.

In the 1920s most of the plantation villagers traveled by foot because they could not afford to own an automobile. The foot bridge was used daily to go to and from work, scool, shopping and play. Often, heavy rains swept through the Kapaia Stream, washing away the low foot bridge, creating a huge inconvenience for the villagers. Archaeological remnants show that at least 2 attempts were made to rebuild the bridge with cement footings (Photo 2, & 4 and construction plans Exhibit 2) show old concrete bridge piers. Finally, in 1948, a suspension bridge, funded by the County of Kauai, was constructed by Contractor I. Maeda for the community of Kapaia.

The Kapaia Swinging Bridge is classified a suspension bridge. It is one of 4 known similarly constructed suspension bridges in Hawaii. All are located on Kauai. The wooden deck is suspended from hangers attached to steel cables draped over 2 wooden towers and secured into solid concrete/boulder anchorages at both ends. The cable span between the two 15' 10" tall towers of the Kapaia Swinging Bridge is 80'. The entire bridge is 125' long. A complete and detailed description is included in the construction plans prepared by the County of Kauai Department of Public Works in December, 1945 (Exhibit 2)

With the emergence of automobiles as a major form of transportation, and with the closing of sugar plantations, the swinging bridge became less important as a mode of transportation, but very important as a historic symbol of an era in Hawaiian history that permeates every facet of local culture today. Until barricades were erected, it was still being used by citizens walking between Hanam'ulu and Lihue.

In September, 2006, the Kapaia Swinging Bridge was declared unsafe and was closed. The 1x12 walk planks are rotting and the steel plates, cables and bolts are rusting. A concerned community petitioned the county to repair the bridge. The Kauai Council, recognizing its functional and historical value, unanimously supported the citizen's desire and promptly appropriated $200,000.00 for repairing the bridge. Unfortunately, the County Administration has chosen not to repair the historic structure, leaving its survival in extreme jeopardy.

* NOTICE
*
* The complete text from sections 3 (if applicable), 7, 8, and
* the bibliography from section 9 should be printed on contin*
uation sheets, of which this is a sample. Use the header
* shown at the top of this page, filling in the name of the
* property, county and State, and section number, and using
* a running page number. When the property being documented
* is part of a multiple property listing, use the alternative
* header given below.
****

The Kapaia Swinging Bridge crosses the Kapaia Stream, whose source is the Kapaia Reservoir and outlet is Hanama'ulu Bay. Kapaia Camp was one of many camps established by Lihue Plantation . Workers from Kapaia irrigated and maintained the sugar cane fields at Hanama'ulu.

Because the Kapaia terrain made it unsuitable for sugar cultivation, Lihue Plantation allowed the area to be used for shops, churches and other agricultural activities. Lands were leased, and later sold to enterprising farmers and businessmen. The interspersion of private landowners, business enterprises and the plantation camp gave the community of Kapaia a truly unique, multicultural character. Chinese and Japanese shops with names like Ah Chock, Naganuma, Ogata and Ihara established themselves to serve the people of the area. Portuguese merchants such as Fernandes and Carvalho opened general merchandising stores.

A historical account of KapaiaValley in the 1930s is described in a book written and illustrated by Mr. David Hyun, a nationally recognized architect who grew up in Kapaia from 1926 (9 years old) until graduation from Kauai High School in 1935. His book portrays a completely factual version of daily living in Kapaia during the most prolific period of its history. The truth of Mr. Hyun's writings have been collaborated by more than one long time resident of Kapaia Valley. Ethel Iida Inagaki and her cousin, Kimiyo Takemoto Fujimoto are very close in age to David Hyun. They, as well as others, confirm that everything (with exception to a few minor memory mistakes) written by David Hyun is historically factual.

Tales of Old Kapaia, by David Hyun (Exhibit 1), serves as the most important source of information in our bid to convince you of the historical significance of the Kapaia Swinging Bridge. The magic of Kapaia Valley is revealed through the simple wanderings of a young boy growing up at a time when children were free to explore their pristine surroundings, learning to appreciate the beauty of nature; free to roam the neighborhood, learning to accept, appreciate and thrive on diversity. Mr. Hyun's illustrations and writings stand alone in portraying the historical significance of the Kapaia Swinging Bridge as it relates to the history of Lihue Plantation Company, the people of Kapaia Valley, the island of Kauai and the State of Hawaii.

The Kapaia Foot Bridge, which was rebuilt as the Kapaia Suspension(Swinging)Bridge in 1948, linked Upper and Lower Kapaia Valley into a community bustling with activity.

Exhibit 1a: Map illustration by David Hyun Kapaia 1929

Below 10 (Hanging Foot Bridge):

Much of the plantation housing was located on the "Lower Valley" side of the bridge. The Filipino Plantation Camp as well as many Japanese and Hawaiian households were located on the "Lower Valley" side of the swinging bridge.
Also on the "Lower Valley" side were:
Immaculate Conception Catholic Church
A large cock fighting area
A brothel
Watercress farms
Rice farms
Taro farms

Above 10(Hanging Foot Bridge):

All of the businesss and most of the churches, including the Buddhist Temple, were on the "Upper Valley" side of the swinging bridge.
Also located on the "Upper Valley" side were:
Ah Chock Chinese Store
Naganuma, Moriwake, Ihara, Tanaka, Japanese Stores
Fernandes, Carvalho Portuguese General Stores
A Filipino Dance Hall
Ogata Sewing School
Ogata Pool Hall
Boiser Boxing Gym
Tom Sui Chinese Restaurant
Korean Methodist Church
Chinese Church

Japanese Newspaper Publishing Company
Barber Shop
Doi Auto repair, service company

David Hyun's map makes it obvious that the pathway across the swinging bridge was much shorter and more convenient than climbing up Kapaia Road, onto Kuhio Highway, then trekking down Kuhio Highway, to the shops and churches. Old timers will attest to the fact that the bridge was a necessity to the daily life of the plantation immigrants, many of whom did not have the luxury of an automobile.

Most of the traversing was done by people walking from their camp homes, across the bridge, to all of the activity on the "Upper Valley" side of Kapaia Stream. Japanese children from Hanama'ulu and lower Kapaia Valley crossed daily to attend Japanese School. Plantation laborers from the "Upper Valley" met across the bridge at 5 am daily to walk together to Hanama'ulu, where they were trucked to the sugar fields. Housewives walked back and forth the bridge to do their daily grocery shopping and to visit friends. These are just a few examples demonstrating the integral role of the Kapaia Swinging Bridge in the daily life of Kauai's sugar plantation immigrant population.

In the 1950s and early '60s, Lihue Plantation began phasing out camp housing, offering private ownership to their employees in Hanama'ulu, Puhi and elsewhere. By 2000, when Lihue Plantation closed, all of the plantation housing had disappeared and all of the private farms and businesses were gone.

Only remnants of a once flourishing plantation community still exist. The Catholic Church and Buddhist Temple still serve the spiritual needs of the island. A few prized longan trees planted by Chinese immigrants, still bear fruit. The "Boiser House" still stands and the swinging bridge remains suspended over Kapaia Stream.

The County of Kauai was maintaining the bridge and its surroundings until a few years ago. In September, 2006, the bridge was closed due to unsafe conditions caused by maintenance neglect. At the present time, our county government has no plans to repair the bridge.

It is our hope that by placing the bridge on the Hawaii Register of Historic Places, our county leaders will recognize the invaluable historical significance of the Kapaia Swinging Bridge. Our ultimate goal is to honor those who came before us by keeping this historical treasure as a bridge connecting the descendants of the Hawaiian and immigrant laborers to each other; and as a bridge welcoming those desiring to be a part of a truly special culture.

NPS Form 10-900-a OMB No. 1024-0018
(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

1. County of Kauai Engineer's Report 11/ 1947, 3/1948
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3. Communication from Office of the Chairman and Executive Officer 6/6/1945
4. Lihue Plantation Archives Hamilton Library Ubiversity of Hawaii
5. Hanamaulu Town Celebration Website www.
6. Immaculate Conception Centennial Booklet 1984
Fujimoto, Kimiyo Takemoto. Interview 2006
Inagaki, Ethel Iida. Interview 2006
Hyun, David. Interview 2006
7. Hyun, David. Tales of Old Kapaia Self Published , 2003
8. Oral History
Kimiyo Takemoto Fujimoto
Ethel Iida Inagaki
David Hyun

Exhibits:

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6. County of Kauai construction plans for Kapaia Swinging Bridge 1945
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Map illustration from Tales of O

8. ld Kapaia page XIII

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(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
Section 10 Page 1
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI

Property consist of a wooden deck, abutment on concrete piers spanning the Kapaia Stream. It touches ground on parcel TMK3-7-01:9 Unit B on one the east side, and parcel TMK 3-7-01-1 on the west side of the stream.

The structure is 125’ long, 4’ wide walking space , 7.5’ total length of 3x4’ wooden girders.

80’ span between pier 1 and pier 2. Each pier consists of a concrete base upon which the wooden tower is bolted onto with angle steel plates. Height of tower from bottom steel plates to top of tower is 15’ 10”

Boundary is further defined by the Construction plans included with the application Exhibit 2) and the UTM points given in section 10.

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
Section photos Page 1
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI
Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing south, showing north side of bridge
Photo #1 of 5



NPS Form 10-900-a OMB No. 1024-0018
(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section photos Page 2
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI
Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing east, showing west to east span of bridge
Photo #2 of 5



NPS Form 10-900-a OMB No. 1024-0018
(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section photos Page 2
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI
Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing east, showing west to east span of bridge
Photo #3 of 5





Photo #5 of 5
Photo by Laraine Moriguchi 2006



NPS Form 10-900 OMB No. 1024-0018
(Rev. 10-90)

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 How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a).
Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic: Kapaia Swinging Bridge

other names/site number: Kapaia Valley Swinging Bridge; Kapaia Suspension Bridge

2. Location

street & number: end of Laukini Road , across Kapaia Stream to Kapaia Road NAnot for publication

city or town: Kapaia (Lihue) NAvicinity

state: HI code ____ county: Kauai code ____ zip code: 96766

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, 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 ___

nationally ___ statewide ___locally. (___ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official Date

State or Federal agency and bureau

---

4. National Park Service Certification

I, hereby certify that this property is:
____ entered in the National Register _____ See continuation sheet.

____ determined eligible for the _____ National Register. See continuation sheet.

____ determined not eligible for the _____National Register

____ removed from the National Register _____

____ other (explain): _____

Signature of Keeper Date of Action _____

---

5. Classification

Ownership of Property (Check as many boxes as apply)
X private
X public-local
___public-State
___public-Federal

Category of Property (Check only one box)
___ building(s)
___ district
___ site
X structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
NA	NA	buildings
NA	NA	sites
1	2	structures
		objects
1	2	Total

Number of contributing resources previously listed in the National Register
0

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.)
N/A

6. Function or Use

Historic Functions

Cat: TRANSPORTATION
Sub: PEDESTRIAN RELATED=FOOT BRIDGE

Current Functions

Cat: TRANSPORTATION
Sub: PEDESTRIAN RELATED=FOOT BRIDGE

7. Description

Architectural Classification

Other: Suspension Bridge

Materials
foundation: Concrete/Rock

walls: N/A
roof:N/A
other: Wood/Metal/Steel

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

Kapaia Swinging Bridge is nestled in the heart of Kapaia Valley, where only remnants of a once flourishing community existed.

The Immaculate Conception Catholic Church occupied the east side of the Kapaia Stream. Rice fields, a Filipino "camp", taro patches, Hawaiian and Japanese families lived on the inner valley side.

On the west side of the bridge stood the Lihue Hongwanji Buddhist Temple, Korean Methodits Church and Chinese Church. Naganuma Store, Ogata Store, Moriwake and Ah Chock's store lined the road leading up to the main Kuhio Highway.

Most of the immigrant villagers traveled by foot, so using the bridge connecting both sides of the Kapaia Stream was a convenient necessity. Often, heavy rains swept through the Kapaia Stream, washing away the low foot bridge, creating a huge inconvenience for the villagers. Archaeological remnants show that at least 2 attempts were made to rebuild the bridge with cement footings. Finally, in 1948, a suspension bridge was constructed by the County of Kauai.

With the emergence of automobiles as a major form of transportation, and with the closing of sugar plantations, the swinging bridge became less important as a mode of transportation, but very important as a historic symbol of an era in Hawaiian history that permeates every facet of local culture today.

In September, 2006, the Kapaia Swinging Bridge was declared unsafe for use and was closed. Concerned citizens petitioned the county to repair the bridge. The Kauai Council, recognizing its functional and historical value, and unanimously supported the citizen's desire and promptly appropriated $200,000.00 for repairing the bridge.

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)

X **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

X **B** Property is associated with the lives of persons significant in our past.

X **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 a grave.
____ D a cemetery.
____ E a reconstructed building, object, or structure.
____ F a commemorative property.
____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)

Transportation
Engineering
Ethnic Heritage

Period of Significance

1948

Significant Dates

1948 Construction of Kapaia Swinging Bridge completed

Significant Person
N/A

Cultural Affiliation

Sugar Plantation immigrants to Hawaii. Multicultural

Architect/Builder

County of Kauai, Department of Public Works. Draftsman: Shibao, Harutsuno; Engineer: Omori, Kunji
Contractor: Maeda, I.

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

---

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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Name of repository: _____

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11. Form Prepared By

name/title: Laraine Moriguchi
organization: Save Kapaia Swinging Bridge date: 2/8/2008

street & number: 4453 Laukini Road telephone: 808 246-6812
city or town: Lihue state: HI zip code: 96766

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A Filipino Dance Hall
Ogata Sewing School
Ogata Pool Hall
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Korean Methodist Church
Chinese Church

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Doi Auto repair, Service Company

David Hyun's map makes it obvious that the pathway across the swinging bridge was much shorter and more convenient than climbing up Kapaia Road, onto Kuhio Highway, then trekking down Kuhio Highway, to the shops and churches. Old timers will attest to the fact that the bridge was a necessity to the daily life of the plantation immigrants, many of whom did not have the luxury of an automobile.

Most of the traversing was done by people walking from their camp homes, across the bridge, to all of the activity on the "Upper Valley" side of Kapaia Stream. Japanese children from Hanama'ulu and lower Kapaia Valley crossed daily to attend Japanese School. Plantation laborers from the "Upper Valley" met across the bridge at 5 am daily to walk together to Hanama'ulu, where they were trucked to the sugar fields. Housewives walked back and forth the bridge to do their daily grocery shopping and to visit friends. These are just a few examples demonstrating the integral role of the Kapaia Swinging Bridge in the daily life of Kauai's sugar plantation immigrant population.

In the 1950s and early '60s, Lihue Plantation began phasing out camp housing, offering private ownership to their employees in Hanama'ulu, Puhi and elsewhere. By 2000, when Lihue Plantation closed, all of the plantation housing had disappeared and all of the private farms and businesses were gone.

Only remnants of a once flourishing plantation community still exist. The Catholic Church and Buddhist Temple still serve the spiritual needs of the island. A few prized longan trees planted by Chinese immigrants still bear fruit. The "Boiser House" still stands and the swinging bridge remains suspended over Kapaia Stream.

The County of Kauai was maintaining the bridge and its surroundings until a few years ago. In September, 2006, the bridge was closed due to unsafe conditions caused by maintenance neglect. At the present time, our county government has no plans to repair the bridge.

It is our hope that by placing the bridge on the Hawaii Register of Historic Places, our county leaders will recognize the invaluable historical significance of the Kapaia Swinging Bridge. Our ultimate goal is to honor those who came before us by keeping this

historical treasure as a bridge connecting the descendants of the Hawaiian and immigrant laborers to each other; and as a bridge welcoming those desiring to be a part of a truly special culture.

1. County of Kauai Engineer's Report 11/ 1947, 3/1948
2. Department of Public Works Communication June 18, 1947; 1/7/1948; 4/7/1948; 11/5/1947
3. Communication from Office of the Chairman and Executive Officer 6/6/1945
4. Lihue Plantation Archives Hamilton Library Ubiversity of Hawaii
5. Hanamaulu Town Celebration Website www.
6. Immaculate Conception Centennial Booklet 1984
Fujimoto, Kimiyo Takemoto. Interview 2006
Inagaki, Ethel Iida. Interview 2006
Hyun, David. Interview 2006
7. Hyun, David. Tales of Old Kapaia Self Published , 2003
8. Oral History
Kimiyo Takemoto Fujimoto
Ethel Iida Inagaki
David Hyun

Exhibits:

1. Tales of Old Kapaia by David Hyun
2. County of Kauai construction plans for Kapaia Swinging Bridge 1945
3. "Swinging bridge link to past" article in The Garden Island Newspaper 11/20/06

Map illustration from Tales of O

4. ld Kapaia page XIII

Property consist of a wooden deck, abutment on concrete piers spanning the Kapaia Stream. It touches ground on parcel TMK3-7-01:9 Unit B on one the east side, and parcel TMK 3-7-01-1 on the west side of the stream.

The structure is 125' long, 4' wide walking space , 7.5' total length of 3x4' wooden girders.

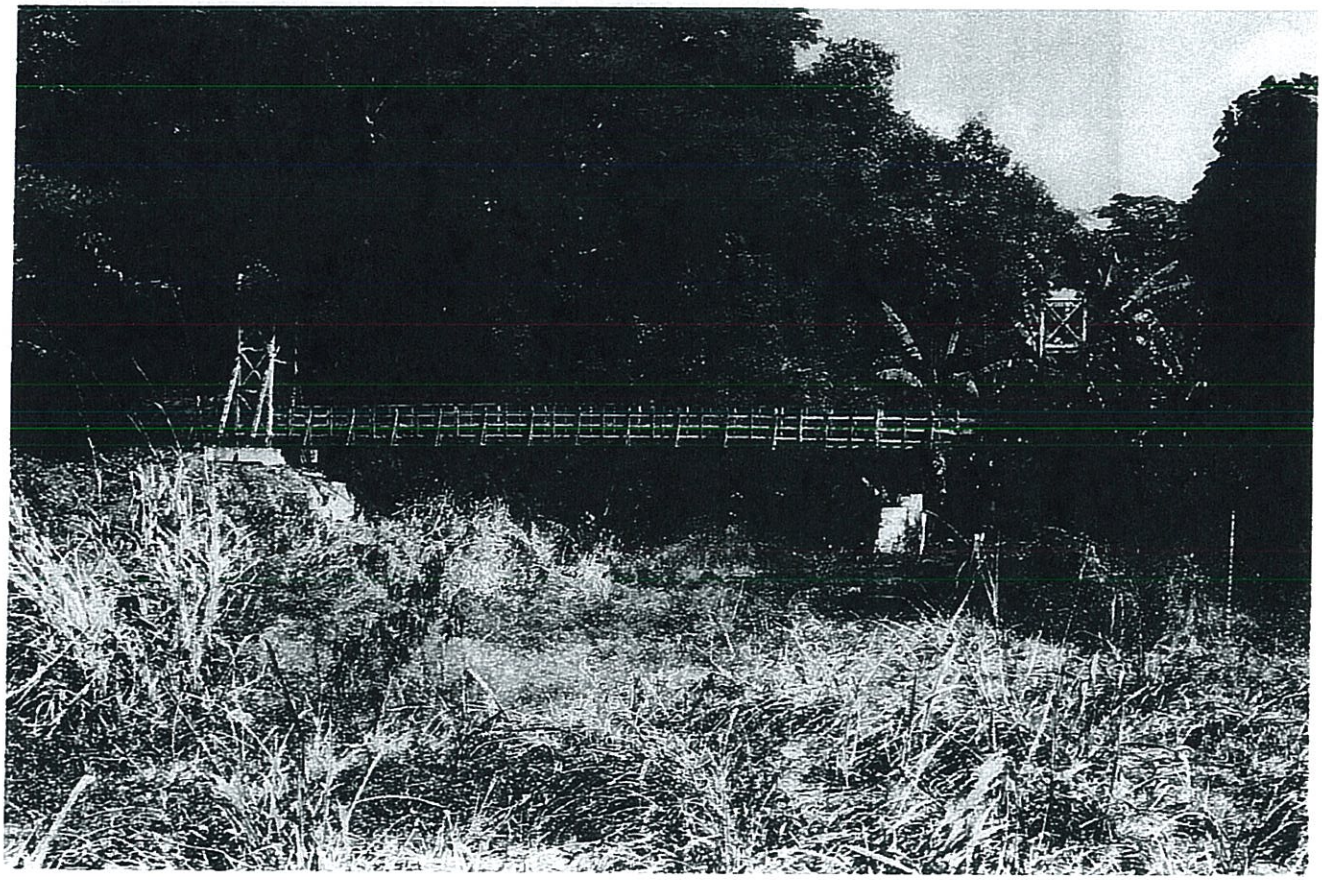
80' span between pier 1 and pier 2. Each pier consists of a concrete base upon which the wooden tower is bolted onto with angle steel plates. Height of tower from bottom steel plates to top of tower is 15' 10"

Boundary is further defined by the Construction plans included with the application Exhibit 2) and the UTM points given in section 10.

NPS Form 10-900-a OMB No. 1024-0018
(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
Section photos Page 1
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI
Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing south, showing north side of bridge
Photo #1 of 5



NPS Form 10-900-a OMB No. 1024-0018
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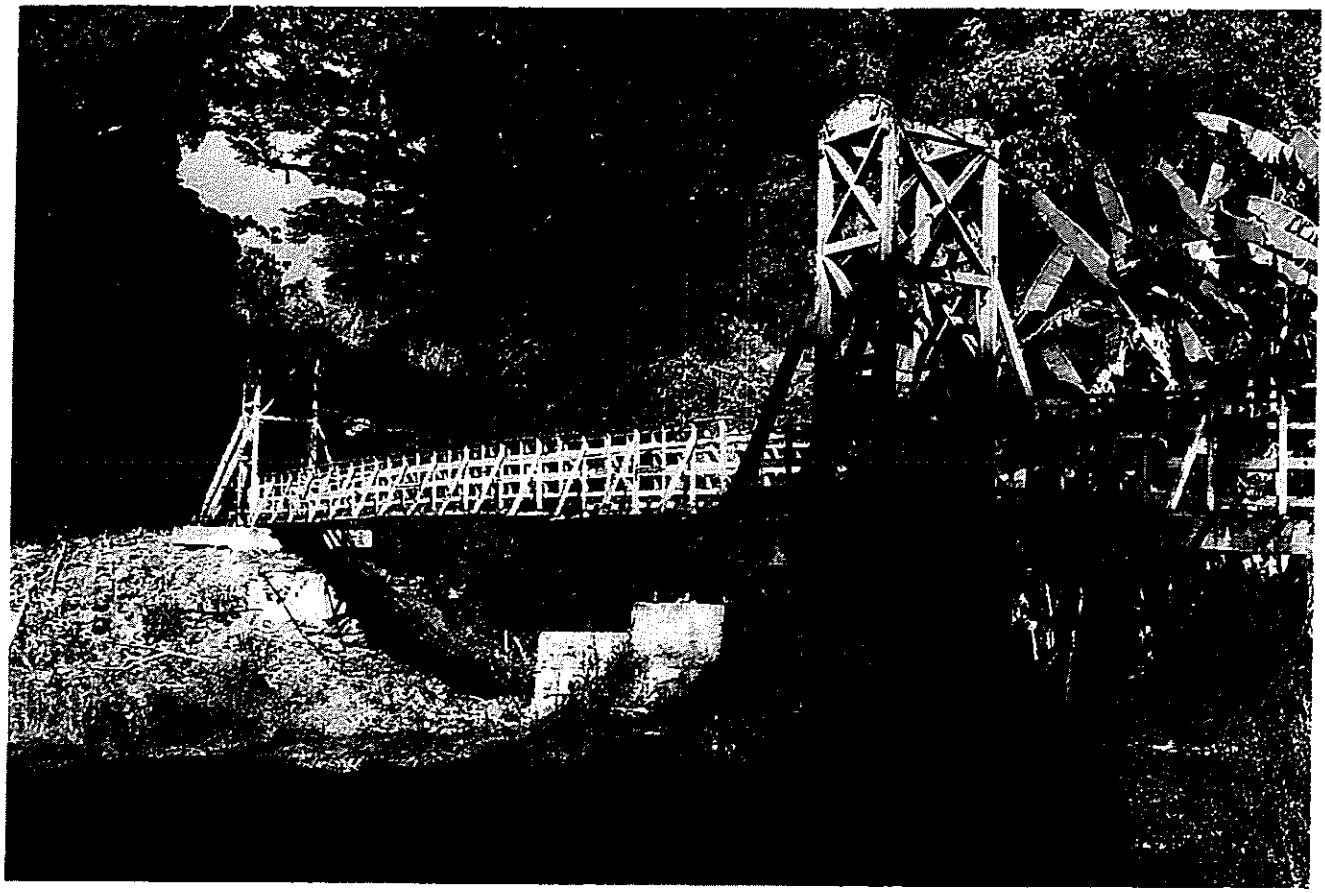
CONTINUATION SHEET
Section photos Page 2
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI
Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing east, showing west to east span of bridge
Photo #2 of 5



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Photographer: Laraine Moriguchi
Date of photograph: 10/17/2006
Camera facing east, showing west to east span of bridge
Photo #3 of 5

CERTIFICATE OF THE COUNTY CLERK

I hereby certify that heretofore attached is a true and correct copy of Bill No. 2208, which was passed on first reading and ordered to print by the Council of the County of Kaua'i at its meeting held on February 14, 2007, by the following vote:

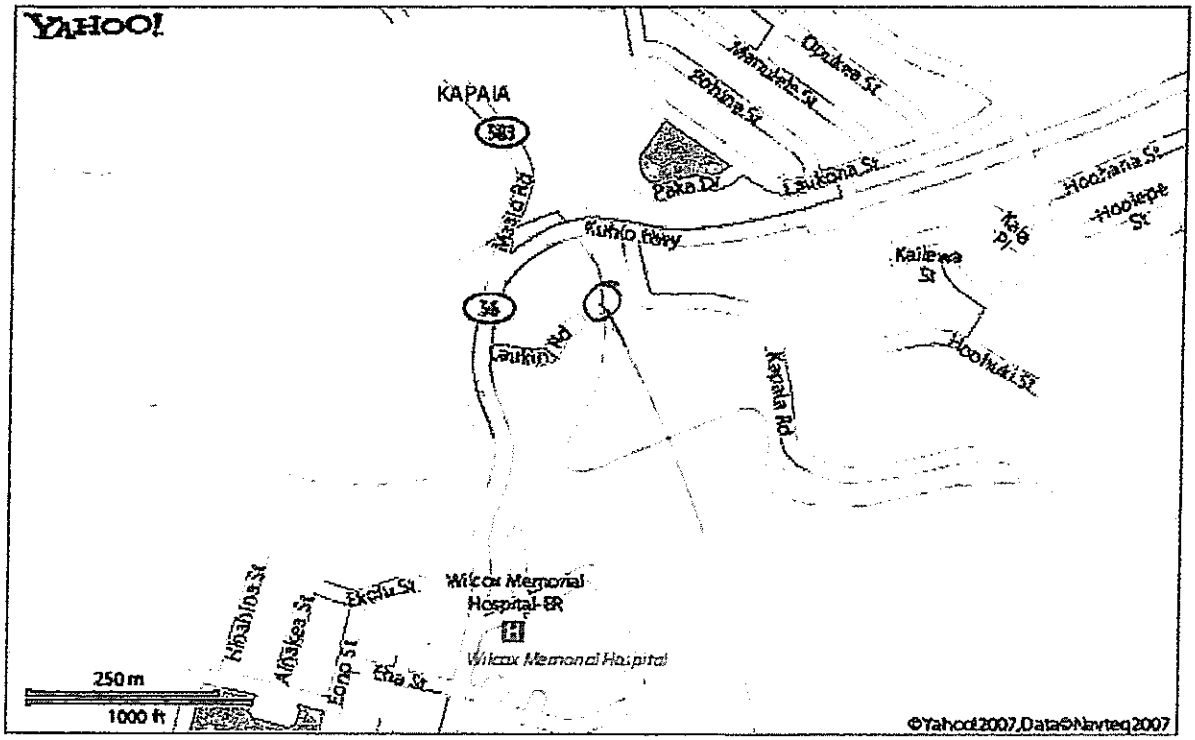
FOR PASSAGE:	Bynum, Furfaro, Iseri-Carvalho, Kouchi, Rapozo, Yukimura, Asing	TOTAL - 7,
AGAINST PASSAGE:	None	TOTAL - 0,
EXCUSED & NOT VOTING:	None	TOTAL - 0.

Līhu'e, Hawai'i
February 14, 2007

Peter A. Nakamura
County Clerk, County of Kaua'i

Yahoo! Maps - Lihue, HI 96766

YAHOO! LOCAL Maps



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

Kapaa



Map • Kapaia, Kauai 1926

OLD KAPAIA, KAUAI
Map of 1929
"Where modern Hawaii was born."

This is a map of real people and places that once existed. It is a true historical map. Together with the "Old Kapaia," this map records the Way that the culture of modern Hawaii began long ago.

Old Kapaia was one of many towns throughout the Islands of Old Hawaii where the culture of Harmonious Diversity was born. Despite the loss of lands, loss of kingdom, and even the loss of life to modern diseases, the Aloha Spirit of the Hawaiian people enabled them to receive the immigrant peoples of the world and to teach them to live together. Immigrants came from East and West: Chinese, Japanese, Koreans, Filipinos - and Portuguese, Spaniards, Scottish, English and U.S. Mainland Haoles (Caucasians).

With the "Tales of Old Kapaia," this map is a genuine record of how modern Hawaii began...Aloha, David Hyun, May 1, 2003.

Numerical Legends to the Map

1 Kapaia River
2 Island Highway
3 Sugar Cane Fields
4 Swimming Hole
5 Swimming Hole
6 Foot Trail
7 Foot Trail
8 Foot Trail
9 Foot Trail
10 Hanging Foot Bridge
11 Side Road
12 Side Road
13 Dirt Road
14 Dirt Road
15 Dirt Road
16 Steep Slope
17 Hillside Slope
18 Road Cut Cliff
19 Guava Bushes
20 Lantana Bushes
21 Island Plum Tree
22 Lichee Tree
23 Star Apple Tree
24 Chinese Grapefruit
25 Abandoned Rice Patch
26 Taro Patch
27 Monkey Pod Tree
28 Kapaia Playground
29 Shoot Marble Circle
30 Volleyball Court
31 Soft Baseball
32 One Basket Basketball
33 Shot-Put Range
34 Japanese Girl Barbers
35 Tom Sui Chop Suey
36 Parking
37 Fernandes Store
38 Ihara Store
39 Fujita Store
40 Service Station
41 Chinese Temple
42 Chinese House
43 Chinese House
44 Chinese House
45 Carvalho Store
46 Watanabe Home
47 Halmoni Home
48 Boiser Home
49 Boiser Boxing Gym
50 store.
51 Naganuma Store
52 Pool Hall
53 Korean Methodist Ch.
54 Hyun Residence
55 Hyun Garage
56 Vegetable Garden
57 Chicken Coop
58 Duck Pond.
59 Buddhist Temple
60 Priest Residence
61 Auditorium-Gym.
62 Teacher's Compound
63 Japanese School
64 Ah Chock Store
65 Ching Residence
66 Chinese Home
67 Chinese Home
68 Chinese Home
69 Lovey Dovey House
70 Ghost House
71 To Waialua waterfalls
72 Old Chinese House
73 Rice Mill & Flume
74 Portuguese Catholic Ch.
75 Nun's Home
76 Hawaiian Family
77 Hunting Dogs Yard
78 Plantation Housing

NPS Form 10-900-a OMB No. 1024-0018
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National Park Service

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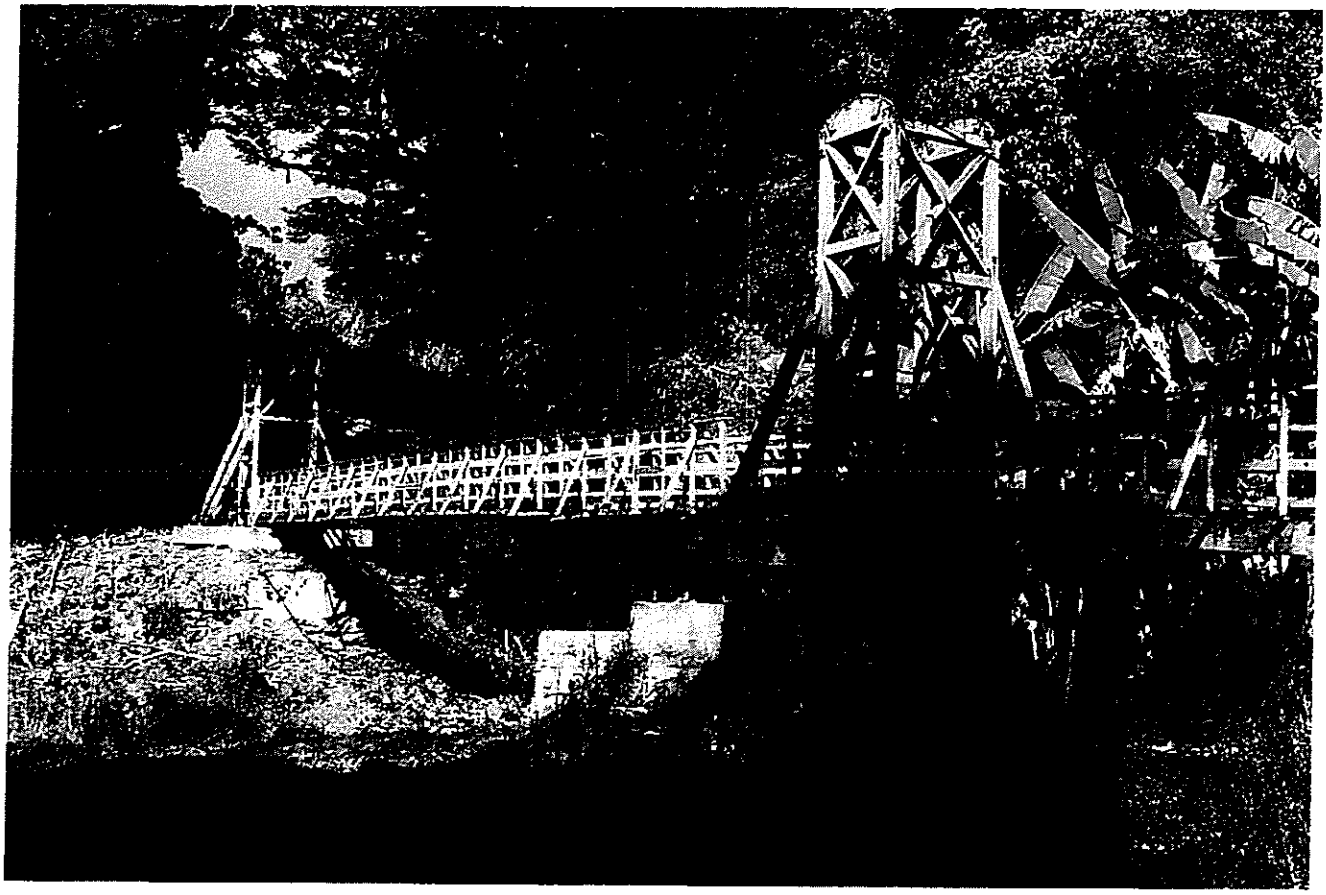

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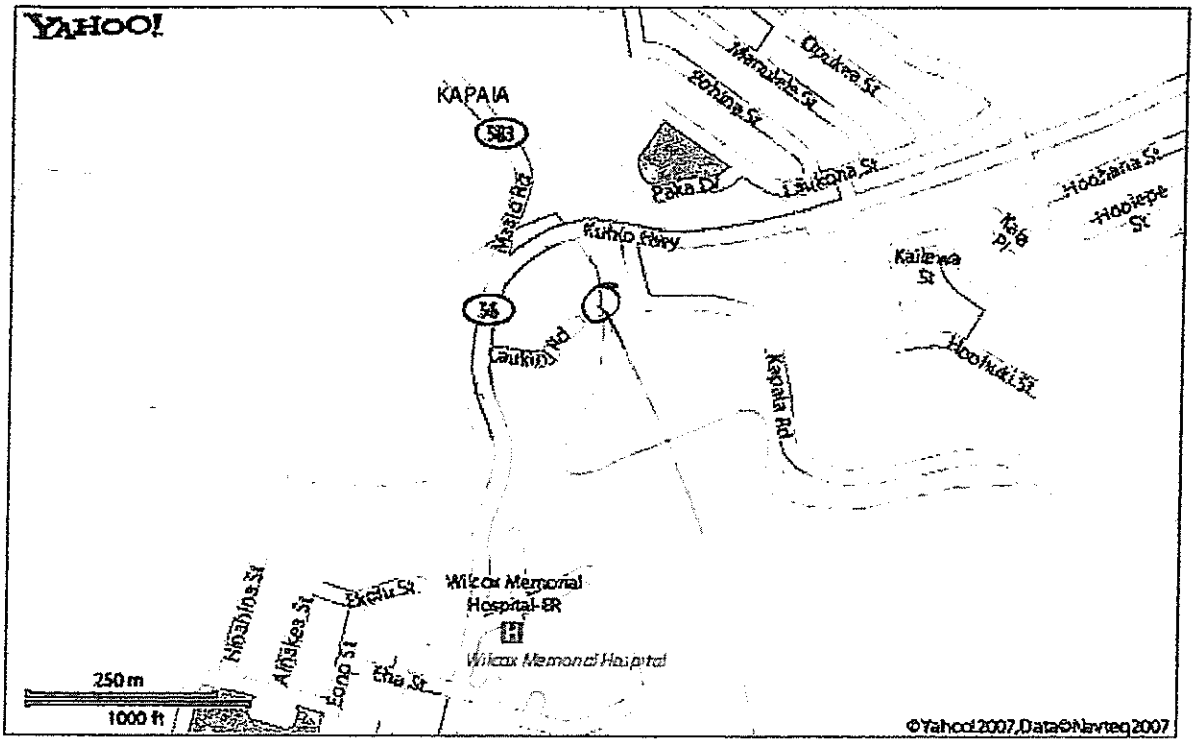

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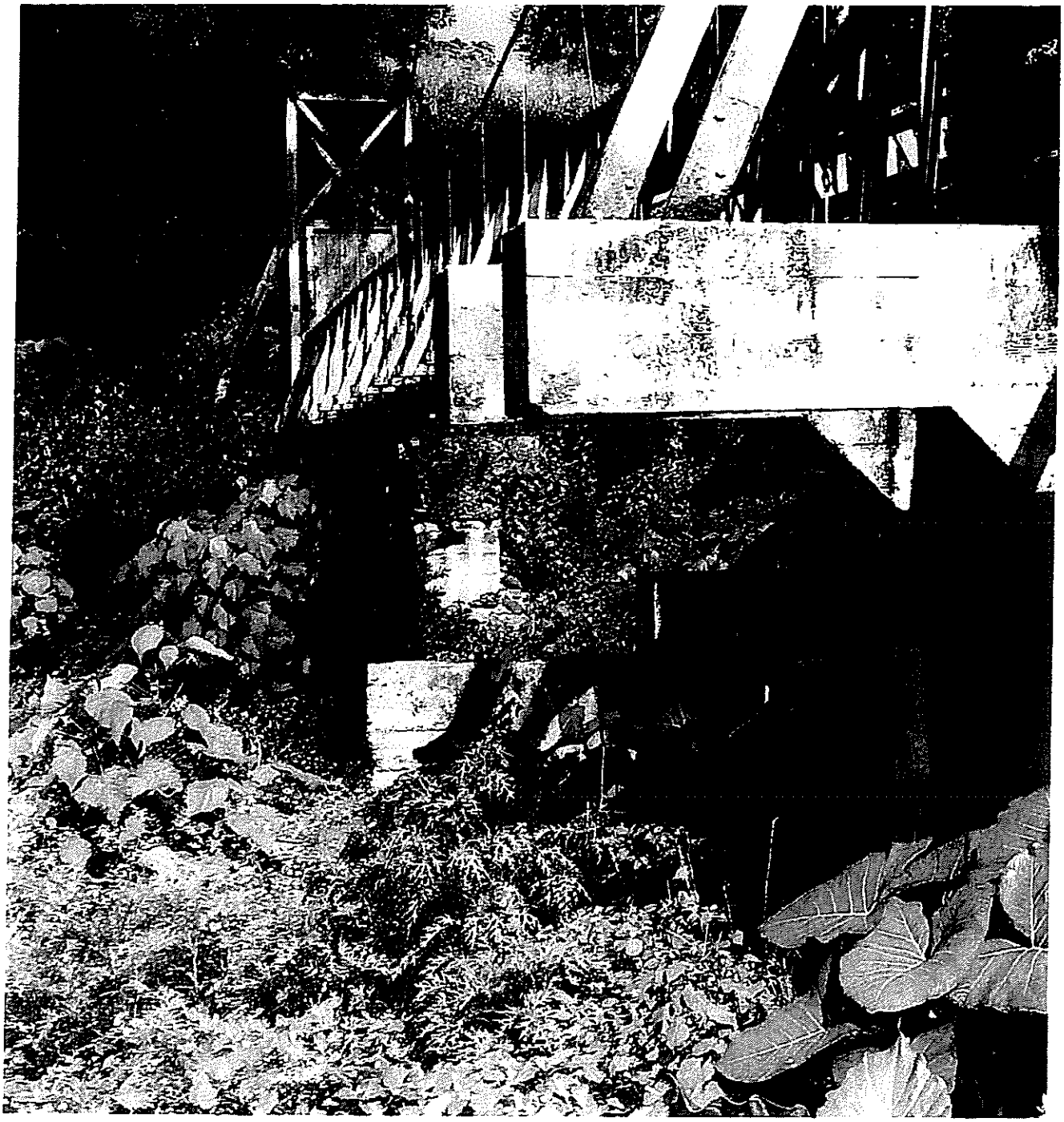
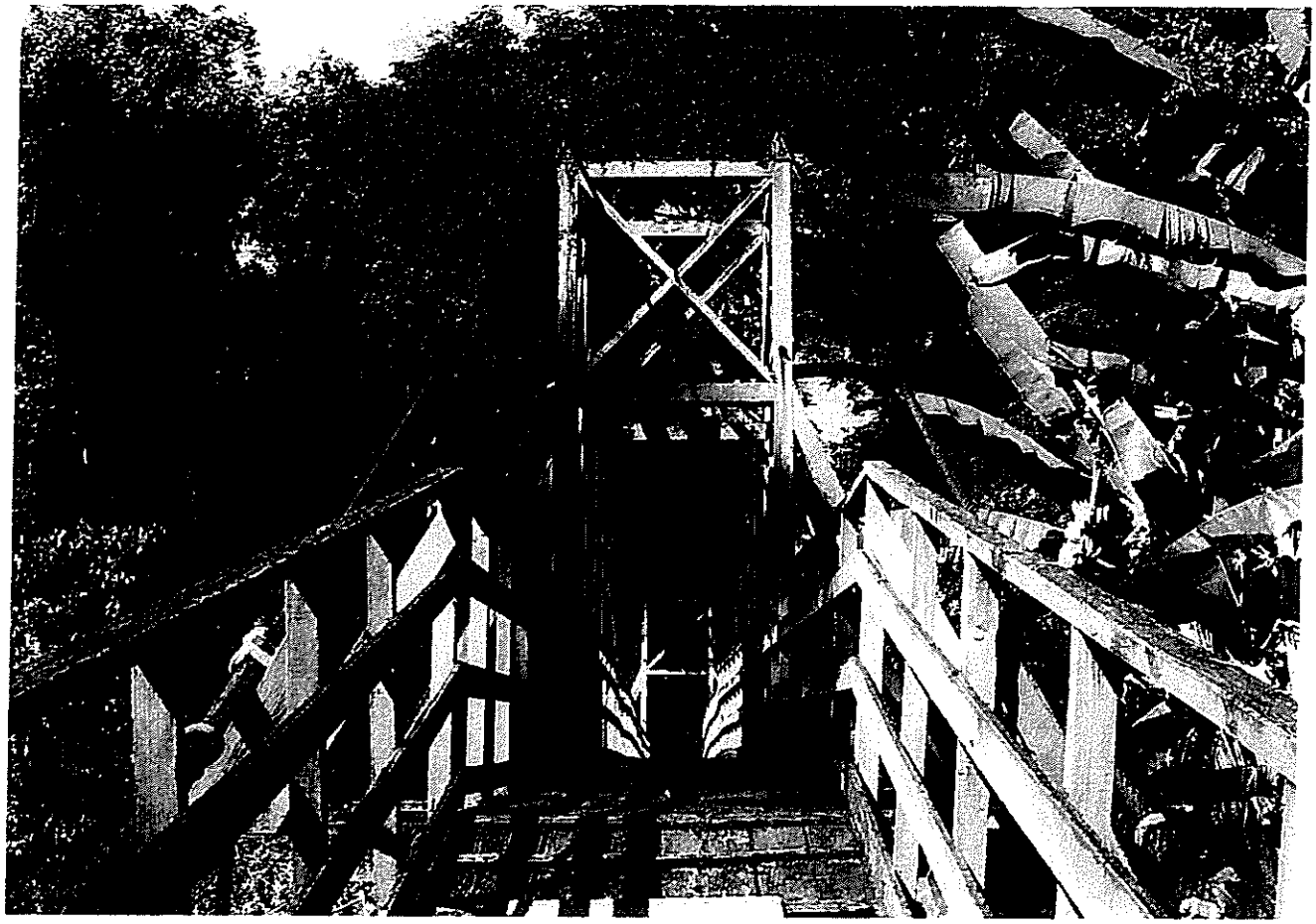
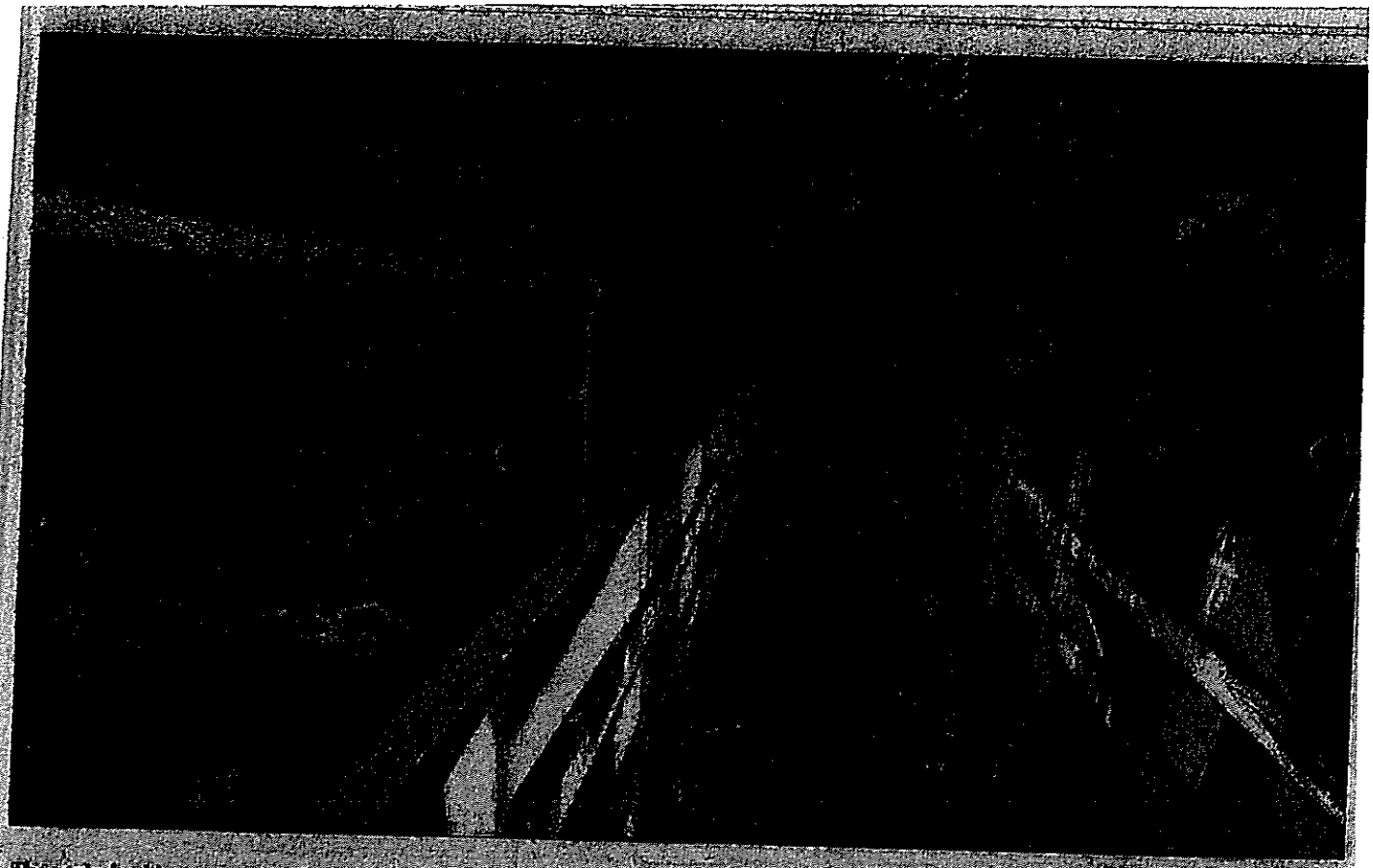


Photo #5 of 5
Photo by Laraine Moriguchi 2006





Ken Hoover / The Garden Island

The rusted cable suspensions between the planks on this bridge are hanging on by a thread. The Kapaia Suspension Bridge was built to serve the once bustling community of Kapaia and nearby plantation "camp" homes.

Swinging bridge link to past

Group seeks restoration funds

Lester Chang
THE GARDEN ISLAND

KAPAIA — The Kapaia Swinging Bridge — which enabled generations of Filipino, Portuguese and Chinese plantation workers access in this East Kaua'i community for more than 60 years — has fallen into disrepair and been closed since September for safety reasons.

Now a group that includes descendants of those plantation workers wants the Kaua'i County Council to appropriate funds to repair it and make it a functioning landmark for a new generation of Hanama'ulu residents.

At a meeting of the historic County Building yesterday, the council reviewed a petition signed by 300 people urging government to repair the bridge before it falls apart.

James "Kinio" St. John, a Kapaia Valley resident for 20 years who attended the meeting, said the council seemed sympathetic to the funding request.

Without the bridge, the only way for pedestrians to travel between Kapaia and Hanama'ulu would be on Kuhio Highway.

"It would be terrible if somebody used the highway bridge and was to get hit by car," he said.

St. John said he favors restoring the bridge because of its historic value and because of the "safety factor" for people who use the bridge — "children and the kupuna."

County engineer Donald Fujimoto, who received a letter asking for government intervention, indicated the plea for help has merit.

"It's old; it has historic value," he said before the meeting. "We will probably be coming in with a money bill for repairs."

Fujimoto said the bridge has undergone only minor repairs since Hurricane 'Iniki in 1992.

Fujimoto said the bridge has dry rot and holes in a floorboard and wooden pathway leading to the structure.

St. John said the bridge's historic value mandates it be repaired as quickly as possible, before more deterioration occurs.

"There are only four swinging bridges like this on Kaua'i, and the other three are very well-taken care off," St. John said during a break in the meeting.

Those three pedestrian bridges are located in Waimea, Hanapepe and in Keapana Valley in Kapa'a.

Fujimoto said the county administration plans to hire a consultant soon to check the condition of all the bridges.

The bridges were built to offer alternate routes when heavy rains flooded rivers and made roads impassable.

In the letter to Fujimoto, proponents of work on the Kapaia bridge asked why maintenance had been neglected to the point where the structure "is now in danger of falling into the stream below."

Laraine Moriguchi, a co-signer and descendent of plantation labor immigrants, said in the letter the original bridge — a wooden plank one — was built more than 100 years ago.

After succeeding bridges washed away during heavy rains that flooded the stream banks, the suspension bridge that stands now was built in 1945.

The bridge enabled Chinese, Filipino and Portuguese laborers and families to visit each other at their respective plantation camps on both sides of the waterway

See Bridge, A6



Keh Poeney / The Garden Island

The Kapaia Suspension Bridge *connected the descendants of the Hawaiian and plantation labor immigrants to each other for more than a century. It was originally a small wooden plank which evolved into a cement based wooden foot bridge. After being washed away and rebuilt many times throughout the years, the bridge was suspended in 1945. The County of Kaua'i maintained the bridge and its surrounding area until recently. In September 2006 the bridge was declared unsafe for use and was closed. For more information, email: savekapaiabridge@yahoo.com*

Bridge

Continued from A1

near the bridge, Moriguchi said.

"The Kapaia swing bridge linked extremely diverse cultures to form a unique society found nowhere else in this world," she said in the letter. "Today, remnants of a flourishing plantation community still exist."

Though a valley resident for two decades, St. John was young compared to two other letter-signers. Kinue Fujimoto, 89, and Ethel Inagaki, 90, were both raised in the Kapaia Valley.

Lester Chang, staff writer, can be reached at 245-3681 (ext. 225) or lchang@kauaipubco.com.

F THANKS

)SEPH RAPOZO

h 17,1936-October 28, 2006

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BILL NO. 2208

ORDINANCE NO. _____

AN ORDINANCE AMENDING ORDINANCE NO B-2006-646 AS AMENDED, RELATING TO THE CAPITAL BUDGET OF THE COUNTY OF KAUAI, STATE OF HAWAII, FOR THE FISCAL YEAR JULY 1, 2006 THROUGH JUNE 30, 2007, BY REVISING THE SURPLUS ESTIMATED IN THE GENERAL FUND

BE IT ORDAINED BY THE COUNCIL OF THE COUNTY OF KAUAI, STATE OF HAWAII:

SECTION 1. That pursuant to Sec. 19.10A and 19.07B of the Charter of the County of Kauai, as amended, Ordinance No. B-2006-646, relating to the Capital Budget of the County of Kauai, State of Hawaii, for the fiscal year July 1, 2006 through June 30, 2007, be hereby amended as follows:

The sum of $200,000.00, be and is hereby transferred from the item designated as follows:

PROJECT CONTINGENCY	$200,000.00

Of the General Fund and appropriated to the new item entitled:

KAPAIA SWINGING BRIDGE	$200,000.00

SECTION 2. This Ordinance shall take effect upon its approval.

INTRODUCED BY: _____ DATED: _____

JAY FURFARO
(By Request)

DATE OF INTRODUCTION:

February 14, 2007

Lihue, Kauai, Hawaii

NATIONAL REGISTER NOMINATIONS: ISLAND OF OAHU

1. The Ala Wai Canal
2. Kalauao Springs Bridge
3. Kalauao Stream Bridge
4. Kapalama Canal Bridge

NPS Form 10-900
(Oct. 1990)

9757

OMB No. 10024-0018

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 *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name The Ala Wai Canal

other names/site number The Waikiki Drainage Canal

2. Location

street & number The Ala Wai Boulevard ☐ not for publication

city or town Honolulu ☐ vicinity

state Hawaii code HI county Honolulu code 003 zip code 96815

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 ☐ nationally ☐ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State of Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is: Signature of the Keeper Date of Action

☐ entered in the National Register.
☐ See continuation sheet.

☐ determined eligible for the National Register
☐ See continuation sheet.

☐ determined not eligible for the National Register.

☐ removed from the National Register.

☐ other, (explain:) _____

The Ala Wai Canal
Name of Property

Honolulu County, HI
County and State

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

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
		buildings
		sites
	3 bridges	structures
		objects
		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

EXTRACTION: extractive facility = canal

RECREATION: outdoor recreation = boating and fishing

OTHER: drainage facility = canal

Current Functions
(Enter categories from instructions)

RECREATION: outdoor recreation = boating and fishing

OTHER: drainage facility = canal

7. Description

Architectural Classification
(Enter categories from instructions)

No style

Materials
(Enter categories from instructions)

foundation

walls stone and concrete

roof

other

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

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.)

- [X] **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.)

Property is:

- [ ] **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 of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

COMMUNITY PLANNING
AND DEVELOPMENT

SOCIAL HISTORY

Period of Significance

1921-1928

Significant Dates

Significant Person
(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

Walter F. Dillingham, builder

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

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

Primary location of additional data:

- [ ] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Name of repository:

_____

The Ala Wai Canal
Name of Property

Honolulu County, HI
County and State

10. Geographical Data

Acreage of Property 48.5 acres

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	03	623625	2353500
2	03	620500	2354875
3	03	620125	2354750
4			

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Erica Steele

organization N/A date May 12, 1992

street & number 3735 Diamond Head Circle telephone (808) 734-3225

city or town Honolulu state Hawaii zip code 96815

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name Department of Land and Natural Resources

street & number Kalanimoku Building telephone

city or town Honolulu state HI zip code 96813

Paperwork Reduction Act Statement: This information is being collected for applications 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. 470 *et seq.*).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20503.

The Ala Wai Canal
Honolulu County, HI

Description

People smile at her beauty, but sometimes they wrinkle their noses at her aroma.
Joggers sweat their way along her banks. Sunbathers perch on her concrete shores. Lovers watch the reflection of the moon on her surface. Ancient fishermen probe her murky depths for the tasty mullet.
She is the Ala Wai Canal - a delight to tourist and Islanders alike.
But she is much more than an open space next to the sky-crowding high rises. On any given day she is a health clinic, market, rendezvous and serious playground.

Ron Youngblood
November 27, 1969

The Ala Wai Canal is a 2-mile long man-made waterway of variable depth and width located in the Waikiki district of Honolulu. The canal is fed by the Manoa-Palolo drainage ditch which drains from the Manoa and Palolo valleys, as well as a number of smaller streams, drainage ditches and storm sewers which also drain into the canal. It forms the boundary of the Waikiki district, separating Waikiki from the Makiki, Moilili and Ala Moana areas of the city. Since its construction in 1928 the canal has been used for recreational purposes which include boating (motoring, rowing and canoe paddling) and fishing.

Constructed by the Hawaiian Dredging Company between 1921 and 1928, the canal was designed to drain low-lying wetlands in Waikiki and to provide fill that would reclaim over six hundred acres of land in the district. The canal was dredged by the "Kewalo" and consists of two straight segments joined at Kalakaua Avenue by a 45 degree elbow. The first segment of the canal, which opens to the ocean at the Ala Wai Boat Harbor, is 750 meters long and 50 meters wide. The second segment extends 2350 meters from Kalakaua Avenue to Kapahulu Avenue and is 76 meters wide.

There are three venues by which one can cross the waterway - the Ala Moana bridge, the Kalakaua bridge and the McCully bridge. When the Ala Wai Canal was originally constructed, only temporary bridges crossed it, to allow the dredge "Kewalo" to move freely about the area. Upon completion of the dredging, the Kalakaua bridge was built in 1929 by R.E. Woolley; it is a graceful multiple-arch reinforced concrete bridge. Subsequently, the McCully bridge and the bridge at Ala Moana Boulevard were added.

The length of the *makai* (ocean) side of the canal is spanned by a concrete tree-lined sidewalk, which is a popular site for jogging. Only a short stretch of the *mauka* (mountain) portion of the canal has a public walkway between the Kalakaua and Ala Moana bridges and on either side of the canal is a tranquil tree-lined footpath, the makai side of which is run by a graceful concrete arched railing. Sixteen stairwells which run the makai length of the

The Ala Wai Canal
Honolulu County, HI

Description (continued)

canal drop down from the sidewalk to the canal's surface. These additions to the canal landscape were made after the completion of the canal.

A municipal golf course, an elementary school, and a park run along the mauka side of the canal and are among the many changes bordering that side of the canal since the original construction of the Ala Wai. In addition, several high-rise apartment buildings have also been built. The surrounding visual landscape of the canal has seen enormous changes as the Waikiki, McCully and Moilili districts have developed over the years: the landscape has been transformed from an agricultural area into a residential neighborhood and finally, into a congested maze of high-rise condominiums and hotels. These alterations have had a dramatic effect upon the overall integrity of the canal landscape.

Nonetheless, there have been no significant changes to the structure of the canal itself since its original construction. Over the years, the original retaining walls contructed of stone have necessitated some repairs. In 1950 work was done to prevent crumbling masonry from falling into the canal. A new concrete facing was placed in front of the original loose stone wall. In 1992 in ongoing work the Harbors Division (the State agency responsible for the canal) is currently reinforcing portions of the wall. Some portions of the wall are being replaced because of deterioration. The main concern for the integrity of the canal is the health of its waters due to problems of siltation and water pollution caused by the sediments deposited into the canal by streams and storm drains. The sediment has necessitated occasional draining. While the original depth of the canal at the time of its construction was 10 to 25 feet, in 1990 the average depth of the canal was between 6 and 10 feet. Because of this, the canal has been dredged twice since its original construction, once in 1966 and again in 1978. It would appear ready to be dredged again, considering the current very shallow depth of water in the canal.

Despite the problem of pollution the Ala Wai "water sports park" continues to be heavily used by Waikiki residents and visitors, with an estimated daily year-round use by some 4,000 people in 1986. Throughout its history the canal has been a popular site for boating and fishing, and its banks are frequented by joggers and walkers. The Ala Wai Canal has been considered "one of the best courses for crew races in the U.S." and has been used by visiting crew's for training, including the Yale Olympic crew on their way to the games in Melbourne, Australia in 1956. The canal is used regularly by local outrigger canoe clubs, and has been for many years. Until the 1970s numerous commercial boating operations operated along the Ala Wai. For many years fishing has been a popular activity along the banks of the Ala Wai; archival photos show fishermen's perches lining the sides of the canal. Today the perches are gone, though it is not uncommon to see people hanging a line into the Ala Wai's murky waters.

The Ala Wai Canal
Honolulu County, HI

Description (continued)

The Ala Wai Canal provides an important aesthetic dimension to the Waikiki neighborhood with its open space and tranquil waters. While the land surrounding the Ala Wai has undergone incredible change in the last 71 years, the environment at the canal has remained relatively constant.

Statement of Significance

The Ala Wai Canal is historically significant because of its pivotal role in the development of the Waikiki district, first as a residential neighborhood and soon after as a world-renowned resort area. The reclamation project in Waikiki, made possible by the dredging of the Ala Wai Canal, made a significant contribution to the eventual development of the State's tourism-based economy. Without the reclamation of wetlands and fishponds in Waikiki used for agriculture and aquaculture farming through 1920, Waikiki as we know it today, with its 75,000 visitors a day and the $70 million in property taxes it generates for the city, would not have been possible. The structure, which the original proposer of the canal, Lucius E. Pinkham envisioned as a great lagoon to be used for boating and recreational purposes, remains in the midst of so much change, relatively unchanged, and continues to be used regularly used by paddlers and fishermen.

Historical Background and Significance:

Since the 1500s, "Waiatite" was the seat of government for Hawaiian royalty on the island of Oahu. From that time forward Waikiki was also a documented rich and productive agricultural region, until 1921 when construction of the Ala Wai Canal began. For centuries large *loko* (fishponds) and taro *lo'i* (terraces) were fed by the many springs that flowed in Waikiki (literally, "spouting waters") and amply supplied the native Hawaiians living in the area with food. Only in the 1830s and 40s, due to a severe drop in the native population brought on by the introduction of Western diseases, did the wetlands and fishponds fall into an unproductive state. By the late 1800s and early 1900s the wetlands were again fruitful, and native Hawaiian farmers were joined by immigrant farmers who grew rice in the Waikiki area to sell to immigrant workers on the plantations.

Even after 1809, when Kamehameha I moved his court to Honolulu, Waikiki continued to be a favored haunt of Hawaiian royalty. The area was also increasingly popular with the growing number of *haole* (foreigners) living in Honolulu toward the turn of the century. As Waikiki's popularity began to grow, the value of the area could not go unnoticed for long and the community began to develop and change. The wetlands (referred to by many as "swamp lands") could, in the eyes of many in Honolulu, be put to better use than raising ducks and growing rice - but only if the land could be "reclaimed" (filled in).

The Ala Wai Canal
Honolulu County, HI

Statement of Significance (continued)

Bath houses began to be established, the first in 1881. In 1903, the Honolulu Rapid Transit Company inaugurated a service between Honolulu and Waikiki, providing easier access to the area. By 1921, the year construction of the Ala Wai Canal began, five major hotels had been constructed in Waikiki. One project that had considerable influence was the reclamation of Fort DeRussy in the Waikiki area. In the first decade of the twentieth century, the U.S. Department of War acquired 73 acres of land in Waikiki; from 1909 to 1911 the Quartermaster Corps was assigned the task of filling "a portion of the fish ponds which covered most of the fort (Fort DeRussy)." This was the first reclamation of land in the area.

Increased public concern over the mosquito problem and the potential spread of contagious and infectious diseases in Hawaii was one of the most important factors leading to the construction of the Ala Wai and the Waikiki Reclamation Project. The mosquito was accidentally introduced to Hawaii in 1826, and the Waikiki wetlands provided an ideal breeding ground for these insects. In 1909 W. C. Hodby, chief quarantine officer of the U.S. Public Health and Marine-Hospital Service, published a report entitled "The Outlook for Quarantinable Diseases in the Territory of Hawaii." In it he urged a "relentless and unceasing war against mosquitoes..." The Sanitary Commission, created by the Legislature in 1911 to address increasing concern over the danger of contagious and infectious disease introduced in Hawaii, reported that "certain swamps and low lands must be filled in order to protect our public health." With the construction of the Ala Wai Canal the mosquito-breeding wetlands were drained and filled, eliminating what many considered to be a potentially serious health hazard.

One final factor that led to the construction of the canal was the concern over the draining of wetlands on to the shores of Waikiki's beaches, at a time when bathing was becoming increasingly popular and there were a growing number of visitors to Hawaii's beaches. The proposed drainage canal would carry the runoff away from the Waikiki beaches.

The original proposal to build the Ala Wai Canal was put forward in 1906 by Lucius E. Pinkham, then president of the Board of Health of the Territory of Hawaii. In a report to the board, Pinkham recommended the reclamation of the Waikiki district of the city of Honolulu, proclaiming that the lands in Waikiki were in a deleterious and unsanitary condition. He proposed to fill in what he termed swamp lands to create an "attractive and charming" residential neighborhood . This reclamation of 625 acres would be accomplished by the construction of a "great lagoon" that would yield the necessary fill material and "create a quite marvelously beautiful, unique district, a Venice in the midst of the Pacific." He envisaged that the canal would be used for boating, providing an ideal course for racing. Thus while the canal would serve a recreational purpose upon its completion, the primary reason for its construction was to provide the necessary fill for adjacent lands and to drain runoff from the Manoa, Makiki and Palolo valleys away from Waikiki's beaches. While the proposal was shelved

The Ala Wai Canal
Honolulu County, HI

Statement of Significance (continued)

for a number of years, upon his appointment as governor of the Territory by then-president Woodrow Wilson in 1913, Pinkham devoted much of the energy of his four-year term to the implementation of his Waikiki plan.

In 1917 under Act 102, S.L. 1917, $5,000 was appropriated to the Superintendent of Public Works to do a complete survey, map and plans for the area in Honolulu "between King Street and the sea beach, and between Kapahulu road and Sheridan street." This would become the complete area of the reclamation project in the 1920s.

Also in 1917, Act 231 was passed authorizing Governor Pinkham to appoint a commission to devise a plan for the reclamation and improvement of this area of land. The plan was to include a "main lagoon or canal" for drainage and "to receive and take care of the natural flood waters of said area."

Under Governor Pinkham, the legislature appropriated $100,000 for the excavation of the canal and passed Act 14, S.L. 1918 authorizing the Superintendent of Public Works to "acquire for public use, by condemnation, purchase, exchange or otherwise, all necessary lands and rights of way for the purpose of digging and constructing a portion of the drainage canal or lagoon..." Many of the lands in Waikiki were acquired by a practice of land condemnation. Under a 1896 law, Act 61, the Territory of Hawaii's Board of Health could judge whether any land was unsanitary and require the owners to take the necessary steps to improve the land. This usually meant filling the land. While this practice was no great hardship for property owners who were interested in developing their land for residential or commercial purposes, for wetland farmers it essentially meant the eradication of their livelihood. In addition, if under the law land owners were financially unable to fill the land, or unwilling, the government could undertake the improvement and cover the cost through a lien placed on the property. Through this process many wetland farmers in Waikiki lost their land and livelihood.

By June 1920, 85 percent of the land required for the building of the canal had been acquired and bids to dredge the canal were solicited. In December 1920, Lyman Bigelow, Superintendent of Public Works advertised for bids in the Honolulu Star-Bulletin. On December 23, 1920 the bids were opened and the contract for the project was awarded to the Hawaiian Dredging Company, owned by Walter F. Dillingham. Dillingham's bid was one of only two bids received by the Territory for the project.

In the same year under Act 220, S.L. 1921 a resolution was issued on October 14 declaring construction of the Waikiki Drainage Canal "necessary for the proper drainage and sanitation" of Waikiki and appropriating $600,000 for the canal. Act 221 confirmed the boundaries of the reclamation project and provided for a commission to plan for boulevards, streets and parks within the district.

The Ala Wai Canal
Honolulu County, HI

Statement of Significance (continued)

Two contracts were negotiated between the Territory of Hawaii and Hawaiian Dredging Company to contract for the construction of the canal. Unit 1, Job No. 2979 entitled, "Proposal for Dredging a Drainage Canal and Filling and Reclaiming Certain Unsanitary Lands at Waikiki" was the primary agreement which consisted of dredging a canal 60 feet wide some two miles inland from the "sea beach at Ala Moana Road up to and intercepting the Apuakehau Stream" and called for the construction of "a dyke 6 feet high and 10 feet wide at the top along the entire makai (south) side of this Canal." The contract for Unit 2, Job No. 2986, the "Second Unit of the Waikiki Reclamation and Sanitation Project at Waikiki" called for a canal to be dredged "from the sea beach at Ala Moana Road to a point about 500 feet toward the reef."

Construction was begun in 1921, and by January of 1922 Hawaiian Dredging Company had completed the first phase of the project, Unit 2, and was beginning work on Unit 1, Contract 2979. The hydraulic dredge "Kewalo" was used by Hawaiian Dredging Company to dredge the canal. Because of the size of the dredge it could not successfully operate in a width of 60 feet so the canal had to be cut to an approximate width of 150 feet.

By mid-1923 the "Kewalo" had cut its way almost 6,500 feet towards Kapahulu Road, cutting a channel approximately 135 feet wide and 10-20 feet deep. The Superintendent of Public Works, Lyman H. Bigelow, reported that the canal "has now intercepted Apuakehau Stream which flowed by the Outrigger Club and all the filthy waters which previously flowed on to this fine swimming beach have been diverted and now flow out to the sea by way of the canal."

By mid-1924 the canal was 150 feet wide and had been dredged "its entire length" to Kapahulu Road. In his annual report to the Governor in 1924, Bigelow stated that the canal had been excavated its entire length ending at Kapahulu Road. Due to a lack of funds the Diamond Head end of the canal, called for in Lucius Pinkham's original proposal, was put on hold until "some later date, when funds are made available." Pinkham had recommended that the canal should exit back out to the ocean at Kapiolani Park, with tides gates at the both entrances to be closed at high tide and "the waters thus forced through the lagoon to exit at the Ala Moana bridge." This portion of the canal was in fact never completed, though in 1967 the local Rotary club and other civic groups brought the idea up again - with no success.

In order to provide the additional fill material necessary to bring the Waikiki Reclamation Project to completion Act 248, S.L. 1923 was passed authorizing the widening of the canal by 100 feet.

The canal acquired its name in 1925 when the City Planning Commission requested that citizens of Honolulu submit suitable names for the renaming of the Waikiki drainage canal. Jennie Wilson, wife of Mayor Wilson, suggested the name Ala Wai, Hawaiian for "waterway."

The Ala Wai Canal
Honolulu County, HI

Statement of Significance (continued)

The "Kewalo" headed back to McCully Street to begin dredging fill for the McCully tract, a vast area of pondfields and fishponds. By mid-1927 the filling of the McCully tract was completed and the canal was 250 feet wide almost to Kapahulu Road.

In 1928 the "Kewalo" exited the canal in and the construction of the Ala Wai was thus completed. That same year a supplement in the Honolulu Advertiser noted the dramatic increase in the value of land. According to V. Von Holt, president of the realty company Whitney & Von Holt, Ltd., land values had gone from $500 an acre for a piece of agricultural property prior to the construction of the canal to up to $4 a square foot for business property in 1928. With a great increase in available property, numerous residential development projects were undertaken in Waikiki. The number of visitors was also on the rise since the beginning of the reclamation project. Between 1921 and 1927, the number of visitors to Waikiki doubled from 8,000 to 17, 451 according to the Hawaii Visitors Bureau. In addition, in 1927 a total of 19,567 "one-day tourists" visited Hawaii's beaches as they travelled on cruise ships stopping in the islands. This same year the visitor's bureau launched its largest ever campaign to promote Hawaii and "put Waikiki and other attractions of the islands on the resort map," aggressively promoting Hawaii's "third industry" - tourism. Today tourism is the state's number one industry and Waikiki is at its core.

The Ala Wai Canal easily merits inclusion on the National Register of Historic Places, for local and state significance. This project allowed Waikiki to be transformed from an agriculturally productive region to a tourist mecca, upon which the state's economy has become increasingly dependent. Today, Waikiki's 450 acres generate $70 million in property taxes for the city annually, roughly one-third of the total property taxes received by the city. Property values in the region have skyrocketed, from an average of $840 an acre in 1917 to $22 million in 1990. Given the history of the reclamation project and resultant changes in the Waikiki district over the last 70 years, it is impossible not to conclude that the construction of the Ala Wai Canal has had a momentous impact on the development of the surrounding community and its economy, and on the economy of the entire state.

However, despite the significance of the structure, the building of the Ala Wai Canal and the reclamation project tells a sad story. The story is one in which many farmers lost their land and livelihood through a questionable practice of land condemnation and where a tranquil paradise, such as Waikiki was at the close of the 19th century, has been transformed into bustling, recreational playground with no sense of the history of the community from which it came. In fact the Ala Wai Canal is one of the only reminders of the spirit of Waikiki as it was in 1921.

The Ala Wai Canal
Honolulu County, HI

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The Ala Wai Canal
Honolulu County, HI

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The Ala Wai Canal
Honolulu County, HI

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Verbal Boundary Description

The boundary of the nominated property is delineated by the polygon whose vertices are marked by the following UTM reference points: 1) 03 623625/2353500, 2) 03 620500/2354875, 3) 03 620125/2354750.

Boundary Jusitification

The boundary of the nominated property includes the entire parcel of land historically associated with the canal ~~as well as the adjacent boulevards on the makai side of the canal~~. This area makes up the recreational "water park" that is the Ala Wai Canal today.


HONOLULU
Waikiki
Moiliili
Kapahulu
KAPIOLANI PARK
UNIVERSITY OF HAWAII
Manoa
St Louis Heights
Palolo
Kaalawai
Diamond Head
DIAMOND HEAD STATE MONUMENT
Blaisdell Center
McKinley High Sch
Muriel Sch (KIKI) Radio Tower
Mother Waldron Playground
Kaahumanu Sch
Lincoln Sch
Makiki Japanese Language Sch
Maryknoll High Sch
Maryknoll Sch
University High Sch
Tachikawa Sch
Kapiolani Community College
Washington Sch
McCully Rec Center
Lunalilo Sch
Honolulu Stadium State Park
Moiliili Japanese Sch
Moiliili Triangle
Moiliili Field
Kanewai Field
Hokulani Sch
St Louis High Sch
Chaminade Univ of Honolulu
Kuhio Sch
Kaimuki High Sch
Sacred Hearts Academy
Ahiolani Sch
St Patricks Sch
Rec Center
Iolani Sch
Ala Wai Sch
Thomas Jefferson Sch
St Marys Sch
Lholiao Sch
Hawaii Sch for the Deaf and Blind
Waikiki Sch
Waikiki Shell
Paki Playground
Kapiolani Community College
Queen's Medical Center
Kewalo Basin
Aina Moana State Recreation Area
Boat Harbor
Ala Wai Canal
Ala Wai Golf Course
Manoa-Palolo Drainage Canal
Fort De Russy Military Res
Honolulu Zoo
Monsarrat
Kapahulu Playground
Kaimuki Playground
Pukele Playground
Waahila
Water Tank
Shopping Center
Lights
Wrecks
Reef
Kapua Entrance
Sans Souci Beach
Waikiki Beach Park
Kuhio Beach Park
Aquarium
Tennis
Fire Sta
Radio Tower (KGMB)
TV Tower (KHON)
TV Tower (KITV)
Radio Tower (KPOI)
(KIUM) Radio
(KIKU) TV
Tower
Cemetery
Military Reservation
Quarry
Ala Moana
Ala Wai Field
Kalakaua
Kapiolani
Kuhio
Kapahulu
Kilauea
Harding
Pahoa
Waialae
Date St
Young St
King St
Beretania St
Dole St
Bertram Drive
Alencastre St
Punahou St
Keeaumoku St
Pensacola St
Ward St
Kamakee St
Piikoi St
Lunalilo Freeway
6 Lane
2 Lane
Ala Moana Park
Thomas Square
Cartwright Field
Mother Waldron Playground
Kaimuki Playground
Pukele Playground
Paki Playground
Kapiolani Park
Kapiolani Community College
Kaalawai
Cliffs
Head
Trail
Fire Sta
Water Tank
Aquarium
Tennis
Cemetery
Quarry
Military Reservation
Ala Moana
Ala Wai Field
Kalakaua
Kapiolani
Kuhio
Kapahulu
Kilauea
Harding
Pahoa
Waialae
Date St
Young St
King St
Beretania St
Dole St
Bertram Drive
Alencastre St
Punahou St
Keeaumoku St
Pensacola St
Ward St
Kamakee St
Piikoi St
Lunalilo Freeway
6 Lane
2 Lane
Ala Moana Park
Thomas Square
Cartwright Field
Mother Waldron Playground
Kaimuki Playground
Pukele Playground
Paki Playground
Kapiolani Park
Kapiolani Community College
Kaalawai
Cliffs
Head
Trail
Fire Sta
Water Tank
Aquarium
Tennis
Cemetery
Quarry
Military Reservation

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 Property

Historic name: Kalauao Springs Bridge

Other names/site number: Kalauao Spring Bridge
Kalauao Springs Eastbound Bridge & Kalauao Springs 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 Kalauao Springs

City or town: Aiea State: Hawaii County: Honolulu

Not 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**

Kalauao Springs Bridge
Name of Property

Honolulu, HI
County and State

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	X
Public – Federal	☐

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☐
Site	☐
Structure	X
Object	☐

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
		sites
2		structures
		objects
2	0	Total

Number of contributing resources previously listed in the National Register 0

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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

7. Description

Architectural Classification
(Enter categories from instructions.)
Other, Bridge

Materials: (enter categories from instructions.)
Principal exterior materials of the property: FOUNDATION: Concrete; 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 Kalauao Springs Bridge was built in 1936 as a single two-lane, two-direction reinforced concrete girder bridge was constructed to cross the outflow of Kalauao Springs. Post-wartime activities made the capacity of Kamehameha Highway and this single bridge inadequate, so that in 1945 a second, parallel, bridge was constructed and each of the two structures then carried traffic in a single direction. The structural design of the 1936 and1945 bridges is 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 is similar, using concrete with cross-shaped voids with concrete stanchions at the ends. The only major visible difference between the 1936 and 1945 bridges is that, the 1936 bridge has at-grade shoulders for pedestrian traffic, while the 1945 bridge has grade-separated concrete pedestrian sidewalks. Moreover, the 1936 stanchions are curved away from traffic and the 1945 stanchions are straight.

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 integrity of the bridge structures have been compromised due to the 1966 bridge expansions and surrounding urbanization.

[1] National Bridge Inventory Database, Kalauao Spring Bridge, on website nationalbridges.com, accessed May 23, 2012. [The eastbound bridge has a NBI Structure Number of 003000990402053 and the westbound bridge has a NBI Structure Number of 003000990402054.]

Narrative Description

Both reinforced-concrete three-lane bridges cross the waterway created by the outflow of Kalauao Springs, also known as Kalauao Springs Ditch (makai of the bridge).[2] Eastbound traffic travels on the makai bridge and the mauka bridge carries westbound traffic. The makai eastbound bridge has a single span of about 40'. The mauka westbound bridge has a more complex design; there are two spans, each approximately 26', on the 1945 section, and a single span of about 51' on the 1966 section. Both the eastbound and westbound bridges have a roadway approximately 40' wide. Each bridge has concrete walkways approximately 4' wide, which are 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 40' 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 the parapet between the balusters are slightly thinner (4" thick) and each section has 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.[3] 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. Extending along 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 an approximately 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 4' long. In plan, they form an arc of a circle spanning about 30 degrees. One end of each stanchion squarely abuts the parapet and the stanchion arcs 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. 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.

[2] State of Hawaii, Taxation Maps Bureau, First Division, Zone 9, Section 8, Plat 14. June 1975.
[3] 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. 1-30.

Typically, concrete bridges of this type and period have year built and name inscriptions on their end stanchions. However, the concrete wedge covers the name inscription on this stanchion. The east end stanchion has the date inscription "1936" in 3"-high block numbers.

The 1966 parapet and end stanchions of the eastbound bridge are on the makai side of the bridge. The lower part of the1966 parapet is built of concrete, which is 1'-2" thick and 1'-6" high. There is a horizontal line incised across it, 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 bottom rail 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. The 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 scribed around its circumference at heights of 9" and 1'-6" above the walkway. The west stanchion has the inscription "Kalauao Springs Bridge 1966" in 3"-high block lettering. The added steel guardrails partially obscure this inscription.

The substructure of the eastbound bridge was not accessible for observation due to steep embankments, dense underbrush, and water in the channel makai of the bridge. Unlike the many intermittent streams in Hawai'i that sometimes have dry streambeds, this stream is spring fed, so it always has water in it. The 1965 drawings show the abutments, of both the 1936 section and the portion added in 1966, supported by piles. The girders in both the original and newer sections span the 40' distance between abutments, but the 1966 section has prestressed girders, which have a different design than the 1936 cast-in-place girders.[4]

Westbound Bridge (1945/1966)

This bridge has the 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 the same height and thickness, but shorter in length than the 1936 ones; they 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 obscures the name inscription, "Kalauao Springs" can be read beneath it. The western stanchion has no added guardrail and "1945" is inscribed in 3"-high block numbers. The 1966 parapet of the westbound bridge was constructed exactly like the 1966 parapet of the eastbound bridge (see description above).

The substructure of the 1945/1966 westbound bridge was not accessible for close observation due to steep embankments and water in the drainage channel mauka of the bridge.[5] As mentioned above, this spring-fed stream always has water in it. A glimpse of the 1945 substructure design is possible from the median. This portion of the westbound bridge, which carries the two makai lanes, has two spans. The visible part of its central line of support consists of concrete piles, with

[4] State of Hawaii, Department of Transportation, Highways Division, Design Branch, Project No. U-090-1 (9), Drawings 67 & 69, Kalauao Springs Bridge Widening, Sheets 1 &3 of 6. June 1965.
[5] State of Hawaii, Taxation Maps Bureau, First Division, Zone 9, Section 8, Plat 16. December 1984.

square cross-sections, topped by a transverse concrete beam or pile cap. The 1945 drawings show the abutment design also consists of lines of piles, but with rock fill placed (at a 1:1 slope) under each abutment's transverse concrete beam. The 1945 drawings also show the upper concrete part of the piles labeled as "Socket Piles"; these have a wider section for insertion of "Untreated Timber Piles" at the lower ends of the composite piles. From the bank of the waterway north of the bridge, there is a view of the substructure's design for the 1966 traffic lane and walkway, although the utility pipes paralleling the highway do not allow for a clear photograph. The added 1966 portion is a single span, utilizing prestressed concrete girders. The bridge abutments of the 1966 design are board-formed concrete on precast concrete pile foundations.

Site Information

The Kalauao Springs Bridge is located along a primarily urban section of Kamehameha Highway, but the Sumida Farm near the bridge provides a reminder of the original rural character of this area. Mauka of the highway, to the northeast, and wrapping around the Sumida Farm, is the expansive Pearl Ridge Shopping Center, built circa 1969 (with additional phases of development in later years). Sumida Farm is northwest of the bridge, which has several acres of watercress under cultivation, and is an anomaly in this urban area. One spring of the original two Kalauao Springs currently supplies the water for Sumida Farm watercress cultivation. The lower part of the Pearl Ridge Shopping Center is located to the east of the present farm and spring. This development covered one of the springs at Kalauao with pavement, leaving only the existing spring actively flowing.[6] Makai of the highway, to the southeast, is a low-rise strip mall, and to the southwest of the bridge are various commercial establishments, including McDonald's, an automotive shop and two gas stations. The setting around the bridge has changed greatly since its original 1936 construction date. Historic aerial photos show that before World War II the area was rural, with small farm plots in an area slightly larger than that now occupied by Sumida Farm. Surrounding these plots, primarily mauka of Kamehameha Highway, were sugarcane fields. 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 Kalauao Springs 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. The bridge was surrounded on all sides by agricultural fields, with only scattered buildings in the vicinity. Further development followed the construction of the close in 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.

[6] Dee Ruzicka, interview with David and Barbara Sumida, March 9, 2006.

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. The 1966 additions to the bridges are quite different in the design of their structure, parapets, and stanchions. This contrast, however, 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 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.

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.)

- [X] 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

Kalauao Springs Bridge
Name of Property

Honolulu, HI
County and State

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)

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 Kalauao Springs Bridge is significant at the local level under National Register Criterion A for its association with the history of O'ahu's road transportation network, as a part of the Kamehameha Highway segment of O'ahu's belt road system. It is important for its association with the development of this section of Kamehameha Highway and the adjacent Aiea settlement, which grew into a suburb after its initial establishment as the mill village of a sugarcane plantation. This property's significance in the area of transportation (Kamehameha Highway history), for the period from the 1936 bridge construction through 1970 (when the H-1 Freeway became the main road corridor in this vicinity), also links it to the history of the Honolulu Plantation Company in Aiea.

The State of Hawaii, Department of Transportation (HDOT) confirmed the Kalauao Stream Bridge's eligibility under Criteria A in their November 2013 publication: "Hawaii State Historic Bridge Inventory and Evaluation" conducted in order to "identify which of the 708 bridges built before 1968…are eligible for listing on the Hawaii State Register of Historic Places (HSRHP)." Specifically, the report stated that the Kalauao Stream Bridge was: "…eligible under Criterion A for its association with post-war developments of the community due to bridge widening in 1966."

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 –Waimalu 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.[7]
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, the original alignment of 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, 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. The Kalauao Springs are makai of the original Kamehameha Highway alignment. The marshy lands around Kalauao Springs posed problems for pre-Territorial-period road planners, but were ideal for wetland agriculture.

The Kalauao Springs were two natural springs of percolating water located mauka of the Kalauao Springs Bridge. Commercial farming in the area around these springs dates back to at least the late 1800s, when rice was a primary crop. Before rice cultivation, the springs irrigated taro loi (common Hawaiian term for flooded terraces). Near the end of the nineteenth century, a tannery was located at the springs. In 1928, Moriichi and Makiyo Sumida began farming assorted wetland produce on a two-acre plot of land at the springs that was leased from Kamehameha Schools/Bishop Estate. At this time, the area near the springs contained many small farms growing similar produce -- bananas, taro, rice, and watercress. Through the ensuing years, the Sumida property grew as they acquired neighboring leases and, by 1950, watercress became the sole crop grown. The Sumida Farm is still in operation in the area just mauka of Kalauao Springs Bridge, one of the few agricultural operations in this area to remain as the surrounding land was urbanized.

[7] 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.

The course of the area's urbanization started with the idea of realigning Kamehameha Highway through the agricultural land near the Kalauao Springs. Planning for this realignment had been underway for a few years before NRH funds became available in 1933. Road improvements from Honolulu to Pearl City were on the first list for NRH funding, which was a federal grant, with no matching Territorial appropriation required. 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, was to be undertaken "if financially possible."[8] Two years later, this second-priority section (realignment of Kamehameha Highway west of Aiea) still awaited funding. In 1935, Louis S. Cain, Superintendent of Public Works (SPW) 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.[9] In March 1937, the contract amount reported for construction of a longer highway segment (from "Aiea through Pearl City") was $203,000.[10]

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. Because no original drawings were located for the 1936 bridges in this highway segment, their designers are not known. The original 1937 Kamehameha Highway lanes are the present-day two inner lanes of the eastbound half of the highway. The construction firm of Walker & Olund, Ltd. built the section of this 1937 road between about Kaonohi Street and Aiea, including the Kalauao Springs Bridge.[11] See the subsection below for further information about that firm and about the funding for the 1936-1937 Aiea-to-Pearl City highway construction.

In 1945, the Territory of Hawaii, using federal funds, improved Kamehameha Highway between Aiea and Pearl City with 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 project included the 1945 Kalauao Springs Bridge, which was originally a two-lane bridge with matching parapets and stanchions.

William R. Bartels, bridge engineer for the Hawaii Territorial Highway Department, designed the 1945 Kalauao Springs Bridge. Bartels received his education and training in Germany and immigrated to Hawaii in 1932 when he commenced working with the Highway Department; he continued his career there until his retirement in 1958.[12] During that period, he was a prolific and versatile designer, responsible for large and sophisticated bridge construction projects in Hawai'i, including many tee-beam and rigid-frame concrete bridges, as well as the other two bridges (Waimalu Bridge and Kalauao Stream Bridge) along this stretch of Kamehameha Highway. Bartels' name appears on the original 1945 drawings of the Kalauao Springs Bridge as the designer. He designed and checked these drawings, dated June 1945, with the aid of drafters

[8] "Hawaii Road Building Projects Selected," Honolulu Star Bulletin, June 24, 1933. p. 1.
[9] "Cain Submits Road Plan to U.S. Officials," Honolulu Star Bulletin, May 3, 1935. p. 1
[10] "Cain Reveals Road Scheme for 5 Islands," Honolulu Star Bulletin, March 6, 1937. p. 1.
[11] "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.
[12] "TH Honors 4 Veteran Employees," Honolulu Advertiser, July 1, 1958 article at the University of Hawai'i, Hamilton Library, Honolulu Newspapers Clipping Morgue, on microfiche in Biographical section, under: Bartels.

D. Yanagihara and P. Yamashita. B. F. Rush, the Territorial Highway Engineer at the time, approved the drawings on June 18, 1945.

The 1945 highway and bridge construction, respectively, was carried out under Hawaii Project Nos. DA-WR 10 (2) and DA-WR 10 (3).[13] According to the SPW 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.[14]

The SPW 1945 report explains the term "access money" as 100% Federal funding for military access roads and "those highways which are part of the strategic network."[15] 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."[16] 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, Waipio 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.[17] For most of the twentieth century, Everett Earl Black was a well-connected Hawaii 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.[18] E. E. Black, Ltd. obtained many road and bridge contracts in Hawaii, starting as early as 1931.[19] 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.[20]

In 1966, the State of Hawaii, Department of Transportation carried out another improvement to this segment of Kamehameha Highway, adding a third lane to both existing two-lane roadways. They accomplished this under FAP No. U-090-I (9). The widening project responded to

[13] 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.
[14] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946 [Honolulu: author.] [1946]. p. 17.
[15] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1945 [Honolulu: author.] [1945]. p 13.
[16] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946 [Honolulu: author.] [1946]. p. 17.
[17] Ibid., p. 26.
[18] Michael T. Holmes, The Specter of Communism in Hawai'i (Honolulu: University of Hawai'i Press) 1994.
[19] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1931 (Honolulu: Honolulu Star Bulletin) 1932.
p. 28.
[20] Ronna Bolante, "Can Locals Compete?" Hawai'i Business, on website http://www.hawaiibusiness.com/Hawaii-Business/July-2002, accessed February 20, 2013.

numerous complaints about "bumper-to-bumper Kamehameha Highway rush hour traffic past Pearl Harbor," with protests reported at least as early as 1964.[21] The third lane was added on the outer edge (opposite the median) 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.[22]

1930s Kamehameha Highway Funding around Kalauao and Construction Difficulties

The 1930s contract from the Territorial Department of Public Works for the section of Kamehameha Highway that included the Kalauao Springs and Kalauao Stream bridges was awarded for $153,647.87, with the cost covered by the federal government, as "U.S. Public Works Project No. NRH-9-C."[23] This type of funding was a grant, and the Territory did not have to match the federal money. After the election of Franklin Roosevelt as President in 1932, the federal government responded to the Great Depression with several measures to provide employment.

> In June 1933, Congress passed the National Industrial Recovery Act (NIRA). The act was designed to help individual states with a variety of programs including new highway construction…. It was also designed to aid the states in providing unemployment relief for the millions out of work. Under the NIRA of 1933, individual states were able to obtain additional funds through grant programs, such as the National Recovery Highway… program, [under which] the United States Bureau of Public Roads stipulated that portions of the funding should be used for roadside landscaping and to develop shore routes and inland tourist lanes.[24]

This section of Kamehameha Highway did run near part of Pearl Harbor's shoreline, but it certainly was not intended to be primarily a tourist route. Instead it served the resident population; the Territory's SPW noted that upon its "completion the public will have available an improved highway from Honolulu to the fast growing community of Wahiawa."[25] This section was not an easy area for highway construction, due to numerous wetlands in the ahupuaa of Kalauao, Waimalu, Waiau, and Waimano. The names of all of those ahupuaa contain the word wai (Hawaiian term for water), except for Kalauao, which means "the multitude [of] clouds."[26] These ahupuaa, between the settlements at Aiea and Pearl City, were noted for their extensive irrigated fields in the early Western-contact period (eighteenth and nineteenth centuries). Such wetlands were one reason that the original alignment of Kamehameha Highway had been inland, on ground more topographically varied, but also more solid.

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[21] "Pearl City Traffic Saddens Police, Too," Honolulu Star Bulletin, June 22, 1964. p. 3.
[22] State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), As Built Plans of Kamehameha Highway Widening, Drawings 1-6 & 58-87. July 22, 1965.
[23] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1936 (Honolulu: New Freedom Press) [1936]. p. 10.
[24] Irene Jackson Henry and William Henry, Historic American Engineering Record, Veterans Memorial Park and Parkway, Muskegon, Michigan. (Eagle, Michigan: Henry & Henry Preservation and Architectural Consultants) July 1996, on website lcweb2.loc.gov/pnp/habshaer/mi/mi0400/mi0455/, accessed June 13, 2012.
[25] SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1937 (Honolulu: Porter Printing Company, Ltd.) [1937]. p. 22.
[26] Mary Kawena Pukui, Samuel E. Elbert, & Esther T. Mookini, Place Names of Hawaii (Honolulu: University of Hawai'i Press) 1976. p. 75.

A newspaper article about the 1937 opening of the "Aiea Highway," the name at that period for this portion of Kamehameha Highway, noted that for the contractors:

> A difficult engineering problem was faced in building a durable road bed since the highway skirts Pearl Harbor and in many places passes through former swamp lands. . . . In constructing the highway, it was necessary to lay a lumber mat of 265,000 board feet before putting in the rock sub-base. [27]

Although part of "Aiea Highway" officially opened for traffic on August 24, 1937, there was a mile-long portion where it was "still necessary to detour through Aiea to the old Kamehameha Highway."[28] Despite the ceremonies "marking an important step in territorial highway development," the roadway surface was, at that date, only loose rocks treated with oil, with a plan that "a macadam finish will be applied within one year."[29]

The contracting company that built the Kalauao Springs Bridge and Kalauao Stream Bridge in 1936-1937, along with several miles of connecting highway segments, was the firm of Walker & Olund, Ltd. John Walker, born in Scotland, came to Hawai'i about 1884. Around 1900 he founded his own company, under the name John Walker, Contractor, and the firm has continued to this day, currently under the name Walker-Moody Construction Company, Ltd. Alfred E. Olund, who was born in Minnesota and arrived in Hawai'i by 1912, started working with Walker in 1920. In 1924, the firm was called Walker & Olund, Ltd., which name continued in use until 1939, despite the 1928 death of John Walker. The business did not get renamed Walker-Moody Construction Company, Ltd., until 1941, although Olund had left the firm and Moody had joined it in 1939. Today, Walker-Moody Construction Company's website states that it was "one of Hawaii's largest and most respected construction firms."[30] Some of the landmark projects that the company completed in its early decades include: the Sacred Heart Catholic Church [1914], "the territorial office building [1926], the new Honolulu city hall [1929], Pier 11 [1930], the Territorial hospital for the insane at Kaneohe [1935], the concrete work for the great oil tanks at Pearl Harbor naval base [1924], and the magnificent new home of C. Brewer & Co., Ltd. … 1930."[31]

Honolulu Plantation Company, Aiea

Before the construction of the 1937 "Aiea Highway," 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 Kalihi. All HPC-cultivated land was leased,

[27] "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6
[28] "New Aiea Road Open August 20," Honolulu Star Bulletin, August 3, 1937. p. 5.
[29] "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.
[30] Walker-Moody Construction Company, Ltd., "The Walker Moody Story – Company History, Start – 1940," on website http://www.walker-moody.com/inde.php/company-history-start-1940.html, accessed June 13, 2012.
[31] Ibid. (in Olund biography section).

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, CA. 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.[32]

HPC was one of the very few sugar plantations in Hawaii with a year-round water supply that was sufficient for its irrigation needs.[33] 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.[34]

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 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.[35] Another writer notes "post-war urban growth supplied the final blow."[36] 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.[37]

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

[32] William H. Dorrance, Sugar Islands, The 165-year Story of Sugar in Hawai'i. (Honolulu: Mutual Publishing LLC) 2000. p. 50.
[33] Jared G. Smith, Plantation Sketches (Honolulu: Advertiser Press) 1924. p. 132.
[34] Ibid., pp. 138-39.
[35] Edward D. Beechert, Working in Hawaii, A Labor History. (Honolulu: University of Hawai'i Press) 1985. p. 304.
[36] William H. Dorrance, Sugar Islands, The 165-year Story of Sugar in Hawai'i (Honolulu: Mutual Publishing LLC) 2000. P. 50
[37] Ibid.

short spans (typically 15 to 40 feet).[38] 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."[39]

The 1936 and 1945 portions of the Kalauao Springs 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.[40] A nationwide bridge study notes this combination of bridge types was used for a few widening projects.[41]

Conclusion

The Kalauao Springs Bridge is eligible for the National Register of Historic Places under Criterion A (Events) as a contributing element to the development of the around the island road system developed by the Territory in the 1930s.

[38] 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.
[39] Heritage Center, State of Hawai'i, Historic Bridge Inventory and Evaluation, Draft, 2008. pp. I-71 & I-72.
[40] State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), Waimalu Stream Bridge Widening, Drawing 73. June 1965.
[41] Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, October 2005. p. 3-93.

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.

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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.

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

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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.

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Territorial Highway Department, Hawaii Highway Planning Survey, Bridge Inventory for the Island of Oahu. Prepared in Cooperation with the U.S. Department of Commerce, Bureau of Public Roads. September 1950.

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

Walker-Moody Construction Company, Ltd. "The Walker Moody Story – Company History, Start – 1940," on website http://www.walker-moody.com/index.php/ company-history start-1940.html, accessed June 13, 2012.

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

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 #_____
__x__recorded by Historic American Engineering Record # _hi-116__
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____ State Historic Preservation Office
__x__ 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

Acreage 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:

Or
UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

1. Zone: 04	Easting: 609540	Northing: 2364800
2. Zone:	Easting:	Northing:
3. Zone:	Easting:	Northing:
4. Zone:	Easting :	Northing:

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

The boundary of the Kalauao Springs Bridge is defined by the outer limits of the structures, enclosed by a rectangle measuring approximately 60' x 115' that includes the superstructures 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 Kalauao Spring 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_____

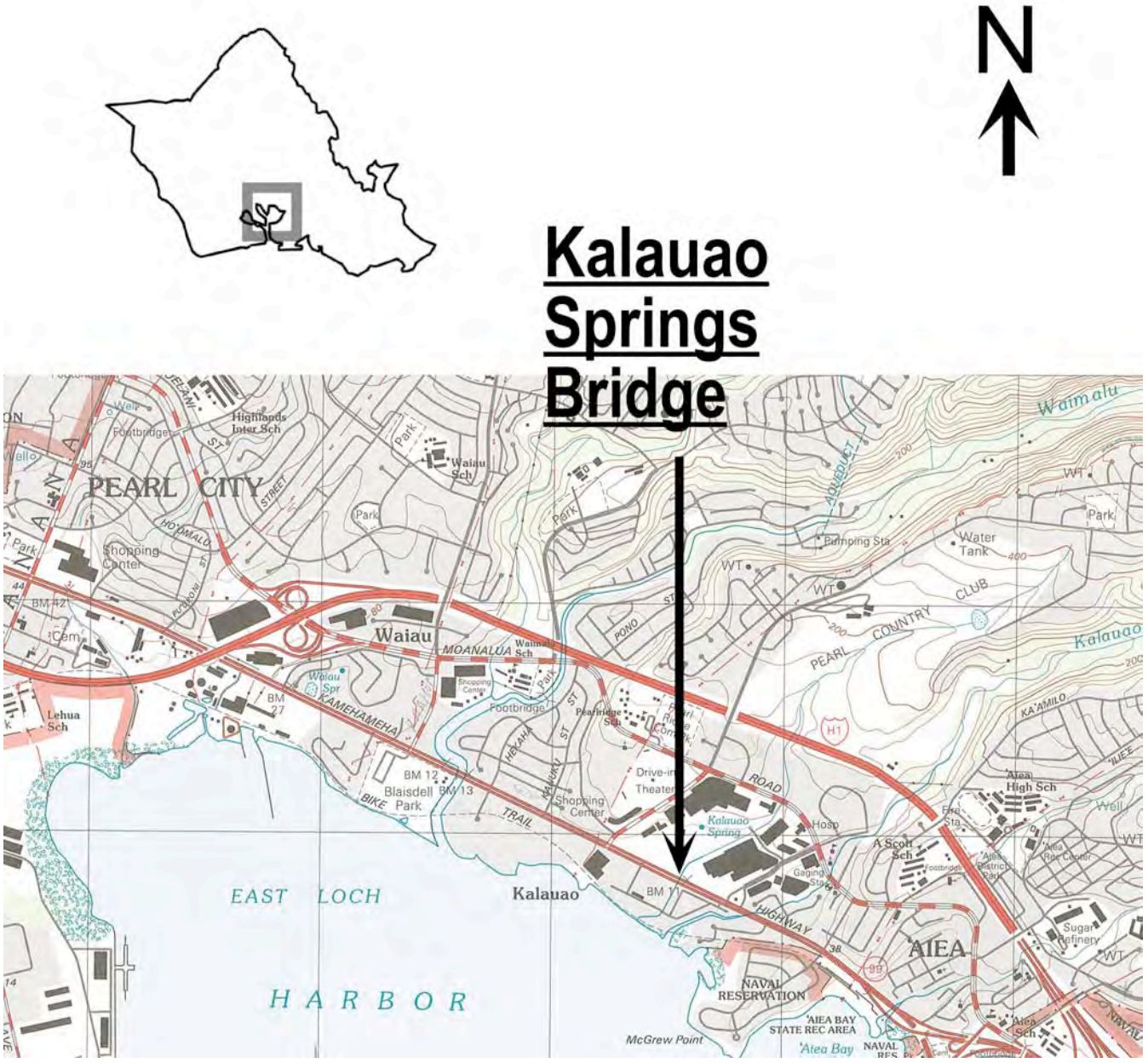
Additional Documentation

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.)

Resource	File Name	Description
#1	HI_Honolulu_Kalauao Springs Bridge_001.jpeg	USGS Map
#2	HI_Honolulu_Kalauao Springs Bridge_002.jpeg	Google Earth Map
#3	HI_Honolulu_Kalauao Springs Bridge_003.jpeg	Location Map
#4	HI_Honolulu_Kalauao Springs Bridge_004.jpeg	Photo Map
#5	HI_Honolulu_Kalauao Springs Bridge_005.jpeg	Historic Aerial
#6	HI_Honolulu_Kalauao Springs Bridge_006.jpeg	Aerial Photo
#7	HI_Honolulu_Kalauao Springs Bridge_007.jpeg	Photo Key

USGS Map


N
Kalauao
Springs
Bridge
PEARL CITY
Waiau
MOANALUA
KAMEHAMEHA
Kalauao
EAST LOCH
HARBOR
AIEA
NAVAL RESERVATION
McGrew Point
Waimalu
Kalauao
PEARL COUNTRY CLUB
Water Tank
Pumping Sta
Shopping Center
Lehua Sch
Blaisdell Park
Drive-in Theater
Kalauao Spring
Sugar Refinery
Aiea High Sch
A Scott Sch
Aiea Bay
Aiea Sch

Google Map of Property



Map of Bridge Site

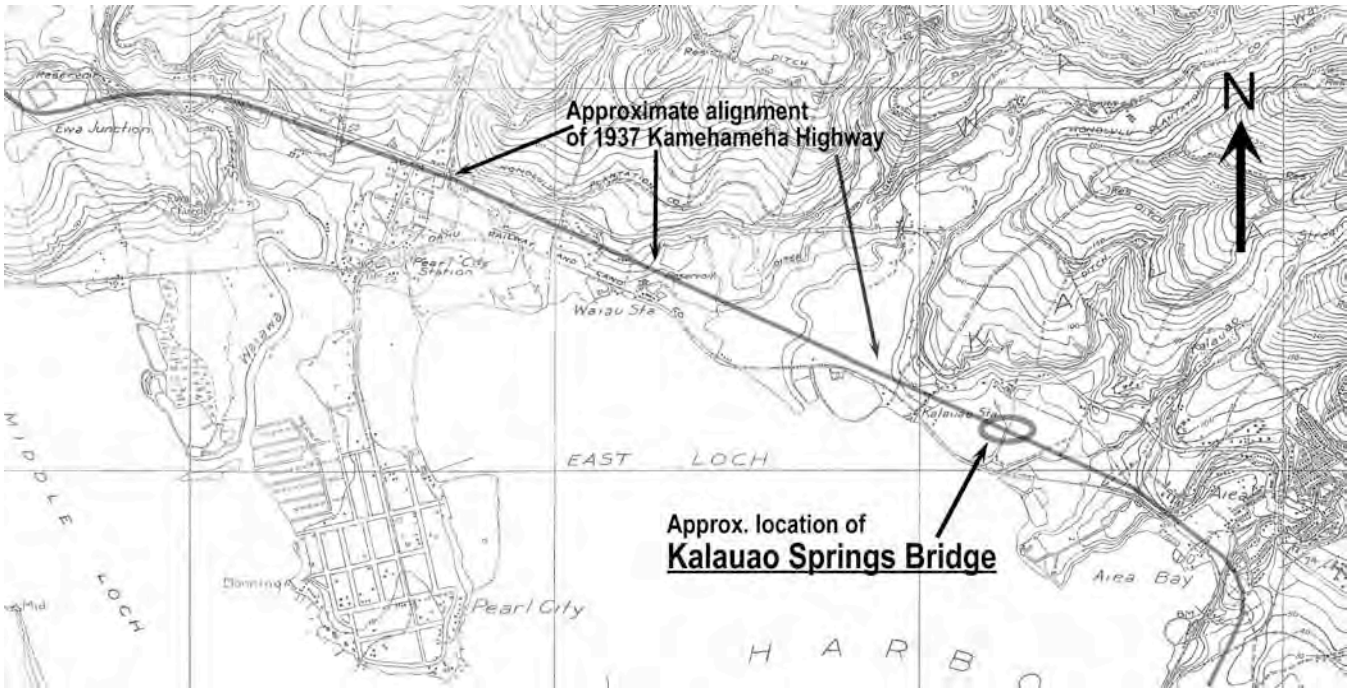
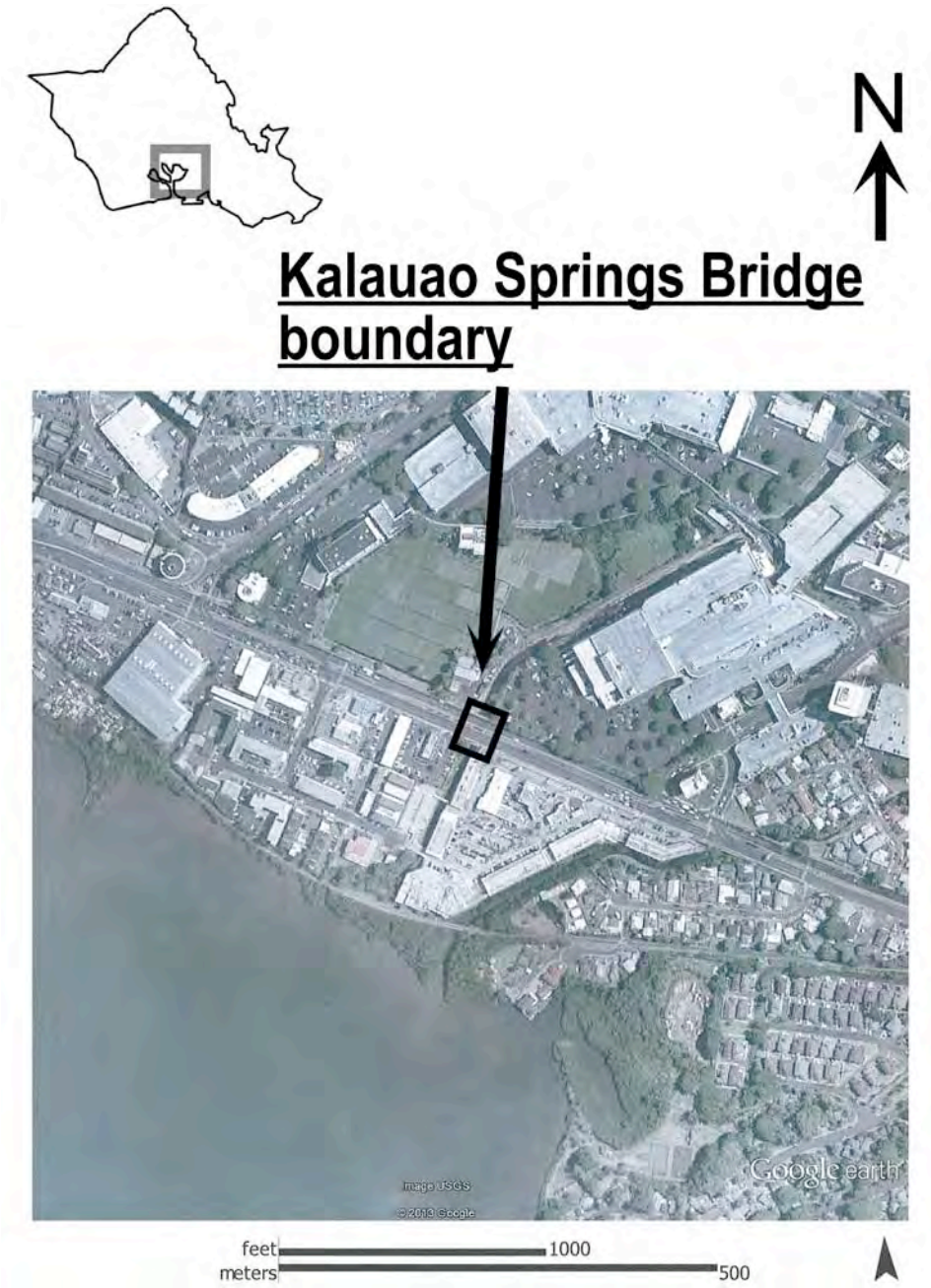
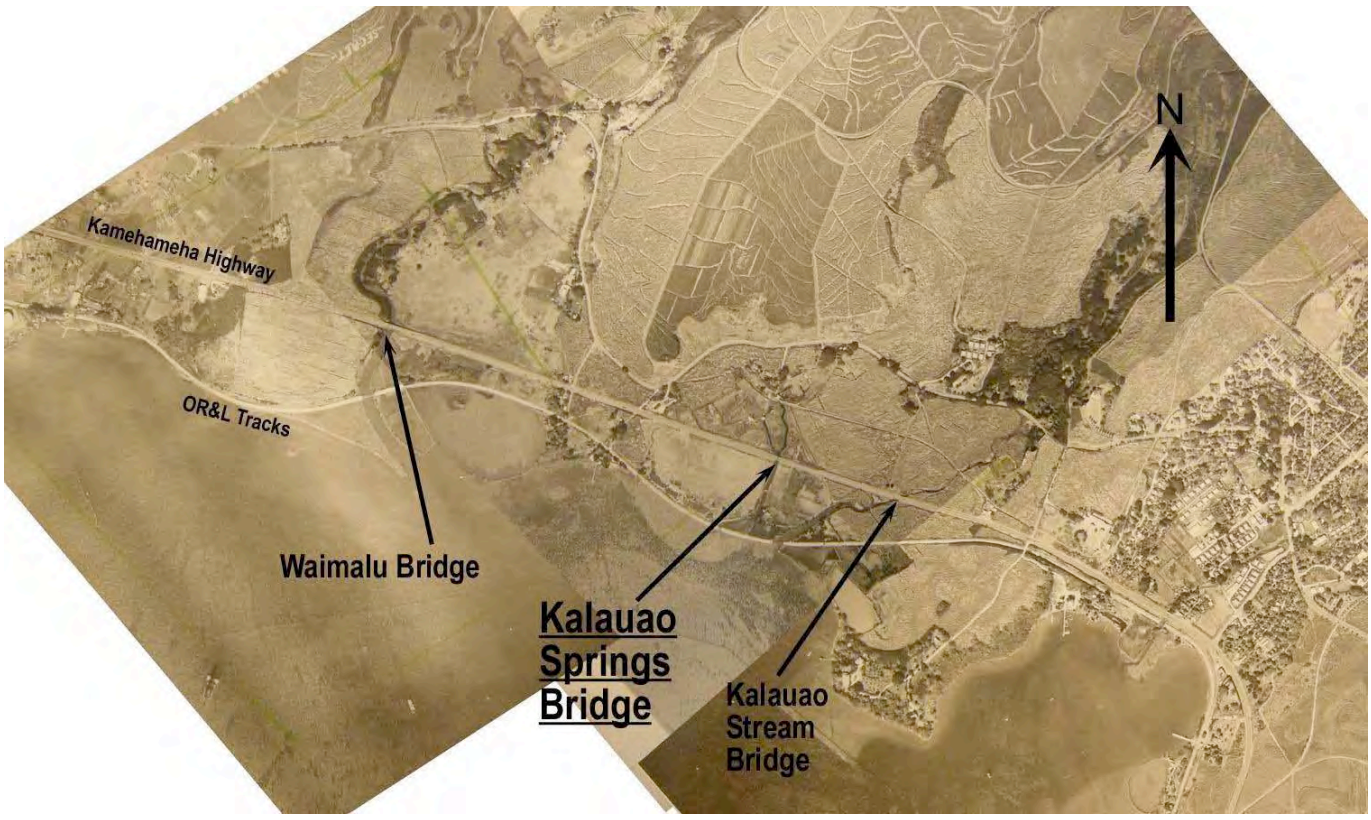


Photo Map


N
Kalauao Springs Bridge boundary
Image USGS
© 2013 Google
Google earth
feet
meters
1000
500

Historic Aerial Photo of Site



Aerial Photo of Site



Photo Key

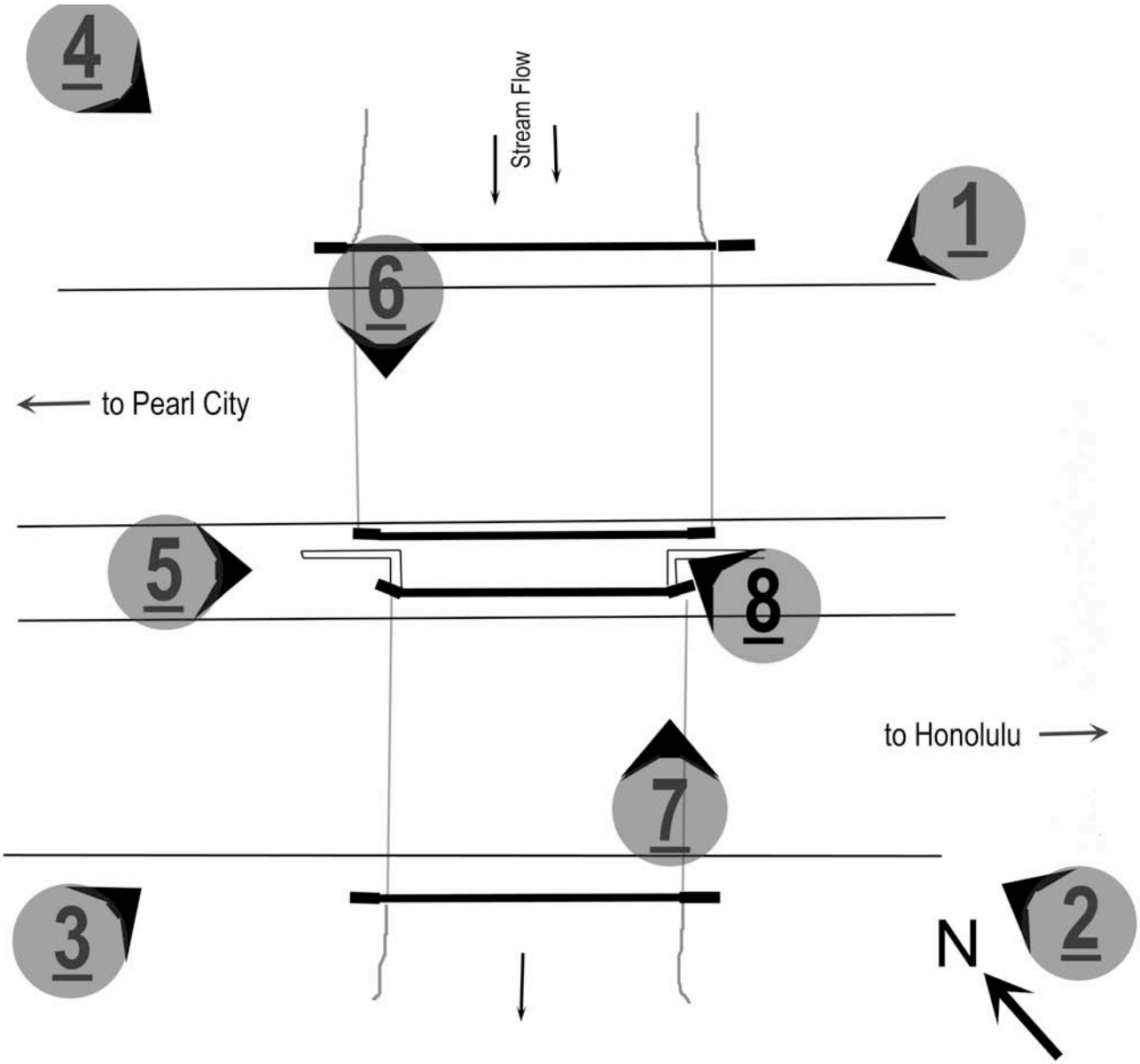


Photo	File Name	Description
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#3	HI_Honolulu_Kalauao Springs Bridge_010.jpeg	HI_Honolulu_Kalauao Springs Bridge_010.jpeg
#4	HI_Honolulu_Kalauao Springs Bridge_011.jpeg	HI_Honolulu_Kalauao Springs Bridge_011.jpeg
#5	HI_Honolulu_Kalauao Springs Bridge_012.jpeg	HI_Honolulu_Kalauao Springs Bridge_012.jpeg
#6	HI_Honolulu_Kalauao Springs Bridge_013.jpeg	HI_Honolulu_Kalauao Springs Bridge_013.jpeg
#7	HI_Honolulu_Kalauao Springs Bridge_014.jpeg	HI_Honolulu_Kalauao Springs Bridge_014.jpeg
#8	HI_Honolulu_Kalauao Springs Bridge_015.jpeg	HI_Honolulu_Kalauao Springs Bridge_015.jpeg
#9	HI_Honolulu_Kalauao Springs Bridge_016.jpeg	HI_Honolulu_Kalauao Springs Bridge_016.jpeg

Photo: 1 of 8
Name of Property: Kalauao Springs Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Overview showing approach to westbound bridge
Camera Facing: W



Photo:	2 of 8
Name of Property:	Kalauao Springs Bridge
City or Vicinity:	ʻAiea
Photographer:	Stanely Solamillo
Date Photographed:	February 24, 2020
Description	Overview of eastern end of eastbound bridge
Camera Facing:	N



Photo: 3 of 8
Name of Property: Kalauao Springs Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Overview of approach to eastbound bridge
Camera Facing: E



Photo: 4 of 8
Name of Property: Kalauao Springs Bridge
City or Vicinity: ʻAiea
Photographer: Stanely Solamillo
Date Photographed: February 24, 2020
Description: Overview of westbound bridge, camera facing south. Note the 1945 parapet near the center of the photograph and the westbound 1966 parapet on the left.
Camera Facing: S



Photo:	5 of 8
Name of Property:	Kalauao Springs Bridge
City or Vicinity:	ʻAiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	Detail showing the median and the space between the eastbound bridge's 1936 parapet (right) and westbound bridge's 1945 parapet (left- partially obscured by chain link fence)
Camera Facing:	SE



Photo:	6 of 8
Name of Property:	Kalauao Springs Bridge
City or Vicinity:	ʻAiea
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 southwest.
Camera Facing:	SW



Photo: 7 of 8
Name of Property: Kalauao Springs Bridge
City or Vicinity: ʻAiea
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 facing northeast.
Camera Facing: NE



Photo:	8 of 8
Name of Property:	Kalauao Springs Bridge
City or Vicinity:	‘Aiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	View of westbound bridge's 1945 parapet and makai end of central line of piles and transverse concrete beam (pile cap), camera facing north.
Camera Facing:	N



OMB Control No. 1024-0018
expiration date 03/31/2022

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 Property

Historic name: __Kalauao Stream Bridge_____
Other names/site number: __Kalauao Stream Eastbound Bridge & Kalauao 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 Kalauao Stream _____
City or town: __Aiea__ State: ___HI____ County: __Honolulu_____
Not 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**

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	x
Public – Federal	☐

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☐
Site	☐
Structure	x
Object	☐

Kalauao Stream Bridge — Honolulu, HI
Name of Property — County and State

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
		sites
2		structures
		objects
2		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

7. Description

Architectural Classification
(Enter categories from instructions.)
Other, Bridge

Materials: (enter categories from instructions.)
Principal exterior materials of the property: FOUNDATION: Concrete & abutment of lava rock; WALLS: Concrete (parapets & stanchions); OTHER: Steel I-beams (under westbound lanes, 1945 portion)

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 Kalauao Stream Bridge was built in 1936 as a single two-lane, two-direction, reinforced concrete girder bridge to cross the Kalauao Stream. The bridge is part of Kamehameha Highway, and at the point at which the bridge crosses the stream, the stream is running diagonally to the bridge in aerial view. Post-wartime activities made the capacity of Kamehameha Highway and the Kalauao Stream single bridge inadequate, so that in 1945 a second, parallel, bridge was constructed *mauka* and each of the two two-lane bridges then carried traffic in a single direction. Parapet designs of both the 1936 and 1945 bridge are similar, using concrete with cross-shaped voids and have concrete stanchions at the ends. The only major visible differences between the 1936 and 1945 bridges are that, the 1936 bridge has at-grade shoulders for pedestrian traffic, while the 1945 bridge has grade- separated concrete pedestrian sidewalks. Moreover, the 1936 stanchions are curved away from traffic and the 1945 stanchions are straight. However, there are structural differences. The original 1936 (today's eastbound) bridge used board-formed, cast-in-place concrete with five longitudinal concrete beams, and the 1945 (westbound) bridge has six

longitudinal girders (stringers) that are steel I–beams. The longitudinal I -beam stringers are supported at mid-point by 17 square concrete piles, topped by a 3'-0" tall concrete beam.

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, capped with two horizontal cylindrical metal rails. The concrete end stanchions are simple rectangular forms with year built (1966) and name inscriptions. The 1966 alterations mean that only the center parapets, walkways, and stanchions remain on the 1936 and 1945 bridges. The condition of the bridge is good. The integrity of the bridge structures have been compromised due to the 1966 bridge expansions and surrounding urbanization.

[1] National Bridge Inventory Database, Kalauao Spring Bridge, on website nationalbridges.com, accessed May 23, 2012. [The eastbound bridge has a NBI Structure Number of 003000990402053 and the westbound bridge has a NBI Structure Number

Narrative Description

Both three-lane bridges carry Kamehameha Highway across Kalauao Stream. The 1936 eastbound bridge is entirely reinforced-concrete construction, with a single span of approximately 54' and a total length (measured down the centerline of the road) of 60'. The 1945 westbound bridge is mostly reinforced-concrete construction, but also utilizes steel I-beam stringers; it has two spans, each measuring about 48', with a total bridge length of 108'. As noted in the summary above, both bridges were widened in 1966 using pre-stressed concrete girders.[2] Further information and context about the structural types are given below, in the description and significance sections.

Both eastbound and westbound bridges have roadway widths of approximately 40'. Each bridge has concrete walkways, approximately 4' wide and about 4" higher than the roadway surface. The eastbound bridge has walkways along both its 1936 mauka parapet and along its 1966 makai (seaward) 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 activities increased the width of each bridge from two to three traffic lanes and provided 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" in height and about 60' in length. The parapet has a top railing that is 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 the parapet 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 Hawai‘i during the 1930s and 1940s and are commonly referred to as a Greek cross shape.[3] Each cross void is 1'-3" high and 8" wide. The base of each parapet is 7" high and 10" thick, across 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 difference in height results in an approximately 4"-high concrete curb along the road.

[2] State of Hawai‘i, Department of Transportation, Highways Division, Design Branch. FAP No. U-090-I (9), Drawing 58, Kalauao Stream Bridge Widening, Sheet No. K-1. June 1965.
[3] 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.

The 1936 concrete end stanchions are 3'-3" high (measured from the roadway), 1'-9" thick, and about 4' long. In plan, each forms the arc of a circle spanning about 30 degrees. One end of each stanchion squarely abuts the parapet and the stanchion arcs 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. 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. Typically, concrete bridges of this type and period have year built and bridge name inscriptions on their end stanchions, as is the case here. However, the added concrete wedge covers the name inscription on this stanchion. The east end stanchion has the date inscription "1936" in 3"-high block numbers.

The 1966 parapet and end stanchions of the eastbound bridge are on the makai side of the bridge. The lower part of the 1966 parapet is concrete, 1'-2" thick and 1'-6" high. The upper section of this 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. 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 has the inscription "Kalauao Stream Bridge 1966" in 3"-high block lettering.

Examination of the eastbound bridge's superstructure and substructure from below reveals the structural design of both the original 1936 bridge and the section under the 1966 traffic lane and walkway. The 1936 portion of the superstructure carries the two mauka lanes. It is board-formed, cast-in-place concrete with five longitudinal concrete beams, each measuring about 3'-6" high and 1'-6" wide. The added 1966 portion of the superstructure has two prestressed-concrete longitudinal girders spanning the stream. These 1966 girders are slightly taller and have a more complex shape than the 1936 ones. Engineer's drawings from 1965 show both the 1936 and 1966 portions of the bridge's substructure consist of board-formed concrete abutments supported by concrete pile foundations.[4]

Westbound Bridge (1945/1966)

This bridge has three westbound lanes of 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, with a few differences. This 1945 parapet is much longer, over 100' in length; and, instead of having a walkway extending along its length, it has a 6"-high, 10"-wide concrete curb. Another difference is that the 1945 concrete end stanchions are rectangular, not curved.

The 1945 rectangular stanchions measure 3'-3" in height, 1'-9" in depth, and 3'-6" in length. Each end stanchion has 1½" stepped corners and squarely abuts the parapet. Both the eastern and western end stanchions have added W-beam guardrails that are through-bolted to them. These

[4] State of Hawai'i, Department of Transportation, Highways Division, Design Branch. FAP No. U-090-I (9), Drawing 58, Kalauao Stream Bridge Widening, Sheet No. K-1. June 1965.

guardrails obscure the name (Kalauao Stream) and year built (1945) inscriptions on the stanchions. A 3"-diameter, red bullseye reflector is set into the traffic-facing (east) end of the eastern stanchion; but the paint on it and the guardrail render it non-functional.

The 1966 parapet on this section of the bridge is about 107' long. The 1966 parapet and end stanchions of this bridge are of typical construction, as described above for the eastbound bridge, with metal parapet railings and incised-line stanchions.

Under the reinforced-concrete deck of the westbound bridge, the 1945 section has six longitudinal girders (stringers) that are steel I–beams; each is about 3' high with a flange width of about 1', and spaced at 7'-0" on center. The westbound bridge has two spans of about 50' each. The longitudinal I -beam stringers are supported at mid-point by 17 square concrete piles, topped by a 3'-0" tall concrete beam. The 1966 section of this bridge has a different structure, with two longitudinal girders of pre-stressed concrete that are 3'-9" high. Their mid-span support is a 3'-0" tall concrete beam which is supported by four octagonal concrete piles.

The east abutment of the westbound bridge is of board-formed concrete, and the west abutment is of lava rock and concrete mortar masonry. On the downstream side of this bridge, the stream channel narrows from the approximately 96' width under the westbound bridge to the approximately 54' width under the eastbound bridge; this reduction in width is accomplished by means of concrete retaining walls that extend into the stream channel from the eastbound bridge abutments. These vertical retaining walls are 1'-6" thick and extend into the stream channel, about 20' on the east side and about 26' on the west side, in an orientation approximately parallel to the roadway.

Site Information

The Kalauao Stream Bridge is located along a mixed urban/residential section of Kamehameha Highway. This bridge lies makai, or downstream, of a channelized portion of Kalauao Stream. Mauka of the highway, on both sides of the stream, are a few residences. To the northwest, beyond the residences, is a mid-rise office building, occupied by American Savings Bank, and the expansive Pearl Ridge Shopping Center. That shopping center was initially built ca. 1969, with additional phases of development in following years. Makai of the highway, there are residences on the southeast side of the stream, and a low-rise strip mall on the southwest side. Approximately one-half mile to the east is the well-developed community of ʻAiea. Historic aerial photos show that the setting around the bridge has changed greatly since its original 1936 construction date. Before World War II, the area was rural, and sugarcane fields were prevalent in the area. ʻAiea historically had a sugar mill, along with residential and commercial buildings. 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 Kalauao 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. The bridge was surrounded on all sides by agricultural fields, with only scattered buildings located in its 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.

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. The 1966 additions to the bridges are quite different in the design of their structure, parapets, and stanchions. This contrast, however, conveys the history of the area and its rapid post-statehood growth. The 1966 sections of the bridges are not considered detracting features. They 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.

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.)

- [x] 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

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)

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 Kalauao Stream Bridge is significant at the local level under National Register Criterion A for its association with the history of O'ahu's road transportation system, as part of the Kamehameha Highway segment of O'ahu's belt road system. It is important for its association with the development of this section of Kamehameha Highway and the adjacent 'Aiea settlement, which grew into a suburb after its initial establishment as the mill village of a sugarcane plantation. This property's significance in the area of transportation (Kamehameha Highway history), for the period from the 1936 bridge construction through 1970 (when the H-1 Freeway became the main road corridor in this vicinity), also links it to the history of the Honolulu Plantation Company in 'Aiea.

The State of Hawaii, Department of Transportation (HDOT) confirmed the Kalauao Stream Bridge's eligibility under Criteria A in their November 2013 publication: "Hawaii State Historic Bridge Inventory and Evaluation" conducted in order to "identify which of the 708 bridges built before 1968…are eligible for listing on the Hawaii State Register of Historic Places (HSRHP)." Specifically, the report stated that the Kalauao Stream Bridge was: "…eligible under Criterion A for its association with post-war developments of the community due to bridge widening in 1966." (Note: The relevant pages from the HDOT Inventory has been attached to this document as 'Appendix A')

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 series of project numbers – Waimalu Bridge and Kalauao Springs Bridge. The Territory of Hawai‘i, 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.[5] In 1945, under Hawai‘i 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. In 1966 a widening of Kamehameha Highway, FAP No. U-090-I (9), included an additional lane on the outboard sides of all six bridges.

Kamehameha Highway

Until 1936, the original alignment of Kamehameha Highway was the only road that provided passage across the ahupua‘a (Hawaiian term for land divisions that typically extend from the mountains to the sea) of Kalauao, Waimalu, and Waimano, between the settlements at ‘Aiea and Pearl City. The pre-1936 alignment of this highway extended 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 what is now the Pearl Ridge Shopping Center and then followed Moanalua Loop.

The progression of the area’s urbanization started with realignment of Kamehameha Highway through the wetlands near Pearl Harbor’s East Loch. Planning for this realignment had been underway for a few years before NRH funds became available in 1933. Road improvements from Honolulu to Pearl City were on the first list for NRH funding, which was a federal grant, with no matching Territorial appropriation. 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, was to be undertaken "if financially possible."[6] Two years later, this second-priority section (realignment of Kamehameha Highway west of ‘Aiea) was still unfunded. In 1935, Louis S. Cain, Superintendent of Public Works (SPW) for the Territory of Hawai‘i, submitted a throughfare 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

[5] Superintendent of Public Works [hereafter SPW], Report to the Governor, Territory of Hawai‘i for the Year Ending June 30, 1936 (Honolulu: New Freedom Press) 1937. pp. 10 & 11.
[6] "Hawai‘i Road Building Projects Selected," Honolulu Star Bulletin, June 24

expected to cost $148,000.[7] In March 1937, the contract amount reported for construction of a longer highway segment (from "'Aiea through Pearl City") was $203,000.[8]

On August 24, 1937, the new alignment of Kamehameha Highway between ʻAiea and Pearl City was dedicated. This new road passed over the three 1936 bridges, crossing Waimalu Stream, Kalauao Springs, and Kalauao Stream. Because no original drawings were located for the 1936 bridges in this highway segment, their designers are not known. The original 1937 Kamehameha Highway lanes are the present-day two inner lanes of the eastbound half of the highway. The construction firm of Walker & Olund, Ltd. built the section of this 1937 road between Ka'ōnohi Street and ʻAiea, including the Kalauao Stream Bridge. [9]

In 1945, the Territory of Hawaiʻi, using federal funds, improved Kamehameha Highway between ʻAiea and Pearl City with 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 traffic. This improvement project included the 1945 Kalauao Stream Bridge, which was originally a two-lane bridge with matching parapets and stanchions.

William R. Bartels, bridge engineer for the Hawaiʻi Territorial Highway Department, designed the 1945 Kalauao Stream Bridge. Bartels received his education and training in Germany and immigrated to Hawaiʻi in 1932 when he commenced work with the Highway Department. He continued his career there until his retirement in 1958.[10] During that period, he was a prolific and versatile designer, responsible for large and sophisticated bridge construction projects in Hawaiʻi, including many tee-beam and rigid-frame concrete bridges, as well as the two reinforced-concrete girder bridges (Waimalu and Kalauao Springs 1945 bridges) along this Waimalu-ʻAiea stretch of Kamehameha Highway. Bartels' name appears on the original 1945 drawings of the Kalauao Stream Bridge as the designer. He designed and checked these drawings, with the aid of drafters D. Yanagihara and P. Yamashita. B. F. Rush, the Territorial Highway Engineer at the time, approved the drawings on June 18, 1945. All the sheets for this bridge were dated June 1945, except for one wingwall detail drawing, dated August 1946.

The 1945 highway and bridge construction, respectively, was carried out under Hawaiʻi Project Nos. DA-WR 10 (2) and DA-WR 10 (3).[11] According to the SPW report that was issued 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

[7] "Cain Submits Road Plan to U.S. Officials," *Honolulu Star Bulletin*, May 3, 1935. p. 1.
[8] "Cain Reveals Road Scheme for 5 Islands," Honolulu Star Bulletin, March 6, 1937. p. 1.
[9] "Aiea Highway Link Dedicated," *Honolulu Star Bulletin*, August 25, 1937. p. 6.
[10] "TH Honors 4 Veteran Employees," *Honolulu Advertiser*, July 1, 1958, article at the University of Hawaiʻi, Hamilton Library, Honolulu Newspapers Clipping Morgue, on microfiche in Biographical section, under: Bartels.
[11] State of Hawaiʻi, 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.

> access money were spent on the latter with the result that all traffic has benefited by these improvements.[12]

The SPW 1945 report explained the term "access money" as 100% Federal funding for military access roads and "those highways which are part of the strategic network."[13] 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."[14] This widened section 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.[15] For most of the twentieth century, Everett Earl Black (1889-1995) was a well- connected Hawaii 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.[16] E. E. Black, Ltd. obtained many road and bridge contracts in Hawaii, starting as early as 1931.[17] 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.[18]

In 1966, the State of Hawai‘i, Department of Transportation carried out another improvement of this section of Kamehameha Highway, adding a third lane to both existing two-lane roadways, under FAP No. U-090-I (9). The widening project in response to numerous complaints about "bumper-to-bumper Kamehameha Highway rush hour traffic past Pearl Harbor," with protests reported at least as early as 1964.[19] The third lane was added on the outer edge (opposite the median) of each roadway. The work resulted in the demolition of the outer parapets and stanchions of the 1936 and 1945 bridges and the addition of the extant 1966 parapets and stanchions on the outer edge of the new traffic lanes.[20]

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[12] SPW, *Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946* [Honolulu: author] [1946]. p. 17.
[13] SPW, *Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1945*. [Honolulu: author] [1945]. p 13.
[14] SPW, *Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946* [Honolulu: author] [1946]. p. 17.
[15] Ibid., p. 26.
[16] Michael T. Holmes, *The Specter of Communism in Hawai‘i* (Honolulu: University of Hawai‘i Press) 1994.
[17] SPW, *Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1931* (Honolulu: Honolulu Star Bulletin) 1932. p. 28.
[18] Ronna Bolante, “Can Locals Compete?” *Hawai‘i Business,* on website http://www.hawaiibusiness.com/Hawaii-Business/July-2002, accessed February 20, 2013.
[19] "Pearl City Traffic Saddens Police, Too" *Honolulu Star Bulletin*, June 22, 1964. p. 3.
[20] State of Hawai‘i, 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.

1930s Kamehameha Highway Funding around Kalauao and Construction Difficulties

The contract from the Territorial Department of Public Works for the section of Kamehameha Highway that included the Kalauao Springs and Kalauao Stream bridges was awarded to Walker and Olund, Ltd. For $153,647.87, with the cost covered by the federal government, as "U.S. Public Works Project No. NRH-9-C."[21] This type of funding was a grant and funds did not have to be matched with Territorial money. After the election of Franklin Roosevelt as President in 1932, the federal government took several measures to provide employment during the Great Depression.

> In June 1933, Congress passed the National Industrial Recovery Act (NIRA). The act was designed to help individual states with a variety of programs including new highway construction…. It was also designed to aid the states in providing unemployment relief for the millions out of work. Under the NIRA of 1933, individual states were able to obtain additional funds through grant programs, such as the National Recovery Highway… program, [under which] the United States Bureau of Public Roads stipulated that portions of the funding should be used for roadside landscaping and to develop shore routes and inland tourist lanes.[22]

This section of Kamehameha Highway did run near part of Pearl Harbor's shoreline, but it certainly was not intended to be primarily a tourist route. Instead it served the resident population; the Territory's SPW noted that upon its "completion the public will have available an improved highway from Honolulu to the fast growing community of Wahiawā."[23] This section was not an easy area for highway construction, due to numerous wetlands in the *ahupua'a* of Kalauao, Waimalu, Waiau, and Waimano. The names of all of those *ahupua'a* contain the word *wai* (water), except for Kalauao, which means "the multitude [of] clouds."[24]These *ahupua'a,* between the settlements at 'Aiea and Pearl City, were noted for their extensive irrigated fields in the early Western-contact period (eighteenth and nineteenth centuries). Such wetlands were one reason that the original alignment of Kamehameha Highway had been inland, on ground more topographically varied, but also more solid.

A newspaper article which reported on the 1937 opening of the "'Aiea Highway," the name at that period for this portion of Kamehameha Highway, noted that for the contractors:
A difficult engineering problem was faced in building a durable road bed since the highway skirts Pearl Harbor and in many places passes through former swamp lands… In

[21] SPW, *Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1936* (Honolulu: New Freedom Press) [1936]. p. 10.

[22] Irene Jackson Henry and William Henry, Historic American Engineering Record, Veterans Memorial Park and Parkway, Muskegon, Michigan. (Eagle, Michigan: Henry & Henry Preservation and Architectural Consultants). July 1996, from website lcweb2.loc.gov/pnp/habshaer/mi/mi0400/mi0455/, accessed June 13, 2012.

[23] SPW, *Report to the Governor, Territory of Hawaii for the Year Ending June 30, 1937* (Honolulu: Porter Printing Company, Ltd.)[1937]. p. 22.

[24] Mary Kawena Pukui, Samuel E. Elbert, & Esther T. Mookini, *Place Names of Hawaii* (Honolulu: University of Hawai'i Press) 1976. p.75.

constructing the highway, it was necessary to lay a lumber mat of 265,000 board feet before putting in the rock sub-base.[25]

Although part of this highway officially opened for traffic on August 24, 1937, there was a mile-long portion where it was "still necessary to detour through ‘Aiea to the old Kamehameha Highway."[26] Despite the ceremonies "marking an important step in territorial highway development," the roadway surface was, at that date, only loose rocks treated with oil, with a plan that "a macadam finish will be applied within one year."[27]

The contracting company that built the Kalauao Springs Bridge and Kalauao Stream Bridge in 1936-1937, along with several miles of connecting highway segments, was the firm of Walker & Olund, Ltd. John Walker, born in Scotland, came to Hawai‘i about 1884. Around 1900 he founded his own company, under the name John Walker, Contractor, and the firm has continued to this day, currently under the name Walker-Moody Construction Company, Ltd. Alfred E. Olund, who was born in Minnesota and arrived in Hawai‘i by 1912, started working with Walker in 1920. In 1924, the firm was called Walker & Olund, Ltd., whose name continued in use until 1939, despite the 1928 death of John Walker. The business did not get renamed Walker-Moody Construction Company, Ltd., until 1941, although Olund had left the firm and Max Moody had joined it in 1939. In 2013, Walker-Moody Construction Company's website stated that Walker's company "was one of Hawai‘i's largest and most respected construction firms."[28] Some of the landmark projects that the company completed in its early decades were the Sacred Heart Catholic Church [1914], "the territorial office building [1926], the new Honolulu city hall [1929], Pier 11 [1930], the Territorial hospital for the insane at Kaneohe [1935], the concrete work for the great oil tanks at Pearl Harbor naval base [1924], and the magnificent new home of C. Brewer & Co., Ltd …..1930."[29]

Honolulu Plantation Company, ‘Aiea

Before the construction of the 1937 "‘Aiea Highway," most of the land around ‘Aiea , especially *mauka* of Kamehameha Highway, was planted in sugarcane. These sugarcane fields 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 lands 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 beyond the Southeast Loch of Pearl Harbor, almost to Bishop Point and Fort Kamehameha at the harbor mouth, as well as east to Kalihi. All HPC-cultivated land was leased, with some non-contiguous parcels in the eastern section. The only fee-simple land owned by the

[25] "Aiea Highway Link Dedicated," *Honolulu Star Bulletin*, August 25, 1937. p. 6.
[26] "New Aiea Road Open August 20," *Honolulu Star Bulletin*, August 3, 1937. p. 5.
[27] "Aiea Highway Link Dedicated," *Honolulu Star Bulletin*, August 25, 1937. p. 6.
[28] Walker-Moody Construction Company, Ltd., "The Walker Moody Story – Company History, Start – 1940," on website at http://www.walker-moody.com/inde.php/company-history-start-1940.html, accessed on June 13, 2012.
[29] Ibid. (in Olund biography section).

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, CA. 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 which was in excess of local demand.[30]

HPC was one of the very few sugar plantations in Hawaii with a year-round water supply that was sufficient for its irrigation needs.[31] 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 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 operated a private dairy.[32]

Over the years, HPC lost much of its leased acreage. The lands lost included some at Pearl Harbor in 1907 for the naval base, and additional lands east of Bishop Point, and others lost for Hickam Field in 1935. The military occupied other HPC sugarcane fields during World War II. One author stated that the military confiscation of HPC land led to its closure in 1947.[33] Another writer noted that "post-war urban growth supplied the final blow.”[34] 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.[35]

Reinforced-Concrete Girder Bridges

Reinforced-concrete girder bridge construction was common in the early twentieth century. The

[30] William H. Dorrance, *Sugar Islands, The 165-year Story of Sugar in Hawai‘i*. (Honolulu: Mutual Publishing LLC) 2000. p. 50.
[31] Jared G. Smith, *Plantation Sketches* (Honolulu: Advertiser Press) 1924. p. 132.
[32] Ibid., pp. 138-39.
[33] Edward D. Beechert, *Working in Hawaii, A Labor History*. (Honolulu: University of Hawai‘i Press) 1985. p. 304.
[34] William H. Dorrance, *Sugar Islands, The 165-year Story of Sugar in Hawai‘i* (Honolulu: Mutual Publishing LLC) 2000. p. 50.
[35] Ibid.

character-defining features of this type include a monolithic deck and girder system and short spans (typically 15 to 40 feet).[36] 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, reinforced-concrete girder bridges were often constructed 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."[37]

The 1936 portion of the Kalauao Stream Bridge was a relatively short-span, narrow (two-lane) bridge that used cast-in-place reinforced-concrete girders. See the section below for information on the 1945 portion of the Kalauao Stream Bridge. The portions of the bridges added in 1966 used pre-stressed girders.[38] A nationwide bridge study notes the combination of cast-in-place concrete girder bridges with pre-stressed (pre-cast) concrete girders for added portions was used for a number of widening projects.[39]

Steel I-Beam Bridges

The 1945 portion of the Kalauao Stream Bridge is classified as a steel I-beam bridge. This bridge type uses rolled steel beams as longitudinal members (stringers). Rolled steel beams came into general use for highway bridges in the 1920s and 1930s, as steel plants gained the ability to form steel beams into the greater lengths and depths required by bridge designers. By the early 1960s, the use of steel I-beams for bridge structures became less common, due to rising steel prices and the decreasing costs of pre-stressed concrete beams.[40]

Conclusion

The Kalauao Stream Bridge is eligible for the National Register of Historic Places under Criterion A (Events) as a contributing element to the development of the around the island road system developed by the Territory in the 1930s.

[36] 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.
[37] Heritage Center, State of Hawai‘i, Historic Bridge Inventory and Evaluation, Draft, 2008. pp. I-71 & I-72.
[38] State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), Waimalu Stream Bridge Widening, Drawing 73. June 1965.
[39] Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, October 2005. p. 3-93.
[40] 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. 3-107.

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 report.

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 – Hawai‘i 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.

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"Allotment to Hawai'i 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.

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

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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.

Pukui, Mary Kawena, Samuel E. Elbert, & Esther T. Mookini. *Place Names of Hawaii.* Honolulu: University of Hawai'i Press. 1976.

State of Hawai'i, Department of Transportation, Highways Division. Bridge Inspection Report, Kalauao Stream Bridge. January 15, 2011.

Superintendent of Public Works. *Report to the Governor, Territory of Hawaii, for the Year Ending June 30.* Honolulu: Various Publishers. Various Years.

Territorial Highway Department, Hawaii Highway Planning Survey. Bridge Inventory for the Island of Oahu.Prepared in Cooperation with the U.S. Department of Commerce, Bureau of Public Roads. September 1950.

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

Walker-Moody Construction Company, Ltd. "The Walker Moody Story – Company History, Start – 1940," on website http://www.walker-moody.com/index.php/company-history-start-1940.html, accessed June 13, 2012.

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

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 #_____
__X__recorded by Historic American Engineering Record # __HI-117_____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____ State Historic Preservation Office
__X__ 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

Acreage 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:

Or
UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

1. Zone: 04	Easting: 609850	Northing: 2364650
2. Zone:	Easting:	Northing:
3. Zone:	Easting:	Northing:
4. Zone:	Easting :	Northing:

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

The boundary of Kalauao Stream Bridge is defined by the outer limits of the structures, enclosed by a parallelogram measuring approximately 105' x 115' that includes the superstructures and abutments of both the eastbound and westbound bridges. See boundary map on Continuation Sheet 10.1.

Boundary Justification (Explain why the boundaries were selected.)
The boundary of the property includes all historic features of the bridges that are named Kalauao Stream 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

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.)

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.

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

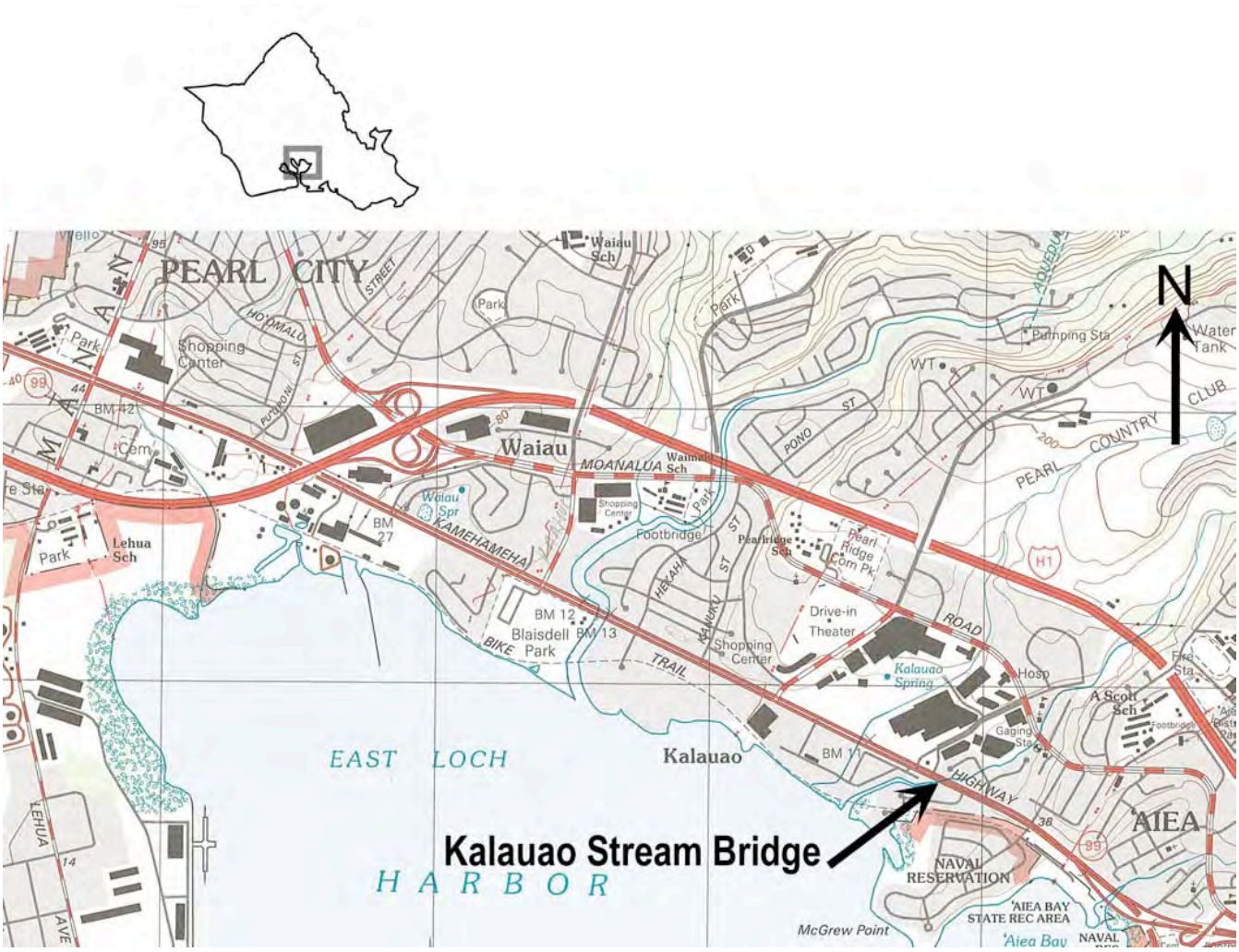

Figure 2: USGS Map showing location of property

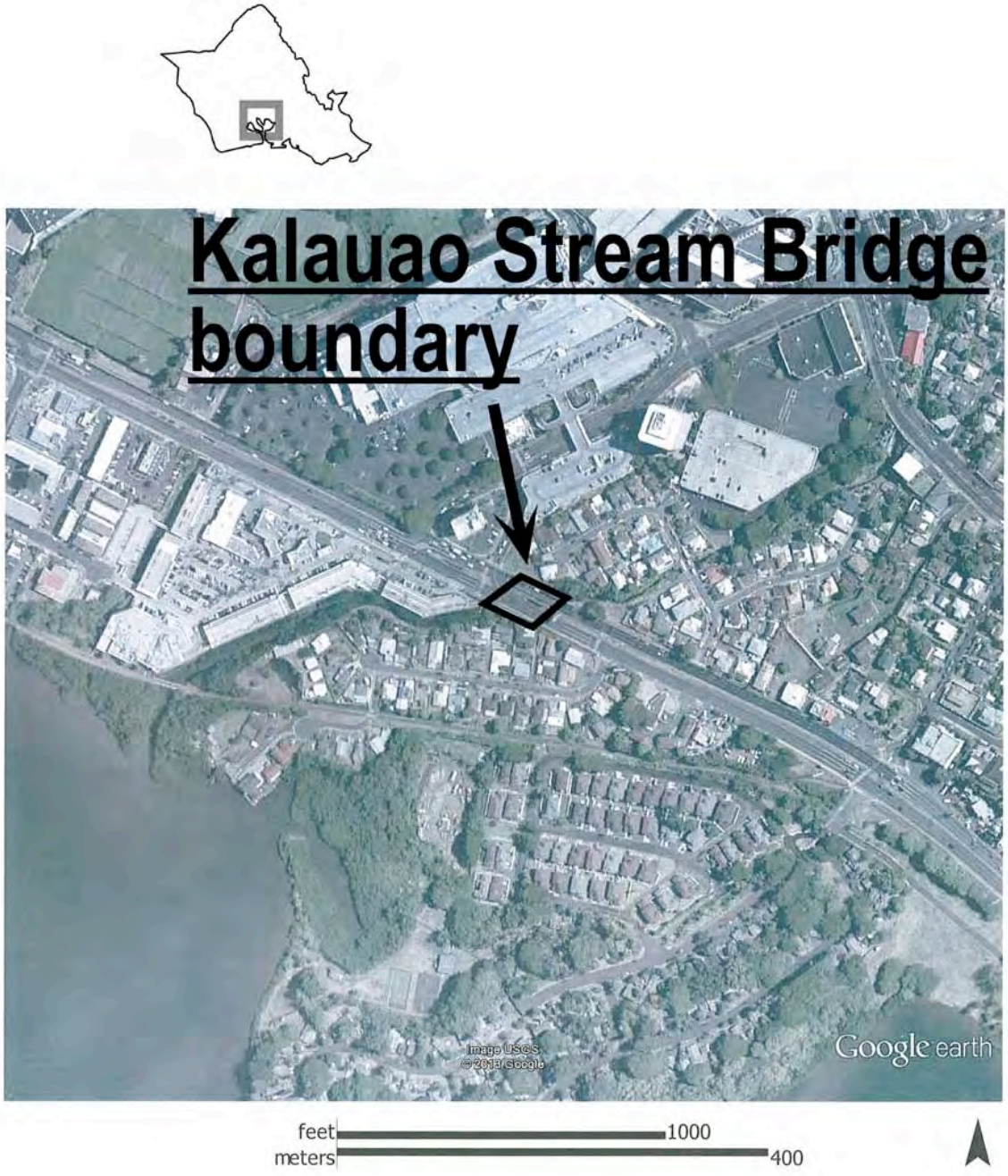

Figure 3: Historic Map showing location of property

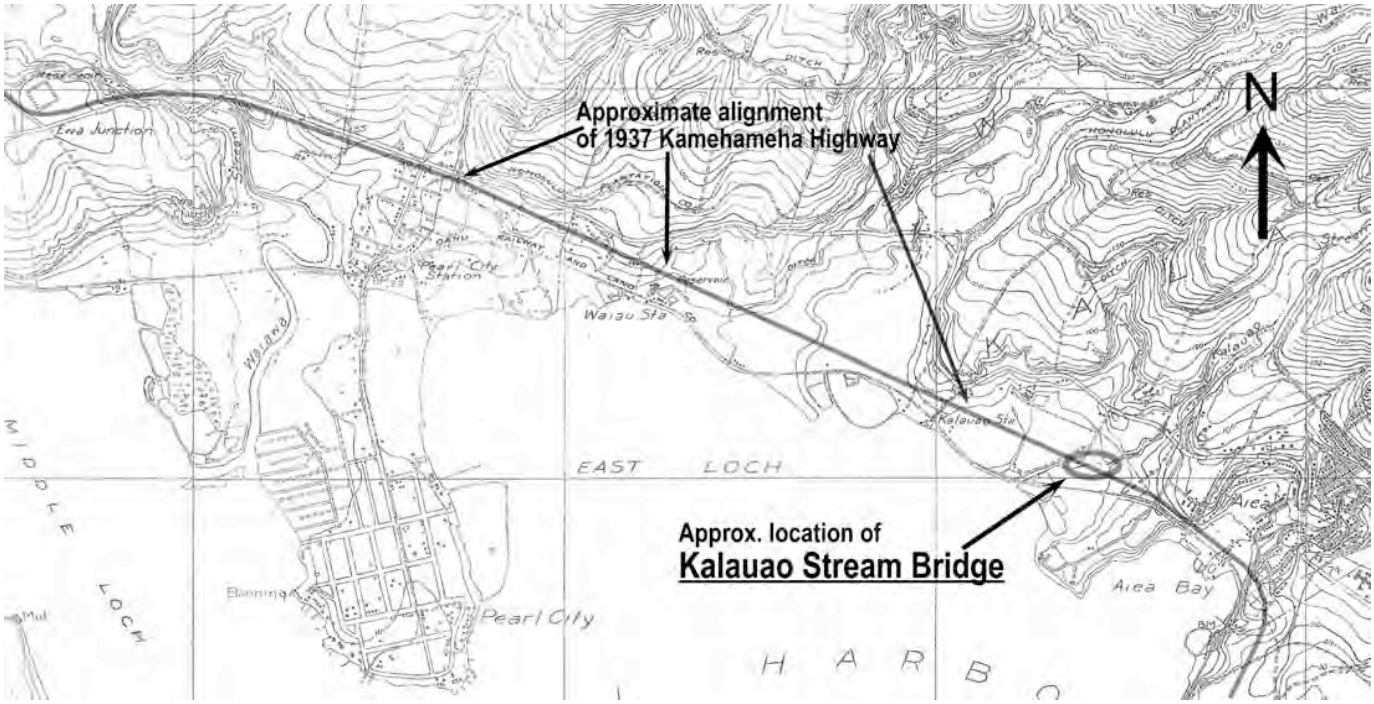

Figure 4: Historic photo showing location of property

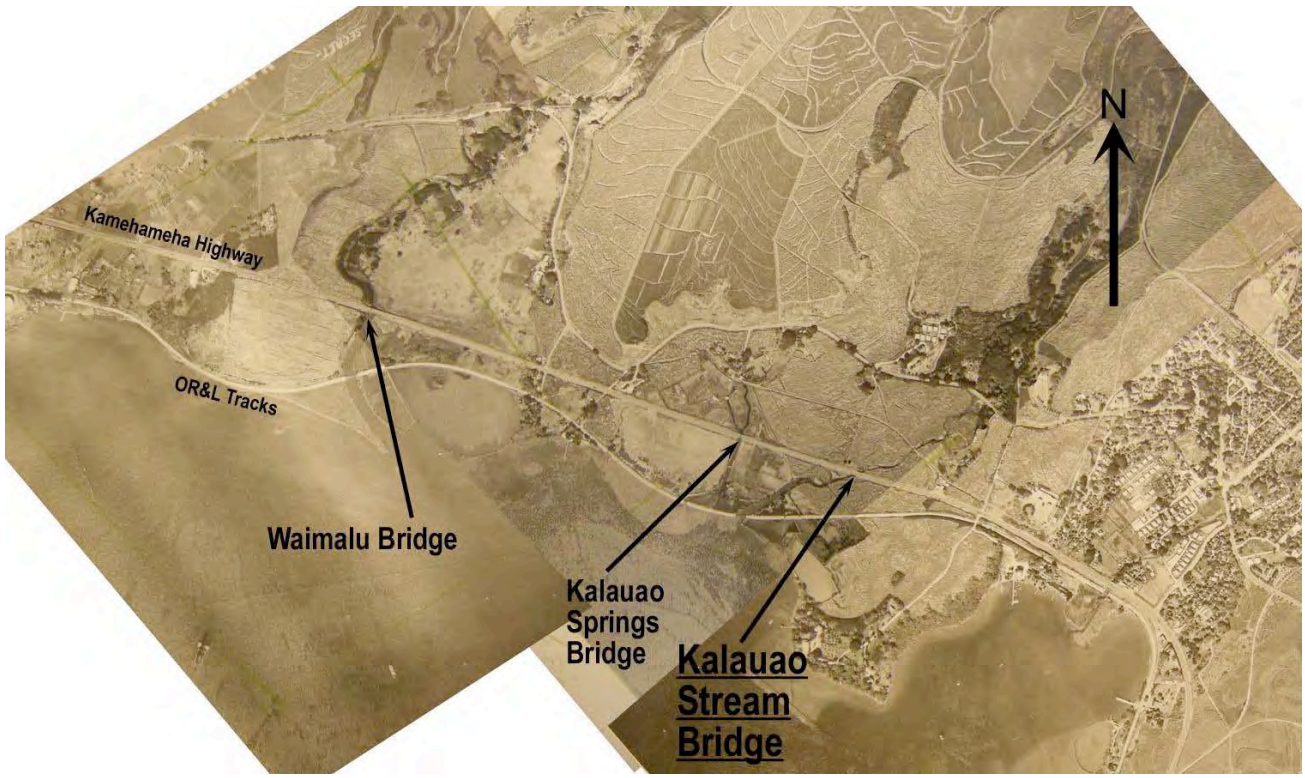

Figure 5: Historic photo showing location of property

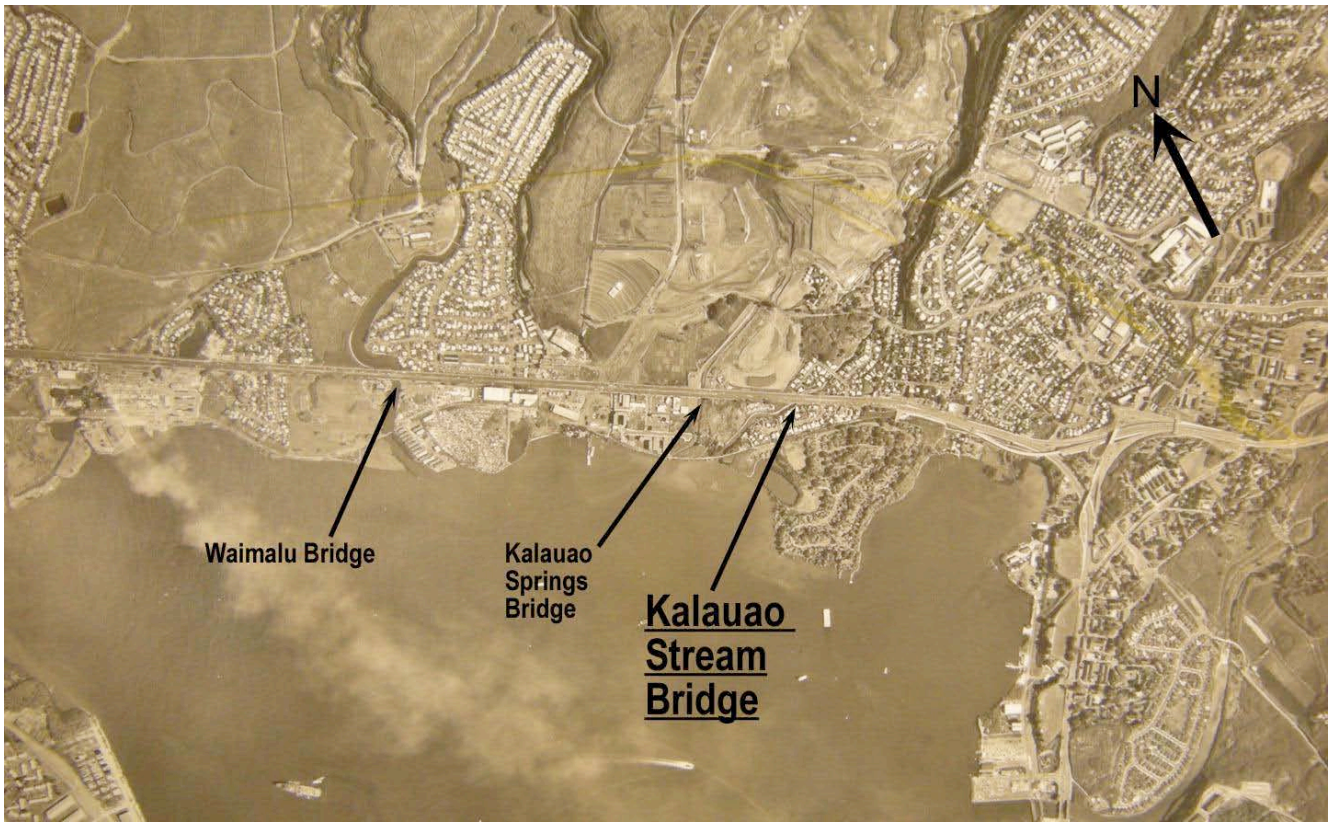

Figure 6: Historic Drawing

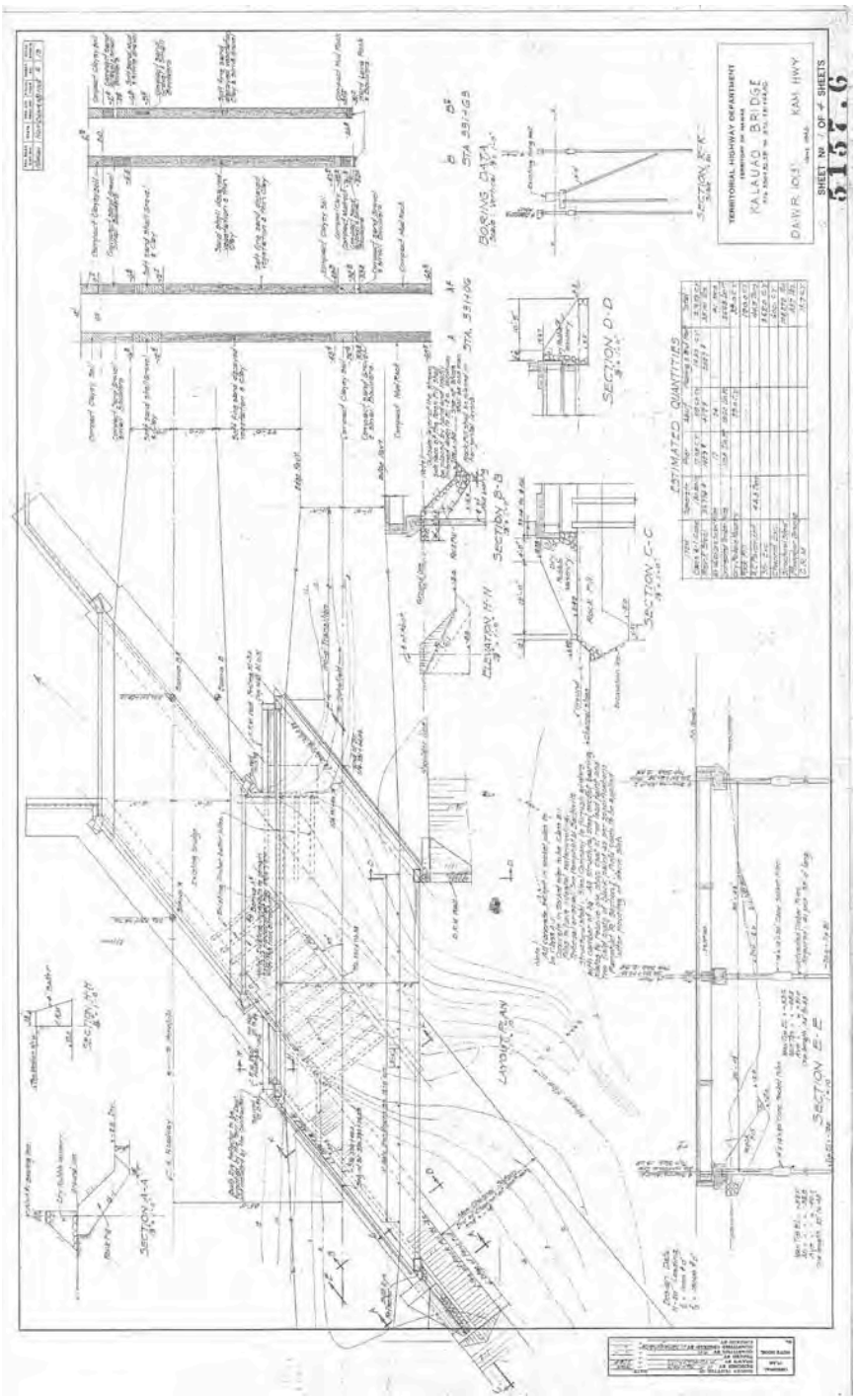

Photo #	File Name	Description
1	HI_Honolulu_KalauaoStreamBridge_0001	Overview showing approach to westbound bridge, camera facing west.
2	HI_Honolulu_KalauaoStreamBridge_0002	Overview with westbound bridge on the right and eastbound bridge on the left, camera facing northwest.
3	HI_Honolulu_KalauaoStreamBridge_0003	Overview showing approach to eastbound bridge, camera facing east.
4	HI_Honolulu_KalauaoStreamBridge_0004	Overview of approach showing the median, with eastbound bridge on the right and westbound bridge on the left, camera facing east-southeast.
5	HI_Honolulu_KalauaoStreamBridge_0005	Overview with eastbound bridge on the right and westbound bridge on the left, camera facing southeast.
6	HI_Honolulu_KalauaoStreamBridge_0006	Detail of a 1966 parapet and stanchion with scale device (one-foot increments), camera facing southwest.
7	HI_Honolulu_KalauaoStreamBridge_0007	Detail of a 1936 parapet and stanchion with scale device (one-foot increments), camera facing northeast.
8	HI_Honolulu_KalauaoStreamBridge_0008	Oblique view of a 1936 end stanchion, camera facing west.
9	HI_Honolulu_KalauaoStreamBridge_0009	Detail of 1945 end stanchion (right) with scale device (one-foot increments), camera facing northwest. Note the bullseye reflector in the end stanchion.
10	HI_Honolulu_KalauaoStreamBridge_0010	View from below of westbound bridge, showing both the 1966 pre-stressed concrete girders (right side) and the 1945 steel I-beam girders, as well as the lava rock and concrete masonry abutment, camera facing west.
11	HI_Honolulu_KalauaoStreamBridge_0011	View from below of 1936 portion of eastbound bridge deck and abutments, camera facing southwest.
12	HI_Honolulu_KalauaoStreamBridge_0012	View from below of 1945 portion of westbound bridge deck and supporting piles, camera facing northeast.

Photo Key

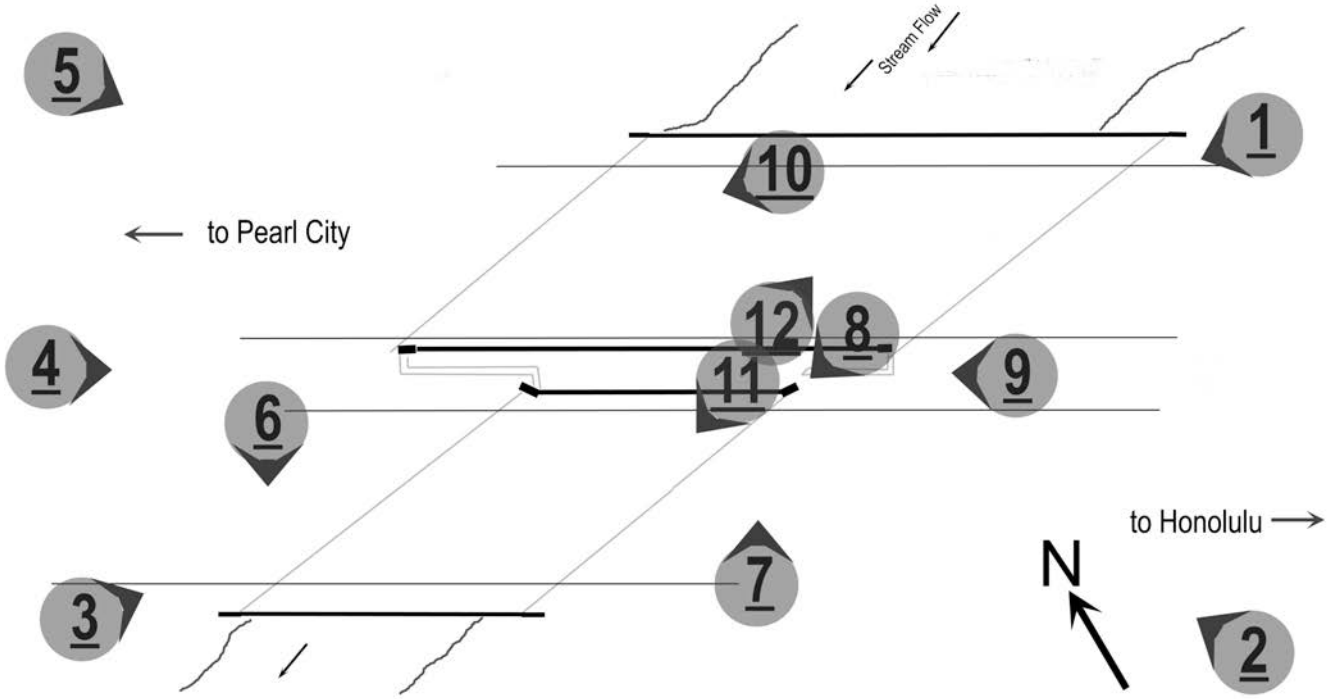

Photo:	1 of 17
Name of Property:	Kalauao Stream Bridge
City or Vicinity:	ʻAiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	Overview showing approach to westbound bridge
Camera Facing:	W



Photo: 2 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Overview with westbound bridge on the right and eastbound bridge on the left
Camera Facing: NW



Photo: 3 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Overview showing approach to eastbound bridge
Camera Facing: E



Photo:	4 of 17
Name of Property:	Kalauao Stream Bridge
City or Vicinity:	ʻAiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	Overview of approach showing the median, with eastbound bridge on the right and westbound bridge on the left
Camera Facing:	SE



Photo: 5 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Overview with eastbound bridge on the right and westbound bridge on the left
Camera Facing: SE



Photo: 6 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Detail of a 1966 parapet and stanchion with scale device (one-foot increments)
Camera Facing: SW



Photo: 7 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Detail of a 1936 parapet and stanchion with scale device (one-foot increments)
Camera Facing: NE



Photo: 8 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description Oblique view of a 1936 end stanchion
Camera Facing: W



Photo:	9 of 17
Name of Property:	Kalauao Stream Bridge
City or Vicinity:	ʻAiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	Detail of 1945 end stanchion (right) with scale device (one-foot increments). Note the bullseye reflector in the end stanchion.
Camera Facing:	NW



Photo: 10 of 17

Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description: View from below of westbound bridge, showing both the 1966 pre-stressed concrete girders (right side) and the 1945 steel I-beam girders, as well as the lava rock and concrete masonry abutment
Camera Facing: W



Photo: 11 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description View from below of 1936 portion of eastbound bridge deck and abutments
Camera Facing: SW



Photo: 12 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



Photo: 13 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



Photo: 14 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



Photo: 15 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



Photo: 16 of 17
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



Photo:	17 of 17
Name of Property:	Kalauao Stream Bridge
City or Vicinity:	‘Aiea
Photographer:	Stanley Solamillo
Date Photographed:	February 24, 2020
Description	View from below of 1945 portion of westbound bridge deck and supporting piles
Camera Facing:	NE



Photo: 18 of 18
Name of Property: Kalauao Stream Bridge
City or Vicinity: ʻAiea
Photographer: Stanley Solamillo
Date Photographed: February 24, 2020
Description

View from below of 1945 portion of westbound bridge deck and supporting piles

Camera Facing: NE



OMB Control No. 1024-0018
expiration date 03/31/2022

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 Property

Historic name: Kapalama Canal Bridge
Other names/site number: _____
Name of related multiple property listing**:**
_____
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Dillingham Boulevard and Kapalama Drainage Canal
City or town: Honolulu State: Hawaii County: Honolulu
Not For Publication: [ ] Vicinity: [x]

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 ___local

Applicable National Register Criteria:

___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**

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	X
Public – State	☐
Public – Federal	☐

Category of Property

(Check only **one** box.)

Building(s)	☐
District	☐
Site	☐
Structure	X
Object	☐

Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
		buildings
		sites
1		structures
		objects
1		Total

Number of contributing resources previously listed in the National Register _____

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

7. Description

Architectural Classification
(Enter categories from instructions.)

Bridge

Materials: (enter categories from instructions.)
Principal exterior materials of the property: Concrete

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 Kapalama Canal Bridge is a five-span, reinforced concrete tee-beam bridge located in Honolulu, on the island of Oahu. It carries Dillingham Boulevard over the Kapalama Drainage Canal. This 1930 bridge has a parapet design featuring narrow arched-top voids; a parapet design that first appeared on Oahu bridges ca. 1930 and was in use during the period between the earlier solid concrete parapets, which were typically in use during the 1920s, and the later parapets with cross-shaped voids that appeared ca. 1936. The bridge is about 113 feet in length, divided into five spans. The individual span lengths of approximately 22 feet is among the shorter span lengths for tee-beam bridges in Hawaii. Its overall length is somewhat typical, with at least four known tee-beam bridges on Oahu with longer overall spans. The bridge appears to be in fair condition, with few alterations (besides resurfacing of the roadway) since its construction.

Narrative Description

The Kapalama Canal Bridge is a reinforced concrete tee beam bridge that carries Dillingham Boulevard, an asphalt surfaced roadway approximately 56 feet wide, over the Kapalama Drainage Canal. At both sides of the roadway crossing the bridge are 9'-10" wide concrete walkways set about 5 inches higher than the roadway, which form curbs. The bridge has five spans of about 22'-6" each, for a total length of about 113 feet.

At the ends of the parapets are concrete end stanchions, which are rectangular in plan and elevation. The end stanchions are 4'-6" wide, 2' thick, and 3'-4" high with a 9" high base and an 8" high cap. On the top of the cap, set about 2" in from the edge is a low-sloped hip, about 1½" high at its highest point, or "ridge". Between the base and top cap, the vertical sides of the end stanchions are inset about 3". The three sides of the end stanchions not facing the parapet each have inset panels, the front and back panels are 3'-5" x 1'-3" and the side panel is 1' x 1'-2". The same low-sloped hip shape found on the top of the caps is also inset within the rear and side panels. Typically, concrete bridges of this type and period have date and name inscriptions on their end stanchions. Here, "Kapalama Canal" is on the front panels of the northeast and southwest stanchions. On the front panels of the northwest and southeast stanchions is the date "1930". The incised block letters of the inscriptions are about 3" high.

The top of the cap of each end stanchion has been partially re-surfaced with concrete. The southeast stanchion has a portion of this added concrete chipped away to reveal that a steel pipe with an inside diameter of about 2" is imbedded vertically in the center of the stanchion.

The concrete parapets of the bridge are about 3'-1" high with a bottom rail measuring 9" high by 1'-6" wide, and a top rail that is 6" high and 1' wide. The upper surface of the top rail is slightly peaked. Between these rails are 6" thick 1'-10" high concrete panels that are perforated with narrow arched openings. These openings are spaced at 1' on center (o.c.), with each measuring 6½" wide and 1'-2" high. Along the length of the parapet are four rectangular stanchions which are 2'-9" wide, 2' thick, and about 3'-3" high. These stanchions have an 8" high cap with a hip-bevel decoration raised about 1½" above the cap. The inboard and outboard faces of the stanchions have 1'-8" x 1'-2" inset panels with a hip-bevel decoration.

The substructure of the Kapalama Canal Bridge consists of concrete abutments and masonry wing walls with coursed, quarry-faced basalt lava rock set in concrete mortar. At some sections of the wing walls, such as at the southwest, the mortar joints are raised in a v-profile. The four bents of the bridge are concrete transverse beams with beveled ends. Each transverse beam is supported by about fourteen concrete, square-section piles that are driven down into the stream bed. The transverse beams in turn support the longitudinal concrete beams of the bridge superstructure.

Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

Site Information:

The Kapalama Canal Bridge is located along a well-traveled commercial section of Dillingham Boulevard. East of the bridge is the campus of Honolulu Community College. A strip mall lies to the south, and a used car lot to the north. Kapalama Shopping Center is located about 1 block northwest of the bridge. The setting around the bridge has changed greatly since its construction. At that time, the area around it was vacant; the land fronting Dillingham Boulevard between about Waiakamilo Road and what would become Alakawa Street was undeveloped.

Integrity Assessment

The location of the property has not changed. The Kapalama Canal Bridge is in its original location.

The setting of the property has changed. When the bridge was constructed, the surrounding area, including the land between the former Kapiolani and Bishop Estate tracts to the west, and the commercial area of Iwilei to the east, was vacant. No buildings existed along Dillingham Boulevard from (what would become) Alakawa Street westward, almost to Waiakamilo Road. Now the area has dense commercial development. Integrity of setting is not retained.

The design, materials, and workmanship of the property are retained. The historic character of the bridge's stanchions and parapet is still apparent. They retain sufficient integrity of their original form (design), physical elements (materials), and evidence of skill (workmanship) employed in their construction, to allow the bridge to reflect its historic appearance. Besides road resurfacing, the only noticeable alteration is the removal of vertical metal poles that once projected up from the end stanchions.

The feeling and association of the property are largely retained. Although changes to the setting have somewhat degraded the bridge's ability to communicate its identity, the bridge still 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.

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.)

- [X] 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

Areas of Significance
(Enter categories from instructions.)

Transportation

Period of Significance

1930-1949

Significant Dates

1930

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder

Daniel Balch, Assistant City and County of Honolulu Engineer
George K. Dawson, City and County of Honolulu Engineer

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 1930 Kapalama Canal Bridge is significant at the local level under Criterion A for its contribution to the development of an effective road transportation system on Oʻahu; as part of Dillingham Boulevard, an important arterial in Honolulu's urban core. The bridge facilitated passage along the boulevard through the Kapalama area and provided an improved linkage between Honolulu's downtown, the port area, and points west to Pearl Harbor. The property's significance in the area of transportation (Dillingham Boulevard) is for the period from the 1930 bridge construction through 1949, when Nimitz Highway replaced Dillingham Boulevard as the main corridor in this vicinity. Between those dates, the bridge was a critical element of the main transportation route from downtown to Pearl Harbor, and other points west.

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

The Kapalama Canal Bridge is significant at the local level under Criterion A as a part of the extension of Dillingham Boulevard from downtown Honolulu through the Kapalama area to the residential area centered at Kalihi Street, and further west to Pearl Harbor. The Kapalama Canal Bridge was built by the City and County of Honolulu in 1930 in conjunction with the construction of the section of Dillingham Boulevard between Waiakamilo Road and King Street. Engineers working on the project were Assistant City and County Engineer Daniel Balch and structural engineer George Dawson.[1]

The construction of Kapalama Canal Bridge in 1930 and the development of Dillingham Boulevard opened the entire tract of land between King Street and Waiakamilo Road for development, as well as providing a direct route from downtown to Pearl Harbor and other points west, including the John Rodgers Airport, which opened in March 1927. The Kapalama Canal Bridge and the connection of Dillingham Boulevard to North King Street in 1930 created better access to downtown for the Kapiolani Tract, the Bishop Estate Tract, and the planned industrial subdivision in the Kapalama area. The Kapalama industrial area could not be developed until the Kapalama Drainage Canal was completed in 1939. A December 1935 newspaper article reported on a small boom in residential development that was occurring on the *makai* side of Dillingham Boulevard, despite the Great Depression.[2] Numerous elements, including the draining of the area, the construction of the bridge and road, and the subsequent construction of the Kapalama Canal, were necessary for the transformation of Kapalama - from wetlands to buildable acreage - to take place. An aerial photograph dated 1963 shows that by this time, nearly all of the parcels surrounding the Kapalama Canal Bridge were fully developed, which marked the culmination of the development of an industrial district that was envisioned nearly four decades earlier.[3]

[1] Bethany Thompson, Historic Bridge Inventory, Island Of Oahu. Honolulu: State of Hawaii Department of Transportation, Highways Division. June 1983. pp. VII-13.
[2] "Little America," December 4, 1935 article in the University of Hawaii, Hamilton Library, Honolulu Newspapers Clippings Morgue, on microfiche in Subject section under: Dillingham Boulevard. .
[3] Hawaii State Archives, Folder PPA-48-3, photo EKM-2CC-206. January 12, 1963.

History of the Kapalama Area

The Kapalama Canal Bridge is located within the Kapalama ahupua'a.[4] In the Hawaiian language, Kapalama means "the enclosure of lama." In Hawaiian, *lama* means light, as in enlightenment and palama refers to a compound, enclosed by sacred lama wood.[5] Lama also was used to describe the enlightenment found through dance. By legend, such an enclosure was located there, hence the name.[6]

At the time of the Mahele, [7] ca. 1850, the terraced area of Kapalama that extended from the edge of the sea to the foothills (above what would become School Street) was planted in taro.[8] Two streams, Niuhelewai Stream and Kapalama Stream drained this area. Kapalama Stream extended mauka[9] on a route running just east of Waiakamilo Road / Houghtailing Street before crossing west near H1 Freeway to extend up Kalihi Valley east of Kalihi Street. Niuhelewai Stream was about one-half-mile east of Kapalama Stream, extending up to a spring located just makai of (future) School Street. This spring was west of Lanakila Street and just across School Street from the former Insane Asylum (now the site of Hawaii Public Housing Authority). Near (former) Vineyard Boulevard (now Halona Street / H1 Freeway), a branch of Niuhelewai Stream extended northwest, crossing School Street near Houghtailing and meandering mauka. Niuhelewai is described in Place Names of Hawaii as "Old part of Honolulu, site of a battle in which Ka-hekili of Maui defeated Ka-hahana of O'ahu; a stream here was choked with corpses."[10]

By the late 1800s, rice was planted in Kapalama surrounding the site of the future bridge.[11] Pineapples were planted farther west, near what would become Kalihi Street. To the east, the area of Iwilei was an industrial site near the edge of downtown Honolulu that contained a fertilizer works, a slaughterhouse, and a prison. King Street was the only east-west road through Kapalama and the Oahu Railway & Land Co. (OR&L) main line ran just makai of King Street. By 1912, School Street was built westward through Kapalama to Kalihi Street, and the former OR&L line makai of King was now called the Kalihi Line. A new main line ran makai from the downtown depot before intersecting the Kalihi Line just west of Middle Street. The Kalihi line appears to have been abandoned in the late 1920s.

Kapalama had begun to urbanize with the 1901 establishment of the Kapiolani Tract subdivision by developer William C. Achi. This subdivision was on a grid pattern with about 1200 lots in two north-south rows of blocks. The subdivision extended makai from King Street between Kalihi Street and Puuhale Road. Further urbanization occurred by 1912, with the Bishop Estate Tract that extended east of the Kapiolani Tract to Waiakamilo Road. Queen Street ran west-east through both subdivisions, terminating at Waiakamilo Road. The area of Kapalama between the two OR&L lines and between Waiakamilo Road and Iwilei was planted in sugarcane.[12]

[4] Hawaiian term for a geographical area that typically extends from the mountains to the sea.
[5] Lama is the Hawaiian name for the endemic ebony trees, Diospyros. Pālama as defined above. Hawaiian Dictionaries. Accessed June 1, 2020. http://wehewehe.org/gsdl2.85/cgi-bin/hdict?e=q-11000-00---off-0hdict--00-1----0-10-0---0---0direct-10-ED--4--textpukuielbert,textmamaka-----0-1l--11-en-Zz-1---Zz-1-home-palama--00-3-1-00-0--4----0-0-11-00-0utfZz-8-00&a=d&d=D131799.
[6] Sterling, Elspeth P. and Catherine C. Summers, *Sites of Oahu* (Honolulu: Bishop Museum Press) 1978. p. 319.
[7] The transformation of Hawaiian traditions of royal land tenure to the codified western practice of private land ownership.
[8] Sterling and Summers, *Sites*, p. 320.
[9] Mauka is a Hawaiian word meaning "in the direction of the mountains." Makai is a Hawaiian word meaning "in the direction of the sea."
[10] Mary Kawena Pukui and Samuel H. Elbert and Esther T. Mookini, *Place Names of Hawaii* (Honolulu: University of Hawaii Press) 1974. p. 166.
[11] Monsarrat, M.D. map "Honolulu, Hawaiian Islands," 1897.
[12] "Cost of Big Drain Project is Set High," *Honolulu Advertiser*, November 14, 1924. p. 1.

West Queen Street Extension (Dillingham Boulevard) and the Kapalama Canal Bridge

By 1922 the City and County of Honolulu had plans to fill this vacant area with a grid of streets, centered around the extension of Queen Street from Waiakamilo Road, to an intersection with King Street at Liliha Street. This was referred to as the West Queen Street Extension[13] and would eventually become Dillingham Boulevard. By the end of the 1920s, the City and County had laid down a solid roadbed of fill along this route and installed sewer lines. An article in the Honolulu Star Bulletin reported that in February of 1930, the City and County of Honolulu was still waiting for this fill to settle before surfacing the roadway and installing its curbs, walkways, and lighting.[14] This additional work for 4300 feet of roadway was anticipated to be contracted in the summer of 1930, and was estimated to cost $180,000.

The Honolulu Star Bulletin also reported that in 1930 the City and County planned a canal (Kapalama Drainage Canal) to join the area's two streams (Kapalama Stream and Niuhelewai Stream) at a cost of about $750,000, to "fill the same purpose as the Ala Wai."[15] Earth from the dredged canal would fill nearby low lying land. The 110-foot Kapalama Canal Bridge was planned to span the planned Kapalama Drainage Canal at a cost of about $35,000. However, the bridge was completed years before the canal was even begun. When built, the bridge spanned Niuhelewai Stream and perhaps some portion of adjoining wetlands until the canal was dredged.

The contractor for the Kapalama Canal Bridge is unknown. The engineers were Daniel Balch and George K. Dawson.[16] At the time of the bridge's construction, Daniel Balch was Assistant to City and County Engineer Louis S. Cain, and George Dawson was a structural engineer for the City and County. Balch began his career in 1915 as an engineer for the Territorial Harbor Board.[17] In 1925 he began work for the City and County of Honolulu as assistant engineer to Louis Cain. (Balch followed Cain to the Territorial Department of Public Works as assistant Superintendent in 1935 when Cain became Superintendent. Balch became Superintendent upon Cain's death in 1940 and retired in 1943.[18]) Little is known about George Dawson, except that he was engineer for the 1932 steel through-deck Karsten Thot Bridge over the Wahiawa Reservoir,[19] as well as the 1932 Queen Street Bridge (Nuuanu Stream), both on Oahu.

In early October 1930, the City and County Board of Supervisors named the new West Queen Street Extension "Dillingham Boulevard," in honor of Benjamin F. Dillingham (1844-1918),[20] who had built Oahu's first railroad, was responsible for the formation of several sugar plantations, and was associated with the dredging and construction of Pearl Harbor Naval Base. In 1931 Dillingham Boulevard was extended west of Puuhale Road to Pearl Harbor. The full length of Dillingham Boulevard from Honolulu to Pearl Harbor was in place by late October 1931 when it was called "one of Oahu's finest highways." [21]

Another road running in a roughly east-west direction towards Pearl Harbor was the next logical development. The eight-lane Honolulu to Pearl Harbor road (later named Nimitz Highway), which began at Waiakamilo Road and terminated at Pearl Harbor, was soon built makai of Dillingham Boulevard.

[13] City Planning Commission, City and County of Honolulu, map "Proposed Street Plan Kapalama Section," December 1922.
[14] "Contract for Queen Street Work Will Be Let This Summer," *Honolulu Star Bulletin*, February 1, 1930. Sec. 2, p. 1.
[15] Ibid.
[16] Thompson, Historic Bridge Inventory Oahu, VII-13.
[17] "Daniel Balch New Chief of Public Works," *Honolulu Star Bulletin*, September 17, 1940.
[18] "D.F. Balch," obituary, December 19, 1961.
[19] Heritage Center, School of Architecture, UH Manoa, State of Hawaii, Historic Bridge Inventory and Evaluation (Draft prepared for the State of Hawaii, Department of Transportation, Highways Division) 2008. p. V-43.
[20] "Memory of B.F. Dillingham Honored By Supervisors In Naming New Boulevard," Honolulu Advertiser, October 8, 1930, 1.
[21] "Dillingham Boulevard Is One Of Oahu's Finest Highways," *Honolulu Star Bulletin*, October 31, 1931. Sec. 3, p. 1.

Construction for it began in July 1941, but it took many years to complete. Delays were due partly to the fact that during World War II a rail line located along this corridor was in heavy use. Only after the war did a preference for trucking lead to the closure of railroads. Following the war, the necessary parcels along the corridor were acquired and construction on the road resumed. Nimitz Highway, finally completed in 1949, "cost the federal government $1,388,000, with lesser funding amounts provided by the Territory of Hawaii and the City & County of Honolulu." [22] Once complete, Nimitz Highway replaced Dillingham Boulevard as the main corridor in this vicinity.

Kapalama Drainage Canal

The potential commercial value of the low-lying land of the Kapalama area makai of King Street was understood since at least the early 1920s. In 1923-24, the Territorial Board of Health condemned as unsanitary almost 58 acres in this area. The board ordered the land filled, and by June 30, 1924 approximately eleven acres had been filled with spoils from the dredging of the harbor slip between Piers 16 and 17. An additional eleven acres was contracted to be filled by the Hawaiian Dredging Co and paid for from the territorial sanitation fund. The 1924 Annual Report of the [Territorial] Department of Public Works stated, "this district is being gradually converted into an industrial center of considerable magnitude and these filling operations have converted practically worthless swamp lands into property selling as high as $30,000 per acre."[23] During 1924-25, little fill was added to the condemned land because of the unavailability of fill material within pumping distance of the project. However, when Kapalama Basin in Honolulu Harbor was dredged (1925-1926), the remaining acreage was raised to grade level using that fill. In mid-1926 the "entire district [was] being gradually converted into an industrial center of considerable magnitude."[24]

The City and County of Honolulu began planning a drainage system to prevent heavy rains from inundating the filled acreage. In August 1924, city planning engineer Capt. Charles Welsh submitted a drainage plan for what would become the Kapalama Drainage Canal to the City Planning Commission.[25] Welsh's plan called for an open canal, fiev feet deep and 100 feet wide, extending about 4000 feet mauka from Kapalama Basin slightly west of Niuhelewai Stream. At the mauka point (near the mauka side of Vineyard Street extension), the original plan had the canal curving to the northwest before branching into two open drains. One of these branches extended northwest to Houghtailing Road and then near School Street and Kapalama Avenue. The other branch ran northeast to School Street and became a (closed) box drain extending up Houghtailing Street to Konia Street.

This initial plan contained the basis for the final design of the Kapalama Drainage Canal system in that it "combines the two streams which now meander across Palama district into one channel through the lowest section of that area. The combination of these two streams into a single channel also permits the full development of the maximum amount of land in that portion of the city. It also provides a minimum amount of drainage sewers to be maintained from public funds."[26]

[22] Mason Architects, Inc, Nimitz Highway Improvements Project Historic Resources Survey Phase II (Prepared for Parsons Brinckerhoff, Inc.) 2005. p. 16.
[23] Superintendent of Public Works, *Report to the Governor of the Territory of Hawaii for the Year Ending June 30*, 1924 (Honolulu: Honolulu Star Bulletin) 1925. p. 10-11.
[24] Superintendent of Public Works, *Report to the Governor of the Territory of Hawaii for the Year Ending June 30*, 1926 (Honolulu: Honolulu Star Bulletin) 1927. p. 6.
[25] "Captain Charles R. Welsh Submits First Report To City Planning Commission On Drainage Plan For Kapalama District," *Honolulu Advertiser*, August 10, 1924, p. 12.
[26] "Capt. Welsh Submits Report," *Honolulu Advertiser*, August 10, 1924. p. 12.

In November 1924, the City and County altered Welsh's original plan by adding a branch to the area of the insane asylum at School and Liliha Streets, and a branch to Kamehameha School (present Bishop Museum).[27] The depth of the large canal at the lower section was increased to about nine feet, and the projected cost of the project was $837,000. Although Welsh's original plan in August pointed out the development potential of draining this area, an additional road across Palama was needed to alleviate the congestion on King Street. This additional road was the West Queen Street Extension (later Dillingham Boulevard), but "it would be useless to build a new street on fresh fill across this land unless the flood waters coming down from the mountains were taken care of first." [28]

Although the Honolulu Advertiser asserted in November 1924 that the Queen Street extension "cannot be done until a drainage canal is constructed"[29] the City and County had different ideas; the Kapalama Canal Bridge and the West Queen Street Extension/Dillingham Boulevard were completed in 1930-31, at least six years before the Kapalama Drainage Canal was started.

The canal got underway sometime in late 1937 to early 1938. A Works Progress Administration (WPA) grant of $310,000 partly funded the $670,000 project; the remaining money came from bond sales of $300,000 and reserves from the city's flood control fund.[30]

The Hawaiian Contracting Company of Honolulu (a Dillingham company) completed the Kapalama Drainage Canal in February 1939 in just under a year. The shape and configuration of the final drainage system includes a canal extending mauka from Kapalama Basin along the approximate contour of Niuhelewai Stream, to about Vineyard Street where narrower branch channels extend to School Street and Kapalama Avenue, School and Houghtailing Streets, and School and Liliha Streets. When completed, the system contained 2.6 miles of canal and other drainage structures and drained an area of 1,145 acres.[31]

Tee-Beam Bridges On Oahu

Concrete tee-beam bridges are the most common type of extant pre-World War II bridges in the state of Hawaii.[32] They are a part of the evolution of reinforced-concrete deck bridge technology in Hawaii that began with the first slab bridges around 1908. Often County-designed, these early slab bridges frequently consisted of concrete decks replacing older type superstructures on their original abutments, which were often mortared lava rock.

Design of reinforced-concrete bridges progressed rapidly during the first decades of the 20th century.[33] The strength of concrete girder and tee-beam types, and their lower cost, led to their use in locations with short spans, rather than the concrete arched types.

Although the earliest tee-beam bridges in Hawaii date from around 1912, after about 1925 this bridge type became the preferred choice for bridge construction by the Territorial Highway Department. The pattern of reinforcing steel within the girders is the feature that most distinguishes the tee-beam type from other concrete girder bridges. Changing the arrangement of the reinforcing steel in the girders and deck, from the configuration used in earlier concrete girder bridges, serves to structurally join the two and allows

[27] "Proposed Kapalama Plan Discussed at Meetings of Planners and Public," *Honolulu Advertiser*, November 16, 1924, p. 14.
[28] Ibid.
[29] Ibid.
[30] "Start Canal at Kapalama in December," and "Kapalama Flood Control Bonds May Be Sold In Issue," *Honolulu Advertiser*, October 1, 1937, p. 1, p. 4. "Delay Seen On Flood Project," *Honolulu Star Bulletin*, October 1, 1937. p. 3.
[31] "Another Step Forward in Flood Control," *Honolulu Star Bulletin*, February 25, 1939, p. 12.
[32] Heritage Center, School of Architecture, UH Manoa, State of Hawaii, Historic Bridge Inventory and Evaluation (Draft prepared for the State of Hawaii, Department of Transportation, Highways Division) 2008. p. I-72.
[33] 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 Project) October 2005. pp. 2-26.

the two components to work together; thus tee-beam bridges can efficiently carry a greater load.[34] This relatively small change over standard concrete girder construction provided an increased carrying capacity, and the tee-beam type quickly came into wide use, with examples constructed into the 1950s.

Tee-beam bridges in Hawaii generally had parapets with voids, below a reinforced-concrete rail cap. “Several standard rail patterns [were] used by the Territorial Highway Department, either "Greek-cross", arched, or simple rectangular voids.”[35] Earlier masonry (lava rock or concrete) bridges typically had solid railings.

[34] Ibid. p. 3-88.
[35] Heritage Center, School of Architecture, UH Manoa, State of Hawaii, Historic Bridge Inventory and Evaluation (Draft prepared for the State of Hawaii, Department of Transportation, Highways Division) 2008. p. I-72.

9. Major Bibliographical References

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

No drawings or early photographs of the original 1930 bridge were located for this report.

Historic aerial photographs of the area around the bridge are located at the Hawaii State Archives in folders PPA-48-3, PPA-49-4, and PPA-58-2. Current aerial photo from Google Earth 6.1. Kalihi vicinity. Approximate elevation 3000', Borders and Labels data layer. Available from server kh.google.com. accessed February 21, 2013.

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Honolulu Advertiser

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"Kapalama Plan." August 15, 1924. p. 11.

"Cost Of Big Drain Project Is Set High." November 14, 1924. p. 1.

"Proposed Kapalama Plan Discussed At Meeting Of Planners and Public." November 16, 1924. p. 14.

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"New Bids For Puuloa Project." September 18, 1931. p. 12.

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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 # _____
____ 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: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property ___Less than one (1) 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:

Or

UTM References
Datum (indicated on USGS map):

☐ NAD 1927 or ☐ NAD 1983

1. Zone: 04	Easting:	616860	Northing: 2358210
2. Zone:	Easting:		Northing:
3. Zone:	Easting:		Northing:
4. Zone:	Easting :		Northing:

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

The boundary of the Kapalama Canal Bridge is defined by the outer limits of the structure, enclosed by a parallelogram measuring approximately 125' x 80' that includes the superstructure and abutments.

Boundary Justification (Explain why the boundaries were selected.)

The boundary of the property includes all historic features of the bridge.

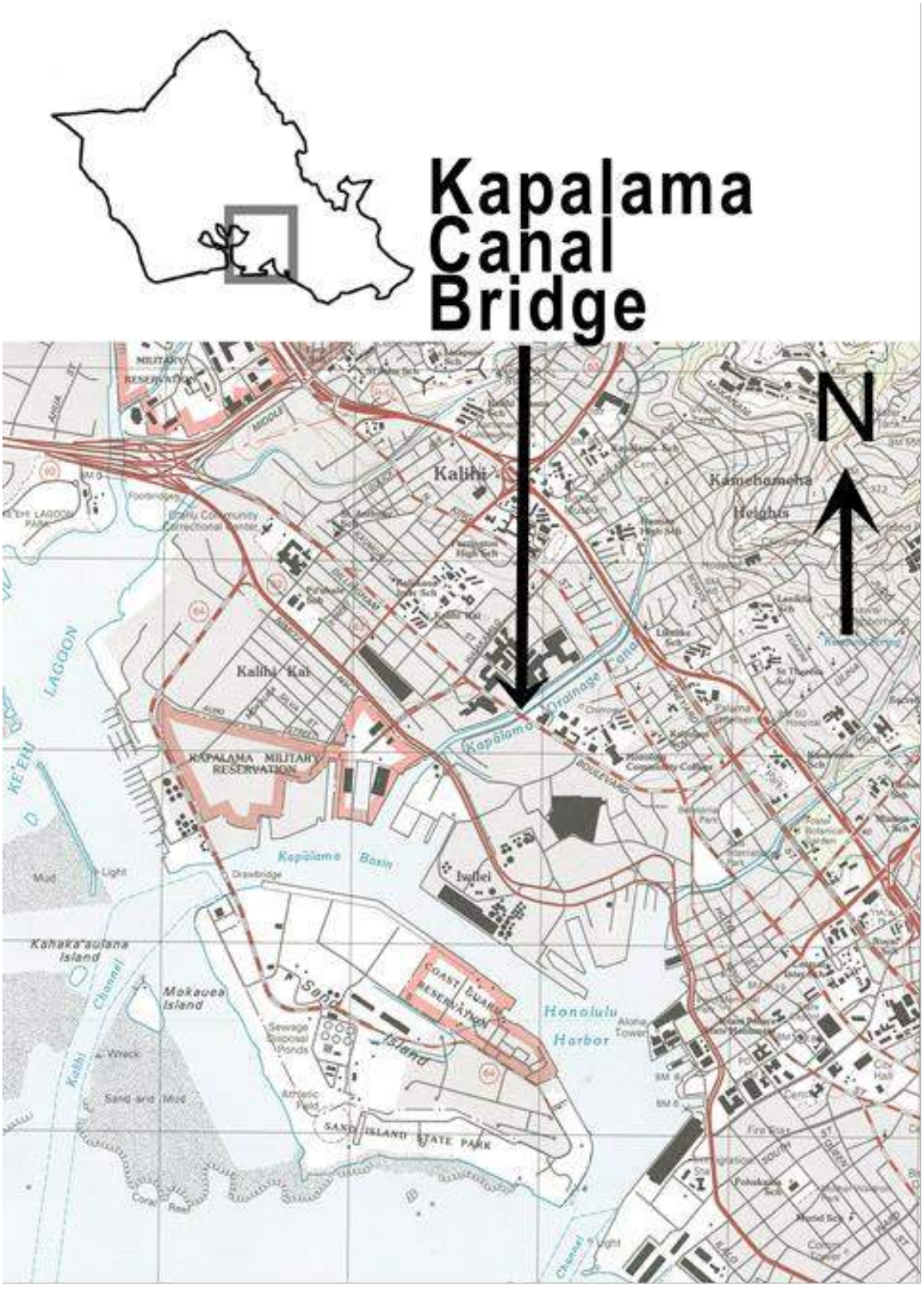
11. Form Prepared By

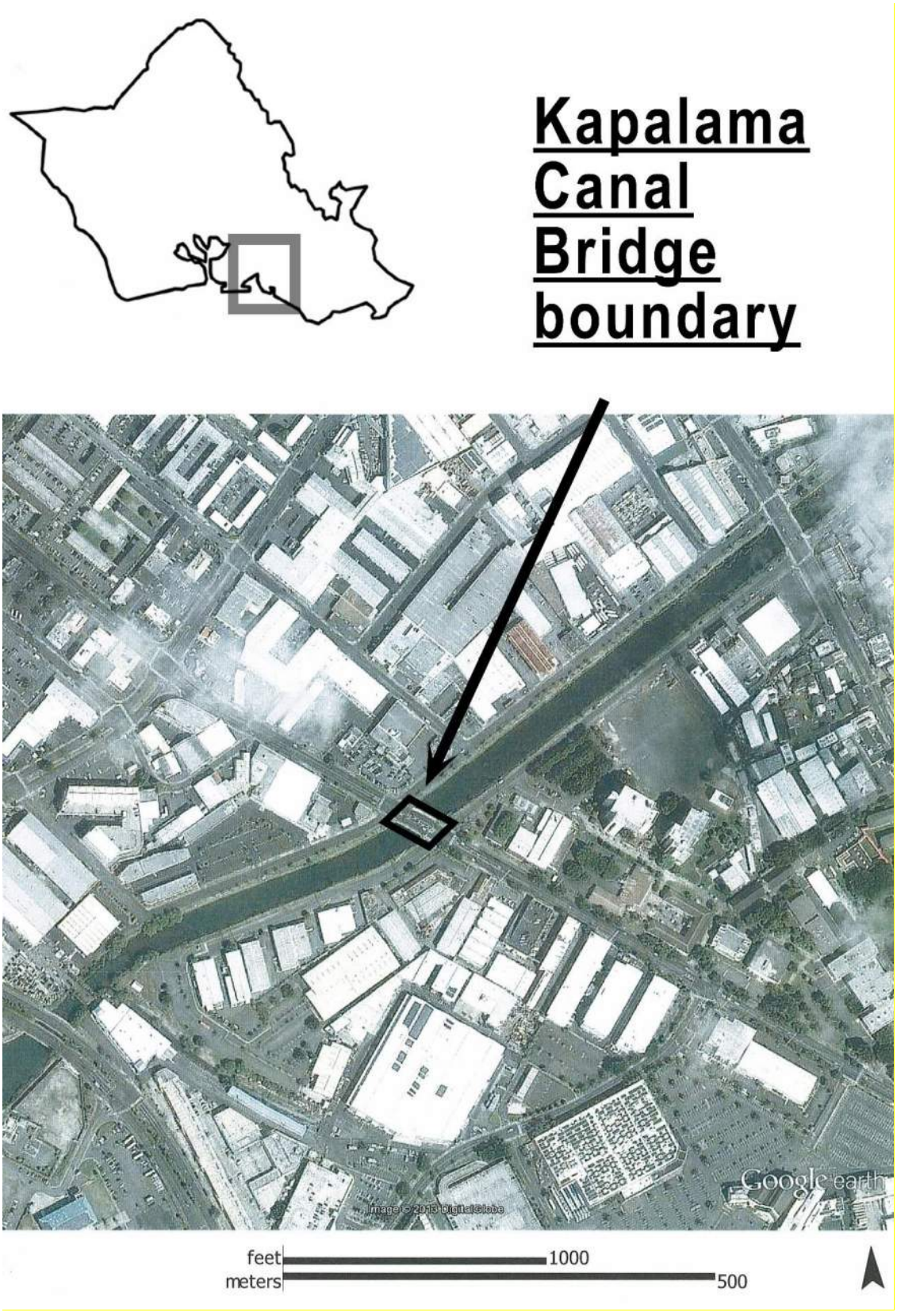
name/title: Dee Ruzika
organization: Mason Architects, Inc.
street & number: 119 Merchant Street, Suite 501
city or town: Honolulu state: Hawaii zip code: 96813
e-mail dr@masonarch.com
telephone: 808.536.5336
date:

Additional Documentation

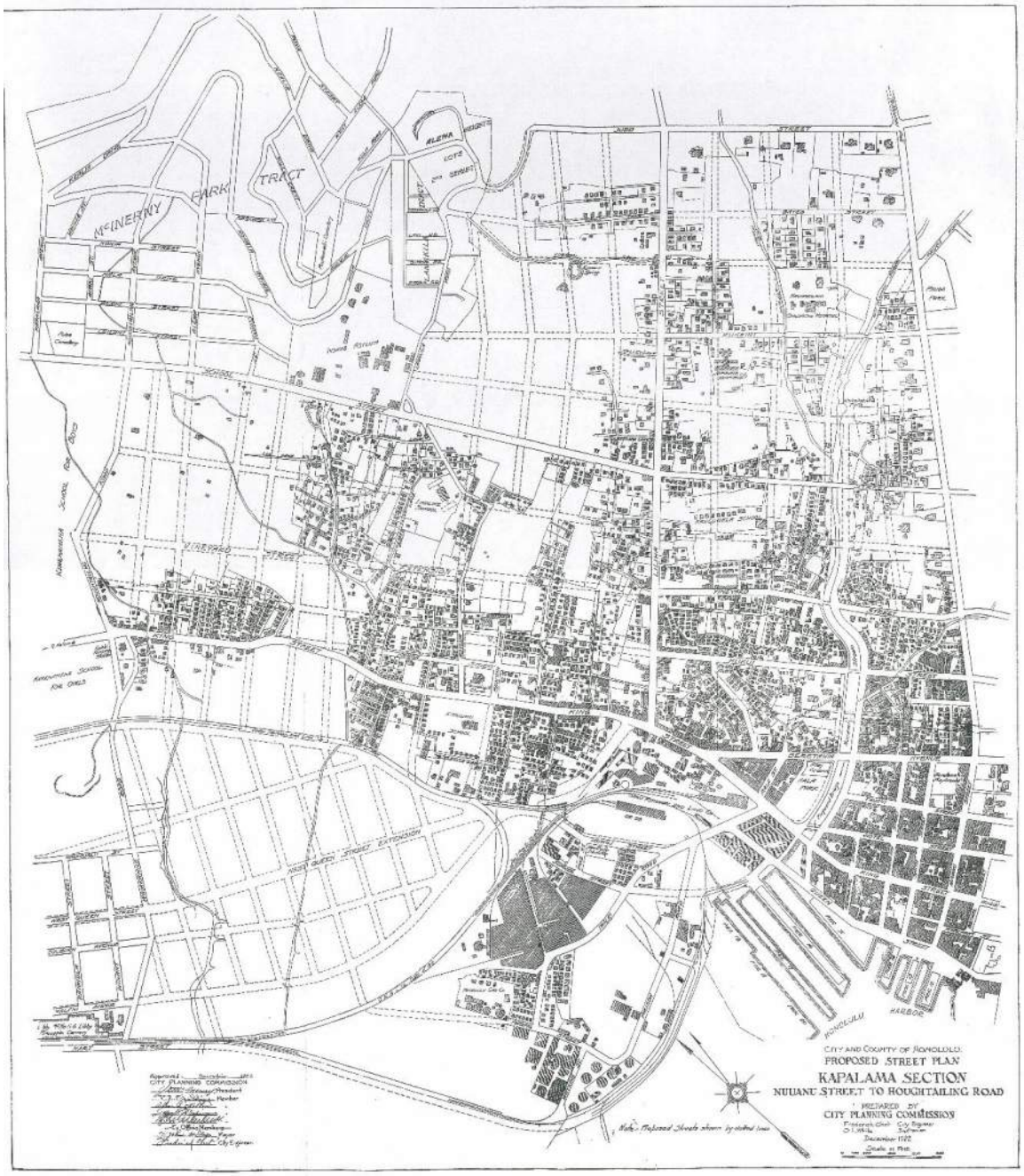
Submit the following items with the completed form:

- **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.)

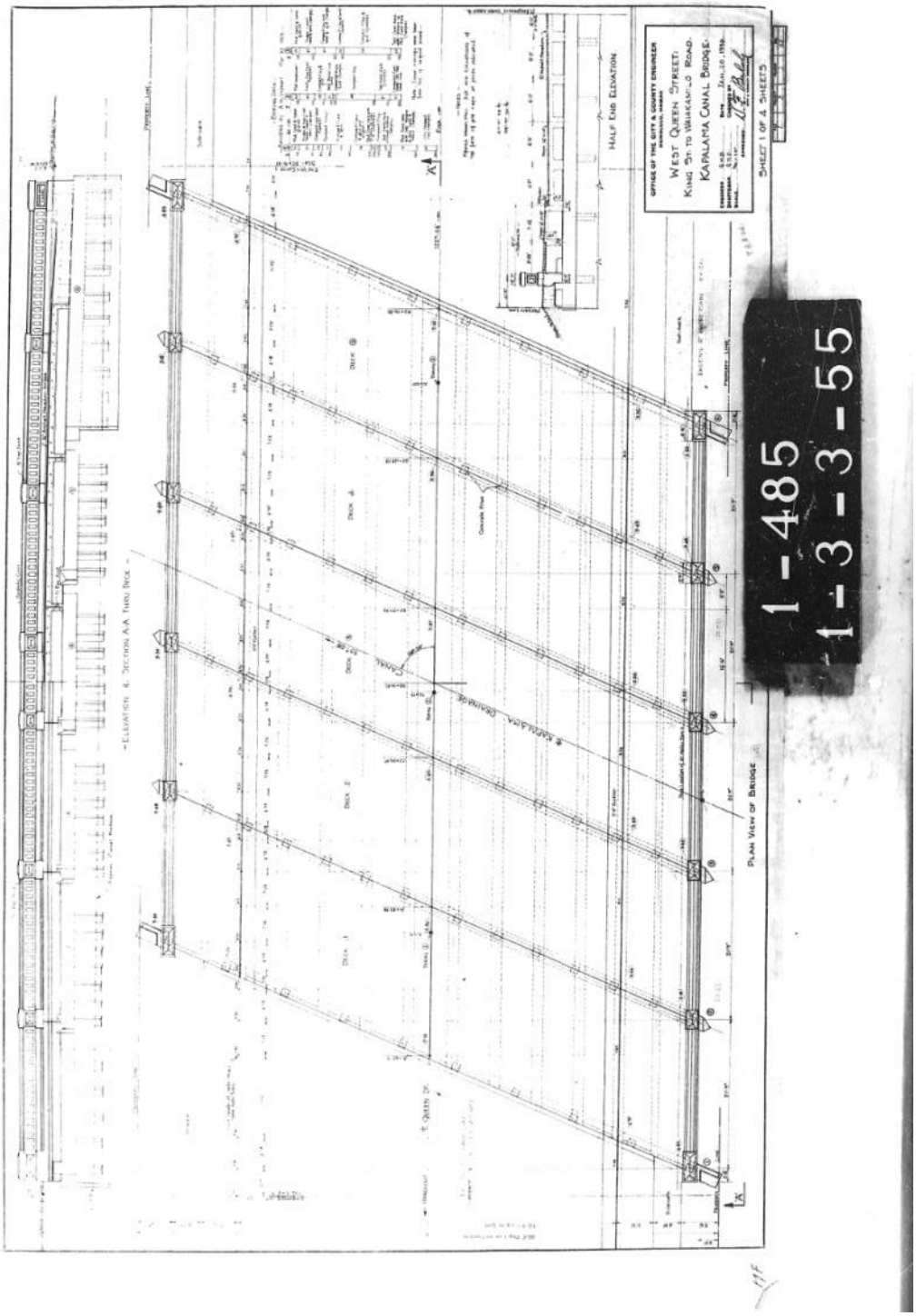

Kapalama
Canal
Bridge
N
Kalihi
Kamehameha
Heights
Kalihi Kai
LAGOON
KAPALAMA MILITARY RESERVATION
Kapālama Basin
Iwilei
Kahaka'aulana Island
Mokauea Island
Sand Island
Honolulu Harbor
SAND ISLAND STATE PARK
Kapālama Drainage Canal


Kapalama
Canal
Bridge
boundary
Google earth
feet
1000
meters
500

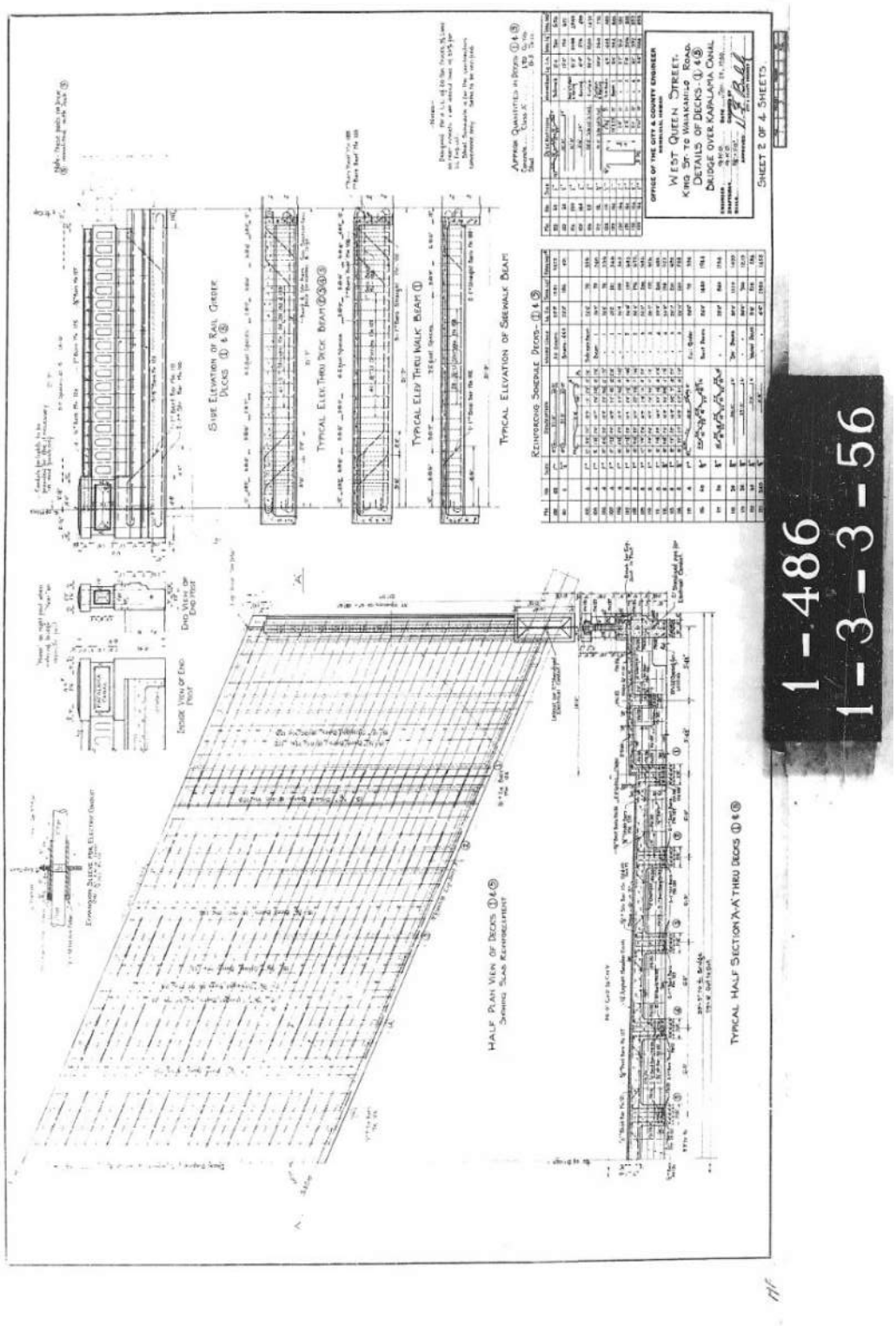
Map from 1922 showing the proposed West Queen Street Extension (Dillingham Boulevard) at lower left. Note Niuhelewai and Kapalama Streams (not labeled). *City Planning Commission, City and County of Honolulu, map "Proposed Street Plan Kapalama Section," December 1922.*



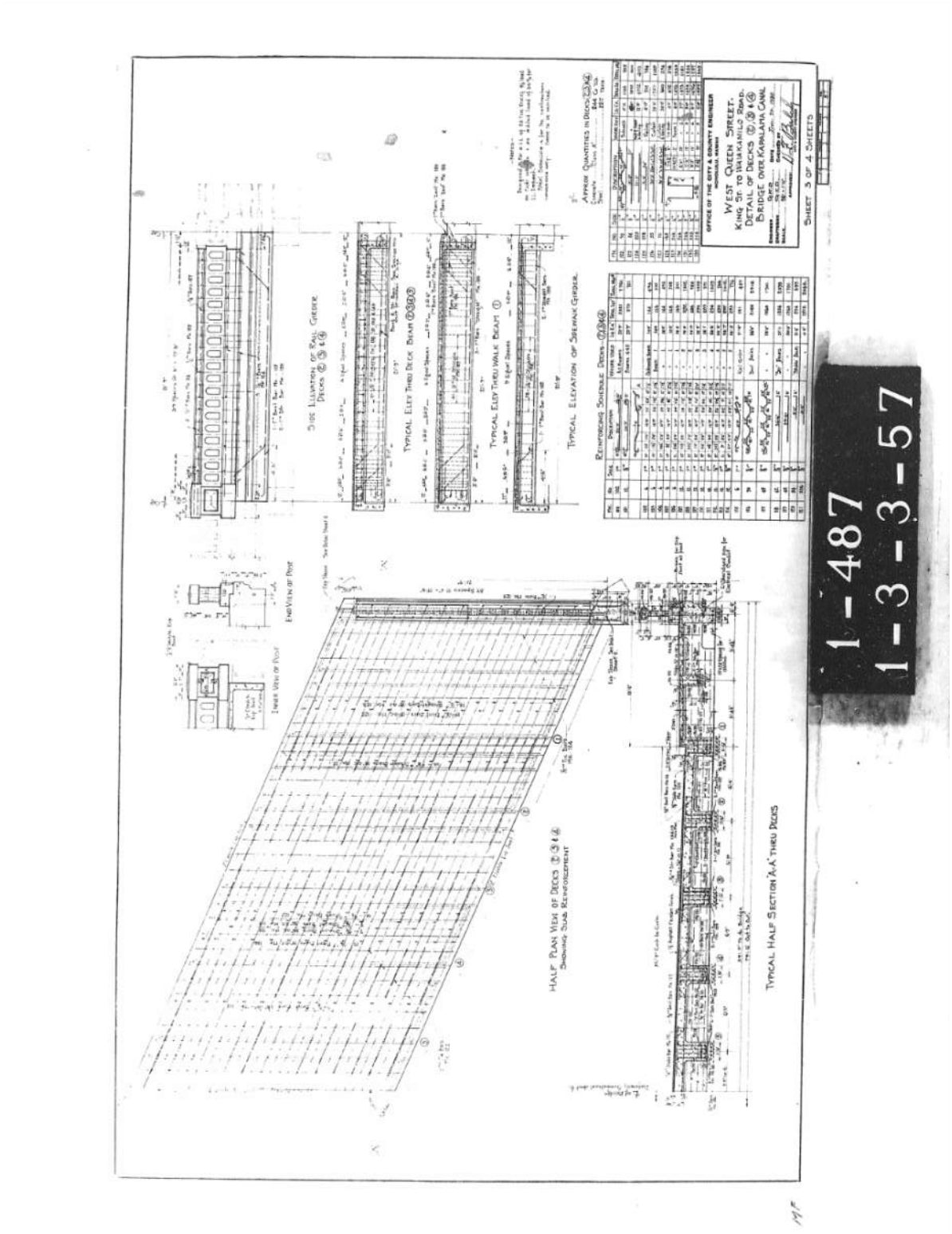
Bridge Over Kapālama Canal, West Queen Street. Office of the City & County Engineer, Honolulu Hawai'i. January 20, 1930.



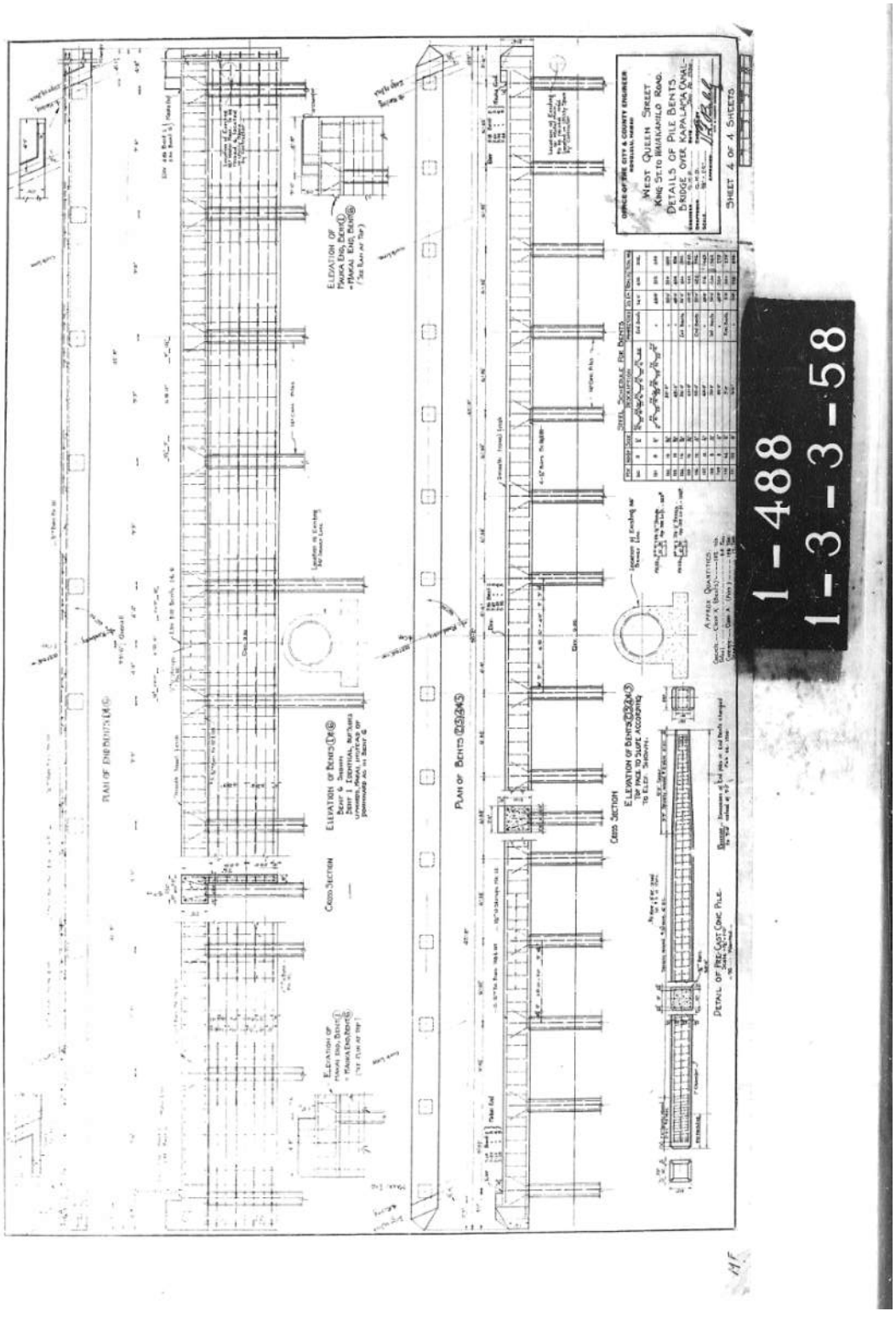
Bridge Over Kapālama Canal, West Queen Street. Details of Decks. Office of the City & County Engineer, Honolulu Hawai'i. January 20, 1930.



Bridge Over Kapālama Canal, West Queen Street. Detail of Decks. Office of the City & County Engineer, Honolulu Hawai'i. January 20, 1930.



King St to Waiakamilo Road, West Queen Street. Detail of Pile Bents. Office of the City & County Engineer, Honolulu Hawai'i. January 20, 1930.



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: Kapālama Canal Bridge

City or Vicinity: Honolulu

County: Honolulu State: Hawaii

Photographer: Dee Ruzika

Date Photographed: August 2012

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

Photo Key

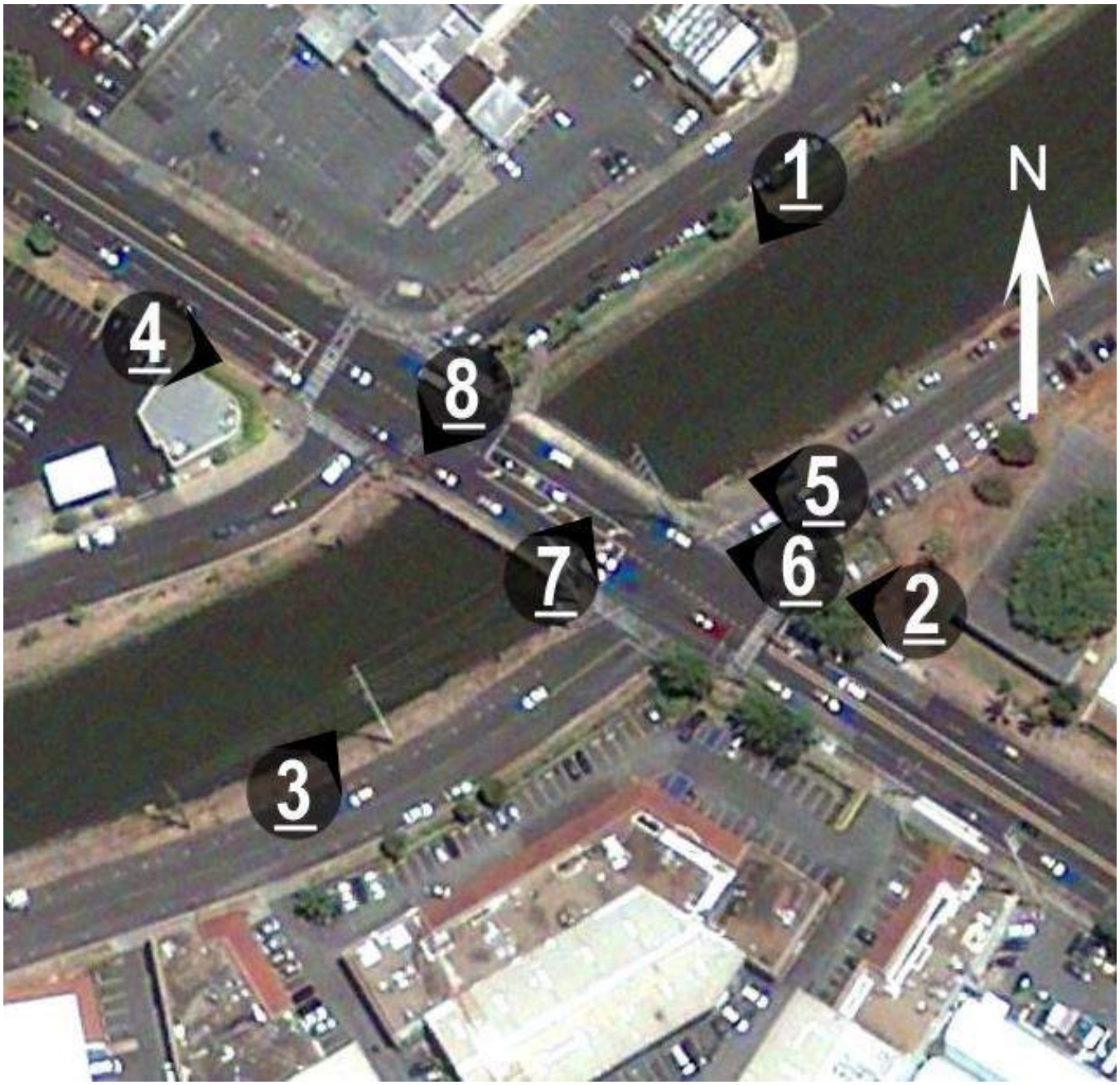


PHOTO LOG

Name of Property: Kapalama Canal Bridge
City or Vicinity: Kapalama
County: Honolulu State: HI
Photographer: Dee Ruzicka, Mason Architects, Inc.
Date Photographed: September, 2012
Location of Original Digital Files: Mason Architects, Inc. 119 Merchant St., Honolulu, HI 96813

Photo #1 (HI_HonoluluCounty_KapalamaCanalBridge_0001)
Overview elevation of Kapalama Canal Bridge, camera facing south west.

Photo #2 (HI_HonoluluCounty_KapalamaCanalBridge_0002)
Overview of bridge, camera facing west.

Photo #3 (HI_HonoluluCounty_KapalamaCanalBridge_0003)
Overview elevation of bridge, camera facing north east.

Photo #4 (HI_HonoluluCounty_KapalamaCanalBridge_0004)
Overview of bridge, camera facing east.

Photo #5 (HI_HonoluluCounty_KapalamaCanalBridge_0005)
Oblique view of the outboard side of parapet, camera facing west.

Photo #6 (HI_HonoluluCounty_KapalamaCanalBridge_0006)
Oblique view of the inboard side of parapet and the walkway, camera facing west

Photo #7 (HI_HonoluluCounty_KapalamaCanalBridge_0007)
Detail of typical parapet with measuring tape in 1' graduations, camera facing north east.

Photo #8 (HI_HonoluluCounty_KapalamaCanalBridge_0008)
Detail of typical end stanchion showing inscription camera facing south west.

Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0001



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0002



Kapālama Canal Bridge
Name of Property

Honolulu, Hawaii
County and State

HI_HonoluluCounty_KapalamaCanalBridge_0003



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0004



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0005



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0006



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0007



Kapālama Canal Bridge | Honolulu, Hawaii
Name of Property | County and State

HI_HonoluluCounty_KapalamaCanalBridge_0008



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.

NATIONAL REGISTER NOMINATIONS: ISLAND OF MAUI

1. Kaahumanu Ave – Naniloa Drive Overpass
2. Waiale Drive Bridge
3. Hana Belt Road

NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires Jan. 2005)

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 *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

==========

1. Name of Property

==========

historic name Ka`ahumanu Avenue - Naniloa Drive Overpass

other names/site number Naniloa Drive Overpass, Naniloa Drive/Highway Underpass

==========

2. Location

==========

street & number Naniloa Drive at Kaahumanu Avenue not for publication

city or town Wailuku vicinity N/A

state Hawai`i code HI county Maui code 009

zip code 96793

==========

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 ___ nationally

___ statewide ___ locally. (___See continuation sheet for additional comments.)

_____ _____

Signature of certifying official Date

_____

State or Federal Agency or Tribal government

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

_____

Signature of commenting official/Title Date

_____

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

____ entered in the National Register _____ _____
___ See continuation sheet.
____ determined eligible for the _____ _____
National Register
___ See continuation sheet.
____ determined not eligible for the _____ _____
National Register
____ removed from the National Register _____ _____

____ other (explain): _____

_____ _____ _____
Signature of Keeper Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)

___ private
___ public-local
_X_ public-State
___ public-Federal

Category of Property (Check only one box)

___ building(s)
___ district
___ site
_X_ structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
_____	_____	buildings
_____	_____	sites
__1__	_____	structures
_____	_____	objects
_____	_____	Total

Number of contributing resources previously listed in the National Register N/A

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) N/A

6. Function or Use

Historic Functions (Enter categories from instructions)
Cat: Transportation Sub: road-related

Current Functions (Enter categories from instructions)
Cat: Transportation Sub: road-related

7. Description

Architectural Classification (Enter categories from instructions)
Other: rigid-frame concrete

Materials (Enter categories from instructions)
foundation
roof
walls reinforced concrete
other concrete, wood, asphalt
masonry (basalt or lava rock)

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

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)

X 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.

X 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 a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
Engineering
Transportation

Period of Significance 1936

Significant Dates 1936

Significant Person (Complete if Criterion B is marked above)
N/A

Cultural Affiliation N/A

Architect/Builder William Bartels, Territorial Highway Engineer

Hawaiian Contracting Company, builder

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

==========
9. Major Bibliographical References
==========
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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 # _____

Primary Location of Additional Data
___ State Historic Preservation Office
_x_ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository: _____

==========
10. Geographical Data
==========

Acreage of Property approximately 2 acres

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	E	760	490	3	__	_____	_____
2	XJ	2,311	874	4	__	_____	_____

___ See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

The nominated property is an irregularly shaped parcel at the intersection of Ka`ahumanu Avenue and Naniloa Drive. The bridge is centered on the previously listed UTM reference. A map of the property boundaries is attached.

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

The boundaries encompass the property that is historically associated with the structure. The nominated structure includes the entire bridge, all masonry retaining walls, timber guardrails along the exit/entrance ramps and sidewalk, and the property on which these are situated. The property is entirely within the Hawai`i Department of Transportation right-of-way.

==========
11. Form Prepared By
==========

name/title Dawn E. Duensing, Cultural Resources Planner

organization Maui County Planning Department date 10/16/04

street & number 250 S. High Street telephone (808)270-7841

city or town Wailuku state HI zip code 96793

==========
Additional Documentation
==========

Submit the following items with the completed form:
Continuation Sheets

Maps
A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name State of Hawai`i Department of Transportation

street & number 869 Punchbowl Street telephone (808)587-2150

city or town Honolulu state HI zip code 96813

Paperwork Reduction Act Statement: This information is being collected for applications 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. 470 et seq.). A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to Keeper, National Register of Historic Places, 1849 "C" Street NW, Washington, DC 20240.

Designed by Territorial Highway engineer William Bartels, the Ka`ahumanu Avenue-Naniloa Drive Bridge is a rigid-frame concrete bridge with cantilever ends that spans a gap in Wailuku's "Sand Hills" as it carries Naniloa Drive over Ka`ahumanu Avenue. Prominently situated at the crest of a hill, the bridge has served as a distinctive gateway into Wailuku for nearly seventy years. Built as a grade-separation structure in 1936, the bridge's architectural details and rigid-frame construction are unique on Maui.

The Ka`ahumanu Avenue-Naniloa Drive Bridge is constructed entirely of reinforced concrete. It features parapets with cross-shaped voids and raised rail caps that were typical of many 1930s-era bridges on Maui. The Art Deco ornamentation, expressed on the vertically articulated piers and the horizontal relief on the bridge walls, is unique on Maui. The cross-shaped voids, rail caps, and articulated piers are painted in contrasting colors to highlight the architectural details. The construction date, 1936, is inscribed on the structure's southeast and northwest end piers. The structure's single-span is 51'-0" long; the overall structure length is 63'-0". The bridge height above the road is 14'-7". The bridge's roadway measures 20'-0" wide, with sidewalks on both sides measuring 2'-6" wide. Completed in 1937, the bridge cost $12,700 and was built by the Hawaiian Contracting Company. The structure required 271 cubic yards of concrete and 46,600 pounds of reinforcing steel. The Ka`ahumanu Avenue-Naniloa Drive Overpass is unaltered and in good condition, with only minor repairs. Most of the repairs are the result of vehicle impacts on the bridge's girders.

The Ka`ahumanu Avenue-Naniloa Drive Bridge retains a high level of historic integrity in its location, design, workmanship, materials, and feeling. Its original design and workmanship are evident in the decorative Art Deco piers and railings. When the bridge was built in 1936, the Sand Hills was a residential area and the bridge was flanked by adjacent residences and utility poles. The bridge's setting has urbanized over time; the nearby residential neighborhoods and commercial enterprises now have a higher density. Despite Wailuku's more urbanized setting, the bridge retains its prominent setting at the crest of a long hill where Ka`ahumanu Avenue enters Wailuku. Motorists approaching the bridge still enjoy beautiful views of the West Maui Mountains much as they did in 1936 when the bridge was built. The bridge itself is visible for more than a mile as motorists approach Wailuku.

The Ka`ahumanu Avenue-Naniloa Drive Bridge is complemented by timber guardrails and cut basalt (lava rock) masonry retaining walls that contribute to the bridge's historic feeling. On the west side of the bridge along Ka`ahumanu Avenue are entrance and exit ramps providing access to and from Naniloa Drive. These ramps are protected by timber guardrails on timber posts. On the structure's northeast side, a timber guardrail with concrete posts is situated along a sidewalk that ascends to the overpass. Masonry retaining walls constructed of cut basalt flank all sides of the structure and add to the historic character of the bridge. Another retaining wall, also built of basalt, runs along and above the entrance ramp from Ka`ahumanu Avenue. The basalt masonry walls are excellent examples of traditional local craftsmanship.

The Naniloa Drive - Ka`ahumanu Avenue Bridge achieves state and local significance in the areas of engineering and transportation under criteria A and C. One of the earliest remaining rigid-frame bridges built in the Territory of Hawai`i, the structure is one of two such bridges built in Hawai`i in 1936. The bridge represents the advances in engineering technology being achieved in Hawai`i during the early twentieth century. The Ka`ahumanu Avenue-Naniloa Drive Bridge is one of only two grade-separation structures on Maui, the other being the nearby Wai`ale Drive Bridge, which is already listed on the National Register of Historic Places. The completion of these grade-separation structures, together with a 1.9 mile road linking Wailuku and Kahului, improved travel time and motorist safety while also providing jobs during the Great Depression.

William Bartels, Territory of Hawai`i Bridge Engineer, introduced the rigid-frame bridge to Hawai`i in 1936. Bartels realized that the rigid-frame bridge was an excellent engineering solution for separating the grades at the new intersection at Naniloa Drive and Kaahumanu Avenue. Developed in New York by Arthur Hayden in 1922, the rigid-frame bridge was especially suited for grade-separation structures where the distance between the roadway grades was restricted and the length of the approaches important. Bartels realized that a rigid-frame bridge would fit neatly into the narrow gap bulldozed through Wailuku's "Sand Hills." From an engineering perspective, he understood that Hayden's sophisticated technology offered greater structural strength than other bridges of the era, especially girder bridges. His bridge derived its strength from the rigid connection between the structure's vertical and horizontal members, which spread the load more evenly throughout the entire bridge. The structure was no longer supported only by its abutments as girder bridges were, instead, the rigid-frame bridge was an integral unit with all members working together to support the structure and its loads. Another attractive feature of rigid-frame construction was its economy. Greater structural strength resulted in a more efficient use of materials, which permitted a narrower cross section that required considerably less excavation and concrete. Greater economy meant that Bartels could further stretch the Territory's dollars for public highway projects.

In addition to being a modern, practical structure, Hayden designed the rigid-frame bridge to be aesthetically pleasing, with a form that mimicked the graceful appearance of conventional arch bridges. Bartels realized that the intrinsic form of the bridge made it a good choice for settings where an aesthetic bridge was required, such as the prominent hilltop at the entrance to Wailuku. The structure was also readily adaptable to a variety of architectural treatments. Although Bartel's choice of a rigid-frame technology was unique on Maui, his open parapet with cross-patterned voids was typical of Hawai`i's 1930s bridges. The Art Deco elements, however, reflected the popular stylistic influences of the era and rendered the structure as one of Maui's most architecturally distinguished bridges. The rigid-frame engineering, unique architectural details, and prominent location at the crest of a hill leading into Wailuku made the Naniloa Drive-Kaahumanu Avenue Overpass an attractive gateway into Maui's county seat. Seventy years after its construction, the bridge has become a renowned Wailuku landmark that is specifically recognized by the county's Wailuku-Kahului Community Plan as culturally significant.

The Naniloa Drive Ka`ahumanu Avenue Overpass is a fine example of Hawai`i's juxtaposition between modern technology and traditional building methods. While the

structure represented the latest in bridge engineering technology, the adjacent retaining walls reflected traditional construction techniques that relied on native lava rock (basalt) masonry. Local basalt was a common bridge construction material in the late 1800s when masonry arch bridges were built. In 1905, the Territorial Superintendent of Public Works recommended that reinforced concrete be used to build Hawai`i's bridges. Even after the superintendent's recommendations, basalt masonry continued to be used for bridge abutments, wingwalls, guardwalls, and retaining walls. Just as the Naniloa Drive Overpass exhibits fine, modern architectural details and workmanship, the cut-rock retaining walls are excellent examples of traditional local craftsmanship.

The Naniloa Drive - Ka`ahumanu Avenue Bridge was part of a major bridge and road-building project on Maui in 1936. These projects demonstrated that Maui directly benefited from the U.S. Government's efforts to improve the nation's transportation facilities, but perhaps more importantly, to improve traffic safety. As with the rest of the nation, transportation funding played a major role in providing jobs during the Great Depression. Although no documentation was located to determine whether federal funding was appropriated for the Naniloa Drive bridge, it is extremely likely that federal funds were used since the U.S. Government funded the other components of this project, the Wai`ale Drive Bridge and the new road into Wailuku.

The Wailuku-Kahului Road, now known as Ka`ahumanu Avenue, was constructed to provide direct access between Maui's port town of Kahului and its county seat and commercial center, Wailuku. The new 1.9-mile road cut through the Sand Hills and replaced a beach road between the two towns, reducing the trip by one mile. Important safety features of the new thoroughfare were grade-separation structures at Naniloa and Wai`ale Drives. The Wai`ale Drive Bridge, funded by the Emergency Relief Appropriation Act of 1935, was built to carry Kaahumanu Avenue traffic over Wai`ale Drive and the adjacent railroad tracks. The other grade-separation structure was built to carry Ka`ahumanu Avenue under Naniloa Drive. Both bridges were built during the federal government's nation-wide effort to improve traffic safety by means of grade-separation structures. The combination of these three projects was a significant transportation achievement on Maui. The new road and grade-separation structures improved travel time between Maui's two main towns while also providing increased safety. These projects were also an important part of the Federal aid highway program in Hawai`i. The mid 1930s were boom years for bridge and road construction in the Territory of Hawai`i, as it was finally granted federal road aid that had been denied between 1917 and 1925. Many of these road and bridge programs were also an important part of Great Depression relief efforts.

The Ka`ahumanu Avenue - Naniloa Drive Overpass was designed by William R. Bartels and built by the Hawaiian Contracting Company. Bartels came to Hawai`i in 1932 and was an engineer for the Territorial Department of Public Works until his retirement in 1957. Hawai`i's most renowned bridge engineer, Bartels was responsible for many of the Territory's major bridge projects including the 1936 Wahiawa Bridge on Kauai, which is also a rigid-frame structure, and the 1936 Kupapaulua Bridge on Hawai`i, a concrete-arch bridge. Bartels is credited with designing and building bridges that combined the most modern technology available with aesthetically-pleasing architectural features, as is evidenced in the Ka`ahumanu Drive - Naniloa Drive Overpass.

Major Bibliographical References

Duensing, Dawn E. *Bronx River Parkway, HAER No. NY-327.* [Washington D.C.]: National Park Service, Historic American Engineering Record, 2001.

Hayden, Arthur G. and Maurice Barron. *The Rigid-Frame Bridge.* Third Edition. NY: John Wiley & Sons, Inc. 1950.

Spencer Mason Architects. *State of Hawai`i Historic Bridge Inventory and Evaluation.* Draft. [Honolulu]: State of Hawai`i Department of Transportation, Highways Division, 1996.

Superintendent of Public Works. *Annual Report.* [Honolulu]: Superintendent of Public Works. 1905, 1936.

The Maui News, 1936.

Wailuku - Kahului Community Plan. [Wailuku, HI]: Maui County Council, 2002.

Section Additional Documentation: Photographs

Ka`ahumanu Avenue - Naniloa Drive Overpass
Maui,Hawai`i

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Photographs were taken by Dawn E. Duensing, who has the negatives.

1. Ka`ahumanu Avenue - Naniloa Drive Overpass
2. Maui County, Hawai`i
3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Ka`ahumanu Avenue - Naniloa Drive Overpass, retaining walls and guardrails; view looking west
7. Photograph #1

3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Ka`ahumanu Avenue - Naniloa Drive Overpass, retaining walls and guardrails; view looking east

3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Ka`ahumanu Avenue - Naniloa Drive Overpass, view of roadway and bridge; looking north

3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Ka`ahumanu Avenue - Naniloa Drive Overpass, northwest pier with inscribed date of construction; view looking west

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

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 How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name: WAI'ALE DRIVE BRIDGE

other names/site number: Wai'ale Road Overpass; R. R. Overpass

2. Location

street & number: Ka'ahumanu Avenue, 0.1 miles E of Kinipopo Street — not for publication: N/A

city or town: Wailuku — vicinity: Kahului

state: Hawai'i — code: HI — county: Maui — code: 009 — zip code: 96793

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this _X_ 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 _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant ___ nationally _X_ statewide ___ locally. (___ See continuation sheet for additional comments.)

Signature of certifying official — Date: 9-16-98

State or Federal agency and bureau

In my opinion, the property ___ meets ___ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official — Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:
___ entered in the National Register
___ See continuation sheet.
___ determined eligible for the National Register
___ See continuation sheet.
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain): _____

Signature of Keeper — Date of Action

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public-local
- X public-State
- public-Federal

Category of Property
(Check only one box)

- building(s)
- district
- site
- X structure
- object

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

Number of Resources within Property

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	objects
1	0	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions (Enter categories from instructions)
Cat: Transportation Sub: Road-related (vehicular); Rail-related

Current Functions (Enter categories from instructions)
Cat: Transportation Sub: Road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER/ Rigid-Frame Steel-Stringer Bridge

Materials
(Enter categories from instructions)
foundation N/A
roof N/A
walls N/A
other Steel, concrete, masonry

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

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)

X **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.

X **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.)

Property is:

____ **A** owned by a religious institution or used for religious purposes.

____ **B** removed from its original location.

____ **C** a birthplace or a grave.

____ **D** a cemetery.

____ **E** a reconstructed building, object, or structure.

____ **F** a commemorative property.

____ **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)

ENGINEERING
TRANSPORTATION

Period of Significance
1936 (date of original construction)

Significant Dates
1936

Significant Person
(Complete if Criterion B is marked above)
N/A

Cultural Affiliation
N/A

Architect/Builder
(designer/engineer) William R. Bartels (THD)
(builder) Hawaiian Contracting Company
(fabricator) U.S. Steel Products / American Bridge Company

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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 #
___

Primary Location of Additional Data
___ State Historic Preservation Office
_X_ Other State agency
___ Federal agency
___ Local government
___ University
___ Other (Name of repository):
___

10. Geographical Data

Acreage of Property less than one (1) acre.

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	04	759910	2312320	3	__	_____	_____
2	__	_____	_____	4	__	_____	_____

___ See continuation sheet.

Verbal Boundary Description

The nominated property is a rectangular shaped parcel measuring 79 feet by 49.6 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification

The nominated structure includes the bridge's superstructure, substructure, retaining wall on south side, floor system and approach spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title	Barbara Shideler/Architect; Spencer Leineweber/Architect; Ann Yoklavich/Architectural Historian		
organization	Spencer Mason Architects	date	May 21, 1996
street & number	1050 Smith Street	telephone	(808) 536-3636
city or town	Honolulu state Hawai'i	zip code	96817

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps
A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional Items
(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name	State of Hawai'i, Department of Transportation		
street & number	869 Punchbowl Street	telephone	(808) 587-2150
city or town	Honolulu	state HI	zip code 96813

Paperwork Reduction Act Statement: This information is being collected for applications 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. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.

Narrative Description

The Wai'ale Drive Bridge carries Ka'ahumanu Avenue (State Highway 32) across Wai'ale Drive in Wailuku, Maui. The bridge was designed to provided a grade separation for the now-defunct Wailuku Sugar Company railroad alignment to the mill.[1] This is one of two steel stringer grade separations designed by William R. Bartels of the Territorial Highways Department in 1936, and constructed by the Hawaiian Contracting Company of Honolulu by steel members fabricated by U.S. Steel Products and the American Bridge Company.[2]

The Wai'ale Drive Bridge is in its original location along Ka'ahumanu Avenue. The bridge's original design, a steel rigid-frame structure with cantilever ends, remains intact. The bridge has two main spans, the longest is located over the roadway and the other over the now-defunct railroad alignment. The use of steel, a relatively uncommon material in Hawai'i, can be attributed to the industrial purpose of the bridge. The industrial feeling and mill setting of the area has since become more residential since the bridge was first built. The materials used for the bridge, both steel structure and railing, concrete deck and posts, and masonry (basalt or "lava rock") abutments and wingwalls are original, and no reconstruction or major repair of the bridge has been noted by the State DOT. The workmanship of the bridge is evident, particularly in the coursed basalt abutments. The historic feeling remains intact, primarily due to the relatively narrow roadway, uncommon materials, and evidence of the span over the old railroad line. The association the bridge conveys is somewhat diminished since the railroad line to the mill is now gone, nonetheless, the span over the railroad right-of-way clearly remains.

construction date(s):	1936
construction type:	steel-rigid frame with cantilever ends
construction cost:	unknown
span number:	2
total length:	79'
max. span(s):	51'
roadway width:	34'
height above road:	13.6'
superstructure:	reinforced-concrete flat slab (deck) on steel stringers
substructure:	masonry (lava-rock) abutments and wingwalls; reinforced-concrete intermediate support
floor/decking:	asphalt on concrete deck
parapets:	steel balusters with reinforced-concrete rail, and intermediate and end piers
other features:	bridge name and date of construction incised on end piers; two 2.5' sidewalks on either side of roadway ; masonry and concrete pedestrian stair to roadway below
alterations:	railroad tracks removed beneath bridge

[1]Hawai'i (State), Department of Transportation, Design Plans: *Waiale R. R. Overpass, Sta. 20.* prepared by Territorial Highway Department, Territory of Hawai'i, (Honolulu, October 1935).

[2]Spencer Mason Architects, *Historic Bridge Inventory: Island of Kauai*, Prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1989), 210.

Narrative Statement of Significance

The Wai'ale Drive Bridge is significant for its contributions to the fields of engineering and transportation in Hawai'i. The steel stringer bridge is eligible under Criterion A for its associations with the economic development of Maui by providing economical transportation to the mill for the sugar cane plantations located in the Wailuku region. The Wai'ale Drive Bridge is eligible under Criterion C as a uncommon example of a steel stringer bridge in Hawai'i, as well as a rare example of the use of vernacular materials (the lava-rock abutments) on a Federal Aid bridge. The bridge is representative of the "work of a master": William R. Bartels, the chief designer for the Territorial Highway Department.

The Wai'ale Drive Bridge was constructed as part of the upgrading of the Maui Belt Road undertaken by the Territory in the 1930s utilizing Federal funds. The bridge was built with U.S. Works Program Grade Crossing funding which provided federal money, without the usual match requirement, to build bridges separating railroad and road grades. This is the only bridge on Maui associated with the U.S. Works Program Grade Crossing funding. The bridge spanned the railroad alignment to the Wailuku Sugar Company mill, a vital element of Kahului-Wailuku's economic base.

The Wai'ale Drive Bridge is one of two steel rigid-frame bridges in the state (the other is the Līhu'e Mill Bridge on Kaua'i). The erection of steel stringer bridges was a deliberate effort by the Territorial government in permanent public works improvements requiring the latest technology and utilizing federal assistance. The materials selected for the bridge's construction are an usual mixture of steel and "lava rock", a local basalt. The use of steel is uncommon in Hawai'i due to the extreme marine environment and may reflect the requirements of the U.S. Grade Crossing Program. Local basalts were commonly used in bridge construction in Hawai'i during the nineteenth and early twentieth-centuries. Masonry fell out of favor for bridge construction after reinforced-concrete was introduced to Hawai'i in 1904-05, however the material made a resurgence during the Depression.

The bridge was designed by William R. Bartels and constructed by the Hawai'ian Contracting Company with materials fabricated by U. S. Steel Products and the American Bridge Company. Bartels was responsible for the design of all major Territorial bridge projects between 1932 and his retirement from the department in 1956.[3] His work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

---

[3]Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in *Historic Bridge Inventory and Evaluation: Island of Hawaii*, Prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

Major Bibliographical References

Alvarez, Patricia. "A History of Road and Bridge Development on the Island of Hawaii" in *Historic Bridge Inventory and Evaluation: Island of Hawaii and A History of Road and Bridge Development on the Island of Hawaii.* Prepared for the State of Hawai'i Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration, Honolulu, 1987a.

Hawai'i Heritage Center. *Historic Bridge Inventory: Island of Maui* . Prepared for the State of Hawai'i Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration, Honolulu, 1990.

Hawai'i (State), Department of Transportation. Structure Inventory and Appraisal (SI&A) Sheets for Structures Built Before 1940. (Computer printout known as the State Bridge Inventory). Honolulu, 1994.

_____. Bridge Inventory Sheets for State-owned Bridges. Unpublished data in Bridge Design Section, Honolulu, 1986.

_____. Design Plans: *Waiale R. R. Overpass, Sta. 20.* prepared by Territorial Highway Department, Territory of Hawai'i. Honolulu, October 1935.

Spencer Mason Architects. *Historic Bridge Inventory: Island of Kauai* . Prepared for the State of Hawai'i Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration, Honolulu, 1989.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES CONTINUATION SHEET

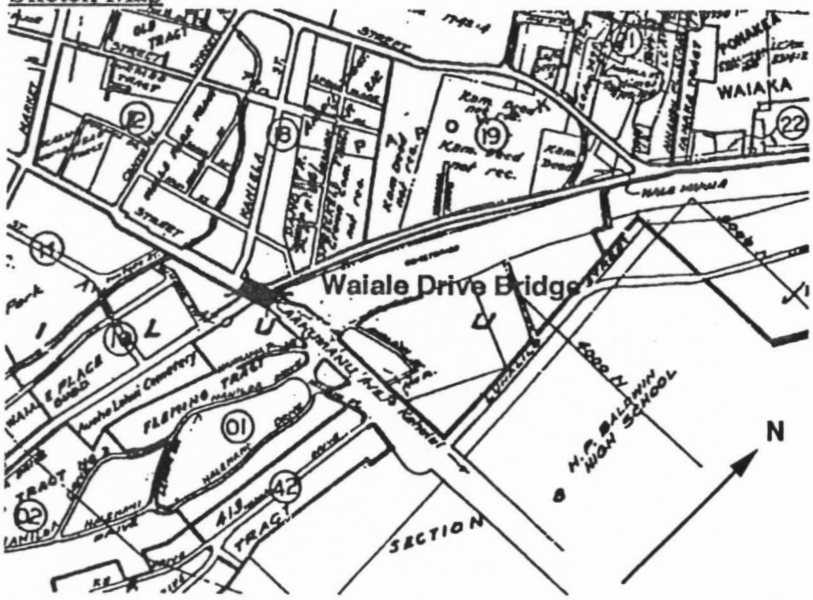
Wai'ale Drive Bridge
Maui, Hawai'i

Additional Documentation

Geographical Map

A United States Geological Survey (USGS) Map indicating the location of the nominated property is appended to the National Register Multiple Property form for "Historic Highway Bridges of Hawai'i, 1894 - 1941".

Sketch Map



Photographs

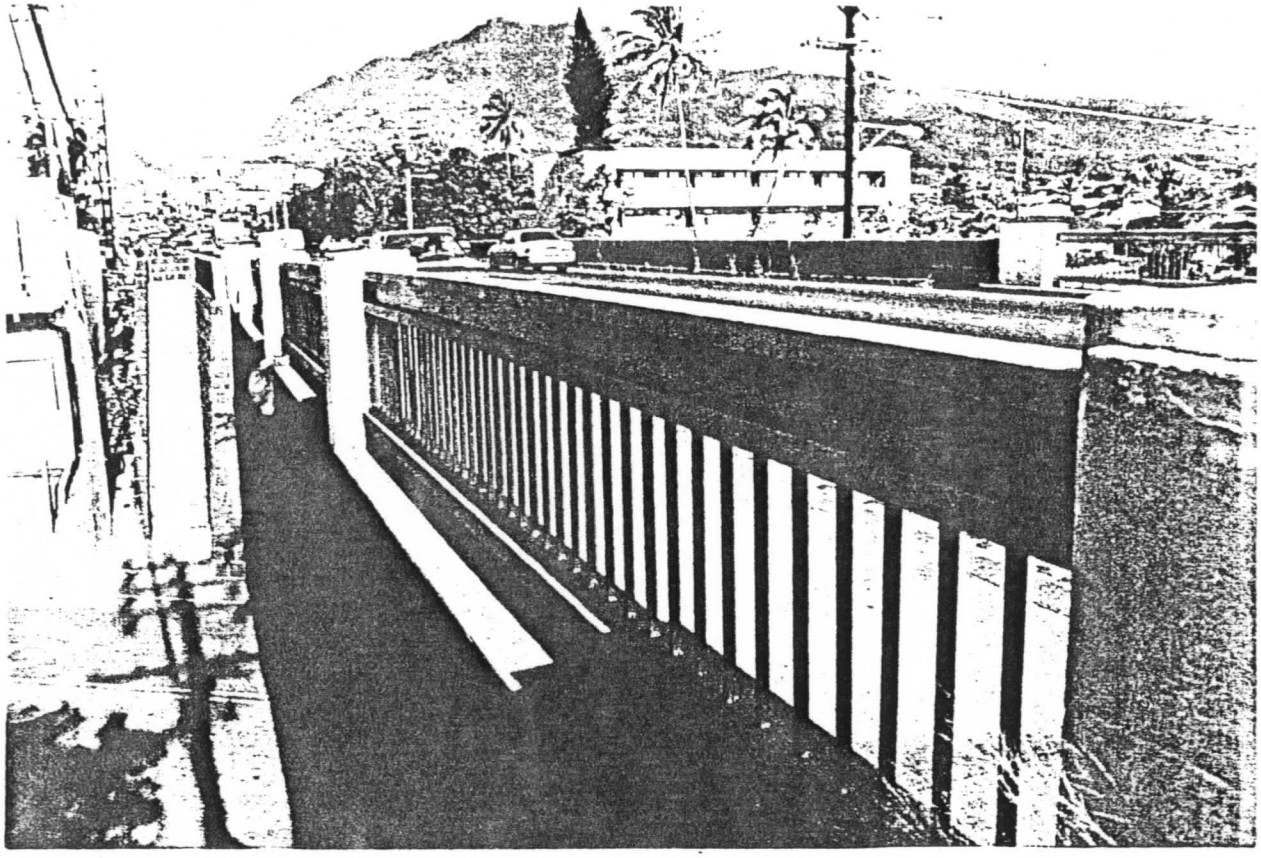
The following information applies to all photographs for this bridge:

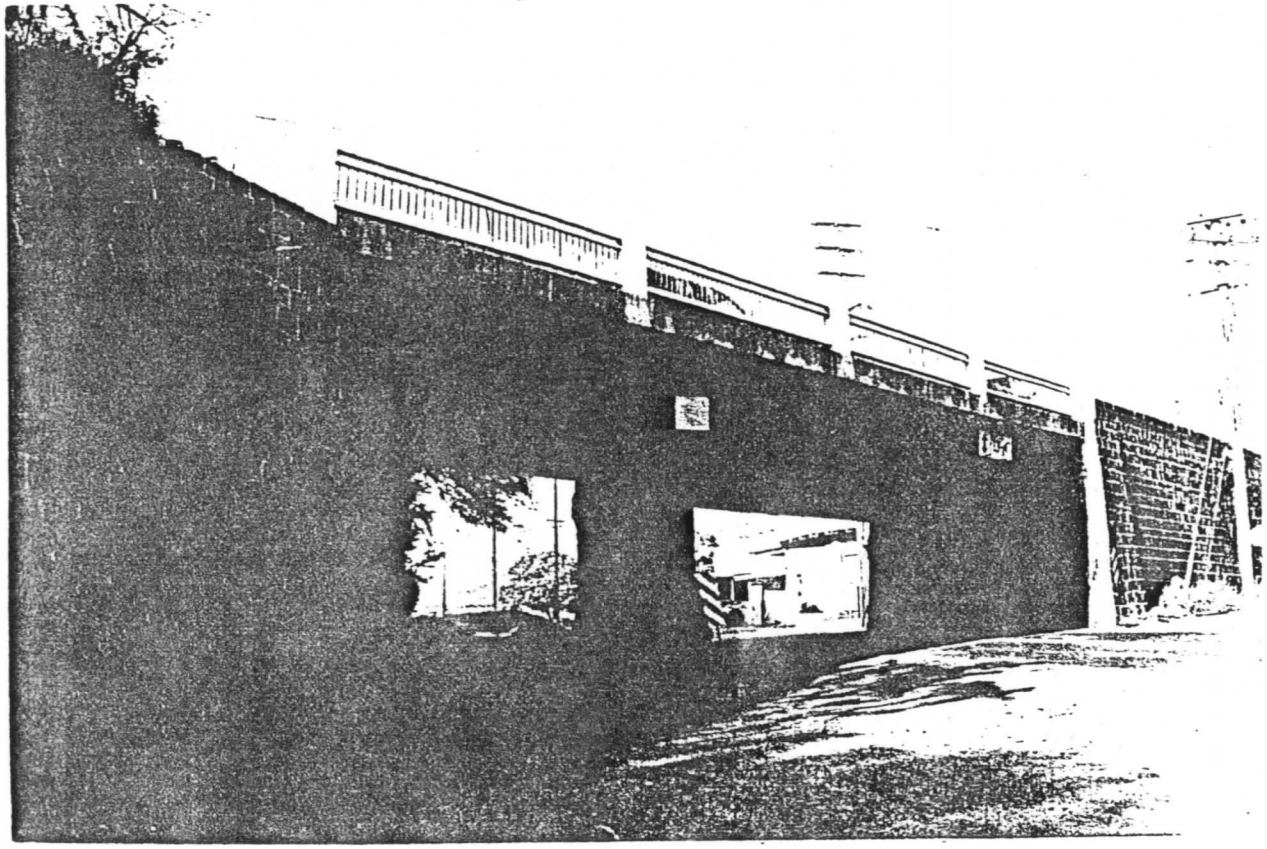
Name of Property:	Wai'ale Drive Bridge
Location:	Wailuku, Maui, Hawai'i
Name of Photographer:	Barbara Sannino Shideler, AIA
Date of Photograph:	May 1994
Location of Original Negative:	State of Hawai'i, Department of Transportation 869 Punchbowl Street, Honolulu, HI 96813
Photograph Number 1:	Detail of rail with view of approach; view from SE.
Photograph Number 2:	Substructure; view from NE.

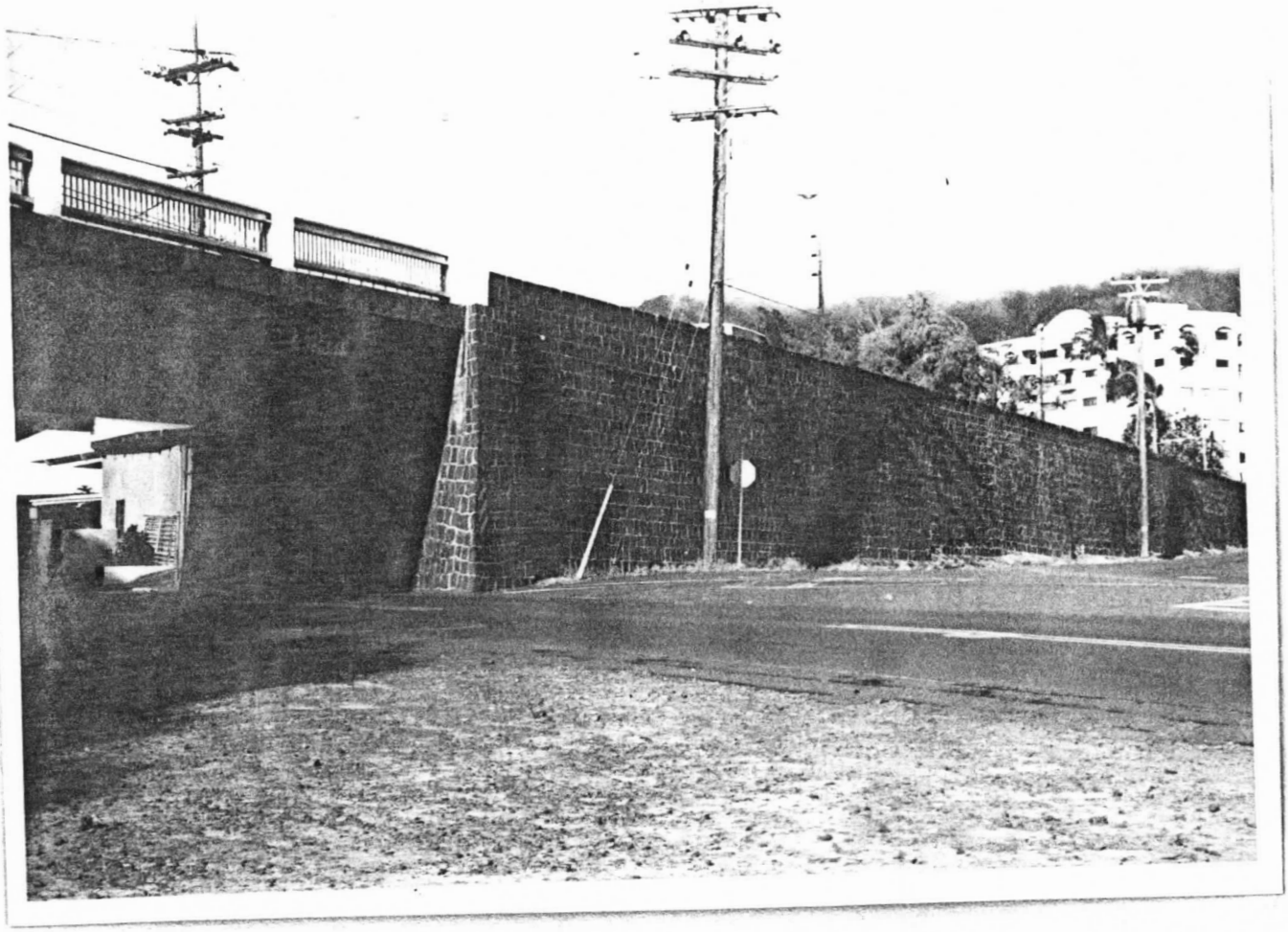
Wai'ale Drive Bridge, Wailuku, Maui, Hawai'i

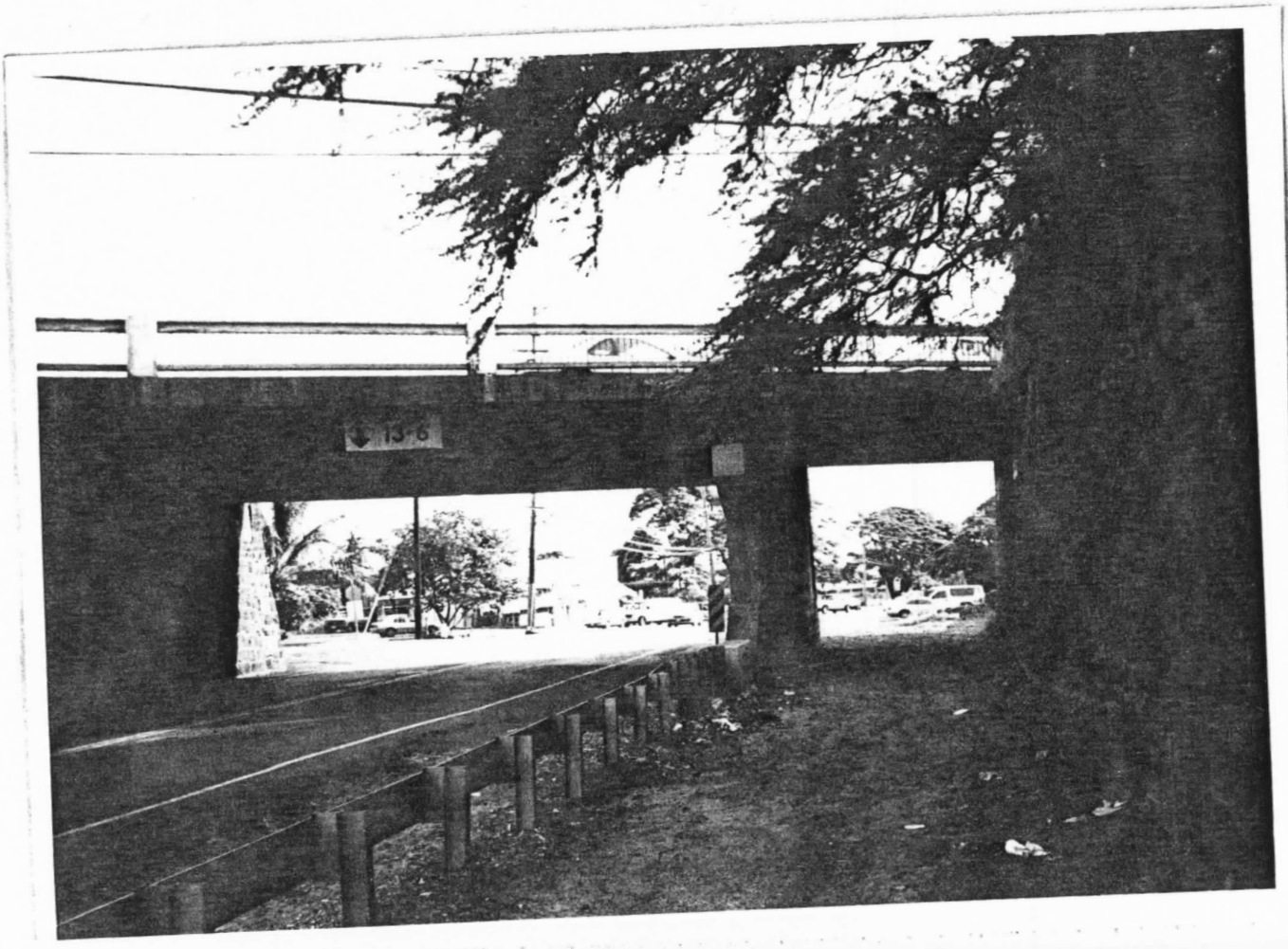
Top: Detail of rail with view of approach; view from SE.

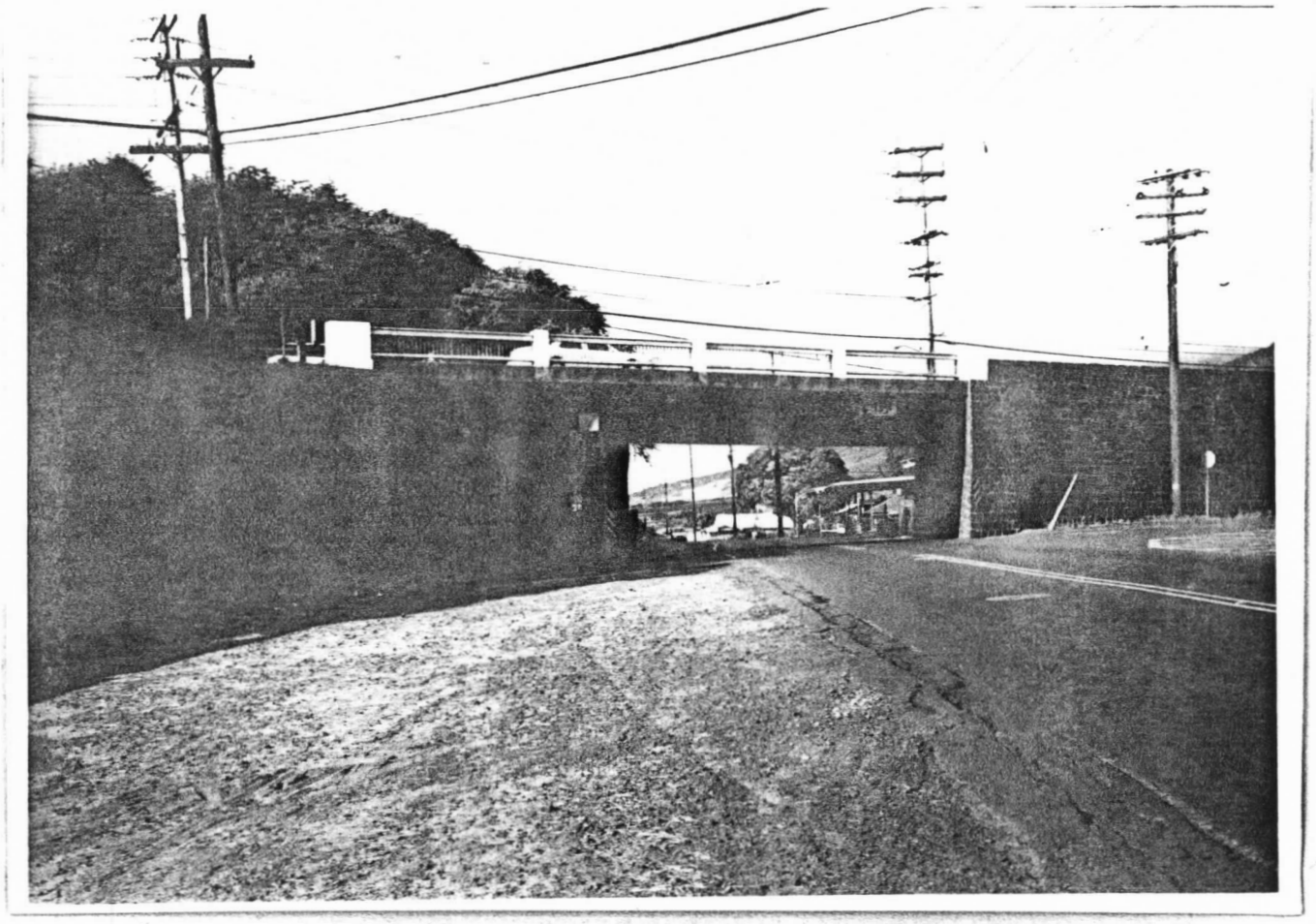
Bottom: Substructure; view from NE.

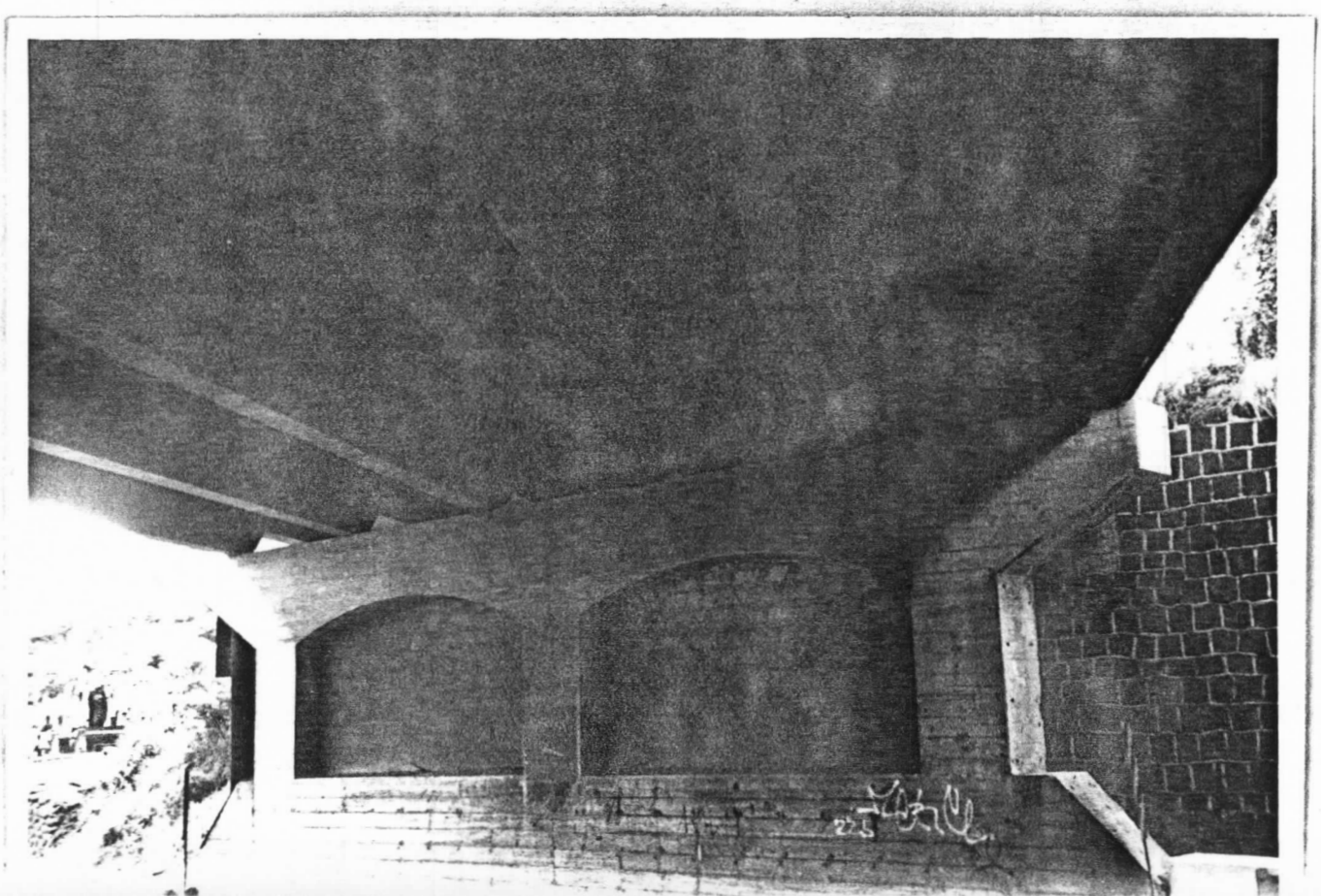


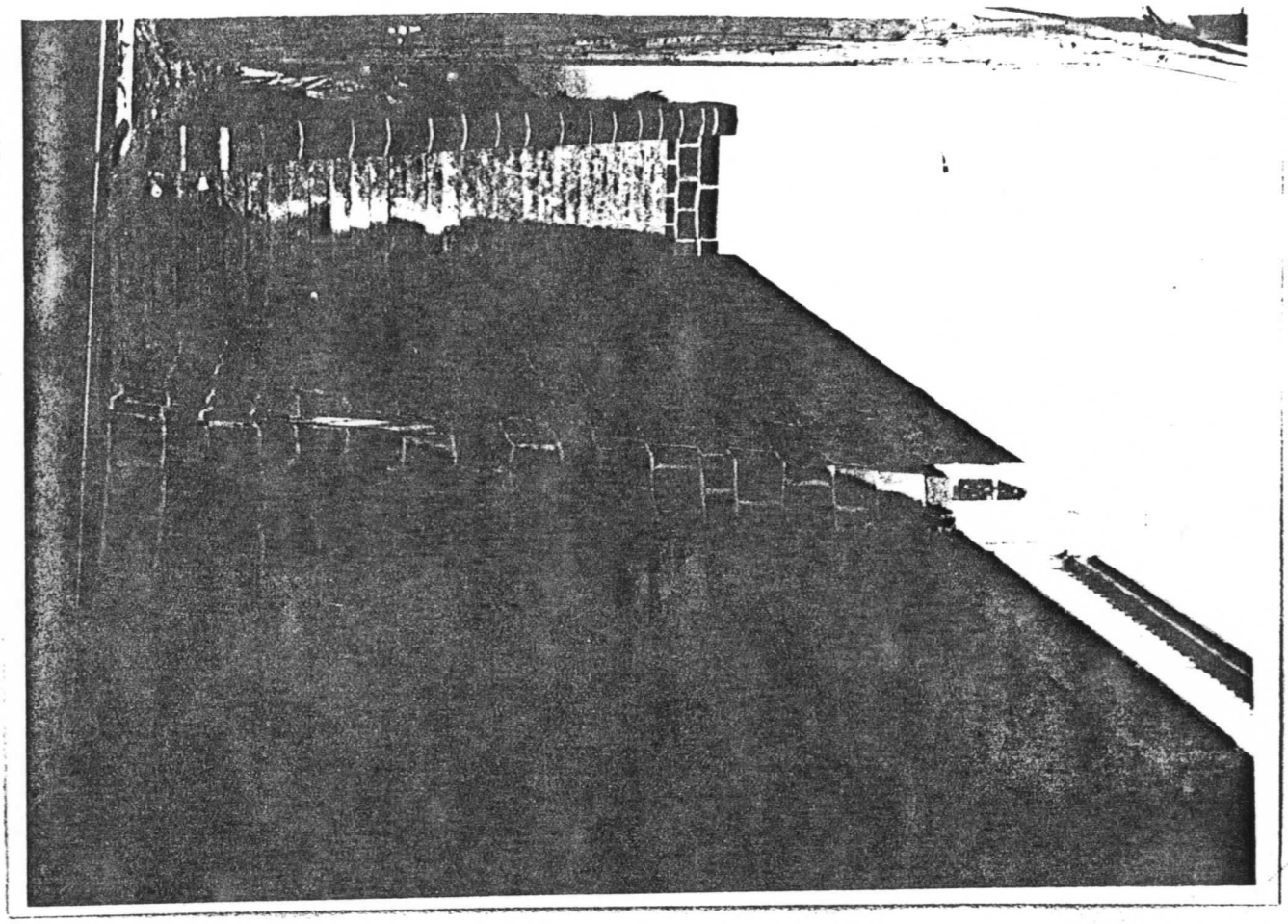




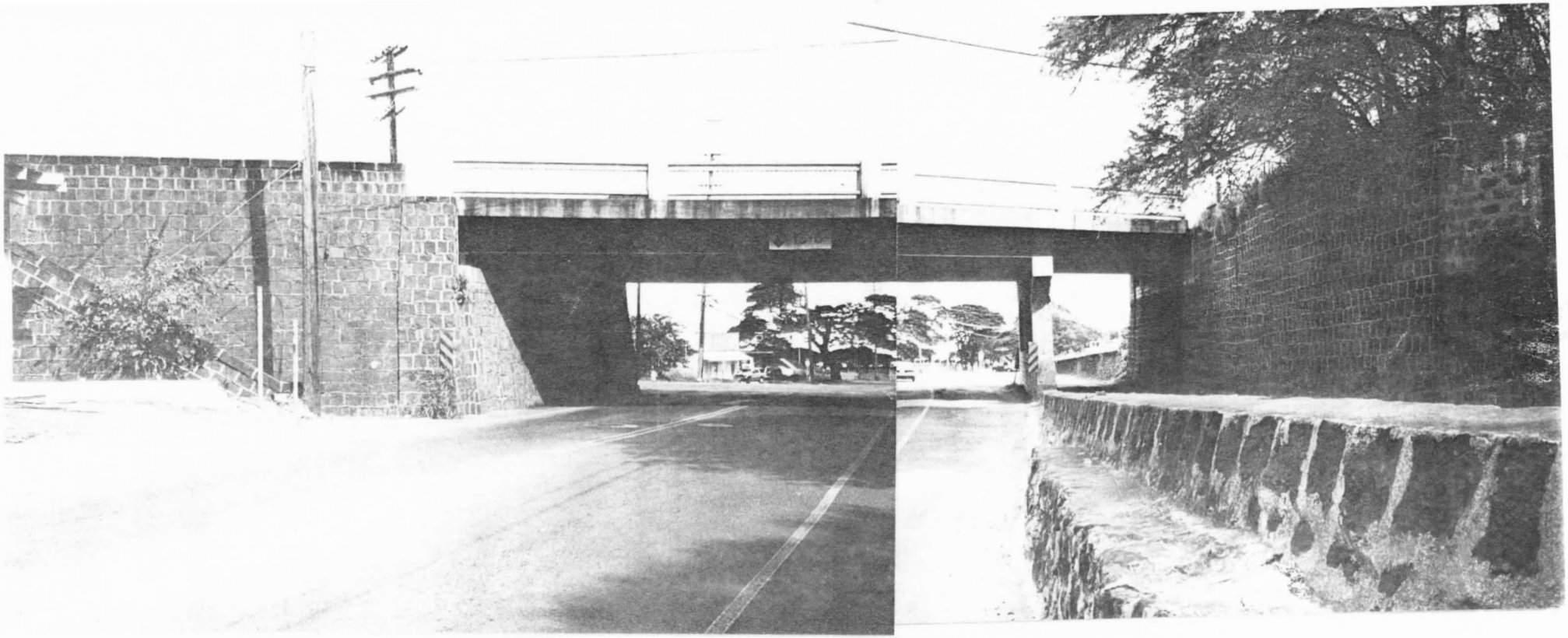

13·6

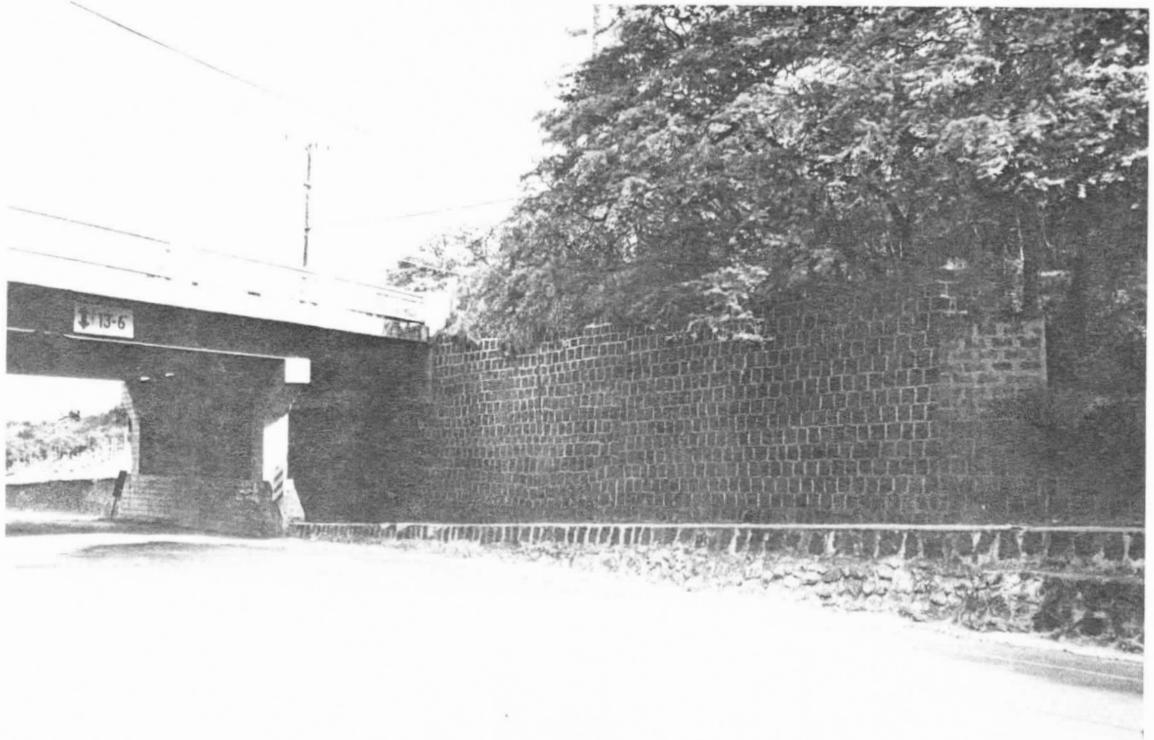






1. Wailuc Drive Bridge
2. Maui County, Hawaii
3. Elizabeth Andersen
4.




13-6

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

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 How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Hāna Belt Road
other names/site number Belt Road, Hāna Road, Hāna Highway, Piʻilani Highway

2. Location
street & number Hāna Highway (State Rte. 360), Piʻilani Highway (Rte. 31) not for publication __
city or town Makawao District to Hāna District
vicinity Haʻikū, Keʻanae, Nāhiku, Hāna, Kīpahulu
state Hawaiʻi code HI county Maui code 009 zip code __

3. State/Federal Agency Certification
As the designated authority under the National Historic Preservation Act of 1986, 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 ___ nationally ___ statewide ___ locally. (___ See continuation sheet for additional comments.)

Signature of certifying official Date

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is: Signature of Keeper Date of Action

___ entered in the National Register
__ See continuation sheet.

___ determined eligible for the National Register
__ See continuation sheet.

___ determined not eligible for the National Register

___ removed from the National Register

____ other (explain): _____

5. Classification
Ownership of Property
(Check as many boxes as apply)

___ private

_x_ public-local

_x_ public-State

___ public-Federal

Category of Property
(Check only one box)

___ building(s)

_x_ district

___ site

___ structure

___ object

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of Resources within Property

Contributing	Noncontributing	
____	_____	buildings
____	_____	sites
73	1	structures (bridges and culverts)
_____	_____	objects
73	1	Total

Number of contributing resources previously listed in the

National Register N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

Current Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

7. Description

Architectural Classification
(Enter categories from instructions)

Other: OTHER: roadways; bridges: reinforced concrete, girder, flat slab, masonry (basalt or lava rock)

Materials
(Enter categories from instructions)

foundation _____

roof _____

walls _____

_____

other asphalt, concrete, masonry (lava rock)

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)

__X__ 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.

__X__ 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.)

Property is:

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

Engineering _____

Social History _____

Transportation _____

Commerce _____

Period of Significance

circa 1900 to 1947

Significant Dates

circa 1900 to 1947

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder

County engineers, including Hugh Howell, Paul Low, and A. H. Wong; builders were county employees, prison labor, and private contractors. Private contractors included Wilson and McCandless, Hugh Howell Engineering Company, and Moses Akiona, Ltd. Designers also included William D'Esmond, architect; Joseph Matson, and D. Kapohakimohewa.

9. Major Bibliographical References Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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

_____

Primary Location of Additional Data

___ State Historic Preservation Office

_X_ Other State agency

___ Federal agency

___ Local government

___ University

___ Other

Name of repository:

State of Hawai'i Department of Transportation

10. Geographical Data Acreage of Property _ _____

UTM References
(Place additional UTM references on a continuation sheet)

Zone	Easting	Northing	Zone	Easting	Northing
1	04	787810	2314160	3 04	789510	2312640
2	04	788850	2313440	4 04	789860	2312530

_X_ See continuation sheet.

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

The boundaries of the nominated district are delineated by the course of the Hāna Belt Road. The right-of-way is approximately 40' wide for the portion of road under the jurisdiction of the State of Hawai'i. The right-of-way is variable along the entire length of road. The historic district begins near Mile Marker 3 on the Hāna Highway, State Route 360, near Huelo, and ends on the south end of Koukou'ai Bridge near Kīpahulu on Route 31.

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

The boundaries are coterminous with its historic right-of-way. The beginning and end points were selected to encompass the portion of the Hāna Belt Road that retains the greatest historic integrity and character. This section of roadway is relatively unaltered and is the most spectacular portion of Maui's historic belt road system, both in its scenery and its historic character. The boundaries include the highest concentration of stylistically consistent historic bridges in the State of Hawai'i.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 10 Geographical Data Page 2

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

UTMs continued:

	zone/easting	northing	
5	04/790890	2311540	points 1-4: Ha'ikū, Hawai'i quad
6	04/791260	2311740	
7	04/791400	2311610	
8	04/792250	2310930	
9	04/793400	2310360	
10	04/793620	2310280	points 5-17: Ke'anae, Hawai'i quad
11	04/794270	2309800	
12	04/794310	2309020	
13	04/795250	2309060	
14	04/796560	2309440	
15	04/796790	2309280	
16	04/797770	2308430	
17	04/797540	2306640	
18	04/797580	2305320	
19	04/797800	2305090	
20	04/798000	2304760	
21	04/798680	2304860	
22	04/798890	2304800	
23	04/799550	2304630	points 18-32: Nāhiku, Hawai'i quad
24	04/799760	2304420	
25	04/799920	2304330	
26	04/800000	2304410	
27	04/800520	2304260	
28	04/800880	2304190	
29	04/801930	2303950	
30	04/802190	23033830	
31	04/		
32	04/	2303830	

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 10 Geographical Data Page 3

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

UTMs continued:

	zone/easting	northing	
33	04/803810	2303440	
34	04/803910	2303270	
35	04/804000	2303160	
36	04/804170	2303130	
37	04/804290	2303000	
38	04/804900	2303020	points 33-47: Hāna, Hawai'i quad
39	04/805350	2303020	
40	04/805650	2302900	
41	04/806060	2302760	
42	04/807160	2302510	
43	04/807630	2302290	
44	04/812440		
45	04/812960	2295650	
46	04/812960	2293760	
47	04/812580	2292900	
48	04/811030	2290640	
49	04/810240	2290700	
50	04/809900	2290260	
51	04/809480	2290260	
52	04/809190	2290300	
53	04/809070	2290210	points 48-60: Kīpahulu, Hawai'i quad
54	04/808730	2289420	
55	04/808500	2289330	
56	04/808210	2289200	
57	04/808000	2289200	
58	04/807770	2288590	
59	04/807680	2288060	
60	04/805910	2286630	

11. Form Prepared By

name/title Dawn E. Duensing, historian
organization Maui County Cultural Resources Commission date 1/13/01
street & number P.O. Box 888 telephone (808)572-6583
city or town Makawao state HI zip code 96768

Additional Documentation. Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items
(Check with the SHPO or FPO for any additional items)

Property Owner(Complete this item at the request of the SHPO or FPO.)

name State of Hawai'i, Department of Transportation
street & number 869 Punchbowl Street telephone
city or town Honolulu state Hawai'i zip code 96813

name County of Maui, Department of Public Works & Waste Management
street & number 200 S. High Street telephone
city or town Wailuku state Hawai'i zip code 96793

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 1

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

The Hāna Belt Road is coterminous with its historic right-of-way. The Hāna Highway portion of the "belt road" traverses approximately fifty-one miles along Maui's north and east coast from Kahului in central Maui to the remote East Maui community of Hāna. After Hāna, the road continues as the Pi'ilani Highway and circles back around East Maui's south side, a distance of thirty-seven miles. Together, these East Maui roads were part of Maui's "belt" road system around the entire island. The proposed historic district includes approximately forty-two miles of road from a point near Mile Marker 3 on the Hāna Highway near Huelo to Koukou'ai Bridge on Pi'ilani Highway near the Kīpahulu section of Haleakalā National Park. The narrow road winds around more than 600 curves and over fifty-nine bridges. The Hāna Belt Road is famous for its one-lane bridges with sharp approaches and encompasses the highest concentration of unaltered and stylistically consistent historic bridges in Hawai'i. The Belt Road to Hāna is notable for its breathtaking scenery as it passes waterfalls, v-shaped valleys, and small villages, often hugging the precipitous sea cliffs on Maui's rugged coastline. The roadway width varies from less than 16' wide along the sea cliffs and other rugged terrain to approximately 22' wide through level topography and residential areas. Along most of the roadway, there is no shoulder or a very narrow shoulder. The road's alignment dates to its construction in the 1920s. The Belt Road is the only overland automobile route that connects East Maui communities with the rest of the island. The period of significance is circa 1900 when Mauians began calling for an improved road and a rudimentary wagon road was constructed near Nāhiku, to 1947 when the last bridge was built to service the Hāna Belt Road.

TOPOGRAPHY AND EARLY ROAD

The Hāna Belt Road traverses through some of Hawai'i's most rugged topography and rainiest climate. The island of Maui is comprised of two shield volcanoes joined by an isthmus, which constitutes east and west Maui. East Maui, where the Hāna Belt Road is located, is the immense Haleakalā, a dormant volcano more than 10,000' in elevation. In earlier times, lava flows poured into the ocean to create the jagged coastline along which the road is aligned. Centuries of stream erosion from the wet, tradewind climate on Haleakalā's windward (northeastern) slope cut a rugged terrain of great sea cliffs and v-shaped valleys. The wet climate allowed

dense forests to grow over the rough terrain and helped make the Hāna District in East Maui one of Hawai'i's most isolated and inaccessible areas.

Prior to 1450 A.D., Maui was divided into two separate kingdoms, one with a court at Lahaina, the other with a court in Hāna. The East Maui coastal area was well populated in ancient times, but had little contact with the rest of Maui due to its isolated location. Traditionally, Hawaiians preferred to rely on their highly-developed navigational skills and traveled by canoe. As a result, Hāna was often politically tied to the more accessible communities across the channel on the island of Hawai'i. In the sixteenth century, Maui's King Pi'ilani conquered East Maui and pulled Hāna into his political sphere. Pi'ilani was notable for his public works projects, including the *Alaloa*, or main road, which began in West Maui.[1]

The predecessor trail to the Hāna Belt Road was built by Pi'ilani's son, Kihapi'ilani, in the sixteenth century. The trail was paved with hand-fitted basalt (lava) rocks. The 1848 account of Moses Manu noted, "This road was treacherous and difficult for the stranger, but when it was paved by Kihapi'ilani this road became a fine thing." When completed, the road was 4' to 6' wide, 138 miles long, and encircled the entire island. With the completion of Kihapi'ilani's East Maui trail, known as the King's Highway, Maui became the only island in the Hawaiian chain to have a "belt" road that completely encircled it.[2] In 1828, missionaries noted that the trail was "paved" and extended over thirty miles. They reported that it was a great help in ascending and descending the steep mountains and cliffs in the area. The early trail's switchbacks over the mountains near Honomanū were still visible in the 1940s.[3] Today, intact portions of the King's Highway remain, although most of the road has been obliterated by agriculture or paved over by modern roadways, including the Hāna Belt Road.

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[1] Gail Bartholomew, *Maui Remembers: A Local History*. (Honolulu: Mutual Publishing), 1994, 2.

[2] Bartholomew, *Maui Remembers*, 2; Trust for Public Land and Bay Pacific Consulting, *East Maui Resource Inventory*, Prepared for the Rivers, Trails, and Conservation Assistance Program, National Park Service, U.S. Department of the Interior (Honolulu: 1998), 9.

[3] E. E. Pleasant, "Maui 100 Years Ago: The Old Trail to Hāna." *The Maui News*, June 13, 1942.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 3

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

THE HĀNA BELT ROAD

The modern history of the Hāna Belt Road began in the 1870s when fifteen miles of unpaved road was built from central Maui into East Maui's rain forest to facilitate the construction of the Hāmākua Ditch, which was completed in 1878. The ditch was an extraordinary nineteenth century engineering marvel built to ensure the economic success of sugar by bringing water from rainy East Maui to central Maui's arid plantations. In 1900, Mauians began considering the necessity of extending a good wagon road through to Hāna, which would be part of the island's "belt" (around-the-island) road system. That year, a rudimentary road was built from Ke'anae to Nāhiku to service the Nāhiku Rubber Company. Construction through this country was difficult due to the terrain and climate. The road was surfaced with cinder, but was not adequate for automobile traffic. In 1905, the Superintendent of Public Works reported that the road in East Maui traversed through very rough country and as a result, was built "as narrow as possible in order to construct, with the money available, the maximum length of road."[4] Overland travel continued by horse and many travelers followed the trails along the irrigation ditches. Steamer remained the preferred mode of transportation for travel along the Hāna coast.[5]

By the early 1900s, Maui leaders began planning for an improved route to Hāna. Beginning in 1908 and reaching a peak in 1911, numerous concrete bridges were built along the Hāna coast in anticipation of road improvements.[6] In 1914, the Maui County Board of Supervisors lobbied the Territory of Hawai'i Legislature for funding to extend the road from Kailua to Ke'anae. Territorial Governor Pinkham was adamantly opposed to the Hāna Belt Road and blocked most of its funding. Despite the governor's opposition, money was appropriated and the Wilson and McCandless firm completed a "several-mile" section of road between Ke'anae and Nāhiku in

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[4] Bartholomew, *Maui Remembers*, 161; Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, prepared for the State of Hawai'i, Department of Transportation, Highways Division. Draft. [Honolulu], 1996, IV 12.

[5] "Raymond Adds Ginger To Loan Fund Meeting," *The Maui News*, May 23, 1914.

[6] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, IV 12.

Narrative Description (continued)

1914. *The Maui News* reported that this "fine piece of road" was of "practically no benefit" since it ended in a forest reserve miles from any habitation. The newspaper noted that one section of road closely traversed along the mountainside a few thousand feet above sea level, with other sections following the Ko'olau Ditch. The road was praised for passing through some of the most spectacular scenery in the islands. Although money had been pledged to carry the road all the way into Ke'anae, Governor Pinkham refused to approve the appropriation and Maui was left with an inaccessible stretch of road.[7]

By 1920, the road from central Maui to Kailua was suitable for modern automobile traffic. Parts of the road were paved with macadam to ensure that it was passable during the rainy season. Keeping the road open was essential as it was the primary transportation route into Maui's pineapple country and muddy roads had periodically shut down pineapple operations. Maui County stretched funding as far as it could by using convict labor on the belt road projects.[8] Territorial funding to extend and complete the coastal highway to Hāna, however, continued to be a problem and was not resolved until Wallace Farrington became governor. Major sections of the Hāna coast remained inaccessible to automobile traffic, namely the region between Kailua and Nāhiku, the area with the most challenging topography. With Governor Farrington's strong backing, the major portion of today's Hāna Highway was constructed in two separate construction projects between 1923 and 1926. The road between Kailua and Ke'anae was built from 1923 to 1925. Immediately thereafter, a road between Wailua and Nāhiku that connected with the route into Hāna was constructed and opened to the public in 1926.

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[7] "Raymond Adds Ginger To Loan Fund Meeting," *The Maui News*, May 23, 1914; "Belt Road Or Nothing Says Board," *The Maui News*, June 20, 1914; "Let's Have The Belt Road Money," *The Maui News*, June 20, 1914; "No Ke'anae Highway Says Governor," *The Maui News*, July 18, 1914; "Road Pau on Nāhiku Part Belt Road," *The Maui News*, November 14, 1914.

[8] "No Money For Belt Road For Two Years," *The Maui News*, May 7, 1920; "Convict Labor to Work on Belt Road," *The Maui News*, September 17, 1920.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 5

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Maui County Engineer Paul Low was credited with supervising "one of the most difficult and at the same time finest pieces of road engineering" on Maui.[9] In January 1923, Low presented his estimates to complete the Hāna road as two projects, the first of which was the roadway extension from Kailua to Ke'anae, a distance of 11.67 miles, which would require the excavation of 273,000 cubic yards of earth. The second phase of the project extended the road from Ke'anae to Wailuaiki near Nāhiku, a distance of 5.67 miles that called for almost 30,000 cubic yards of earth to be excavated. Low used earlier survey work done by engineers of the Maui Loan Fund Commission, which had been created by the Territorial Legislature to oversee special funds for Hawai'i's belt road systems. Low credited engineers Harvey and Howell with designing the original plans. Hugh Howell also served as Maui County engineer between 1906 and 1914. In addition to the earlier surveys, Low and a team of county surveyors scouted the route for the Hāna Belt Road, took field notes, and prepared plans and specifications. Low's 1923 estimates included engineering costs, excavation, fill, retaining walls, culverts, bridges, macadam pavement, and tunnels to relocate some ditches. The new road was to be built on a 16'-wide bench, with a pavement width of 12'-0".[10]

The Kailua to Ke'anae section of the belt road took two years to build. Crews worked from both ends of the project and met in May 1925. The road opened to the public on June 11, 1925. The new section of road was described as "serpentine" as it passed through a dozen gulches and wound around "mountain sides that dip into the ocean." Although the distance between the two communities was only four miles as the crow flies, the mileage needed to complete the road around the difficult topography was nearly twelve miles. In order to build the new road, workers were lowered by rope over the steep cliffs and gulches to dig a footing, set their drills, bore holes, and set the powder and fuses that would blast the new roadbed. The most spectacular piece of the road was also considered its most impressive engineering feat. This portion of road traversed down the mountain side (west) to the bottom of Honomanū Gulch,

[9] "Steam Shovels Meet Next Week," *The Maui News*, July 31, 1926.

[10] "Itemized Costs Proposed Belt Road Presented," *The Maui News*, January 19, 1923; "Estimate Made Belt Road Cost By Way Kailua," *The Maui News*, January 13, 1923; "Magnificent Scenery Unfolds Before Eyes of Travelers On Motor Trip Over New Road Leading To Hāna," *The Maui News*, December 22, 1926.

where it crossed a bridge and proceeded up the other mountain side (east side of the gulch) to a peak on the Ke'anae side. Motorists had impressive views from both sides of the gulch, including a view of the road on the other side. Governor Farrington described the scene as a "gorgeous spectacle [with] the blue sea in many places hundreds of feet below you, the white surf beating against the shore line and these wonderful green hills, the many gulches and every playing light, shade and color on the sides of beautiful and majestic Haleakalā." *The Maui News* noted that the road was still rough in many places, unsurfaced, and in need of widening so that cars could pass each other at any point. The article pointed out the road opened up "marvelously beautiful scenery" that most Maui residents had never seen. As a piece of engineering, the editor claimed that there was nothing in the Territory of Hawai'i or perhaps the world quite like the new road to Ke'anae. A Los Angeles-based writer admired the landscape features, including bamboo thickets, mountain apple, and native kukui trees.[11]

Work began immediately on the final link of the Hāna Belt Road project. In 1925, Maui's road program received a substantial boost when President Calvin Coolidge approved a bond issue for the Territory of Hawai'i that included $150,000 to continue construction of the Hāna Belt Road. County Engineer Low reported that finishing work was being done on the newly completed section to Ke'anae, including top-dressing the road, finishing culverts, and improving bridge approaches. Stone masons were building wing walls on the bridges and retaining walls in the valleys. Crews with forty men each had started to build the last link of the road from both the Hāna and Ke'anae sides, which was a length of 3.5 miles. This section was benched at 16'-0" wide, although plans called for the road to eventually be widened to 20'-0" after it had settled. Several bridges near Wailua were also built during this phase, including the Waikani Bridge and the bridge at West Wailuanui. Construction of the last link of road was difficult as

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[11] "First Car Runs Over Belt Road Kailua-Ke'anae," *The Maui News*, May 23, 1925; "Dream Of Thirty Years Ago About To Be Realized," *The Maui News*, June 6, 1925; "Hundreds Motor to Ke'anae: Maui Turns Out To See Opening Of Scenic Road," *The Maui News*, June 13, 1925; "Magnificent Scenery Unfolds Before Eyes of Travelers On Motor Trip Over New Road Leading To Hāna," *The Maui News*, December 22, 1926; "Maui's New Road," editorial, *The Maui News*, June 17, 1925; "Wonder And Charm Of Maui Scenery To Be Pictured And Told Hundreds Of Thousands Readers On Mainland," *The Maui News*, August 15, 1925.

much of the work consisted of blasting the solid rock in the area. Shovels on both sides of the project failed due to the stresses of working on solid rock cuts and the necessity of removing hundreds of tons of rock along the right-of-way. At times, the steam shovels could not do the work without considerable blasting and hand work. Heavy rains disrupted the project as well, causing floods and undermining embankments. In November 1926, a flood in the Wailuanui Valley caused a landslide over the road, washed out the scaffolding on the Waikani Bridge, and carried away 600 bags of cement to be used on the bridge.[12]

The Hāna Belt Road was opened to the public on December 18, 1926. *Honiron*, a publication of Honolulu Iron Works, described the road as "spectacularly chiseled out of abrupt cliffs and precipitous valleys." It noted that miles of the roadway were nothing more than a 16'-wide shelf cut into the mountainside, with towering masses of rock above and sheer drops measuring hundreds of feet to the ocean below. When asked how the scenery of the new section of road compared to the Kailua-Ke'anae section, Low commented that there was no comparison. He admired the section of road above the Wailua Valley that traveled along a narrow ledge for about a mile and provided a lovely panorama of *taro* patches and rice fields in the quaint village of Wailua below. *The Maui News* noted that the newly completed Hāna Belt Road was the "great road making achievement in the Islands, fraught with tremendous difficulties in engineering and construction work" and completed by "dare-devil exploits." The paper claimed the road was the most scenic driveway in the world, with vistas of lofty mountains, the Pacific Ocean, wild canyons, cataracts, waterfalls, and luxurious tropical vegetation. Signs marked "bad turn" and "go slow" were installed to mark dangerous curves and other points in the road. The average speed for driving the Hāna Belt Road was 20 m.p.h. Although Low's

[12] "Coolidge Approves Proposed $2,590,000 Hawai'i Bond Issue," *The Maui News*, August 22, 1925; "Kailua-Kōpili'ula Road Work Making Headway, Says Low," *The Maui News*, March 13, 1926; "Workers Blast Tons Of Rock On Belt Road," *The Maui News*, May 15, 1926; "Builders Progress In Construction Of Belt Road Project," *The Maui News*, April 17, 1926; "Flood Threatens Belt Road Bridge," *The Maui News*, November 17, 1926.

Narrative Description (continued)

1923 estimates to complete the road to Hāna included pavement, the road was not paved when it was opened in 1926.[13]

Approximately six miles west of Hāna, near Upper Nāhiku, the Hāna Belt Road enters a coastal plain, which permits the alignment to run in a relatively straight path. The road passes over some minor gulches via a number of culverts and several bridges. Approximately four miles south of Hāna, the coastal plain ends and the road again passes through East Maui's challenging terrain. South of Ala'ala'ula Bridge, the road traverses through a series of rugged gulches similar to those near Ke'anae. South of Waikakoi Bridge, the road is benched into the high cliffs, around steep mountains and into the deep valley of Wailua Cove, before climbing back out of the valley. This portion of road is similar to the road near Honomanū Gulch near Ke'anae. Near Kīpahulu, the Hāna Belt Road passes through the scenic 'Ohe'o Gulch and Koukou'ai Gulch, which were spanned by concrete arch bridges in 1916 and 1911 respectively. It is uncertain when the belt road between Hāna and Kīpahulu was built, although it was being used for automobile traffic by the time the belt road was completed between Kailua and Hāna in 1926.[14]

BRIDGES and CULVERTS

The Hāna Belt Road includes fifty-nine bridges and numerous culverts constructed between 1908 and 1947. Sixteen of these bridges are located on the Hāna Belt Road south of Hāna (Pi'ilani Highway, Route 31) and forty-three on the Hāna Belt Road between Hāna and Huelo

[13] "Magnificent Scenery Unfolds Before Eyes of Travelers On Motor Trip Over New Road Leading To Hāna," *The Maui News*, December 22, 1926; "Honiron Tells Of Maui Road To Hāna," *The Maui News*, March 5, 1927; "Linking Up Maui," *The Maui News*, editorial, December 18, 1926; "Celebration Typical Of Maui," editorial, *The Maui News*, December 22, 1926.

[14] "Magnificent Scenery Unfolds Before Eyes of Travelers On Motor Trip Over New Road Leading To Hāna," *The Maui News*, December 22, 1926; "Maui Belt Road Circled," *The Maui News*, January 15, 1927.

Narrative Description (continued)

(Hāna Highway, Route 360). The narrowest bridges are approximately 12'-6" wide and the widest bridge is approximately 20'-6". More than half of the bridges are single span.

The majority of bridges in the district were constructed of reinforced cast-in-place concrete. County and territorial engineers utilized structural systems typical for the early twentieth century, including concrete arch, flat slab, girder, and simple tee-beam spans. Eighty percent of the concrete bridges were constructed between 1908 and 1929. Two unique bridges in the historic district are rare surviving examples of masonry arch construction with basalt (lava rock). Many of the bridges have wingwalls, abutments, and piers constructed of concrete rubble masonry with basalt.

The majority of bridges featured two styles of parapet construction. Twenty-four bridges built between 1908 and 1915 had a solid-paneled, reinforced-concrete parapet with a peaked concrete rail cap. From 1916 to 1929, thirty-one bridges were built with a reinforced-concrete parapet of simple vertical concrete balusters and a square concrete rail cap.[15] The Pu'uhaoa Bridge, built in 1910, and the Waiokamilo Bridge, built in 1921, featured a more ornate open-rail parapet. Two bridges constructed in 1947, Kawaipapa and Wailua, are unique along the corridor, with concrete post-and-beam railings. Some of the bridges have construction dates inscribed on the parapets.

Masonry Arch Bridges

Two masonry arch bridges are located on the Hāna Belt Road south of Hāna, the Hāhālawe Bridge and Wai'ele Bridge. Constructed in 1910, both bridges utilized cut basalt blocks to build the abutments and arch rings. The bridges feature solid reinforced-concrete parapets with rail caps. "A.D. 1910" is inscribed on the outer parapet of each bridge. The bridge walls and rock abutments may date to different construction periods, with the concrete parapets being from a later date. The bridges retain their historic integrity, and feature fine craftsmanship and uncommon materials.[16]

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[15] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 191.

[16] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 192.

Narrative Description (continued)

Concrete Arch Bridges

After 1904, concrete arch bridges were built in Hawai'i, often using standardized plans. Two types of concrete arch bridges were constructed in Hawai'i, solid and open spandrel. The solid-spandrel bridges were generally arch-deck bridges in which the traffic deck rested upon the arch. Between 1916 and 1926, several bridges of this type were built on Maui, including three bridges built along the Hāna Coast: 'Ohe'o Bridge, Hanawī Bridge, and Kūhiwa Bridge. The 'Ohe'o Bridge spans the scenic 'Ohe'o Gulch in Haleakalā National Park.

The open-spandrel concrete arch bridges demonstrated sophisticated engineering for their day and marked the evolution of concrete technology toward lighter, yet larger structures. Koukou'ai Bridge was the first open-spandrel arch bridge on Maui and is an excellent example of early twentieth century bridge construction in the Hawaiian Islands. Built in 1911, it spans a deep gorge just south of Haleakalā National Park. The other open-spandrel concrete arch bridge on the Hāna Coast is the Waikani Bridge, built in 1926 by the Akiona Contracting Company and designed by local architect William D'Esmond. The bridge dramatically crosses a deep gorge at the end of a long valley and is perhaps the most aesthetically pleasing bridge along the Hāna Belt Road.[17]

Concrete Deck Girder and Flat Slab Bridges

Concrete deck girder, including tee-beam spans and simple deck girder, were the most common types of bridge built along the Hāna Belt Road. Territorial and county engineers realized that these structures were both economical and strong over short spans. As a result, the government began using concrete deck bridges rather than arch or timber bridges after 1911. The majority of these bridges were built between 1911 and 1928. The 1912 Waikamoi Bridge is one of the earliest remaining examples of a concrete slab bridge in Hawai'i. Concrete slab bridges were cast on site using formwork built by local carpenters. The earlier bridges featured a solid-

[17] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 192-194.

paneled reinforced-concrete parapet, with the later bridges utilizing simple vertical concrete balusters and a square concrete rail cap.[18] Three bridges date to the 1930s and two were built in 1947. The bridges constructed in 1947 utilized a post-and-beam design that is unique in the Hāna Belt Road corridor.

Culverts

Honolulu Iron Work's publication *Honiron* reported that numerous culverts along the Hāna Belt Road were necessary due to the to the demanding topography. During the 1920s, Calco Corrugated Culverts manufactured from Armco Ingot Iron were used in road construction.[19] Today, there are also culverts constructed of basalt, which are visible from the road. Many of the culverts are topped by lava rock walls on the road. Numerous culverts are not visible from the road and are covered by dense vegetation, which makes it difficult to establish an accurate count of culverts, both contributing and non contributing, along the Hāna Belt Road.

Many culverts along the Hāna Belt Road were built using concrete abutments, concrete slabs, and small concrete parapets. Example of this type of structure include: Culvert #1 between Nā'ili'ilihā'ele Bridge and 'O'opuola Bridge; Culverts #2, #3, and #4 near Ke'anae between Palauhulu Bridge and Waiokamilo Bridge; Culverts #9 and #10 located in the town of Hāna, south of Kawaipapa Bridge near the Hāna Fire Station; and Kalena Culvert north of Koukou'ai Bridge.

Four distinctive culverts (Culverts #5, #6, #7, and #8) constructed of concrete abutments, concrete slabs, and open parapets with simple vertical concrete balusters and concrete rail caps are located west of Hāna and east of Honomā'ele Bridge. These structures vary in span length from 5'-5" to 14'-7". Another distinctive culvert is located adjacent to (east of) Waiokamilo Bridge and spans the Hāna Highway at the "Y" intersection with Wailua Road. Its parapets were built to match those of the Waiokamilo Bridge. Two culverts with concrete abutments,

[18] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 195-198.

[19] "Honiron Tells Of Maui Road To Hāna," *The Maui News*, March 5, 1927.

Narrative Description (continued)

concrete slabs, and solid parapets are Mo'omonui Culvert and Maluhiana'iwi Culvert. The construction dates are inscribed on each of these culverts.

To most observers, many of these culverts would be regarded as bridges, even though they are considered to be culverts by the State Department of Transportation. The State of Hawai'i Department of Transportation (DOT) considers a culvert to have a span of less than 10'-0" in accordance with Federal Highway Administration guidelines. Some of the structures considered to be culverts by the DOT measured longer than 10'.

VISTAS and VIEWS

There is hardly a place along the Hāna Belt Road where motorists are not rewarded with a variety of scenic views, including the ocean, mountains, sea cliffs, waterfalls, small villages, native and exotic vegetation, and traditional landscapes.

Although it is sometimes difficult to find pullouts along the narrow road, viewpoints are scattered throughout the Hāna Belt Road corridor. At most of the bridges, motorists can park on either side to view waterfalls and valleys. The most impressive waterfalls are located at the Waikani Bridge, 'Ohe'o Bridge, and Wailua Bridge. The Kīpahulu District of Haleakalā National Park includes the picturesque 'Ohe'o Gulch; its pools are a popular swimming spot. Elements of the East Maui Irrigation Company ditchworks can be seen at numerous bridges along the road, including the Kōpili'ula Bridge. Just after the Kōpili'ula Bridge, the Hāna Belt Road runs parallel to the irrigation ditch for a short distance. Scenic views are provided at Kaumahina State Wayside near Ke'anae and Wailua Valley Lookout Park above the village of Wailua. Pua'a Ka'a State Park is directly adjacent to the road near Nāhiku. Traditional cultural landscapes of taro patches are viewed in the villages of Ke'anae and Wailua. Native vegetation along the Hāna Belt Road includes hapu'u fern, ko'a, kukui, and pandanus forests. Most of the vegetation along the road, however, is exotic, with species such as bamboo and ginger impacting the landscape. On the coastal plain near the town of Hāna are large ranching areas, which were formerly used for sugar cane cultivation.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 13

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

ALTERATIONS

Maintaining the Hāna Belt Road over the years has been no easy task. Since the earliest days, highway crews have struggled to keep up with damage caused by landslides, rocks, vegetation, downed trees, and floods. A journalist driving the road in 1940 referred to it as a "paved trail following the line of the ditch through the wild jungle."[20] The road was not completely paved until 1962. Over the years, lava-rock retaining walls and guardwalls were constructed in various locations along the road. These walls complement the historic character of the Hāna Belt Road.

In 1969, the State of Hawai'i transferred jurisdiction over the portion of the Hāna Belt Road between Hāna and Kīpahulu, which is now known as the Pi'ilani Highway, to the County of Maui. The Hāna Belt Road between Huelo and Hāna remained under the jurisdiction of the State of Hawai'i. The manner in which the road is maintained and preserved is significantly different between the two government agencies.

Although the state's portion of the Hāna Belt Road (Hāna Highway) between Huelo and Hāna retains its historic character and integrity, there have been alterations along the roadway. The most noticeable change to the state section of the Hāna Belt Road is the addition of w-beam and thrie-beam steel guardrails. It is unknown when the first guardrails were installed along the Hāna Belt Road. Earlier guardrails along the road were built of concrete posts and timber. Concrete posts are still present along the roadside in some areas. Another change over the years has been road widening. There are still many segments of the road that are close to the original 16' width (especially on the cliffs near Ke'anae) and too narrow for cars to pass each other without yielding. The road, however, has been widened in many areas. In a few places where there is a more level topography, as through villages and near the beginning of the road near Huelo, the pavement is up to 22'-0" wide. In several locations, the Department of

[20] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, IV 14.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 14

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Transportation has used the new layers of asphalt during repaving projects to super-elevate curves, particularly in the area between Ke'anae and Wailua. On many bridges, added layers of asphalt have significantly shortened the height of the bridge parapets and asphalt often fills part of the openings between bridge railings. Other changes along the road include painting some bridges and lava rock walls white to increase nighttime visibility, installation of numerous cautionary signs ("one-lane bridge," "narrow road"), reflector signs, and reflectors in the pavement. There have been a few jersey barriers added to the road, usually in places where the roadbed is being undermined alongside a steep cliff.

In the mid 1990s, the road west of Ke'anae that traverses the steep mountainside on the east side of Honomanū Gulch was widened. Work included blasting and removing a significant piece of the mountain near the road's summit to relocate the damaged road (which was collapsing into the ocean) away from the cliff. A rock wall which does not match the character of the typical basalt parapets seen along the Hāna Belt Road was built between the mountain and the road to catch falling rocks. Concrete gutters were installed and wide shoulders were added. The state Department of Transportation has installed concrete gutters and new culverts in other locations along the road, especially in the area between Wailua and Nāhiku.

The bridges along the Hāna Belt Road retain their historic character. One notable exception is Kawaipapa Bridge. Constructed in 1947, the bridge was altered in 1991 when a new bridge was added to the to the west end of the original structure. The 1991 bridge expansion was modeled on the original bridge, with replications of the post-and-beam bridge walls. The consequence of the expanded bridge was that the original bridge lost its historic integrity and is a non-contributing structure.

The County of Maui section of the Hāna Belt Road, known called the Pi'ilani Highway, has been subjected to fewer changes than the state-maintained portion of the belt road. The county has widened the road in a few locations, but for the most part, the pavement is no widr than 18'-0" and often averages 15' to 16' wide. Some guardrails have been added, but not to the same extent as the state-maintained section of the Hāna Belt Road.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 15

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Although the Hāna Belt Road has been improved over the years, many of the bridges along the road have suffered from a lack of maintenance. Many of the bridge walls originally averaged 34" high. The walls are now shorter due to repeated layers of asphalt. In many cases, the additional asphalt is approximately 12" deep. The majority of the bridges in the Hāna corridor have weeds and vegetation growing in the concrete joints. A few bridge walls have been damaged by accidents. Many of the damaged walls were repaired to match the original design, although in a few cases, damage was not repaired neatly or was repaired with a non-matching element. An example of repaired bridge wall is the Waikani Bridge balustrades, which were severely damaged on the west end. Rather than restoring the end of the bridge wall, the repair consisted of building a rock wall in place of the balustrades. Another example of a bridge alteration that does not match the original structure is Nua'ailua Bridge. Altered in 1940, the *mauka* (mountain side) parapet was replaced with a non-matching concrete wall, most likely as a result of road widening.

The Hāna Belt Road retains its historic character and integrity. For the most part, the road is relatively unaltered. The road's alignment has not been changed since it was completed in 1926, although sections of the road on sea cliffs have collapsed into the ocean and necessitated reconstruction. The road retains its historic character and integrity in its rural location and narrow lanes. The bridges retain historic integrity with sharp and narrow approaches, original materials, and original design. Although a majority of the bridges are quite simple in appearance, several bridges are more elaborate and were designed and built by masters. The bridge designs and materials survive intact, with a few minor exceptions.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 16

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

Inventory of Contributing Bridges & Significant Culverts

Listed in geographical order east from Huelo:

Hōlua Bridge: constructed 1929; concrete tee-beam; one span, 48'-0"; total length 49'-0"; bridge width 16'-7"; approximate height above stream 28'-0".

Kailua Bridge: constructed 1929; concrete tee-beam; one span, 39'-0"; total length 40'-0"; bridge width 20'-6"; approximate height above stream 18'-0".

Nā'ili'ilihā'ele Bridge: constructed 1930; concrete tee-beam; three spans, 21'-6"; total length 64'-0"; bridge width 20'-3"; approximate height above stream 20'-6". Designer: County Engineer Office.

Culvert #1: concrete, one span, approximate length 9'-0".

'O'opuola Bridge: constructed 1925, altered 1931; concrete tee-beam; one span, 29'-0"; long; total bridge length 30'-0"; bridge width 19'-8"; approximate height above stream 18'-6". Designer: County Engineer Office.

Makanali Bridge: constructed 1928; concrete slab; one span, 18'-0"; total length 18'-0"; bridge width 16'-6". Designer/builder: Department of Public Works.

Ka'aiea Bridge: constructed 1928; concrete tee-beam; one span, 20'-0"; total length 22'-0"; bridge width 16'-6"; approximate height above stream 15'-0". Designer/Builder: Department of Public Works.

Waikamoi Bridge: constructed 1912; concrete slab; two spans, 19'-0"; total length 41'-0"; bridge width 12'-9"; approximate height above stream 17'-0". Designer/Builder: Hugh Howell, Senior Engineer.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 17

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Puohokamoa Bridge: constructed 1912; concrete tee-beam; two spans, 25'-0"; total length 56'-4"; bridge width 15'-3", approximate height above stream 13'-0".

Haipua'ena Bridge: constructed 1912; concrete slab; two spans, 16'-0"; total length 34'-6"; bridge width 12'-9"; approximate height above stream 11'-0". Designer/Builder: Hugh Howell, Senior Engineer.

Kōlea (Punala) Bridge: constructed 1911; concrete tee-beam; one span, 30'-0"; total length 34'-0"; bridge width 12'-8"; approximate height above stream 13'-0". Designer/Builder: Hugh Howell, Senior Engineer.

Honomanū Bridge: constructed 1911; concrete tee-beam; two spans, 23'-0"; total length 48'-0"; bridge width 12'-8"; approximate height above stream 15'-0". Designer/Builder: Hugh Howell, Senior Engineer.

Nua'ailua Bridge: constructed 1911/altered 1940; concrete tee-beam; one span, 22'-0"; total length 35'-0"; bridge width 24'-0"; approximate height above stream 13'-0". Designer/Builder: Joseph Matson, Senior Engineer.

Pi'ina'au Bridge: constructed 1916; concrete tee-beam; one span, 27'-0"; total length 28'-5"; bridge width 19'-0"; approximate height above stream 19'-0".

Palauhulu Bridge: constructed 1916; concrete tee-beam; one span, 30'-0"; total length 31'-0"; bridge width 19'-10"; approximate height above stream 20'-6".

Culvert #2: concrete, one span, approximate length 10'-0".

Culvert #3: concrete, one span, approximate length 15'-0".

Culvert #4: concrete, one span, approximate length 13'-0".

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 18

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Waiokamilo Bridge: constructed 1921, altered 1937; concrete tee-beam; one span, 20'-0"; total length 24'-0"; bridge width 22'-1"; approximate height above stream 11'-0". Designer: D. K. Kapohakimohewa.

Waiokamilo Culvert: concrete, one span, approximate length 10'-3".

Waikani Bridge: constructed 1926; concrete arch, open spandrel; one span, 82'-6"; total length 108'-0"; bridge width 17'-7"; approximate height above stream 32'-0". Designer: William D'Esmond. Builder: Moses Akiona.

West Wailuaiki Bridge: constructed 1926, altered 1937; concrete tee-beam; three spans, 24'-6"; total length 62'-6"; bridge width 19'-7"; approximate height above stream 15'-0". Designer: A. H. Wong.

East Wailuaiki Bridge: constructed 1926; concrete tee-beam; one span, 31'-0"; total length 34'-5"; bridge width 18'-4"; approximate height above stream 16'-0". Designer/builder: A. P. Low, County Engineer.

Kōpili'ula Bridge: constructed 1926; concrete tee-beam; two spans, 34'-2"; total length 76'-7"; bridge width 14'-4"; approximate height above stream 6'-0".

Pua'aka'a (Waiohue) Bridge: constructed 1926; concrete tee-beam; one span, 19'-6"; total length 20'-2"; bridge width 22'-0"; approximate height above stream 7'-8".

Waiohue Bridge: constructed 1926, altered 1937; concrete tee-beam; two spans, 16'-7"; total length 40'-0"; bridge width 13'-2"; approximate height above stream 10'-0".

Waiohuolua Bridge: constructed 1920, altered 1970; concrete tee-beam; one span, 15'-0"; total length 19'-0"; bridge width 12'-9"; approximate height above stream 8'-0". One bridge wall was replaced by w-beam guardrail; the original bridge wall is in the stream below.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 19

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Bridge #2: constructed 1920; concrete tee-beam; one span, 16'-7"; total length 20'-0"; bridge width 12'-6"; approximate height above stream 8'-0".

Pa'akea Bridge: constructed 1920, altered 1937; concrete tee-beam; two spans, 16'-0"; total length 40'-0"; bridge width 12'-9"; approximate height above stream 8'-0".

Kapā'ula Bridge: constructed 1926; concrete tee-beam; two spans, 21'-0"; total length 49'-0"; bridge width 16'-0"; approximate height above stream 51'-0".

Hanawī Bridge: constructed 1926; concrete arch, solid spandrel; one span, 36'-0"; total length 61'-0"; bridge width 20'-4"; approximate height above stream 19'-0".

East Hanawī Bridge: constructed 1926; concrete tee-beam; one span, 18'-5"; total length 22'-10"; bridge width 15'-11"; approximate height above stream 15'-0".

East Hanawī Culvert: concrete, one span, approximate length 11'-8".

Makapipi Bridge: constructed 1926; concrete tee-beam; two spans, 22'-5"; total length 39'-10"; bridge width 16'-0"; approximate height above stream 12'-0".

Kūhiwa Bridge: constructed 1926; concrete arch, solid spandrel; one span, 36'-6"; total length 60'-0"; bridge width 16'-4"; approximate height above stream 35'-0". Builder: County Engineer's Office.

Kupukoi Bridge: constructed 1926; concrete tee-beam; one span, 21'-5"; total length 24'-7"; bridge width 16'-0"; approximate height above stream 15'-0".

Kahalaowaka Bridge: constructed 1926; concrete tee-beam; one span, 22'-4"; total length 24'-5"; bridge width 15'-0"; approximate height above stream 9'-0".

Narrative Description (continued)

Pupape-Manawaikeae Bridge: constructed 1926; concrete tee-beam; one span, 20'-8"; total length 24'-4"; bridge width 16'-2"; approximate height above stream 16'-0".

Kahawaihapapa Bridge: constructed 1922; concrete tee-beam; three spans, 17'-0"; total length 60'-0"; bridge width 16'-0"; approximate height above stream 15'-0". Builder: County Engineer's Office.

Kea'ā'iki Bridge: constructed 1921; concrete tee-beam; one span, 20'-10"; total length 22'-10"; bridge width 16'-1"; approximate height above stream 27'-0". Builder: County Engineer's Office.

West Waioni Bridge: constructed 1920; concrete tee-beam; one span, 24'-5"; total length 29'-5"; bridge width 16'-6"; approximate height above stream 15'-0".

Waioni Bridge: constructed 1920; concrete tee-beam; one span, 20'-7"; total length 24'-5"; bridge width 15'-11"; approximate height above stream 10'-0".

Lanikele Bridge: constructed 1917; concrete tee-beam;, two spans, 22'-4"; total length 51'-6"; bridge width 16'-0"; approximate height above stream 13'-0".

Helele'ike'ōhā Bridge: constructed 1917; concrete tee-beam; one span, 23'-7"; total length 28'-6"; bridge width 16'-1"; approximate height above stream 12'-0".

'Ula'ino Bridge: constructed 1914; concrete tee-beam; two spans, 18'-10"; total length 39'-7"; bridge width 16'-0"; approximate height above stream 12'-0".

Mokulehua Bridge: constructed 1908; concrete tee-beam; three spans, 14'-0"; total length 48'-7"; bridge width 13'-11"; approximate height above stream 21'-0".

Oilowai Bridge: constructed 1914; concrete tee-beam; one span, 20'-7"; total length 22'-10"; bridge width 16'-2"; approximate height above stream 22'-0". Builders: Wilson & McCandless.

Narrative Description (continued)

Honomā'ele Bridge: constructed 1924; concrete tee-beam; two spans, 20'-4"; total length 38'-10"; bridge width 16'-1"; approximate height above stream 14'-0". Builders: County Engineer's Office.

Culvert #5: concrete, one span, approximate length 17'-6".

Culvert #6: concrete, one span, approximate length 12'-0".

Culvert #7: concrete, one span, approximate length 5'5".

Culvert #8: concrete, one span, approximate length 13'-0".

Culvert #9: concrete, one span, approximate length 14'-7".

Culvert #10: concrete, one span, approximate length 14'-0".

Mo'omonui Culvert: constructed 1911, concrete, one span approximate length 8'-3".

Haneo'o (Kaholopo) Bridge: constructed 1900, altered 1917; concrete slab; two spans, 10'-0"; total length 22'-6"; bridge width 15'-1".

Kapi'a (Kawaiokapia) Bridge: constructed 1915, altered 1931; concrete slab; three spans, 17'-6"; total length 58'-4"; bridge width 14'-4"; approximate height above stream 17'-0". Designer/Builder: Wilson and McCandless.

Waiohonu Bridge: constructed 1915; concrete tee-beam; five spans, 18'-6"; total length 97'-6"; bridge width 15'-0"; approximate height above stream 14'-0". Designer/Builder: Wilson and McCandless.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 22

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Papa'ahawahawa Bridge: constructed 1913; concrete tee-beam and concrete slab; two spans, 22'-0"; total length 40'-4"; bridge width 14'-5"; approximate height above stream 9'-0". Designer/Builder: County Engineer's Office.

Ala'ala'ula Bridge: constructed 1915; concrete slab; one span, 30'-0"; total length 54'-0"; bridge width 12'-6"; approximate height above stream 22'-0".

Waikakoi Bridge: constructed 1911; concrete slab; two spans, 14'-0"; total length 33'-6"; bridge width 15'-4"; approximate height above stream 18'-0".

Pa'ihi Bridge: constructed 1911; concrete slab; one span, 36'-6"; total length 42'-4"; bridge width 13'-9"; approximate height above stream 10'-0".

Wailua Bridge: constructed 1947; concrete tee-beam; one span, 60'-0"; total length 66'-1"; bridge width 14'-0"; approximate height above stream 17'-0".

South Wailua (Honolewa) Bridge: constructed 1911; concrete slab; two spans, 25'-0"; total length 57'-0"; bridge width 15'-2"; approximate height above stream 26'-0".

Pu'uhoao Bridge: constructed 1910; concrete tee-beam; one span, 20'-0"; total length 23'-2"; bridge width 12'-9"; approximate height above stream 13'-0".

Waiele (Paehala) Bridge: constructed 1910; masonry arch; one span, 20'-0"; total length 25'-0"; bridge width 12'-6"; approximate height above stream 7'-0".

Kakiweka (Mahalawa) Bridge: constructed 1910; concrete slab; one span, 28'-6"; total length 30'-10"; bridge width 13'-10"; approximate height above stream 16'-0".

Hāhālawe Bridge: constructed 1910; masonry arch; one span, 22'-0"; total length 25'-0"; bridge width 14'-9"; approximate height above stream 10'-0".

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 23

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Description (continued)

Maluhiana'iwi Culvert: constructed 1910; concrete, one span, approximately 13'-9".

Pua'alu'u Bridge: constructed 1910; concrete slab; two spans, 15'-0"; total length 32'-10"; bridge width 14'-5"; approximate height above stream 10'-0".

'Ohe'o Bridge: constructed 1916; concrete arch, solid spandrel; one span, 58'-0"; total length 77'-0"; bridge width 14'-5"; approximate height above stream 44'-0".

Kalena Culvert: concrete, one span, approximate length 13'-5".

Koukou'ai (Kaukau'ai) Bridge: constructed 1911; concrete arch, open spandrel; one span, 31'-10"; total length 58'-0"; bridge width 15'-2"; approximate height above stream 34'-0".[21]

[21] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, prepared for the State of Hawai'i, Department of Transportation, Highways Division. Draft. (Honolulu), 1996, VI 196-198. All bridge widths and culvert span lengths were measured by Dawn Duensing as part of field work in December 2000.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 1

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

The Hāna Belt Road achieves state and local significance in the areas of engineering, transportation, commerce, and social history under criteria A and C. The construction of bridges and a road to Hāna between 1900 and 1947 was a major engineering achievement, as the County of Maui and private contractors benched a road into precipitous mountainsides and through the wilderness of East Maui. Fifty-nine of the bridges built between 1908 and 1947 remain along the route as an example of bridge engineering and construction in Hawai'i during the early twentieth century. The completion of an automobile route to Hāna in 1926 ended that community's isolation from the rest of Maui. The road opened East Maui to settlement, agricultural enterprises, and tourism. The Hāna Belt Road is the best remaining intact example of the old belt road system in Hawai'i. The Hāna Belt Road retains historic integrity in its original road alignment, narrow lanes, bridges, and spectacular setting along Maui's northeast coast.

Engineering

A 1905 Superintendent of Public Works report noted that road construction in the Hāna District was through "very rough country."[22] The plan for a belt road around East Maui was popular with Maui officials and businessmen, but took decades to complete due to high costs and construction difficulties. Building the Hāna Belt Road was an expensive and difficult proposition due to the challenging topography. Miles of road were blasted out of the mountainsides and numerous bridges were required to carry the road across streams and gulches. Construction was complicated by heavy vegetation, torrential rains, and landslides.

The majority of bridges in the Hāna District were built using construction methods and materials typical in Hawai'i during the early twentieth century. Most of the Hāna District bridges (eighty percent) were constructed prior to 1930. County and territorial engineers utilized common structural systems, including concrete arch, flat slab, girder, and simple tee-beam spans. The majority of bridges along the Hāna Belt Road were simple but functional, constructed with tee-beam spans and simple deck girders. The 1912 Waikamoi Bridge is one of

[22] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, IV 12.

Narrative Statement of Significance (continued)

the earliest remaining examples of a concrete slab bridge in Hawai'i. Reinforced concrete was the most prevalent construction material due to the corrosive nature of the Pacific Ocean's salt air and the presence of wood-boring insects that made the use of steel and timber bridges less practical in Hawai'i than in the mainland United States. The Loan Fund Commission, established in 1911 to oversee belt road projects, decided that concrete would be used on Hawai'i's bridges rather than steel. The Commission observed that the concrete was more expensive in the beginning, but realized that the increased cost was justified due to concrete's durability as well as lower maintenance and repair costs. The use of reinforced concrete was an indication of the commitment of the Territory of Hawai'i and Maui County governments to building permanent public works improvements.[23]

Five concrete arch bridges on the Hāna Belt Road remain as excellent examples of early twentieth century bridge construction in the Hawaiian Islands. These bridges used the most modern engineering technology of their day. Today, the bridges make a significant statement regarding Maui's civic pride during the early twentieth century. The open-spandrel concrete arch bridges demonstrated sophisticated engineering and marked the evolution of concrete technology toward lighter yet larger structures. These bridges were constructed for their strength and permanence, although only a few remain in Hawai'i. Koukou'ai Bridge near Kīpahulu was the first open-spandrel arch bridge on Maui and one of the earliest to be built in Hawai'i. The 'Ohe'o Bridge, a solid spandrel concrete arch, spans the scenic 'Ohe'o Gulch in Haleakalā National Park and was declared eligible for the National Register of Historic Places in 1977 as part of the Kīpahulu Historic District (50-17-299). The open-spandrel Waikani Bridge was designed by Maui architect, William D'Esmond, and built by a well-known contractor, Moses Akiona.[24] D'Esmond designed Maui's County Office Building, built in 1927;

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[23] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 191, 195; V 10-12.

[24] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 192-194.

Narrative Statement of Significance (continued)

Pā'ia School, 1926; St. Anthony's School, 1925; and numerous residences on Maui.[25]

Two unique bridges on the Hāna Belt Road are rare surviving examples of masonry arch construction with basalt, Hāhālawe Bridge and Wai'ele Bridge. Fewer than ten masonry arch bridges remain in the state of Hawai'i. Constructed in 1910, both bridges utilized cut basalt blocks for the abutments and arch rings. Basalt arch construction was common in Hawai'i prior to 1898. The bridge walls and rock abutments may date to different construction periods, with the concrete parapets being from a later date. The bridges retain their historic integrity, with each featuring fine craftsmanship and uncommon materials.[26]

The bridges along the Hāna Belt Road present a visual record and timeline of bridge construction technology and innovation on Maui and in Hawai'i. Many bridges are unique due to the use of vernacular materials (basalt). In addition to the masonry arch bridges, a number of bridges used basalt for the construction of abutments, piers and wingwalls. The majority of bridges, however, were built with the latest in construction technology, reinforced concrete. The bridges were built during a period when formal engineering expertise in bridge building was first introduced in Hawai'i and are good examples of the Territory of Hawai'i's progressive highway system. Each county in the territory had a County Engineer's Office, within which was a bridge design office. Many of the bridges on the Belt Road were designed by the County Engineer's Office and the engineers proved themselves to be not only technologically skilled, but also sensitive to aesthetics. In many cases, the bridges also demonstrate the work of skilled builders. The masonry arch and concrete arch bridges show a high degree of detailing and workmanship. Together, the bridges played a integral role in the development of belt roads on

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[25] *The Maui News*, December 4, 1926, section 8; "Drawings and Floor Plans of Proposed St. Anthony School Building," *The Maui News*, March 28, 1925; Dawn E. Duensing, *Historic Architectural Survey of Wailuku, Maui, Hawai'i*, prepared for the County of Maui Department of Planning, 1993, 20.

[26] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 192.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 4

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Statement of Significance (continued)

Maui as well as on other Hawaiian Islands. Today, the Hāna Belt Road bridges remain as the highest concentration of unaltered and stylistically consistent historic bridges in Hawai'i.[27]

Talented local engineers were responsible for the design and construction of the Hāna Belt Road. A substantial portion of the road and bridge design as well as the majority of engineering work was completed by County Engineer's Office. Hugh Howell, who was appointed Maui County engineer in 1906 and again in 1914, had served as an engineer with the Maui Loan Fund Commission and participated in the early survey work for the Hāna Belt Road. He also designed several bridges on the Hāna Belt Road while serving as a county engineer. The Hugh Howell Engineering Company worked on Hāna Belt Road contracts once construction began. Paul Low was Maui County Engineer from 1918 until 1928 and was responsible for supervising the two major phases of Hāna Belt Road construction between 1923 and 1926. He and his county crews used Howell's earlier survey work as the basis for their road design and built the most spectacular sections of road between Kailua and Nahikū. During his tenure as county engineer, Low also supervised a number of Maui's other public works projects, including the County Office Building in 1924. A. H. Wong, who designed the West Wailuaiki Bridge, was appointed county engineer in 1928 to replace Low. After his service with the county, he worked on the construction of Haleakalā Highway and became an engineering supervisor with the Works Progress Administration project building Maui Airport.[28]

Notable local contractors built portions of the Hāna Belt Road and several bridges. The Honolulu firm Wilson and McCandless built the 1914 section of road near Nahikū and Oilowai Bridge. Another important local builder, Moses Akiona, was born in Ke'anae and established his contracting firm, Moses Akiona, Ltd., in 1920. In addition to Waikani bridge, Akiona's firm worked other Maui projects, including Malulani Hospital, Kula Sanitarium, and the Lahaina

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[27] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, IV 7-9.
[28] Howell noted in *The Maui News*, January 10, 1914; January 9, 1915; and February 4, 1916. Low noted in *The Maui News*, February 15, 1918; October 3, 1928; in Duensing, *Historic Architectural Survey*, 35. Wong noted in *The Maui News*, October 17, 1928.

Courthouse. His business eventually grew to become one of the largest contracting firms in the territory. In the 1960s, Akiona and his sons built a section of the H-1 freeway on O'ahu.[29]

Transportation & Commerce

Belt road projects are a significant element in the transportation history of Maui. This road-building program was concurrent with the strategy of all the major Hawaiian Islands to develop belt road systems. By 1900, Mauians were concentrating on the Hāna section of the belt road, calling for a good wagon road to connect central Maui and Hāna. "What the Central Pacific was to California, and what the Panama Canal would be to the Islands," *The Maui News* emphasized in 1903, was "relatively what a good road all the way from Pā'ia to Hāna would mean to Maui." A road to Hāna was believed necessary for the economic development of East Maui and its success in sugar, minor industries, and small-scale farming.[30] Prior to the completion of a road from central Maui to Hāna, travel to East Maui villages was by steamship or an unpaved wagon and horse trail. The route along the Hāna coast was often impassable due to heavy rain. Various sections of the coastal road were built by 1914, but the lack of a continuous road to Hāna was considered a nuisance. One Maui legislator complained that Maui was "the only island on which you cannot traverse by road around it."[31]

The improved transportation provided by the Hāna Belt Road was also considered essential for Maui's commercial development. *Maui News* editorials noted that East Maui had plenty of fertile land and emphasized that a road to Hāna would open the area to settlement. Mauians predicted that a road through East Maui to Hāna would make homestead lands available and would also facilitate trade between East Maui and the rest of the island. Benefits to be obtained from improved transportation to Hāna included increased tax revenues, population, and

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[29] Spencer Mason Architects, *State of Hawai'i Historic Bridge Inventory and Evaluation*, VI 191, V 14.

[30] *The Maui News*, editorial, April 25, 1903.

[31] "Roads First Need View of Fassoth," *The Maui News*, February 11, 1921.

production. Roads connecting the various parts of the island, including Hāna, were viewed as essential to Maui as arteries were to the human body. Some Mauians believed that the Hāna Belt Road project was the most needed road in the territory and noted that Maui was ten years behind the other islands in its belt road construction.[32]

The opening of the Hāna Belt Road in 1926 was a major transportation milestone for Maui. *The Maui News* labeled it "the greatest road making achievement in the Island, one fraught with tremendous difficulties in engineering and construction work." The new road eliminated Hāna's reliance on the weekly steamer for its transportation and communication needs to the outside world. With the new road, the trip to Hāna could now be made overland on one's own timetable rather than by the schedule of a steamer or horse trip. Instead of a round-trip journey of a week, the trip was shortened to 3.5 hours each way.[33]

Another significant commercial aspect of the Hāna Belt Road was tourism. By the 1920s, Maui's businessmen and civic leaders recognized the importance of scenic roads and considered them to be commercial enterprises, without which Maui could not develop its tourism industry. As early as 1912, the Hāna Belt Road, as well as a proposed route to the summit of Haleakalā, were planned as the centerpieces of Maui's road-building projects. Mauians realized that building a road to Hāna would open up some of the finest scenery in the Hawaiian Islands and put Maui "on the tourist map." One civic group claimed that a magnificent scenic highway could be one of Maui's greatest assets. Local businessmen argued that tourism would not thrive on Maui unless the island had good roads to accommodate its visitors. One Mauian claimed that the mere mention of the term "horseback ride" scared tourists from visiting Maui. A businessman pointed out that tourists expected to travel comfortably by automobile and were not always willing to climb into the saddle to go sightseeing. Mauians realized that more tourists visited

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[32] Editorials, *The Maui News*, June 28, 1902; November 15, 1902; December 27, 1902; March 7, 1903; July 4, 1903; "Advocates Belt Road: Maui is Ten Years Behind in Road Matters," *The Maui News*, November 6, 1909.

[33] "Linking Up Maui," *The Maui News*, editorial, December 18, 1926; "Maui Takes Day Off for Road Opening," *The Maui News*, December 22, 1926.

Narrative Statement of Significance (continued)

the Big Island of Hawai'i because that island's attractions, especially Kilauea Volcano, were accessible by automobile, while Maui's attractions remained almost inaccessible. The Hāna Belt Road was a significant piece of a road-building program that aimed to make Maui's scenic attractions easily available. Maui's plans to develop a tourist industry received a tremendous boost with the completion of the Hāna Belt Road in 1926 and the Haleakalā Highway in 1935. These two roads were Maui's crowning achievements in transportation public works projects during the twentieth century. Both highways were important commercial enterprises and remain the island's most popular scenic drives today.[34] The Hāna Belt Road has become an attraction in itself, with tourists driving the route to experience the narrow road and its historic bridges, not just the scenery. Motorists appreciate this unique route that is relatively unchanged from the 1920s and provides an opportunity to visit a rural area that is uniquely Hawaiian.

Social History

The immediate impact of opening the Hāna Belt Road was to end East Maui's centuries of isolation from the rest of Maui. Prior to the belt road's construction, many on Maui maintained that Hāna might as well be on another island.[35] Indeed, in ancient times, Hāna was more connected to communities on the island of Hawai'i that were more easily accessible by canoe. Until the Hāna Belt Road was completed, many Mauians had never seen the 'other side' of Maui, whether they lived in West Maui or East Maui.

The completion of the Hāna Belt Road is a testament to civic pride on Maui during the early twentieth century. The County Act in 1905 authorized the establishment of local governments

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[34] "No Ke'anae Highway Says Governor," *The Maui News*, July 18, 1914; "The Key to Progress," *The Maui News*, May 16, 1914; "Road to Ke'anae Now Maui's Best Bet To Draw Tourist Travel, *The Maui News*, October 7, 1925; Connect Maui Up," *The Maui News*, February 11, 1921; Duensing, Dawn E., *Haleakalā Highway, HAER No. HI-52.* [Washington D.C.], National Park Service, Historic American Engineering Record, 1999.

[35] "New Comer Doesn't Like Our Road Policy," *The Maui News*, August 14, 1915; "Connect Maui Up," *The Maui News*, February 11, 1921.

on Hawai'i's four major islands. On Maui, numerous public works projects during the next thirty years demonstrated residents' keen sense of civic awareness. Substantial public buildings were constructed in the county seat of Wailuku, including the Wailuku Courthouse (built in 1907), County Office Building (1924), Wailuku Library (1928), and Territorial Building (1931). In the Lahaina District, the courthouse was renovated and the Pali Highway was improved in 1925. Prominent schools were built, including the Wailuku Public School in 1905 and Maui High School in 1921, both designed by well-known architect C. W. Dickey. Many of the structures built during this intense period of civil works projects were designed by prominent architects, including Dickey, H. L. Kerr, and William D'Esmond.[36]

The Hāna Belt Road was part of this great, early twentieth century public works movement. First suggested in 1895, the Maui Board of Supervisors sought funding for the road as early as 1900. Although numerous bridges were constructed on the Hāna Belt Road starting in 1908, little money was available for road construction or improvement. Mauians lobbied Hawai'i's governors and legislators for decades before receiving funding to build the dream of an automobile road to Hāna. A 1923 estimate of $692,000 to complete the road was a substantial undertaking for an island with limited resources and a population of approximately 38,000, most of whom were agricultural laborers. Maui's leaders found ways to finance the Hāna Belt Road through the sale of territorial bonds and the savings gained from the use of public employees and prison labor rather than private contractors. In early 1923, the county government demonstrated its determination to go ahead with the project by purchasing a steam shovel and drill and assigning a gang of twenty men to begin work on the new road, even though the territorial legislature had not yet approved the sale of bonds for the project. The county established a prison camp in Kailua to house the fifty convicts expected to work on the road. Within months, leaders purchased another steam shovel and drill so that work could proceed from both ends of the road. Funding eventually was secured from the territorial and federal governments.[37]

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[36] Duensing, *Historic Architectural Survey*, 5-12, 19-20.

[37] "Belt Road Plans Further Advanced," *The Maui News*, February 10, 1923; "Belt Road Funds Knotty Problem Chamber Finds," *The Maui News*, March 9, 1923; "Belt Road Work Will Be

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 9

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Statement of Significance (continued)

A number of bridges on the Hāna Belt Road were significant civic statements for Maui. Altogether, the concrete bridges along the road demonstrated the county's commitment to permanent and modern improvements. Several bridges were visually prominent both in style and location, and also demonstrated fine workmanship. Bridges such as Waikani, Koukou'ai, and 'Ohe'o indicated both the technical and aesthetic sophistication of the community in which they were built. Many of the bridges are examples of exceptional work by important local builders, including Johnny Wilson of Honolulu (in partnership with McCandless) and Moses Akiona. Waikani Bridge is one of the most aesthetically pleasing bridges along the road and was a collaboration of Akiona and D'Esmond. Many other bridges were not quite so grand, but also made pleasing visual statements, including Hanawī Bridge, Kūhiwa Bridge, Waiokamilo Bridge, and Pu'uhaoa Bridge.

The extent of economic development predicted by *Maui News* writers never happened, although many homes and small farms were built along the Hāna Belt Road corridor over the years as land became available and accessible. Census statistics indicate that the Hāna District was home to 3,100 residents in 1920 before the road opened. In 1930, population in the district declined to 2,436. Agriculture remained the dominant activity, with the communities of Ke'anae and Wailua noted for their production of *taro* and rice. Despite the improvements in transportation and the possibilities for more development, the Hāna District's population dwindled to 1,495 by 1950.[38]

The lack of road improvements over the past seventy years has not only preserved the historic character of the Hāna Belt Road, but has also helped to maintain the historic rural character of the Hāna District itself. The absence of an easily-traveled, high-speed traffic artery has served to impede substantial development, which has subsequently allowed Hāna and other communities in East Maui to remain rural. There are no fast food chains, chain stores, strip malls or

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Started By Maui County," *The Maui News*, March 10, 1923; "Belt Road Project Is To Go Forward At Once," *The Maui News*, May 26, 1923, Robert C. Schmitt, *Historical Statistics of Hawai'i*, Honolulu: The University Press of Hawai'i, 1977, 13.

[38] Robert C. Schmitt, *Historical Statistics of Hawai'i*, 13-14.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 10

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

Narrative Statement of Significance (continued)

sprawling subdivisions along the Hāna Belt Road. Travelers along the Hāna Coast are served by the occasional roadside stand and must drive all the way to Hāna for conveniences such as groceries, gas, and restaurants. With a sizable population of residents of Hawaiian ancestry, Hāna is often cited as Maui's "most Hawaiian community." The Hāna community has worked together to "Keep Hāna Hawaiian," as a bumper sticker urges, and preserve its rural lifestyle and values. In the 1990s, residents rallied against the approval of major developments such as a golf course and an adjacent residential community. Many Hāna residents believe that the narrow, winding, and slow Hāna Belt Road is a means to "Keep Hāna Hawaiian."

Today, a trip along the Hāna Belt Road allows a motorist to see much of what would have been viewed in 1926 when the road opened: a spectacular thoroughfare chiseled out of cliffs, passing through huge gullies and past waterfalls, while always presenting stunning views of the Pacific Ocean and East Maui's natural features. Ke'anae still keeps traditional ways, with *taro* being farmed and a Hawaiian lifestyle. A three-room rural school is still in operation in Ke'anae. The section of road above the Wailua Valley, which was admired by Engineer Paul Low, still travels along a narrow ledge for a mile, providing a panoramic view of *taro* patches in the quaint village of Wailua below. Along the way motorists view the historic irrigation ditches, weirs, and intakes still used for Maui's sugar industry. The journey to Hāna provides an opportunity to experience a rural way of life that is uniquely Hawaiian and also a way of life that is becoming more rare in the Hawaiian Islands.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 9 Page 1

Name of property Hāna Belt Road

County and State Maui County, Hawai'i

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The Maui News, 1900-1950.

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 1

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

All photographs, with the exception of photograph #84 (Koukou'ai Bridge), were taken by Dawn E. Duensing. Dawn E. Duensing has all negatives except for that for #84, which is located at the State of Hawai'i Department of Transportation.

1. Hāna Belt Road
2. Maui County, Hawai'i
3. Dawn E. Duensing
4. November 19, 2000
5. Dawn E. Duensing
6. Hōlua Bridge, view looking east
7. Photograph #1

4. November 19, 2000
6. Kailua Bridge, view looking east
7. Photograph #2

4. November 19, 2000
6. Nā'ili'ilihā'ele Bridge, view looking west
7. Photograph #3

4. November 19, 2000
6. 'O'opuola Bridge, view looking west
7. Photograph #4

4. November 19, 2000
6. Makanali Bridge, view looking west
7. Photograph #5

4. November 19, 2000
6. Ka'aiea Bridge, view looking west, with ditchworks in the background
7. Photograph #6

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 2

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. November 19, 2000
6. Waikamoi Bridge, view looking east
7. Photograph #7

4. November 19, 2000
6. Puohokamoa Bridge, view looking *makai* (towards the ocean)
7. Photograph #8

4. November 19, 2000
6. Haipua'ena Bridge, view looking *mauka* (toward the mountain or inland)
7. Photograph #9

4. November 19, 2000
6. Haipua'ena Bridge, view looking east
7. Photograph #10

4. November 19, 2000
6. View from road looking east, just east of Kaumahina State Wayside
7. Photograph #11

4. December 2, 2000
6. Aerial view of road on west side of Honomanū Valley.
7. Photograph #12

4. November 26, 2000
6. West side of Honomanū Valley portion of road as viewed from the road on Honomanū Valley's east side
7. Photograph #13

4. December 2, 2000
6. Kōlea (Punala) Bridge, looking *mauka*
7. Photograph #14

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 3

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. November 26, 2000
6. Hāna Belt Road through Honomanū Gulch, between Kōlea Bridge and Honomanū Bridge, looking east
7. Photograph #15

4. November 26, 2000
6. Honomanū Bridge, looking *mauka*
7. Photograph #16

4. November 26, 2000
6. Nua'ailua Bridge, looking east
7. Photograph #17

4. November 26, 2000
6. Pi'ina'au Bridge, looking west
7. Photograph #18

4. November 26, 2000
6. Palauhulu Bridge, looking *mauka*
7. Photograph #19

4. November 26, 2000
6. Culverts #2 & #3, looking west, culvert #4 is of similar construction.
7. Photograph #20

4. November 26, 2000
6. Waiokamilo Bridge, looking west
7. Photograph #21

4. December 2, 2000
6. Waiokamilo Bridge, *makai* wall. Waiokamilo Culvert, adjacent to bridge, has identical walls.
7. Photograph #22

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 4

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. November 26, 2000
6. View of road on cliff's edge above Wailua Village, after Wailua Valley lookout, looking west
7. Photograph #23

4. December 3, 2000
6. Waikani Bridge, looking *mauka* from west side of bridge
7. Photograph #24

4. November 26, 2000
6. Road view of Waikani Bridge, looking west
7. Photograph #25

4. December 3, 2000
6. View from road on east side of Wailuanui Valley, east of Waikani Bridge; overlooking Wailua Village, with Hāna Belt Road ledge above Wailua visible on left
7. Photograph #26

4. November 26, 2000
6. West Wailuaiki Bridge, looking *mauka* from east side of bridge
7. Photograph #27

4. November 26, 2000
6. East Wailuaiki Bridge, looking east
7. Photograph #28

4. November 26, 2000
6. Kōpili'ula Bridge, looking east
7. Photograph #29

4. November 26, 2000
6. Ditch running alongside Hāna Belt Road after Kōpili'ula Bridge
7. Photograph #30

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 5

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. November 26, 2000
6. Pua'aka'a (Waiohue) Bridge, looking *mauka*
7. Photograph #31

4. November 26,2000
6. Waiohue Bridge, looking east/ *makai*
7. Photograph #32

4. November 26, 2000
6. Waiohuolua Bridge, looking east
7. Photograph #33

4. November 26, 2000
6. Bridge #2, looking east, Pa'akea Bridge is in background
7. Photograph #34

4. January 27, 2000
6. Pa'akea Bridge, looking west
7. Photograph #35

4. December 2, 2000
6. Kapā'ula Bridge, looking west
7. Photograph #36

4. December 2, 2000
6. Hanawī Bridge, from west side of bridge looking *mauka*
7. Photograph #37

4. December 2, 2000
6. East Hanawī Bridge, looking east
7. Photograph #38

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 6

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 2, 2000
6. East Hanawī Culvert, looking east/ *mauka*
7. Photograph #39

4. December 2, 2000
6. Makapipi Bridge, looking *mauka*
7. Photograph #40

4. December 2, 2000
6. View of Hāna Belt Road east of Makapipi Bridge, looking east
7. Photograph #41

4. December 2, 2000
6. Kūhiwa Bridge, looking east
7. Photograph #42

4. December 2, 2000
6. Kupukoi Bridge, looking east
7. Photograph #43

4. December 2, 2000
6. Kahalaowaka Bridge, view looking *mauka*
7. Photograph #44

4. December 2, 2000
6. Pupape-Manawaikeae Bridge, view looking east
7. Photograph #45

4. December 2, 2000
6. Kahawaihapapa Bridge, looking east
7. Photograph #46

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 7

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 2 , 2000
6. Kea'ā'iki Bridge, looking east
7. Photograph #47

4. December 2, 2000
6. West Waioni Bridge, looking east
7. Photograph #48

4. December 2, 2000
6. Waioni Bridge, looking east
7. Photograph #49

4. December 2, 2000
6. Lanikele Bridge, looking west
7. Photograph #50

4. December 2, 2000
6. Helele'ike'ōhā Bridge, looking east
7. Photograph #51

4. December 2, 2000
6. 'Ula'ino Bridge, looking west
7. Photograph #52

4. December 3, 2000
6. Mokulehua Bridge, looking east
7. Photograph #53

4. December 3, 2000
6. Oilowai Bridge, looking east
7. Photograph #54

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 8

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 3, 2000
6. Honomā'ele Bridge, looking west
7. Photograph #55

4. December 3, 2000
6. Culvert #5, looking west
7. Photograph #56

4. December 3, 2000
6. Culvert #6, looking *makai*
7. Photograph #57

4. December 3, 2000
6. Culvert #7, looking *makai*
7. Photograph #58

4. December 3, 2000
6. Culvert #8, looking west
7. Photograph #59

4. December 3, 2000
6. Culvert #9, looking *mauka*
7. Photograph #60

4. December 3, 2000
6. Culvert #10, looking west
7. Photograph #61

4. January 27, 2001
6. Mo'omonui Culvert, looking *mauka*
7. Photograph #62

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 9

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 3, 2000
6. Haneo'o (Kaholopo) Bridge, looking *mauka*
7. Photograph #63

4. December 3, 2000
6. Kapi'a (Kawaiokapia) Bridge, looking north
7. Photograph #64

4. December 3, 2000
6. Waiohonu Bridge, looking south
7. Photograph #65

4. December 3, 2000
6. Papa'ahawahawa Bridge, looking *mauka*
7. Photograph #66

4. December 3, 2000
6. Papa'ahawahawa Bridge, road view looking north
7. Photograph #67

4. December 3, 2000
6. Ala'ala'ula Bridge, looking *mauka*
7. Photograph #68

4. December 3, 2000
6. Waikakoi Bridge, looking north
7. Photograph #69

4. December 3, 2000
6. Pa'ihi Bridge, looking *mauka*
7. Photograph #70

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 10

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 3, 2000
6. Wailua Bridge, looking north
7. Photograph #71

4. December 3, 2000
6. South Wailua (Honolewa) Bridge, looking *mauka*
7. Photograph #72

4. December 3, 2000
6. Pu'uhoao Bridge, looking north
7. Photograph #73

4. December 3, 2000
6. Waiele (Paehala) Bridge, looking north
7. Photograph #74

4. December 3, 2000
6. Kakiweka Bridge, looking *mauka*
7. Photograph #75

4. December 3, 2000
6. Hāhālawe Bridge, looking *mauka*
7. Photograph #76

4. December 3, 2000
6. Maluhiana'iwi Culvert, looking *mauka*
7. Photograph #77

4. December 3, 2000
6. Pua'alu'u Bridge, looking *mauka*
7. Photograph #78

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section Additional Documentation: Photographs Page 11

Name of property Hāna Belt Road
County and State Maui County, Hawai'i

4. December 3, 2000
6. Roadscape south of Pua'alu'u Bridge, looking north
7. Photograph #79

4. December 3, 2000
6. Roadscape north of 'Ohe'o Bridge, looking north
7. Photograph #80

4. December 3, 2000
6. 'Ohe'o Bridge, looking *makai*
7. Photograph #81

4. December 3, 2000
6. 'Ohe'o Bridge, looking *mauka*
7. Photograph #82

4. December 3, 2000
6. Roadscape south of 'Ohe'o Bridge in Haleakalā National Park, looking north
7. Photograph #83

3. August Riccio, Hawai'i Heritage Center
4. 1990
5. State of Hawai'i Department of Transportation
6. Koukou'ai (Kaukau'ai) Bridge, looking *mauka*
7. Photograph #84

NATIONAL REGISTER NOMINATIONS: ISLAND OF HAWAII

1. Steel Trestle Bridges on the Hamakua Coast
2. Nanue Stream Bridge
3. Umauma Stream Bridge
4. Kapue Stream Bridge
5. Paheehee Stream Bridge
6. Kolekole Stream Bridge
7. Hakalau Stream Bridge
8. Hilina Pali Road

NPS Form 10-900-b (Rev. 01/2009) OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is used for documenting property groups relating to one or several historic contexts. See instructions in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items

x New Submission _____ Amended Submission

A. Name of Multiple Property Listing

Steel Trestle Bridges on the Hamakua Coast

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronoligical period for each.)
The Plantation Era of Hamakua Coast on the Island of Hawaii, 1899-1990
The Hilo Railroad (later called the Hawai'i Consolidated Railway), 1909-1946

C. Form Prepared by

name/title Spencer Leineweber, FAIA Professor

organization Heritage Center, University of Hawai'i at Manoa date August 15, 2009

street & number 2410 Campus Road telephone (808) 956-4704

city or town Honolulu state HI zip code 96822

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D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.
(_____ See continuation sheet for additional comments.)

Signature and title of certifying official | Date

State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper Date of Action

Table of Contents for Written Narrative

Provide the following information on continuation sheets. Cite the letter and title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Fill in page numbers for each section in the space below.

	# of Pages
E. Statement of Historic Contexts (if more than one historic context is documented, present them in sequential order.)	1-10
F. Associated Property Types (Provide description, significance, and registration requirments.)	1-4
G. Geographical Data	1-2
H. Summary of Identification and Evaluation Methods (Discuss the methods used in developing the multiple property listing.)	1
I. Major Bibliographical References (List major written works and primary location of additional documentation: State Historic Preservation Office, other State agency, Federal agency, local government, university, or other, specifying repository.)	1-5

Paperwork Reduction Act Statement: This information is being collected for applications 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.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.

STATEMENT OF HISTORIC CONTEXTS

Contents

A. Geographical Considerations in Bridge Building
Statewide Overview
Hawai'i Island Overview

B. Historical Context Statement for Bridge Building
Monarchy and Independent Republic period
Bridge Construction During the Early Territorial Period (1900-1924)
The Federal Aid Program (1925-1941)
Bridge Construction during World War II and the Post-war Period and the National Defense Highway System (1941-1959)

C. Hawai'i Island Road and Bridge Context

D. Significant Designers

E. Prominent Individuals

A. Geographical Considerations in Bridge Building

Statewide Overview: The islands of Hawai'i are the tops of volcanoes, which first erupted from the bottom of the ocean millions of years ago. The landmass that makes up the Hawaiian Islands is comprised almost entirely of basaltic rock and coral reef. Erosion, resulting from the islands' significant rainfall and the constant action of the sea, has carved deep valleys and great *pali* [mountains], thousands of feet high in some places. This mountainous terrain drops steeply to the sea in some areas or meets plains sloping gradually to the shore. The steep mountains, deep valleys and circuitous coastline of the islands have demanded many dramatic bridge construction projects.

Hawai'i Island Overview: Hawai'i Island contains by far the greatest concentration of historic bridges, due to its rural nature and consequent lack of development, as well as an abundance of land for new transportation routes without the destruction of older bridges and roads. Most of the Hawai'i Island's bridges are located along the Hāmākua Coast, north of Hilo, due to the abundant rainfall and consequent streams and gulches. This region is Hawaii's wettest coastal district, starting at 'Upolu Point, the northern tip of the island, and running through Hāmākua and into the Hilo District. From Niuli'i in North Kohala, the coast is a series of deep canyons with rivers flowing down the Kohala Mountains or Mauna Kea. Bridges near the coast span long distances as the erosion is wider and deeper near the sea. This area has the greatest concentration of bridges island wide with fifty-one bridges in 42.5 miles, or more than one bridge per mile.

B. Historical Context Statement for Bridges Statewide

Monarchy and Independent Republic Period: Road and bridge-building in Hawai'i developed in conjunction with an increased need to travel across the land rather than across the sea in the early nineteenth century. Examination of the archival materials and government documents of the Hawaiian Kingdom reveals very limited information concerning bridge building.[1] Considering the dramatic social and political upheavals of Hawaiian history, it is not surprising that few early records about bridge building were retained. After the overthrow of the Hawaiian monarchy in 1893, Hawai'i became an Independent Republic and later an American territory in 1898.

Several bridges remain from this transitional period, including masonry arches built by the Republic of Hawai'i – such as the Māmalahoa-Kalalau, Māmalahoa-Kaumō'ali'i, and Māmalahoa-Laupāhoehoe Bridges on the Island of Hawai'i. The majority of the remaining historic bridges in Hawai'i were constructed by the county and territorial governments.

Bridge Construction During the Early Territorial Period (1900-1924): The Organic Act of 1900 created the Office of the Superintendent of Public Works (SPW) with the responsibility for expending territorial funds on road and bridgework. Five years later, the Territorial Legislature established the county governments on each island, granting them taxing and spending powers in their jurisdictions. Although the counties were granted independent taxing powers, they relied on legislative appropriations to supplement county funds for internal road and bridge improvements. The history of county road-building was closely tied to Territorial and Federal government funding and largesse.[2] Throughout much of the early twentieth century, the county road and bridge-building could not keep up with the economic development and infrastructure needs. In some cases, government funds were so scarce that public roads were maintained by private business so as not to limit expansion and productivity.

In response to a chronic shortage of funds for road construction, the 1911 Legislature recommended the issuance of territorial bonds for Belt Road construction. The purpose of Belt Road construction was to link the communities often in a single road around the island. A Loan Commission, consisting of the SPW, the county Chairman of the Board of Supervisors, and three county residents, was appointed to oversee the fund expenditures.[3] As horses and carriages gave way to automobiles, trucks, and buses, wider and more durable roads were needed to service these vehicles. Originally, bridges were just wide enough to let one horse and buggy cross at a time and no sidewalks were provided for pedestrians, even in urban areas. A Hilo newspaper writer pointed out: "strictly speaking, a pedestrian has no rights which any one is bound to respect."[4] Privately built bridges on plantation roads were often as narrow as eight or nine feet, while those on public roads averaged fourteen or sixteen feet through the first decade of the century. The Loan Fund Commission established eighteen feet as its required road width in 1911, although sixteen feet still was used in rural areas. These road widths prevailed until the 1920s when the recommended width became twenty feet. Sidewalks were generally not added until much later in the 1930s, first on one side, then on both sides by the end of the decade.

During this same period, the Hawaiian Islands witnessed rapid economic growth. The population of the islands more than doubled between 1900 and 1940, primarily due to the importation of laborers for the sugar and pineapple

1 Bethany Thompson,1983, III-4.

2 Hawai'i Heritage Center, 5

3 Alvarez (1987a), 59.

4 Ibid, 63.

industries. This increased the demand for housing, schools, utilities and physical infrastructure. The construction of the Panama Canal in 1915 coincided with these changing social conditions in Hawai'i. Honolulu was eager for the expected economic growth through shipping, trade, and tourism. These prospects mobilized community leaders to increase promotion for Hawai'i, to improve transportation, and to further identify Hawaii as having American cities.[5] Architecture and public works projects, such as road and sewer systems, became civic statements; this strengthened the identification of Hawai'i with the U.S. mainland.

Each county had its own bridge design department located within the County Engineer's Office. Many of the bridge engineers understood the specific construction issues of their islands and built bridges with sophisticated technical expertise and high aesthetic sensitivity. Records for length and sophistication of design were continuously changing; accolades such as "the longest" and "the first" were used repeatedly over the decades to describe the latest achievements.[6]

The bridges constructed with Territorial Loan Funds are among the early examples of the progressive Territorial Highway system in Hawai'i. These bridges are also an example of one of the first uses of formal engineering expertise in bridge making by the new territorial government after the annexation of Hawai'i by the United States. The bridges played a major role in the development of each county's Belt Road plan which connected previously isolated communities with a paved highway and a series of steel-reinforced concrete, timber, or steel bridges.[7] The construction of improved modern vehicular roads, especially the up-to-date replacement of older, weak timber bridges by steel truss and reinforced concrete spans, remedied unsatisfactory road and transportation conditions, improved communications, and helped stimulate the economic and social growth of relatively isolated communities.

The Federal Aid Program (1925-1941): The Federal Aid Highway Systems in Hawai'i consist of three types: the Interstate and Defense Highways; the Federal Aid Primary System; and the Federal Aid Secondary System. The history of bridges in Hawai'i's development as funded by the federal government parallels that of the continental United States, albeit with some construction lag. There was a similar evolution of bridge construction types with the United States due to similar advancements in construction technologies.

Beginning in 1916, in anticipation of its entry into World War I, the U.S. Congress appropriated funds to assist States in developing their transportation networks.[8] Federal Aid funded roads were intended to upgrade existing highways by providing good drainage, clearly marked lanes, improved alignment, grades that could be negotiated in high gear, wide shoulders, safe and wide bridges, and safe bridge approaches. Belt roads, which circled the island, or roads that linked a seaport to federal property (such as military bases or national parks) were usually selected for Federal Aid in Hawai'i.[9] Maintenance of federal roads was to be done by the States from their own funds. Hawai'i was initially excluded from the Federal Aid system although its citizens paid federal taxes. The Hawaiian Legislature passed a Bill of Rights in 1923, demanding equal benefits with the nation's States. President Calvin Coolidge signed

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5 Daina Penkiunas, American Regional Architecture in Hawai'i: Honolulu, 1915-1935, (Doctoral dissertation, University of Virginia, 1990), abstract.

6 Ibid.

7 Barnes Riznik, "Theme: The Hanalei Bridge," Hanalei Valley: Protecting a Cultural Landscape (Unpublished paper, 1985), 1

8 Ibid, 67.

9 Ibid.

the Bill into law in March 1924.

Hawai'i received its first federal funds in 1925 and created the Territorial Highway Department (THD) to oversee the expenditure of the funds as required by the Federal Road Aid Act. The THD prepared the designs for new bridges on designated Federal Aid primary roads. Also in 1925, Congress voted to give Hawai'i the federal highway funds it had not received since 1917. By the mid-1930s, yearly federal contributions rose to the million-dollar mark with the passage of the New Deal road aid measures such as the National Industrial Recovery Act, the Emergency Relief Appropriations Act and Aid for Secondary Road systems.[10] By 1940, approximately sixty-five percent of Hawaii's roads had been built with federal funds.[11]

Bridges were a special concern of the federal highway system, and the Territorial Highway Department began a systematic replacement of narrow and hazardous bridges. With ample funds, the Department began to straighten out the Belt roads and build long, high bridges across the mouths of the valleys. The federal government started funding secondary or feeder roads in the late 1930s. Secondary roads outside of municipalities, connected the Federal Aid primary system with rural communities. Reinforced-concrete tee-beam bridges dominate this period. Rail design was standardized into a few patterns, such as the "Greek-cross void", enabling an easy recognition of THD bridges

Bridge Construction during World War II and the Post-war Period and the National Defense Highway System (1941-1959): After the outbreak of World War II in December 1941, the military constructed many miles of roads in Hawai'i.[12] However, as a Territory of the United States, Hawai'i was not entitled to the same level of federal funding given to other continental States for highway building projects, based on the 1944 Interstate Highway System Act. In 1941, the War Department designated all O'ahu's principal highways as part of a "strategic network of highways." The term "strategic network of highways" implied the route had military importance.[13] Civilian construction virtually halted as manpower and equipment was requisitioned by the military. Highway and bridge construction was restricted to only those projects that materially aided the National Defense System. The military establishment quickly became the largest employer of civilian workers in the Territory.[14]

After World War II, Hawaiian delegates used the Department of Defense's designation of "strategic" to argue that Hawaii's military bases and highway networks were key to National defense. An increased use of motor vehicles and the islands' tourism industry collectively provided pressure to meet growing transportation needs. In 1956, Territorial Highway Engineer Ben E. Nutter provided a "Progress Report on Highways," to the Legislature that detailed highway deficiencies in excess of 50 million dollars - or more than ten times the annual construction budget.[15] The report indicated that the 1954 Hawai'i Federal Aid Highway System was still about 10 years behind in providing modern highways of adequate design and capacity.[16] In the post-war era a sophisticated survey of the island's roads was completed by the Territorial Highway Department. This survey rated roads and bridges on a

10 Ibid, 70.

11 Ibid.

12 Ibid, 76.

13 Balch, D. F. Comparative Report: Nu'uanu Valley Tunnel Route vs. Kalihi Valley Tunnel Rounte. (April 5, 1943), 1

14 James H. Shoemaker. Bank of Hawai'i Dept. of Business Research: Hawai'i and the Business of Defense. Honolulu, Hawai'i. (December, 1954), 8-9

15 Military Backing May Get Federal Aid for T. H. Roads. Honolulu Advertiser. 10/23/1954.

16 Progress Report on Highways. The Territorial Highway Department. December 7, 1956

mathematical "sufficiency rating system."[17] Fewer than half of the Federal Aid system's roads got a passing grade after 25 years of existence.

In 1959 Hawai'i was admitted as the fiftieth state of the United States. The "Hawai'i Statehood Transition Bill" of 1959 made millions of federal dollars available for highway improvement and development. The State Department of Transportation (DOT) was established in January, 1960. At that time, there were about 633.93 miles of roads to build to fill the gaps in the Federal Aid Highway System.[18] Later, in July, 1960, the Interstate Highway System was extended to the State of Hawai'i, which allowed the new Federal Interstate Highway fund to be applied to Hawaii's highway and bridge construction. With Hawaii's significant role in the National defense system, the Interstate Highway fund was intended to serve both military needs and civilian interstate traffic needs.

With adequate federal funds in the post-war era, bridges were usually built as part of large public projects, such as for the construction of the Nimitz Highway, the Tran-Ko'olau Range projects, and the H-1 Interstate Highway. These projects played an important role, tying together military bases and civilian residential districts all over the islands. The distinctive post-war style railing is composed of a reinforced concrete balustrade penetrated with horizontal rectilinear voids with concrete rail caps. Later bridges from this period began the first use of metal in guardrail designs.

Hawai'i Island Road and Bridge Context:
The plantations of South Hilo, North Hilo, and Hāmākua districts were producing raw sugar within a few years after the Reciprocity Treaty of 1876. The treaty allowed Hawaiian sugar to be exported to the American mainland duty-free. The sugar industry developed rapidly in the islands; and by 1900, one-quarter of the sugar produced in the Territory was grown on the Hāmākua coast.[19] The land above the steep coastal bluffs, at the base of the dormant Mauna Kea volcano, was gently sloping fertile with the abundant rainfall. Many plantations were from two to three miles deep, their altitudes ranging from 250 feet closest to the sea to 2,000 feet at their upper boundaries; their ocean frontage varied from two to six miles.[20] The rain, perfect for sugar, also produced deep gulches that had for so long kept the area isolated. The only road to Hilo's harbor was the government wagon trail that was almost impassable in the rainy season with constant bridge washouts. As an alternative to using the road, some plantations had railroads with either locomotive or animal power; others used flumes or cable railways to move cut cane from the high fields to the mills which were usually close to the sea. The mills employed an inventive yet cumbersome method of derricks and pulleys at various landings high above the coast to load their produce on to ships for market. A need for a more efficient transportation system was evident.

Hilo was located at the southern end of this long string of sugar plantations on Hawaii's east coast. Large tracks of prime agricultural land also lay to the south of the town, awaiting development by entrepreneurs with vision and capital. In 1898, Benjamin Franklin Dillingham, a noted Hawaiian businessman, drew up plans for a large sugar mill

17 Ibid, 80.

18 Hawai'i State Highways. 1960. P. 7

19 Alvarez (1987a), 44.

20 Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123.

at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Then he applied for a charter for a railroad that would transport the raw sugar to the wharf in Hilo. The Hilo Railroad Company was incorporated in 1899 by Dillingham; Lorrin Thurston, the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the Monarchy; and Mark Robinson, former Minister of Foreign Affairs for Queen Liliuokalani.[21] The charter for the Hilo Railroad, granted by the Republic of Hawai'i, was issued on March 28, 1899. Under its charter, the Hilo Railroad was authorized - for a period of fifty years - to build a railroad anywhere on the island of Hawai'i, with free use of government lands for the right-of-way, yards, or station areas. Dillingham had just completed a three-foot gauge common carrier on O'ahu. He was aware that the popularity of narrow-gauge for trunk lines was on the wane; he announced that the Hilo Railroad would be built to standard gauge (4'-8 1/2" wide) - the first and only standard-gauge railroad in the islands.[22]

In the first decade of the century, the railroad owners determined that the wharf in Hilo was inadequate to attract the business of large shipping lines. Freighters anchored in deep water had to use lighters, and the whole operation was relatively unprotected from heavy seas during the storm season. A new wharf, sheltered from the sea by a breakwater, was proposed; but its construction was beyond the means of either the railroad or the Territory of Hawai'i. The U.S. Congress financed the breakwater, and the U.S. Army Corps of Engineers designed the project. The railroad had the responsibility for building the wharf. One of the conditions imposed by the government for the improvement of Hilo's harbor was that the railroad company extend its railroad line north along the coast to service the sugar plantations of Hāmākua.[23]

In 1911-12, the Hilo Railroad established a northern rail line to Pa'auilo and sugar was transported to Hilo for shipment from its harbor. The first train began service to Pa'auilo in May 1913.[24] The rail line brought many changes to the Hāmākua coast, including the relocation of many of the mills away from the coast to access the rail service. Trucking sugar to Hilo along the narrow, winding government road (the Old Māmalahoa Highway) was not an economical alternative to the relatively straight run along the rail line. The railroad construction project was a daring engineering feat that crossed the numerous gorges and streams with large steel bridges at the valley mouths and required massive earth cuts for the completion of the comparatively straight roadbed. This was in direct contrast to the previous conservative government policy of roads winding back and forth down sharp grades through valleys. The high cut in the north wall of Hakalau gulch remains as an excellent example of the degree of earth moving accomplished by the railroad engineers.

Work on the first section - 12.7 miles from Hilo to the Hakalau Mill - began in 1908 and was completed in 1911. Construction of the second phase - from Hakalau to Pa'auilo - continued through 1912, with costs of $106,000 per mile, for a total of $3,500,000.[25] The company succeeded in erecting fourteen steel bridges, five wood and steel

21 Ibid, 123-124.

22 Ibid, 125.

23 Ibid.

24 Ken Okimoto, *Exploring the Hamakua Coast: A Pictorial Guide to the Plantation Era.* Hong Kong: Watermark Publishing, 2002. 28.

25 Ibid, 133.

combination bridges, and twenty-four wooden trestles. These bridges, along with two tunnels and expensive grading, gave the Hilo Railroad "one of the highest per-mile construction costs of any railroad under the Stars and Stripes."[26]

John Mason Young was the engineer for the railroad bridges. Young was the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i). Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[27] The bridges' components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year) and were erected by W.W. Beers, described by the *Hilo Tribune* as a New York engineer.[28] All of the steel trestle bridges erected by the railroad were of the same type, deep steel girders with 66- to 72-foot spans set on wide steel trestles and masonry (lava-rock) abutments. The bridges were assembled at the Waiākea railroad yards and shipped out to their sites on railroad cars.

In addition to the steel trestles built by the Hilo Railroad, two multi-span steel truss bridges were constructed over the Wailuku and Wailoa Rivers. These bridges suffered from their positions close to sea level and were the most problematic for the railroad to maintain. The Wailoa drawbridge was destroyed in 1923 by a tidal wave and was remounted on concrete piers.[29] While the Wailuku Bridge was being erected in 1909, a Porter tank engine slipped over its edge into the river. In 1924 "it collapsed in a mysterious manner," its piers folding like dominos.[30] The collapse was attributed to the 1923 tidal wave and was precipitated by the passage of a loaded passenger train.[31] In 1924, the Wailuku Bridge was replaced by a metal truss bridge of three spans, mounted on concrete piers. These bridges lasted in place until the 1946 *tsunami*.

Burdened with debt and unable to meet its obligations, the Hilo Railroad Company was forced into receivership in 1916 and plans for the expansion of the line were abandoned. The railroad was sold for $1,000,000 to the bondholders, and reorganized as the Hawai'i Consolidated Railway. In 1920, the new owners bought three additional passenger coaches as part of a program aimed at catering to the tourist business. In cooperation with the steamship companies, sightseeing specials, operating under the name of *Scenic Express*, were run on the Hāmākua Division when passenger ships were in port. Author Gerald Best described his experience traveling along the coast: "We had seen waterfalls cascading down the slopes of Mauna Kea, passed through magnificent groves of tropical trees and entrancing fields of flowers, and looked upon a completely unforgettable vista of sea and mountains. No wonder the tourists who rode the *Scenic Express* years ago recalled it as the highlight of their visit to Hawaii."[32]

In the 1930s the Depression affected the tourist trade and passenger business dropped off to a low of 16,681 in 1936.[33] Passenger cars were retired, and some cars were converted to haul *bagasse* (sugar cane after the juice has

26 John B. Hungerford, Hawaiian Railroads (Reseda, Ca: Hungerford Press, 1963), 55.

27 John William Siddall, Men of Hawai'i (Territory of Hawai'i: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawai'i, (Honolulu, 1935), 487-488.

28 Hilo Tribune, (11 April 1911): 3.

29 Hilo Herald-Tribune, (23 February 1923): 2.

30 Thrum (1924), 94.

31 Alvarez (1987a), 50.

32 Best, 155.

33 Ibid, 146.

been pressed out) to the canec manufacturing plant in Hilo. During World War II, passenger business picked up due to gas rationing, and several old coaches were used to transport servicemen from Hilo to Pa'auilo, en route to the U.S. Marine Corp training camp at Waimea. By the end of 1945, the railroad was making money and would soon be out of debt for the first time in its existence.

On April 1, 1946, a tsunami hit Hilo at 7:01 AM. The Hawai'i Consolidated Railroad suffered irreparable damage. Freight cars were floated inland, all the track along the waterfront was washed out, the Hilo station and the adjacent buildings were in shambles, and the first span of the Wailuku River bridge, a steel truss, was washed hundreds of feet up the river. In spite of the breakwater, freight cars on the docks were washed into the bay, some floating out to sea and others thrown up on shore. Twelve miles north of Hilo, the railroad bridge at the mouth of the Kolekole Stream lost its center span. Facing an estimated repair cost of $500,000, the railroad asked shippers to determine whether they would use the line if it were rebuilt or were intending to ship their raw sugar by truck. Only Theo H. Davies Ltd. voted to retain the railroad; the rest voted to use the existing highways, despite their poor condition. Hawai'i Consolidated Railroad then offered its entire right-of-way, including all bridges and tunnels, to the Territorial Highway Department and to the Hawai'i County supervisors. Both agencies declined the railroad's offer.

The entire railroad was sold as scrap to Gilmore Steel & Supply Company of San Francisco for $81,000. About the time the scrappers had finished pulling up the rails and begun dismantling the steel bridges, the Territorial Highway Department changed its mind. They decided to improve the Hawai'i Belt Road, along the Hāmākua Coast by relocating it to the railroad right-of-way and to utilize the railroad trestles as highway bridge supports. They bought the bridges still in place, as well as the parts of bridges already trucked to Hilo, for $303,723.53 - nearly four times the amount Gilmore Steel & Supply Company had paid to Hawai'i Consolidated for the entire railroad. These railroad bridge elements were used for the Hawaii Belt Road, FAP19.

The Hawai'i Belt Road (FAP 19; State Route 19): The Territorial Highway Department's first post-war priority on the Big Island was the Hāmākua Coast Highway. There were several reasons for this immediate attention. The upgrade of the existing roads had been interrupted by the war, and what existed was piecemeal. In addition, the Hawai'i Consolidated Railway service to sugar plantations was destroyed and plantations were forced to truck their sugar to Hilo on the narrow winding Belt Road. This method was dangerous for the large trucks as there were many hairpin turns and periodic bridge washouts. After the tsunami of 1946, construction of the new Hawai'i Belt Road (FAP 19) was accelerated. The original cost estimate for the road was 12 million dollars and included a "Highline" portion of the highway from Pepe'ekeo to 'O'ōkala. The proposed highline portion would realign this twenty-four miles of dangerous highway at a higher elevation where the gulches were less wide. The existing route consisted of 340 curves with narrow bridges varying from 12' to 18' wide. The Hāmākua "Highline" proposal was subsequently not adopted, and the cost of this section of highway grew to 17.5 million dollars by the mid-fifties.

In 1950, the Territorial Highway Department under the direction of William R. Bartels and the Independent Iron Works of Oakland, California undertook the "Seismic Wave Damage Rehabilitation Project." Plans were developed to adapt the existing steel railroad trestles into highway bridges. Utilizing remnants of the purchased railroad trestles and trusses, the road beds were widened and strengthened. The two remaining truss spans of the Wailuku River Railroad Bridge were incorporated into the reconstruction of the Kolekole Stream Bridge. The two concrete piers from the truss bridge remain in use under the present Wailuku Bridge which carries the Hawai'i Belt Road (FAP 19)

over the river.[34] Roughly two-thirds of the Hāmākua road was finished (a total of thirty-five bridges) during the tenure of Highway Commissioner Robert M. Belt, from 1952-1958.[35]

All six bridges listed under this Multiple Property Documentation Form have recently undergone or will be going through modification projects. The Hakalau Stream, Kapu'e Stream, Kolekole Stream, Nānue Stream, and Pāhe'ehe'e Stream Bridges have recently undergone seismic retrofit modifications. Information on the modification for each bridge is described in the nomination forms for that bridge. A modification project for the Umauma Stream Bridge is planned for the year 2011. The bridge will be strengthened and widened to conform the current design standards.

D. Significant Designers

William R. Bartels: The trestle bridges adaptation was the work of a person of significance - William R. Bartels, Chief Engineer for the Territorial Highway Department, who was responsible for all major territorial bridge projects from 1932-1956. Bartels was considered a "cracker-jack" engineer who enjoyed the challenge of a difficult assignment, and his work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges show refined aesthetic sensibility which makes them distinctive from the work of other engineers. Bartels was a German born engineer who worked briefly for a sugar plantation on Maui before being hired by the Territorial Highway Department in 1932. He designed most of the territorial bridges from then until 1957. Bartels was responsible for the largest and most sophisticated bridge construction projects in Hawai'i during this time and there was a marked shift to large deck girder and rigid frame bridges. He ended his tenure as Chief of the Bridge Division at age 70. This was well past the standard age of retirement, but he was kept on by special permission and out of necessity and respect for his exceptional abilities. Bridges designed by Bartels are hailed for their accomplishment in engineering as well as aesthetics.

John Mason Young: The specifications and design for the original railroad bridges were drawn up by John Mason Young, the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i). Young was born in Lewisburg, Tennessee and was educated at the University of Florida and Cornell University.[36] In 1908, he came to Hawai'i to be the only engineering professor amongst 13-faculty when the College opened its doors.[37] In 1920, Young became president of the Pacific Engineering Company and maintained part-time teaching status until he retired in 1938.[38] Because of his expertise in Hawai'i, he was placed on a two-person committee that was responsible for writing Honolulu's building ordinance.[39] John Mason Young was also well known for his commercial work within the community. He designed the S. M. Damom Building (Bank of Bishop and Company, later First National Bank and then First Hawaiian Bank), now demolished. T.H. Davies and Company Building, Central

34 Spencer Mason Architects Report, 1996, IV-23

35 Alvarez, 79-80.

36 Kobayashi, 22.

37 Kamins, 9.

38 Kamins, 154.

39 Honolulu Star-Bulletin (29 August 1947), 1.

YMCA; Scottish Rite Cathedral, and canneries for Hawaiian Pineapple and Libby, Mc Neill & Libby.[40] He also served as the structural engineer for the Hawai'i Theatre. Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[41] Young designed the original railroad bridges between 1910-1911 as an integral part of the Hilo Railroad Company.

E. Prominent Individuals

Benjamin Franklin Dillingham: Benjamin Franklin Dillingham is a noted Hawaiian businessman and one of the three founders of Hilo Railroad Company. Dillingham was born in West Brewster, Massachusetts and worked as the first officer of a bark, Whistler. In 1864, while Whistler was stopped in Honolulu, Dillingham was hospitalized after an accident during a horseback riding. He gave up working as a sailor and married a daughter of a friend, Reverend Lowell Smith.[42] After working as a clerk at a hardware store, H. Dimond & Son for four years, he organized the Dillingham Company in 1869. Dillingham became a pioneer in railroad building and established the Oahu Railway and Land Company in 1888.[43] In response to the demand of the sugar industry on Island of Hawaii, he organized and became the president of Hilo Railroad Company in 1910.

Lorrin Thurston: Lorrin Thurston is one of the three founders of Hilo Railroad Company. Thurston served as the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the monarchy. He was born in Honolulu as the son of American missionaries. At Oahu College, he started studying law and completed his education at Columbia University. Upon returning to Hawaii in 1883, he started a law practice. His involvement in the politics began after the being elected to the Hawaiian legislature. He believed in the need for the reduction of the monarchical power and the elimination of the official corruption. In the 1887 revolution, Thurston served as a leader and became Minister of Interior. Kalakaua died in January 1891. Thurston was involved with the Annexation Club in 1892, and he traveled to Washington to facilitate the U.S. annexation. Thurston served as the main figure in the overthrow of the Hawaiian monarchy.[44]

Mark Robinson: Mark P. Robinson is one of the three founders of Hilo Railroad Company. Robinson was appointed by Queen Liliuokalani in 1892 and served as the Minister of Foreign Affairs. He was born in Hawaii and raised among the royal families. His mother, Rebecca Prever was the daughter of Kamekana, a Maui Chiefess. His father, John James Robinson, founded a shipyard, which brought financial wealth to the family. Mark's sisters were Mary Mikahala Robinson Foster and Victoria Ward.[45] Mark P. Robinson died in 1915 at the age of 62.[46]

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40 Ames (1996), 71-73.

41 Siddall (1921), 451 and George Nellist, 487-488.

42 Gardiner, http://www.calodges.org/ncrl/masdirec.html.

43 Siddall (1917), 89

44 *Encyclopedia Britannica*, http://www.britannica.com/EBchecked/topic/594468/Lorrin-A-Thurston.

45 Arcayna, http://archives.starbulletin.com/2006/09/22/features/story06.html.

46 Thrums (1915), 173.

ASSOCIATED HISTORIC BRIDGE PROPERTY TYPES

SELECTION OF HISTORIC BRIDGES

Under this Multiple Property Documentation Form, six steel trestle bridges on the Island of Hawai'i are included. The six bridges are:

Name of the Bridge	Structure Number
Hakalau Stream Bride	001000019030841
Kapu'e Steam Bridge	7001000019030931
Kolekole Stream Bridge	001000190308549
Nānue Stream Bridge	0010000190308146
Pāhe'ehe'e Stream Bridge	00100019038619
Umauma Stream Bridge	001000190308346

These bridges were chosen for their significance as important resources that tell the rich, active past of the area associated with the sugar plantation industry and also for the elaborate trestle structure of the early twentieth-century. All six bridges are significant under the Criteria A for the association with the Hilo Railroad Company, Criteria B for the association with three founders of the Hilo Railroad Company, and Criteria C for the significance as a representative example of early twentieth-century engineering technology as well as a source for information about early twentieth-century steel manufacture and construction. More specific information on each bridge's significance is described in the attached individual nomination forms.

METAL BRIDGES

Description

Although prevalent during the late nineteenth-century, there are only a handful of metal bridges remaining in Hawai'i due to the extremely corrosive nature of the marine environment. These extant metal bridges are of three basic types: steel and wrought iron trusses, steel stringer bridges, and steel trestle bridges.

A truss bridge is "a framework composed of individual members… fastened together that loads applied at the joints produced only direct tension or compression… In its simplest form every truss is a triangle or a combination of triangles."[1] Wrought iron is "a commercial form of iron that is tough, malleable, and relatively soft, contains less than 0.3 percent and usually less than 0.1 percent carbon…"[2]

Stringer bridges are built on "stringers or joists [that] support the floor and in turn are supported by the floor beams. The joists may be supported on the tops of the floorbeams or may be framed into the floorbeam by the use of connection angles."[3]

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1 Milo S. Ketchum. The Design of Highway Bridges of Steel, Timber and Concrete. (New York: McGraw-Hill Book Company, Inc., 1920), 103.

2 Merriam-Webster Online Dictionalry (visited on Sept. 24, 2009)

3 Milo S. Ketchum. The Design of Highway Bridges of Steel, Timber and Concrete. (New York: McGraw-Hill Book Company, Inc., 1920), 141.

Steel trestle bridges are "used for carrying the roadway at a considerable distance above the ground. The tower and intermediate spans are commonly built of plate girders... The tower consists of two trestle bents... braced together by longitudinal bracing... Bracing [with horizontal supports]... is used with either adjustable or rigid diagonal members, while bracing [without horizontal supports]... is used only for rigid members."[4] One of the major difference between steel trestle bridges and trusses or steel stringer bridges is that steel trestle bridges have trestle bents or towers that are directly standing on the ground far below the roadway. As the result, the support structures tend to be much larger and elaborate in appearance in comparison to steel truss or stringer bridges. This nomination concerns the six remaining steel trestle bridges, which were part of the plantation railroad system and converted by the Territory to highway bridges in 1950-53.

Steel Trestle Bridges: Fourteen steel trestle railroad bridges were constructed in 1911 for the Hilo Railroad Company. Five of these (Hakalau, Nānue, Kapue, Pāhe'ehe'e, and Umauma) were reconstructed as territorial highway bridges between 1951 and 1953, the remaining nine were salvaged for use in the reconstruction of Kolekole Stream Bridge. The design concept for each Steel Trestle Bridge is similar in all five bridges. One bridge, the Kolekole Stream Bridge, was constructed using parts from several railroad trestle bridges and has a slightly different design for its concrete piers. The substructure at each bridge is reused 1911-1912 steel trestle railroad supports. These structural steel trestle pieces vary in design dependent on number of spans and height over the valley floor. Bridges composed of additional members are noted in the individual forms. Large steel girders span across the open trestlework. This is essentially the same structural system of the original railroad bridge in each location. Modifications to the railroad trestle systems have been noted in the individual National Register nomination forms. During the FAP 19 project, for the period from 1950-53, each trestle system was topped with a concrete slab deck, sidewalks on both sides, and an asphalt paving system. The same design for the pre-cast concrete railings is used for all bridges. The railing design is an open ten foot by two foot concrete rectangular box topped by a strong horizontal concrete cap. This rail design is typical for territorial bridges constructed during this early 1950s period. Concrete end piers with an incised bridge name and date of construction are part of the 1950s construction. All bridges now have steel guard rails on the approaches at each end. These guard rails obscure the bridge name in some locations. The guard rails are bolted to the concrete piers, and therefore, this installation is reversible.

Significance: The period of significance for the steel trestle bridges begins in 1911, when they were first constructed as railroad bridges and ends in 1953 after their conversion to highway bridges as part of FAP19.

The converted steel trestle bridges have National Register significance under criteria A, B, and C. The railroad line played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the island's sugar production. The Hilo Railroad Company was founded by figures significant in the history of the Hawaiian Islands. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawai'i."[5] Another commentator noted that the completion of the railroad marked nothing less than "an era in the

[4] Milo S. Ketchum. The Design of Highway Bridges of Steel, Timber and Concrete. (New York: McGraw-Hill Book Company, Inc., 1920), 111.

[5] Paradise of the Pacific, (December 1924): 14

development of the Islands."[6] In addition, the converted railroad bridges are the remains of the only standard gauge rail line erected in the islands and can tell us much about early twentieth century steel manufacturing. The steel trestles s represent the "work of a master": John Mason Young, designer of the original railroad line and bridges; as well as the exceptional engineering and creativity of William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the 1950s.

Integrity: The trestle bridges retain their integrity of location although pieces have been added from other railroad bridges. The design of the bridge, particularly any changed connections, retains integrity as most changes are bolted connections, which are reversible without diminishing the significant historic characteristics of the original bridge. The setting of the bridges remains relatively unchanged. The quality of the original workmanship remains apparent, particularly from both an engineering and aesthetic standpoint. There is substantial evidence of engineering and builder labor and skill. The bridges retain a high degree of historic feeling and their associations clearly are apparent to the informed observer. The structural support of the steel trestle system of the original railroad bridge is observable in most locations from the edge of the highway or adjacent road and park systems.

Steel trestle railroad bridges are eligible under Criterion A, B, and C. Specific considerations for eligibility under Criterion A include:

1. **Settlement patterns:** The Steel Trestle Bridges on the Hamakua Coast contributed in a meaningful way to the settlement and development of a geographically definable area, facilitated major passage to or through this region, and have been significantly integral to the development of an effective transportation system, such as the Belt Road. The most significant early road and bridge building projects in the islands were associated with Belt Road construction. Many early metal truss bridges were imported to the islands to accommodate the construction of the Belt Roads, such as those at Hanalei and Wailua on Kaua'i. Homestead roads made possible the settlement and development of the rural areas in which they are located.

2. Early and/or prominent product of private enterprise. The converted highway bridges are among the few remaining examples of bridges constructed by private enterprise. The Hilo Railroad Company (later to become the Hawai'i Consolidated Railroad) was a significant economic force on the Island of Hawai'i during the early twentieth-century.

4. Representative of a significant engineering endeavor. The railroad construction project was a daring engineering feat that crossed the numerous gorges and streams with large steel bridges at the valley mouths and required massive earth cuts for the completion of the comparatively straight road bed. This was in direct contrast to the more conservative government policy of winding roads and small concrete or timber bridges in the backs of valleys or down sharp grades to sea level. The adaptation of these bridges for new use to carry the Belt Road also was a remarkable engineering feat as it required new load calculations and increased width accommodation.

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6 Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

5. Bridges associated with the primary economic endeavor of the islands (c. 1850 -1950) - sugar production. Sugar production changed the pattern of land ownership in the islands, created a viable-trade-oriented economy and radically altered the demographics of the islands through the importation of wage-earning labor. The infrastructure required to support this massive economic endeavor - primarily for irrigation, transportation, and cultivation of sugar cane - changed the face of the islands forever. Many of the metal bridges were constructed to aid in the overland transport of raw cane to the mills for processing, such as the steel railroad trestles erected along the Hāmākua coast of the island of Hawai'i, as well as to provide reasonable access for workers to the sugar lands.

6. Bridges associated with major historical events or natural disasters. Due to its unique location in the center of the Pacific Basin, Hawai'i is susceptible to *tsunami* (seismic sea wave) inundation from nearly every direction. Earthquakes generated in the Aleutian Islands, South America and Japan have swept large, destructive ocean waves onto Hawaiian shores with a great loss of life and property. While the line was damaged by the devastating tsunami of 1946, most portions of the railroad bridges survived. This disaster forced the closure of the rail line and resulted in the acquisition of these bridges by the Territorial Highway Department.

Specific considerations for eligibility under Criterion B include:

1. Bridges associated with the lives of persons significant in our past. The steel trestles railroad bridges were an integral part of the Hilo Railroad Company founded in 1899 by entrepreneur Benjamin F. Dillingham. His partners included other persons notable in Hawaiian history: Lorrin Thurston, the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the Monarchy; and Mark Robinson, former Minister of Foreign Affairs for Queen Liliuokalani.

Specific considerations for eligibility under Criterion C include:

1. Example of a rare structural type. The steel trestle bridges are the remains of the only standard gauge rail line erected in the islands. In addition, they are a rare example of steel construction, since the majority of other railroad trestles were constructed of wood. Analysis of metal bridges may potentially yield information about early twentieth-century steel manufacture and construction. The steel trestle bridges may yield information regarding the only standard gauge railway in the islands.

2. Exceptional work by an important engineer, architect, or builder. An important engineer/designers includes William R. Bartels, Chief Designer for the Territorial Highway Department. The original railroad bridges were designed by John Mason Young in 1910-11. The steel trestle railroad bridges were erected by W.W. Beers, a New York engineer.

3. Bridges of exceptional aesthetic merit. The steel trestle railroad bridges are spectacularly sited along the ocean at the mouths of steep, verdant valleys. The height of the bridges over the stream bed and quality of craftsmanship displayed in their steel construction contributes to their aesthetic value.

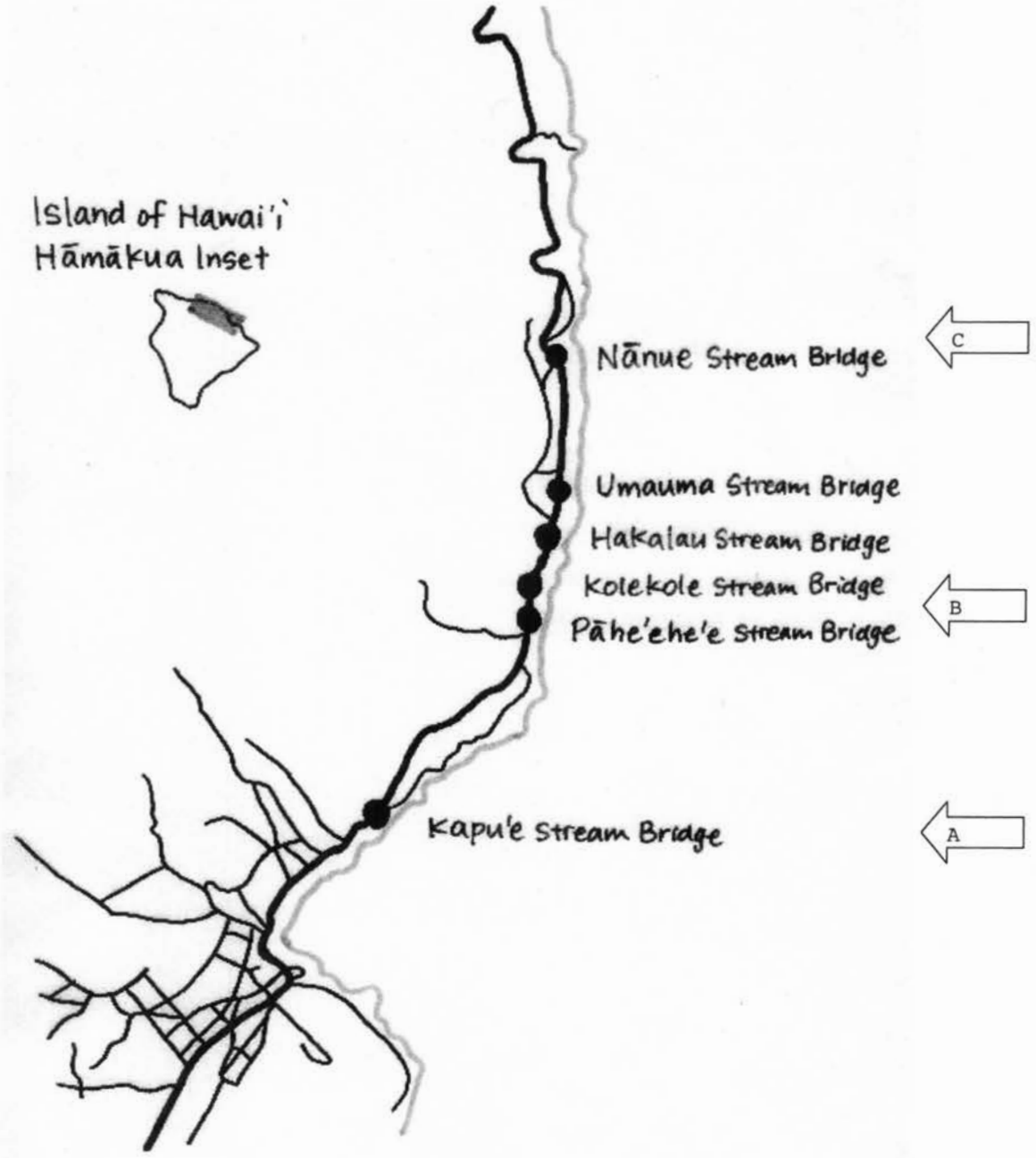
GEOGRAPHICAL DATA

The location of the "Steel Trestle Bridges on the Hāmakua Coast" is the eastern coast line of the Island of Hawai'i in the State of Hawai'i. All six bridges carry the Hawai'i Belt Road (FAP 19).

Traveling north from Hilo the Bridges are located in the following districts:
A. Pāpa'ikou (Kapue Bridge)
B. Honomu (Pāhe'ehe'e Bridge, Kolekole Stream Bridge)
C. Hakalau (Hakalau Highway Bridge, Umauma Stream Bridge, Nānue Bridge)

SKETCH MAP

Island of Hawai'i with Inset of Hamakua Coastline


Island of Hawai'i
Hāmākua Inset
Nānue Stream Bridge
C
Umauma Stream Bridge
Hakalau Stream Bridge
Kolekole Stream Bridge
Pāhe'ehe'e Stream Bridge
B
Kapu'e Stream Bridge
A

SUMMARY OF IDENTIFICATION AND EVALUATION METHODS

Investigation Method

The fieldwork and research was performed during May through August 2009. Field investigations included visual inspections, verification of existing conditions and degree of modifications, and black and white digital photography for each historic bridge.

Documentary Research Methods

The following depositories were researched for materials specific to the bridges; much of the included information was initially researched as part of the Hawai'i State Bridge Inventory. A full bibliography is included in the documentation.

- State of Hawai'i, Department of Transportation
- State of Hawai'i, Historic Preservation Division
- City and County of Honolulu, Department of Public Works
- County of Kaua'i, Department of Public Works
- County of Maui, Department of Public Works
- County of Hawai'i, Department of Public Works
- Bishop Museum Archives
- Hawai'i State Archives
- Hawai'i State Library
- Hamilton Library, University of Hawai'i
- Internet Resources

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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. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name NĀNUE STREAM BRIDGE

Other names/site number Nānue Bridge (structure number 001000190308146)

2. Location

street & number 1.66 miles W of Kauniho Road on FAP 19 ☐ not for publication

city of town Honohina (TMK 3-3-2-01) ☐ vicinity

State Hawai'i code HI county Hawai'i code 001 zip code

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 ___local

Signature of certifying official Date

Title State or Federal agency and bureau

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

Signature of commenting official Date

Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Steel Trestle Bridges on the Hamakua Coast

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

Nānue Stream Bridge is a steel girder and trestle bridge with a total length of 531 feet and a roadway width of 28 feet. It is built at the deck elevation of 286' over Nānue Stream along the Hāmākua Coast on the Island of Hawai'i. Nānue Stream Bridge is the tallest bridge on the Island of Hawai'i. The rural setting of the site has been unchanged. The superstructure is composed of a concrete deck on steel girder and the substructure is composed of c. 1912 steel railroad trestle supports with masonry (lava-rock) abutments. Open horizontal concrete rail and cap are placed as parapets.

Narrative Description

The Nānue Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Nānue Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans. In 1911, fourteen steel trestle girder bridges were erected along the Hāmākua Coast to support railroad tracks for the Hilo Railroad Company.[1] All of the rail bridges along the line were devastated by the tsunami of 1946, and nine of the steel trestle bridges were disassembled and sold as scrap.[2] The remaining five bridges (Hakalau, Nānue, Pāhe'ehe'e, Umauma, and Kapue) were retained and reconstructed as territorial highway bridges between 1950-53.

The bridge remains in its original location; however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment. The setting has experienced little change. In 1953, the bridge was widened for use as a highway bridge with members from the disassembled railroad bridges. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic. The integrity of the original substructure remains intact, and is a remainder of the only standard-gauge railroad constructed in the islands. The bridge's substructure can be viewed from the old Māmalahoa Highway which runs under the highway bridge. The bridge's historic associations are readily apparent to all observers; the bridge retains its historic feeling due to its unusual construction type. Interpretation is aided by the presence of a plaque on the substructure of which reads:

Hamilton & Chambers
Contractors
for Steel Structure
New York, U.S.A.
1912

Nānue Stream Bridge has recently undergone seismic retrofit modifications. The project included addition of hinge restrainers, seat extenders at hinges and abutments, longitudinal concrete edge beams on each side of the deck, and the upgrade of the pier footings.

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[1] Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawai'i, prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration, (Honolulu, 1987a), 50.

[2] Ibid.

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)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [X] B Property is associated with the lives of persons significant in our past.
- [X] 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)

Property is:

- [ ] A owed by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [X] 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.

Areas of Significance

(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1912

1952

Significant Dates

1912

1952

Significant Person

(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Young, John Mason

Bartels, William R.

Period of Significance (justification)

The Nānue Stream Bridge was built in 1911 during the railroad's second phase of construction. In 1952, the Territorial Highway Department, under the direction of William R. Bartels, reconstructed Nānue Stream Bridge as a part of the Hawai'i Belt Road (FAP 19) utilizing members from segments of the demolished railroad bridges.

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

The Nānue Stream Bridge is significant under Criteria A, B, and C,. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technology.

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

Criterion A
The bridge is eligible under Criterion A for its associations with the Hilo Railroad Company, later called the Hawai'i Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the islands' sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawai'i."[3] Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the Islands."[4]

Criterion B
The bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian Islands: the Hilo Railroad Company founders - Benjamin Dillingham, Lorrin Thurston, and Mark Robinson. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.[5]

Criterion C
The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology. The bridge is a rare remaining example of steel girder and trestle construction and was, for many years, the one of the tallest bridges in the state. The bridge represents the "work of a master": John Mason Young, designer of the original railroad line and bridges; as well as William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the 1950s. The structure provides information regarding the only standard gauge railway in the islands.

Developmental history/additional historic context information (if appropriate)

The Nānue Stream Bridge was built in 1911 during the railroad's second phase of construction. The specifications and design of the bridge were drawn up by John Mason Young, the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University

3 Paradise of the Pacific, (December 1924): 14.

4 Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

5 Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123-124

of Hawai'i). Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[6] The bridge's components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year). It was erected by W.W. Beers, described by the *Hilo Tribune* as a New York engineer.[7]

Nānue was one of the most impressive bridges built by the Hilo Railroad. At 207 feet tall, the Nānue Stream Bridge was the tallest bridge on the line, 30 feet taller than the bridge over the Hakalau Stream. After a higher bridge at Māliko Gulch on Maui was demolished in 1967,[8] the Nānue Stream Bridge became the tallest in the state.[9]

In 1952, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Nānue Stream Bridge utilizing members from the railroad bridge. Bartels was responsible for the design of all major territorial bridge projects between 1932 and his retirement from the department in 1956.[10] His work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

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6 John William Siddall, Men of Hawaii (Territory of Hawaii: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawaii, (Honolulu, 1935), 487-488.

7 Hilo Tribune, (11 April 1911): 3.

8 Hilo Tribune, (11 April 1911): 3.

9 Alvarez (1987b), 134.

10 Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawaii, Prepared for the State of Hawaii, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___State Historic Preservation Office
_x_Other State agency
___Federal agency
___Local government
___University
___Other
Name of repository:

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	274299	2204895	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 531 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA Professor
organization Heritage Center, University of Hawai'i at Manoa date
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822
e-mail aspencer@hawaii.edu

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Nānue Stream Bridge

City or Vicinity: Honohina

County: Hawai'i **State:** Hawai'i

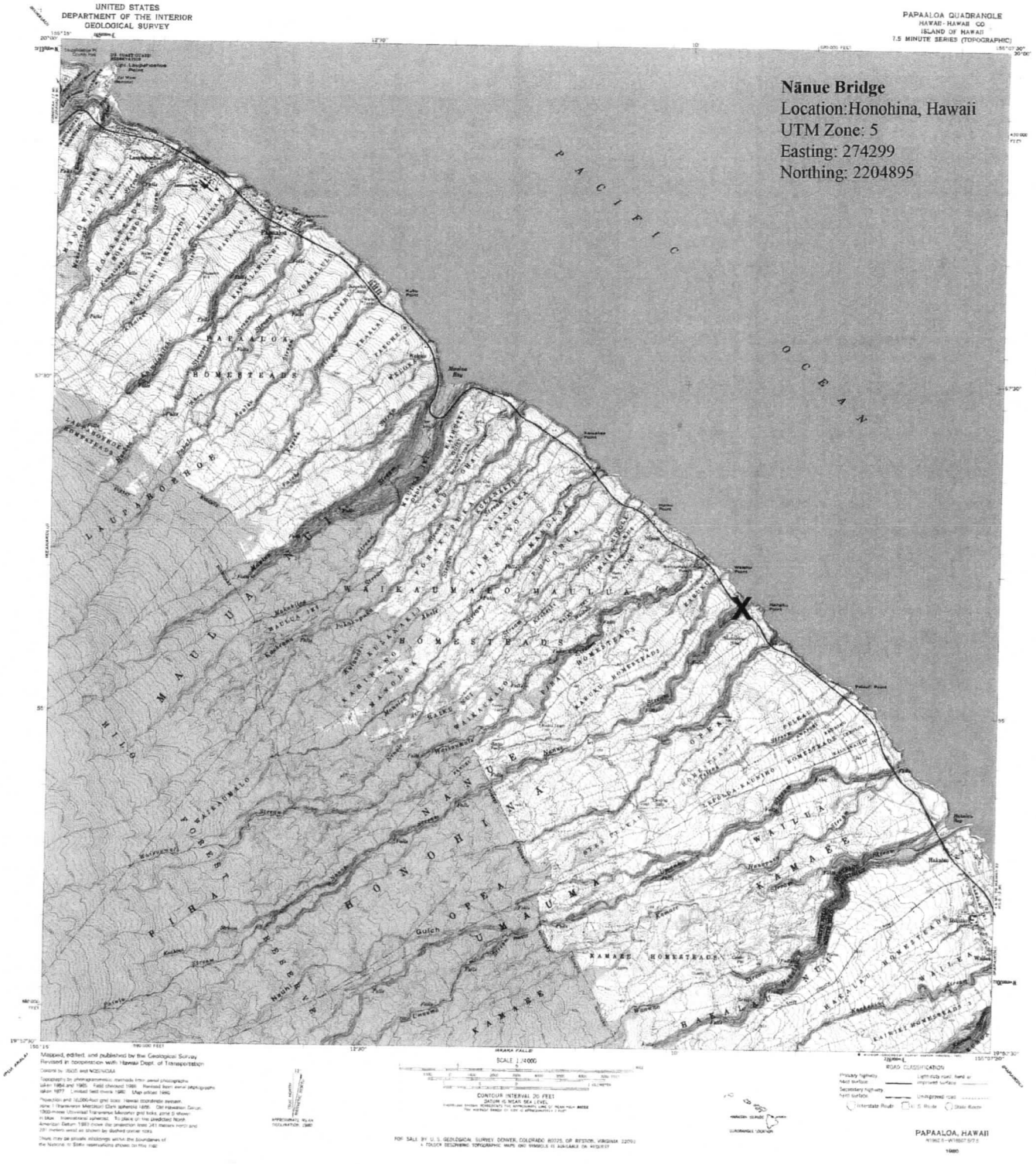
Photographer: Spencer Leineweber, FAIA/Professor

Date Photographed: June 2009

Description of Photograph(s) and number:

Photo #1: Name
Photo #2: Approach
Photo #3: Structure

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PAPAALOA QUADRANGLE
HAWAII-HAWAII CO
ISLAND OF HAWAII
7.5 MINUTE SERIES (TOPOGRAPHIC)
Nānue Bridge
Location:Honohina, Hawaii
UTM Zone: 5
Easting: 274299
Northing: 2204895
PACIFIC OCEAN
PAPAALOA HOMESTEADS
LAUPAHOEHOE
MAULUA NUI
WAIKAUMALO MAULUA HOMESTEADS
MILO FOREST
NANUE
HONOHINA
PIHA
OPEA
UMAUMA
KAMAEE
KAMAEE HOMESTEADS
WAILUA
HAKALAU NUI
HAKALAU HOMESTEADS
WAILEE
KAINIKI HOMESTEADS
Gulch
Mapped, edited, and published by the Geological Survey
Revised in cooperation with Hawaii Dept. of Transportation
SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
PAPAALOA, HAWAII

Sketch Map

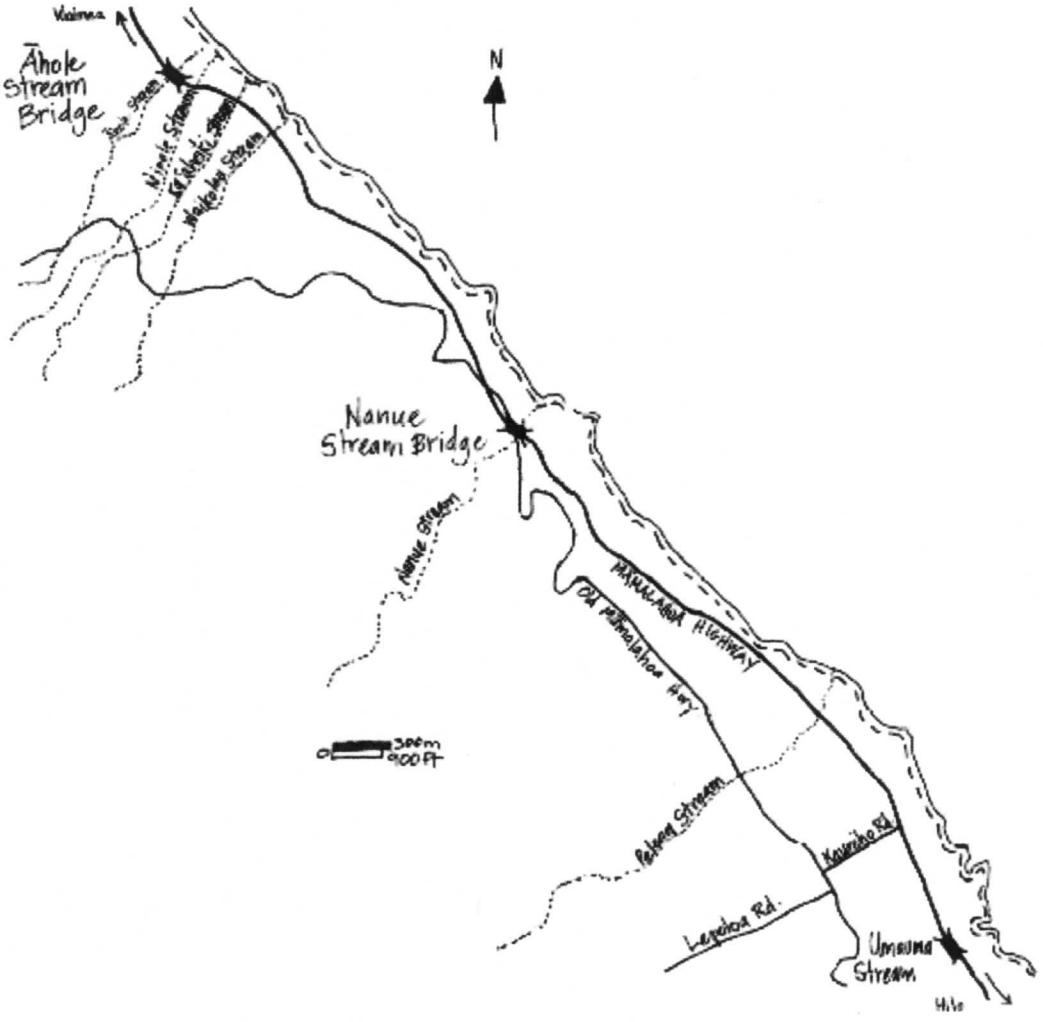

Kaimea
Āhole Stream Bridge
N
Nanue Stream Bridge
Nanue Stream
MĀMALAHOA HIGHWAY
Old Māmalahoa Hwy
300m
900 ft
Pekoa Stream
Kauniho Rd.
Lepeloa Rd.
Umauma Stream
Hilo

Photo #1: Name

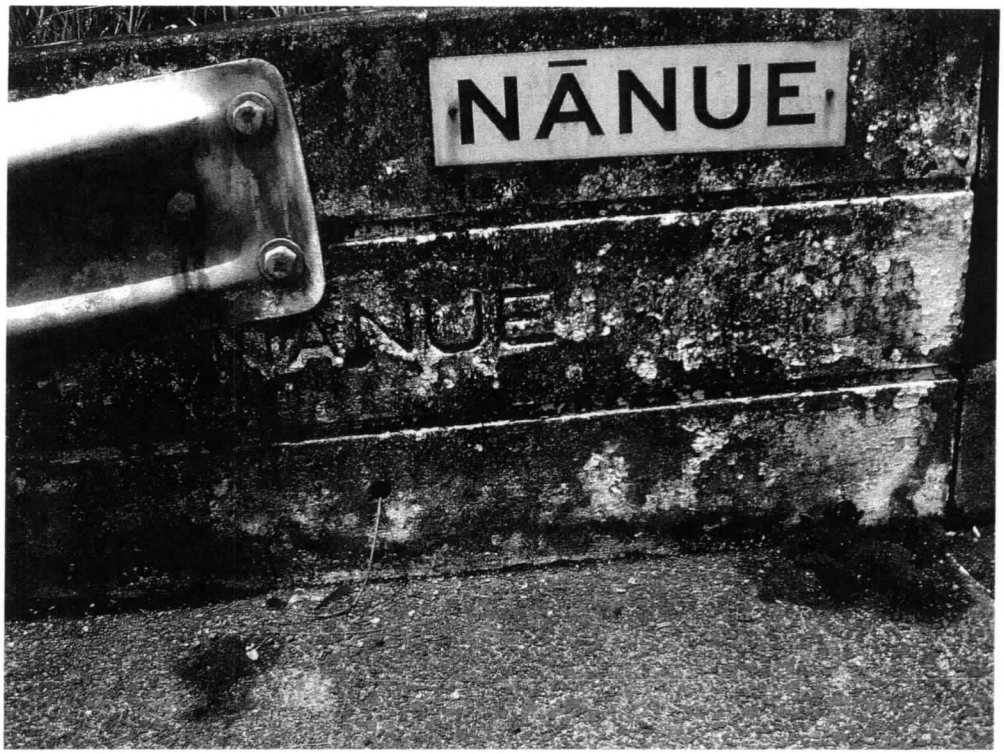
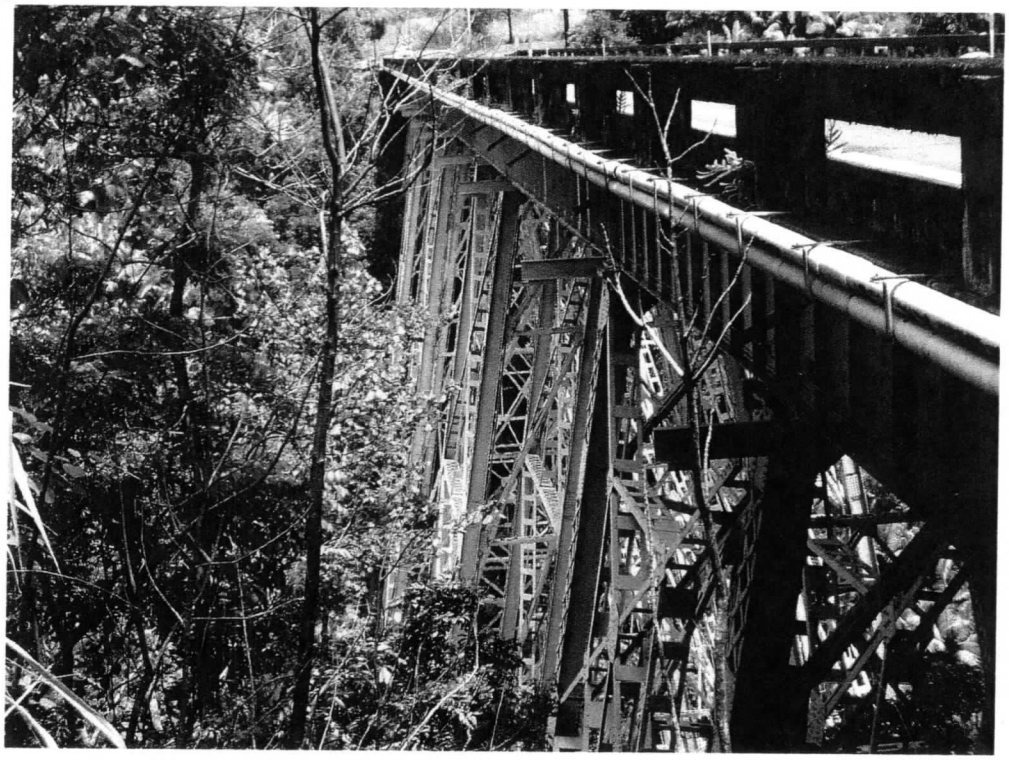


Photo #2: Approach



Photo #3: Structure



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. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name UMAUMA STREAM BRIDGE

Other names/site number Umauma Bridge (structure number 001000190308346)

2. Location

street & number 0.34 miles E of Kauniho Road on FAP 19 ☐ not for publication

city of town Hakulau (TMK 3-3-1-01) ☐ vicinity

State Hawai'i code HI county Hawai'i code 001 zip code

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 ___local

Signature of certifying official Date

Title State or Federal agency and bureau

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

Signature of commenting official Date

Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Steel Trestle Bridges on the Hamakua Coast

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

Umauma Stream Bridge is a steel girder and trestle bridge with a total length of 281 feet and a roadway width of 28 feet. It is built at the deck elevation of 261' over Umauma Stream along the Hāmākua Coast of the Island of Hawai'i.The rural setting of the site remains unchanged. The superstructure is composed of a concrete deck on steel girders, and the substructure is composed of c. 1912 steel railroad trestle supports with masonry (lava-rock) abutments. Open horizontal concrete rail and cap were added as parapets in 1955. Concrete end piers, also added in 1955, have an incised bridge name and date of construction.

Narrative Description

The Umauma Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Umauma Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans. In 1911, fourteen steel trestle girder bridges were erected along the Hāmākua Coast to support railroad tracks for the Hilo Railroad Company.[1] All of the rail bridges along the line were devastated by the *tsunami* of 1946, and nine of the steel trestle bridges were disassembled and sold as scrap.[2] The remaining five bridges (Hakalau, Nānue, Pāhe'ehe'e, Umauma, and Kapue) were retained and reconstructed as Territorial highway bridges between 1950-53.

The bridge remains in its original location; however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment. The setting has experienced little, if any, change. In 1953, the bridge was widened for use as a highway bridge with members from the disassembled railroad bridges. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic. The integrity of the original substructure remains intact, and is a remainder of the only standard-gauge railroad constructed in the islands. The bridge's substructure can be viewed from the old Māmalahoa Highway nearby. The bridge's historic associations are readily apparent to all observers; the bridge retains its historic feeling due to its unusual construction type. Interpretation is aided by the presence of a plaque on the substructure of which reads:

Hamilton & Chambers
Contractors
for Steel Structure
New York, U.S.A.
1912

A modification project for the Umauma Stream Bridge is planned for the year 2011. The overall intent of the project is to strengthen and widen the roadway to conform to the current design standards including the bridge gurdrails/perapets.

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1 Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawaiÿi, prepared for the State of Hawaiÿi, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration, (Honolulu, 1987a), 50.

2 Ibid.

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)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [X] B Property is associated with the lives of persons significant in our past.
- [X] 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)

Property is:

- [ ] A owed 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.

Areas of Significance
(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1912

1952

Significant Dates

1912

1952

Significant Person
(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Young, John Mason (1912)

Bartels, William R. (1952)

Period of Significance (justification)

The Umauma Stream Bridge was built in 1911 during the railroad's second phase of construction. In 1952, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Umauma Stream Bridge utilizing members from segments of the demolished railroad bridges.

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

The Umauma Stream Bridge is significant under Criterions A, B, and C. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technology.

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

Criterion A

The Umauma Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawai'i. The bridge is eligible under Criterion A for its associations with the Hilo Railroad Company, later called the Hawai'i Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the islands' sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawai'i."[3] Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the Islands."[4] Nonetheless, the steel railroad trestles and truss spans from the original bridge remains intact. The new highway and reconstructed bridges bypassed and straightened-out the old Māmalahoa Highway and the more irregular parts of the Hawai'i Belt Road (FAP 19) providing modern transportation facilities for the island of Hawai'i, thus greatly contributing to its commercial growth in the latter half of the twentieth-century.

Criterion B

The bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian Islands: the Hilo Railroad Company founders - Benjamin Dillingham, Lorrin Thurston, and Mark Robinson. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.[5] The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology.

Criterion C

The bridge is a rare remaining example of steel girder and trestle construction. The bridge represents the "work of a master": John Mason Young, designer of the original railroad line and bridges; as well as William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the 1950s. The Structure provides information about early twentieth-century steel manufacture and construction, as well as information regarding the only standard gauge railway in the islands.

[3] Paradise of the Pacific, (December 1924): 14.

[4] Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

[5] Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123-124

Developmental history/additional historic context information (if appropriate)

The Umauma Stream Bridge was built in 1911 during the railroad's second phase of construction. The specifications and design of the bridge were drawn up by John Mason Young, the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i). Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[6] The bridge's components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year). It was erected by W.W. Beers, described by the *Hilo Tribune* as a New York engineer.[7]

In 1952, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Umauma Stream Bridge utilizing members from segments of the railroad bridge. Bartels was responsible for the design of all major territorial bridge projects between 1932 and his retirement from the department in 1956.[8] His work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

6 John William Siddall, Men of Hawaii (Territory of Hawaii: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawaii, (Honolulu, 1935), 487-488.

7 Hilo Tribune, (11 April 1911): 3.

8 Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawaii, Prepared for the State of Hawaii, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___ State Historic Preservation Office
_x_ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	276412	2202637	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 281 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA Professor
organization Heritage Center, University of Hawai'i at Manoa date _____
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822
e-mail aspencer@hawaii.edu

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Umauma Stream Bridge

City or Vicinity: Hakalau

County: Hawai'i **State:** Hawai'i

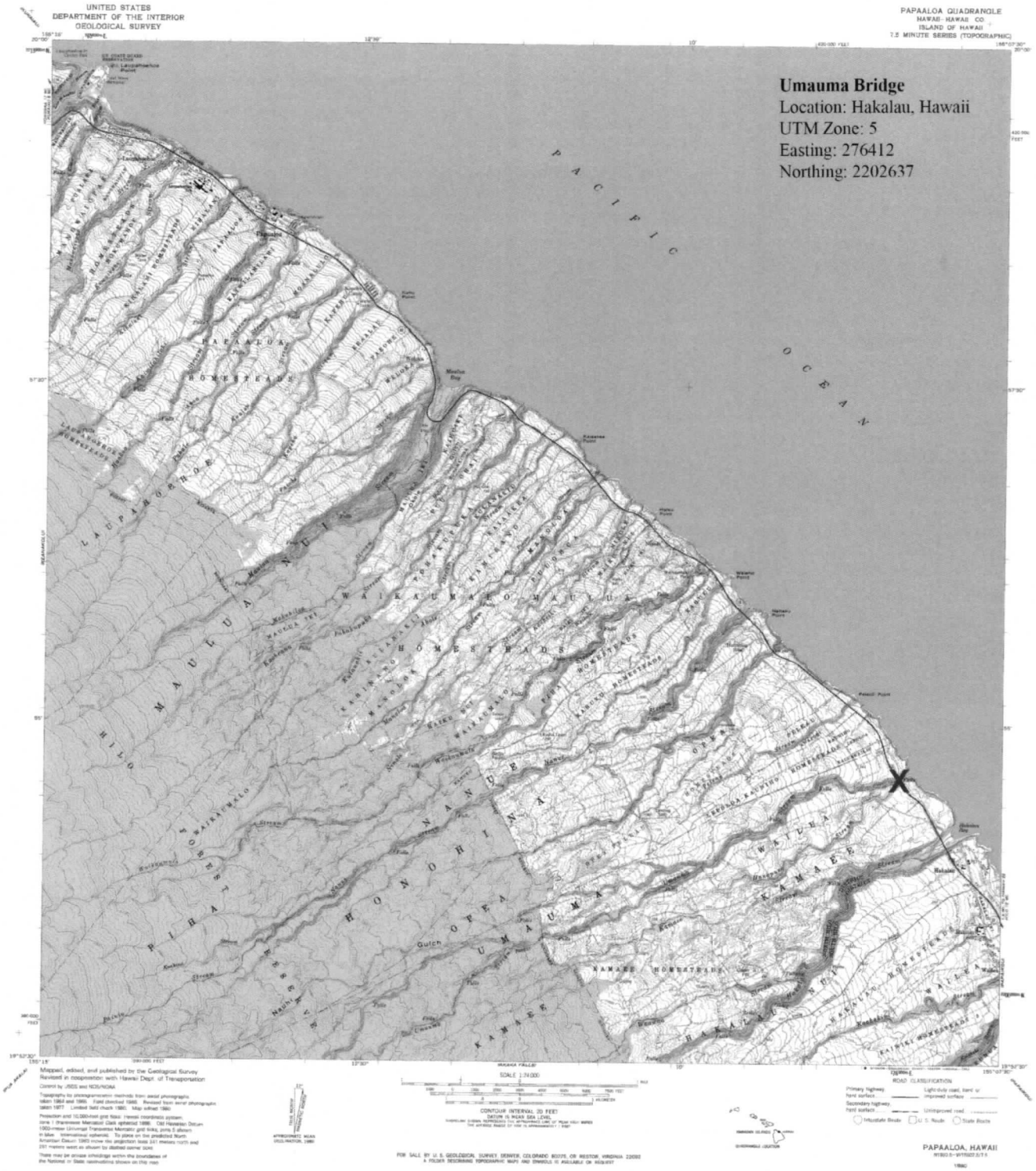
Photographer: Spencer Leineweber, FAIA/Professor

Date Photographed: August 2009

Description of Photograph(s) and number:

Photo #1: Name
Photo #2: Railing
Photo #3: Structure

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PAPAALOA QUADRANGLE
HAWAII-HAWAII CO.
ISLAND OF HAWAII
7.5 MINUTE SERIES (TOPOGRAPHIC)
Umauma Bridge
Location: Hakalau, Hawaii
UTM Zone: 5
Easting: 276412
Northing: 2202637
PACIFIC
OCEAN
PAPAALOA, HAWAII

Sketch Map

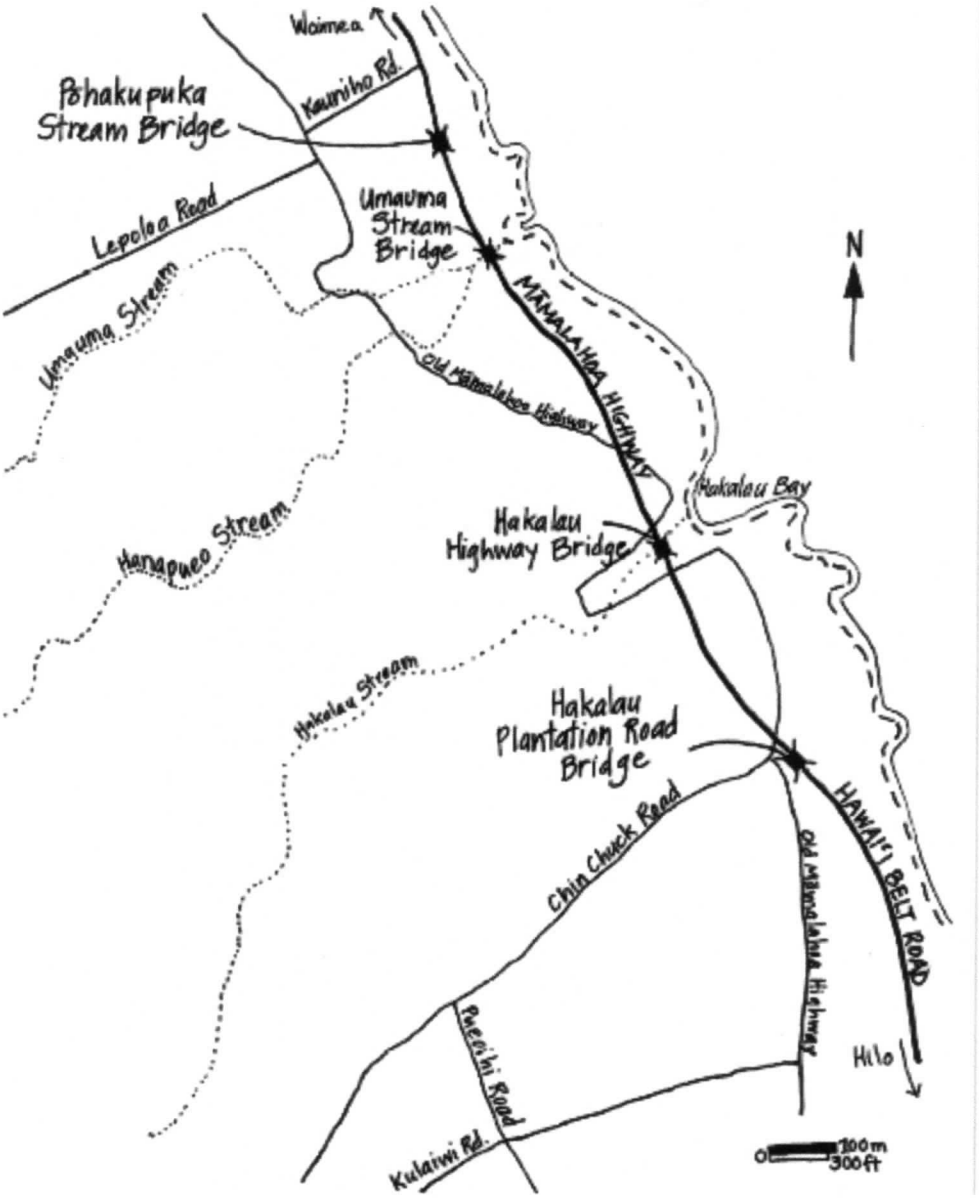

Waimea
Kawiriho Rd.
Pohakupuka Stream Bridge
Lepoloa Road
Umauma Stream Bridge
Umauma Stream
Old Mamalahoa Highway
MAMALAHOA HIGHWAY
N
Hakalau Bay
Hakalau Highway Bridge
Hanapueo Stream
Hakalau Stream
Hakalau Plantation Road Bridge
China Chuck Road
Old Mamalahoa Highway
HAWAI'I BELT ROAD
Hilo
Puaahi Road
Kulaimi Rd.
0
100 m
300 ft

Photo #1: Name

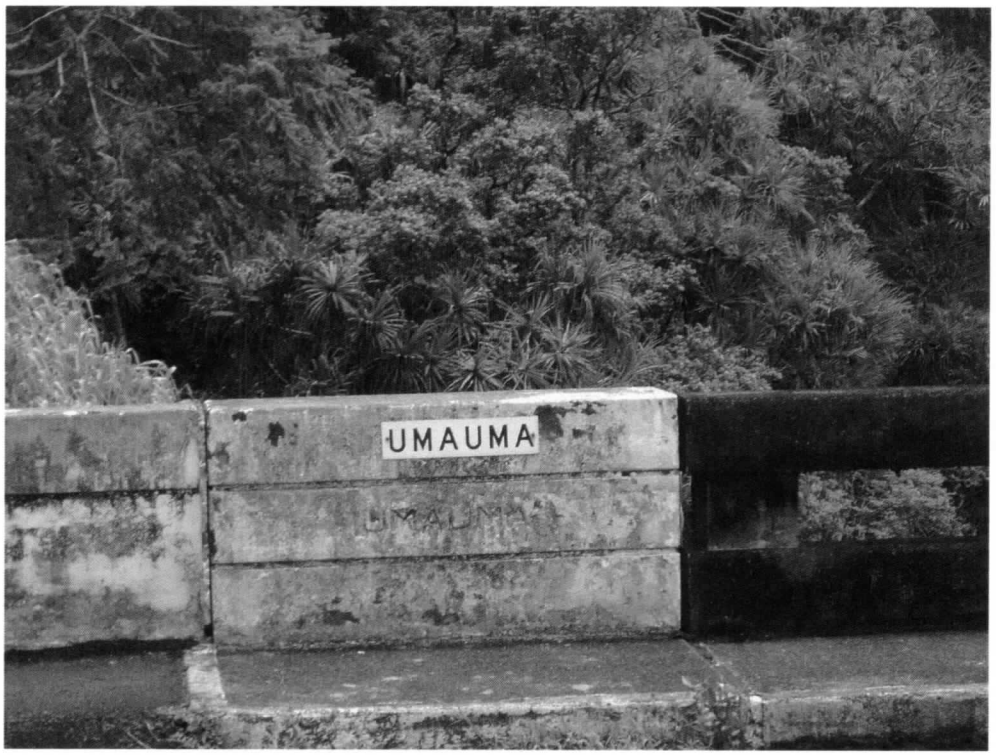


Photo #2: Railing

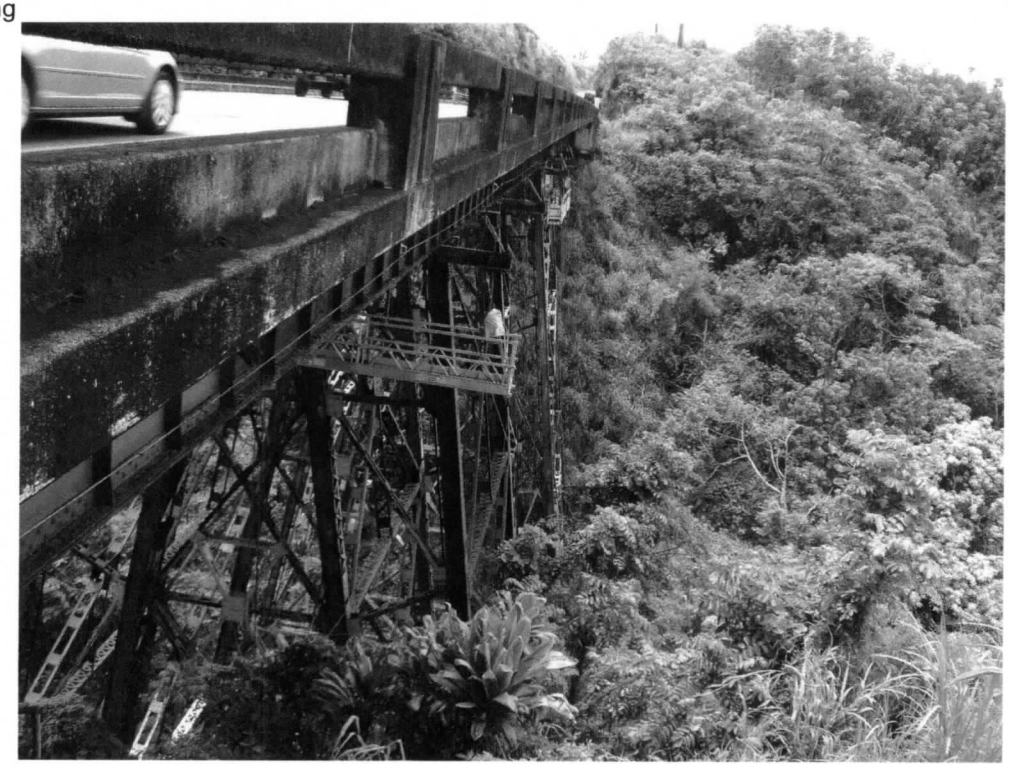


Photo #3: Structure



United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

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1. Name of Property

Historic name KAPU'E STREAM BRIDGE

Other names/site number Kapu'e Bridge (structure number 001000190309317)

2. Location

street & number 0.7 miles W of Kaieie Road on FAP 19 ☐ not for publication

city of town Pāpa'ikou (TMK 3-2-7-04) ☐ vicinity

State Hawai'i code HI county Hawai'i code 001 zip code _____

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 ___local

_____ _____
Signature of certifying official Date

_____ _____
Title State or Federal agency and bureau

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

_____ _____
Signature of commenting official Date

_____ _____
Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:) _____

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Historic Concrete and Steel Trestle Bridges along Hamakua Coast on the Island of Hawai'i

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: rail-related

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Kapu'e Stream Bridge is a steel girder and trestle bridge with a total length of 415 feet and a roadway width of 28 feet. It is built at the deck elevation of 232' over Kapu'e Stream along the Hāmākua Coast of the Island of Hawai'i. The rural setting of the site remains unchanged. The superstructure of the bridge is composed of a concrete deck on steel girders, and the substructure is composed of c.1911 steel railroad trestle supports with masonry (lava-rock) abutments. Open horizontal concrete rail and cap were added as parapets in 1950. Concrete end piers have an incised bridge name and date of construction added in 1950.

Narrative Description

The Kapu'e Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Kapu'e Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans steel element. In 1911, fourteen steel trestle girder bridges were erected along the Hāmākua Coast to support railroad tracks for the Hilo Railroad Company.[1] All of the rail bridges along the line were devastated by the tsunami of 1946, and nine of the steel trestle bridges were disassembled and sold as scrap.[2] Five bridges (Hakalau, Nānue, Pāhe'ehe'e, Umauma, and Kapue) were retained and reconstructed as territorial highway bridges between 1950-53. A sixth bridge Kolekole Bridge was constructed from pieces of other railroad trestle bridges.

The bridge remains in its original location; however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment. The setting has experienced little, if any, change. In 1953, the bridge was widened for use as a highway bridge with members from the disassembled railroad bridges. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic. The integrity of the original substructure remains intact, and is a remainder of the only standard-gauge railroad constructed in the islands. The bridge's substructure can be viewed from the old Māmalahoa Highway which runs under the highway bridge. The bridge's historic associations are readily apparent to all observers; the bridge retains its historic feeling due to its unusual construction type. Interpretation is aided by the presence of a plaque on the substructure which reads:

Hamilton & Chambers
Contractors
for Steel Structure
New York, U.S.A.
1912

The Kapu'e Stream Bridge has recently undergone seismic retrofit modifications. The project included addition of hinge restrainers and seat extenders at hinges and abutments.

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[1] Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawai'i" in Historic Bridge Inventory and Evaluation: Island of Hawai'i, prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration, (Honolulu, 1987a), 50.

[2] Ibid.

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)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [X] B Property is associated with the lives of persons significant in our past.
- [X] 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)

Property is:

- [ ] A owed 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.

Areas of Significance
(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1911

1950

Significant Dates

1911

1950

Significant Person
(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Young, John Mason (1911)

Bartels, William R. (1950)

Period of Significance (justification)

The Kapu'e Stream Bridge was built in 1911 during the railroad's second phase of construction. In 1950, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Kapu'e Stream Bridge as a part of the Hawai'i Belt Road (FAP 19) utilizing members from segments of the demolished railroad bridges.

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

The Kapu'e Stream Bridge is significant under Criteria A, B, and C. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technology.

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

Criterion A

The Kapu'e Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawai'i. The bridge is eligible under Criterion A for its associations with the Hilo Railroad Company, later called the Hawai'i Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the islands' sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawai'i."[3] Another writer noted that the completion of the railroad marked nothing less than "an era in the development of the islands."[4] The steel railroad trestles and truss spans from the original bridge remains intact. The new highway and reconstructed bridges bypassed and straightened-out the old Māmalahoa Highway and the more irregular parts of the Hawai'i Belt Road (FAP 19) providing modern transportation facilities for the island of Hawai'i, thus greatly contributing to its commercial growth in the latter half of the twentieth-century.

Criterion B

The Kapu'e Stream Bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian islands: the Hilo Railroad Company founders - Benjamin Dillingham, Lorrin Thurston, and Mark Robinson. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.[5]

Criterion C

The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology. The bridge is a rare remaining example of steel girder and trestle construction. The bridge represents the "work of a master", John Mason Young, designer of the original railroad line and bridges; as well as William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the early 1950s. Analysis of the structure may provide information about early twentieth-century steel manufacture and construction, as well as information regarding the only standard gauge railway in the islands.

[3] Paradise of the Pacific, (December 1924): 14.

[4] Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

[5] Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123-124

Developmental history/additional historic context information (if appropriate)

The Kapu'e Stream Bridge was built in 1911 during the railroad's second phase of construction. The specifications and design of the bridge were drawn up by John Mason Young, the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i). Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[6] The bridge's components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year). It was erected by W.W. Beers, described by the *Hilo Tribune* as a New York engineer.[7]

The specifications and design of the bridge construction were drawn up by William R. Bartels, the chief engineer of Territorial Highway Department. William R. Bartels was a German born engineer who worked briefly for a sugar plantation on Maui before being hired by the Territorial Highway Department in 1932. In 1950, the Territorial Highway Department, under the direction of Bartels utilized members from segments of the demolished railroad bridges. Bartels designed most territorial bridges from 1932 until 1957. He was responsible for the largest and most sophisticated bridge construction projects in Hawai'i during this time during which there was a marked shift to large deck girder and rigid frame bridges. Bartels ended his tenure as Chief of the Bridge Division at age 70. This was well past the standard retirement age but he was kept on by special permission and out of necessity because his abilities were exceptional. His work characteristically utilized the latest technology and involved a high degree of engineering complexity. His bridges also evidence a refined aesthetic sensibility, which makes them distinctive from the work of other engineers. Bridges designed by Bartels are hailed for their accomplishment in engineering as well as aesthetics.

Kapu'e Stream Bridge was erected by James W. Glover, a well known local entrepreneur who owned Kahuku Ranch in South Point, some farms, restaurants, and even ran for the state Senate. In the 1940s, Glover began work in Hilo to do highway and infrastructure work. Some historic projects include the Hālawa Watershaft, Ala Wai Yacht harbor, Nu'uanu Reservoir, Kawaihae Overseas Terminal, sections of the H-1 Freeway, many of the roads along the Hāmākua Coast, and new Lyman Airfield Runway.

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6 John William Siddall, Men of Hawai'i (Territory of Hawai'i: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawai'i, (Honolulu, 1935), 487-488.

7 Hilo Tribune, (11 April 1911): 3. 48Hilo Tribune, (11 April 1911): 3.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___ State Historic Preservation Office
_x_ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository:

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	280744	2188667	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 415 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA/Professor
organization Heritage Center, University of Hawai'i at Manoa date
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822
e-mail aspencer@hawaii.edu

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Kapu'e Stream Bridge

City or Vicinity: Pāpa'ikou

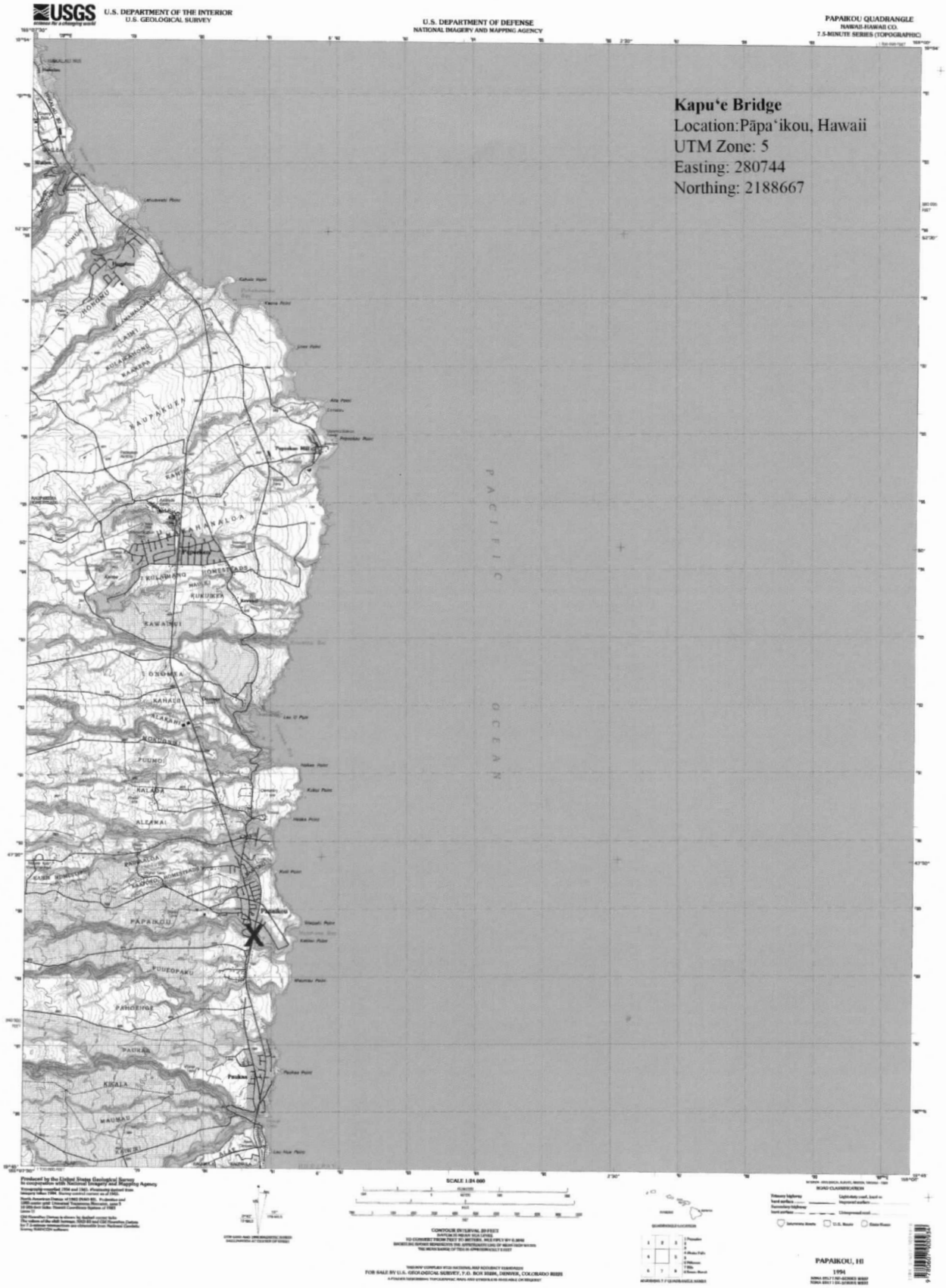
County: Hawai'i **State:** Hawai'i
sdfsdf
Photographer: Spencer Leineweber, FAIA/Professor

Date Photographed:

Description of Photograph(s) and number:

Photo #1: Approach
Photo #2: Name
Photo #3: Railing/Structure

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
U.S. DEPARTMENT OF DEFENSE
NATIONAL IMAGERY AND MAPPING AGENCY
PAPAIKOU QUADRANGLE
HAWAII-HAWAII CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)
Kapu'e Bridge
Location:Pāpa'ikou, Hawaii
UTM Zone: 5
Easting: 280744
Northing: 2188667
PACIFIC
OCEAN
PAPAIKOU
PAPAIKOU, HI
1994

Sketch Map

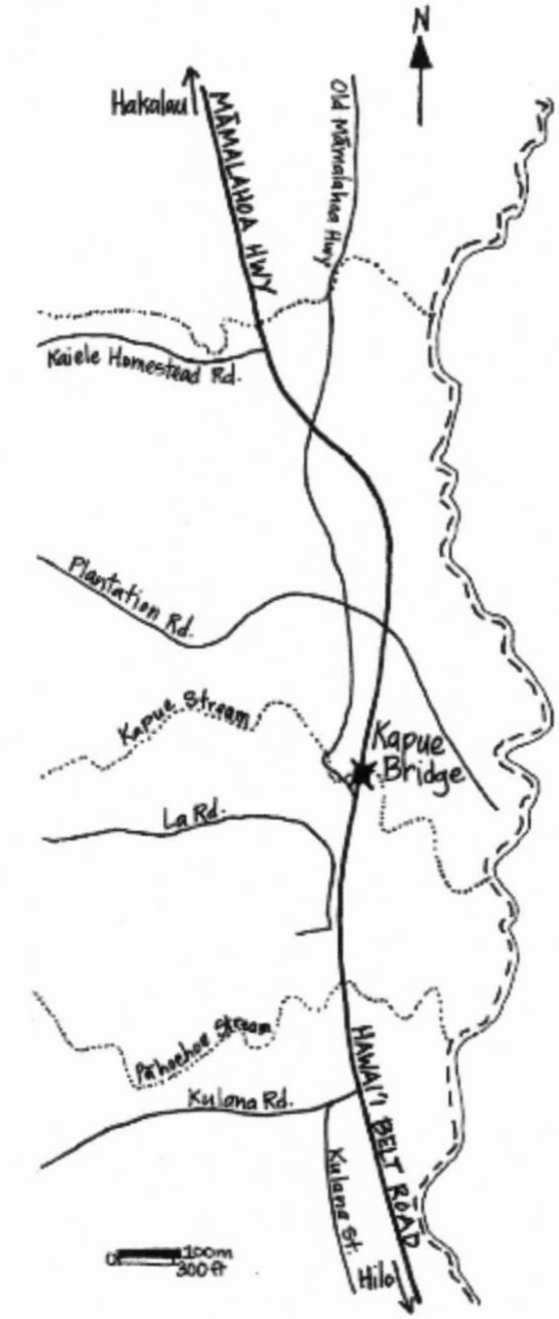

N
Hakalau
MĀMALAHOA HWY
Old Māmalahoa Hwy
Kaiele Homestead Rd.
Plantation Rd.
Kapue Stream
Kapue Bridge
La Rd.
Pahoehoe Stream
Kulana Rd.
HAWAI'I BELT ROAD
Kulana St.
Hilo
100m
300 ft

Photo #1: Approach



Photo #2: Name



Photo #3: Railing/Structure



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. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name PĀHEʻEHEʻE STREAM BRIDGE

Other names/site number Pāheʻeheʻe Gulch Bridge, Pāheʻeheʻe Bridge (structure number 001000190308619)

2. Location

street & number 0.9 miles W of Akaka Falls Road on FAP 19 ☐ not for publication

city of town Honohina (TMK 3-2-8-17) ☐ vicinity

State Hawaiʻi code HI county Hawaiʻi code 001 zip code

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 ___local

Signature of certifying official Date

Title State or Federal agency and bureau

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

Signature of commenting official Date

Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Steel Trestle Bridges on the Hamakua Coast

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: rail-related

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Pāhe'ehe'e Stream Bridge is a steel girder and trestle bridge with a total length of 255 feet and a roadway width of 28 feet. It is built at the deck elevation of 194' over Pāhe'ehe'e Stream along the Hāmākua Coast of the Island of Hawai'i. The rural setting of the site has been unchanged. The superstructure is composed of a concrete deck on steel girders, and the substructure is composed of c. 1911 steel railroad trestle supports with masonry (lava-rock) abutments. Open horizontal concrete rail and cap were added as parapets in 1950s. Concrete end piers with an incised bridge name and date were part of the roadway conversion.

Narrative Description

The Pāhe'ehe'e Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Pāhe'ehe'e Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans. In 1911, fourteen steel trestle girder bridges were erected along the Hāmākua Coast to support railroad tracks for the Hilo Railroad Company.[1] Substantial parts of the railroad were devastated by the tsunami of 1946, and nine of the steel trestle bridges were disassembled and sold as scrap.[2] The remaining five bridges (Hakalau, Nānue, Pāhe'ehe'e, Umauma, and Kapue) were retained and reconstructed as territorial highway bridges between 1950-53.

The bridge remains in its original location; however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment. The setting has experienced little, if any, change. In 1953, the bridge was widened for use as a highway bridge with members from railroad bridge. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic. The integrity of the original substructure remains intact, and is a remainder of the only standard-gauge railroad constructed in the islands. The bridge's substructure can be viewed from the old Māmalahoa Highway which runs under the highway bridge. The bridge's historic associations are readily apparent to all observers; the bridge retains its historic feeling due to its unusual construction type. Interpretation is aided by the presence of a plaque on the substructure of which reads:

Hamilton & Chambers
Contractors
for Steel Structure
New York, U.S.A.
1912

The Pāhe'ehe'e Stream Bridge has recently undergone seismic retrofit modifications. The project included addition of hinge restrainers, seat extenders at hinges and abutments, longitudinal concrete edge beams on each side of the deck, and the upgrade of pier footings.

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1 Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawaiÿi, prepared for the State of Hawaiÿi, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration, (Honolulu, 1987a), 50.

2 Ibid.

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)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [X] B Property is associated with the lives of persons significant in our past.
- [X] 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)

Property is:

- [ ] A owed 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.

Areas of Significance
(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1911

1950

Significant Dates

1911

1950

Significant Person
(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Young, John Mason (1911)

Bartels, William R. (1950)

Period of Significance (justification)

The Pāheʻeheʻe Stream Bridge was built in 1911 during the railroad's second phase of construction. In 1950-53, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Pāheʻeheʻe Stream Bridge utilizing members from segments of the demolished railroad bridges.

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

The Pāheʻeheʻe Stream Bridge is significant under Criteria A, B, and C. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technology.

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

Criterion A

The Pāheʻeheʻe Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawaiʻi. The bridge is eligible under Criterion A for its associations with Hilo Railroad Company, later called the Hawaiʻi Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the islands' sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawaiʻi."[3]

Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the Islands."[4] Nonetheless, the steel railroad trestles and truss spans from the original bridge remains intact. The new highway and reconstructed bridges bypassed and straightened-out the old Māmalahoa Highway and the more irregular parts of the Hawaiʻi Belt Road (FAP 19) providing modern transportation facilities for the island of Hawaiʻi, thus greatly contributing to its commercial growth in the latter half of the twentieth-century.

Criterion B

The bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian Islands: the Hilo Railroad Company founders - Benjamin Dillingham, Lorrin Thurston, and Mark Robinson. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at ʻŌlaʻa, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawaiÿi and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.[5]

Criterion C

The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology. The bridge is a rare remaining example of steel girder and trestle construction. The bridge represents the "work of a master": John Mason Young, designer of the original railroad line and bridges; as well as William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the 1950s. The structure provides information regarding the only standard gauge railway in the islands.

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[3] Paradise of the Pacific, (December 1924): 14.

[4] Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

[5] Gerald M. Best, Railroads of Hawaiʻi (San Marino, California: Golden West Books, 1978), 123-124

Developmental history/additional historic context information (if appropriate)

The Pāhe'ehe'e Stream Bridge was built in 1911 during the railroad's second phase of construction. The specifications and design of the bridge were drawn up by John Mason Young, the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i). Young had been involved in steel bridge design and construction on mainland railroads before coming to Hawai'i.[6] The bridge's components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year). It was erected by W.W. Beers, described by the *Hilo Tribune* as a New York engineer.[7]

In 1950, the Territorial Highway Department, under the direction of William R. Bartels reconstructed Pāhe'ehe'e Bridge utilizing members from segments of the demolished railroad bridges. Bartels was responsible for the design of all major territorial bridge projects between 1932 and his retirement from the department in 1956.[8] His work characteristically utilized the latest technology and involved a high degree of engineering complexity. His bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

---

6 John William Siddall, Men of Hawaii (Territory of Hawaii: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawaii, (Honolulu, 1935), 487-488

7 Hilo Tribune, (11 April 1911): 3.

8 Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawaii" in Historic Bridge Inventory and Evaluation: Island of Hawaii, Prepared for the State of Hawaii, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___ State Historic Preservation Office
_x_ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository:

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	278815	2199102	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 255 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA Professor
organization Heritage Center, University of Hawai'i at Manoa date
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822
e-mail aspencer@hawaii.edu

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Pāhe'ehe'e Stream Bridge

City or Vicinity: Honohina

County: Hawai'i **State:** Hawai'i

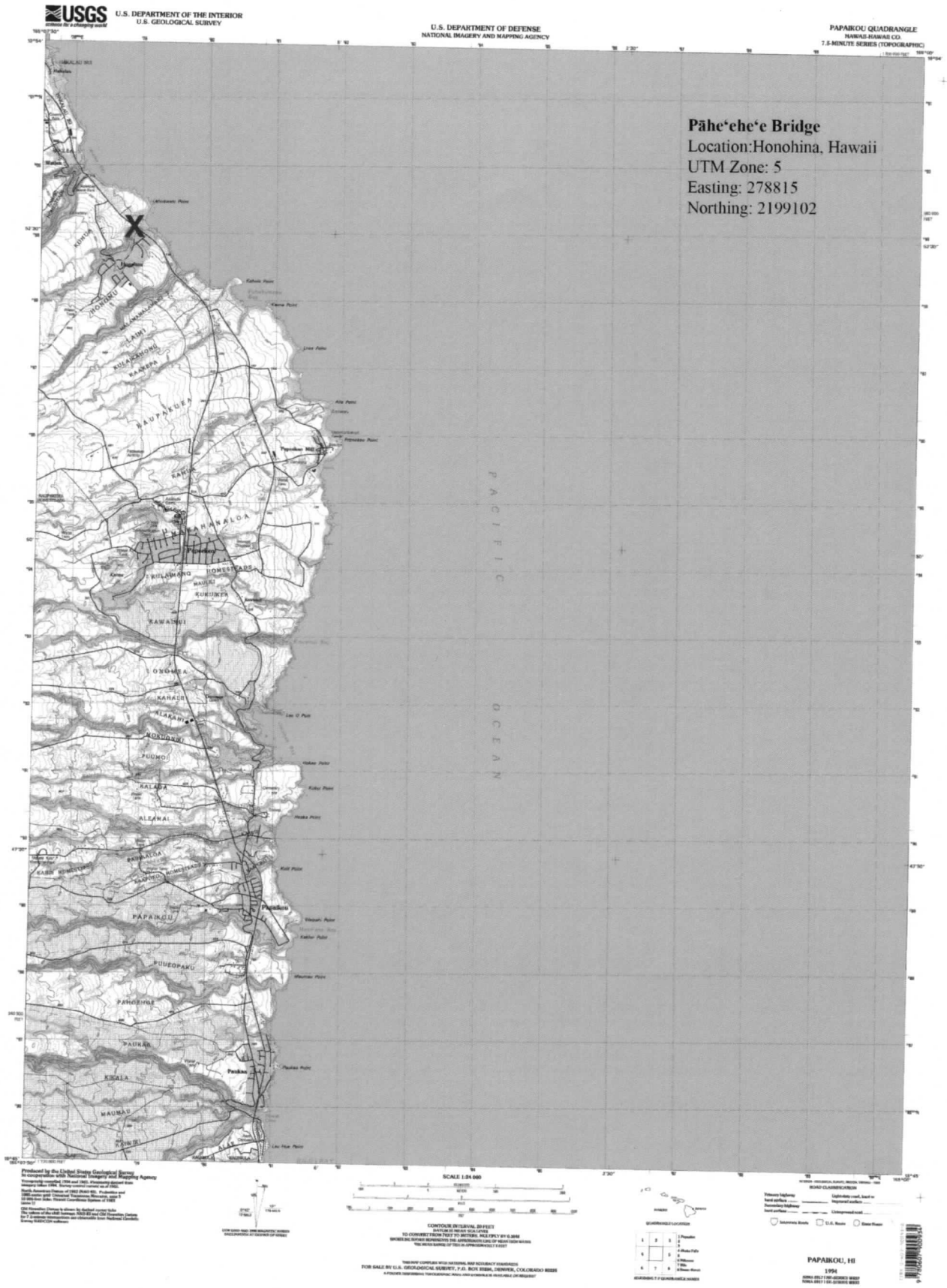
Photographer: Spencer Leineweber, FAIA/Professor

Date Photographed: August 2009

Description of Photograph(s) and number:

Photo #1: Name
Photo #2: Railing
Photo #3: Structure
Photo #4: Footing

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
U.S. DEPARTMENT OF DEFENSE
NATIONAL IMAGERY AND MAPPING AGENCY
PAPAIKOU QUADRANGLE
HAWAII-HAWAII CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)
Pāhe'ehe'e Bridge
Location:Honohina, Hawaii
UTM Zone: 5
Easting: 278815
Northing: 2199102
PACIFIC OCEAN
PAPAIKOU, HI
1994

Sketch Map

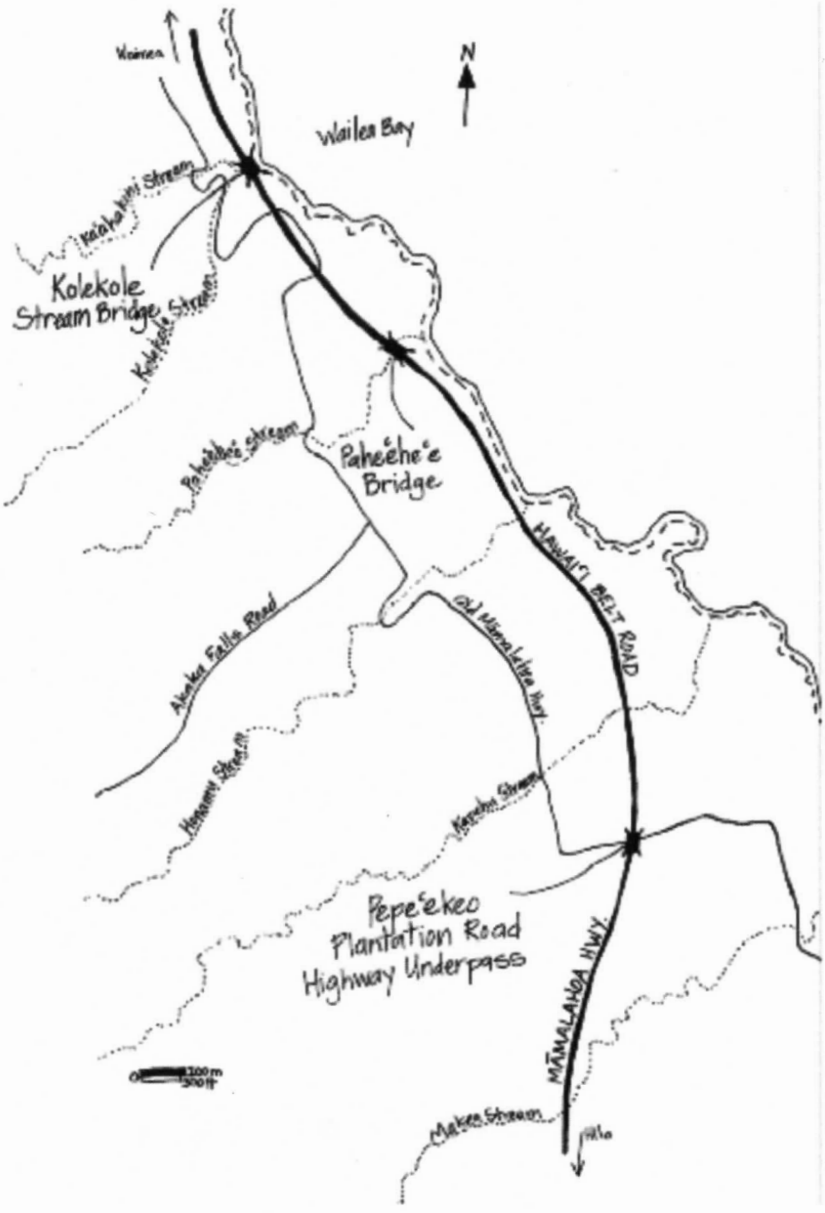

N
Wailea Bay
Kolekole
Stream Bridge
Paheʻeheʻe
Bridge
HAWAIʻI BELT ROAD
Akaka Falls Road
Old Māmalahoa Hwy.
Pepeʻekeo
Plantation Road
Highway Underpass
MĀMALAHOA HWY.
Makea Stream

Photo #1: Name



Photo #2: Railing



Photo #3: Structure



Photo #4: Footing



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. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name KOLEKOLE STREAM BRIDGE

Other names/site number N/A (structure number 001000190308549)

2. Location

street & number Hawai'i Belt Rd., 0.10MI W/Kolekole Pk Rd ☐ not for publication

city of town Pepe'ekeo (TMK 3-2-9-03) ☐ vicinity

State Hawai'i code HI county Hawai'i code 001 zip code

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 ___local

Signature of certifying official Date

Title State or Federal agency and bureau

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

Signature of commenting official Date

Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Steel Trestle Bridges on the Hamakua Coast

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A

walls: N/A

roof: N/A

other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Kolekole Stream Bridge was built with steel girder and F1 beam system. The total length of the bridge is 497 feet and the roadway width is 28 feet. It is built at the deck elevation of 183' over Kolekole stream along the Hāmākua Coast of the Island of Hawai'i. The rural setting of the site remains unchanged. The bridge has reinforced concrete and steel superstructure and substructure.

Narrative Description

The Kolekole Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Kolekole Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans. This bridge is a part of the "Seismic Wave Damage Rehabilitation Project" (FAP19).

This bridge remains in its original location, however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment. Some of the parts and materials of Kolekole Stream Bridge were salvaged from the Wailuku River Bridge and Maulua Gulch Bridge. The setting of the bridge has changed very little and the integrity of the whole structure remains intact. The Bridge was assembled from parts of a number of other railroad bridges. Three types of spanning structure were used in this bridge: steel trusses for spans No.3 and 4; steel girders for spans No.2, 5 and 6; and a concrete approach slab for span No.1. Its unusual construction type contributes to the historic character and feeling of the bridge.

The Kolokole Highway Bridge has recently undergone seismic retrofit modifications. The project included addition of hinge restrainers, seat extenders at hinges and butments, creep blocks or transverse shear connectors, FRP wraps for columns and link beams for confinement and/or added shear capacity, built-up beams/piercaps, and longitudinal restrainers with rock anchors.

KOLEKOLE STREAM BRIDGE
Name of Property

Hawai'i County, Hawai'i
County and State

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)

[X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.

[X] B Property is associated with the lives of persons significant in our past.

[X] 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)

Property is:

[ ] A owed 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.

Areas of Significance
(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1950

Significant Dates

1911, 1950

Significant Person
(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Glover, Jas. W.

Period of Significance (justification)

The Kolekole Stream Bridge was built in 1950-1953 as a part of the "Seismic Wave Damage Rehabilitation Project".

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

Kolekole Stream Bridge is significant under Criterions A, B, and C. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technology.

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

Criterion A

The Kolekole Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawai'i. The bridge is eligible under Criterion A for its associations with Hilo Railroad Company, later called the Hawai'i Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the islands' sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawaii." Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the islands."

Criterion B

The bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian Islands: the Hilo Railroad Company founders-Benjamin Dillingham, Lorrin Thurston, and Mark Robinson.[1] Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawai'i and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.[2]

Criterion C

The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology. The bridge is a rare remaining example of steel girder and trestle construction. The bridge represents the "work of a master": Jas. W. Glover, a well-known local entrepreneur, who did the highway and infrastructure work in the 1940s. The structure provides information about early twentieth-century steel manufacture and construction, as well as information regarding the only standard gauge railway in the islands.

Developmental history/additional historic context information (if appropriate)

The builder of this bridge was Jas. W. Glover, a well known local entrepreneur who owned Kahuku Ranch in South Point, some farms, restaurants, and even ran for the state Senate. In the 1940s, Glover branched to Hilo to do highway and infrastructure work. Some historic projects include the Hālawa Watershaft, Ala Wai Yacht harbor, Nu'uanu Reservoir, Kawaihae Overseas Terminal, sections of the H-1 Freeway, many of the roads along the Hāmākua Coast, and new Lyman Airfield Runway.[3]

[1] Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawai'i" in Historic Bridge Inventory and Evaluation: Island of Hawai'i, prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of transportation, Federal Highways Administration, (Honolulu, 1987a)

[2] Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123-124

[3] Carol Banks Weber, "Jas. W. Glover Celebrates 60th Anniversary" in Building Industry, September 1995, P69-70

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___State Historic Preservation Office
_x_ Other State agency
___Federal agency
___Local government
___University
___Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	278133	2199902	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 497 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA Professor
organization Heritage Center, University of Hawai'i at Manoa date _____
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822
e-mail aspencer@hawaii.edu

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Kolekole Stream Bridge

City or Vicinity: Pepe'ekeo

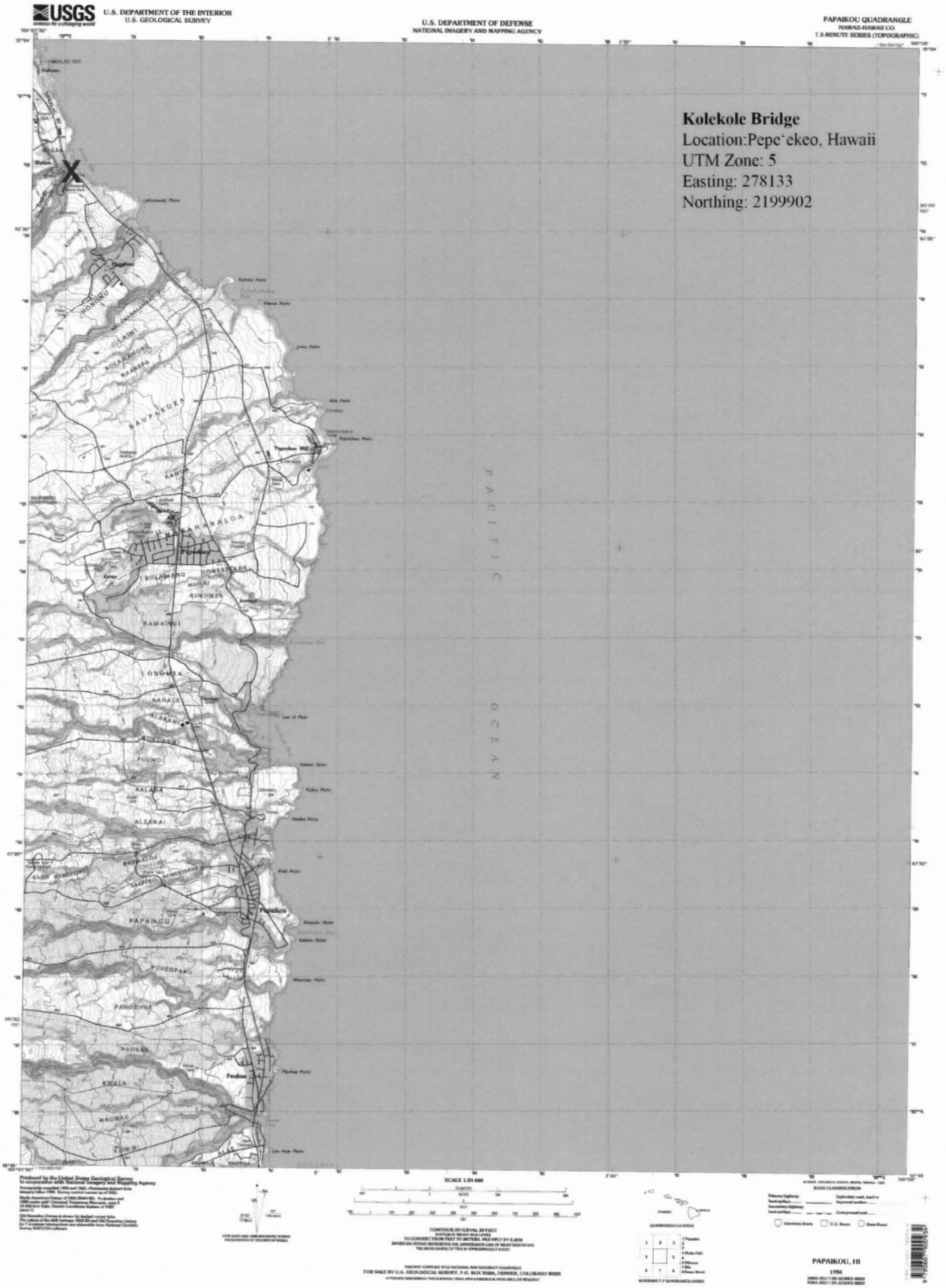
County: Hawai'i **State:** Hawai'i
sdfsdf
Photographer: Spencer Leineweber, FAIA/ Professor

Date Photographed:

Description of Photograph(s) and number:

Photo #1: Name
Photo #2: Approach
Photo #3: Structure
Photo #4: View from Beach Park

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
U.S. DEPARTMENT OF DEFENSE
NATIONAL IMAGERY AND MAPPING AGENCY
PAPAIKOU QUADRANGLE
HAWAII-HAWAII CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)
Kolekole Bridge
Location:Pepe'ekeo, Hawaii
UTM Zone: 5
Easting: 278133
Northing: 2199902
PACIFIC OCEAN
PAPAIKOU, HI
1994

Sketch Map

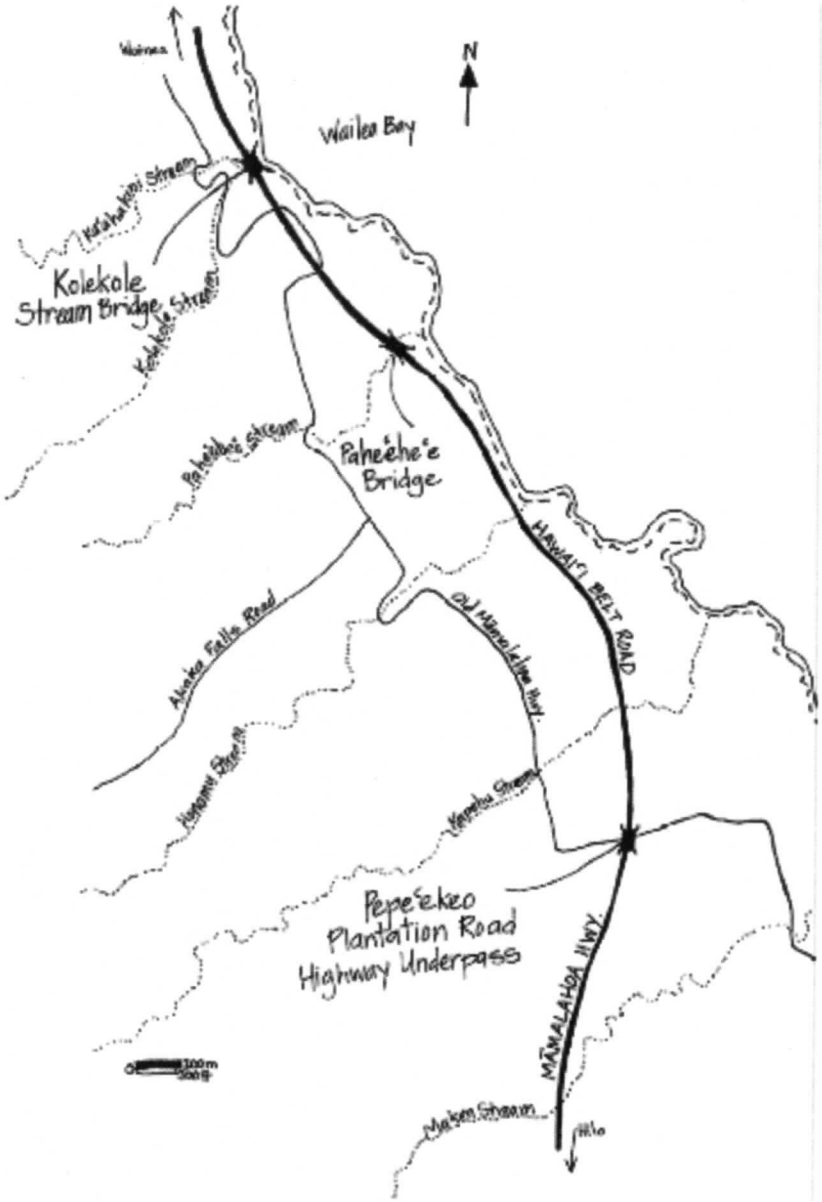

N
Wailea Bay
Kolekole
Stream Bridge
Paheehe'e
Bridge
HAWAI'I BELT ROAD
Old Māmalahoa Hwy.
Pepe'ekeo
Plantation Road
Highway Underpass
MĀMALAHOA HWY.
Hilo

Photo #1: Name

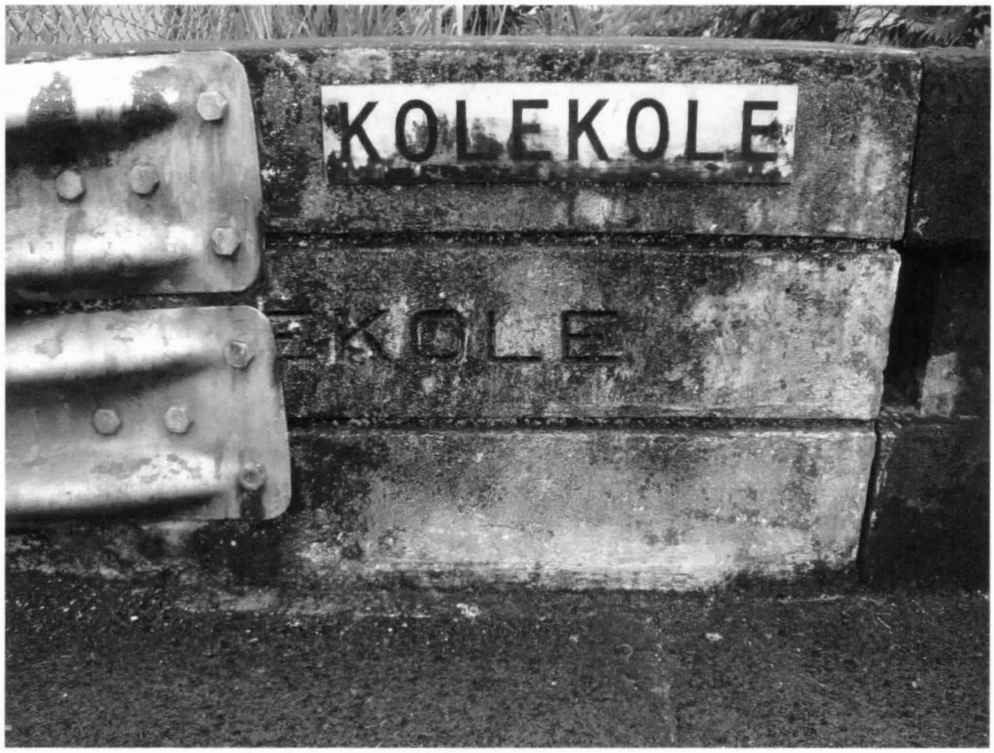


Photo #2: Approach



Photo #3: Structure



Photo #4: View from Beach Park



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. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name HAKALAU STREAM BRIDGE

Other names/site number Hakalau Highway Bridge (structure number 001000190308410)

2. Location

street & number Hawai'i Belt Road ☐ not for publication

city of town Hakalau (TMK 3-2-9-02) ☐ vicinity

State Hawai'i code HI county Hawai'i code 001 zip code

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 ___local

Signature of certifying official Date

Title State or Federal agency and bureau

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

Signature of commenting official Date

Title State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is: Signature of the Keeper Date of Action

___ 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:)

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [ ] private
- [ ] public - Local
- [x] public - State
- [ ] public - Federal
- [ ] private

Category of Property
(Check only **one** box)

- [ ] building(s)
- [ ] district
- [ ] site
- [x] structure
- [ ] building(s)
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	Objects
0	0	buildings
0	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

Steel Trestle Bridges on the Hamakua Coast

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: rail-related

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related (vehicular)

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: steel girder and trestle bridge

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: METAL

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Hakalau Stream Bridge is a steel girder and trestle bridge with the total length of 775 feet, a 261-feet height over the stream bed, and a roadway width of 28 feet. It is built over Hakalau Stream along the Hāmākua Coast of the Island of Hawai'i and the rural setting of the bridge remains unchanged. The superstructure of the bridge is composed of a concrete deck on steel girders, and the substructure is composed of c.1911 steel railroad trestle supports with masonry (lava-rock) abutments. Open horizontal concrete rail, concrete cap and concrete end piers with incised bridge name and date of construction are portions added in the 1950s rehabilitation.

Narrative Description

The Hakalau Stream Bridge carries the Hawai'i Belt Road (FAP 19) over Hakalau Stream along the Hāmākua Coast of the Island of Hawai'i. The present highway bridge was reconstructed from older railroad trestle and girder spans. In 1911-1912, fourteen steel trestle girder bridges were erected along the Hāmākua Coast to support railroad tracks for the Hilo Railroad Company. All of the rail bridges along the line were devastated by the tsunami of 1946, and nine of the steel trestle bridges were disassembled and sold as scrap. The remaining five bridges (Hakalau, Nānue, Pāhe'ehe'e, Umauma, and Kapue) were retained and modified as territorial highway bridges between 1950-53. Kolekole Bridge was assembled using parts of other demolished railroad trestle bridges.

The railroad bridge remains in its original location; however, the Hawai'i Belt Road, the primary transportation artery for the island, was re-routed in the early 1950s in order to utilize the abandoned railroad alignment and railroad bridge trestle system. The setting has experienced little, if any, change. In 1953, the bridge was widened for use as a highway bridge with members from the disassembled railroad bridges. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic. The integrity of the original substructure remains intact, and is a remainder of the only standard-gauge railroad constructed in the islands. The bridge's substructure can be viewed from the old Māmalahoa Highway which runs under the highway bridge. The bridge's historic associations are readily apparent to all observers; the bridge retains its historic feeling due to its unusual construction type. Interpretation is aided by the presence of a plaque on the substructure which reads:

Hamilton & Chambers
Contractors
for Steel Structure
New York, U.S.A.
1912

The Hakalau Stream Bridge has recently undergone seismic retrofit modifications. The project included addition of hinge restrainers, seat extenders at hinges and abutments, longitudinal struts at abutments, and the upgrade of pier footings.

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)

- [x] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [x] B Property is associated with the lives of persons significant in our past.
- [x] 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)

Property is:

- [ ] A owed 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.

Areas of Significance

(Enter categories from instructions)

ENGINEERING

TRANSPORTATION

Period of Significance

1911

1953

Significant Dates

1911

1953

Significant Person

(Complete only if Criterion B is marked above)

Dillingham, Benjamin
Thurston, Lorrin
Robinson, Mark

Cultural Affiliation

N/A

Architect/Builder

Young, John Mason

Bartels, William R.

Period of Significance (justification)
The Hakalau Stream Bridge was built in 1911 as a railroad bridge during the railroad's second phase of construction to the area north of Hilo. In 1953, the Territorial Highway Department, under the direction of William R. Bartels, reconstructed Hakalau Stream Bridge as a part of the Hawai'i Belt Road (FAP 19) utilizing members of the original railroad trestle support system and additional materials from other railroad bridges.

Criteria Consideratons (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance and applicable criteria)

The Hakalau Stream Bridge is significant under Criteria A, B, and C. Criterion A is applicable for the bridge's association with the Hilo Railroad Company. Criterion B is applicable for the bridge's association with three founders of the Hilo Railroad Company. Criterion C is applicable since the bridge is a representative example of early twentieth-century engineering technologyas well as a source for information about early twentieth-century steel manufacture and construction.

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

Criterion A
The Hakalau Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawai'i. The bridge is eligible under Criterion A for its associations with the Hilo Railroad Company, later called the Hawai'i Consolidated Railway, which played a major role in the development of the Hilo and the Hāmākua Coast by providing transportation to the harbor for the island's sugar production. The railroad and its numerous bridges together have been called the "greatest engineering feat in Hawai'i."[1] Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the islands."[2] The steel railroad trestles and truss spans from the original bridge remain intact with minor modifications for seismic upgrading and bolted connections. The new highway and reconstructed bridges bypassed and straightened-out the old Māmalahoa Highway and the more irregular parts of the Hawai'i Belt Road (FAP 19) providing modern transportation facilities for the island of Hawai'i, thus greatly contributing to its commercial growth in the latter half of the twentieth-century.

Criterion B
The bridge is eligible under Criterion B for its association with figures significant in the history of the Hawaiian islands: the Hilo Railroad Company founders - Benjamin Dillingham, Lorrin Thurston, and Mark Robinson. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at 'Ōla'a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the former Republic of Hawai'i and a former Interior Minister under the monarchy. Mark Robinson worked as the former Minister of Foreign Affairs for Queen Liliuokalani.[3]

Criterion C

1 Paradise of the Pacific, (December 1924): 14.

2 Thomas Thrum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.

3 Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123-124

The bridge is eligible under Criterion C as a representative example of early twentieth-century engineering technology. The bridge is a rare remaining example of steel girder and trestle construction and was, for many years, the longest span in the state. The bridge represents the "work of a master": John Mason Young, designer of the original railroad line and bridges; as well as William R. Bartels, of the Territorial Highway Department, who engineered their conversion from railroad to highway use in the 1950s. The analysis of the structure may provide information about early twentieth-century steel manufacture and construction, as well as information regarding the only standard gauge railway in the islands.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Developmental history/additional historic context information (if appropriate)

The Hakalau Railroad Trestle Bridge was built in 1911 by the Hilo Railroad Company during the railroad's second phase of construction to support the plantation industry of the island. John Mason Young drew the specifications and design of the bridge. Young was the founder of Pacific Engineering Company of Honolulu and a pioneer faculty member of the College of Agriculture and Mechanic Arts (later the University of Hawai'i).[4] The bridge's components were ordered from the New York firm of Hamilton and Chambers (who also fabricated the steel for the Hanalei River Bridge on Kaua'i the same year). It was erected by W.W. Beers, described by the Hilo Tribune as a New York engineer.[5]

Hakalau Railroad Trestle Bridge was one of the most impressive bridges built by the Hilo Railroad. At 775 feet long and sitting on seven steel towers, the Hakalau Stream Bridge was the second longest bridge on the line, outdistanced only by the Maulua Bridge at more than 1000 feet. After the Maulua Bridge was taken down, Hakalau became the longest highway bridge in the territory for several years.[6] It was also among the tallest, with a height of 261 feet, only 25 feet shy of the tallest bridge over Nānue Stream.

In 1946, the railroad line were devastated by a tsunami. Hakalau Stream Bridge and four other bridges were retained and reconstructed when the rest of the steel trestle bridges were disassembled.[7] A sixth bridge was assembled from remaining parts from other bridges. The Hawai'i Belt Road (FAP 19) was re-routed in the early 1950s to utilize the abandoned railroad alignment since the original Belt Road was too narrow and winding for the large strucks used by the plantation industry in lieu of the devastated railroad. In 1953, Hakalau Stream Bridge was widened for use as a highway bridge with members from the disassembled railroad bridges. The reconstruction follows the original trestle design, however bolted rather than riveted connections were utilized. A concrete deck, sidewalks and rail were added to facilitate automobile and pedestrian traffic.

---

[4] John William Siddall, Men of Hawai'i (Territory of Hawai'i: Honolulu Star Bulletin, 1921), 451; and George Nellist, Men of Hawai'i, (Honolulu, 1935), 487-488.

[5] Hilo Tribune, (11 April 1911): 3.

[6] Hawai'i (State), Department of Planning and Economic Development, The State of Hawai'i Data Book, 1982. A Statistical Abstract (Honolulu: Department of Planning and Economic Development, 1983), 414.

[7] Patricia Alvarez, "A History of Road and Bridge Development on the Island of Hawai'i" in Historic Bridge Inventory and Evaluation: Island of Hawai'i, prepared for the State of Hawai'i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration, (Honolulu, 1987a), 50.

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

See Continuation Sheet.

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 #_____

Primary location of additional data:

___ State Historic Preservation Office
x Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository:

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property Less than one acre.
(Do not include previously listed resource acreage)

UTM References
(Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	5	277032	2201749	3			
2				4			

Verbal Boundary Description (describe the boundaries of the property)

The nominated property is a rectangular shaped parcel measuring 772 feet by 28 feet, which is centered on the UTM point listed above. Included within this parcel are the bridge's superstructure, substructure, floor system, and approach spans.

Boundary Justification (explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system and appropriate spans and the property upon which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with this bridge.

11. Form Prepared By

name/title Spencer Leineweber, FAIA Professor
organization Heritage Center, University of Hawai'i at Mānoa date August 15, 2009
street & number 2410 Campus Road telephone (808) 956-4704
city or town Honolulu state HI zip code 96822

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items)

Photographs:

Submit clear and descriptive black and white photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Hakalau Stream Bridge

City or Vicinity: Hakalau

County: Hawai'i **State:** Hawai'i

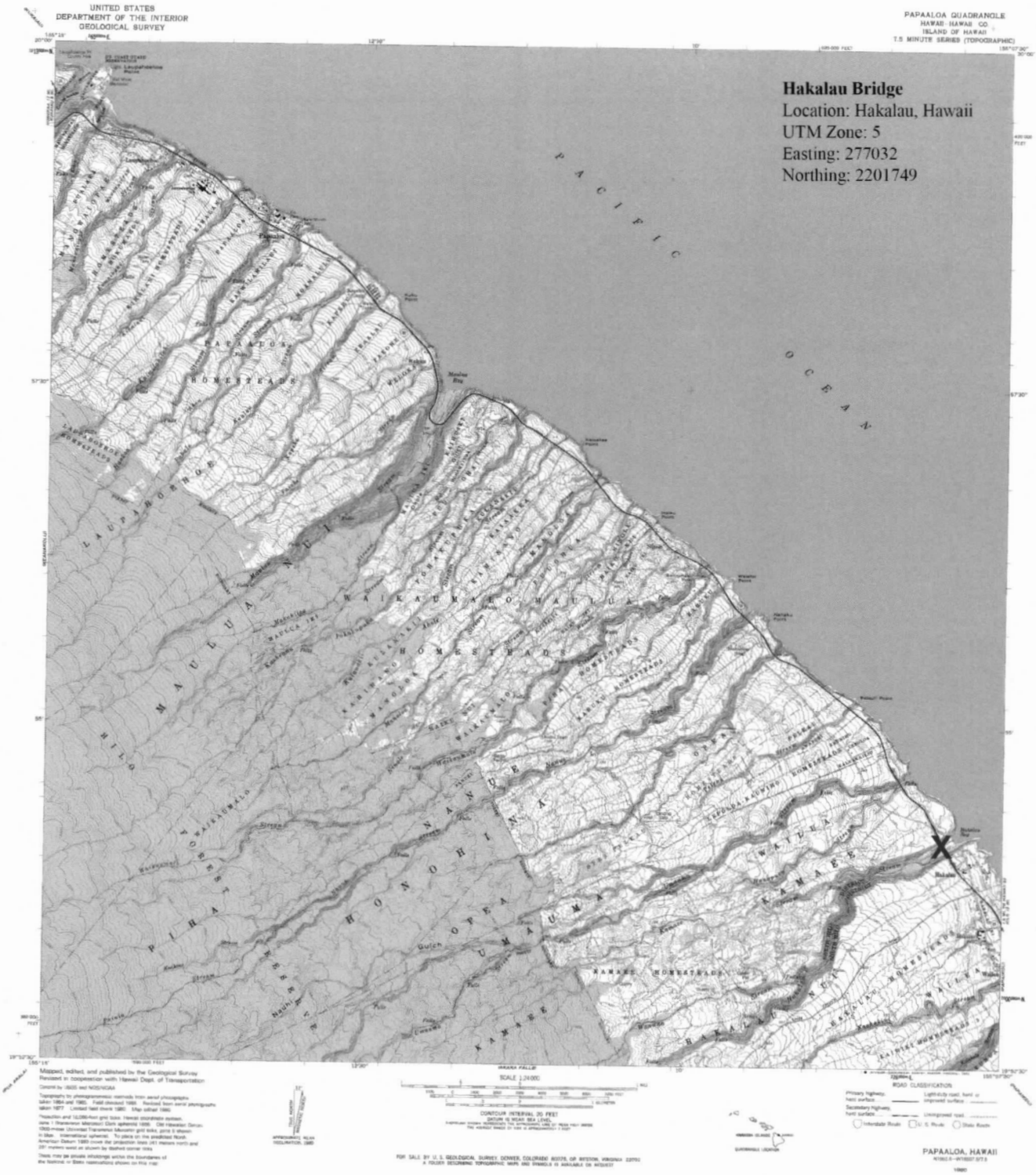
Photographer: Spencer Leineweber, FAIA/Professor

Date Photographed: August 2009

Description of Photograph(s) and number:

Photo #1: Approach
Photo #2: Name
Photo #3: Trestle Substructure.

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PAPAALOA QUADRANGLE
HAWAII-HAWAII CO.
ISLAND OF HAWAII
7.5 MINUTE SERIES (TOPOGRAPHIC)
Hakalau Bridge
Location: Hakalau, Hawaii
UTM Zone: 5
Easting: 277032
Northing: 2201749
PACIFIC
OCEAN
PAPAALOA, HAWAII

Sketch Map

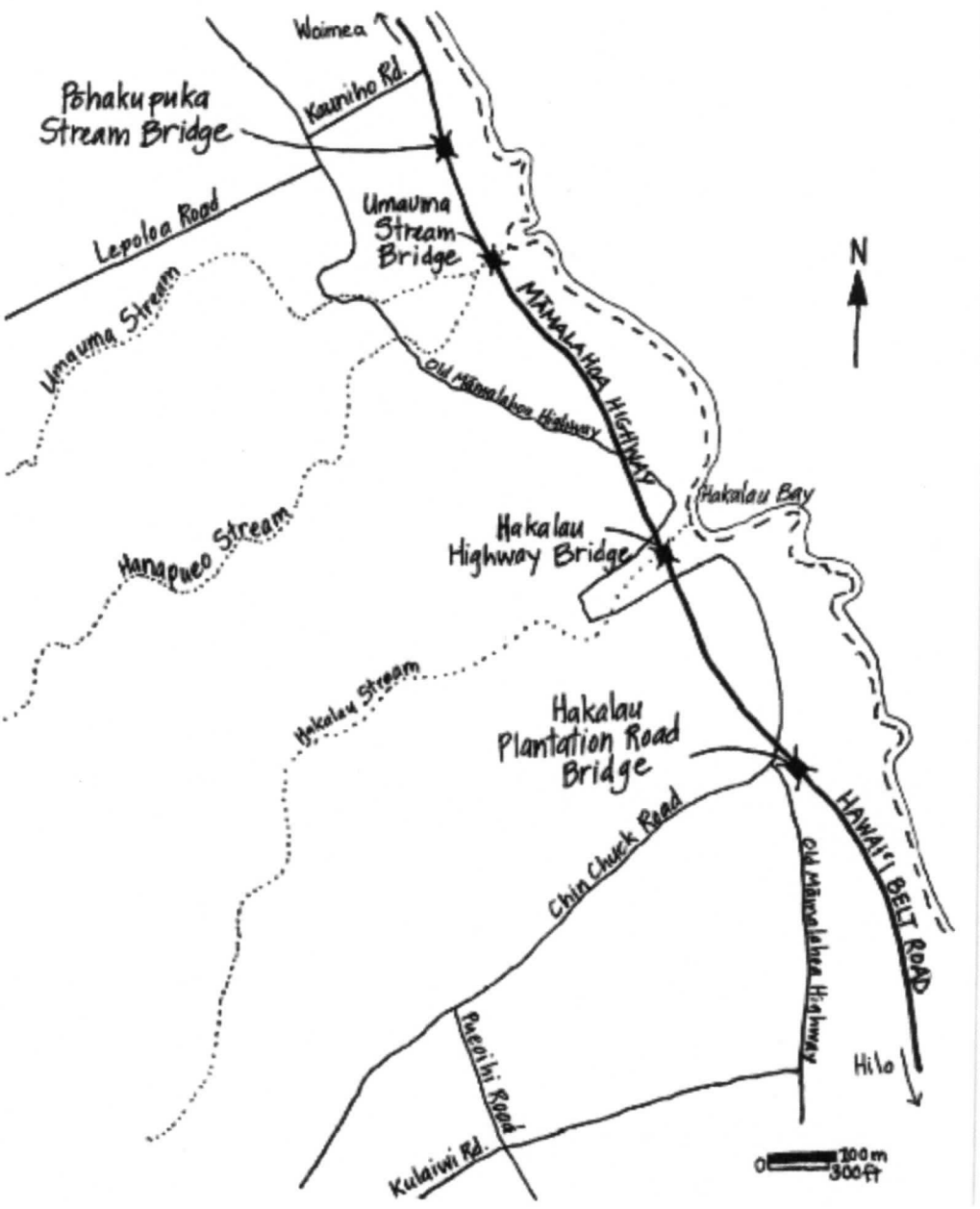

Waimea
Kauniho Rd.
Pōhakupuka Stream Bridge
Lepoloa Road
Umauma Stream Bridge
Umauma Stream
Old Māmalahoa Highway
MĀMALAHOA HIGHWAY
N
Hakalau Bay
Hakalau Highway Bridge
Hanapueo Stream
Hakalau Stream
Hakalau Plantation Road Bridge
China Chuck Road
HAWAI'I BELT ROAD
Old Māmalahoa Highway
Hilo
Paeohi Road
Kulaiwi Rd.
0
200 m
300 ft

Photo #1: Approach



Photo #2: Name

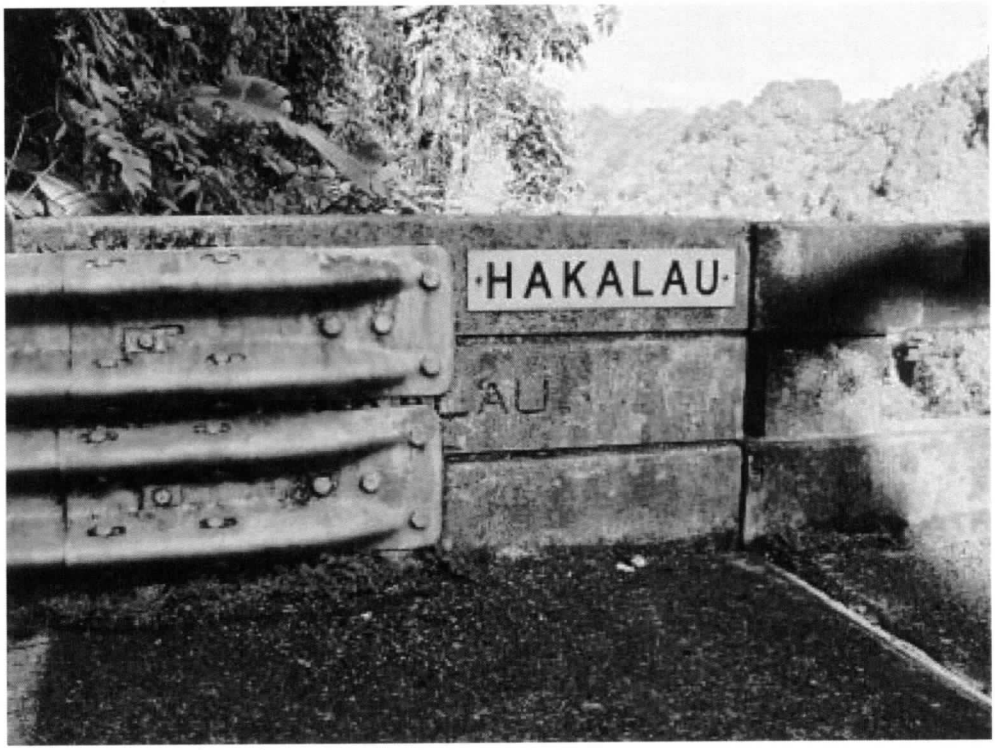


Photo #3: Trestle Substructure



NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires 1-31-2009)

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 *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. 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. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

==========

1. Name of Property

==========

historic name Hilina Pali Road

other names/site number N/A

==========

2. Location

==========

street & number Hawaii Volcanoes National Park not for publication____
city or town Hilo vicinity X state Hawaii code HI
county Hawaii code 001 zip code 96718

==========

3. State/Federal Agency Certification

==========

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X 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 X meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant X nationally ___ statewide ___ locally. (___See continuation sheet for additional comments.)

Peter A. McMahon Deputy State Historic Preservation Officer 6/18/2009
Signature of certifying official Date

Historic Preservation Division, Department of Land and Natural Resources, State of Hawaii
State or Federal Agency or Tribal government

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

_____
Signature of commenting official/Title Date

_____
State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

____ entered in the National Register _____
___ See continuation sheet.
____ determined eligible for the _____
National Register
___ See continuation sheet.
____ determined not eligible for the _____
National Register
____ removed from the National Register _____
____ other (explain): _____

_____
Signature of Keeper Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)

__ private
__ public-local
__ public-State
X public-Federal

Category of Property (Check only one box)

__ building(s)
X district
__ site
__ structure
__ object

Number of Resources within Property

Contributing	Noncontributing	
1	2	buildings
2	1	sites
4	0	structures
0	0	objects
7	3	Total

Number of contributing resources previously listed in the National Register N/A

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat:	Recreation	Sub:	outdoor recreation
	Transportation		road-related
	Landscape		natural feature

Current Functions (Enter categories from instructions)

Cat:	Recreation	Sub:	outdoor recreation
	Transportation		road-related
	Landscape		natural feature

7. Description

Architectural Classification (Enter categories from instructions)

OTHER: National Park Service Rustic style

Materials (Enter categories from instructions)

foundation	masonry (lava rock)
roof	corrugated metal
walls	timber
other	asphalt, masonry (lava rock)

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

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)

X 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.

X 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 a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
transportation
landscape architecture

Period of Significance 1928-1955

Significant Dates 1930
1949
1950

Significant Person (Complete if Criterion B is marked above) _____

Cultural Affiliation N/A

Architect/Builder Thomas Vint, Civilian Conservation Corps, National Park Service

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

==========

9. Major Bibliographical References

==========

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

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 # _____
X recorded by Historic American Engineering Record # HI-47, HI-51

Primary Location of Additional Data
___ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
X Other
Name of repository: Hawaii Volcanoes National Park archives

10. Geographical Data

Acreage of Property _____

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	__	_____	_____	3	__	_____	_____
2	__	_____	_____	4	__	_____	_____

X See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

The boundaries of the nominated district are delineated by the course of the Hilina Pali Road. The right-of-way is approximately 12' wide and is variable along the entire length of the road. The district begins at the intersection of Hilina Pali Road with Chain of Craters Road and extends 8.2 miles to a shelter on the cliff. In addition to structures located within the right-of-way of the road, associated drainage features constructed by the CCC to the west of the road alignment were also considered as well as the nodes of development along the road's alignment, including the Kulana'okuaiki campground, Kipuka Nene campground, and the shelter.

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

The boundaries are coterminus with the Hilina Pali Road's historic right-of-way. The beginning and end points signify the extent of the road. Since National Park Service roads were designed to have nodes of development providing visitor amenities or serving an administrative function, sites along the route of Hilina Pali Road have also been considered.

11. Form Prepared By

name/title Justine Christianson, Historian
organization Heritage Documentation Programs, National Park Service date July 2007
street & number 1201 Eye Street, NW, 2270 telephone 202-354-2183
city or town Washington state DC zip code 20005

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name _____

street & number_____ telephone_____

city or town_____ state_____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications 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. 470 et seq.). A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to range from approximately 18 hours to 36 hours depending on several factors including, but not limited to, how much documentation may already exist on the type of property being nominated and whether the property is being nominated as part of a Multiple Property Documentation Form. In most cases, it is estimated to average 36 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form to meet minimum National Register documentation requirements. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, 1849 C St., NW, Washington, DC 20240

Narrative Description

Hilina Pali Road is a secondary road in the Hawaii Volcanoes National Park road system, located on the Island of Hawaii. The paved one lane road measures approximately 12' wide and extends southwest from the Chain of Craters Road 8.2 miles to a shelter that provides views of the Pacific Ocean and Ka'u Wilderness Area below. The sparse vegetation consists of *a'ali'i* (*Dodonaea vicosa*), molasses grass (*Melinis minutiflora*), beardgrass (*Schizachryium condensatum*), broomsedge (*Andropogon virginicus*), *pukiawe* (*Styphelia tameiameia*), natal redtop (*Rhyncheletrum repens*), *'akia* (*Wikstroemia phillyreifolia*), bracken fern (*Pteridium aquilinum*), and *'ohi'a* (*Metrosideros polymorpha*) in addition to pahoehoe lava flows. Hawaii Volcanoes National Park authorized the construction of Hilina Pali Road as part of a comprehensive park plan directing the development of park infrastructure and access roads. It was designed primarily for park personnel to access the backcountry but its use grew to include trips by visitors who had more time to spend in the park.

The design of Hilina Pali Road followed the general principles of National Park Service road construction, which were developed so that roads and associated structures could be designed to be minimally invasive, in essence so that they would "lie lightly on the land." The National Park Service (NPS) in collaboration with the Bureau of Public Roads (BPR) in the 1920s and 1930s "produced a distinctive 'park road' aesthetic...[that] drew heavily on nineteenth-century carriage design techniques but updated these practices to accommodate the demands of automobile traffic and the geographic diversity of the national parks."[1] NPS personnel accomplished this by aligning park roads to highlight scenic elements, create a varied experience for the traveler, and follow the topography of the land. Other techniques included creating scenic vistas through vegetation management, introducing traffic calming measures such as narrow roadways and sinuous curves so that drivers could not hurry from one point to another, naturalizing cuts and fills, and utilizing native materials in construction.[2] These characteristics of park roads can be seen along the Hilina Pali Road. Park visitors are able to experience the varied landscape of the middle section of the park south of the Kilauea Caldera as the road takes them through the Koa'e fault system, aa and pahoehoe lava flows, and grasslands before rewarding them with an expansive view of the Pacific Ocean at the edge of the pali, where the road terminates. The road's alignment follows gentle curves rather than a straightaway. In addition, the structures associated with the road exhibit the characteristics of the Rustic style, developed by the NPS and characterized by the use of native materials and forms. This can be seen in the drainage structures associated with the road and the shelter at the road's end.

Current Appearance

Hilina Pali Road begins at an intersection with the Chain of Craters Road. The first feature of interest is the Koa'e fault system, a two-mile wide and nine-mile long fault that has been active for at least 1,100 years. It is most apparent around the 3.5 mile marker, where the road curves up and around the fault line. Lava rock fill was used to maintain the grade of the road in this location. The fill contains larger lava rock on the bottom with small rocks on top and is sloped

1 Timothy Davis, "Drawing on the Road," in Timothy Davis, Todd A. Croteau and Christopher Marston, *America's National Park Roads and Parkways: Drawing from the Historic American Engineering Record* (Baltimore: The Johns Hopkins University Press, 2004), 5.
2 Davis, "Drawing on the Road," 1-13.

to prevent rockslides. The fill was probably obtained from a cut made a short distance up the road.

At mile 3.3 is the Kulana'okuaiki campground [NC] paved turnoff. The campground dates to 1999 and features a comfort station and emergency call box. The NPS had the campground built as a replacement to the older Kipuka Nene campground [C], which had to be closed to protect the endangered state bird of Hawaii, the Nene. The Kipuka Nene campground is located past the Koa'e fault at mile 5 and is accessed by a spur road. The location of the campground on a slight elevation prevented lava from flowing over the site. Instead, the flows surround it, creating an oasis of vegetation (called a kipuka). The campground contains a shelter constructed of timber with a corrugated metal roof and featuring a lava rock chimney. Opposite the spur road to the Kipuka Nene campground is a fire cache that houses firefighting equipment, a necessity in dry months when a fire can easily start and rapidly spread in the grassy Ka'u Desert [NC]. After the Kipuka Nene campground, lava flows (particularly pahoehoe) are the predominant landscape feature until the vicinity of mile 6 when the landscape shifts to grassland.

Hilina Pali Road travels through the Ka'u Desert, which despite being a desert still gets nearly 50 inches of rain a year. This amount of rain, coupled with sparse vegetation and deposits of ash and sand, creates erosion and flooding problems that had to be dealt with to keep the road passable. The Civilian Conservation Corps (CCC) was tasked with building structures to control water, both on the road and alongside it. The structures adjacent to the road take the form of retaining walls and dams that protect the sparse vegetation and soil by channeling water across naturally occurring gullies in the pahoehoe lava. On Hilina Pali Road itself, crews constructed fords and retaining walls.

The first ford [C] is just after Kipuka Nene campground. It has been covered with concrete but the original lava rock surfacing is apparent at its edges. The second ford [C], located at mile 5.4, is the longest. A lava rock wall runs along the west side of the road in the location of the ford. Although this ford has been covered with asphalt, the original lava rock can be seen along its edges. The third ford [C] is at mile 6.5, and the original lava rock surfacing is apparent along the roadside as well. The fourth ford [C] is at mile 7.3. The original lava rock surfacing is most apparent at this ford, where it can be seen at either end. The remainder of the ford has been covered with concrete.

At mile 8.2, the road ends at the trailhead for the Ka'u Desert Trail and the Hilina Pali Trail with a gravel parking area and visitor amenities. There is a wooden hitching post and a paved path leading to a modern comfort station [NC] at the parking area. Another paved path leads to a scenic overlook on the edge of the pali (cliff) that provides an uninterrupted view of the Ka'u Desert and the Pacific Ocean. Located at the overlook is a lava rock shelter [C] designed in the late 1920s that exemplifies the National Park Service Rustic style through its use of native materials and form. A trail from the shelter goes down the cliff side to a CCC-built directional aid of copper sitting on a lava rock column.

Archaeological investigations have identified traces of the original Hilina Pali alignment as well as the CCC-built water diversion structures alongside the road. In 1998, 2002, and 2003, field crews conducted surveys of CCC erosion control features in the vicinity of Hilina Pali Road.[3] In 2004, an archaeological survey was done of the last 3.6 miles of Hilina Pali Road before the park embarked on a project to chip seal that portion of the road. The old Hilina Pali Road alignment consists of "a worn two-track surface in the pahoehoe and occasionally by rock alignments or retaining walls built on the edges to create a level surface."[4] Three petroglyphs were also discovered along the alignment: "The first petroglyph illustrates "CCC" and the date of "7[?]/5 [or 8]/39" underneath it. The second consists of the initials C, with a K underneath it. The last petroglyph has "HF" and the date of "1939" underneath it."[5] Finally, the investigation identified a number of retaining wall remnants along the current Hilina Pali alignment.[6]

Although Hilina Pali Road had to undergo some realignment in the 1940s due to washouts from torrential rains and was resurfaced in 2005, it retains a high degree of integrity in both its form and intent.

Resource Inventory

In addition to the road itself, other resources were considered as part of the district. Since National Park Service roads were designed to provide a particular experience for the visitor traveling along them, roadway features like shelters, turnoffs, and campgrounds are integral to the road infrastructure. The physical road and the structures along it are integrated as a seamless whole through the use of similar architectural styles and materials and through the blending of the natural and built environments. In addition, the retaining walls and dams constructed by the CCC in the vicinity of the road were a unique feature built to protect it from washouts as well as to conserve vegetation and soil.

Resource	Status	Type	Year Built
Kulana'okuaiki Campground	**NC**	**S**	**1999**

The campground was constructed as an alternative to the original Kipuka Nene campground when it had to be closed in 1999. It is accessed via a spur road from Hilina Pali Road and has a paved loop drive for vehicle parking. Paths access the camp sites. The campground also features a lava rock-faced comfort station with a corrugated metal roof and an emergency call box for use by campers and motorists. The campground is non-contributing due to its recent construction.

3Summer Roper, Author, and Jadelyn Moniz Nakamura, Principal Investigator, "Hilina Pali 2005, The Civilian Conservation Corps: An Archaeological Inventory Survey of the Hilina Pali Erosion Control Project of 1940."
4 Jennifer Waipa, HAVO Project No. HAVO 2004I report, July 23, 2004, 3-4.
5 Waipa, 4.
6 Waipa, 5.

Fire Cache #4 **NC** **B** **1940**

The fire cache, painted a distinctive red, is one of four such structures built during this time period by the CCC for the NPS to house its firefighting equipment. Constructed on a lava rock foundation of corrugated metal with a corrugated metal gable roof, the building measures 4' x 6'. As the NPS expanded access to the park's backcountry, structures like fire caches were necessary for administrative purposes.[7]

Kipuka Nene Campground **C** **S** **1929-41, 1951**

Although the exact date of its establishment is unknown, Kipuka Nene was in use by the 1930s when a park photograph shows a group of Hilo businessmen in hunting gear at the site. A paved turnoff from Hilina Pali Road provides access to the shelter and camp sites that make up the campground. The shelter was in place by 1951, although the lava rock fireplace and chimney may be a later addition dating to the Mission 66 era of construction in the park. The shelter has timber posts supporting a side gable roof of corrugated metal. The western end of the shelter has a half wall of board and batten siding, which is also used to fill the gables. The eastern wall of the shelter extends to the roof. At one time, a cistern was located outside the eastern wall, but it was removed ca. 2000 and only the footprint remains. In the center of the south wall is a lava rock chimney. The campground also contains lua that probably date to the establishment of the site, sometime between 1929 and 1941.

Ford 1 **C** **STR** **1941-50, 1955**

Located just past the Kipuka Nene campground, this ford has been covered with concrete, but the original lava rock surfacing is apparent in areas. It is 31' long and 14' wide with 1.5' shoulders on either side. A Civil Works Improvement Project involved constructing culverts along the road in 1934 to manage rainfall, but they were washed out in the 1930s-1950. Park administrators had CCC crews build what they termed "washes" (but are being referred to as fords in this nomination) of lava rock to mitigate the damage to the roads from heavy rains. The fords had to be raised in 1955 with a layer of concrete so that buses from the Kilauea Military Camp could safely drive over them.[8]

Ford 2 **C** **STR** **1941-50, 1955**

Located at mile 5.4, this ford is the longest of the four along Hilina Pali Road at 160' long. The park had fords constructed by CCC crews after heavy rains in the 1930s-1950 destroyed the original culverts built in 1934 as part of a Civil Works Improvement Project. The fords had to be raised in 1955 with a layer of concrete so that buses from the Kilauea Military Camp could safely drive over them. At the bottom of the ford on the left side of the road is a section of mortared in place boulders. The right side of the road features a 24' long lava rock wall that is 4" high and ranges from 18-20" wide. This wall ends with mortared in place boulders along the bottom of the wash, just like the other side of the road. The existence of a wall makes this ford different from the other three along the road, and there are two possibilities for its existence. The first explanation is that builders may have followed the 1935/39 survey of the

7 Carey & Co., Inc., Historic Resources Study, "Hawai'i Volcanoes and Haleakala National Parks: The Early Years (1916-1945)," August 30, 2002, 65.

8 Measurements made in summer 2006 by Stacy Day and Jay Wozniak, HAER field team.

road, which provided a plan of the washes to be constructed. The drawings specified a 4" curtain wall at a minimum 2' length to be constructed along the stream side of the road. The other possibility is that it is a remnant of the check dams and retaining walls constructed by the CCC as part of job number 327 after a flood in 1939 destroyed parts of the road.[9] In addition to the extant lava rock wall, the original lava rock lining of the ford is apparent at its edges.

Ford 3 **C** **STR** **1941-50, 1955**
Located at mile 6.5, this ford is 63' long with some of the original lava rock surfacing visible.[10] The park had fords constructed by CCC crews after heavy rains in the 1930s-1950 destroyed the original culverts built in 1934 as part of a Civil Works Improvement Project. All the fords had to be raised in 1955 with a layer of concrete so buses from the Kilauea Military Camp could safely drive over them.

Ford 4 **C** **STR** **1941-50, 1955**
Located at mile 7.3, this ford is 78' long and has sections of the original mortared lava rock surfacing visible.[11] The park had fords constructed by CCC crews after heavy rains in the 1930s-1950 destroyed the original culverts built in 1934 as part of a Civil Works Improvement Project. All the fords had to be raised in 1955 with a layer of concrete so buses from the Kilauea Military Camp could safely drive over them.

Comfort Station **NC** **B** **Unknown**
At the end of Hilina Pali Road is a parking lot and comfort station for visitors. A paved path extending from a gravel parking area leads to the modern comfort station, faced in horizontal board and batten siding and covered by a corrugated metal roof. The recent construction of the comfort station makes it noncontributing to the district.

Shelter **C** **B** **late 1920s**
The shelter located on the pali (cliff) edge at the end of Hilina Pali Road serves as a destination point, offering breathtaking views of the coastline and Pacific Ocean. Thomas C. Vint, landscape architect with the National Park Service's Western Field Office, designed the shelter ca. 1928 in the Rustic style. It occupies a conspicuous position on the horizon with no nearby vegetation that could serve as screening, but it nevertheless manages to be an unobtrusive element in the landscape due to its low profile and the use of native lava rock. The shelter is open at the end overlooking the edge of the cliff and the Pacific Ocean below, and there are also openings in the side walls. The rear wall is solid lava rock and curves around a cistern, located outside. Originally there was a spigot on the interior rear wall for visitors to get water from the cistern. The front gable roof has a timber truss system and is covered with corrugated metal. Covered redwood gutters direct water to the redwood cistern, both of which are reconstructions dating from the early 2000s. Aside from the reconstructed gutters and cistern, the rest of the shelter is intact and has a high degree of integrity.

9 Measurements made in summer 2006 by Stacy Day and Jay Wozniak, HAER field team.
10 Measurements made in summer 2006 by Stacy Day and Jay Wozniak, HAER field team.
11 Measurements made in summer 2006 by Stacy Day and Jay Wozniak, HAER field team.

CCC Erosion Control Structures C S 1940

In the vicinity of Hilina Pali Road, CCC crews were put to work in 1940 on job number 327, the Hilina Pali erosion control project. After flooding and subsequent erosion were observed in 1939 by park staff on the Hilina Pali route, plans were made to construct erosion control structures to mitigate the intermittent streams in the area. The purpose of the lava rock structures was to channel "the water flow into the previously eroded and bare areas" in an effort to "prevent more vegetation, soil, and sand from being swept away during floods and damaging infrastructure. The retaining walls also served the purpose of supporting and maintaining the banks of vegetation helping to keep them in place."[12] These features were identified in archaeological surveys made in 1998, 2002, and 2003 as part of site number 22487, located to the west of the end of the Hilina Pali Road and spanning about 2 kilometers. The site features seventy-eight walls, two historic petroglyphs, four mounds, thirteen dams, and two cairns, as well as quarries where the lava rock used in construction was obtained. As described in the archaeological survey report, "the CCC locally quarried the pahoehoe bedrock of the area and used the rocks to construct walls along the drainages. These retaining walls were built to help contain the water flow into these gullies and by doing this the soil and vegetation would not be washed away and eroded. The CCC also used these rocks to construct dams to help guide the water flow down the drainages."[13] The retaining walls were generally of dry laid lava rock construction of varying heights and lengths, depending on the topography and surrounding vegetation. Dams were also constructed of dry laid rock across the channels. This would have helped protect not only the vegetation of the area but also the nearby Hilina Pali Road from being washed out. The association of these structures with erosion control on the Hilina Pali Road makes them a contributing element.

12 "Archaeological Inventory Survey of the Hilina Pali Erosion Control Project," 24.
13 "Archaeological Inventory Survey of the Hilina Pali Erosion Control Project," 35. This report contains descriptions of each structure found.

STATEMENT OF SIGNIFICANCE

Summary

Hilina Pali Road is part of the planned road system of Hawaii Volcanoes National Park, serving as a secondary road that provides visitors and park personnel with backcountry access to the land in the southern portion of the park. The Hilina Pali Road is significant for its association with National Park Service road design and construction principles, as well as the NPS Rustic style. Its period of significance is 1928 to 1955, which encompasses the design, construction, and alteration of the road.

The road meets National Register Criterion A because of its association with the development of a national park system and the work of the Civilian Conservation Corps (CCC). From the establishment of the NPS in 1916 until 1942 when World War II halted development, Park Service architects and landscape architects based in the Branch of Plans and Design (divided in 1934 into the Western Division and Eastern Division) developed a vocabulary of design and construction to be utilized at parks across the country with adaptions to the particular environment and landscape of the park. Park administrators, such as those at Hawaii Volcanoes National Park, created master park plans complete with roads, trails, and nodes of development for administrative and visitor use that guided development. At Hawaii Volcanoes National Park, Park Service personnel designed a road system to provide access to natural features of the park to visitors and staff via both primary and secondary roads (of which Hilina Pali Road is one). The construction of Hilina Pali Road aided the development of the park, opening up the southern portion of parkland to visitors traveling by automobile or tour bus who had limited time to spend in the park. Throughout the national park system, including Hilina Pali Road in Hawaii Volcanoes National Park, men enrolled in the CCC built roads and various types of structures and buildings.

Hilina Pali Road meets National Register Criterion C because it embodies the tenets of National Park Service road design and construction techniques as well as the Rustic style.[14] During the 1916-42 time period, Park Service "landscape architects, architects, and engineers forged a cohesive style of landscape design which fulfilled the demands for park development while preserving the outstanding natural qualities for which each park had been designated."[15] Roads were considered an integral component of landscape design, and the NPS worked with the Bureau of Public Roads (BPR) to develop safe and aesthetically pleasing road systems throughout the national park system. Park roads

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14 Much work has been done on the history of National Park Service road design and architecture. See for example, Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction* (Baltimore: The Johns Hopkins University Press, 1998), see especially Chapter 6: " Principles and Practices for Naturalistic Roads and Trails"; Ethan Carr, *Wilderness by Design: Landscape Architecture and the National Park Service* (Lincoln: University of Nebraska Press, 1998); Timothy Davis, Todd A. Croteau and Christopher Marston, *America's National Park Roads and Parkways: Drawings from the Historic American Engineering Record* (Baltimore: Johns Hopkins University Press, 2004); Laura E. Soulliere, *Historic Roads in the National Park System—Special Historic Study* (U.S. Department of the Interior, National Park Service, Denver Service Center, 1995) among others.

15 McClelland, 1.

were to lie lightly on the land, following the topography of the landscape through which they traveled. On the Hilina Pali Road, travelers wind through a volcanic rock and grasslands landscape on a sinuous path rather than a straight one. Any necessary cuts and fills have been naturalized. In addition, Park Service design called for the journey through the landscape to be just as important as the destination point, so the road was sighted to best take advantage of landscape features like the Koa'e fault. NPS policy encouraged the design and construction of structures that harmonized with the landscape through the use of native materials and forms. This was the guiding principle of the National Park Service Rustic style, developed by NPS landscape architects and architects. On Hilina Pali Road, the Kipuka Nene shelter, fords, and the shelter at road's end were designed in the Rustic style. Albert Good, an architectural consultant to the Park Service, drew plans, elevations and sections for the 1938 *Park Structures and Facilities*, a publication that helped standardize park architecture. Good defined "successfully handled" Park Service Rustic architecture "as a style which, through the use of native materials in proper scale, and through the avoidance of severely straight lines and over-sophistication, gives the feeling of having been executed by pioneer craftsmen with limited hand tools. It thus achieves sympathy with natural surroundings and with the past."[16] Park structures were ultimately subordinate to their surroundings and merely part of a larger, comprehensive park plan.[17]

Hilina Pali Road is therefore significant in the areas of transportation as an example of early road construction in the national park system and illustrates how National Park Service designers along with the Bureau of Public Roads developed roads to be unobtrusive elements in the landscape. The road is also significant in landscape architecture as Park Service personnel developed methods of "scenic preservation" while also providing access to visitors. On Hilina Pali Road, this is exhibited by the siting of the road to take advantage of landscape features and the naturalization of cuts and fills. The development of Hilina Pali Road is associated with influential National Park Service personnel like Thomas Vint, as well as other government entities like the Bureau of Public Roads and the Civilian Conservation Corps.

Hilina Pali Road retains a high degree of integrity, which Linda Flint McClelland defines in *Building the National Parks* as "historic integrity of location, setting, design, materials, workmanship, feeling and association and overall reflect the physical appearance and condition of the landscape during the period of significance."[18] While Hilina Pali Road has undergone some alteration to accommodate natural phenomena (primarily heavy rains) and visitor use (specifically the raising up of the fords with concrete to accommodate buses), the integral characteristics of park road design remain: a narrow roadway, a sinuous alignment, and an association with the surrounding natural environment through the use of natural materials and siting of the road to take advantage of landscape features. In addition, the land remains undeveloped aside from the planned nodes of development along the road's route.

16 Albert H. Good, *Park and Recreation Structures* (Boulder: Graybooks, 1990; reprint, U.S. Department of the Interior, National Park Service, 1938), 5.
17 Good, 6.
18 McClelland, 512.

Historical Background and Significance

A park encompassing the Hawaiian volcanoes on both the islands of Hawaii and Maui was established in 1916, the first created after the official establishment of the National Park Service. Hawaii National Park, as it was called, was divided in 1961 into two parks: the park land on the Island of Hawaii was renamed Hawaii Volcanoes National Park while the park land on Maui was named Haleakala National Park. After the park's establishment, park personnel had to design the infrastructure for both park and visitor use. A road system was essential to make the park's features accessible, and Hilina Pali Road was a secondary road in that system, created to provide backcountry access to the park's southern mid-section. At first, the road was intended primarily for Park Service personnel use in law enforcement and for goat drives, with the benefit of providing park visitors with a way to access the pali, "a little-known awe-inspiring spot" that resulted from "a fault, several square miles of country having subsided 1500 feet at some remote time." Originally, the road was constructed of a 6" base of crushed aa lava with a 2" surface of ash/rock on top and surfaced with gravel or crude oil. As the park developed, personnel looked for ways to entice visitors to spend longer periods of time in the park and offering a different landscape experience than that provided by traveling Crater Rim Drive around Kilauea Crater was one option. Hilina Pali Road's use expanded, therefore, to include motor trips by tourists.

Park Superintendent Evans suggested in 1927 to Stephen T. Mather, Director of the National Park Service, that Hilina Pali would be an ideal location for an overlook. He reported "this bluff, overlooking the coast line at a height of 2,000 feet and a distance of two miles, constitutes a fine objective for an auto trail."[19] Thomas Vint, chief landscape architect of the Western Field Office from 1928-33, chose the shelter's exact location at the edge of the pali overlooking the Pacific Ocean and recommended its design. The Hui o Pele organization, "composed of those who have visited the fire pit, Halemaumau, in the crater of Kilauea, the home of the fire goddess Pele, and paid due homage," donated membership fees for the shelter's construction.[20] Lavelle M. Hewitt, Senior Foreman, Landscape Architect, endorsed "Native Island architecture in isolated locations such as Hilina Pali" rather than using a standardized NPS design in a letter to the park superintendent, Edward G. Wingate. Hewitt stated, "if we want to enjoy architecture native to certain areas, then let's go to Yosemite and the Adirondacks and enjoy the area themselves as well."[21] His endorsement reflected NPS design principles that advocated adapting designs to their particular location to create a harmonious integration of structure and environment. The resulting shelter, designed by NPS Chief Landscape Architect Thomas Vint, expressed the principles of the Rustic style.

Beginning in May and June 1931 and continuing through the 1940s, park funds were expended when available on improving Hilina Pali Road to make it accessible to visitors with a "large car with a reasonable load" so that they could

19 Superintendent to Stephen T. Mather, March 1927 Monthly Report, located in Hawaii Volcanoes National Park Archives (hereafter cited as HAVO Archives).

20 "Hawaii National Park, Hawaii," (U.S. Department of the Interior, National Park Service, 1937), 11-12.

21 Lavelle M. Hewitt, Sr Foreman, Landscape Architect to Superintendent Edward G. Wingate, "Comments on Hilina Pali and Apua Point Rest Houses," in Folder: Apua Pont Resthouse and Roads, 1938-41, 620-75, HAVO Archives.

visit this section of the park and not risk "serious...damage to the car or tires."[22] Engineer Robertson of the National Park Service's Branch of Engineering conducted a survey in the mid-1930s of the road's route, with a resurvey of one section that had been washed out in 1941. The surveyed road closely follows the original truck trail route, although the original curves were lengthened, some cutting and filling occurred, and the washout was avoided.[23]

Construction occurred sporadically from the late 1930s to 1949. A lack of funding, construction problems, and interruptions in the workforce contributed to the delays. The Civilian Conservation Corps (CCC) worked on the road from 1939 until 1942 when the CCC disbanded in Hawaii.[24] After World War II, the park completed construction. When the CCC attempted to begin work in 1939, they faced problems, including delays while waiting for machine parts from the mainland in March 1940. The number of available workers also dropped as crew members were put to work on other, more urgent, projects.[25] The CCC also installed a copper directional marker atop a lava rock pillar a short distance down the pali from the road's terminus. The directional marker is still standing unchanged from its erection in 1936.[26] In addition, a CCC crew was employed on job number 327 in 1940 constructing an array of walls and dams along the streambeds in the vicinity of Hilina Pali using locally quarried lava rock to protect both the sparse vegetation and soils as well as the road from washouts.

Park staff continued construction of Hilina Pali Road at the end of World War II. A press release from the park on November 14, 1949 announced that the Hilina Pali Road had been completed, stating: "The newly-oiled road winds through prehistoric lava flows and provides a great variety of scenic views culminating at Hilina Pali where visitors will enjoy one of the most magnificent seascapes in the Territory. A panorama of approximately 40 miles of the Big Island's seashore will unfold for the visitor when he reaches the Pali." Due to the lack of construction funds, the press release cautioned that the road had not been finished to Park Service standards so it was only for light use.[27] Despite the announcement that the road had been completed, work continued into 1950 to address drainage issues.

In 1950, work on the road involved grading, laying down 2" of emulsified asphalt and crushed rock and bitumuls, oiling the surface, and paving the steeper grades to help with the periodic flooding of the road, all on the upper 5-1/2 miles.[28] In addition to the construction of new drainage features, the damage to the road from earlier drainage issues

22 May 1931 Monthly Report from Superintendents Reports 1927-45, HAVO Archives.
23 United States Department of the Interior, National Park Service, Branch of Engineering, Prepared by Regional Office, "Hilina Pali Truck Trail, Chain of Craters Road to Hilina Pali," Hawaii National Park, dated 1935, 1939.
24 Press Release, September 17, 1942, in Folder: Civilian Conservation Corps in Hawaii, Miscellaneous Correspondence, Accession HAVO-372, Location S-H3, HAVO Archives.
25 See March 1939, March 1940, and April 1940 Monthly Reports, as well as the 1941 Annual Report, all from Superintendent Reports 1927-45, HAVO Archives.
26 December 1937 Monthly Report from Superintendent Report 1937, HAVO Archives.
27 Press Release, November 14, 1949, Folder: Hilina Pali 1949-50, 640-21.1 in Box Accession: HAVO 270, Catalog: HAVO 4959, File Codes: 610.01 through 660-04.1, HAVO Archives.
28 June 1950 Monthly Report from Superintendent Report 1950, HAVO Archives.

had to be repaired. This necessitated laying down 2" of emulsified asphalt and crushed rock and bitumuls and oiling the surface. In addition the steep grades were paved to prevent further damage.[29] Park crews worked on the lower 3-1/2 miles in 1953, blasting aa lava for use in leveling and straightening the road, and seal coating.[30] During the 1950s and 1960s, heavy rains and earthquakes caused damage and subsequent alteration of the road.

The Hilina Pali Road suffered from washouts due to the porous nature of the little soil that existed in this section of the park as well as the sparse vegetation. The first recorded damage to the road from rain occurred in July 1931 when a 2-1/2' deep hole in the road had to be repaired.[31] Serious floods in March 1939, April 1945, and January, February and November 1950 necessitated repairs. To address flooding, a Civil Works Improvement Project built culverts with masonry head walls in 1934.[32] After the 1939 flood when it was clear that the 1934 culverts were ineffectual, Superintendent Wingate recommended that the CCC do emergency repairs. These probably consisted of building check dams and retaining walls, remains of which can still be seen along the road and which have been identified in archaeological investigations. The CCC work was somewhat more effective, as evidenced in a January 1942 report noting "Inspection was made of the erosion control structures built two years ago in the Hilina Pali section. The check dams and retaining walls have withstood the runoff from several heavy rains and they appear to aid considerably in checking the gully erosion."[33]

Engineer Robertson had included a plan of a "wash" in his 1935 survey of the road, and the park used this in constructing a rock-lined ford in January 1941, since the culverts had proven "inadequate to handle the large volume of water" that could drench the area as Park Superintendent Oberhansley noted.[34] The plans specified a 4" curtain wall at a minimun 2' length along the side of the road next to the stream. The width of the ford was 12', which was also the road width. The length of the ford, as noted on the plan, was "various as to size of stream and max. volume of water estimated from previous record." It was not until 1950 that the rest of the fords were completed. The slowness of construction was probably due to a lack of funding. In 1955, the fords had to be raised with concrete because "all four dips were so sharp that the KMC buses could not negotiate them without catching either the front or rear bumpers."[35] Despite the concrete cover, the original grouted lava rock of which they were constructed is still apparent at their edges.

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29 January 1950 Monthly Report from Superintendent Report 1950; 10-742 Justification and Memo from I.J. Castro, Acting Superintendent to Regional Director, Region Four, Subject: Damage to Hilina Pali Road, November 21, 1950, both in Folder: Hilina Pali 1949-50, 640-21.1 in Box Accession: HAVO 270, Catalog: HAVO 4959, File Codes: 610.01 through 660-04.1, HAVO Archives.
30 August 1953 Monthly Report and October 1953 Monthly Report from Superintendent Report 1953, HAVO Archives.
31 July 1931 Monthly Report from Superintendent Report 1931, HAVO Archives.
32 Culverts are indicated on the Hilina Pali Road survey map. 1934 Annual Report from Superintendent Reports 1927-45. Images of the 1950 washout by Superintendent Oberhansley are available in Accession HAVO-554, S-C1, Binder 2 of 5 at HAVO Archives.
33 Naturalist Monthly Report of January 1942 from Superintendent Report 1942-43, HAVO Archives.
34 February 21, 1950, Request for repair money, in Folder: Hilina Pali 1949-50, 640-21.1 in Box Accession: HAVO 270, Catalog: HAVO 4959, File Codes: 610.01 through 660-04.1, HAVO Archives.
35 April 1955 Monthly Report from Superintendent Report 1955, HAVO Archives.

There was periodic discussion among park staff of adding to the road. As early as the 1930s, there was interest in extending the road from the overlook down to the coast, giving both tourists and park personnel better access to that section of the park. A trail built for goat drives was in use by hikers and horseback riders, but the chief ranger described it as poor. He argued "when it is considered that Kilauea is a mountain 4,000 feet high rising directly out of the sea, and that the horizontal distance from Kilauea to the ocean is only five miles, it is easy to realize why a trip to the seacoast might be enchanting." Estimated to cost $102,952.72, the project does not seem to have merited further discussion. This is not surprising given the park's difficulty in funding the completion of the Hilina Pali Road as planned.[36] In 1960, park personnel noted the road "is at present a one-way paved road with occasional pullouts for cars to pass. It also passes through a popular kapuka where picnic facilities are provided. There is need for a safe two-way road to this magnificent observation point as it is increasing in popularity and would be visited by more large groups if the road were less hazardous." The estimated cost of a road widening project was $215,000, and the funds were simply not available.[37] The road therefore remained one lane and relatively unaltered aside from basic maintenance and upkeep, such as a repaving project undertaken in 2005.

Road Development in the Parks

The National Park Service worked with the U.S. Bureau of Public Roads to implement a unified road construction program in the parks. The relationship was formalized with an interbureau agreement signed on January 18, 1926. The NPS focused on the aesthetics of the road while the BPR supplied the engineering and technical expertise, resulting in a "distinctive cultural landscape that has become a defining characteristic, not just of national park roads, but the National Park System in general."[38] In addition, in the 1920s, Daniel Hull, a landscape engineer, and Thomas Vint, a landscape architect, began working on creating a distinct National Park Service Rustic style that utilized the earlier work of landscape architects like Andrew Downing and Frederick Law Olmsted while also taking into consideration "scenic preservation." Although Hull left the National Park Service in 1927, Vint went on to develop the landscape program through the Western Field Office, which began implementing master plans in the parks and developing park infrastructure designs that harmonized with the landscape.[39] The result of the work of the Western Field Office and Vint was a set of general principles to guide park road construction. The most important principle was that even during construction, the landscape had to be protected as much as possible. Throughout the 1920s and 1930s, park service designers worked on creating standards guiding the sloping and naturalization of road banks,

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36 Joseph H. Christ, Chief Ranger, "Report on Hilina Pali Seacoast Location Survey Island of Hawaii," 1930s?, in Folder: Roads, General 630, Box: Accession HAVO 370, Catalog HAVO 4959, File Codes 610.01 through 660-04.1, HAVO Archives.

37 Memo from P.E. Smith, Supervisory Engineer, and C.E. Krueger, Supervisory Landscape Architect to Chief, WODC, Subject: Trip Report, Roads, Hawaii National Park, March 18, 1960, in Folder D30 Roads and Trails, March 1960-November 1962 in Box HAVO 371, HAVO 10243, D30, HAVO Archives.

38 Timothy Davis, Lead Historian, National Park Service, Park Historic Structures and Cultural Landscapes Program, "Historic Roads," *Landscape Lines*, 16, Draft, 4.

39 Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction* (Baltimore: The Johns Hopkins University Press, 1998), see Chapters 5 & 6. See also Ethan Carr, *Wilderness by Design: Landscape Architecture & the National Park Service* (Lincoln: University of Nebraska Press, 1998).

drainage structures, parking areas, masonry work, and other structures like guard rails, tunnels, and bridges.[40] In addition, park designers worked on creating various types of park structures so that they too could harmonize with the landscape. These standardized designs were published in *Portfolio of Comfort Stations and Privies* (1934), *Portfolio of Park Structures* (1934), *Park Structures and Facilities* (1935), and *Park and Recreation Structures* (1938).

In May 1968, the National Park Service published "Park Road Standards" outlining the purpose and design of park roads, which reveals that the basic principles developed in the 1920s and 1930s had survived. George B. Hartzog, Director, described the place of the road in the national parks:

> Park roads are designed with extreme care and located with a sensitive concern for the environment....These roads can take you close to America's most breathtaking places of beauty and history. To experience park at its best, try getting away from your car.... The next best thing, for those who have neither time nor zest for roughing it, is a judicious use of park roads....But park roads are for leisurely driving only. If you are in a hurry, you might do well to take another route now, and come back when you have more time.[41]

The roads in the national parks were to incorporate the experiential aspect of the landscape as well as the visual, rather than simply being paths leading visitors to "scenic wonders." In addition, "every segment of every park road should relate to the environment through which it passes in a meaningful way, and should, to the extent possible, constitute an enjoyable and informative experience in itself."[42] To enhance the experience of driving through the park, the roads should be "laid lightly on the land" rather than simply running in straight lines. In addition, park service planners recommended providing points like parking lots, pulloffs, and vistas at which visitors could leave their automobiles and connect with the landscape. The design standards of road construction in the parks were explicitly stated. Foremost among the principles was that "the road is molded to the terrain through which and upon which it is passing." To achieve this, designers had to eschew cuts and fills whenever possible, instead choosing to follow the topography of the landscape. The scenic qualities of the landscape had to be used to their best advantage to create a "sense of intimacy with the countryside through which it is passing." Ditches and slopes were to be carefully blended into the roadside by rounding slopes, blending them into existing vegetation, and planting them. For vertical grades, the maximum was 7 percent with 8-10 percent allowed for short distances. To make sure that visitors were able to experience the landscape, park roads were to be designed for 25 mph for major and minor roads in areas of natural or cultural resources, 45 mph for parkways and major roads in recreational areas, and 15 mph for special and interpretive

40 McClelland, see Chapter 6.
41 George B. Hartzog, Director, in U.S. Department of the Interior, National Park Service, *Park Road Standards* (Washington, DC: U.S. Government Printing Office, May 1968), np.
42 *Park Road Standards*, np.

roads.[43] These standards and guidelines were applied on the Hilina Pali Road but adapted to the particular environment through which the alignment would run. Yet the adherence to the basic principles of NPS road design and construction create a sense of continuity not only with the other roads and structures located within the park but also within the national park system as a whole.

Conclusion

Hilina Pali Road is a secondary road within the Hawaii Volcanoes National Park road system and plays an important role in providing visitor access to the southwest portion of the park. The road provides visitors with views of volcanic features and the grasslands of the Ka'u Desert, rewarding those who drive to the end of the road with spectacular views of the Pacific Ocean and coastline. The shelter at the pali is quintessential Park Service design, embodying the Rustic style. The road also represents how the National Park Service developed roads that responded to the particular geographical and environmental challenges of the terrain. In this case, park personnel grappled with the issue of flooding, ultimately constructing lava rock lined fords that harmonized with the landscape while serving a specific purpose.

43 *Park Road Standards*, np.

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United States Department of the Interior, National Park Service, Branch of Engineering, Prepared by Regional Office. "Hilina Pali Truck Trail," drawing, Chain of Craters Road to Hilina Pali, Hawaii National Park, 1935, 1939.

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Geographical Data, UTM Reference

	ZONE	EASTING	NORTHING
1.	5	894868	2147376
2.	5	895012	2147191
3.	5	893221	2144369
4.	5	891638	2143047
5.	5	891339	2141325
6.	5	890416	2141003
7.	5	888025	2137952
8.	5	887688	2137987
9.	5	887792	2139162
10.	5	890300	2141548
11.	5	890884	2143326
12.	5	891723	2143803

Quads: Kau Desert, Makaopuli Crater, Volcano

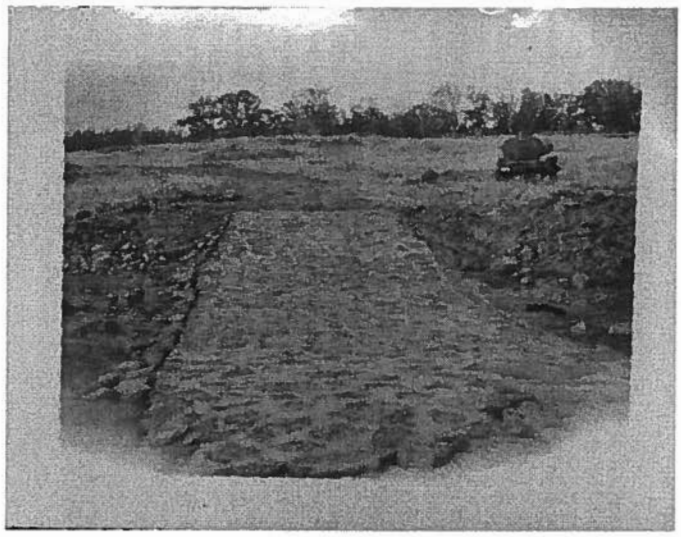
Old Hawaiian Datum

RELATED DOCUMENTATION

Historic Photographs (all available at HAVO)



Hilina Pali Shelter. From Landscape Architect report, 1931-32; Landscape Architect Reports, Accession 370, Catalog #4959.



Hilina Pali washout: storm damage, February 1950, taken by Frank Oberhansley. Historic Photo Collection, HAVO 554, Binder 2 of 5.

Map (available at HAVO)
U.S. Department of the Interior, National Park Service. "Hilina Pali Truck Trail, Chain of Craters Road to Hilina Pali," Hawaii National Park. Branch of Engineering, Prepared by Regional Office, 1937. 8 Sheets.

Drawing (available at HAVO)
U.S. Department of the Interior, National Park Service. "Hui O Pele Shelter," Hawaii National Park, Prepared by Landscape Eng. Division, 1928.

HISTORIC DISTRICTS AND DISTRICT RECOMMENDATIONS

1. Kaui Belt Road (North Shore Section)
2. Pali Highway
3. Hana Belt Road
4. Old Mamalahoa Highway (Hawaii Belt Road)
5. Postwar Hawaii Belt Road, Multiple Property

KAUAI BELT ROAD (NORTH SHORE SECTION)

The Kauai Belt Road (North Shore Section) Historic District is listed in the National Register of Historic Places and Hawaii Register of Historic Places. See Appendices for the nomination form and additional documentation form.

Below bridges and culverts in this district are not included in this report, because they are not on the National Bridge Inventory (NBI).

- Culvert #1 (Located near Mile Marker 2.0) – Not on the NBI
- Culvert #2 (Located near Mile Marker 2.4) – Not on the NBI
- Culvert #3 (Located near Mile Marker 2.6) – Not on the NBI
- Haena Bridge #1 – Does not qualify as a bridge since it is under 20 feet in length
- Haena Bridge #2 – Does not qualify as a bridge since it is under 20 feet in length
- Limahulu Culvert – Not on the NBI

Kauai Belt Road (North Shore Section) Map

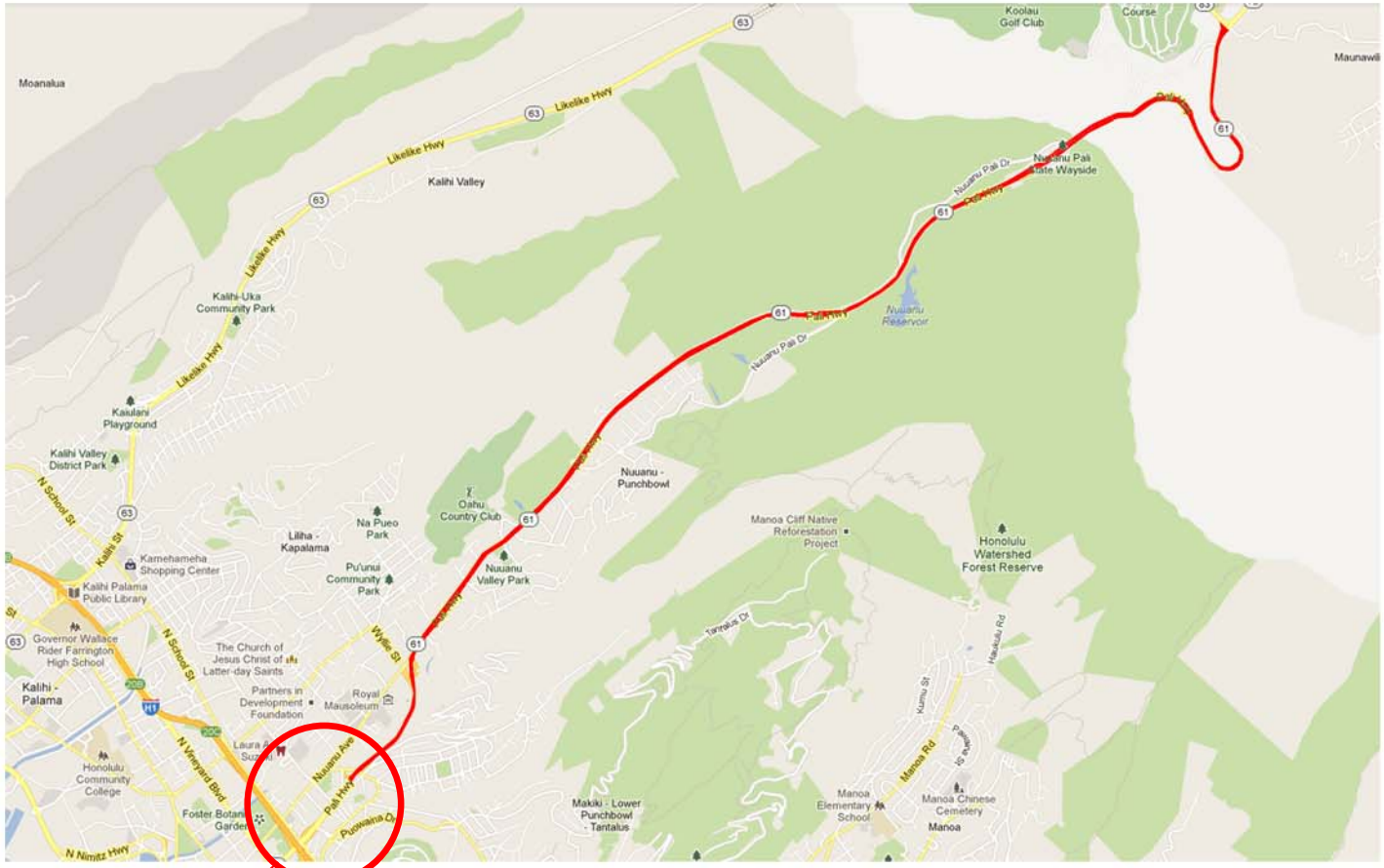


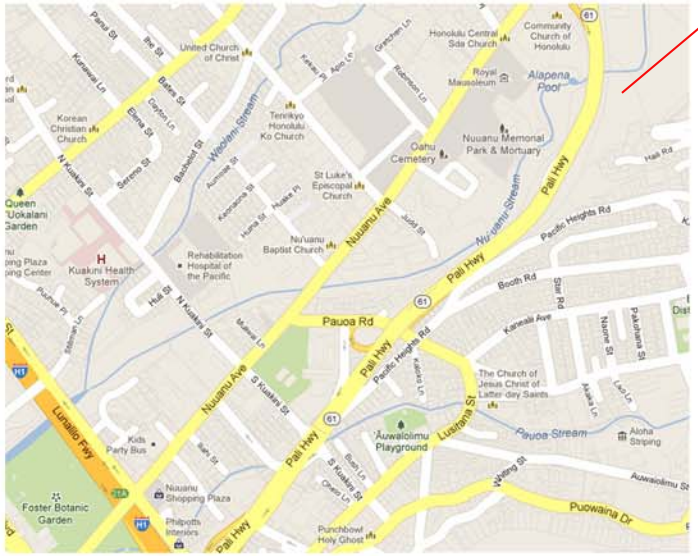
Historic District: Kauai Belt Road (North Shore Section)

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
007005600500123	Hanalei River Bridge	Hanalei River	Kuhio Highway	1912	Steel Truss	Metal Horizontal	State
007005600500593	Lumahai Stream Bridge	Lumahai Stream	Kuhio Highway	1968	Concrete Girder	Concrete and Metal	State
007005600500428 (replaced 007005600500427)	Waikoko Stream Bridge	Waikoko Stream	Kuhio Highway	2019	Reinforced Concrete	Reinforced Concrete Bridge Rail	State
007005600500670	Wainiha River Bridge No. 2	Wainiha River	Kuhio Highway	2004	Steel Truss	Metal Thrie Beam	State
007005600500673	Wainiha River Bridge No. 3	Wainiha River	Kuhio Highway	2007	Steel Truss	Metal Thrie Beam	State
007005600500644	Wainiha Stream Bridge No. 1	Wainiha Stream	Kuhio Highway	2010	Steel Truss	Concrete Solid with Cap	State
007005600500343	Waioli Stream Bridge	Waioli Stream	Kuhio Highway	1912	Concrete Girder	Metal Thrie Beam	State
007005600500397 (replaced 007005600500396)	Waipa Stream Bridge	Waipa Stream	Kuhio Highway	2019	Reinforced Concrete	Reinforced Concrete Bridge Rail	State

PALI HIGHWAY

The 2013 State Historic Bridge Inventory and Evaluation proposed a Pali Highway Historic District. It is not listed in the National Register of Historic Places or Hawaii Register of Historic Places. See Chapter 3.5 for the historic context.





Pali Highway District Starts from the intersection of Pacific Heights Road and Pali Highway to the intersection of Kamehameha Highway and Pali Highway

District Recommendation: Pali Highway

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
003000610400112	Nuuanu Stream Kapena Falls	Nuuanu Stream Kapena Falls	Pali Highway	1962	Concrete Rigid Frame	Concrete and Metal	State
003000610300593	Pali Bridge No. 3 (Inbound)	Mountain (Pali Bridge No. 3)	Pali Highway	1956	Concrete Tee Beam	Concrete Open Horizontal	State
003000610300616	Pali Bridge No. 4 (Inbound)	Mountain (Pali Bridge No. 4)	Pali Highway	1956	Concrete Girder	Concrete Open Horizontal	State
003000610300615	Pali Bridge No. 4B (Outbound)	Mountain (Pali Bridge No. 4B)	Pali Highway	1961	Concrete Girder	Concrete Open Horizontal	State
003000610300621	Pali Bridge No. 5 (Inbound)	Mountain (Pali Bridge No. 5)	Pali Highway	1956	Concrete Girder	Concrete Open Horizontal	State
003000610300623	Pali Bridge No. 5A (Outbound)	Mountain (Pali Bridge No. 5A)	Pali Highway	1961	Concrete Girder	Concrete Open Horizontal	State
003000610300629	Pali Bridge No. 6 (Inbound)	Mountain (Pali Bridge No. 6)	Pali Highway	1956	Concrete Girder	Concrete Open Horizontal	State
003000610300632	Pali Bridge No. 7 (Inbound)	Mountain (Pali Bridge No. 7)	Pali Highway	1956	Concrete Girder	Concrete Open Horizontal	State
003000610300631	Pali Bridge No. 7A (Outbound)	Mountain (Pali Bridge No. 7A)	Pali Highway	1961	Concrete Girder	Concrete Open Horizontal	State
003000610300640	Pali Bridge No. 8 (Inbound)	Mountain (Pali Bridge No. 8)	Pali Highway	1956	Concrete Girder	Concrete Open Horizontal	State
003000610300638	Pali Bridge No. 8A (Outbound)	Mountain (Pali Bridge No. 8A)	Pali Highway	1961	Concrete Girder	Concrete Open Horizontal	State
003000610400015	Pali Highway Overpass (Inbound)	H-1	Pali Highway	1960	Concrete Rigid Frame	Concrete and Metal	State
003000610400014	Pali Highway Overpass (Outbound)	H-1	Pali Highway	1960	Concrete Rigid Frame	Concrete and Metal	State
003000610300591	Pali Partial Bridge No. 1 (Inbound)	Mountain (Pali Partial Bridge No. 1)	Pali Highway	1956	Concrete Tee Beam	Concrete Open Horizontal	State
003000610300592	Pali Partial Bridge No. 2 (Inbound)	Mountain (Pali Partial Bridge No. 2)	Pali Highway	1956	Concrete Tee Beam	Concrete Open Horizontal	State
003000610300613	Pali Partial Bridge No. 4A (Outbound)	Mountain (Pali Bridge No. 4A)	Pali Highway	1961	Concrete Tee Beam	Concrete Open Horizontal	State
003000610300619	Pali Partial Bridge No. 4C (Outbound)	Mountain (Pali Bridge No. 4C)	Pali Highway	1961	Concrete Girder	Concrete Open Horizontal	State
003000610300569	Pali Tunnel No. 1 (Inbound)	Mountain (Pali Tunnel No. 1)	Pali Highway	1957	Concrete Arch Culvert	No Parapet/Railing	State
003000610300568	Pali Tunnel No. 1A (Outbound)	Mountain (Pali Tunnel No. 1A)	Pali Highway	1959	Concrete Arch Culvert	No Parapet/Railing	State
003000610300596	Pali Tunnel No. 2 (Inbound)	Mountain (Pali Tunnel No. 2)	Pali Highway	1957	Concrete Arch Culvert	No Parapet/Railing	State

District Recommendation: Pali Highway

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
003000610300595	Pali Tunnel No. 2A (Outbound)	Mountain (Pali Tunnel No. 2A)	Pali Highway	1961	Concrete Arch Culvert	No Parapet/Railing	State
003000610400090	Partial Bridge No. 8	Unnamed Gulch	Pali Highway	1962	Concrete Tee Beam	Concrete and Metal	State
003000610400064	Pauoa Road Overpass	Pauoa Road	Pali Highway	1961	Concrete Girder	Concrete and Metal	State
003000610400044	Pauoa Stream Culvert	Pauoa Stream	Pali Highway	1925	Concrete Box Culvert	Concrete and Metal	State

HANA BELT ROAD

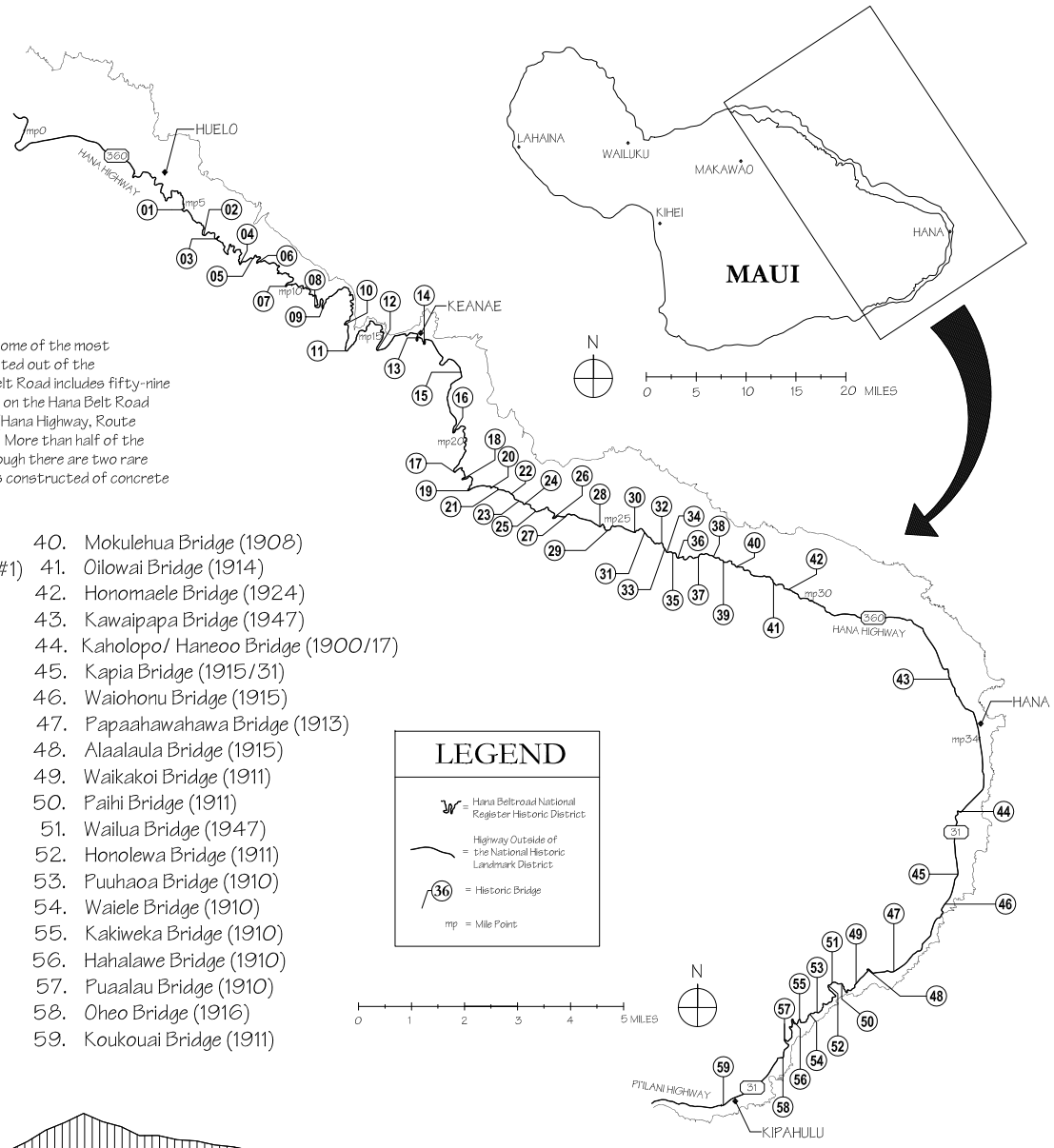
The Hana Belt Road is listed in the National Register of Historic Places and Hawaii Register of Historic Places. See Chapter 3.2 for the historic context.

HISTORIC BRIDGES
OF THE HANA BELT ROAD

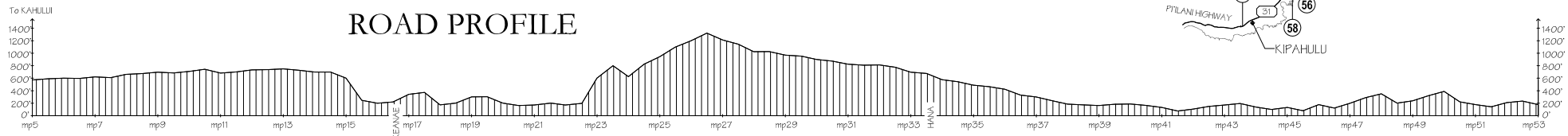
The island of Maui is comprised of two shield volcanoes joined by an isthmus, which constitutes east and west Maui. East Maui, where the Hana Belt Road is located, is the immense Haleakala, a dormant volcano more than 10,000 feet in elevation. Lava flows from earlier times had poured into the ocean, which created the jagged coastline along which the road is aligned. Centuries of stream erosion from the wet, trade-wind climate on Haleakala's windward (northeastern) slope cut a rugged terrain of great sea-cliffs and v-shaped valleys. The wet climate has allowed dense forests to grow over the rough terrain making the Hana District in East Maui one of Hawaii's most isolated and inaccessible areas.

Chiseled into the precipitous cliffs and winding around more than 600 curves, the Hana Belt Road offers some of the most spectacular scenery in the Hawaiian islands and is a marvel of early road engineering. Miles of road were blasted out of the mountainsides and many bridges were required to carry the road across streams and gulches. The Hana Belt Road includes fifty-nine bridges and numerous culverts constructed between 1908 and 1947. Sixteen of these bridges are located on the Hana Belt Road south of Hana (Pi'ilani Highway, Route 31) and forty-three on the Hana Belt Road between Hana and Huelo (Hana Highway, Route 360). The narrowest bridges are approximately 12'-6" wide and the widest bridge is approximately 20'-6". More than half of the bridges are single span. The majority of bridges were constructed of reinforced cast-in-place concrete, though there are two rare surviving examples of masonry arch construction. Many of the bridges have wingwalls, abutments and piers constructed of concrete rubble masonry with basalt (lava rock).

01. Hoalua Bridge (1929)
02. Kailua Bridge (1929)
03. Nailiilihaele Bridge (1930)
04. Oopuola Bridge (1925)
05. Makanali Bridge (1928)
06. Kaaiea Bridge (1928)
07. Waikamoi Bridge (1911)
08. Puohokamoa Bridge (1912)
09. Haipuaena Bridge (1912)
10. Punala Bridge (1911)
11. Honomanu Bridge (1911)
12. Nuaailua Bridge (1911/40)
13. Piinaau Bridge (1916)
14. Palauhulu Bridge (1916)
15. Waiokamilo Bridge (1921/37)
16. Waikani Bridge (1926)
17. West Wailuaiki Bridge (1926)
18. East Wailuaiki Bridge (1926)
19. Kopiliula Bridge (1926)
20. Puakoa Bridge (1926)
21. Waiohue Bridge (1926/37)
22. Waiohuolua Bridge (Unnamed Bridge #1) (1920/70)
23. Unnamed Bridge #2 (1920)
24. Paakea Bridge (1920)
25. Kapaula Bridge (1926)
26. Hanawi Bridge (1926)
27. East Hanawi Bridge (1926)
28. Makapipi Bridge (1926)
29. Kuhiwa Bridge (1926)
30. Kupukoi Bridge (1926)
31. Kahalaowaka Bridge (1926)
32. Pupape-Manawikeae Bridge (1926)
33. Kahaiwaihapapa Bridge (1922)
34. Keaaiki Bridge (1921)
35. West Waioni Bridge (1920)
36. Waioni Bridge (1920)
37. Lanikele Bridge (1917)
38. Heleleikeoha Bridge (1917)
39. Ulaino Bridge (1914)
40. Mokulehua Bridge (1908)
41. Oilowai Bridge (1914)
42. Honomaele Bridge (1924)
43. Kawaipapa Bridge (1947)
44. Kaholopo/ Haneoo Bridge (1900/17)
45. Kapia Bridge (1915/31)
46. Waiohonu Bridge (1915)
47. Papaahawahawa Bridge (1913)
48. Alaalaula Bridge (1915)
49. Waikakoi Bridge (1911)
50. Paihi Bridge (1911)
51. Wailua Bridge (1947)
52. Honolewa Bridge (1911)
53. Puuhaoa Bridge (1910)
54. Waiele Bridge (1910)
55. Kakiweka Bridge (1910)
56. Hahalawe Bridge (1910)
57. Puaalau Bridge (1910)
58. Oheo Bridge (1916)
59. Koukouai Bridge (1911)



ROAD PROFILE



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DELINEATED BY: DANIEL SCHAIBLE, 2005

HANA HIGHWAY RECORDING PROJECT NATIONAL PARK SERVICE UNITED STATES DEPARTMENT OF THE INTERIOR

HANA VICINITY

HANA BELT ROAD (HANA HIGHWAY)
BETWEEN HAIKU AND KIPAHULU/STATE HIGHWAY 360/COUNTY HIGHWAY31
MAUI

HAWAII

SHEET 2 OF 13

HISTORIC AMERICAN ENGINEERING RECORD HI-75

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Historic District: Hana Belt Road

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
009003600904579	Alaalaua No. 27	Alaalaua Stream	Hana Highway	1915	Concrete Tee Beam	Concrete Solid with Cap	County
009003600502419	East Hanawi Stream Bridge	East Hanawi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600502131	East Wailuaiki Stream Bridge	East Wailuaiki Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600904304	Hahalawe No. 19	Hahalawe Stream	Hana Highway	1910	Masonry Arch	Concrete Solid	County
009003600501145	Haipuaena Stream Bridge	Haipuaena Stream	Hana Highway	1912	Concrete Tee Beam	Concrete Solid with Cap	State
009003600502402	Hanawi Stream Bridge	Hanawi Stream	Hana Highway	1926	Closed Spandrel Arch	Concrete Open Vertical	State
009003600502795	Heleleikeoha Stream Bridge	Heleleikeoha Stream	Hana Highway	1917	Concrete Tee Beam	Concrete Open Vertical	State
009003600500509	Hoalua Stream Bridge	Hoalua Stream	Hana Highway	1929	Concrete Tee Beam	Concrete Open Vertical	State
009003600502958	Honomaele Stream Bridge	Honomaele Stream	Hana Highway	1924	Concrete Tee Beam	Concrete Open Vertical	State
009003600501372	Honomanu Stream Bridge	Honomanu Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	State
009003600500858	Kaaiea Stream Bridge	Kaaiea Stream	Hana Highway	1928	Concrete Tee Beam	Concrete Open Vertical	State
009003600502598	Kahalaowaka Stream Bridge	Unnamed Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600502664	Kahawaihapapa Stream Bridge	Kahawaihapapa Stream	Hana Highway	1922	Concrete Tee Beam	Concrete Open Vertical	State
009003600904864	Kahawaiokapia No. 30	Kapia Stream	Hana Highway	1915	Concrete Tee Beam	Concrete Solid	County
009003600904984	Kaholopo No. 31	Haneoo Stream	Hana Highway	1917	Concrete Slab	Metal Thrie Beam	County
009003600500588	Kailua Stream Bridge	Kailua Stream	Hana Highway	1929	Concrete Tee Beam	Concrete Open Vertical	State
009003600502339	Kapaula Stream Bridge	Kapaula Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600503347	Kawaipapa Stream Bridge	Kawaipapa Stream	Hana Highway	1947	Concrete Tee Beam	Concrete Open Horizontal	State
009003600502681	Keaaiki Stream Bridge	Keaaiki Stream	Hana Highway	1921	Concrete Tee Beam	Concrete Open Vertical	State
009003600501317	Kolea (Punalau Stream) Bridge	Punalau Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	State

Historic District: Hana Belt Road

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
009003600502189	Kopiliula Stream Bridge	Kopiliula Stream	Hana Highway	1926	Concrete Girder	Concrete Solid	State
009003600904058	Koukouai No. 16	Koukouai Stream	Hana Highway	1911	Open Spandrel Arch	Concrete Solid with Cap	County
009003600502523	Kuhiwa Stream Bridge	Kuhiwa Stream	Hana Highway	1926	Closed Spandrel Arch	Concrete Open Vertical	State
009003600502546	Kupukoi Stream Bridge	Kupukoi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600502779	Lanikele Stream Bridge	Lanikele Stream	Hana Highway	1917	Concrete Tee Beam	Concrete Open Vertical	State
009003600904329	Mahalawa No. 20	Kakiweka Stream	Hana Highway	1910	Concrete Tee Beam	Concrete Solid with Cap	County
009003600500824	Makanali Stream Bridge	Makanali Stream	Hana Highway	1928	Concrete Slab	Concrete Open Vertical	State
009003600502502	Makapipi Stream Bridge	Makapipi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600502835	Mokulehua Stream Bridge	Mokulehua Stream	Hana Highway	1908	Concrete Slab	Concrete Solid	State
009003600500624	Nailiilihaele Bridge	Nailiilihaele Stream	Hana Highway	1930	Concrete Tee Beam	Concrete Open Vertical	State
009003600501540	Nuaailua Bridge	Nuaailua Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Open Vertical	State
009003600502922	Oilowai Stream Bridge	Oilowai Stream	Hana Highway	1914	Concrete Tee Beam	Concrete Open Vertical	State
009003600500797	Oopuola Bridge	Oopuola Stream	Hana Highway	1925	Concrete Tee Beam	Concrete Open Vertical	State
009003600502301	Paakea Stream-Unnamed Bridge No.3	Paakea Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid	State
009003600904358	Paehala No. 21	Wailele Stream	Hana Highway	1910	Masonry Arch	Concrete Solid with Cap	County
009003600904494	Paihi No. 25	Paihi Stream	Hana Highway	2005	Concrete Girder	Concrete Solid	County
009003600501679	Palauhulu Stream Bridge	Palauhulu Stream	Hana Highway	1916	Concrete Tee Beam	Concrete Open Vertical	State
009003600904636	Papahawahawa No. 28	Papahawahawa Stream	Hana Highway	2011	Concrete Tee Beam	Concrete Solid with Cap	County
009003600501662	Piinaau Stream Bridge	Piinaau Stream	Hana Highway	1916	Concrete Tee Beam	Concrete Open Vertical	State
009003600502231	Puakaa Stream Bridge	Puakaa Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State

Historic District: Hana Belt Road

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
009003600501098	Puohokamoa Bridge	Puohokamoa Stream	Hana Highway	1912	Concrete Tee Beam	Concrete Solid with Cap	State
009003600502652	Pupape Stream Bridge	Pupape Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	State
009003600904386	Puuhaoa No. 22	Unnamed Stream	Hana Highway	1910	Concrete Tee Beam	Concrete Open Decorative	County
009003600904464	South Wailua No. 23	Honolewa Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid with Cap	County
009003600502801	Ulaino Stream Bridge	Ulaino Stream	Hana Highway	1914	Concrete Tee Beam	Concrete Open Vertical	State
009003600502298	Unnamed Bridge No.1 (Waiohuolua Bridge)	Unnamed Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid with Cap	State
009003600502300	Unnamed Bridge No.2	Unnamed Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid with Cap	State
009003600904542	Waikakoi No. 26	Waikakoi Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid with Cap	County
009003600500990	Waikamoi Stream Bridge	Waikamoi Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	State
009003600501942	Waikani Stream Bridge	Waikani Stream	Hana Highway	1926	Open Spandrel Arch	Concrete Open Vertical	State
009003600904475	Wailua No. 24	Wailua Stream	Hana Highway	1947	Concrete Tee Beam	Concrete Open Horizontal	County
009003600904803	Waiohonu No. 29	Waiohonu Stream	Hana Highway	2013	Concrete Tee Beam	Concrete Open Vertical	County
009003600502250	Waiohue Stream Bridge	Waiohue Stream	Hana Highway	1937	Concrete Tee Beam	Concrete Solid with Cap	State
009003600501811	Waiokamilo Stream Bridge	Waiokamilo Stream	Hana Highway	1921	Concrete Tee Beam	Concrete Open Greek Cross	State
009003600502702	Waioni Stream Bridge	Waioni Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Open Vertical	State
009003600502086	West Wailuaiki Stream Bridge	West Wailuaiki Stream	Hana Highway	1937	Concrete Tee Beam	Concrete Open Vertical	State
009003600502697	West Waioni Stream Bridge	West Waioni Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Open Vertical	State

OLD MAMALAHOLA HIGHWAY (HAWAII BELT ROAD)

The 2013 State Historic Bridge Inventory and Evaluation proposed an Old Mamalahoa Highway (Hawaii Belt Road) Historic District. It is not listed in the National Register of Historic Places or Hawaii Register of Historic Places. See Chapter 3.3 for the historic context.


Old Mamalahoa Highway Bridges
HONOKAA
HILO
HAWAII
Waikaumalo Stream Bridge
(001320001100002)
1920
Waikaumalo Park
Opea Stream Bridge
(001310001100002)
1912
Nanue Stream Bridge
(001320001100001)
1930
Mamalahoa Hwy
Umauma Stream Bridge
(001310001100001)
1920
Lepahoa Rd
Hakalau Stream Bridge
(001290001100003)
1930
19
Old Railroad Crossing Bridge
(001290001100002)
1930
Kolekole Beach Park
Kaahakini Stream Bridge
(001290001100001)
1929
Kolekole Stream Bridge
(001280001100004)
1929
Honomu
Paheehee Stream Bridge
(001280001100003)
1929
Hawaii Belt Rd
220
22
Laupahu Rd
Old Mamalahoa Hwy
Beach Rd
19
Waimaauau Stream Bridge
(001280001100001)
1930
Pepeekeo
Waiaama Stream Bridge
(001270001100008)
1930
Kawainui Stream Bridge
(001270001100007)
1900
Kahalii Stream Bridge
(001270001100006)
1929
Hanawi Stream Bridge
(001270001100005)
1922
Kalaoa Stream Bridge
(001270001100004)
1929
Papaikou
Kaieie Stream Bridge
(001270001100003)
1929
Puuokalepa Bridge No. 1
(001270001100002)
1904
19
Kapue Stream Bridge
(001270001100001)
1935
Mamalahoa Hwy
Honolii Stream Bridge
(001260001100006)
1911
Puia Rd
Maili Stream Bridge
(001260001100004)
1916
Kaiwiki Bridge No. 1
(001260001100005)
1920
Kalalau Stream Bridge
(001260001100002)
1920
Waianuenue St
Hilo Bay
Pukihae Stream Bridge
(001260001100001)
1904
Puhi Bay
Kūhiō Bay
Hilo
Liliuokalani Gardens
Wailuku Bridge No.1
(001230001100002)
1919

Old Mamalahoa Highway Bridges



Honokaia Gulch West Branch Bridge
(001470001100002)
1924

Keaakaukau Gulch Bridge
(001460001100004)
1925

Nienie Gulch Bridge
(001460001100001)
1923

Kahawailiilii Gulch Bridge
(001440001100010)
1919

Kaumoali Gulch Bridge
(001430001100002)
1932

Mahuna Gulch Bridge
(001420001100002)
1930

Kaula Gulch Bridge
(001410001100001)
1928

Ahualoa No. 2 Gulch Bridge
(001460001100002)
1923

Inoino Gulch Bridge
(001460001100005)
1924

Honokaia Gulch East Branch Bridge
(001470001100001)
1924

Relief Elevation 2760 Bridge
(001470001100003)
1924

Waikaalulu Gulch Bridge
(001440001100008)
1930

Kalopa Gulch Bridge
(001440001100009)
1930

Waipunahina Gulch Bridge
(001430001100001)
1928

Lauhala Gulch Bridge
(001420001100001)
1930

Laupahoehoe Gulch Bridge
(001360001100001)
1930

Kaiwilahilahi Stream Bridge
(001350001100001)
1923

District Recommendation: Old Mamalahoa Highway (Hawaii Belt Road)

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
001460001100002	Ahualoa No. 2 Gulch Bridge	Ahualoa No. 2 Gulch	Mamalahoa Highway	1923	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001290001100003	Hakalau Stream Bridge	Hakalau Stream	Old Mamalahoa Highway	1930	Closed Spandrel Arch	Concrete Open Decorative	County
001270001100005	Hanawi Stream Bridge	Hanawi Stream	Old Mamalahoa Highway	1922	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001470001100001	Honokaia Gulch East Branch Bridge	Honokaia Gulch	Mamalahoa Highway	1924	Concrete Tee Beam	No Parapet/Railing	County
001470001100002	Honokaia Gulch West Branch Bridge	Honokaia Gulch	Mamalahoa Highway	1924	Concrete Tee Beam	Metal Horizontal	County
001260001100006	Honolii Stream Bridge	Honolii Stream	Old Mamalahoa Highway	1911	Open Spandrel Arch	Concrete Solid with Cap	County
001280001100002	Honomu Stream Bridge	Honomu Stream	Old Mamalahoa Highway	2002	Concrete Girder	Concrete Solid Panel with Cap	County
001460001100005	Inoino Gulch Bridge	Inoino Gulch	Mamalahoa Highway	1924	Concrete Girder	Concrete Solid Panel with Cap	County
001290001100001	Kaahakini Stream Bridge	Kaahakini Stream	Old Mamalahoa Highway	1929	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001270001100006	Kahalii Stream Bridge	Kahalii Stream	Old Mamalahoa Highway	1929	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001440001100010	Kahawailiilii Gulch Bridge	Kahawailiilii Gulch	Old Mamalahoa Highway	1919	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001270001100003	Kaieie Stream Bridge	Kaieie Stream	Old Mamalahoa Highway	1929	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001260001100005	Kaiwiki Bridge No. 1	Kaiwiki Stream	Old Mamalahoa Highway	1920	Concrete Tee Beam	Metal Horizontal	County
001350001100001	Kaiwilahilahi Stream Bridge	Kaiwilahilahi Stream	Old Mamalahoa Highway	1923	Open Spandrel Arch	Concrete Open Vertical	County
001260001100002	Kalalau Stream Bridge	Kalalau Stream	Old Mamalahoa Highway	1920	Masonry Arch	Masonry Rock with Cap	County
001270001100004	Kalaoa Stream Bridge	Kalaoa Stream	Old Mamalahoa Highway	1929	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001440001100009	Kalopa Gulch Bridge	Kalopa Gulch	Kalopa Road	1930	Timber Stringer	Wood	County
001270001100001	Kapue Stream Bridge	Kapue Stream	Old Mamalahoa Highway	1935	Closed Spandrel Arch	Concrete Solid	County
001410001100001	Kaula Gulch Bridge	Kaula Gulch	Old Mamalahoa Highway	1928	Steel Stringer	Wood	County
001430001100002	Kaumoali Gulch Bridge	Kaumoali Gulch	Old Mamalahoa Highway	1932	Masonry Arch	Concrete Open Horizontal	County

District Recommendation: Old Mamalahoa Highway (Hawaii Belt Road)

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
001270001100007	Kawainui Stream Bridge	Kawainui Stream	Old Mamalahoa Highway	1900	Timber Stringer	Wood	County
001460001100004	Keaakaukau Gulch Bridge	Keaakaukau Gulch	Mamalahoa Highway	1925	Concrete Slab	Concrete Solid Panel with Cap	County
001280001100004	Kolekole Stream Bridge	Kolekole Stream	Old Mamalahoa Highway	1929	Closed Spandrel Arch	Concrete Open Arched	County
001420001100001	Lauhala Gulch Bridge	Lauhala Gulch	Old Mamalahoa Highway	1930	Timber Stringer	Wood	County
001360001100001	Laupahoehoe Gulch Bridge	Laupahoehoe Gulch	Old Mamalahoa Highway	1930	Masonry Arch	Masonry Rock	County
001420001100002	Mahuna Gulch Bridge	Mahuna Gulch	Old Mamalahoa Highway	1930	Timber Stringer	Wood	County
001260001100004	Maili Stream Bridge	Maili Stream	Old Mamalahoa Highway	1916	Concrete Tee Beam	Concrete Solid	County
001320001100001	Nanue Stream Bridge	Nanue Stream	Old Mamalahoa Highway	1930	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001460001100001	Nienie Gulch Bridge	Nienie Gulch	Mamalahoa Highway	1923	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001290001100002	Old Railroad Crossing Bridge	Railroad Crossing	Old Mamalahoa Highway	1930	Closed Spandrel Arch	Concrete Solid Panel with Cap	County
001310001100002	Opea Stream Bridge	Opea Stream	Old Mamalahoa Highway	1912	Concrete Tee Beam	Metal Horizontal	County
001280001100003	Paheehee Stream Bridge	Paheehee Stream	Old Mamalahoa Highway	1929	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001260001100001	Pukihae Stream Bridge	Pukihae Stream	Old Mamalahoa Highway	1904	Masonry Arch	Masonry Rock with Cap	County
001270001100002	Puuokalepa Bridge No. 1	Puuokalepa Stream	Old Mamalahoa Highway	1904	Closed Spandrel Arch	Concrete Solid with Cap	County
001470001100003	Relief Elevation 2760 Bridge	Relief	Mamalahoa Highway	1924	Concrete Tee Beam	Metal Horizontal	County
001310001100001	Umauma Stream Bridge	Umauma Stream	Old Mamalahoa Highway	1920	Concrete Tee Beam	Concrete Solid Panel with Cap	County
001270001100008	Waiaama Stream Bridge	Waiaama Stream	Old Mamalahoa Highway	1930	Closed Spandrel Arch	Concrete Solid with Cap	County
001440001100008	Waikaalulu Gulch Bridge	Waikaalulu Gulch	Kalopa Road	1930	Timber Stringer	Wood	County
001320001100002	Waikaumalo Stream Bridge	Waikaumalo Stream	Old Mamalahoa Highway	1920	Timber Stringer	Wood	County

District Recommendation: Old Mamalahoa Highway (Hawaii Belt Road)

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
001230001100002	Wailuku Bridge No.1	Wailuku River	Wainaku Street	1919	Concrete Tee Beam	Concrete Open Decorative	County
001280001100001	Waimaauau Stream Bridge	Waimaauau Stream	Old Mamalahoa Highway	1930	Concrete Slab	Concrete Solid Panel	County
001430001100001	Waipunahina Gulch Bridge	Waipunahina Gulch	Old Mamalahoa Highway	1928	Open Spandrel Arch	Concrete Open Decorative	County

POSTWAR HAWAII BELT ROAD, MULTIPLE PROPERTY

The 2013 State Historic Bridge Inventory and Evaluation proposed a Postwar Hawaii Belt Road Multiple Property Documentation for 19 post-World War II bridges along the Hawaii Belt Road. Six of these bridges are listed in the Hawaii Register of Historic Places under “Steel Trestle Bridges of the Hamakua Coast, Multiple Property.” The Postwar Hawaii Belt Road is not considered a historic district, but as a significant group of postwar bridges along the Hawaii Belt Road. See Chapter 3.4 for the historic context.

Hawaii Belt Road Bridges



District Recommendation: Postwar Hawaii Belt Road, Multiple Property

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/ Railing Type	State/ County
001000190309124	Hanawi Stream Bridge	Hanawi Stream	Hawaii Belt Road	1968	Concrete Girder	Concrete and Metal	State
001000190305863	Kahawailiilii Stream Bridge	Kahawailiilii Stream	Hawaii Belt Road	1959	Concrete Girder	Concrete and Metal	State
001000190306021	Kalopa Stream Bridge	Kalopa Stream	Hawaii Belt Road	1959	Concrete Girder	Concrete Open Horizontal	State
001000190306944	Kaula Stream Bridge	Kaula Stream	Hawaii Belt Road	1959	Concrete Girder	Concrete Open Horizontal	State
001000190309043	Kawainui Stream Bridge	Kawainui Stream	Hawaii Belt Road	1948	Steel Stringer	Concrete Open Greek Cross	State
001000190307519	Kihalani Stream Bridge	Kihalani Stream	Hawaii Belt Road	1956	Concrete Girder	Concrete Open Horizontal	State
001000190307387	Kilau Stream Bridge	Kilau Stream	Hawaii Belt Road	1953	Concrete Tee Beam	Concrete Open Horizontal	State
001000190306590	Kukaiau Stream Bridge	Kukaiau Stream	Hawaii Belt Road	1951	Steel Stringer	Concrete and Metal	State
001000190307474	Kuwaikahi Stream Bridge	Kuwaikahi Stream	Hawaii Belt Road	1957	Steel Stringer	Concrete Open Horizontal	State
001000190307585	Moanalulu Stream Bridge	Moanalulu Stream	Hawaii Belt Road	1956	Concrete Tee Beam	Concrete Open Horizontal	State
001000190307887	Pohakupuka Stream Bridge	Pohakupuka Stream	Hawaii Belt Road	1953	Concrete Rigid Frame	Concrete Open Horizontal	State
001000190409696	Wailuku River Bridge	Wailuku Stream	Hawaii Belt Road	1950	Steel Stringer	Metal Horizontal	State
001000190306280	Waipunahina Stream Bridge	Waipunahina Stream	Hawaii Belt Road	1959	Concrete Girder	Concrete Open Horizontal	State
Listed in Steel Trestle Bridges on the Hamakua Coast, Multiple Property							
001000190308410	Hakalau Stream Bridge	Hakalau Stream	Hawaii Belt Road	1953	Steel Trestle	Concrete Open Horizontal	State
001000190309317	Kapue Stream Bridge	Kapue Stream	Hawaii Belt Road	1950	Steel Trestle	Concrete Open Horizontal	State
001000190308549	Kolekole Stream Bridge	Kolekole Stream	Hawaii Belt Road	1950	Steel Truss	Concrete Open Horizontal	State
001000190308146	Nanue Stream Bridge	Nanue Stream	Hawaii Belt Road	1952	Steel Trestle	Concrete Open Horizontal	State
001000190308619	Paheehee Stream Bridge	Paheehee Stream	Hawaii Belt Road	1950	Steel Trestle	Concrete Open Horizontal	State
001000190308346	Umauma Stream Bridge	Umauma Stream	Hawaii Belt Road	1952	Steel Stringer	Concrete Open Horizontal	State