A. GLOSSARY
DEFINITION OF TERMS

The definitions of terms used in the inventory report are provided below. For identification of bridge types and individual bridge components, please see Chapter 1. All terms marked with an asterisk (*) are defined by the U.S. Department of the Interior, National Park Service.

(a) **ADVISORY COUNCIL ON HISTORIC PRESERVATION (ACHP).**

An independent federal agency that promotes the preservation, enhancement, and productive use of our nation’s historic resources, and advises the President and Congress on national historic preservation policy.

(b) **AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS (AASHTO).**

A non-governmental organization that publishes specifications, test protocols and guidelines utilized in highway design and construction. In 1973, the American Association of State Highway Officials (AASHO) changed its name to AASHTO in order to reflect a broader scope of representation, which now includes not only highways, but also air, rail, water, and public transportation. Where referred to in this inventory report, the organization is thus referred to in context as “AASHO” prior to 1973, and as “AASHTO” in contexts from 1973 to the present day.

(c) **BASE HIGHWAY NETWORK.**

The Base Highway Network includes the through-lane (mainline) portions of the IHS, rural/urban principal arterial system and rural minor arterial system. Ramps, frontage roads and other roadways are not included in the Base Highway Network.

(d) **BRIDGE.**

The NBI Standards published in 23 CFR 650.3 give the following definition: A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

(e) **BRIDGE MANAGEMENT SYSTEM.**

A system designed to optimize the use of available resources for the inspection, maintenance, rehabilitation and replacement of bridges.

(f) **CERTIFIED LOCAL GOVERNMENT (CLG).**

A certified local government is a local government (e.g., a City or County) officially certified to carry out some of the purposes of the National Historic Preservation Act, as amended. CLGs are granted authority for reviewing various cultural resources projects which might otherwise require federal review. In addition, CLGs may receive special grants for cultural resources activities.
(g) **COMMONLY RECOGNIZED (CoRe) STRUCTURAL ELEMENTS.**

A group of structural elements endorsed by AASHTO as a means of providing a uniform basis for data collection for any bridge management system, to enable the sharing of data between States, and to allow for a uniform translation of data to NBI Items 58, 59, 60 and 62.

(h) **CONTRIBUTING RESOURCE.**

A building, site, structure, or object adding to the historic significance of a property.

(i) **CULVERT.**

A structure designed hydraulically to take advantage of submergence to increase hydraulic capacity. Culverts, as distinguished from bridges, are usually covered with embankment and are composed of structural material around the entire perimeter, although some are supported on spread footings with the streambed serving as the bottom of the culvert. Culverts may qualify to be considered "bridge" length.

(j) **DISTRICT.**

A significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

(k) **FEDERAL AID PRIMARY (FAP).**

A system of connected main highways of the Interstate System and important routes, selected by each state highway department subject to the approval of the Bureau of Public Roads.

(l) **FOREST HIGHWAY.**

A road, under the jurisdiction of, and maintained by, a public authority and open to public travel; wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (23 CFR 660).

(m) **FOREST SERVICE DEVELOPMENT ROAD.**

A forest road wholly under the jurisdiction of the Forest Service, which may be “open to public travel”. Bridges on Forest Service Development Roads which are “open to public travel” are subject to the NBIS.

(n) **HAWAII STATE REGISTER OF HISTORIC PLACES (HSRHP).**

A statewide program to identify, evaluate, register and protect Hawaii's historical resources.

(o) **HIGHWAY PERFORMANCE MONITORING SYSTEM.**

The Highway Performance Monitoring System is a database of universe and sample data that describes the nation's public road mileage. The data are annually updated and submitted to FHWA by the State Highway Agencies, Puerto Rico and the District of Columbia. The universe data provides some basic characteristics of all public road mileage while the sample of the arterial and collector systems allows for assessment of the condition, performance, usage and additional characteristics of the nation's major highway systems.
**p. HISTORIC AMERICAN ENGINEERING RECORD (HAER).***

A nationwide documentation program producing a permanent collection of architectural, engineering and landscape documentation at the Library of Congress consisting of measured and interpretive drawings, large-format black and white and color photographs, written historical and descriptive data, and original field notes.

**q. INTEGRITY.*

Authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period.

**r. INVENTORY ROUTE.

The route for which the applicable inventory data is to be recorded. The inventory route may be on the structure or under the structure. Generally inventories along a route are made from west to east and south to north.

**s. LAND MANAGEMENT HIGHWAY SYSTEM.

Consists of adjoining state and local public roads that provide major public access to Bureau of Land Management administered public lands, resources, and facilities.

**t. NATIONAL BRIDGE INSPECTION STANDARDS.

Federal regulations establishing requirements for inspection procedures, frequency of inspections, qualifications of personnel, inspection reports, and preparation and maintenance of a State bridge inventory. The National Bridge Inspection Standards apply to all structures defined as bridges located on all public roads.

**u. NATIONAL BRIDGE INVENTORY (NBI).

The aggregation of structure inventory and appraisal data collected to fulfill the requirements of the National Bridge Inspection Standards. Each State shall prepare and maintain an inventory of all bridges subject to the National Bridge Inspection Standards.

**v. NATIONAL BRIDGE INVENTORY (NBI) RECORD.

Data which has been coded according to the Guide for each structure carrying highway traffic or each inventory route which goes under a structure. These data are furnished and stored in a compact alphanumeric format on magnetic tapes or disks suitable for electronic data processing.

**w. NATIONAL REGISTER OF HISTORIC PLACES (NRHP).***

The official list of recognized properties of national, state and local significance in American history, architecture, archeology, engineering, and culture, maintained and expanded by the National Park Service on behalf of the Secretary of the Interior.

**x. PRESERVATION.*

Preservation places a premium on the retention of all historic fabric through conservation, maintenance and repair. It reflects a building's continuum over time, through successive occupancies, and the respectful changes and alterations that are made.
(y) **PUBLIC ROAD.**

Any road under the jurisdiction of and maintained by a public authority and open to public travel.

(z) **RECONSTRUCTION.***

Reconstruction establishes limited opportunities to re-create a non-surviving site, landscape, building, structure, or object in all new materials.

(aa) **REHABILITATION.***

Rehabilitation emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it is assumed the property is more deteriorated prior to work. (Both Preservation and Rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.)

(bb) **RESTORATION.***

Restoration focuses on the retention of materials from the most significant time in a property's history, while permitting the removal of materials from other periods.

(cc) **SECRETARY OF THE INTERIOR’S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES.***

Intended to promote responsible preservation practices that help protect our Nation's irreplaceable cultural resources.

(dd) **STRATEGIC HIGHWAY CORRIDOR NETWORK.***

A system of highways which are strategically important to the defense of the United States. It includes the Interstate Highways and 25,215 kilometers of other non-interstate highways. The Military Traffic Management Command Report SE 89-4b-27, Strategic Highway Corridor Network, January 1991, contains additional information on the Network.

(ee) **STRUCTURE INVENTORY AND APPRAISAL SHEET.***

The graphic representation of the data recorded and stored for each NBI record in accordance with this Guide.

(ff) **WORKMANSHIP.***

Quality of integrity applying to the physical evidence of the crafts of a particular culture, people, or artisan.
B. SIGNIFICANT PERSONS LIST
SIGNIFICANT DESIGNERS OF HISTORIC HAWAII BRIDGES

BARTELS, WILLIAM R. (THD)
As Chief Engineer for the THD, William R. Bartels was responsible for all major territorial bridge projects constructed from 1932 to 1956. In addition to displaying a refined aesthetic sensibility, bridges designed by Bartels characteristically utilized the latest technology and involved a high degree of engineering complexity.

Bartels was a German born engineer who briefly worked for a sugar plantation on Maui before being hired by the Territorial Highway Department in 1932. He designed most of the territorial bridges for the next 25 years. Bartels was responsible for the largest and most sophisticated bridge construction projects in Hawaii during this time, and there was a marked shift towards construction of large deck girder and rigid frame bridges.

In 1950, the THD, 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 railroad trestles and trusses, 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 Highway Bridge. Two concrete piers from the truss bridge remain in use under the present Wailuku Bridge, which carries the Hawaii Belt Road (FAP 19) over the river.

Bartels 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 because his abilities were so great.

BELT, ROBERT M. (Kauai)
Robert M. Belt served as Resident Engineer and then District Engineer for the THD on Kauai during the first half of the 20th century. Belt’s contributions include several bridges significant to the development of the Kauai Belt Road System, as well as bridges that exemplify the geometric styling and increasing complexity characteristic of the late 1930s.

At 365 feet in length, the Waimea Bridge, designed by Belt, was one of the longest bridges on Kauai when it was built in 1940; the engineering of this bridge and the curved lines of its concrete substructure would have been considered complex for its time. An article about the opening of the Waimea Bridge stated that “from an engineer’s point of view... it has been one of the most satisfactory construction jobs on the island.”

From his work supervising construction of the Wahiawa Bridge on Kauai, Belt reported that the construction process was difficult because the foundations had to be dug quite deep. Subsequently, he wrote about the event in a poem entitled “Prayer of the Inspecting Engineer.” He is noted to have written several other poems about early engineering in Hawaii.

CHUN, WILLIAM HOY (Hawaii)
William Hoy "Cappy" Chun acted as project engineer for the County of Hawaii during the 1920s and 1930s. Born and raised in Hawaii, Chun was a graduate of the Illinois Institute of Technology. In 1925, Chun was appointed Assistant County Engineer for the County of Hawaii where he was responsible for the “investigations, surveys and preparations of plans and specifications for highways, waterways, sewerage, bridges and reinforced concrete
structures” in the County of Hawaii under the Engineer’s Department. During 1931-1932 he participated in Federal Aid Programs where he surveyed and planned the first Federal Aid Highway System on the island of Hawaii, made the first traffic census, and surveyed the North Kona, South Kona, Kohala Mountain, and Hamakua Road projects which totaled forty miles of road.

Chun was the designer of the Wailoa bridge in Hilo (previously listed on the NHRP and since demolished); the Mamalahoa-Waipunahina and Ainako Stream-Waianuenue Bridges (both feature Italianate balustrades and are two of the most ornate open-spandrel arch bridges in the state); and many early concrete slab and girder bridges built for the county during the 1920s along the Mamalahoa Highway.

He also designed the sewer system of Hilo in the 1930s and was the chief engineer for Hilo Water Works until 1961. Working with Chun on many projects was En Leong Wung of whom little is known. Wung designed many important county bridge projects and later served as County Engineer until he stepped down in 1946.

**DAWSON, G. K. (Oahu)**

G. K. Dawson, an engineer with the City and County of Honolulu, is credited with designing the steel truss Kaukonahua Bridge (also known as the Karsten Thot Bridge) in 1932. The Karsten Thot Bridge was constructed at a major crossing, the north fork of the Kaukonahua Stream, north of Wahiawa, a sugar plantation town in central Oahu. The bridge was an important transportation link for the central Oahu region and contributed to the growth of Wahiawa, in particular.

The Karsten Thot Bridge is the only steel truss erected in Hawaii during the Depression-era. The construction and material choice was likely made possible due to cost considerations regarding the bridge’s long span (210 feet) required by the Kaukonahua Stream; it was authorized by the City and County of Honolulu, despite the THD’s policy against the use of metal bridges due to salt water corrosion problems. It is one of only three metal trusses in the islands and the only bridge of its type on Oahu.

**GARLINGHOUSE, RALPH L. (Kauai)**

Ralph L. Garlinghouse was one of two main County Engineers for Kauai during the early 20th century. Garlinghouse and Joseph H. Moragne, who acted as County Engineer during the early 1900s, designed and/or oversaw most of Kauai’s early bridge construction projects.

Bridges designed by Garlinghouse include: Koloa Bridge (1928), constructed to by-pass and straighten out the old belt road; the Waipa Bridge extension (1925), which added a 90-foot long, five span, cast-in-place concrete structure; and the Lawai Bridge widening (1928), a reinforced concrete solid-spandrel arch deck bridge originally constructed circa 1907 – it is the only remaining arch deck structure on Kauai.

---

2. Ibid.
3. Ibid.
**HOWELL, HUGH (Maui)**

Hugh Howell served as the County of Maui Engineer from 1905-1913 and as a private roads contractor from 1913-1921. Howell was responsible for much of the initial road and bridge construction work on the Hana Belt Road in both his public and private professional capacities.

**MORAGNE, JOSEPH HUGHES (Kauai)**

Joseph Hughes 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 and the Territorial DPW until he became the first County Engineer for the County of Kauai Engineer’s Office in 1907.4

Following a recommendation from the SPW to use concrete arch bridges “wherever the span is not too great,” Moragne popularized the use of reinforced concrete on Kauai beginning in 1909.5 He also engineered the Kauai Belt Road, constructed from 1910-1920, engineered the Kokee irrigation system, and during the 1920s designed the Hanalei and Kaapoko Tunnels, which spanned 6,028 feet and 3,558 feet, respectively.

Significant bridges designed by Moragne include: the Waioli Bridge (1912), the earliest concrete girder bridge on Kauai and in the state at the time of its construction; the Huleia Cane Haul Bridge (1909), the first reinforced concrete bridge built in Hawaii; and the Hanalei River Bridge (steel truss, 1912) and the Waipa Stream Bridge (concrete, 1912), some of the earliest examples of road construction progress and development through formal engineering expertise and industrial technology funded by the new Territorial Government.

**OHRT, FRED (Oahu)**

Previously of the firm Libby, McNeill & Libby, Fred Ohrt became the first Manager and Chief Engineer of the Honolulu Board of Water Supply in 1929 and remained in the position until 1952. Among his many endeavors as Chief Engineer, he also established a primary principle that construction necessary to support a utility need not spoil the surrounding landscape, thus balancing aesthetics, functionality, and nature unique to the islands.6

Along with fellow designer Guy Rothwell, Ohrt is credited with designing the Anahulu Stream Bridge (1921), which carries Kamehameha Highway across the Anahulu Stream in Haleiwa. This unique double “rainbow” or Marsh through-deck arch bridge constructed of reinforced concrete exhibits the work of highly skilled craftsmen and designers. The bridge's historic association as an important civic structure associated with the development of Haleiwa can be readily discerned by pedestrian and automobile traffic along Kamehameha Avenue.

---

4 “Civil Engineer Joseph H. Moragne,” The Garden Isle (Lihue, HI), April 21, 2013.
5 Ibid.
ROTHWELL, GUY (Oahu)
Guy Rothwell attended Oahu College and graduated from the University of Washington with a degree in architectural engineering. He began his career as a Navy Yard draftsman in Puget Sound, Washington, and worked as a ship draftsman at the Navy Yard in Pearl Harbor during the First World War. In 1924, he became a Registered Professional Engineer and Architect within the Territory of Hawaii.

Along with fellow designer Fred Ohrt, Rothwell is credited with designing the Anahulu Stream Bridge (1921), which carries Kamehameha Highway across the Anahulu Stream in Haleiwa. This unique double “rainbow” or Marsh through-deck arch bridge constructed of reinforced concrete exhibits the work of highly skilled craftsmen and designers. The bridge’s historic association as an important civic structure associated with the development of Haleiwa can be readily discerned by pedestrian and automobile traffic along Kamehameha Avenue.

Rothwell’s other buildings include: Palama Settlement in Kalihi, the Harris Memorial Church in Nuuanu, Roosevelt High School, Honolulu Hale (City Hall), the Honolulu Stadium, the original gymnasium at the University of Hawaii at Manoa, and the Beretania, Kalihi, and Kaimuki pumping stations for the Sewer and Water Commission of Honolulu.7

WAY, W. F. (Oahu)
W.F. Way designed the Puowaina Drive Bridge (at Auwaiolimu Street), constructed in 1936. The bridge, a reinforced concrete continuous tee beam structure built on reinforced concrete trestles, exhibits a high level of complexity for its time due to the continuous tee beam design of the structure, which eliminates the need for expansion joints in the deck, and because of its exceptional height.

YOUNG, JOHN MASON (Hawaii)
John Mason Young was born in Lewisburg, Tennessee in 1847. Following his military stint in the Spanish American War as a young man, Young became Professor of Mechanical Engineering at the University of Florida, his alma mater. While obtaining additional engineering degrees from Cornell University, Young worked for various companies on the east coast designing bridges and cableways.8

In 1908, he became the first Professor of Engineering at the University of Hawaii at Manoa and was instrumental in helping to draw up plans for the campus and oversee construction of four campus buildings: Hawaii Hall, Miller Hall, Dean Hall, and Crawford Hall. That same year, he also founded the Pacific Engineering Company, which helped construct many significant buildings in Hawaii.9

Young worked with William R. Bartels on the design of several steel trestle bridges constructed during the 1950s along the Hawaii Belt Road (FAP 19). The five steel trestle bridges associated with Young include: the Paheehee Stream Bridge (1950), Kapue Stream Bridge (1950), Nanue Stream Bridge (1952), Umauma Stream Bridge (1952), and Hakalau Stream Bridge (1953) – one of the longest bridges in the Territory at 774.9-feet long at the time of its construction.

9 Ibid.
C. NATIONAL REGISTER FORMS
KAUAI NOMINATION FORMS

KAUAI BELT ROAD (NORTH SHORE SECTION)
   NORTH SHORE ROUTE
   HANALEI BRIDGE
   WAIPA BRIDGE – KUHIO HIGHWAY
   WAIOLI BRIDGE – KUHIO HIGHWAY
   MANOA STREAM FORD – KUHIO HIGHWAY
   LIMAHULI STREAM CROSSING – KUHIO HIGHWAY
   HAENA BRIDGE NUMBER 1 – KUHIO HIGHWAY
   HAENA BRIDGE NUMBER 2 – KUHIO HIGHWAY
   WAIKOKO BRIDGE – KUHIO HIGHWAY
   WAINIHA BRIDGE #1, #2, #3 – KUHIO HIGHWAY
   PU’U’ŌPAE BRIDGE
   PU’U’ŌPAE BRIDGE MISCELLANEOUS
   OPAEKAA ROAD BRIDGE
   KAPAIA SWINGING BRIDGE
4. National Park Service Certification

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

- entered in the National Register Deb Blad 9/11/04
- 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
- public-State
- public-Federal

Category of Property
(Check only one box)

- building(s)
- 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
Hawai‘i - Kaua‘i Belt Road, Kaua‘i County

Number of Resources within Property

<table>
<thead>
<tr>
<th>Contributing</th>
<th>Noncontributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>__</td>
<td>___ buildings</td>
</tr>
<tr>
<td>2</td>
<td>___ sites</td>
</tr>
<tr>
<td>13</td>
<td>2 structures (bridges and culverts)</td>
</tr>
<tr>
<td>___</td>
<td>___ objects</td>
</tr>
<tr>
<td>15</td>
<td>2 Total</td>
</tr>
</tbody>
</table>

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)

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 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

Commerence
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

___ previously determined eligible by the National Register

1978: Hanalei Bridge, Waiʻoli Bridge, Waipā Bridge

___ designated a National Historic Landmark

___ recorded by Historic American Buildings Survey

# ______

___ recorded by Historic American Engineering Record

# ______

5
10. Geographical Data

Acreage of Property ______ 54 ______

UTM References

(Place additional UTM references on a continuation sheet)

<table>
<thead>
<tr>
<th>Zone Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>451000</td>
</tr>
<tr>
<td>204</td>
<td>450980</td>
</tr>
</tbody>
</table>

_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 coterminous 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 Ha‘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.
Hawai‘i - Kaua‘i Belt Road, Kaua‘i County

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:

<table>
<thead>
<tr>
<th>Zone</th>
<th>Northing</th>
<th>Easting</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>448980</td>
<td>2455410</td>
</tr>
<tr>
<td>6</td>
<td>447720</td>
<td>2455110</td>
</tr>
<tr>
<td>7</td>
<td>447030</td>
<td>2455480</td>
</tr>
<tr>
<td>8</td>
<td>446760</td>
<td>2455820</td>
</tr>
<tr>
<td>9</td>
<td>444420</td>
<td>2456410</td>
</tr>
<tr>
<td>10</td>
<td>443700</td>
<td>2456840</td>
</tr>
<tr>
<td>11</td>
<td>443680</td>
<td>2456880</td>
</tr>
<tr>
<td>12</td>
<td>443480</td>
<td>2457730</td>
</tr>
<tr>
<td>13</td>
<td>441450</td>
<td>2457600</td>
</tr>
<tr>
<td>14</td>
<td>440310</td>
<td>2457770</td>
</tr>
<tr>
<td>15</td>
<td>439640</td>
<td>2457710</td>
</tr>
</tbody>
</table>
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
The Kaua'i Belt Road between Princeville and Ha'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 Ha'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 Ha'ena, ending at Mile Marker 10 at Ha'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 Ha'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 Ha'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.
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 Waipa Bridge. After crossing Waipa 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 Ke‘e Beach in Hā‘ena State Park at Mile Marker 10.
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. 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 Ha‘ena.

Foreigners, among them American missionaries, were the first to travel primarily by land and introduced horses to the Hawaiian Islands in 1803. 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 Ha‘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.

In 1865, William T. Brigham’s account of his sightseeing journey to Ha‘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 Ha‘ena took the entire day, much as it had for Alexander in 1849.

---

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.
4 The Kaua‘i Papers, 138.
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." An 1893 Hawaiian Government Survey map illustrated this section of road as a series of switchbacks descending the hill.

Knudsen's journal is valuable for its description of the historical alignment of the trail/road from Hanalei Hill (above the Hanalei Bridge) to Ke'e Landing at the end of the road in Ha'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 Ha'ena, passing both the dry and wet caves before reaching Ke'e Landing.

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.

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.
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 Hawaii’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 Hawaii’s 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. 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. A. A. Wilson finally began construction on the
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

12 Superintendent of Public Works, Report for 1904, 66.
13 Superintendent of Public Works, Report for 1904, 3-5.
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". 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. The second section was expected to be ready by March 1912 if the weather cooperated.

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. 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.

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.
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.\(^{27}\)

\(^{21}\) "Tenders, Steel Bridge," \textit{Garden Island}, August 8, 1911.
\(^{22}\) "Meeting of the Loan Fund Commission," \textit{Garden Island}, September 12, 1911; "Loan Com. In Busy Meeting," \textit{Garden Island}, September 26, 1911; original bridge plaque notes Hamilton & Chambers as designers.
\(^{23}\) "Loan Com. In Busy Meeting," \textit{Garden Island}, September 26, 1911; "Hamilton and Chambers" noted on plaque on Hanalei Bridge.
\(^{24}\) "Kaua'i Loan Fund Meets," \textit{Garden Island}, January 21, 1913.
\(^{25}\) "Loan Fund Commission," \textit{Garden Island}, May 29, 1912.
\(^{26}\) "Loan Fund Meets," \textit{Garden Island}, July 16, 1912.
\(^{27}\) "Bridges Collapse," \textit{Garden Island}, August 6, 1912.
In November 1912, Moragne reported that bridge construction in the Hanalei District was progressing satisfactorily. Waipā Bridge was completed. Waiʻoli 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 Kilauea, 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 Haʻena. 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 Haʻena. 32

Completion of the Kauaʻi Belt Road entered its final phase in early 1915 when Supervisor Menefoglio proposed a $100,000 bond to complete the road from Māna (Barking Sands) to Haʻena. He estimated that by immediately funding the road work through bonds, Kauaʻi 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 Kauaʻi 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

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 Kauaʻi Loan Fund Commission Held at Līhuʻe, Kauaʻi, 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.
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 Molo'a to Ha'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 Ha'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 Ha'ena, the Waipā Bridge was extended, and the Lumaha'i Bridge was reinforced. In addition, the belt road was improved and extended to Ha'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,

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. 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." 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). 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. 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 Ke'e Beach, the "Hā'ena Road Extension" project probably improved the existing road to Hā'ena and built a new road from Hā'ena to Ke'e Beach. The road was macadamized in 1926. Almost $3,000 in additional funding was

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, and land was taken in mid 1928. This additional appropriation and land may have provided for the road to be extended to the Wet Caves/Ke'e 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 and built by contractor George W. Mahikoa. The structures may have been the first concrete-frame bridges built on Kaua'i. 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. The original design plans for the Waipā Bridge indicated there was an existing "old" timber bridge over the river in 1912. In

---

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 Kalâheo 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.
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. The Waipā Bridge collapsed in 1919 and a temporary trestle of "light construction" was built to span the washout. 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. The Waipā extension bridge had five spans for a total length of 90'. 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 Lumahaʻi, causing them to collapse.

Hawaii'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. Waikoko Bridge was also damaged when the tidal wave undermined its eastern abutment, which caused the bridge to sink on one
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. The Board of Supervisors minutes noted that repairs on the damaged "main" Wainiha Bridge (#3) had begun by mid April. 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. 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.

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. In December, flooding from Hurricane Nina damaged Wainiha Bridge #3 again, making it impassable to traffic until it was repaired.

---

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.
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 Ha‘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 Ha‘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 Wainihia: "Temporary Bridge No. 3B for Wainiha;" "Temporary Bridge No. 2 for Wainiha;" "Wainiha [3], Hanalei Side;" "Wainiha Bridge No. 3C Ha‘ena Side Approach;" "Dimension Diagram Bridge No. 1A & Bridge #2."
The Kaua'i Belt Road between Princeville and Ha'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 Ha'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 Ha'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.
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. 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. 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. 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.

64 State of Hawai'i, Department of Transportation, plans for "Lumaha'i Bridge," 1967.
65 State Department of Transportation, "Kaua'i Belt Road Kaliliwai to Ha`ena: Preliminary Case Report, Hanalei, Wa`oli & Waipā Bridges," 2-3.
In the early 1980s, Ha'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 Ha'ena Bridge #2, the Kaua'i Belt Road from Princeville to Ha'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.
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.


*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.)

Waipa 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.

Lumahai 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.
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.  

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.

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

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

island on which you cannot traverse by road around it.\textsuperscript{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.\textsuperscript{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 \textit{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."\textsuperscript{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.\textsuperscript{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.\textsuperscript{74}

\textsuperscript{70} "Roads First Need View of Fassoth," \textit{The Maui News}, February 11, 1921.

\textsuperscript{71} "Hanalei Notes," \textit{Garden Island}, May 20, 1919.

\textsuperscript{72} "A Happy Day In Sight," \textit{Garden Island}, July 10, 1917.

\textsuperscript{73} "Road Maintenance on Kaua'i," \textit{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.

\textsuperscript{74} "Road Progress," \textit{Garden Island}, July 24, 1917.
Kaua‘i residents enthusiastically noted that their roads were the best in the Territory of Hawai‘i. Most of the road between Lihu‘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 pretty well up to date." Some considered good roads a community’s most valuable asset, especially on Kaua‘i where a variety of scenic roads appealed to tourists. 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."

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.

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.
Hawai'i - Kaua'i Belt Road, Kaua'i County

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

Major Bibliographical References

*The Garden Island.* 1900-1950. Published in Līhu'e, Hawai'i.


Hawai'i (State). Department of Transportation. "As-Built" Plans for Kauai Belt Road, Lumaha'i Bridge, and Approaches, Federal Aid Secondary Project No. S-0560(1) Unit 2. 1967.


_____ "Kaua'i Belt Road Kalihiwai to Hā'ena: Preliminary Case Report, Hanalei, Wai'oli & Waipā Bridges. Honolulu: State of Hawai'i, Department of Transportation, Land Transportation Facilities Division, Planning Branch. 1978.

Hawai'i (Territory). *Report of the Superintendent of Public Works.* 1900 - 1906. At the Hawai'i State Archives.

Hawai'i (Territory). 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. [Honolulu]: Territorial Highway Department, Hawai'i Highway Planning Survey. 1950.

Kaua'i (County). Department of Public Works. Bridge Plans.

Kaua'i (County). Kaua'i County Clerk. Index File to Board of Supervisors/County Council Records.

NPS Form 10-900-a
OMB No. 1024-0018
United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 9 Page 2

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


McKay, Helen. Photograph Album #47b, ca. 1912-1930. At the Hawai'i State Archives.


Photograph Album #43. Public Works Projects, 1904-1905. At the Hawai'i State Archives.


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

1. Kaua'ī Belt Road (North Shore section)
2. Kaua'ī 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
NPS Form 10-900-aOMB No. 1024-0018  
Hawai‘i - Kaua‘i Belt Road, Kaua‘i County

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. Ha‘ena Bridge #2, view looking mauka  
7. Photograph #11

4. February 9, 2002  
6. Manoa 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
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

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
CITY, TOWN
Hanalei District
STATE Kauai

3 CLASSIFICATION
CATEGORY X DISTRICT
X BUILDING(S)
X STRUCTURE
X SITE
X OBJECT

OWNERSHIP X PUBLIC
PRIVATE
BOTH
PUBLIC ACQUISITION
IN PROCESS
BEING CONSIDERED

STATUS
X OCCUPIED
X UNOCCUPIED
X WORK IN PROGRESS
X ACCESSIBLE
YES: RESTRICTED
YES: UNRESTRICTED
X NO

PRESENT USE
X AGRICULTURE
X COMMERCIAL
X EDUCATIONAL
X ENTERTAINMENT
X GOVERNMENT
X INDUSTRIAL
X MILITARY
X TRANSPORTATION
X OTHER:

4 OWNER OF PROPERTY
NAME State of Hawaii
STREET & NUMBER Department of Transportation
CITY, TOWN Lihue, Kauai 96766

5 LOCATION OF LEGAL DESCRIPTION
COURTHOUSE, REGISTRY OF DEEDS, ETC.
Department of Transportation
CITY, TOWN Lihue, Kauai

6 REPRESENTATION IN EXISTING SURVEYS
TITLE Bridge Data Sheet
DATE October 20, 1950

DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN Lihue, Kauai, Hawaii 96766
STATE 2009

FOR NPS USE ONLY
RECEIVED DATE ENTERED

SCANNED 10
### Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Check One</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Unaltered</td>
</tr>
<tr>
<td>Good</td>
<td>Altered</td>
</tr>
<tr>
<td>Fair</td>
<td>Original Site</td>
</tr>
</tbody>
</table>

---

Describe the present and original (if known) physical appearance.

See attached architectural description of bridges and photographs.
**PERIOD**
- Prehistoric
- 1400-1499
- 1500-1699
- 1800-1899
- 1900-

**AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW**
- Archeology-Prehistoric
- Archeology-Historic
- Agriculture
- Architecture
- Art
- Commerce
- Communications
- Community Planning
- Conservation
- Economics
- Education
- Engineering
- Exploration/Settlement
- Industry
- Invention
- Landscape Architecture
- Religion
- Law
- Literature
- Military
- Music
- Philosophy
- Politics/Government
- Science
- Sculpture
- Social/Humanitarian
- Theater
- Transportation
- Other (specify)

**SPECIFIC DATES 1912-1920**

**STATEMENT OF SIGNIFICANCE**

see attachment 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. Wainiha Valley House
17. Wainiha Taro Shack
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

GEORAPHICAL DATA
ACREAGE OF NOMINATED PROPERTY
UTM REFERENCES

<table>
<thead>
<tr>
<th>A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ZONE</td>
<td>EASTING</td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>VERBAL BOUNDARY DESCRIPTION</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>STATE</th>
<th>CODE</th>
<th>COUNTY</th>
<th>CODE</th>
</tr>
</thead>
</table>

FORM PREPARED BY

NAME/TITLE:  Julia Neal, Director, Historic Buildings Kauai, Project
ORGANIZATION: Kauai Historical Society Box 248
STREET & NUMBER: Lihue, Kauai, Hi. 96766
CITY OR TOWN:  
STATE:  
DATE: Nov. 10, 1976
TELEPHONE: 245-6931

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

COPY 897
ARCHITECTURAL DESCRIPTION AND MERIT

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 aggregate, 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, ornamental rails that slant approximately four inches from one end of the bridge to the other. The bridge remains structurally sound.

WAIKIKO 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 supports 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 than the newer, multispans section.

WAIOILI BRIDGE

The Waioili Bridge is a multi-span, cast-in-place concrete bridge with pointed cap railings, built in 1917. It remains 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 National 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 Kamaulli 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 approximately 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 additional 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 an 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.
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

Number of Tracks:

Name of Railroad:

Latitude N
Longitude W

Map Location: Map - U.S.G.S.
Coordinates: 833280-2783480

Quadrangle: Kapaa

Scale: 1/62,500

Description (See sketch on reverse side)

Kind of Crossing: Bridge over River

Type of Bridge: Steel Through Truss

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

Total Length of Center Line of Road: 113 ft.

Materials Used
Substructure:
Superstructure:
Abutments: Reinf. Conc.
Steel

Pavement: Timber

Construction Data

Date of Construction: 1912; repaired in 1934

Load Limits; Design:
Estimated:

Plans on File with:

File No.: 10 Tons
Approach Roadway:
   Width:    Grade:    Alignment:
   NE  17 ft.     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

Cross-section

Plan

Kilaeua

Hanalei River

Timber Deck

General Condition of Bridge
Superstructure: Fair
Substructure: Fair

Steel beginning to corrode - Railings badly corroded

Date of Inspection: Oct. 20, 1950
Floor: Poor
Paint:
BRIDGE DATA SHEET

Date of Original Inventory: October 20, 1950

Island: Kauai
Bridge Number: 41
Name of Bridge: Waioli

Route Number: FAS 243
Project Number: County

Number of Tracks:
Latitude N
Longitude W
Coordinates: 829750-2782230

General Location: Hanalei
Name of Road: Kauai Belt Road
Name of Road Project: County
Name of Stream: Waioli Stream
Name of Railroad:

Map Location: Map - U.S.G.S.
Quadrangle: Na Pali
Scale: 1/62,500

Description (See sketch on reverse side)
Kind of Crossing: Bridge over Stream
Type of Bridge: Reinforced Concrete

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

Total Length of Center Line of Road: 90.5 ft.

Materials Used
Substructure:
Abutments: Reinf. Conc.
Piers: Reinf. Conc.
Superstructure:
Reinf. Conc.

Construction Data
Date of Construction: 1912

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

Plans on File with:

File No.:
Clearances

Approach Roadway:
- Width: NE 10 ft, SW 10 ft.

Bridge Roadway Width: 13 ft.

Sidewalk Widths: Right: 0 ft, Left: 0 ft.

Surface of road to stream bed: 11 ft.
Clear distance of opening above stream bed: 9 ft.

Sketch

Cross-section

Plan

Ha'alei

Waioli Stream

general Condition of Bridge

Superstructure: Good
Substructure: Good

Date of Inspection: Oct. 20, 1950

Floor: Poor
Paint:

Notes
Date of Original Inventory: October 20, 1950

Island: Kauai
Bridge Number: 42
Name of Bridge: Waipa

Route Number: FAS 243
Project Number: County

Number of Tracks:
Latitude: N
Longitude: W
Coordinates: 828950-2782750

Location

General Location: Hanalei
Name of Road: Kauai Belt Road
Name of Road Project: County
Name of Stream: Waipa Stream
Name of Railroad:
Map Location: Map - U.S.G.S.
Quadrangle: Na Pali
Scale: 1/62,500

Description (See sketch on reverse side)

Kind of Crossing: Bridge over Stream
Type of Bridge: Reinforced Concrete
Number of Spans: 8
Length of Spans: 16 ft.
Type: Flat Slab

Total Length of Center Line of Road: 138.5 ft.

Materials Used

Substructure:
Abutments: Reinf. Conc.
Piers: Reinf. Conc.

Superstructure:
Reinf. Conc.

Pavement:
Bit. Surface Treatment

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:
  - NW: 14 ft.
  - SE: 14 ft.
- Grade: 16 ft.
- Alignment: Bit. Surface Treatment
- Surface: 

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

Plan

Haena
- 14 ft.
- 16 ft.
- 13.5 ft.

Kilauea
- 14 ft.
- 13.5 ft.

General Condition of Bridge

Superstructure: Fair - Railing Chipped
Substructure: Fair

Date of Inspection: Oct. 20, 1950
Floor: Fair
Paint:
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
Name of Road Project: County
Name of Stream: Waikoko Stream
Name of Railroad:
Map Location: Map - U.S.G.S.
    Quadrangle: Na Pali
    Scale: 1/62,500
Route Number: FAS 243
Project Number: County
Number of Tracks:
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: 1
    Length of Spans: 43 ft.
    Type: Flat Slab
Total Length of Center Line of Road: 45 ft.

Materials Used
Substructure:
    Abutments: Reinf. Conc.
Superstructure:
    Reinf. Conc.
Pavement:
    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:  
   NW 14 ft.
   SE 14 ft.

   Grade:  
   Alignment:  
   Surface:  
   Tangent  
   Tangent  
   Bit. Surface  

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

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

Substructure: Fair

Date of Inspection: Oct. 20, 1950

Floor: 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
   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.


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


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
ATTACHMENT H-1
Page 4

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

AND/OR COMMON

2 LOCATION
STREET & NUMBER
CITY, TOWN Hanalei
STATE Hawaii

3 CLASSIFICATION
CATEGORY
DISTRICT
BUILDING(S)
STRUCTURE
SITE
OBJECT

OWNERSHIP
PUBLIC
PRIVATE
BOTH
PUBLIC ACQUISITION
IN PROCESS
BEING CONSIDERED

STATUS
OCCUPIED
UNOCCUPIED
WORK IN PROGRESS
ACCESSIBLE
YES: RESTRICTED
YES: UNRESTRICTED
NO

PRESENT USE
AGRICULTURE
COMMERCIAL
EDUCATIONAL
ENTERTAINMENT
GOVERNMENT
INDUSTRIAL
MILITARY
TRANSPORTATION

4 OWNER OF PROPERTY
NAME State of Hawaii, Department of Transportation
STREET & NUMBER 869 Punchbowl Street
CITY, TOWN Honolulu
STATE

5 LOCATION OF LEGAL DESCRIPTION
COURTHOUSE, REGISTRY OF DEEDS, ETC.

6 REPRESENTATION IN EXISTING SURVEYS
TITLE Bridge Data Sheet
DATE October 20, 1950
DEPOSITORY FOR SURVEY RECORDS Department of Transportation
CITY, TOWN Lihue
STATE Hawaii

Environmental Impact Statement released February 23, 1977
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.
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.

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY

UTM REFERENCES

A [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
ZONE EASTING NORTHING
C [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
ZONE EASTING NORTHING

VERBAL BOUNDARY DESCRIPTION

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

STATE CODE COUNTY CODE

FORM PREPARED BY

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

STREET & NUMBER
P. O. Box 1778
TELEPHONE

CITY OR TOWN
Lihue, Hawaii
STATE
96766

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

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

DIRECTOR, OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION

ATTEST:

KEEPER OF THE NATIONAL REGISTER

DATE

8 - 75
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.
1 NAME

HISTORIC

Waipa Bridge - Kuhio Highway (Bridge Number: 42)

AND/OR COMMON

2 LOCATION

STREET & NUMBER

CITY, TOWN

Hanalei

STATE

Hawaii

CITY, TOWN

Honolulu

STATE

Hawaii

3 CLASSIFICATION

CATEGORY

DISTRICT

BUILDINGS

STRUCTURE

OBJECT

OWNERSHIP

PUBLIC

PRIVATE

BOTH

PUBLIC ACQUISITION

IN PROCESS

BEING CONSIDERED

STATUS

OCCUPIED

UNOCCUPIED

WORK IN PROGRESS

ACCESSIBLE

YES: RESTRICTED

YES: UNRESTRICTED

NO

PRESENT USE

AGRICULTURE

MUSEUM

COMMERCIAL

PARK

EDUCATIONAL

PRIVATE RESIDENCE

ENTERTAINMENT

RELIGIOUS

GOVERNMENT

SCIczyptic

INDUSTRIAL

TRANSPORTATION

MILITARY

OTHER:

4 OWNER OF PROPERTY

NAME

State of Hawaii, Department of Transportation

STREET & NUMBER

869 Punchbowl Street

CITY, TOWN

Honolulu

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

DATE

October 20, 1950

FEDERAL

STATE

COUNTY

LOCAL

DEPOSITORY FOR

SURVEY RECORDS

City, Town

Department of Transportation

STATE

Hawaii

96766
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 high 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.
**SIGNIFICANCE**

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>ARCHAEOLOGY-PREHISTORIC</th>
<th>ARCHITECTURE</th>
<th>ARCHEOLOGY-HISTORIC</th>
<th>ART</th>
<th>COMMERCIAL ENTERPRISE</th>
<th>COMMUNICATIONS</th>
<th>COMMERCE</th>
<th>COMMUNITY PLANNING</th>
<th>ECONOMICS</th>
<th>EDUCATION</th>
<th>ENGINEERING</th>
<th>EXPLORATION/SETTLEMENT</th>
<th>INDUSTRY</th>
<th>INVENTION</th>
<th>LANDSCAPE ARCHITECTURE</th>
<th>LAW</th>
<th>LITERATURE</th>
<th>MILITARY</th>
<th>MUSIC</th>
<th>PHILOSOPHY</th>
<th>POLITICS/GOVERNMENT</th>
<th>RELIGION</th>
<th>SCIENCE</th>
<th>SCULPTURE</th>
<th>SOCIAL/HUMANITARIAN</th>
<th>THEATER</th>
<th>TRANSPORTATION</th>
<th>OTHER (SPECIFY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-1499</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500-1599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1600-1699</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1700-1799</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1800-1899</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1900-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECIFIC DATES** 1912 and 1925

**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.

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.
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.

GEOGRAPHICAL DATA
ACREAGE OF NOMINATED PROPERTY

<table>
<thead>
<tr>
<th>UTM REFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>ZONE</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

VERBAL BOUNDARY DESCRIPTION

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

<table>
<thead>
<tr>
<th>STATE</th>
<th>CODE</th>
<th>COUNTY</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FORM PREPARED BY
NAME / TITLE
Julie Neal, Director, Historic Buildings, Kauai, Project Nov. 10, 1976
ORGANIZATION
Kauai Historical Society
STREET & NUMBER
P. O. Box 1778
CITY OR TOWN
Lihue, Hawaii

STATE HISTORIC PRESERVATION OFFICER CERTIFICATION
THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

<table>
<thead>
<tr>
<th>NATIONAL</th>
<th>STATE</th>
<th>LOCAL</th>
</tr>
</thead>
</table>

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-666), 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

<table>
<thead>
<tr>
<th>TITLE</th>
<th>DATE</th>
</tr>
</thead>
</table>

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST:

<table>
<thead>
<tr>
<th>DATE</th>
</tr>
</thead>
</table>

KEEPER OF THE NATIONAL REGISTER
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

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
CITY, TOWN
Hanalei
STATE
Hawaii
CODE
96714
COUNTY
Kauai

3 CLASSIFICATION
CATEGORY
DISTRICT
BUILDING(S)
STRUCTURE
SITE
OBJECT

OWNERSHIP
PUBLIC
PRIVATE
BOTH

PUBLIC ACQUISITION
IN PROCESS
BEING CONSIDERED

STATUS
OCCUPIED
UNOCCUPIED
WORK IN PROGRESS
ACCESSIBLE
YES: RESTRICTED
YES: UNRESTRICTED
NO

PRESENT USE
AGRICULTURE
MUSEUM
COMMERCIAL
PARK
EDUCATIONAL
PRIVATE RESIDENCE
ENTERTAINMENT
RELIGIOUS
GOVERNMENT
SCIENTIFIC
INDUSTRIAL
TRANSPORTATION
MILITARY
OTHER:

4 OWNER OF PROPERTY
NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu,
STATE

VICINITY OF
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
DATE
October 20, 1950
DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii
CODE 96766
REPRESENTED IN FEDERAL
STATE
CITY, TOWN
DATE
Environmental Impact Statement
released February 23, 1977
FEDERAL
STATE
COUNTY
LOCAL
DESCRIPTION

DESCRIPTION

CONDITION

EXCELLENT
GOOD
FAIR

DETERIORATED
RUINS
UNEXPOSED

CHECK ONE

UNALTERED
ALTERED

CHECK ONE

ORIGINAL SITE
MOVED
DATE

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Waioli Bridge is a 26-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.
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-technical 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.
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.

GEOGRAPHICAL DATA
ACREAGE OF NOMINATED PROPERTY

UTM REFERENCES

ZONE EASTING NORTHING

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
Julia Neal, Director, Historic Buildings, Kauai, Project Nov. 10, 1976
ORGANIZATION
Kauai Historical Society
STREET & NUMBER
P. O. Box 1778
CITY OR TOWN
Lihue
STATE
Hawaii

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

DATE

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

DIRECTOR, OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION
ATTEST:

KEEPER OF THE NATIONAL REGISTER

GPO 892 493
NAME

Ma'ana Stream Ford - Kuhio Highway

LOCATION

CITY, TOWN: Hanalei
STATE: Hawaii

CLASSIFICATION

CATEGORY: STRUCTURE

OWNERSHIP: PUBLIC

STATUS: OCCUPIED

PRESENT USE: TRANSPORTATION

OWNER OF PROPERTY

NAME: State of Hawaii, Department of Transportation

LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.

REPRESENTATION IN EXISTING SURVEYS

TITLE: Environmental Impact Statement
DATE: February 23, 1977

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN: Lihue
STATE: Hawaii

8 - 90
<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CHECK ONE</th>
<th>CHECK ONE</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>EXEMPLARY</em></td>
<td><em>ATLANTIC</em></td>
<td><em>ORIGINAL SITE</em></td>
</tr>
<tr>
<td><em>GOOD</em></td>
<td><em>UNCHANGED</em></td>
<td><em>MOVED</em></td>
</tr>
<tr>
<td><em>FAIR</em></td>
<td><em>ALTERED</em></td>
<td><em>DATE</em></td>
</tr>
</tbody>
</table>

DECRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Manoa Stream Ford is a 15-foot shallow crossing of concrete aggregate 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.
SIGNIFICANCE

PERIOD
- PREHISTORIC
- 1400-1499
- 1500-1599
- 1600-1699
- 1700-1799
- 1800-1899
- 1900-

AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW
- ARCHEOLOGY-PREHISTORIC
- ARCHEOLOGY-HISTORIC
- AGRICULTURE
- ARCHITECTURE
- ART
- COMMERCE
- COMMUNICATIONS
- COMMUNITY PLANNING
- CONSERVATION
- ECONOMICS
- EDUCATION
- ENGINEERING
- EXPLORATION/SETTLEMENT
- INDUSTRY
- INVENTION
- LANDSCAPE ARCHITECTURE
- LAW
- LITERATURE
- MILITARY
- MUSIC
- PHILOSOPHY
- POLITICS/GOVERNMENT
- RELIGION
- SCIENCE
- SCULPTURE
- SOCIAL/HUMANITARIAN
- THEATER
- TRANSPORTATION
- OTHER (SPECIFY)

SPECIFIC DATES 1912

STATEMENT OF SIGNIFICANCE

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

 Territory of Hawaii

8 - 92
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

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY

UTM REFERENCES

ZONE EASTING NORTHING

ZONE EASTING NORTHING

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

STREET & NUMBER

P. O. Box 1778

CITY OR TOWN

Lihue

STATE

Hawaii

CODE

96766

DATE

April 1, 1977

TELEPHONE

245-6931

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

KEEPER OF THE NATIONAL REGISTER

CP 0 892-453
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

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
CITY, TOWN
Hanalei
STATE
Hawaii
CODE
96714
COUNTY
Kauai

3 CLASSIFICATION
CATEGORY
DISTRICT
BUILDING(S)
STRUCTURE
SITE
OBJECT

X STRUCTURE

OWNERSHIP
PUBLIC
PRIVATE
ENTRANCE

STATUS
X OCCUPIED
UNOCCUPIED
WORK IN PROGRESS
ACCESSIBLE

PRESENT USE
AGRICULTURE
COMMERCIAL
EDUCATIONAL
ENTERTAINMENT
GOVERNMENT
INDUSTRIAL
TRANSPORTATION

4 OWNER OF PROPERTY
NAME
State of Hawaii, Department of Transportation
STREET & NUMBER
869 Punchbowl Street
CITY, TOWN
Honolulu
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
DEPOSITORY FOR SURVEY RECORDS
Department of Transportation
CITY, TOWN
Lihue
STATE
Hawaii
CODE
96766
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.
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.
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

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY

UTM REFERENCES

A
ZONE
4
EASTING
40320
NORTHING
245770
B
ZONE

C
ZONE

D
ZONE

VERBAL BOUNDARY DESCRIPTION

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

<table>
<thead>
<tr>
<th>STATE</th>
<th>CODE</th>
<th>COUNTY</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FORM PREPARED BY

NAME / TITLE

Robert J. Schleck, President

ORGANIZATION

Kauai Historical Society

STREET & NUMBER

P. O. Box 1778

CITY OR TOWN

Lihue, Hawaii

DATE

April 1, 1977

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

ATTEST:

KEEPER OF THE NATIONAL REGISTER
**NAME**

**HISTORIC**

Haena Bridge Number 1 - Kuhio Highway

**AND/OR COMMON**

---

**LOCATION**

**STREET & NUMBER**

CITY, TOWN: Hanalei

STATE: Hawaii

CODE: 96714

COUNTY: Kauai

---

**CLASSIFICATION**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>OWNERSHIP</th>
<th>STATUS</th>
<th>PRESENT USE</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>DISTRICT</em></td>
<td>X PUBLIC</td>
<td>X OCCUPIED</td>
<td><em>AGRICULTURE</em></td>
</tr>
<tr>
<td><em>BUILDING(S)</em></td>
<td><em>PRIVATE</em></td>
<td><em>UNOCCUPIED</em></td>
<td><em>COMMERCIAL</em></td>
</tr>
<tr>
<td><em>STRUCTURE</em></td>
<td><em>BOTH</em></td>
<td><em>WORK IN PROGRESS</em></td>
<td><em>COMMERCIAL</em></td>
</tr>
<tr>
<td><em>SITE</em></td>
<td>PUBLIC ACQUISITION</td>
<td>ACCESSIBLE</td>
<td><em>EDUCATIONAL</em></td>
</tr>
<tr>
<td><em>OBJECT</em></td>
<td><em>IN PROCESS</em></td>
<td><em>YES: RESTRICTED</em></td>
<td><em>PRIVATE RESIDENCE</em></td>
</tr>
<tr>
<td></td>
<td><em>BEING CONSIDERED</em></td>
<td><em>YES: UNRESTRICTED</em></td>
<td><em>ENTERTAINMENT</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>NO</em></td>
<td><em>RELIGIOUS</em></td>
</tr>
</tbody>
</table>

---

**OWNER OF PROPERTY**

**NAME**

State of Hawaii, Department of Transportation

**STREET & NUMBER**

869 Punchbowl Street

CITY, TOWN: Honolulu

STATE: Hawaii

---

**LOCATION OF LEGAL DESCRIPTION**

COURTHOUSE.

REGISTRY OF DEEDS, ETC.

**STREET & NUMBER**

---

**REPRESENTATION IN EXISTING SURVEYS**

**TITLE**

Environmental Impact Statement

**DATE**

February 23, 1977

---

**DEPOSITORY FOR SURVEY RECORDS**

Department of Transportation

CITY, TOWN: Libue

STATE: Hawaii

CODE: 96766

---
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.
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.
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.

GEOGRAPHICAL DATA
ACREAGE OF NOMINATED PROPERTY
UTM REFERENCES
A
ZONE
EASTING
NORTHING
B
ZONE
EASTING
NORTHING
C
D
ZONE
EASTING
NORTHING
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
Kauai Historical Society
ORGANIZATION
245-6931
DATE
April 1, 1977
STREET & NUMBER
P. O. Box 1778
CITY OR TOWN
Lihue,
STATE
Hawaii 96766

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

DIRECTOR, OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION
ATTEST:

KEEPER OF THE NATIONAL REGISTER

GP0 692.453
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

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

CITY, TOWN

Hanalei

STATE

Hawaii

6 - 108

3 CLASSIFICATION

CATEGORY

DISTRICT

BUILDING(S)

STRUCTURE

SITE

OBJECT

OWNERSHIP

PUBLIC

PRIVATE

BOTH

PUBLIC ACQUISITION

IN PROCESS

BEING CONSIDERED

STATUS

OCCUPIED

UNOCCUPIED

WORK IN PROGRESS

ACCESSIBLE

YES: RESTRICTED

YES: UNRESTRICTED

NO

PRESENT USE

AGRICULTURE

COMMERCIAL

EDUCATIONAL

ENTERTAINMENT

GOVERNMENT

INDUSTRIAL

MILITARY

TRANSPORTATION

OTHER:

4 OWNER OF PROPERTY

NAME

State of Hawaii, Department of Transportation

STREET & NUMBER

869 Punchbowl Street

CITY, TOWN

Honolulu

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

STATE

COUNTY

LOCAL

DEPOSITORY FOR SURVEY RECORDS

Department of Transportation

CITY, TOWN

Lihue

STATE

Hawaii

96766
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.
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, 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.
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

GEOGRAPHICAL DATA
ACREAGE OF NOMINATED PROPERTY
UTM REFERENCES

| A [0, 4] | B [1, 6, 9] | C [2, 15, 1, 0] | D [3, 1, 3] |
| ZONE     | EASTING    | NORTHING      | ZONE     |

VERBAL BOUNDARY DESCRIPTION

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

<table>
<thead>
<tr>
<th>STATE</th>
<th>CODE</th>
<th>COUNTY</th>
<th>CODE</th>
</tr>
</thead>
</table>

FORM PREPARED BY
NAME / TITLE
Robert J. Schleck, President

ORGANIZATION
Kauai Historical Society

STREET & NUMBER
P. O. Box 1778

CITY OR TOWN
Hanalei

STATE
Hawaii

PHONE
245-6931

DATE
April 1, 1977

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST:

KEEPER OF THE NATIONAL REGISTER

GPO 892-453
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

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

CITY, TOWN
Hanalei
STATE Code
Hawaii 96714

3 CLASSIFICATION

CATEGORY

DISTRICT
BUILDING(S)
STRUCTURE
SITE
OBJECT

X PUBLIC
PRIVATE
BOOTH
PUBLIC ACQUISITION
IN PROCESS
BEING CONSIDERED

OWNERSHIP

X OCCUPIED
UNOCCUPIED
WORK IN PROGRESS
ACCESSIBLE
YES: RESTRICTED
NO:

STATUS

PRESENT USE

AGRICULTURE
COMMERCIAL
EDUCATIONAL
ENTERTAINMENT
GOVERNMENT
INDUSTRIAL
MILITARY
MUSEUM
PARK
PRIVATE RESIDENCE
RELIGIOUS
SCIENTIFIC
TRANSPORTATION

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation

STREET & NUMBER
869 Punchbowl Street

CITY, TOWN
Honolulu
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

DATE
October 20, 1950

DEPOSITORY FOR SURVEY RECORDS
Department of Transportation

CITY, TOWN
Lihue
STATE
Hawaii

Environmental Impact Statement released February 23,1977
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 occurred 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.
SIGNIFICANCE

AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

PERIOD
PREHISTORIC  
1-400  
400-1499  
1500-1599  
1600-1699  
1700-1799  
1800-1899  
1900- 

ARCHAEOLOGY-PREHISTORIC  
ARCHAEOLOGY-HISTORIC  
AGRICULTURE  
ARCHITECTURE  
ART  
COMMERCE  
COMMUNICATIONS  
COMMUNITY PLANNING  
CONSERVATION  
ECONOMICS  
EDUCATION  
ENGINEERING  
EXPLORATION/SETTLEMENT  
INDUSTRY  
INVENTION  
LANDSCAPE ARCHITECTURE  
LAW  
LITERATURE  
MILITARY  
MUSIC  
PHILOSOPHY  
POLITICS/GOVERNMENT  
RELIGION  
SCIENCE  
SCULPTURE  
SOCIAL/HUMANITARIAN  
THEATER  
TRANSPORTATION  

SPECIFIC DATES  1913  

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.
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.

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY
UTM REFERENCES

ZONE | EASTING | NORTHING
A | | |
C | | |

ZONE | EASTING | NORTHING
B | | |
D | | |

VERBAL BOUNDARY DESCRIPTION

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

STATE | CODE | COUNTY | CODE

FORM PREPARED BY

NAME/TITLE
Julia Neal, Director, Historic Buildings, Kauai, Project Nov. 10, 1977
ORGANIZATION
Kauai Historical Society

STREET & NUMBER
P. O. Box 1778

CITY OR TOWN
Lihue

STATE
Hawaii

TELEPHONE
245-6931

CODE
96766

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

TEST:

KEEPER OF THE NATIONAL REGISTER
UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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

CITY, TOWN
Hanalei
VICINITY OF

STATE
Hawaii
CODE 96714
COUNTY Kauai

3 CLASSIFICATION

CATEGORY
DISTRICT
BUILDING(S)
STRUCTURE
SITE
OBJECT

OWNERSHIP
X PUBLIC
PRIVATE
BOTH

PUBLIC ACQUISITION
IN PROCESS
BEING CONSIDERED

STATUS
X OCCUPIED
UNOCCUPIED
WORK IN PROGRESS
ACCESSIBLE

PRESENT USE
AGRICULTURE
MUSEUM
COMMERCIAL
PARK
EDUCATIONAL
PRIVATE RESIDENCE
ENTERTAINMENT
RELIGIOUS
GOVERNMENT
SCIENTIFIC
INDUSTRIAL
TRANSPORTATION
MILITARY
OTHER:

4 OWNER OF PROPERTY

NAME
State of Hawaii, Department of Transportation

STREET & NUMBER
869 Punchbowl Street

CITY, TOWN
Honolulu
VICINITY OF
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
STATE
COUNTY
LOCAL

DEPOSITORY FOR SURVEY RECORDS
Department of Transportation

CITY, TOWN
Lihue
STATE
Hawaii
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.
### SIGNIFICANCE

**PERIOD**
- □ PREHISTORIC
- □ 100-1499
- □ 1500-1599
- □ 1600-1699
- □ 1700-1799
- □ 1800-1899
- □ 1900-

### AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW
- □ ARCHAEOLOGY-PREHISTORIC
- □ ARCHAEOLOGY-HISTORIC
- □ AGRICULTURE
- □ ART
- □ COMMERCIAL
- □ COMMUNICATIONS
- □ COMMUNITY PLANNING
- □ CONSERVATION
- □ ECONOMICS
- □ EDUCATION
- □ ENGINEERING
- □ EXPLORATION/SETTLEMENT
- □ INDUSTRY
- □ INVENTION
- □ LANDSCAPE ARCHITECTURE
- □ LAW
- □ LITERATURE
- □ MILITARY
- □ MUSIC
- □ PHILOSOPHY
- □ POLITICS/GOVERNMENT
- □ RELIGION
- □ SCIENCE
- □ SCULPTURE
- □ SOCIAL/HUMANITARIAN
- □ THEATER
- □ TRANSPORTATION
- □ OTHER (SPECIFY)

### SPECIFIC DATES

| 1957 |

### STATEMENT OF SIGNIFICANCE

The Waimoku 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 Kukui Highway. The Waimoku Bridge replaced three spans (Stringer Span on Pile, Timber Truss, and Timber and Reinforced Concrete Truss) built, respectively in 1922 (#1), 1931 (#2) and 1931 (#3).
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

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY

UTM REFERENCES

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

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

STREET & NUMBER
P. O. Box 1778 245-6931

CITY OR TOWN  STATE
Lihue  Hawaii  96766

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

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

KEEPER OF THE NATIONAL REGISTER

8 - 124
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 & Kapapa 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. Classification

Ownership of Property
(Choose as many boxes as apply)

- [ ] private
- [X] public-local
- [ ] public-State
- [ ] public-Federal

Category of Property
(Choose only one box)

- [ ] building(s)
- [ ] district
- [ ] site
- [X] structure
- [ ] object

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

- [ ] Contributing
- [ ] Noncontributing

- Number of contributing buildings
- Number of contributing sites
- Number of contributing structures
- Number of contributing objects
- Total

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)

- [ ] 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)

☐ 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.

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 Criteria 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 Nati 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 Kaua'i County
☐ 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

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 ______ Lihue________________________ 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.
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–Oloheha, 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," 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 Waialua River Bridge that was dismantled in 1919 and used for roads and bridges in the area. (See "Age," below.)

An archaeological 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
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
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 'Ōpe'ae Road Bridge top chords and western end posts, they may also have come from the old Wailua Bridge. (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.” The other two are 'Ōpe'ae 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).
NOTES


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'opae, Pu'upilo and Kalama—have, confusingly, changed since they were constructed. Pu'u'opae 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'opae 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'opae U about 40 yards from the bridge.

5. Spencer Mason Architects, p. 216.


National Register of Historic Places
Continuation Sheet

Section 7 Page 5 of 10 Name of property Puʻuʻōpaʻe Bridge County and State Kauaʻi, Hawaiʻi

Narrative Description, Continued
Kaua'i County Department of Public Works. "Repairing of Truss Bridge Across Kalama Stream, Wailua Hmstd, Dist. of Kawaihau, Kauai." 1958.
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
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
ASSOCIATE MEMBER A.S.C.E.
SUPERINTENDENT

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
National Register of Historic Places
Continuation Sheet

Section 7 Page 8 of 10 Name of property Pu'u'opae Bridge County and State Kauai, Hawaii

Narrative Description, Continued
Kauai County Board of Supervisors records, P1150
AGREEMENT

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.
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.

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.
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.” 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.” 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.

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.” 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.

Despite the formidable opposition, some of Kauai’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.”

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
lottery at the court house in Lihu'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 ‘Olohe‘ena’, ‘Puuopae’, and ‘Puu pilo’, 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.”

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 ox cars in hauling firewood from the mountains and there is nothing else in the way of roads there today.”

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.” 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.

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.

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 Olohe‘ena Rd., which provided the lifeline between the homesteads and the Belt Road. Several joined to form an association in 1918 to
"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 Waialua 1st series were lotteried "so that homesteaders may drive up to their prospective front doors just as soon as they have selected the lots."

Kapa'a Homesteads roads and bridges increased in importance after the Waialua Homesteads were opened, because Waialua 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). Oloheana funneled both sets of homesteaders from their maula lands to the Belt Road. Waialua Homesteads was not directly linked to the Belt Road until 1936, when Depression-era federal funding constructed the 'Opaeka'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.

By the time the 31 lots in adjacent Waialua 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." 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.

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 Waialua tract when it was opened in 1919) became Game Warden;
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, ʻŌpaekā'a, Kamalu and Oloheha 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 Hawai'i'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, Conrades, Kauai, Hanohano, Kauai, 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, Areong, 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.
National Register of Historic Places
Continuation Sheet

Section _ 8 _ Page _ 5 of 6 _ Name of property _ Pu‘u‘ōpae Bridge _ County and State _ Kaua‘i, Hawai‘i

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 Waialua Bridge. It remains a valuable historical resource for interpreting the too-little understood, non-plantation-related development of Territorial Hawai‘i.

NOTES


15. “Petition from Kapaa for construction of homestead roads in Kapaa mauka,” records of the Kauai County Board of Supervisors, P895, August 6, 1913.


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.


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-Olohe, Island of Kauai, HTS Plat 3016, Surveyed by S. W. Tay, March-June, 1912," which is located in the Kauaii Historical Society archives.
Major Bibliographical References


Bushnell, Tina and Hammatt, Hallett. “Archaeological Investigation of Pu'upuea (Kalama) Bridge in Wailua Homesteads, South Oloheka, Ahupu'a Puna District, Kaua'i, Hawaii.” Study prepared by Cultural Surveys Hawaii, Inc. for Belt Collins and Associates, December 1996.


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 Board of Supervisors Minutes Books and Miscellaneous Documents. 1911-1929. Office of the Kaua‘i County Clerk, Lihu‘e.


_______. “Hawaii Territory Survey: Kapaa Section.” HTS Plat 3014. 1914.


National Register of Historic Places
Continuation Sheet

Section ___ Page ___ of ___ 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 Olohe'na 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'
Geographical Data

Detail of USGS Map, Kapaa Quadrangle, Hawaii-Kauai Co., 7.5-Minute Series (full map is enclosed).
National Register of Historic Places
Continuation Sheet

Section _10_ Page __ 3 of 4 _ Name of property _ Pu‘u‘ōpa Bridge _ County and State _ Kaua‘i, Hawai‘i

Geographical Data

Map detail: Hawaii Territory Survey: Kapaa Homesteads 2nd Series. HTS Plat 3016. 1912
Geographical Data

Map detail: Hawaii Territory Survey: Wailua Homesteads First Series, HTS Plat 3033. 1919
PUUOPAE BRIDGE (KALAMA STREAM)
Kapaa Homesteads 2nd Series

APPROACH

VIEW FROM NORTHWEST SIDE
Puuopae Bridge, originally known as Kapaa Homesteads Bridge No. 2, was built in 1915. It is the earliest bridge to be constructed beyond the Belt Road, in the island's homesteading lands, that is included in Kauai's Historic Bridge Inventory.* Puuopae Bridge stands today both as a record of building standards of the era and as a testament to the little-remembered historic homesteading movement in Hawaii.

**INTEGRITY**

**Location.** The Puuopae Bridge is in its original location, carrying Puuopae Road over Kalama Stream in the Kapaa Homesteads.** The placement of Puuopae Road is shown on the Hawaii 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 opening the following year. (Appendix B)

**Design.** Puuopae Bridge was originally trussed, as evidenced by a small sketch included in correspondence regarding the construction of the bridge in 1915, but its original concrete-encased steel floor remains in place. (Appendix C) The 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. (Appendix A)

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

**Workmanship.** The bridge is not in its original condition. Repair data located in the County Engineering office indicates that in 1958, two 48 foot I-beams were installed

---

* There is confusion about the name of this bridge. It was originally identified as Kapaa Homesteads Bridge No. 2, and it was occasionally referred to in the road supervisor's reports during construction as Puupilo Bridge, but it has traditionally been called Puuopae Bridge. Although it crosses over Kalama Stream (and one sheet of repair plans in the County Engineer's office refers to it as Kalama Stream Bridge, it is not the Kalama Bridge, which is located makai of this bridge on Kamalu Road.

** Underlined clauses are cited from the 1989 Historic Bridge Inventory: Island of Kauai.
beneath the concrete and steel girder floor system for structural support. While the plans indicate that the truss was still in place at the start of the project, it might have been removed after the I-beam support system was in place. Rusting and collision damage have also affected the original workmanship.

**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.

**Association.** The construction of Puuopae Bridge in 1915, two years after the Kapaa 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 Hawaii 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 Kapaa, Kalaheo and elsewhere in Hawaii.

The sale of public land as a strategy to increase Hawaii’s population of small, independent farmers was controversial. Most of the early territorial governors supported big sugar interests and showed “little faith in homesteading.” 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.” 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.

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.” 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.

Despite the formidable opposition, some of the 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 Oloheana-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.”

The Waipouli Homesteads tract that Broadbent referenced was also known as Kapaa Homesteads 2nd Series. It included 81 lots ranging in size from 17.27 acres to 41.32 acres. The lots were sold by lottery at the court house in Lihue 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 survey map of the tract, they did not, in fact, exist when the Kapaa 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 ‘Oloheana’, ‘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.” The Board of Supervisors referred the matter to County Road Supervisor Joseph H. Moragne for action, but a letter to The Garden Island indicated that no progress had been made six months later: “As for roads, there are none, there are cattle trails all over this country and these were followed by oxcart in hauling firewood from the mountains and there is nothing else in the way of roads there today.”

Water, too, was unavailable in Kapaa Homesteads. In December 1913 the homesteaders petitioned the Supervisors “for water pipes to be laid for their use.” 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.

Makee was in a potentially advantageous position with regard to the Kapaa 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 by 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.

The Kapaa 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 Oloheana.
Rd., which provided the lifeline between the homesteads and the Belt Road. Several joined to form an association in 1918 to “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 Kapaa undoubtedly helped convince officials that roads should be in place before new homesteading lands in 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.”

Kapaa 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 Kapaa Homesteads roads—Puupilo, Puupae and Kamalu (which ran parallel to Puupae along the foot of Nounou Mountain). Oloheha funneled both sets of homesteaders from their mauka lands to the Belt Road. (Appendix B) Wailua Homesteads was not linked to the Belt Road until 1936, when Depression-era federal funding constructed the Opaekaa Bridge and extended Kuamoo to the ocean. As a result, this network— including Puupae Bridge remained important throughout the homesteading era.13

By the time the 31 lots in adjacent Wailua Homesteads 1st Series were lotteried in December 1919, at least some of the Kapaa Homesteaders were farming successfully: The Garden Island reported in January of that year that 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 Hawaii reported that lot owners had “become landlords to corporate agricultural operators.”14 Its final report to the governor on December 31, 1946 declared that

in Honolua, 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 Canners Co.15

Many of the Kapaa 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 Kapaa holdings by buying a lot in the Wailua tract when it was opened in 1919) became Game Warden; C. K. Amalu served as a judge. Gradually, much of the Wailua and Kapaa Homesteads 2nd Series was rezoned for residential use. Today, the
"bowl" of land adjacent to Puuopae Bridge, bordered by Puuopae, Opaekaa, Kamalu and Oloheana roads contains some of the only remaining area of significant agricultural acreage (nearly 400 acres) in the region.

AGE

1. Written correspondence between Hawaii Superintendent of Public Works Charles R. Forbes and Kauai County Road Supervisor Joseph H. Moragne establishes the bridge’s period of construction as being between March and July 1915. (Appendix C)

On March 3, 1915 Hawaii Superintendent of Public Works Charles R. Forbes visited Kauai for a few days to investigate the surveyed routes for a plantation railroad in the Waipouli homesteads. He might also have discussed with Moragne the lack of adequate roads in the area, because his correspondence dated March 25, 1915 referenced Moragne’s letter of March 19. Perhaps plans for Puuopae bridge had already been developed, since Forbes’s correspondence included both a blueprint pinpointing the location of the bridge on Puuopae Road (with a small sketch of a truss-style bridge design below it) and an agreement for the Territory to pay the county $800 to construct the bridge. The agreement was approved by the Kauai Board of Supervisors on April 7, 1915.

Work proceeded quickly on the bridge. At the June 8 meeting of the Board of Supervisors, Moragne reported that construction was in progress. It had been completed by the time of the August report.

2. As previously noted, the end posts of the bridge have the same dimensions and riveted construction as the top chords and western end posts of the Opaekaa Bridge. 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.” Opaekaa Stream Bridge one mile from the Puuopae Bridge was constructed from parts of the dismantled bridge. (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 Kapaa Homesteads.) The County Road Supervisor’s activities report of May 1920, eight months after Wailua Bridge was dismantled, notes that small bridge repairs had been completed in the area: Since the end posts on Puuopae Bridge are so similar to the Opaekaa Bridge top chords and western end posts, they may also have come from the old Wailua Bridge.

ADDITIONAL CRITERIA

Events. The Puuopae Bridge and Road have been integral to the story of the Kapaa and Wailua Homesteads’ origins and development.
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 Hawaii and strengthen the psychological bonds with the United States. One of the requirements of the lottery winners in Kapaa 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, now Macy's) before acquiring his homesteading lands in Kapaa, was described 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." 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."

The history of the Kapaa 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 Kapaa 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, Kanai, Hanohano, Kaui, Kainoa, Kelekoma, Booge, French, Miyashi, Souza, Reis, Wilson, Tracy, Johonnott, 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.

DISTINCTIVE CHARACTERISTICS

Type. Puuopae Bridge is a rare example of a bridge with a steel girder floor system, an unusual combination of concrete-encased steel floor beams and steel girders. It is one of only two of its structural type. Only this bridge and the Eleele Pedestrian Overpass are classified as having steel girder floor systems on the State Bridge Inventory, and the Puuopae Bridge predates Eleele by almost a quarter of a century.

Period. Puuopae Bridge is an excellent example of the early twentieth century period of homestead bridge construction.

Construction. Its single span is 46 feet and its length is 48 feet. The height of the soffit of the bridge over the stream is about 11 feet.
Work of a Master. The actual design 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 Puuopae Bridge through his position as county road supervisor and engineer as well as his correspondence with Charles Forbes about the construction of the bridge. He certainly supervised its construction. Investigations about the designer of this bridge are continuing.

Artistic Value. The bridge is purely functional, and has no artistic characteristics. However, the pattern formed by the rivets is interesting.

Distinguishable Entity. The Puuopae Bridge is a distinguishable entity because it is the earliest bridge in the Historic Inventory built in Kauai’s homesteading tracts. It is one of only three bridges on Kauai where riveted metal construction is visible. The other two are S-18 Hanalei River Bridge and C-13 Opaekaa Stream Bridge, both of which are listed on the National Register of Historic Places. It also has [a rare] combination of concrete-encased steel floor beams and steel girders.

Unusual Resource. The Puuopae Bridge is an unusual resource because of its historical links to the development of the Kapaa Homesteads, and the direct involvement of the community there in pressuring the government to build 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.

SUMMARY

The historical significance of Puuopae Bridge as a very early example of bridge-building in the homesteading lands is great. Although the bridge has lost its truss, its original flooring and dimensions make it a valuable resource for interpreting the too-little understood, non-plantation-related development of Territorial Hawaii.
United States Department of the Interior
National Park Service

National Register of Historic Places
Inventory—Nomination Form

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Ownership</th>
<th>Status</th>
<th>Present Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>district</td>
<td>X__ public</td>
<td>X__ occupied</td>
<td>___ museum</td>
</tr>
<tr>
<td>building(s)</td>
<td>private</td>
<td>unoccupied</td>
<td>___ park</td>
</tr>
<tr>
<td>structure</td>
<td>both</td>
<td>work in progress</td>
<td>___ commercial</td>
</tr>
<tr>
<td>site</td>
<td>X__ Public Acquisition</td>
<td>yes: restricted</td>
<td>___ educational</td>
</tr>
<tr>
<td>object</td>
<td>in process</td>
<td>Accessible</td>
<td>___ entertainment</td>
</tr>
<tr>
<td></td>
<td>being considered</td>
<td>X__ yes: unrestricted</td>
<td>___ government</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>no</td>
<td>___ industrial</td>
</tr>
</tbody>
</table>

4. Owner of Property

name  County of Kauai

street & number  4396 Rice Street

city, town  Lihue  X__ 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?  X__ yes  ___ no

date  1982

___ federal  X__ state  ___ county  ___ local

depository for survey records  Department of Land & Natural Resources

city, town  Honolulu  state  Hawaii
7. Description

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.
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
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
Opaekaa Bridge
vicinity of Kapaa, Kauai, Hawaii

photographer: Don Hibbard
1982

lateral view of the bridge from the southeast
negative in DLNR
1 of 3 photographs

Opaekaa Bridge
vicinity of Kapaa, Kauai, Hawaii

photographer: Don Hibbard
1982

head on view from the north
negative in DLNR
2 of 3 photographs
Opaekaa Bridge
vicinity of Kapaa, Kauai, Hawaii
photographer: Don Hibbard
1982

view of manufacturer's name plate on
top chord, west side
negative on file in DLNR
photograph 3 of 3
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 no. 2 (Summer 1978)

10. Geographical Data

Acreage of nominated property: less than a quarter acre

Quadrangle name: Kapaa

UMT References

A Zone Easting Northing
4 4 6 0 7 0 0

B Zone Easting Northing
2 4 3 9 7 8 0

Verbal boundary description and justification:
This nomination includes the bridge, its footings and the land & water they stand upon and span.

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]

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: [Signature]

date

Chief of Registration: 8 - 170
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 Supervisor, 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.
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 does not meet the National Register Criteria. I recommend that this property be considered significant ___
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

<table>
<thead>
<tr>
<th>Contributing Noncontributing</th>
<th>NA</th>
<th>NA</th>
<th>buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>sites</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td>structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>objects</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

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 Methodists 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.
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.

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.)

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 University of Hawaii
6. Immaculate Conception Centennial Booklet 1984
7. Tales of Old Kapaia by David Hyun
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. Id 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 # _________

___ 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: ____________________________

10. Geographical Data

Acreage of Property: Less than 1 acre

UTM References (Place additional __ 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 ________

---------------------------------

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.
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, school, 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, and 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.
The Kapaia Swinging Bridge crosses the Kapaia Stream; whose source is the Kapaia Reservoir and outlet is Hanamaʻulu Bay. Kapaia Camp was one of many camps established by Lihue Plantation. Workers from Kapaia irrigated and maintained the sugar cane fields at Hanamaʻulu.

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 Kapaia Valley 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.
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
NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
Section 8  Page 3
name of property : Kapaia Swinging Bridge
county and State: Kauai, HI

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
name of property: Kapaia Swinging Bridge
county and State: Kauai, HI

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.
NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
Section 9  Page 1
name of property: Kapaia Swinging Bridge
county and State: Kauai, HI

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 University of Hawaii
6. Immaculate Conception Centennial Booklet 1984
   Fujimoto, Kimiyo Takemoto. Interview 2006
   Inagaki, Ethel Iida. Interview 2006
   Hyun, David. Interview 2006
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. Id 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.
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
NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET
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
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
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

AGAINST PASSAGE: None

EXCUSED & NOT VOTING: None

TOTAL - 7, TOTAL - 0, TOTAL - 0.

Lihu'e, Hawai'i
February 14, 2007

Peter A. Nakamura
County Clerk, County of Kaua'i
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.

http://maps.yahoo.com/print?ard=1&v3=0&.intl=us&.mvt=m&tp=1&stx=&clat=21.989888&clon... 1/7/2008
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 Kapaa," this map records the Way that the culture of modern Hawaii began long ago.

Old Kapaa 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 Kapaa," 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 Sai Chop Suey
36 Parking
37 Fernandes Store
38 Ibara Store
39 Fuijita Store
40 Service Station
41 Chinese Temple
42 Chinese House
43 Chinese House
44 Chinese House
45 Carvalho Store
46 Wata nabe Home
47 Hanon Home
48 Boiser Home
49 Boiser Boxing Gym
50 Store
51 Hagamuna 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 Loevy Dovie 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

XII
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
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

AGAINST PASSAGE: None

EXCUSED & NOT VOTING: None

TOTAL - 7,
TOTAL - 0,
TOTAL - 0.

Līhu‘e, Hawai‘i
February 14, 2007

Peter A. Nakamura
County Clerk, County of Kaua‘i
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.

http://maps.yahoo.com/print?ard=1&v3=0&.intl=us&.mvt=m&tp=1&stx=&clat=21.989888&clon... 1/7/2008
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 Hooles (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  27 Monkey Pod Tree  53 Korean Methodist Ch.
2 Island Highway  28 Kapaia Playground  34 Hyun Residence
3 Sugar Cane Fields  29 Shoot Marble Circle  55 Hyun Garage
4 Swimming Hole  30 Volleyball Court  56 Vegetable Garden
5 Swimming Hole  31 Soft Baseball  57 Chicken Coop
6 Foot Trail  32 One Basket Basketball  58 Duck Pond
7 Foot Trail  33 Golf Club Range  59 Buddhist Temple
8 Foot Trail  34 Japanese Girl Barbers  60 Priest Residence
9 Foot Trail  35 Tom Sue Chop Suey  61 Auditorium - Gym.
10 Hanging Foot Bridge  36 Parking  62 Teacher's Compound
11 Side Road  37 Fernandes Store  63 Japanese School
12 Side Road  38 Ibara Store  64 Ah Chock Store
13 Dirt Road  39 Fujita Store  65 Ching Residence
14 Dirt Road  40 Service Station  66 Chinese Home
15 Dirt Road  41 Chinese Temple  67 Chinese Home
16 Steep Slope  42 Chinese House  68 Chinese Home
17 Hillside Slope  43 Chinese House  69 Lovey Dovey House
18 Road Cut Cliff  44 Chinese House  70 Ghost House
19 Guaya Bushes  45 Carvalho Store  71 To Waialua Waterfalls
20 Lantana Bushes  46 Wata nabe Home  72 Old Chinese House
21 Island Plum Tree  47 Halmoni Home  73 Rice Mill & Flume
22 Lichee Tree  48 Boise Home  74 Portuguese Catholic Ch.
23 Star Apple Tree  49 Boiseer Boxing Gym  75 Nun's Home
24 Chinese Grapefruit  50 Store  76 Hawaiian Family
25 Abandoned Rice Patch  51 Nagashima Store  77 Hunting Dogs Yard
26 Taro Patch  52 Pool Hall  78 Plantation Housing
Photo #5 of 5
Photo by Laraine Moriguchi 2006
Swinging bridge link to past

Group seeks restoration funds

Without the bridge, the only way for pedestrians to cross between Kapaha and Kaneohe would be on Kamehameha Highway. It would be a waste if somebody used the swinging bridge and was to get hit by a car or hit the bridge. St. John said.

A group from Waialua said they were restoring the bridge because it brought values and became an "access bridge" for people who live in the valley, residents, and the community.

"Everyone associated with the valley," St. John said before the meeting. "We will probably be coming in with a bylaw that requires all of these bridges to be restored. We want the people to restore the bridge before it is too late and too expensive.

St. John said that the bridge is an important link for the valley.

During a break in the meeting, those three pedestrian bridges are located in Waialua, Kalihi Valley, and in Kamuela Valley to Keha's. A group of safety officials and the city administration plans to make a proposal about the swing bridge.

The swinging bridge has a long history of being restored and the community is concerned about the bridge being restored.

"It's a long history there," St. John said before the meeting. "We will probably be coming in with a bylaw that requires the bridge to be restored. We want the people to restore the bridge before it is too late and too expensive.

St. John said that the bridge is an important link for the valley.

During a break in the meeting, those three pedestrian bridges are located in Waialua, Kalihi Valley, and in Kamuela Valley to Keha's. A group of safety officials and the city administration plans to make a proposal about the swing bridge.

The swinging bridge has a long history of being restored and the community is concerned about the bridge being restored.

"It's a long history there," St. John said before the meeting. "We will probably be coming in with a bylaw that requires the bridge to be restored. We want the people to restore the bridge before it is too late and too expensive.

St. John said that the bridge is an important link for the valley.
The Kapaa 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 Kauai 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: savekapabridge@yahoo.com.

Peter K.

Peter K. "Pete" died at Queen’s Medical Center in O‘ahu on November 7, 1957, at the age of 48.

Born in Hilo in 1909, he was a brother and uncle of Liliuokalani Kainapahu. His nephew, Kainapahu in 1957, was a

**OF THANKS**

JOSPEH RAPozo

17.1936-12.1.1929

"I am grateful and thankful for you, Pete."

The Kapaa Swing Bridge linked extremely diverse cultures to form a unique society that no longer exists in this world," she said in the letter.

"Today, remnants of a flourishing plantation community still exist."

Through a valley resident, Pete was young compared to his other letter-signers, Laura Fujimoto, Mina and Ethel Inouye, 90, were both raised in the Kapaa Valley.

Lester Chang, staff writer, can be reached at 245-3681 (ext. 223) or lchang@kauai.gov.com.
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: [Signature] DATED: __________

[Signature]
(By Request)

DATE OF INTRODUCTION:

February 14, 2007

Lihue, Kauai, Hawaii
OAHU NOMINATION FORMS

THE ALA WAI CANAL
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

☐ I hereby certify that this □ nomination
does not meet 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

☐ satisfies ☐ does not meet the National Register criteria. I recommend that this property be considered significant

☐ nationally  ☐ state wide  ☐ 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:

☐ 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 the Keeper  ____________________________  Date of Action  ________________

☐ 8 - 207
**The Ala Wai Canal**

**Honolulu County, HI**

**5. Classification**

<table>
<thead>
<tr>
<th>Ownership of Property (Check as many boxes as apply)</th>
<th>Category of Property (Check only one box)</th>
<th>Number of Resources within Property (Do not include previously listed resources in the count.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ private</td>
<td>□ building(s)</td>
<td>Contributing buildings</td>
</tr>
<tr>
<td>□ public-local</td>
<td>□ district</td>
<td></td>
</tr>
<tr>
<td>√ public-State</td>
<td>□ site</td>
<td>Noncontributing sites</td>
</tr>
<tr>
<td>□ public-Federal</td>
<td>□ structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ object</td>
<td></td>
</tr>
</tbody>
</table>

Number of contributing resources previously listed in the National Register

|                                |                                           |                                           |
|                                |                                           |                                           |

**6. Function or Use**

<table>
<thead>
<tr>
<th>Historic Functions (Enter categories from instructions)</th>
<th>Current Functions (Enter categories from instructions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTRACTIVE: extractive facility</td>
<td>RECREATION: outdoor recreation</td>
</tr>
<tr>
<td>= canal</td>
<td>= boating and fishing</td>
</tr>
<tr>
<td>RECREATION: outdoor recreation</td>
<td>OTHER: drainage facility = canal</td>
</tr>
<tr>
<td>= boating and fishing</td>
<td></td>
</tr>
<tr>
<td>OTHER: drainage facility = canal</td>
<td></td>
</tr>
</tbody>
</table>

**7. Description**

<table>
<thead>
<tr>
<th>Architectural Classification (Enter categories from instructions)</th>
<th>Materials (Enter categories from instructions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No style</td>
<td>foundation</td>
</tr>
<tr>
<td></td>
<td>walls  stone and concrete</td>
</tr>
<tr>
<td></td>
<td>roof</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
</tbody>
</table>

**Narrative Description**

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

Honolulu County, HI

10. Geographical Data

Acreage of Property 48.5 acres

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

1 Zone 6 2 1 3 6 2 1 5 2 1 3 5 1 3 5 1 0 0
Easting 6 2 1 3 6 2 1 0 0
Northing 2 1 3 5 1 4 8 1 7 5

3 Zone 6 2 0 1 2 5 2 1 3 5 4 7 5 0
Easting 6 2 0 1 0
Northing 1 1 1 1

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
Name of Property

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
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, Moiliili and Ala Moana areas of the city. Since its construction in 1928 the canal has been used for recreational purposes which include boating (motorizing, 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)

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 Moiliili 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 constructed 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 by paddlers and fishermen.

Historical Background and Significance:

Since the 1500s, "Waialae" 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 loke (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. Hoddy, 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 Apuaheau 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 Kapahu 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 Apuaheau 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 Kapahu Road. In his annual report to the Governor in 1924, Bigelow stated that the canal had been excavated its entire length ending at Kapahu 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

Bibliography


"City Workers To Strengthen Canal's Banks." Honolulu Advertiser, June 30, 1950.


The Ala Wai Canal
Honolulu County, HI

Bibliography (continued)


The Ala Wai Canal
Honolulu County, HI

Bibliography (continued)

"Realtor Sees Big Growth At Waikiki." Honolulu Advertiser, October 17, 1928.
"Waikiki Magic Sends Lure World Over." Honolulu Advertiser, October 17, 1928.

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 Justification

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 mauka side of the canal. This area makes up the recreational "water park" that is the Ala Wai Canal today.
MAUI NOMINATION FORMS

KAUUMANU AVE- NANILOA DRIVE OVERPASS

WAI’ALE DRIVE BRIDGE

HĀNA BELT ROAD
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

<blank line>

Name: Ka‘ahumanu Avenue - Naniloa Drive Overpass

<blank line>

Other names/site number: Naniloa Drive Overpass, Naniloa Drive/Highway Underpass

2. Location

<blank line>

Street & number: Naniloa Drive at Kaahumanu Avenue

City or town: Wailuku

State: Hawai‘i

Zip code: 96793

Vicinity: N/A

State/Federal Agency Certification

<blank line>

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

Service or Federal agency and bureau

8-223
4. National Park Service Certification

☐ 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

Contribute     Noncontributing

Buildings

Sites

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 ( ) 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.
Ka`ahumanu Drive - Naniloa Drive Overpass
Maui County, Hawai`i

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.)

=================================================================================================
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
[-] Other State agency
[-] Federal agency
[-] Local government
[-] University
[-] Other
Name of repository: ____________________________

8-226
Ka anumaku Drive - Naniloa Drive Overpass  
Maui County, Hawai`i  

10. Geographical Data  

- Acreage of Property: approximately 2 acres  

Circle:  

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

<table>
<thead>
<tr>
<th>Zone</th>
<th>Easting</th>
<th>Northing</th>
<th>Zone</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>760</td>
<td>420</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>334</td>
<td>874</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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.  

Form Prepared By  

Circle:  

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 PPO for any additional items)
Ka`ahumanu Drive - Naniloa Drive Overpass
Maui County, Hawai`i

----------------------------------------------------------------------------------
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
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’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 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 row 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 beloved 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-Kanulului 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-box 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


Maui News, 1936.

Photographs were taken by Dawn E. Duensing, who has the negatives.

1. Kaʻahumanu Avenue - Naniloa Drive Overpass
2. Maui County, Hawaiʻi
3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Kaʻahumanu 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. Kaʻahumanu Avenue - Naniloa Drive Overpass, retaining walls and guardrails; view looking east

3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Kaʻahumanu Avenue - Naniloa Drive Overpass, view of roadway and bridge; looking north

3. Dawn E. Duensing
4. September 12, 2004
5. Dawn E. Duensing
6. Kaʻahumanu Avenue - Naniloa Drive Overpass, northwest pier with inscribed date of construction; view looking west
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
   city or town: Wailuku
   state: Hawai'i
   code: HI
   county: Maui
   code: 009
   zip code: 96793
   not for publication: N/A
   vicinity: Kahului

3. State/Federal Agency Certification

   As the designated authority under the National Historic Preservation Act of 1966, 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: [Signature]
   Date: 9/16/98

   State or Federal agency and bureau:

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 Keeper:
   Date of Action:

   [Signature]

   [Date]

   State or Federal agency and bureau:

USD/NPS NRHP Registration Form
Wai'ale Drive Bridge
Maui, Hawai'i

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

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

Number of Resources within Property

<table>
<thead>
<tr>
<th></th>
<th>Contributing</th>
<th>Noncontributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>buildings</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>sites</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>structures</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>objects</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

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, 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.
USD/NPS NRHP Registration Form
Waiali Drive Bridge
Maui, Hawaii
Historic Highway Bridges of Hawaii, 1894 - 1941. Page 4

11. Form Prepared By
name/title: Barbara Shideler/Architect; Spencer Leineweber/Architect; Ann Yoklaviich/Architectural Historian
organization: Spencer Mason Architects
date: May 21, 1996
street & number: 1050 Smith Street
telephone: (808) 336-3636
city or town: Honolulu state: Hawaii
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 Hawaii, 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 97127, Washington, DC 20040-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.
NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 1 Wai‘ale Drive Bridge
Maui, Hawai‘i

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 provide 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

1Hawai‘i (State), Department of Transportation, Design Plans: Wai‘ale R. R. Overpass, Sta. 20. prepared by Territorial Highway Department, Territory of Hawai‘i, (Honolulu, October 1935).
2Spencer 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 an 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 Lihu‘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 unusual 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 basalt 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. 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.

---

3Patricia 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


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.


________________. 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.
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.
Waiʻale Drive Bridge, Wailuku, Maui, Hawaiʻi

Top: Detail of rail with view of approach; view from SE.
Bottom: Substructure; view from NE.
1. Waiake Drive Bridge
2. Maui County, Hawaii
3. Elizabeth Anderson
NPS Form 10-900
(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 name Hana Bolt Road
other names/site number Belt Road, Hana Road, Hana Highway, Pi'ilani Highway

2. Location

street & number Hana Highway (State Rte. 360), Pi'ilani Highway (Rte. 31) not for publication

not for publication in Makawao District to Hana District

not for publication in Haiku, Ke'anae, Nahiku, Hana, Kipahulu

state Hawaii code III county Maui code 969 zip code 96756

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] 11/20/01

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  Danah O. Pepe 6/15/01

___ 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

2
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. Kapohakimohena.

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)

<table>
<thead>
<tr>
<th>Zone Easting Northing</th>
<th>Zone Easting Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 04 787810 2314160</td>
<td>3 04 789510 2312640</td>
</tr>
<tr>
<td>2 04 788850 2313440</td>
<td>4 04 789860 2312530</td>
</tr>
</tbody>
</table>

☐ 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 and is variable along the entire length of the road. The historic district begins .2 miles west of Mile Marker 3 on the Hāna Highway, State Route 360, near Huelo, and ends on the south end of Koukou‘ai Bridge near Kipahulu on Route 31.

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

The boundaries are coterminous with the Hāna Belt Road’s 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.
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:

<table>
<thead>
<tr>
<th>zone/easting</th>
<th>northing</th>
<th>points 1-4: Hā‘ikū, Hawai‘i quad</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>04/79080</td>
<td>2311540</td>
</tr>
<tr>
<td>6</td>
<td>04/79120</td>
<td>2311740</td>
</tr>
<tr>
<td>7</td>
<td>04/79160</td>
<td>2311610</td>
</tr>
<tr>
<td>8</td>
<td>04/79200</td>
<td>2310930</td>
</tr>
<tr>
<td>9</td>
<td>04/79240</td>
<td>2310360</td>
</tr>
<tr>
<td>10</td>
<td>04/79280</td>
<td>2310280</td>
</tr>
<tr>
<td>11</td>
<td>04/79320</td>
<td>2309800</td>
</tr>
<tr>
<td>12</td>
<td>04/79360</td>
<td>2309020</td>
</tr>
<tr>
<td>13</td>
<td>04/79400</td>
<td>2309060</td>
</tr>
<tr>
<td>14</td>
<td>04/79440</td>
<td>2309440</td>
</tr>
<tr>
<td>15</td>
<td>04/79480</td>
<td>2309280</td>
</tr>
<tr>
<td>16</td>
<td>04/79520</td>
<td>2308430</td>
</tr>
<tr>
<td>17</td>
<td>04/79560</td>
<td>2306640</td>
</tr>
<tr>
<td>18</td>
<td>04/79600</td>
<td>2305320</td>
</tr>
<tr>
<td>19</td>
<td>04/79640</td>
<td>2305090</td>
</tr>
<tr>
<td>20</td>
<td>04/79680</td>
<td>2304760</td>
</tr>
<tr>
<td>21</td>
<td>04/79720</td>
<td>2304860</td>
</tr>
<tr>
<td>22</td>
<td>04/79760</td>
<td>2304800</td>
</tr>
<tr>
<td>23</td>
<td>04/79800</td>
<td>2304630</td>
</tr>
<tr>
<td>24</td>
<td>04/79840</td>
<td>2304420</td>
</tr>
<tr>
<td>25</td>
<td>04/79880</td>
<td>2304330</td>
</tr>
<tr>
<td>26</td>
<td>04/80000</td>
<td>2304190</td>
</tr>
<tr>
<td>27</td>
<td>04/80040</td>
<td>2304260</td>
</tr>
<tr>
<td>28</td>
<td>04/80080</td>
<td>2304190</td>
</tr>
<tr>
<td>29</td>
<td>04/80120</td>
<td>2303950</td>
</tr>
<tr>
<td>30</td>
<td>04/80160</td>
<td>23033830</td>
</tr>
<tr>
<td>31</td>
<td>04/</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>04/</td>
<td>2303830</td>
</tr>
</tbody>
</table>
NPS Form 10-900-aOMB No. 1024-0018
Hawai‘i - Hāna Belt Road, Maui County

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:

<table>
<thead>
<tr>
<th>zone/easting</th>
<th>northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>04/803810 2303440</td>
</tr>
<tr>
<td>34</td>
<td>04/803910 2303270</td>
</tr>
<tr>
<td>35</td>
<td>04/804000 2303160</td>
</tr>
<tr>
<td>36</td>
<td>04/804170 2303130</td>
</tr>
<tr>
<td>37</td>
<td>04/804290 2303000</td>
</tr>
<tr>
<td>38</td>
<td>04/804900 2303020</td>
</tr>
<tr>
<td>39</td>
<td>04/805350 2303020</td>
</tr>
<tr>
<td>40</td>
<td>04/805650 2302900</td>
</tr>
<tr>
<td>41</td>
<td>04/806060 2302760</td>
</tr>
<tr>
<td>42</td>
<td>04/807160 2302510</td>
</tr>
<tr>
<td>43</td>
<td>04/807630 2302290</td>
</tr>
<tr>
<td>44</td>
<td>04/812440</td>
</tr>
<tr>
<td>45</td>
<td>04/812960 2295650</td>
</tr>
<tr>
<td>46</td>
<td>04/812960 2293760</td>
</tr>
<tr>
<td>47</td>
<td>04/812580 2292900</td>
</tr>
<tr>
<td>48</td>
<td>04/811030 2290640</td>
</tr>
<tr>
<td>49</td>
<td>04/810240 2290700</td>
</tr>
<tr>
<td>50</td>
<td>04/809900 2290260</td>
</tr>
<tr>
<td>51</td>
<td>04/809480 2290260</td>
</tr>
<tr>
<td>52</td>
<td>04/809190 2290300</td>
</tr>
<tr>
<td>53</td>
<td>04/809070 2290210</td>
</tr>
<tr>
<td>54</td>
<td>04/808730 2289420</td>
</tr>
<tr>
<td>55</td>
<td>04/808500 2289330</td>
</tr>
<tr>
<td>56</td>
<td>04/808210 2289200</td>
</tr>
<tr>
<td>57</td>
<td>04/808000 2289200</td>
</tr>
<tr>
<td>58</td>
<td>04/807770 2288590</td>
</tr>
<tr>
<td>59</td>
<td>04/807680 2288060</td>
</tr>
<tr>
<td>60</td>
<td>04/805910 2286630</td>
</tr>
</tbody>
</table>

points 33-47: Hāna, Hawai‘i quad
points 48-60: Kipahulu, Hawai‘i quad
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  (808)587-2150
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  (808)270-7845
city or town  Wailuku  state  Hawai‘i  zip code  96793
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 Pilani 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 .2 miles west of Mile Marker 3 on the Hāna Highway near Hulal to Koukou’ai Bridge on Pilani Highway near the Kipahulu 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 istmus, 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 Alaloi, or main road, which began in West Maui.¹

The predecessor trail to the Hāna Belt Road was built by Pi‘ilani’s son, Kihapili‘ani, 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 Kihapili‘ani 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 Kihapili‘ani’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 Honomanu 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.

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, Māuians 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 Kālua 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

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.
6 Spencer Mason Architects, State of Hawai'i Historic Bridge Inventory and Evaluation, IV 12.
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 belt 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 Keʻanae 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.


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. 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 Nahiku, 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”.

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 mountainside (west) to the bottom of Phonomanu Gulch,

where it crossed a bridge and proceeded up the other mountainside (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 Haleakala.” 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 Hana and Ke'anae sides, which was a length of 3.5 miles. This section was bench at 16'-0" wide, although plans called for the road to eventually be widened to 20'-0" after it had settled. Several bridges near Wailau were also built during this phase, including the Waikani Bridge and the bridge at West Wailauaui. Construction of the last link of road was difficult as

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.\textsuperscript{12}

The Hāna Belt Road was opened to the public on December 18, 1926. \textit{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. \textit{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

1923 estimates to complete the road to Hāna included pavement, the road was not paved when it was opened in 1926.\textsuperscript{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‘alau‘a 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 Waialua Cove, before climbing back out of the valley. This portion of road is similar to the road near Honomanu Gulch near Ke‘anae. Near Kipahulu, 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 Kipahulu was built, although it was being used for automobile traffic by the time the belt road was completed between Kailua and Hāna in 1926.\textsuperscript{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 (Pīlani Highway, Route 31) and forty-three on the Hāna Belt Road between Hāna and Huelo


United States Department of the Interior  
National Park Service  

NATIONAL REGISTER OF HISTORIC PLACES  
CONTINUATION SHEET  

Section 7 Page 9  

Name of property Hāna Belt Road  
County and State Maui County, Hawai‘i  

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 proposed 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. 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, Kawaiapapa 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 Hāhalawe 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.  

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.
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, Hanawi Bridge, and Kahiwa 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. Kōkou‘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. 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. 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 Na'ililiiha'ele Bridge and 'Opuolu 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,

---

19 "Honiron Tells Of Maui Road To Hāna," *The Maui News*, March 5, 1927.
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 these structures 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 Kipahulu District of Haleakalā National Park includes the picturesque Ohe'o Guich; 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 Nahiku. 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, kuku'i, 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 that were formerly used for sugar cane cultivation.
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." The road was not completely paved until 1962. Over the years, lava-rock retaining walls and guardrails were constructed in various locations along the road. These walls complement the historic character of the Hāna Belt Road.

In 1969, the State of Hawaiʻi transferred jurisdiction over the portion of the Hāna Belt Road between Hāna and Kāpahulu, which is now known as the Piʻilani Highway, to the County of Maui. The Hāna Belt Road between Huelo and Hāna remained under the jurisdiction of the State of Hawaiʻi. 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. Concrete posts from earlier guardrails 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 Keʻanae) and too narrow for cars to pass each other without yielding. The road, however, has been widened in most 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 Transportation has used the new layers of asphalt during

---

20 Spencer Mason Architects, State of Hawaiʻi Historic Bridge Inventory and Evaluation, IV 14.
Narrative Description (continued)

repaving projects to super-elevate curves, particularly in the area east of 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 Honomanu Gulch was widened. Work included blasting and removing a large section 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 Hana 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 Nahiku.

The bridges along the Hana Belt Road retain their historic character. One notable exception is Kawaihapa 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 Hana Belt Road, now 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 wider 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 Hana Belt Road.
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 Nuaʻailua 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.
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".

Na‘i‘i’ilaha‘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"; total length 30'-0"; bridge width 19'-8"; approximate height above stream 18'-6". Designer: County Engineer Office.

Makanalani Bridge: constructed 1928; concrete slab; one span, 18'-0"; total length 18'-0"; bridge width 16'-6". Designer/builder: Department of Public Works.

Ka‘alea 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.

Waikamot 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.
Puohokamoa Bridge: constructed 1912; concrete trestle; 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.

Kolea (Punala) Bridge: constructed 1911; concrete trestle; one span, 30’-0”; total length 34’-0”; bridge width 12’-8”; approximate height above stream 13’-0”. Designer/Builder: Hugh Howell, Senior Engineer.

Honomanu Bridge: constructed 1911; concrete trestle; 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 trestle; 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 trestle; one span, 27’-0”; total length 28’-5”; bridge width 19’-0”; approximate height above stream 19’-0”.

Palauhulu Bridge: constructed 1916; concrete trestle; 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”.
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. Kapolakimohewa.

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'Smond. 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.

Kopilulea 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.
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".

Hanawi 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 Hanawi 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 Hanawi Culvert: concrete, one span, approximate length 11'-8".

Makapidpi 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".
Pupape-Manawalekeae 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'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'-5"; 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'ohi 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.
Section 7  Page 21

Name of property Hana Belt Road
County and State Maui County, Hawaii

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 (Kahawaikapia) 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.

Waishonu 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.
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".

Designers/Built by: County Engineer's Office.

Alo'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 (Hono'olewa) Bridge: constructed 1911; concrete slab; two spans, 25'-0"; total length 57'-0"; bridge width 15'-2"; approximate height above stream 26'-0".

Pu'uho'oo Bridge: constructed 1910; concrete tee-beam; one span, 20'-0"; total length 23'-2"; bridge width 12'-9"; approximate height above stream 13'-0".

Waiale (Pa'ehala) Bridge: constructed 1910; masonry arch; one span, 20'-0"; total length 25'-0"; bridge width 12'-6"; approximate height above stream 7'-0".

Kakikiwaka (Mahalawa) Bridge: constructed 1910; concrete slab; one span, 28'-6"; total length 30'-10"; bridge width 13'-10"; approximate height above stream 16'-0".

Hahalawe Bridge: constructed 1910; masonry arch; one span, 22'-0"; total length 25'-0"; bridge width 14'-9"; approximate height above stream 10'-0".
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.
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 behched 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.”\(^\text{22}\) 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 guiches. 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.
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 Hana 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. Koupouai Bridge near Kipahulu 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 Kipahulu 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;

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.
Form 10-900-OMB No. 1024-9018
Hawai'i - Hāna Belt Road, Maui County

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 3

Name of property: Hāna Belt Road
County and State: Maui County, Hawai'i

Narrative Statement of Significance (continued)

Pa'ia School, 1926; St. Anthony's School, 1925; and numerous residences on Maui.  

Two unique bridges on the Hāna Belt Road are rare surviving examples of masonry arch construction with basalt, Ha'ahalahale 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.  

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 an integral role in the development of belt roads on


26 Spencer Mason Architects, State of Hawai'i Historic Bridge Inventory and Evaluation, VI 192.
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.  

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 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 Kāului and Nahiku. 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 Wailuaikū Bridge, was appointed county engineer in 1928 to replace Low. After his service with the county, he worked on the construction of Hāleakalā Highway and became an engineering supervisor with the Works Progress Administration project building Maui Airport.  

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 Nahiku and Olowai 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 on other Maui projects, including Malulani Hospital, Kula Sanitarium, and the Lahaina

27 Spencer Mason Architects, State of Hawai‘i Historic Bridge Inventory and Evaluation, IV 7-9.  
Narrative Statement of Significance (continued)

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 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

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.
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

32 The Maui News, editorials, 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.
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. 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. 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


Form 10-900-aOMB No. 1024-0018
Hawai'i - Hāna Belt Road, Maui County

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 8 Page 8

Name of property  Hāna Belt Road
County and State  Maui County, Hawai‘i

Narrative Statement of Significance (continued)

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. I. 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

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
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’Emond. Many other bridges were not quite so grand, but also made pleasing visual statements, including Hanawi Bridge, Kūhiwa Bridge, Waikamilo 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

---

Form 10-900-OMB No. 1024-0018
Hawai‘i - Hāna Belt Road, Maui County

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 practices 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.


Hawai‘i Heritage Center. *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*. [Honolulu]: State of Hawai‘i, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highway Administration, 1990.


SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 0100615 Date Listed: 06/15/01

Property Name: Hana Belt Road County: Maui State: HI

Multiple Name: N/A

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

[Signature] Date of Action

Amended Items in Nomination:
The following amendments are hereby made to the documentation and confirmed with the HI SHPO:

Section 5. Classification
The road itself, not just the bridges and culverts, should be counted as a contributing structure. Therefore, the total number of contributing structures is changed to 74. The one (1) non-contributing structure remains the same.

Section 10. Geographical Data
The acreage of the property was not provided. The correct acreage of the district is 153 acres.

DISTRIBUTION: National Register property file; Nominating Authority
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. Na‘ili‘ili‘ihē‘ele Bridge, view looking west
7. Photograph #3

4. November 19, 2000
6. ‘Opuuola Bridge, view looking west
7. Photograph #4

4. November 19, 2000
6. Makanāli Bridge, view looking west
7. Photograph #5

4. November 19, 2000
6. Ka‘aia 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. Waikamol Bridge, view looking east
7. Photograph #7

4. November 19, 2000
6. Puohokamo 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 Honomanu Valley.
7. Photograph #12

4. November 26, 2000
6. West side of Honomanu Valley portion of road as viewed from the road on Honomanu Valley’s east side
7. Photograph #13

4. December 2, 2000
6. Kolea (Punana) Bridge, looking mauka
7. Photograph #14
4. November 26, 2000
6. Hāna Belt Road through Honomanū Gulch, between Kolea 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 ali‘iua Bridge, looking east
7. Photograph #17

4. November 26, 2000
6. Pīna‘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
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 Wailuaui Valley, east of Waikani Bridge; overlooking Wailua Village, with Hana Belt Road above Wailua visible on left
7. Photograph #26

4. November 26, 2000
6. West Waialuaiki Bridge, looking mauka from east side of bridge
7. Photograph #27

4. November 26, 2000
6. East Waialuaiki Bridge, looking east
7. Photograph #28

4. November 26, 2000
6. Kopili’ula Bridge, looking east
7. Photograph #29

4. November 26, 2000
6. Ditch running alongside Hana Belt Road after Kopili’ula Bridge
7. Photograph #30
NPS Form 10-900-aOMB No. 1024-0018
Hawai'i - Hāna Belt Road, Maui County

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

6. Pa'akea Bridge, with Bridge #2 in background, looking west
7. Photograph #35

4. December 2, 2000
6. Kapā'ula Bridge, looking west
7. Photograph #36

4. December 2, 2000
6. Hanawi Bridge, from west side of bridge looking mauka
7. Photograph #37

4. December 2, 2000
6. East Hanawi 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, Hawaii

4. December 2, 2000
6. East Hanawt Culvert, looking east / mauka
7. Photograph #39

4. December 2, 2000
6. Makapipe Bridge, looking mauka
7. Photograph #40

4. December 2, 2000
6. View of Hāna Belt Road east of Makapipe Bridge, looking east
7. Photograph #41

4. December 2, 2000
6. Kāhiwa Bridge, looking east
7. Photograph #42

4. December 2, 2000
6. Kupukoi Bridge, looking east
7. Photograph #43

4. December 2, 2000
6. Kahalawaka 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. Kahawaiapapa 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, Hawaii

4. December 2, 2000
6. Kea‘niki 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. Heleleʻikeʻohā Bridge, looking east
7. Photograph #51

4. December 2, 2000
6. ʻUlaʻino Bridge, looking west
7. Photograph #52

4. December 3, 2000
6. Mokulehua Bridge, looking east
7. Photograph #53

4. December 3, 2000
6. Oillowai Bridge, looking east
7. Photograph #54
Name of property: Hāna Belt Road
County and State: Maui County, Hawai‘i

4. December 3, 2000
6. Honoma‘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

6. Mo‘omomui Culvert, looking mauka
7. Photograph #62
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 (Kahawaiokapia) Bridge, looking north
7. Photograph #64

4. December 3, 2000
6. Waolahonu 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

52
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
NPS Form 10-900-a OMB No. 1024-0018
Hawai‘i - Hāna Belt Road, Maui County

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‘aluu 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
HAWAII NOMINATION FORMS

STEEL TRESTLE BRIDGES ON THE HAMAKUA COAST

NĀNUE STREAM BRIDGE
UMAUMA STREAM BRIDGE
KAPU’E STREAM BRIDGE
PĀHE’EHE’E STREAM BRIDGE
KOLEKOLE STREAM BRIDGE
HAKALAU STREAM BRIDGE
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 chronological period for each.)
The Plantation Era of Hamakua Coast on the Island of Hawaii, 1859-1950
The Hilo Railroad (later called the Hawaii Consolidated Railway), 1909-1946

C. Form Prepared by

name/title Spencer Leineweber, FAIA, Professor
organization Heritage Center, University of Hawaii at Manoa
date August 15, 2009
street & number 2410 Campus Road
telephone (808) 956-4704

city or town Honolulu
state HI
zip code 96822
e-mail aspencer@hawaii.edu

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

8-309
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.

E. Statement of Historic Contexts
(if more than one historic context is documented, present them in sequential order.)

# of Pages
1-10

F. Associated Property Types
(Provide description, significance, and registration requirements.)

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.
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

County of Hawai'i, Hawai'i
Steel Trestle Bridges on the Hāmākua Coast

Section number E  Page 1

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 Hawai'i's wettest coastal district, starting at 'Upolu Point, the northern tip of the island, and running through Hāmākua and into the Hilo District. From Niulii 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 Māmalaha-Kalalau, Māmalaha-Kaumō‘alii, and Māmalaha-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. 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.

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. 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. 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. 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

---

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. By 1940, approximately sixty-five percent of Hawai‘i’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 we 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 Hawai‘i’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 Route. (April 5, 1943), 1
16 Progress Report on Highways. The Territorial Highway Department. December 7, 1956
mathematical "sufficiency rating system."\textsuperscript{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.\textsuperscript{18} Later, in July, 1969, 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.

\textbf{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.\textsuperscript{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.\textsuperscript{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

\textsuperscript{17} Ibid, 80.
\textsuperscript{18} Hawai'i State Highways. 1960. P. 7
\textsuperscript{19} Alvarez (1987a), 44.
\textsuperscript{20} Gerald M. Best, Railroads of Hawai'i (San Marino, California: Golden West Books, 1978), 123.
at 'Olai'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. 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.

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.

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. 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. The company succeeded in erecting fourteen steel bridges, five wood and steel...
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."  

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. 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 Kauai the same year) and were erected by W.W. Beers, described by the Hilo Tribune as a New York engineer. 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 Waikuku and Wailoa Rivers. These bridges suffered from their positions close to sea level and were the most problematic for the railroad to maintain. The Waikuku drawbridge was destroyed in 1923 by a tidal wave and was remounted on concrete piers. 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. The collapse was attributed to the 1923 tidal wave and was precipitated by the passage of a loaded passenger train. 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."

In the 1930s the Depression affected the tourist trade and passenger business dropped off to a low of 16,681 in 1936. Passenger cars were retired, and some cars were converted to haul bagasse (sugar cane after the juice has

---

30 Thrum (1924), 94.
31 Alvarez (1987a), 50.
32 Best, 155.
33 Ibid, 146.
been pressed out) to the cane 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 began 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 Hawai‘i Belt Road, FAP 19.

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. 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.

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 to 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. In 1908, he came to Hawai'i to be the only engineering professor amongst 13-faculty when the College opened its doors. In 1920, Young became president of the Pacific Engineering Company and maintained part-time teaching status until he retired in 1938. Because of his expertise in Hawai'i, he was placed on a two-person committee that was responsible for writing Honolulu's building ordinance. 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 Kamin's, 9.
38 Kamin's, 154.
39 Honolulu Star-Bulletin (29 August 1947), 1.
YMCA; Scottish Rite Cathedral, and canneries for Hawaiian Pineapple and Libby, McNeill & Libby. 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. 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. 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. 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.

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. Mark P. Robinson died in 1915 at the age of 62.
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:

<table>
<thead>
<tr>
<th>Name of the Bridge</th>
<th>Structure Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hakalau Stream Bridge</td>
<td>001000019030841</td>
</tr>
<tr>
<td>Kapu‘e Steam Bridge</td>
<td>700100019030931</td>
</tr>
<tr>
<td>Kolekole Stream Bridge</td>
<td>001000190308549</td>
</tr>
<tr>
<td>Nānue Stream Bridge</td>
<td>001000190308146</td>
</tr>
<tr>
<td>Pāhe‘ehe‘e Stream Bridge</td>
<td>00100019038619</td>
</tr>
<tr>
<td>Umauma Stream Bridge</td>
<td>001000190308345</td>
</tr>
</tbody>
</table>

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

---

² Merriam-Webster Online Dictionary (visited on Sept. 24, 2009)
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." One of the major differences 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, Nāhne, 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." Another commentator noted that the completion of the railroad marked nothing less than "an era in the

---

5 Paradise of the Pacific. (December 1924): 14
development of the Islands. 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 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.

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: Lorin 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.
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

County of Hawai‘i, Hawai‘i
Steel Trestle Bridges on the Hāmakua Coast

Section number G Page 1

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
United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

County of Hawai'i, Hawai'i
Steel Trestle Bridges on the Hamakua Coast

Island of Hawai'i
Hamakua Inset

Nānue Stream Bridge
Umauma Stream Bridge
Hakalau Stream Bridge
Kolekole Stream Bridge
Pahe'ehe'e Stream Bridge

Kapule Stream Bridge
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
MAJOR BIBLIOGRAPHICAL REFERENCES


__________. *Historic Bridge Inventory and Evaluation: Island of Hawai‘i and A History of Road and Bridge Development on the 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 Highway Administration, Honolulu, 1987b.


Hawai‘i (County), Department of Public Works. Inventory of Bridges. Hilo, Hawai‘i, 1980.

Hawai‘i (Kingdom), Department of the Interior. *Report of the Minister of the Interior to the Legislative Assembly* Honolulu, various dates.


Hawai‘i (State), Department of Transportation. Bridge Inventory Sheets for State-owned bridges. Unpublished data in Bridge Design Section, Honolulu, 1986.

Hawai‘i (State), Department of Transportation. *Hawai‘i State Highways*. Honolulu, 1960.


__________. Structure Inventory and Appraisal Sheets for Bridges Built Before 1940. (Computer printout known as the State Bridge Inventory). Honolulu, 1993-94.

__________. Bridge plans on file with Bridge Design Section. Honolulu, var. dates.


Hawai‘i (Territory), Department of Public Works. *Report of the Superintendent of Public Works to the Governor of the Territory of Hawai‘i*. Honolulu, various years.


Honolulu Advertiser. 240 Miles of Highways Built By Army During War. Honolulu, 12/12/1946.


Honolulu Star Bulletin. "$1,785,500 in Military Spending Here Gets Okay". Honolulu, 8/24/1950.


_________. *Paradise of the Pacific Vol.62 No.6* Honolulu, June 1950


Spencer Mason Architects. *Historic Bridge Inventory: Island of Kaua‘i*. 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.


Thompson, Bethany. *Historic Bridge Inventory: Island of O‘ahu*. 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, 1983.


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  NÄNUE 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

city of town  Honohina (TMK 3-3-2-01)

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:

___ 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
NÄNUE STREAM BRIDGE
Name of Property

Hawaii County, Hawaii
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public - Local
- public - State
- public - Federal
- private

Category of Property
(Check only one box)

- building(s)
- district
- site
- structure
- building(s)
- object

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

<table>
<thead>
<tr>
<th>Contributing</th>
<th>Noncontributing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>buildings</td>
</tr>
<tr>
<td></td>
<td>sites</td>
</tr>
<tr>
<td></td>
<td>structures</td>
</tr>
<tr>
<td>1</td>
<td>Objects</td>
</tr>
<tr>
<td>0</td>
<td>buildings</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

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
NANUE STREAM BRIDGE
Name of Property

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.

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.
Nānue Stream Bridge

Name of Property

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:

□ 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, Lorin
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 Considerations (explanation, if necessary)
Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of significance 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." 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, Lorrrin 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. Lorrrin 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.

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 Hawaii (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. 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.

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, the Nānue Stream Bridge became the tallest in the state.

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. 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.

---

7 Hilo Tribune, (11 April 1911): 3.
8 Hilo Tribune, (11 April 1911): 3.
9 Alvarez (1987b), 134.
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 87 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
- 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   Zone Easting Northing 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 Reduction Project (1024-0018), Washington, DC 20503.
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  
**City of town**  Hakulau (TMK 3-3-1-01)  
**State**  Hawai'i  
**County**  Hawai'i  
**Code**  HI  
**ZIP code**  001

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:

___ 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
UMAUMA STREAM BRIDGE
Name of Property

Hawaii County, Hawaii
County and State

5. Classification

<table>
<thead>
<tr>
<th>Ownership of Property (Check as many boxes as apply)</th>
<th>Category of Property (Check only one box)</th>
<th>Number of Resources within Property (Do not include previously listed resources in the count.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x public - State</td>
<td>x structure</td>
<td>Contributing: 0, Noncontributing: 0 (buildings)</td>
</tr>
<tr>
<td>private</td>
<td>building(s)</td>
<td>sites: 0</td>
</tr>
<tr>
<td>public - Federal</td>
<td>district</td>
<td>structures: 0</td>
</tr>
<tr>
<td></td>
<td>site</td>
<td>Objects: 0</td>
</tr>
<tr>
<td></td>
<td>building(s)</td>
<td>buildings: 0</td>
</tr>
<tr>
<td></td>
<td>object</td>
<td>Total: 0</td>
</tr>
</tbody>
</table>

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

6. Function or Use

<table>
<thead>
<tr>
<th>Historic Functions (Enter categories from instructions)</th>
<th>Current Functions (Enter categories from instructions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANSPORTATION: road-related (vehicular)</td>
<td>TRANSPORTATION: road-related (vehicular)</td>
</tr>
</tbody>
</table>

7. Description

<table>
<thead>
<tr>
<th>Architectural Classification (Enter categories from instructions)</th>
<th>Materials (Enter categories from instructions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTHER: Steel girder and trestle bridge</td>
<td>foundation: N/A</td>
</tr>
</tbody>
</table>

Narrative Description
UMAUMA STREAM BRIDGE

히리시티, 허손

(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 Hawaii. 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 Hawaii Belt Road (FAP 19) over Umauma Stream along the Hāmākua Coast of the Island of Hawaii. 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. 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, Nāmāe, 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 Hawaii 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 guardrails/perapets.

1 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), 50.
2 Ibid.

8 - 347
### 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)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>A Property is associated with events that have made a significant contribution to the broad patterns of our history.</td>
</tr>
<tr>
<td>X</td>
<td>B Property is associated with the lives of persons significant in our past.</td>
</tr>
<tr>
<td>X</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>D Property has yielded, or is likely to yield, information important in prehistory or history.</td>
</tr>
</tbody>
</table>

#### Areas of Significance
(Enter categories from instructions)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINEERING</td>
<td></td>
</tr>
<tr>
<td>TRANSPORTATION</td>
<td></td>
</tr>
</tbody>
</table>

#### Period of Significance

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td></td>
</tr>
<tr>
<td>1952</td>
<td></td>
</tr>
</tbody>
</table>

#### Significant Dates

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td></td>
</tr>
<tr>
<td>1952</td>
<td></td>
</tr>
</tbody>
</table>

#### Significant Person
(Complete only if Criteria B is marked above)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dillingham, Benjamin</td>
<td></td>
</tr>
<tr>
<td>Thurston, Lorrin</td>
<td></td>
</tr>
<tr>
<td>Robinson, Mark</td>
<td></td>
</tr>
</tbody>
</table>

#### Cultural Affiliation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

#### Architect/Builder

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Young, John Mason (1912)</td>
<td></td>
</tr>
<tr>
<td>Bartels, William R. (1952)</td>
<td></td>
</tr>
</tbody>
</table>

### 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 Considerations (explanation, if necessary)

- A property is associated with events that have made a significant contribution to the broad patterns of our history.
- A property is associated with the lives of persons significant in our past.
- A 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.
- A property has yielded, or is likely to yield, information important in prehistory or history.
- An 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.
Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of significance and applicable criteria)

The Umauma 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 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 remain 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 ‘Ola‘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 Uumauma 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 Uumauma 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.

---


\(^7\) 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
- 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)

1  Zone  Easting  Northing
  5  276412  2202637
  3  Zone  Easting  Northing

2  Zone  Easting  Northing

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
street & number  2410 Campus Road

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 Reduction Project (1024-0018), Washington, DC 20503.
Umauma Bridge
Location: Hakalau, Hawaii
UTM Zone: 5
Easting: 276412
Northing: 2202637
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  KAPU'E STREAM BRIDGE  
Other names/site number  Kapu'e Bridge (structure number 001000190309317)  

2. Location  

street & number  0.7 miles W of Kaeie Road on FAP 19  
not for publication  
city of town  Päpa’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:  

___ 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  

8 - 357
## 5. Classification

<table>
<thead>
<tr>
<th>Ownership of Property</th>
<th>Category of Property</th>
<th>Number of Resources within Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Check as many boxes as apply)</td>
<td>(Check only one box)</td>
<td>(Do not include previously listed resources in the count.)</td>
</tr>
<tr>
<td>x private</td>
<td>building(s)</td>
<td>Contributing</td>
</tr>
<tr>
<td>public - Local</td>
<td>district</td>
<td>0</td>
</tr>
<tr>
<td>public - State</td>
<td>site</td>
<td>0</td>
</tr>
<tr>
<td>public - Federal</td>
<td>structure</td>
<td>1</td>
</tr>
<tr>
<td>private</td>
<td>building(s)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>object</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### 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)

<table>
<thead>
<tr>
<th>Materials</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>foundation</td>
<td>N/A</td>
</tr>
<tr>
<td>walls</td>
<td>N/A</td>
</tr>
<tr>
<td>roof</td>
<td>N/A</td>
</tr>
<tr>
<td>other</td>
<td>METAL</td>
</tr>
</tbody>
</table>
KAPUE STREAM BRIDGE

Hawai’i County, Hawaii

Name of Property

County and State

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. 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. Five bridges (Hakalau, Nānue, Pāhe’ehe’e, Umauma, and Kapu) 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.

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

<table>
<thead>
<tr>
<th>Applicable National Register Criteria</th>
<th>Areas of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mark &quot;x&quot; in one or more boxes for the criteria qualifying the property for National Register listing)</td>
<td>(Enter categories from instructions)</td>
</tr>
<tr>
<td>A Property is associated with events that have made a significant contribution to the broad patterns of our history.</td>
<td>ENGINEERING</td>
</tr>
<tr>
<td>B Property is associated with the lives of persons significant in our past.</td>
<td>TRANSPORTATION</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>D Property has yielded, or is likely to yield, information important in prehistory or history.</td>
<td></td>
</tr>
</tbody>
</table>

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 old or achieving significance within the past 50 years.

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 Considerations (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of significance 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." Another writer noted that the completion of the railroad marked nothing less than "an era in the development of the islands." 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 Māmalahon 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 'Ola'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.

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.

United States Department of the Interior

3 Paradise of the Pacific, (December 1924): 14.
4 Thomas Thurum, 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
KAPUE STREAM BRIDGE
Name of Property

Hawai'i County, Hawaii
County and State

National Park Service

National Register of Historic Places Continuation Sheet

KAPUE STREAM BRIDGE

Hawai'i County, Hawaii

Steel Trestle Bridges on the Hamakua Coast

Section number 8 Page 1

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. 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.

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.

---

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 #___________

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)

1
zone

2
zone

Easting
280744
Easting

Northing
2186667
Northing

2186667

3
zone

Easting

Northing

4
zone

Easting

Northing

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
street & number  2410 Campus Road
city or town  Honolulu
state  HI
e-mail  aspencer@hawaii.edu

date

telephone  (808) 956-4704

zip code  96622
KAPUE STREAM BRIDGE

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

**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 737127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reduction Project (1624-0018), Washington, DC 20503.
KAPUE STREAM BRIDGE
Name of Property

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**  
**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**  
**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:)

_________________________
KOLEKOLE STREAM BRIDGE
Name of Property

Hawai'i County, Hawai'i
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public - Local
- public - State
- public - Federal
- private

Category of Property
(Check only one box)

- building(s)
- district
- site
- structure
- building(s)
- object

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

<table>
<thead>
<tr>
<th>Contributing</th>
<th>Noncontributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>buildings</td>
<td>0</td>
</tr>
<tr>
<td>sites</td>
<td>0</td>
</tr>
<tr>
<td>structures</td>
<td>0</td>
</tr>
<tr>
<td>Objects</td>
<td>0</td>
</tr>
<tr>
<td>buildings</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

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

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
KOLEKOLE STREAM BRIDGE

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 Kolekole 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.
KOLEKO STREAM BRIDGE
Name of Property

Hawaii County, Hawaii
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:

X 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)

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 Considerations (explanation, if necessary)
KOLEKOLE STREAM BRIDGE

Hawaii County, Hawaii

Name of Property

County and State

Statement of Significance

Summary Paragraph (provide a summary paragraph that includes level of significance and applicable criteria)

Kokekole 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 Kokekole Stream Bridge is significant for its contributions to the fields of engineering and transportation in Hawaii. The bridge is eligible under Criterion A for its associations with Hilo Railroad Company, later called the Hawaii Consolidated Railway, which played a major role in the development of the Hilo and the Hamakua 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. Benjamin Dillingham was a noted businessman who drew up plans for a large sugar mill at ‘Ola’a, eight miles south of Hilo in the previously uncultivated Puna district. Lorrin Thurston was the Minister to Washington during the Republic of Hawaii and a former Interior Minister under the monarchy. Mark Robinson worked as the Minister of Foreign Affairs for Queen Liliuokalani.

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 Hamakua Coast, and new Lyman Airfield Runway.

---

1 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

2 Gerald M. Best, Railroads of Hawaii (San Marino, California: Golden West Books, 1978), 123-124

KOLEKOLE STREAM BRIDGE

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)

1  Zone  278133  Easting  2199902  Northing
Zone  Easting  Northing
2
3

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
KOLEKOLE STREAM BRIDGE
Hawaii County, Hawaii
Name of Property
County and State

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: Hawaii
State: Hawaii

Photographer: Spencer Leineweber, FAIN/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 Reduction Project (1024-0018), Washington, DC 20503.
Kolekole Bridge
Location: Pupekeo, Hawaii
UTM Zone: 5
Easting: 278133
Northing: 2199902
KOLEKOLE STREAM BRIDGE
Name of Property

Hawai'i County, Hawai'i
County and State

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

city of town  
Hakalau (TMK 3-2-9-02)

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:)

__________________________________  

8 - 380
HAKALAU STREAM BRIDGE
Name of Property

Hawai‘i County, Hawaii
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- private
- public - Local
- public - State
- public - Federal
- private

Category of Property
(Check only one box)

- building(s)
- district
- site
- structure
- building(s)
- object

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

<table>
<thead>
<tr>
<th>Contributing</th>
<th>Noncontributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>buildings</td>
<td>0</td>
</tr>
<tr>
<td>sites</td>
<td>0</td>
</tr>
<tr>
<td>structures</td>
<td>1</td>
</tr>
<tr>
<td>Objects</td>
<td>0</td>
</tr>
<tr>
<td>buildings</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
</tbody>
</table>

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
HAKALAU STREAM BRIDGE
Name of Property

(Hawaii County, Hawaii)
County and State

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)

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.

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, Lorin

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 Considerations (explanation, if necessary)

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of significance 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 technology as 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." Another commentator noted that the completion of the railroad marked nothing less than "an era in the development of the islands." 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.

Criterion C

1 Paradise of the Pacific, (December 1924): 14.
2 Thomas Thurum, Hawaiian Almanac and Annual (Honolulu: Hawaiian Gazette Company, 1914), 142.
3 Gerald M. Best, Railroads of Hawai'i (Sac Marine, 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.
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'ī). 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. 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. 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. 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.

---

5 Hilo Tribune, (11 April 1911): 3.
7 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.
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.

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)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>277032</td>
<td>2201749</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

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
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.
HAKALAU STREAM BRIDGE
Hawai'i County, Hawaii

Name of Property

Photo #1: Approach

Photo #2: Name
Photo #3: Trestle Substructure
D. BRIDGE REHABILITATION GUIDELINES
STANDARDS AND GUIDELINES FOR THE TREATMENT OF HISTORIC BRIDGES

The principles, priorities, and guidelines for rehabilitating historic bridges comprised in this document are intended as a preliminary guide for evaluating rehabilitation options and determining appropriate treatments of historic bridges. These guidelines should be considered along with other requirements such as safety, cost-effectiveness, and other factors normally considered in bridge rehabilitation projects. The term "historic bridge" is applied to those bridges listed on or determined to be eligible for the NHRP by the application of criteria developed for that purpose.

A coherent approach to the treatment of historic bridges requires (1) identification and evaluation of the resources to be preserved or protected, (2) a comprehensive plan for dealing with the resources identified, and (3) a methodology for the application of appropriate treatments, including standards and guidelines.

The identification and evaluation of structures and a commitment to preservation plans are necessary steps for the retention of historically significant bridges. The successful implementation of a bridge preservation program is dependent upon acceptable guidelines and standards that accommodate the perspectives of both the preservation community and transportation agencies. Because civil engineering structures primarily serve functions in the public domain, their preservation focuses attention on what appears to be diametrically opposed legislative mandates. Thus, today's bridge repair and replacement projects bring together two sets of professionals whose divergent approaches have been established by legislation whose ultimate aim is the public good.

At present, the standards referred to in bridge rehabilitation projects are: AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications, adopted by the American Association of State Highway and Transportation Officials (AASHTO), and the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. The first is a detailed manual on bridge design; the second is a set of ten standards and expanded guidelines for the evaluation of proposed rehabilitations. The former must be quantitative and detailed to be useful for safe design practice, while the latter must be qualitative and broad enough to be applicable to a wide variety of historic resources.

Structural inadequacies can be corrected by rehabilitation alternatives which include strengthening the critical members, adding supplemental members, reducing the dead load, modifying the structural system, and repairing or replacing damaged members. The most obvious structural deficiency is inadequate load-carrying capacity for the superstructure. Other, often hidden deficiencies include mechanical problems with joints, bearings or other details, and substructure deterioration or instability. Engineering concerns are compounded by problems of functional obsolescence which include inadequate geometrics (vertical clearance, deck width, and approach alignments), inadequate safety barriers, and inadequate hydraulic capacity. Solutions to correct these defects are complex because bridges are "pure" structures designed to carry maximum loads with minimal materials. Unlike the case for most buildings, the structural framework of most bridges is exposed and unsheathed. Therefore, working on the structural system without affecting the appearance of the structure is extremely difficult.

It is difficult to force an old bridge, designed for the loads, speeds, and vehicles of decades past, into the design mold for a new bridge. This problem has been acknowledged by the FHWA and the ability to grant exceptions to AASHTO standards for historic bridges has been addressed by officials of that agency in the past few years. A report issued by the FHWA in October 1984, “Mitigation Options Related to Historic and Archeological Properties,” states:

---

57 The Heritage Center, School of Architecture at the University of Hawaii at Manoa, State of Hawaii Historic Bridge Inventory and Evaluation, Prepared for the State of Hawaii Department of Transportation, Highways Division, in in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 2008).
The standards are unlikely to be changed or modified now or in the near future. However, the frequency of granting exceptions is likely to increase as those standards are being questioned more routinely. Division Administrators are authorized to grant exceptions on a case-by-case basis if they believe the exception is justified.

The AASHTO’s issued Policy on Geometric Design of Highways and Streets (2004) includes historical significance as a factor for granting exceptions on local roads and streets:

Existing substandard structures should be improved, but because of their high replacement cost, reasonably adequate bridges and culverts that meet tolerable criteria may be retained. Some of the non-technical factors that should be considered are the esthetic value and the historical significance attached to famous structures, covered bridges, and stone arches.

It is important to recognize throughout the rehabilitative process the need to emphasize public safety. Thus, exceptions are granted on a case-by-case basis, and they specifically state that such exceptions are not to be construed as precedent-setting actions. "Tolerable criteria" have sometimes been interpreted to include engineering studies that support the capacity of a bridge to carry the anticipated loads and traffic safely, and an accident frequency that is not abnormally high. Non-technical factors which should be considered when determining the treatment of historic bridges include the degree of local public interest in the bridge; the importance of the bridge as a representative of the period, type of design, or example remaining in the state; the cost-effectiveness of rehabilitation; and the extent and magnitude of variances from AASHTO standards. The needs of each bridge and its site must be considered in light of the needs of the overall highway network. In cases where a substandard historic bridge meets tolerable criteria, exceptions may be encouraged by local transportation officials when guidelines for the appropriate treatment of historic bridges are readily available.

**STANDARDS AND GUIDELINES FOR REHABILITATION OF HISTORIC BRIDGES**

The STANDARDS, patterned after the Secretary of Interior’s "Standards for Rehabilitation," are intentionally general so as to be applicable to all bridges. They are not rigid rules which evaluate all bridges alike. While there is a system of options and alternatives which may apply to most bridges, each historic bridge should be evaluated on its own merits with respect to its historic, character-defining elements. A hierarchy of important elements for each bridge should be established and referred to as rehabilitation plans commence. Thus, creative solutions might be found in the process of designing necessary upgrades.

The GUIDELINES consist of a general section that addresses structural upgrading, geometric modification, materials repair and maintenance, and removal to a less demanding site. Following the general guidelines are additional guidelines which may be necessary when considering non-vehicular uses, replacement, or bridges located in historic districts. Through AASHTO, Guidelines for Historic Bridge Rehabilitation and Replacement was published in March 2007 and is available for reference online at:

http://environment.transportation.org/cop/groups/historic_bridges/media/p/30.aspx

The concepts contained in this document are intended for use in the treatment of all historic bridges, and should not be restricted solely to bridge rehabilitation and replacement projects. The STANDARDS and GUIDELINES are applicable to any historic bridge project, including upgrading for safety or other purposes and bridge maintenance. It is hoped that the document will serve as a framework for an expanded version of guidelines that may be compiled as the body of information from successful bridge rehabilitation projects develops.
STANDARDS FOR THE TREATMENT OF HISTORIC BRIDGES

The decision to retain a bridge in service must be based on legislative mandates and considerations such as economy, safety, and the existing and future transportation needs of the overall highway network. The historical importance of the structure at the national, state, and local levels must be fully considered to assure a reasonable, balanced decision. As suggested in AASHTO’s most recent policy, where the bridge meets tolerable criteria, exceptions to current accepted engineering standards should be sought.

Regardless of which alternative is chosen for rehabilitation of the historic bridge, the treatment should be carried out with careful consideration of the following standards:

1. Every reasonable effort should be made to continue the historic bridge in some form of useful transportation service. Primary consideration should be given to rehabilitation of the bridge on site. Only when this option has been fully exhausted should other alternatives be explored.

2. The original character-defining qualities or elements of a bridge, its site, and its environment should be respected. The removal, concealment, or alteration of any historic material or distinctive engineering or architectural features should be avoided when possible.

3. All bridges should be recognized as products of their own time. Proposed alterations that have no historical basis and which seek to create a false historical appearance should be discouraged.

4. Changes which have taken place in the course of time may be evidence of the history and development of a bridge, its site, and its environment. These changes may have acquired significance in their own right, and this significance should be recognized, be carefully evaluated, and respected.

5. Distinctive engineering and stylistic features or examples of skilled craftsmanship which characterize a bridge should be treated with sensitivity.

6. Deteriorated structural members and architectural details should be retained and repaired, rather than replaced, whenever possible. In the event replacement is necessary, the new material should match the material being replaced in design, color, texture, and other visual qualities.

7. The surface cleaning and treatments of bridges should be done with processes that will not damage the historic materials.

8. Every reasonable effort should be made to protect and preserve significant archeological and other cultural and environmental resources by or adjacent to any bridge.

9. Contemporary designs for new bridges located in historic districts, should not be discouraged. Contemporary designs for proposed alterations and additions to historic bridges should be compatible with the size, scale, visual quality, and character of the historic district, or of the bridge and its environment, and any alterations and additions should not destroy or conceal significant structural, architectural, or historical materials.
10. Wherever possible, additions or alterations to bridges should be made in such a manner that their subsequent removal would not impair the essential form and integrity of the original bridge.

**FEDERAL GUIDELINES FOR THE TREATMENT OF HISTORIC BRIDGES**

**THE SURFACE TRANSPORTATION AND UNIFORM RELOCATION ASSISTANCE ACT OF 1987**

The Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), Section 123 (f), Historic Bridges, established a series of requirements and emphasis areas concerning historic bridges on and off the Federal Aid system.

The legislation encouraged states to give special consideration to rehabilitating, reusing, and preserving historic bridges by explicitly making these activities eligible for reimbursable project costs on bridges in service for motorized vehicles. It is the policy of the Federal Highway Administration (FHWA) to consider a wide range of preservation options; including avoidance, rehabilitation, modified use, marketing, and relocation. If the load capacity and safety features (geometrics) of a historic bridge are adequate to serve on the public road at its existing location, the bridge should be rehabilitated at a reasonable cost, so it can continue to provide service. If the bridge's load capacity and safety features are adequate to serve on a public road at another location, the movement of the bridge to the new location should be considered as part of the original project. If such relocation of the historic bridge is made part of the Federal Aid proposal, then reasonable costs associated with actions to relocate and preserve the historic integrity of the historic bridge are eligible for reimbursement without reference to the cost of demolition.

These actions could include work approved by the FHWA which ensures the historical integrity of design, scale, and materials. This would include replacing portions of historic elements of the structure in-kind, cleaning, repainting, or rehabilitating to maintain (preserve) both the structural and the historic integrity of the historic bridge. At the completion of the project, the bridge may no longer be classified as deficient for purposes of the NBI for at least 10 years.

**PRESERVATION**

The Surface Transportation and Uniform Relocation Assistance Act (STURAA) of 1987 makes funds, which otherwise would have been used for bridge demolition, available for actions to preserve or reduce the impact of the project on a historic bridge.

In the case of historic bridges which can no longer be used on a public road, reasonable costs associated with preservation could include modification for recreational use, relocation, etc. The FHWA will determine the reasonable level of funding, not exceeding the estimated cost of demolition (based upon professional advice of the state highway bridge engineer). These bridges will be removed from the NBI and are no longer eligible for FHWA funding.

STURAA imposes a requirement that, prior to demolition of a historic bridge, the state shall market (sell or donate) the bridge to a state or local government agency or responsible private entity. This preservation effort is to be coordinated with the SHPO and the local historical society to ensure that a reasonable audience is reached and a good faith effort is made.
In the marketing effort, the state needs to specify what preservation work is needed; that reasonable funding is available for the preservation work; and that any potential recipients must be able to demonstrate their ability to assume legal and financial responsibility for the bridge, including holding highway agencies harmless in any liability action. Any non-governmental party must be able to demonstrate its economic and administrative ability to perform the essential obligations necessary for the operation of the bridge.

If a bridge cannot be sold and a recipient accepts donation of the bridge, the recipient can be reimbursed for costs incurred in such activities as relocation, site preparation, reassembly, etc. Costs eligible for reimbursement to preserve a historic bridge which is no longer used on a public road shall not exceed the estimated cost of demolition. Maintenance costs (including prepaid annuities) are not eligible for reimbursement. No bridge will be marketed or donated to a party unless that party agrees to; (1) accept title, (2) maintain (preserve) the bridge and the features that give it its historic significance (qualities that qualify it to the National Register), and (3) assume all future legal and financial responsibility for the bridge and to hold the state highway agency and the FHWA harmless in any liability action. In the event that no acceptable party is found by a good-faith effort and within a reasonable period of time, the requirements of the new legislation are satisfied and the FHWA may complete the Section 106 and Section 4(f) processes.

**GENERAL GUIDELINES FOR THE TREATMENT OF HISTORIC BRIDGES**

The specifics of each historic bridge and its environment will determine whether rehabilitation options for the continued use of the bridge are feasible. In planning the proposed treatment of a historic bridge, the following priorities should be explored.

I. **Continued Use for Vehicular Purposes**

   The preferred use for historic bridges is continued service for vehicular purposes. This alternative will probably require consideration of one or more of the following:

   **A. Structural Upgrading**

   1. Identify the structural system and its individual character-defining features
   a) The structural system should be evaluated using non-destructive testing techniques, where possible.
   b) Passive solutions which adjust the live load by restricting vehicles should be explored, examples include load posting, signaling, and channeling.
   c) The structural system should be respected, and its visual characteristics should be retained if modifications are necessary.
      (1) The original load-carrying system should be retained, if possible.
      (2) The dead load should be reduced by providing a lighter deck system, if possible.
      (3) If the load-carrying system must be altered, the character-defining visual qualities of the original structural system should be retained. Modified systems which can be visually minimized include the introduction of structure continuity and other methods of reinforcement.
(4) If visual modifications are necessary, they should be kept as unobtrusive as possible.
   a) Modifications may include changing the configuration of isolated members or the addition of helping structures.
   b) Supplemental members should be added as needed under the deck of the structure, if possible.

2. Modifications should follow the following guidelines
   a) Visually intrusive structural modifications should be kept as inconspicuous as possible, and should affect only secondary views, if possible. Consideration should be given to whether there is a primary view.
      1) Bridges which carry highways are seen by roadway travelers from afar, in elevation, and while traveling on the bridge deck. Modifications should be made with this in mind.
      2) Where circumstances are such that the primary view is from below the bridge, such as an overpass, modifications should be made accordingly.
   b) Modifications should be so designed that there is the least possible loss of historic material, and so that the character-defining features are not obscured, damaged, or destroyed.
   c) Structural modifications, or helping structures, should be clearly differentiated from the historic bridge. The design should be compatible in terms of mass, materials, scale, and detail.
   d) Traffic railings, or safety barriers, should be designed to meet requisite load requirements, and at the same time should be designed and installed so that character-defining features of the bridge are not obscured or damaged.
   e) Deteriorated structural elements should be replaced in kind or with a material which duplicates the visual appearance of the original element.

B. Geometric Modifications

1. Evaluate the geometric constraints of the bridge in the context of the overall highway network. Determine realistic needs for geometric parameters in light of connecting highways, projected traffic volumes, accident history, and the proposed nature of future traffic needs.

2. Explore passive (off-bridge) solutions.
   a) Adjust alignment of the approaches, restrict the bridge to one-way traffic, or both.
      1) Create holding lanes for traffic at the approaches to a one-lane bridge with appropriate provisions for safety.
      2) Leave the historic bridge in place for one-lane traffic and move a visually compatible historic bridge to an adjacent site to carry the second lane.
      3) Leave the historic bridge in place for one-lane traffic and construct a visually compatible new bridge on an adjacent site to carry the second lane.
   b) The flow of approaching traffic should be adjusted by restricting vehicles, restricting speed, or installing signs and traffic signals.
   c) Provide sidewalks external to the bridge for pedestrian safety.
   d) The bridge should be widened by cantilevering a new deck from either side of the existing structure, where structurally feasible and aesthetically and historically appropriate.
3. Alter the geometric configuration of the bridge to remedy geometric deficiencies.
   a) To increase the vertical clearance on through bridges, the depth of the portal frames and sway frames should be reduced with minimum possible destruction of historic fabric.
   b) To increase the vertical clearance on grade-separation structures, the superstructure should be raised or the roadway lowered.
   c) To increase the roadway width, some types of structures can be modified (e.g., multigirder, some concrete and stone bridges). Modifications should be designed to be compatible with the original structure.

C. Materials Repair and Maintenance

1. Identify features that are important in defining the overall historic character of the bridge.
2. Historic materials should be repaired, if possible. If replacement of a feature is necessary, it should be replaced in kind or with a compatible substitute material.
   a) Masonry Superstructure and Substructure
      (1) Drainage and vegetation
         (a) Provide proper deck drainage systems which do not damage or promote deterioration of the superstructure or substructure
         (b) Remove vegetation growing on bridge superstructure or substructure.
      (2) Cleaning
         (a) Clean masonry only when necessary to halt deterioration or to remove heavy soiling.
         (b) Clean masonry with the gentlest method possible.
         (c) Use cleaning method on test patches to determine long-range detrimental effect of cleaning.
      (3) Repointing
         (a) Remove deteriorated mortar by carefully hand-raking the joints to avoid damaging the masonry.
         (b) Duplicate old mortar in strength, composition, color, and texture.
         (c) Duplicate old mortar joints in width and joint profile.
      (4) Repair of deteriorated sections
         (a) Replace extensively deteriorated or missing features in kind or with a compatible substitute material.
         (b) Replace masonry sections that are not repairable, in kind, using the same materials or compatible substitute materials. Dismantle deteriorated sections by hand, and with care.
         (c) Do not apply non-historic coatings, such as stucco, gunite, and sealants, to masonry surfaces as a substitute for repointing and masonry repairs.
   b) Metals
      (1) Cleaning
         (a) Identify metal prior to cleaning and test for gentlest possible cleaning method.
         (b) Use the gentlest possible cleaning methods for cast iron, wrought iron, and steel (structural metals found on historic bridges) to remove paint buildup and corrosion. If hand scraping and wire brushing prove ineffective, low pressure dry grit or walnut shell blasting may be used as long as it does not abrade or damage the surface. Test patches should be cleaned to determine damage.
      (2) Repaint with colors that are appropriate for the historic bridge.
(3) Replace deteriorated or missing decorative elements in kind or with a compatible substitute material.

c) Wood
   (1) Repair historic wood features by patching or reinforcing, using recognized preservation techniques.
   (2) Replace in-kind historic wood features which need to be replaced. If replacement in-kind is not possible, substitute materials that are compatible in texture and form, and that convey the same visual appearance as the original.

D. Removal to a Less Demanding Site

1. If possible, seek a less demanding site on the existing transportation system.
2. If possible, find a new owner for the historic bridge among public agencies such as state parks and recreation departments, or county or municipal parks departments, or state tourism agencies.
3. If a new owner cannot be located in the public sector, an owner in quasi-public or nonprofit groups should be sought.
4. If no recipient can be found in public or quasi-public groups, an owner in the private sector may be sought.
5. Ensure that the recipient of the bridge is prepared to maintain it, and rehabilitate it if necessary. A preservation covenant or restriction may be necessary to ensure this.
6. When possible, undertake the selection and preparation of a relocation site in the proximity of the original site.
7. Prior to removal, make a complete and comprehensive inventory of all bridge parts. The parts should be carefully numbered and referenced to the inventory for identification.
8. If possible, remove the bridge without disassembling.
9. If disassembly is necessary, disassemble the bridge in such a manner as to allow for its reassembly.
10. Reassemble the bridge to duplicate its original configuration.
11. Do any required cleaning or repair of the bridge in conformance with previously stated guidelines as appropriate.

II. Continued Use for Non-vehicular Purposes

If it is not feasible to continue a historic bridge in service for vehicular purposes, priority shall be given to continued use for non-vehicular purposes, at an existing site or at a new site. Preference shall be given to transportation-related uses of the historic bridge. Non-vehicular uses of a historic bridge may include:

A. Transportation-Related Functions

1. Where feasible the bridge should be retained in a transportation or transportation-related function.
   a) While the most feasible transportation use may be to leave the bridge in place as a bicycle or pedestrian crossing, or to move it to a public park or recreation area for the same purpose, other uses and other locations should not be precluded, including ones that involve private ownership.
2. Adaptive use in situ will often be the only alternative for masonry or concrete bridges because of their nature or size. However, others are movable, particularly metal and timber trusses. In instances where the features in the immediate vicinity of the bridge have an associative value, preference should be given to adaptive use in situ. This is particularly important where the bridge is located within the boundaries of a historic district, or is clearly associated with contemporary transportation or industrial features.

3. In choosing among alternatives, greater consideration should be given to those factors that will enhance or protect the historic bridge than to the specific nature of the adaptive use or its location. Such factors include: provision for maintenance; protection from vandalism; accessibility to the public; and opportunities for interpretation.

4. While an adaptive use may reflect a reduced level of loading, structural adequacy for the new use must still be determined, and rehabilitation undertaken when appropriate.

5. The selection and preparation of an alternative site should be undertaken with sensitivity to the historical use and siting of the bridge.
   a) A bridge that has distinctive features that link it with a particular use should be used in its historical context.
   b) Bridges should not be placed where they are clearly too long or too short for the obstruction that they span, and skews generally should be avoided. New abutments should be of compatible design and clearly distinguishable from the historic bridge.

6. Consistent with safety considerations, the structure itself should be returned to its historic configuration by removing visually obtrusive, non-character-defining elements that may have been added to permit the bridge to serve its present function, but which are not required for the new function. These might include elements added to enhance stiffness or load capacity, or secondary features, such as modern decks and guardrails.

7. Elements which have been added to the bridge over the course of its history and which are determined to be character-defining should not be removed.

8. Missing nonstructural elements of the bridge, including decorative features, that are distinctive of the style, type, or period in which the bridge was built should be replaced if they can be replicated from similar elements that survive on the same or a similar bridge.

B. Non-Transportation-Related Functions

1. If it is not feasible to retain the bridge in a transportation-related function, consideration should be given to non-transportation-related uses including public recreational uses, use as interpretive sites or museums, or architectural adaptations that could provide residential, commercial, or educational space.
   a) In such instances, the adaptive use should not obscure or alter the essential elements of the structure that impart its identity and significance as a bridge.
   b) If the bridge is to remain or be moved within a historic district, careful consideration should be given to the compatibility of the proposed use with the architectural and historical character of the historic district.
   c) Items A.1, A.2, and A.7 above are equally applicable to architecturally adaptive uses.

C. Adaptive Re-Use

If an adaptive use cannot be found, consideration should be given to retaining the bridge either in place or at an alternative location as a historical ruin or monument.
III. Replacement with Mitigation

When alternatives for continued use of a historic bridge for vehicular or non-vehicular uses have been considered and determined to be not feasible or prudent, and the historic bridge must be removed from its site, replacement with mitigation is the remaining alternative. Historic bridges which are scheduled for demolition, or alteration which destroys historic integrity, are documented to mitigate the adverse effect of demolition or alteration. Such documentation should be prepared for inclusion in the HAER collection in the Library of Congress. Additional mitigation options include storage and/or salvage of all or parts of a bridge, an alternative generally applicable to metal bridges. Mitigation options may include:

A. Documentation

The primary criterion in documenting historic bridges is whether the bridge can reveal information critical to understanding and interpreting bridge design, fabrication, engineering, and technology. Documenting bridges can contribute to understanding the development of transportation systems in the United States. Moreover, documentation provides information on the lives and works of individuals and engineers who contributed to advancing bridge technology. The following guidelines are recommended for documentation of historic bridges:

1. When a bridge has been determined to be eligible for the NRHP and all alternatives for preservation are exhausted, the federal and state agencies involved should consult with the appropriate Regional Office of the National Park Service (Western Regional Office in San Francisco) to determine the documentation level required. Generally, the levels of documentation correspond to the level of significance of the bridge as follows:
   a) Documentation Level I for bridges of national significance requires:
      (1) measured drawings,
      (2) large-format contemporary photographs,
      (3) photocopies of selected existing drawings (when available),
      (4) historic photographs and illustrations, and
      (5) written data.
   b) Documentation Level II for bridges of state significance requires
      (1) photocopies of selected existing drawings (when available),
      (2) historic photographs and illustrations,
      (3) large-format contemporary photographs, and
      (4) written data.
   c) Documentation Level III for bridges of local significance requires
      (1) dimensioned sketch plans and elevations showing bridge configuration,
      (2) large-format contemporary photographs, and
      (3) written data.

2. Individuals compiling documentation should be professionally qualified with demonstrable experience in bridge history and in documenting historic bridges.

3. Documentation should focus on the existing bridge and should be an accurate record of existing conditions supplemented by information obtained from reliable secondary sources with documentary limitations clearly stated.

4. Documentation should be prepared in such a manner as to permit the independent verification of information.

5. Documentation should be prepared on materials that are readily reproducible, durable, and of standard sizes that meet accession and archival requirements of the Library of Congress.
   a) Documentation should be clearly and concisely presented.
B. **Storage and/or Salvage**

If storage and/or salvage are part of the mitigation required for the bridge, additional consideration is necessary after documentation, as noted above, has been completed.

1. The goal of salvaging parts or all of the historic bridge should be identified in order to determine appropriate treatment.
2. If future use of the bridge is anticipated, a comprehensive inventory of all bridge parts should be completed. The bridge parts should be carefully numbered and referenced to the inventory for identification.
3. If future use of the entire bridge is anticipated, the bridge should be dismantled with care in such a way as to allow reassembly. The bridge parts should be stored in a place where they will be protected from deterioration.
4. If only portions of the bridge will be salvaged, those portions should be removed with care and stored or delivered to the new owner.
5. Guidelines included in Section I-D: Removal to a Less Demanding Site, may be applicable.

**IV. Special Considerations for Bridges Located in Historic Districts**

Bridges located within the boundaries of designated historic districts may contribute to, or detract from, the overall character of the historic district. Treatment of an existing historic bridge, a replacement bridge, or a new bridge within a historic district should take into consideration the character of the historic district. Considerations for a bridge located within a historic district may include:

A. **Consultation**

In consultation with the SHPO, designated historic districts and their important characteristics should be identified.

1. Identify features which are important in defining the overall historic character of the district.
2. Identify character-defining features of the historic bridge and its relationship to the buildings, streetscapes, and landscapes in the historic district.

B. **Treatment**

The treatment to be given historic bridges should be established with reference to the Priority Levels presented in the section on **Standards and Guidelines for the Treatment of Historic Bridges**.

1. If the bridge is a historic bridge and/or contributing structure within the designated historic district, rehabilitation options may include:
   - Priority I: Continued Use for Vehicular Purposes, or
   - Priority II: Continued Use for Non-vehicular Purposes
2. When the bridge cannot be upgraded adequately for continued vehicular use and the site precludes other uses, the historic bridge may need to be replaced. This alternative may require replacement with mitigation, including documentation.
3. In addition to the evaluation of appropriate treatments for the historic bridge, the design of the replacement bridge should include consideration of the new bridge’s compatibility within the historic district.
C. New Bridges

New bridges built in existing historic districts, whether replacement bridges or not, should be designed to be compatible with the character of the historic district in which they are located.

1. The design and construction of the new or replacement bridge should be compatible with the bridge site and the historic character of the district in terms of size, scale, design, materials, color, and texture.
2. The design of the new or replacement bridge should preserve the historic relationship between the bridge, its site, and the buildings adjacent to it.
3. The design of the new replacement bridge should retain the historic relationship between the overall bridge siting and streetscape and landscape features in the district.
4. If the historic substructure is sound, the replacement bridge should incorporate it as part of the new bridge.
ADDITIONAL RESOURCES

- **Flexibility in Design: A Guide for Achieving Flexibility in Highway Design**
  ©2004 American Association of State Highway and Transportation Officials

- **NCHRP Document 189: Design and Management of Historic Roads (Web-Only)**
  National Cooperative Highway Research Program (NCHRP), Transportation Research Board of the National Academies
  Prepared by: Mary E. McCahon, Larry Sutherland, and Steven Shaup / TranSystems, Inc.
  January 2012

- **NCHRP Document 742: Communicating the Value of Preservation: A Playbook**
  National Cooperative Highway Research Program (NCHRP), Transportation Research Board of the National Academies
  Prepared by: Joe Crossett and Kyle Schneweis / High Street Consulting Group in association with Burns & McDonnell, Parris Communications, and CDM Smith
  © 2012 National Academy of Sciences

- **Guidelines for Historic Bridge Rehabilitation and Replacement**
  American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment
  March 2007

- **Best Practices and Lessons Learned on the Preservation and Rehabilitation of Historic Bridges**
  American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment
  Prepared by: Parsons Brinckerhoff, Inc. in association with TranSystems, Inc. and Brelend C. Gowan, JD
  July 2012

  Written by: Paul Daniel Marriott, with the generous underwriting of The James Marston Fitch Charitable Foundation
  June 2010

- **The Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation’s Bridges**
  Prepared by: Office of Engineering, Bridge Division, Bridge Management Branch
  December 1995

- **Context Sensitive Solutions**
  U.S. Department of Transportation, Federal Highway Administration
  [http://contextsensitivesolutions.org](http://contextsensitivesolutions.org)
E. 2000 MOA ON COUNTY OF HAWAII BRIDGES
October 31, 2000

Mr. Galen M. Kuba, Division Chief
Engineering Chief
County of Hawaii
Department of Public Works
25 Aupuni Street, Room 202
Hilo, Hawaii 96720-4252

Dear Mr. Kuba:

SUBJECT: Section 106 Compliance
Photo Documentation of Kaahakini/Mamalahoa Bridge,
Inoino/Mamalahoa Bridge, Waikaalulu/Mamalahoa Bridge
TMK: Various, Island of Hawaii

Thank you for transmitting the photo documentation of the above bridges. This meets the conditions of the Memorandum of Agreement. For your information, we are currently working with the State Department of Transportation and the Federal Highways Administration on accepting one-lane bridges to receive federal funding. We hope to have something tangible in the near future.

Thank you for working with our office. Should you have further questions, please call Tonia Moy at (808)692-8030.

Aloha,

TIMOTHY E. JOHNS
State Historic Preservation Officer

TM:jk
Mr. Kazu Hayashida  
Hawaii Department of Transportation  
869 Punchbowl Street  
Honolulu, HI 96813-5097

Dear Mr. Hayashida:

Subject: National Historic Preservation Act  
Section 106 Compliance  
Memorandum of Agreement  
Replacement of Various Bridges  
Mamalahoa Highway Historic Bridge District  
Island of Hawaii

Enclosed for your files is a copy of the revised Memorandum of Agreement (MOA) accepted by all parties. This acceptance completes the requirements of Section 106 of the National Historic Preservation Act and the regulations of the Advisory Council on Historic Preservation for the referenced project. Please note that the original agreement is kept on file at the Council and a copy will be sent to all signatories.

Thank you for your continued assistance with this project. Please call me at (808) 541-2700, if you should have any questions.

Sincerely yours,

Richelle M. Suzuki  
Transportation Engineer

Enclosure
MEMORANDUM OF AGREEMENT
Among the
ADVISORY COUNCIL ON HISTORIC PRESERVATION,
FEDERAL HIGHWAY ADMINISTRATION,
HAWAII STATE HISTORIC PRESERVATION OFFICE, and the
COUNTY OF HAWAII DEPARTMENT OF PUBLIC WORKS
Regarding the Replacement of
HONOMU/MAMALAOHA BRIDGE, KALAOA/MAMALAOHA BRIDGE,
OPEA/MAMALAOHA BRIDGE, KALOPA/MAMALAOHA BRIDGE,
INOINO/MAMALAOHA BRIDGE, WAIKAALULU/MAMALAOHA BRIDGE,
AND KAAHAKINI/MAMALAOHA BRIDGE

WHEREAS, the above named bridges are within the Mamalahoa Highway Historic Bridge District; and

WHEREAS, the Federal Highway Administration (FHWA) has determined that replacement of the subject bridges will have an effect upon the Mamalahoa Highway Historic Bridge District, located along the Hamakua coast of the Island of Hawaii, a district eligible for inclusion in the National Register of Historic Places (NRHP), and has consulted with the Hawaii State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (Council) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the FHWA has determined that the subject bridges need to be replaced due to structural deficiencies and geometries; and

WHEREAS, the Honomu/Mamalahoa Bridge, Kalaoa/Mamalahoa Bridge, Opea/Mamalahoa Bridge, and the Kalopa/Mamalahoa Bridge have examples of their respective bridge types that remain in-place and parties to this agreement have agreed that their recordation is not necessary;

WHEREAS, the Memorandum of Agreement dated September 22, 1998, is hereby superseded by this Memorandum of Agreement due to the discovery of burial sites in the vicinity of Inoino/Mamalahoa Bridge;

NOW, THEREFORE, FHWA, the SHPO, the Council, and HDOT agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account its effect on historic properties.

STIPULATIONS

FHWA will ensure that the following measures are carried out prior to the initiation of construction:
1. The existing Inoino/Mamalahoa Bridge shall be replaced at the same location. However, Mahuna Gulch Bridge and Lauhala Gulch Bridge shall be maintained as examples of timber bridges.

2. The Kaahakini/Mamalahoa Bridge shall be photo documented as an example of a concrete deck girder bridge prior to demolition. The photographs should be HABS quality, utilizing 4" x 5" negatives and archivally processed. Documentation of the Kaahakini/Mamalahoa Bridge shall be submitted to the Historic Preservation Office, FHWA, and the National Park Service, HABS Program.

3. The Inoino/Mamalahoa Bridge and the Waikaalulu/Mamalahoa Bridge shall be photo documented as examples of a timber girder bridge prior to demolition. The photographs should be HABS quality, utilizing 4" x 5" negatives and archivally processed. Documentation of the Inoino/Mamalahoa Bridge and the Waikaalulu/Mamalahoa Bridge shall be submitted to the Historic Preservation Office, FHWA, and the National Park Service, HABS Program.

4. SHPO shall review the design of the new bridges to ensure compatibility with the historic character of the old highway.

5. Before the replacement of any bridge within the Mamalahoa Highway Historic Bridge District other than those specified in this MOA, a preservation plan shall be developed by the County of Hawaii Department of Public Works for the remaining bridges within the district. The SHPO shall approve the preservation plan.

6. Dispute Resolution:
   a. At any time during the implementation of the measure stipulated in this Agreement, should an objection be raised by a local government or a member of the public, FHWA shall consult with the objecting party, the SHPO, and as needed, with the Council to resolve the objection. A record of the objection and FHWA's actions to resolve the objection shall be retained by the FHWA as part of the project files.

   b. Should an objection be raised by a signatory to this Agreement (ACHP, the SHPO, the Hawaii DOT, the County of Hawaii or Historic Hawaii Foundation) regarding the implementation of the measure stipulated in this Agreement, FHWA shall consult with the objecting party to resolve the objection. A record of the objection and FHWA's action to resolve the objection shall be retained by the FHWA as part of the project files. If FHWA determines that the objection cannot be resolved, it shall nevertheless seek the recommendations of the objecting party, document its consideration of the objecting party's recommendations in the project files and inform the objecting party and the ACHP of that consideration.
Execution of this Memorandum of Agreement and implementation of its terms evidence that FHWA has afforded the Council an opportunity to comment on the replacement of the above named bridges and its effects on historic properties, and that FHWA has taken into account the effects of the undertaking on historic properties.

ADVISORY COUNCIL ON HISTORIC PROPERTIES
By: John Fowler, Executive Director Date: 5/23/89

FEDERAL HIGHWAY ADMINISTRATION
By: Abraham Wong Date: 3/1/99
Abraham Wong, Division Administrator

HAWAII STATE HISTORIC PRESERVATION OFFICE
By: Michael D. Wilson, State Historic Preservation Officer Date: 3/30/99

Concurred By:

HAWAII DEPARTMENT OF TRANSPORTATION
By: Kazu Hayashida Date: 3/10/99
Kazu Hayashida, Director

DEPARTMENT OF PUBLIC WORKS
By: Jiro Sumada, Deputy Chief Engineer Date: 2/22/98

HISTORIC HAWAII FOUNDATION
By: David Scott, Executive Director Date: 4/15/99
F. MEETING MINUTES
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
February 9th 2012

Project: HISTORIC BRIDGE INVENTORY AND EVALUATION REPORT
Coordination Meeting

Meeting Date: February 3rd 2012
Time: 9:00 AM
Location: HDOT Kapolei, Conference Room 611

Attendees: HDOT Todd Nishioka, Misako Mimura, Paul Santo, Rob Miyasaki
SHPD Ross Stephenson, Mike Gushard
MKE Glenn Miyasato
HHF Katie Kissling
FAI Louis Fung, Tonia Moy

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introduction
   a. A meeting was held to go over the May 2008 Historic Bridge Inventory and Evaluation report prepared by Spencer Leineweber and how Hawaii Department of Transportation (HDOT) will be moving forward to completing the report. This report was considered final by the consultant; however, there is no documentation that this was accepted by HDOT. HDOT, Historic Hawaii Foundation (HHF), and State Historic Preservation Division (SHPD) had comments to the report and have not considered this final. MKE Associates LLC (MKE) and Fung Associates, Inc. (FAI) may be assisting HDOT in proceeding with the report.

II. Issues with 2008 Report
   a. HDOT has tabbed pages which included bridges replaced and demolished or information outdated.
   b. HDOT hopes to see the report have an executive summary with all other background information be included as part of the appendix.
   c. HHF reviewed and had comments back in 2008. Issues include the integrity and criteria methodology. HHF has mentioned that the report itself is outdated. Bridges may have not been looked at since the 70s and 80s. HHF felt that the report was not reliable since the
content was outdated. Therefore, they do not use the report and currently conduct their own research. HHF does not support the criteria established by Spencer Leineweber and thus believes that the report needs to be redone.

d. SHPD has mentioned that the report is not user friendly. The report needs a better way to identify the bridges, provide location and area maps, provide color photographs, and provide structure numbers. SHPD hopes to see mitigation standardized (i.e. if this type of railing, this should be done to mitigate). A wish list was provided by SHPD. A five year or more projection of what bridges are going to be 50-years-old should also be included in the report. It was noted that the funding may be an issue so HDOT will have to manage based on funding availability. SHPD uses the report as a resource.

III. Salvageable Information

a. There was discussion on what could be salvaged from the May 2008 draft report. History and background information could be used, but all other materials may be outdated and needs to be re-evaluated. It has been agreed to do a new report and salvage only the history and background information.

IV. Moving Forward

a. In the interim, SHPD will be coordinating and working with HDOT on individual bridges on a case-by-case basis until a new report is completed. With a commitment from HDOT to complete the report, SHPD is willing to move forward on bridge projects that were being delayed until the report is completed.

b. Currently, SHPD has obtained federal funding to view bridges on neighbor islands and will be able to better assist with addressing bridge mitigation.

c. An agreed rating of system should be set and documented for consistency, in case a new administration or new group of personnel works on this.

d. Include the report as part of a Programmatic Agreement.

e. Due to the availability of funds, scope of work was discussed. HDOT will need to determine if funding is sufficient for MKE and FAI to complete the report.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama

May 16th 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION

Meeting Date: May 16th 2012

Time: 1:00 PM

Location: HDOT Kapolei, Bridge Design Section, Conference Room 611

Attendees: HDOT Misako Mimura, Todd Nishioka
Paul Santo, Neil Hasegawa
FHWA Domingo Galiciano
MKE Glenn Miyasato, Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions

• Notice to proceed on May 7. Project is to update Statewide Bridge Inventory due to dissatisfaction of point system and lack of concurrence from preservation partners in state.
• Ultimate goal for SDOT is to develop a Programmatic Agreement (PA) using the report as the basis for decision-making.

II. Lines of Communication

• Primary contact at SDOT will be Misako Mimura – SDOT Project Manager.
• Glenn Miyasato & Brian Kung are the prime consultants and should be cc’d on all communications though FAI can communicate directly with committee/SDOT, etc.
• Neal Hasegawa – for report information/IT information will be primary contact.
• Mayu Ohama – project coordinator @ FAI.
• Paul Santo – Bridge Engineer, project proponent, has knowledge of history of project.
• Tonia Moy – Project Manager and primary contact @ FAI.
• Domingo Galiciano – FHWA representative to guide through Federal requirements.
III. Review of Draft Work Plan
   a. Bridge Committee development
      • Start from one committee group and later on can divided by the islands, committee
        members will provide their inputs for bridge’s ranking.
      • Conference can be done by video conference at SDOT office with neighbor island
        committee members attending at the SDOT offices on each island.
      • Neal is main contact for bridge inspection reports. Inspection reports will be emailed
        or placed on FTP site.
   b. Availability of data
      • Past reports are all in PDF format. Spencer’s report is in Word but might not be same
        as PDF file. FAI to check accuracy.
   c. Use of Access database program
      • Agreed to use the Access for the inventories, SDOT has own database program.
   d. Report Format
      • All bridge’s criteria should be same, neighbor island variances will come with the
        bridge rankings.
      • FAI proposes to use Spencer’s historic context and include a summary matrix in the
        report, but all bridge information will stay within the Access database to operate as a
        searchable database. How this is formatted and distributed will be subject of future
        consultations.

IV. ACTION ITEMS:
   FAI
   - Set up the FTP site for this project.
   - Check if the Access can lock/unlock the database and certain people can update the data.
   - Start the list of name for committee members.
   - Ask Ross at SHPD who to contact for committee group members.

   SDOT
   - Provide all the reports and upload to the FTP site (Spencer’s Word report from Paul in
     particular).
   - Provide the link to the list of NHO’s from the DOI (Misako).
   - Contact their IT person for the Access database format and connection how to distribute.

   FHWA
   - Provide HABS documentation done by Todd Croteau for Hana Highway bridges.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
July 5th 2012

Project: HAWAII STATEWIDE BRIDGE INVENTORY EVALUATION

Meeting Date: July 5th 2012

Time: 9:00 AM – 11:00 AM

Location: HDOT Offices, Various via video conference

HDOT Hawaii Sal Panem
HDOT Kauai Raymond McCormick
HDOT Maui Ferdinand Cajigal, Fred Gutierrez
HDOT Oahu Pratt Kinimaka
FHWA Domingo Galicinao, Pat V. Phung, Mayela Sosa
SHPD Ross Stephenson
HHF Kiersten Faulkner
County of Hawaii Robert Yanabu
County of Maui Ty Takeno
KHPRC Pat Griffin
Hanalei Roads Committee Barbara Robeson
Community Member Ron Terry
MKE Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions
   • Alvin Takeshita, Highway Administrator from HDOT made opening remarks to note the importance of this project to consider safety and historic preservation. The goal is to use this report to help clarify and streamline the decision-making process and to assist in any future design guidelines or Programmatic Agreements (PA).
   • Mayela Sosa of FHWA fully backs the project and noted that it is about balancing safety and stewardship.
   • This report serves as a preliminary step to aid users in identifying eligible or non-eligible bridges but will not replace the Section 106 process. Bridges found
eligible for listing on the State or National Registers of Historic Places will still need to undergo the Section 106 process. Those not eligible will still need to go Section 106 consultation for any cultural and/or archaeological concerns.

- This report represents a moment in time and will need updating every 5 or 10 years.
- This report is not a PA or a design guideline so it will not address safety issues nor will it take the place of the review process. It is a tool for reviewers and engineers to base design decisions.

II. Comments on May 2008 Statewide Bridge Report
- Historic context is okay but the evaluation method needs improvements and updates.
  - Ranking system needs to be revamped.
- Bridge were marked “non-eligible” without explanation as to why.
- Documentation is geared toward engineers instead of all potential users.
- Lack of community input.

III. Review of Methodology
a) Background Research/Data Collection
- Photos are needed to make an assessment on the bridges. FAI will salvage usable photos from the May 2008 Statewide Bridge Report and from Bridge Inspection Reports, otherwise FAI will request assistance from the counties and the state to acquire photos.
  - Ideal photos would document elevations, deck, and important details of a bridge.
  - If any committee member has photographs of a bridge, please put it on the FTP site and remember to cite the photographer of the photo and provide permission for publication as the photo may be published in the report.

b) Data Analysis
- Preservation value versus numerical value.
  - **Numerical Value**
    - Numerical ranks are misleading and may create conflict. For example a bridge that is the only one left of its kind will have full points for distinctive characteristics and style but may not have points for other categories. This numerical rank compared with a bridge that is more common that may receive full points in all the other categories will score higher than the one-of-a-kind bridge.
  - **Preservation Value**
    - All bridges should first be compliant with the National Register Criteria which will categorize each bridge as eligible or non-eligible.
    - “Potentially eligible” category was discussed but will not be used as the National Register Criteria does not consider potentially eligible bridges.
    - All bridges with eligible status will continue on to a to-be-determined ranking system to determine their preservation value within the eligible category.
    - Bridges with non-eligible status will be explained.
By using the National Register Criteria for eligibility or non-eligibility status as a first pass for the bridges, it will allow early decision-making on how to approach projects.

**Conclusion**

- The report will use eligible and non-eligible based on the National Register of Historic Places criteria as the first pass and then take preservation value into consideration.
- Bridges in many states are considered under only criteria A and C. This project will consider all criteria, though very few, if any, will be eligible under B or D. See National Register Bulletin 15 for complete discussion on criteria.
- Eligible and non-eligible bridges will still go through Section 106 review.

c) **Community Outreach**

- Need committee members’ input on the preservation value.
- County of Hawaii and Maui need more community members.
  - Hawaii County Planning Department may have some contacts since they have 3 or 4 staff members assigned to each area’s community group.
  - Kiersten from Hawaii Historic Foundation has some contact info.
- There will be sign off sheets (signed by all committee members) for consensus/agreed compromises on decisions.

d) **Schedule**

- Comments on the methodology, inventory form, and matrix from the committee members are due on **July, 30th**. Committee members are to send their comments to Tonia Moy. tonia@funghawaii.com.
- Next updated draft methodology, inventory form, and matrix are due at the end of August. FAI will clearly address the criteria and evaluation for high preservation value at that time.

### IV. Other Comments and Questions

- The final report will be uploaded to the HDOT website. Access data will only be kept at the HDOT office and SHPD will receive a copy of the data file.
- The scope will be kept only to the State and County bridges, even though there are some privately-owned, military-owned, and federally-owned bridges.
- Interstate Highway is only on Oahu.
- Standards and guidelines for treatment will follow the Secretary of Interior Standards: [http://www.nps.gov/hps/tps/standguide/](http://www.nps.gov/hps/tps/standguide/).
- Examples of Programmatic Agreement will be provided on the ftp site.
V. ACTION ITEMS:

   • Set up FTP site for everyone to access.
     FTP Site information:
     ftp://funghawaii.com/
     Username: MKEBridges
     Password: HDOT2012
   • A copy of the current methodology, matrix, inventory form, July 5th 2012 meeting agenda, July 5th 2012 meeting minutes, committee list, and the National Historic Preservation Criteria will be downloadable from the FTP site
   • Community outreach to find additional Hawaii and Maui County participants
   • Provide example of a PA and the National Register criteria for eligibility
   • Provide the list of the bridges that needs better photos

b. HDOT
   • Upload the 2008 report on to the FTP site

c. Committee members
   • Provide comments by July 30
   • Upload useful bridge photos along with the permission to use the photos to be publish if needed
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
October 30th 2012

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
Kauai County

Meeting Date: October 29th 2012

Time: 1:00 PM – 4:00 PM

Location: HDOT Kapolei Office, Conference Room 611;
Kauai District Office, 1720 Haleukana Street, Lihue, Kauai 96766

Attendees:
HDOT Misako Mimura, Paul Santo
HDOT Kauai District Raymond J. McCormick, Fred Reyes
HHF Kiersten Faulkner
County of Kauai DPW Kuppusamy Venkatesan
Hanalei Roads Barbara Robeson
KHPRC Pat Griffin
MKE Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions
Briefly explained what we included in the final revised package (methodology, introduction, inventory form and matrix) and list of Kauai bridges.

II. Confirmation of the final methodology, evaluation methods, inventory form, and matrix
a. Feedback of the final package
   • Definition of bridges as greater than 20’ is defined by the federal government as a way to track the funding of projects. For purposes of this report the 20’ definition does not apply. It is noted so that the community is aware that some bridges that are less than 20’ are not included in the database and may be missed. Some bridges may be noted in the future inventory also.
   • Hawaiian punctuation (okina and kahako) will not be used in this project especially since it is difficult to provide consistency for the data base.
• Inventory Form – Use “Historic Register?” and drop down menu to indicate registered bridges or add check boxes to indicate the registered bridges (Yes Registered, No Not Registered). Will note if contributing or non-contributing to district, Hawaii, National etc.
• Matrix – will add a foot note for the private bridges mentioned by the community, since these bridges will not be included in the inventory/matrix. Footnote will read something to the effect: Private and Federal owned bridges are not included in this inventory.

b. Sign off from the members
• All the members who attended the meeting agreed to the final package with the above corrections.
• Members from Kauai that couldn’t attend the meeting were given opportunity to comment and didn’t provide any comments by the closing date of 10/26, so we assume they also concur with the final package.

III. Review of the Bridges on Kauai
a. Review of existing list
• List of Bridges – revise the list in alphabetic order by name and street, indicate the National/Hawaii registered bridges, and provide the pdfs to the community members. Also highlight the bridges noted as eligible in the earlier report.
• Route 560 district bridges are missing.
• Wainiha #1, 2, 3 – replaced, but in the historic district, so will be included in the project and note that they were replaced.
• Wailua River (plantation) on the Kauai district bridge #37 was replaced.
• Kainahola Stream bridge on the Kauai district bridge #52 has a new slab.
• Kilauea Stream Bridge on the Kauai County Bridge #19 was replaced in 2008.

b. Community input on the “high preservation bridges” and “eligible bridges”
• Add Wailana Bridge #1, Kalama Bridge (Yasutake’s Bridge – wrongly termed PuuOpae, used part of 1919 Wailua Bridge), Kapaia Bridge (Pedestrian bridge), Hanapepe Swinging Bridge (private?), associated bridges with the 1930’s belt road construction, Opaekaa #12, Omao Bridge.
• Should look at major periods of development and identify which best represents those periods.
• Wailua Bridge (on the Kauai district bridges #36) should be looked at as high preservation value.

IV. Other Comments and Questions
• After we provide the pdf of the list of bridges, community members will take a look and let us know if bridges are missing or if there are replaced/demolished bridges on the list.
• General information on high preservation bridges recommended by the community will also be needed to locate the correct bridge in the DOT database.
• Barbara from Hanalei Roads Committee will email Tonia a report that touches on the use of terminology by engineers vs. preservation.
V. ACTION ITEMS

- Add and indicate bridges on the Hawaii and National Historic Register to the list.
- Provide (via pdf) and alphabetize the list by name and by street name for the community members.
- Indicate on the inventory form if a bridge is on the Hawaii and National Historic Register.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
November 20th 2012

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
Hawaii County

Meeting Date: November 20th 2012

Time: 1:00 PM – 2:00 PM

Location: HDOT Kapolei, Conference Room 611;
Hawaii District Office, 50 Makaala Street, Hilo

Attendees: HDOT Misako Mimura, Paul Santo, Dean Takiguchi
HDOT Hawaii Sal Panem
SHPD Ross Stephenson
HHF Kiersten Faulkner
Pulama ia Kona Carolyn Witcher
Community Member Ron Terry
MKE Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions

Fung Associates, Inc.(FAI) briefly explained what was included in the final revised package (methodology, introduction, inventory form, and matrix) and the list of bridges on the island of Hawaii.

- List of Bridges – it was noted that the list distributed earlier needed to be updated. The pink highlight from Mamalahoa highway bridges should be removed as they are not part of a registered district and however, the Hamakua steel trestle bridges are registered and should be highlighted pink.

II. Confirmation of the final submitted methodology, evaluation methods, inventory form, and matrix

a. Feedback of the submitted package

- At the previous meeting we discussed that in the Inventory Form, use “On Historic Register?” and drop down menu to indicate registered bridges or add check boxes to indicate the registered bridges (Yes Registered, No Not Registered). Will note if contributing or non-contributing to district, Hawaii, National etc.
Matrix – should be organized by island and include railing types in the character defining feature section.

b. Sign off from the members

- All the members who attended the meeting agreed to the submitted package with the above corrections.
- Members from Hawaii that couldn’t attend the meeting were given opportunity to comment and didn’t provide any comments by the closing date of 11/14. FAI assumes the other committee members concur with the submitted package.

III. Review of the Bridges on Hawaii

a. Review of existing list

- Constructed year for all the steel Trestle Bridges on the list are incorrect, correct on the list and matrix.
- Kawailii Stream bridge and Wailoa stream bridge (#24 and #58 on the Hawaii District Bridges by street list) have been completely replaced.
- Kealakaha stream bridge is not in use (#26 on the Hawaii District Bridges by street list).

b. Community input on the “high preservation bridges” and “eligible bridges”

- Need wider community input to provide history or significance of the bridges since current committee members have limited resources.
- To reach out, FAI and DOT will set up a Facebook account to request the community’s input.
- Ron will be point of contact to reach out to the five Hawaii county developing plan groups (South Kohala, North Kohala, Kona, Puna, Hamakua, Kau) which are supported by the Hawaii planning department.

IV. Other Comments and Questions

- Kiersten suggested to check DOT and SHPD’s Memorandum of Agreements (MOA) for commitments made previously.

V. ACTION ITEMS

- Set up the Facebook account and send out to the committee members.
- Revise the bridge lists.
- Make “On Historic Register?” changes to the Access Database.
- Research DOT and SHPD’s MOA.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
November 28th 2012

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
County of Honolulu

Meeting Date: November 28th 2012

Time: 1:30 PM – 3:00 PM

Location: HDOT Punchbowl, Conference Room;
HDOT Kapolei, Conference Room

Attendees: HDOT Misako Mimura, Neil Hasegawa

FHWA Domingo Galicinao

SHPD Ross Stephenson

CCH DDC Michael Yee, Chris Takashige, Stanley Katsura

HDOT Oahu Pratt Kinimaka

MKE Brian Kung

FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions
Briefly explained what we included in the final submitted package (methodology, introduction, inventory form and matrix) and list of Oahu bridges.

II. Confirmation of the final methodology, evaluation methods, inventory form, and matrix

a. Feedback of the final submitted package

- This project is an inventory that evaluates bridge significance and in the future will be used to help develop the programmatic agreement and stream-line the consultation process.
- Add a segment about bridge periods and a definition of similarly words and phrases: special design districts, registered historic districts, etc.
- For the purposes of this report, bridges are defined as vehicular bridges on public roads. It is noted so that the community is aware privately owned bridges are not included in the database. DOT is planning to update the database every five years and some bridges may be noted in the future.
• Adding the districts (area name ex. North Kohala) into the inventory forms will be difficult as the information is not available.
• Bridges determinations process for MOA (applicable only to federally funded bridge projects):
  o Not Eligible – still needs to go through sec. 106 process and permitting but may be a simple process.
  o Eligible – certain things are allowed to change depending on what is covered in the PA.
  o High Preservation – equivalent to being a registered bridge.
  o Note from SHPD: Best example for each type of the bridge may be focused on this project but still needs to consider maintaining significance feature of the bridges for each projects.
• City & County needs Mayor level approval for bridge determination and lists.
• City & County is concerned about the resulting PA.
  o Concern with opposing community input.

b. Sign off from the members
• The city requests more time to review the package specifically the criteria, will review by mid-December.

III. Review of the Bridges on Oahu
a. Review of existing list
• Bridges that are a part of registered highways may be missing.
• Round Top Drive is a registered road and it may have bridges as a part of the nomination, however the City & County does not own any bridges along the nominated portion of the road.
• Not all bridges are under the jurisdiction of the Department of Design and Construction of the City & County, other departments own some bridges such as Parks and Recreation.
• Bridges that do not have clear ownership may be missing (others may be switching between state and city ownership).

IV. Other Comments and Questions
• Discussion about bridges in harbors and airports- HDOT-Harbors and Airports own vehicular bridges that are accessible by the general public. However, the scope will be limited to bridges in the National Bridge Inventory (NBI) or under the purview of the HDOT-Highways.

IV. ACTION ITEMS:
• Check/find bridges that may be a part of registered highways such as Kuhio Highway, Round Top Drive, etc.
• Update Bridge List.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
December 17th 2012

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
County of Maui

Meeting Date: December 17th 2012

Time: 9:00 AM – 10:30 AM

Location: HDOT offices

Attendees: HDOT Misako Mimura, Neil Hasegawa, Leslie Schwab
FHWA Meesa Otani
HDOT Maui Ferdinand Cajigal
SHPD Ross Stephenson
HHF Kiersten Faulkner
CRC Maui Stanley Solamillo
County of Maui Cary Yamashita
MKE Glenn Miyasato, Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

The following items were discussed and confirmed at the meeting. Comments and corrections to this report should be addressed to the report preparer within 3 days from the date of the report or these minutes will be recorded.

I. Introductions
Briefly explained what we included in the final submitted package (methodology, introduction, inventory form and matrix) and list of Maui bridges.

II. Confirmation of the final methodology, evaluation methods, inventory form, and matrix
a. Feedback of the final submitted package
   • “For the purposes of this report, bridges are defined as vehicular bridges on public roads.”
   o It will be changed to,” For the purposes of this report, bridges are defined as vehicular bridges on public roads and pedestrian bridges on the national bridge inventory list (NBI).”
   • In the Report:
   o Add overall DEM Image maps (which shows topography but not vegetation) with bridge locations will be explored, depending on other Counties. Stanley Solamillo to email committee the example.
b. Sign off from the members
   • All the members who attended the meeting agreed to the submitted package with the above corrections.

III. Review of the Bridges on Maui
   a. Review of existing list
      • CRC Maui is concerned about Hana Highway Bridges and Honolua Bridge.
      • Maui County has done a Haleakala Highway inventory and two county bridges along the highway may be affected as it is possible it may become a heritage corridor in the near future. Ross from SHPD can provide a copy of the inventory. Ross will send FAI a copy.
      • Four county bridges along the Hana highway have been demolished and replaced or are under construction to be replaced. (Paihi Stream bridge, Papahawahawa Stream Bridge, Waiohonu Stream Bridge, Hanaeoo Stream-Kaholopo #31).
      • Bridges in historic districts or historic bridge districts that are replaced will be noted as non-contributing bridges within their respective districts.
        o Replaced bridges refer to replacement of abutment, deck, and railing.
        o Replacement and alteration details will be noted on the bridge inventory form if available.
        o If a bridge has been replaced, it will be noted on the inventory form and marked “Replaced” with the new (bridge) construction date. Thus bridges that have been completely replaced can be tracked. Demolished and replaced bridges will be eliminated from the list of eligible bridges because they will be considered new.

IV. Other Comments and Questions
   • Facebook page to reach out to the community may not be available due to the DOT’s new policies regarding social media pages.
   • Feedback from all the committee meetings (Kauai, Hawaii, Oahu, and Maui) will be submitted to all committee members from all islands.

IV. ACTION ITEMS
   • Update Bridge List.
   • Check on GIS DEM images.
   • HDOT and FAI will look into other ways to reach out to the community.
   • Send out the consolidated minutes and highlight the key changes.
SUMMARY OF COMMITTEE MEETINGS

By: Michelle Cheang and Mayu Ohama
January 10th 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION

Meeting Dates: October 29th 2012 (Kauai); November 20th 2012 (Hawaii); November 28th 2012 (Oahu); December 17th 2012 (Maui)

Time: Various times

Location: HDOT offices on the various islands

I. Scope

- Reminder that this project is an inventory that evaluates bridge significance and in the future will be used to help develop the programmatic agreement to aid in the consultation process.
  - It is not Section 106 consultation or Chapter 6E consultation.
  - Archaeology and cultural issues are not included in this evaluation.
- Types of bridges to include were discussed at various meetings.
  - Included in inventory:
    - Those bridges in the National Bridge Inventory (NBI) or in the HDOT inventory which includes pedestrian overpasses.
  - Excluded from inventory:
    - On Oahu the purview of bridges are spread among various agencies. Therefore, to limit the scope of bridge types to a manageable level, bridges not publicly accessible or are federally or privately owned are excluded from this inventory.
- DOT is planning to update the database every five years and bridges that may be missed will be noted in the future.

II. Comments for submitted methodology, evaluation methods, inventory form, and matrix

- Overall
  - Hawaiian punctuation (okina and kahako) will not be used in this project especially since it is difficult to provide consistency for the data base.
  - Definition of “Bridge”:
    - For the purposes of this report, bridges include vehicular bridges on public roads and pedestrian bridges under the purview of the state or county. It is noted so that privately and federally owned bridges are not included in the database.
    - Definition of bridges as greater than 20’ is defined by the federal government as a way to track the funding of projects. For purposes of this
report the 20’ definition does not apply. It is noted so that the community is aware that some bridges that are less than 20’ may not be included in the database and may be missed, but should be noted by the community if known.

- City & County of Honolulu needs Mayor level approval for bridge evaluations.

**Methodology:**
- Bridge evaluation process was generally agreed to be:
  - **Eligible, High Preservation Value** to include bridges that are on the Hawaii or National Register of Historic Places are generally unique or possess characteristics of a type and exhibit high degrees of historic integrity. HDOT should use the 4F standard to determine treatment of these bridges when using federal funds.
  - **Eligible** will include bridges that are not the best example of a type and are not unique. HDOT should consider maintaining bridges in this category as through attrition, these may become rare examples at some point in time.
  - **Not Eligible** will include those bridges that have lost considerable historic integrity or do not exhibit any quality that relays historic significance. These bridges will still need to go through consultation for archaeological/cultural concerns.
    - Note from SHPD: HDOT should still consider maintaining significant features of the bridges for each project, whether or not it is high preservation value.
- A segment will be added concerning bridge periods. FAI is creating a timeline feature for the report.
- Definitions of similar words and phrases: special design districts, registered historic districts, etc. which are often interpreted differently between engineering disciplines and preservation professionals.
- Overall island maps will be added.

**Evaluation Methods Update:**
- Culverts will not be considered “eligible” unless the culverts exhibit unique adaptations to a site, are part of a historic district, or were the site of an important historic event.
- The *Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges* issued by the Advisory Council on Historic Preservation (see attached) can be followed for all eligible federally funded projects.
  - The Program Comment applies to effects of undertakings on certain common concrete and steel bridges lacking distinction, not previously listed in or determined eligible for listing in the National Register of Historic Places, and not located within or adjacent to historic districts.
  - This Program Comment relieves federal agencies from the Section 106 requirement to consider the effects of undertakings on the bridge types identified in this Program Comment (common designs used extensively throughout the US), except for those considered exceptional or are within or adjacent to historic districts.
Thus this project will look for the exceptional bridges such as the first three level overpass (H1 by Pali) in Hawaii and also note bridges that are near or within historic districts. The hundreds of bridges will otherwise be noted as falling under the program comment.

- **Inventory Form:**
  - Will indicate whether or not a bridge is currently on a historic register. (See attached example).

- **Matrix:**
  - Will be organized by island and include railing types in the character defining feature section:
    - Will add a footnote for the private bridges mentioned by the community, since these bridges will not be included in the inventory/matrix. Footnote will read something to the effect of: Privately owned bridges such as ______ and federally owned bridges are not included in this inventory.

### III. Review of the Bridges

- Community will have input on the list of bridges that are high preservation value and which are eligible.
- Project will look at major periods of development and identify which best represents those periods to determine high preservation bridges vs. eligible bridges.
- Bridges in historic districts or historic bridge districts that are replaced will be noted as non-contributing bridges within their respective districts.
  - Replaced bridges refer to replacement of abutment, deck, and railing.
  - Replacement and alteration details will be noted on the bridge inventory form if available.
  - If a bridge has been replaced, it will be noted on the inventory form and marked “Replaced” with the new (bridge) construction date. Thus bridges that have been completely replaced can be tracked. Demolished and replaced bridges will be eliminated from the list of eligible bridges because they will be considered new.

### IV. Comments and Questions

- Need wider community input to provide history or significance of the bridges since current committee members have limited resources.
  - To reach out, FAI and HDOT will set up a Facebook account to request the community’s input.
    - Current status: Facebook page has been created and is seeking approval from DOT.
  - Ron Terry will be point of contact to reach out to the five Hawaii county developing plan groups (South Kohala, North Kohala, Kona, Puna, Hamakua, Kau) which are supported by the Hawaii County Planning Department.
MEETING MINUTES
By: Michelle Cheang & Mayu Ohama
January 24th 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION

Meeting Date: January 24th 2013

Time: 9:00 AM – 10:00 AM

Location: HDOT Kapolei, Conference Room

Attendees: HDOT Misako Mimura, Todd Nishioka, Paul Santo, Leslie Schwab
SHPD Ross Stephenson
MKE Leilani Nakashima
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

Bridge Parapet Recommendations

I. Comments
   • Overall
     o If there are two railings on the bridge, one for the pedestrian and another for the traffic, both
       railing types will be mentioned on the inventory form, but only the railing that is part of the
       structure will be included in the database field. The other railing will be noted in the
       description portion.
     o “Other” category will be added for the unique ones that do not fall under any of the types.
   • Concrete
     o Caps – cap types will be mentioned (ex. flat, tapered) in the description, but not as separate
       categories.
   • Metal
     o Metal Truss is a “bridge type” so will be deleted from the parapet/railing types.
     o Metal freeway will be deleted and put under metal horizontal.
   • Concrete
     o Concrete open post war rectilinear will be deleted and put under the concrete open horizontal.

II. Other changes
   • Added “No railing/parapet” to the types. Ex. Metal truss bridges does not have a railing.

The attached are the final parapet fields per the meeting.
Bridge Parapet Types

- Concrete solid
- Concrete solid with cap
- Concrete solid panel
- Concrete solid panel with cap
- Concrete solid decorative

- Masonry rock
- Masonry rock with cap

- Metal horizontal
- Metal picket
- Metal Thrie Beam
- Metal decorative

- Concrete open horizontal
- Concrete open vertical
- Concrete open arched
- Concrete open Greek Cross
- Concrete open decorative

- Wood

- Concrete and metal
- Concrete and metal picket
- Concrete and metal decorative

- Other

- No Railing/Parapet
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
July 1st 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
Oahu Island Bridges

Meeting Date: July 1st 2013

Time: 8:30 AM – 11:30 AM

Location: HDOT Punchbowl, 5th Floor Conference Room;
HDOT Kapolei, Conference Room

Attendees: HDOT Misako Mimura, Neil Hasegawa, Sarah Vanapruks
FHWA Domingo Galicinao, Meesa Otani
HHF Kiersten Faulkner
SHPD Ross Stephenson
C&C of Honolulu Mark Yonamine, Stanley Katsura, Michael Yee
HDOT Maintenance Charles Lee, Dawna Emoto
MKE Glenn Miyasato, Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang,
Alison Chiu

I. Introductions
   a. Overview of past meetings and reminder that this is an identification project, not Section
      106 consultation and not a project to discuss treatment of bridges.

II. Review of Summary of Identification and Evaluation Methods
   a. Program comment bridges—FAI reviewed the basic highlights of the program comments
      and how it affected the inventory project.
      i. Post-1945 Bridges that are of common construction types are considered program
         comment bridges:
         1. Steel Multi-Beam or Multi Girder.
         2. Reinforced Concrete Beam and Girder.
         3. Reinforced Concrete Slab.
         4. Culverts and Reinforced Concrete Boxes.
      ii. Through the Program Comment done by FHWA and agreed to by ACHP, no
          further consultation on the eligibility of the bridges need to be done provided that:
          1. The States identify best examples.
          2. It is one of the goals of the project to identify the best examples.
b. Current report has non-contributing bridges within a district as eligible so that reviewers will be aware that the bridge should be consulted upon.
   i. It was agreed by those present that instead of noting these bridges as “eligible”, there will be a note: Non-contributing resource in historic property. This will apply to newer bridges within an historic district and not eligible bridges that are part of other properties such as the Ala Moana Blvd. bridge over the Ala Wai Canal.

   c. Adjacent properties to all not eligible bridges/culverts may have historic resources or original features associated with the bridge, if these associations remain then they will be noted on the matrix and form.

d. HHF reminded the team that they would like to see graphics showing the components of a bridge included in the report.

   e. FAI to check with HART report to ensure eligibility determinations are consistent.
      i. UPDATE: the determinations were consistent, with Waikēle Canal (Inbound) evaluated as High Preservation Value in this report.

III. Review of Bridge Matrices
   a. Summary
      i. Order of bridges will be done alphabetical.
      ii. The field for eligibility for program comments will be noted as “Program Comments”.
         1. Definition for each category will be included (eligible/not eligible/program comments/Non-contributing resource... etc.).
      iii. The matrices will be put at the front of each island chapter to act as an index for the chapter.

   b. Bridge status will be altered/changed only for bridges that have already finished the consultation process or are currently in the consultation process. Future replacement or alterations to bridges that has not finished the consultation process will not be included.

IV. Review of Chapter 4 Oahu
   a. Historic Bridge District: Pali Highway is noted as High Preservation Value group of bridges that fall under the program comment time period.
   b. Reviewed Matrices and eligibility recommendations Oahu Bridges. Recommended changes as follows (Red indicates action items / Yellow indicates status change):
      i. Oahu State
         1. Pauoa Stream Culvert: Consultation recommended due to connection between culvert and adjacent portion of rock wall channelization project.
         2. South Punalu'u Stream Bridge: Recently replaced (will still include in matrix).
         4. North Kahana Stream Bridge: Also recently replaced.
         5. Iiihihaukea Stream Bridge: Will change to High Preservation Value.
         8. Three of the Unnamed Stream-Makaha 3 and 3A: Scheduled for replacement; MOA has been completed.
9. **Ala Wai Canal Bridge (Ala Moana Blvd):** Change to non-contributing.
10. **Kawa Stream Bridge (Kaneohe Bay Dr):** Change to High Preservation Value (HPV).
11. **Railroad Crossing @ Farrington Highway:** (Note was incorrect photo – FAI to email correct photo to attendees) – Likely HPV and FAI to check if it crosses over OR&L right of way which is listed
12. **Waiekele Canal (Inbound):** Noted by Ross to be HPV as part of the last major accommodation project for railroads.
13. **Farrington Hwy-Waialua Plantation Road:** Change to HPV due to use of steel stringer; (owned by state but doesn’t carry public traffic).
14. **Kawaihau Stream (inbound and outbound):** Change to HPV as part of important development.
15. **Kawaihapai Stream:** Note that the original railings are still existing.
16. **Waialua Plantation Road:** Correct the post-war comment to war-time.
17. **Sand Island Bascule Bridge:** Will change to HPV.

**ii. Oahu County**

1. **FAI to look at numerous early 1930s bridges in Nuuanu area to see if should be district, or multiple property, such as Nuuanu Pali Drive bridges.**
2. **Kimo Drive Bridge:** Date will be corrected to 1925.
3. **Waiekele Stream Bridge:** Will change to HPV.
4. **Makiki St. Bridge:** Will change to HPV, because of the arch bridge and age.
5. **Anahulu Stream Bridge:** Change from “1960s” to “1920s” in character defining features on matrix.
6. **North King Street Bridge No.1 – Nuuanu:** Will change to HPV.
7. **Ft. Weaver Rd.:** Will change to HPV because of the arch bridge and age.
8. **Kahala Avenue Bridge No.2 Kapakahi Stream:** Railings replaced 2013.
9. **St. Louis Dr. Bridge:** Will change to HPV because of the arch bridge.
   Metal horizontal railings will be added in between the existing concrete horizontal railings.
10. **Diamond Head Road Bridge – Upper gully:** Change to HPV, current 2013 project replaces railings.
11. **Fern Street Bridge:** Currently re-habbing, may raise height of rail.
12. **Lusitana Street Bridge-Pauoa Stream:** Currently undergoing rehabilitation.
13. **Nuuanu Ave. Arch Bridge-Nuuanu:** FAI to confirm date, possibly 1902; undergoing current rehabilitation to increase railing height via cap.
14. **S-Lai Road Bridges:** On Private road – will note on matrix private road that is maintained by city.
15. **Puowaina Drive Bridge:** Note the railings were re-done but in same style, just higher to meet current code.
16. **Maunawili Road Bridge #3:** FAI to check with Hugh Liu – (Bridge 444) may have been replaced.
17. **Phillip St. Bridge:** Note not eligible, but abuts possible eligible property.
18. **Kalili St. Bridge:** Change to HPV, HECO mainly uses the bridge, only six residential beyond the bridge.
19. **Waipio Point Access**: FAI to check on relationship with OR&L ROW.

20. **McCully Street Bridge-Ala Wai**: Scheduled railing modifications; MOA complete.

21. **Malia Street Bridge No.1 –Waialae Nui Stream**: Railings have been modified.

22. **Kumuhau St. Bridge**: Change to HPV; one of the steel bridges.

23. **Waaloa Way Bridges (Nos. 1,2,3,4)**: BWS maintenance roads, should not be included.

24. **Liholiho St. Box Culvert/No. Beretaina St. Bridge**: Note not eligible, but abuts possible eligible property; scheduled bid proposal for rehabilitation in 2 months.

25. **North Beretania Street Bridge-Nuuanu Stream**: Note not eligible, but abuts possible eligible property.

26. **Kuliouou Rd Bridge**: Note that may be private bridge, County currently working on conveying to owner.

27. **Ahe Street Bridge**: Built in 1950.

28. **Ahuimanu Road Bridge No. 2**: Private bridge without a construction date and information. It is not maintained by the city.

29. **Hauula Homestead Bridge**: Built in 1930.

V. Review of Appendices
   a. Significant Persons List – will be limited list that includes significant engineers.

VI. Review of Schedule
   a. Committee comments for Draft I due on July 30th.
   b. By August 27th, FAI to update methodology, matrix, inventory sheet set per committee meetings comments and complete the final draft report.
   c. Committee comments for the final electronic draft due on September 17th.
   d. FAI to submit the Final report on October 15th.
   e. Committee comments for the final report by the end of October 2013.

VII. Other Comments and Questions
   a. Facebook update: FAI to send link to HHF and SHPD to provide link through their websites.
## MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
July 3rd 2013

**Project:**
HAWEI STATEWIDE BRIDGE INVENTORY AND EVALUATION  
Maui Island Bridges

**Meeting Date:**  
July 3rd 2013

**Time:**  
8:30 AM – 10:30 AM

**Location:**  
HDOT Punchbowl, 5th Floor Conference Room;  
HDOT Kapolei, Conference Room;  
HDOT Maui, Conference Room

**Invitees:**  
HDOT Misako Mimura, Neil Hasegawa, Sarah Vanapruks  
FHWA Domingo Galicinao, Meesa Otani  
HHF Kiersten Faulkner  
SHPD Ross Stephenson  
HDOT Maui District Ferdinand Cajigal  
Planning Maui County Annalise Kehler  
County of Maui Cary Yamashita  
MKE Glenn Miyasato, Brian Kung  
FAI Tonia Moy, Mayu Ohama, Michelle Cheang, Alison Chiu

---

### I. Introductions

a. Overview of past meetings and reminder that this is an identification project, not Section 106 consultation and not a project to discuss treatment of bridges.

### II. Review of Summary of Identification and Evaluation Methods

a. Program comment bridges—FAI reviewed the basic highlights of the program comments and how it affected the inventory project.

i. Post-1945 Bridges that are of common construction types are considered program comment bridges:

1. Steel Multi-Beam or Multi Girder.
2. Reinforced Concrete Beam and Girder.
3. Reinforced Concrete Slab.
4. Culverts and Reinforced Concrete Boxes.
ii. Through the Program Comment done by FHWA and agreed to by ACHP, no further consultation on the eligibility of the bridges need to be done provided that:
   1. The States identify best examples.
   2. It is one of the goals of the project to identify the best examples.

b. Current report has non-contributing bridges within a district as eligible so that reviewers will be aware that the bridge should be consulted upon.
   i. It was agreed by those present that instead of noting these bridges as “eligible”, there will be a note: Non-contributing resource in historic property. This will apply to newer bridges within an historic district and not eligible bridges that are part of other properties such as the Ala Moana Blvd. bridge over the Ala Wai Canal.

c. Adjacent properties to all not eligible bridges/culverts may have historic resources or original features associated with the bridge, if these associations remain then they will be noted on the matrix and form.

III. Review of Chapter 5 Maui and Molokai
   a. Historic Bridge District: Team agreed that Hana Highway will be High Preservation Value (43 bridges).
   b. Bridge status will be altered/changed only for bridges that have already finished the consultation process or are currently in the consultation process. Future replacement or alterations to bridges that have not finished the consultation process will not be included.
   c. Reviewed Matrices and eligibility recommendation Maui Bridges – Recommended changes as follows (Red indicates action items / Yellow indicates status change):
      i. Maui State
         1. Anakaluahine Stream Bridge: Will update to eligible, as only railings have changed; deck and rock abutments remain intact.
         2. Honolua Stream Bridge: Also change to eligible for same reasons.
         3. Papanahoa Bridge: Difficult to tell from available photos; Maui District office will supply most current report with additional pictures; FAI to change the feature crossing to be Kauaola to Kanoulu.
         4. Pohakuokala Bridge on Haleakala Highway: Add a note that may be eligible in another 10 years; while it does not rise to level of exceptional significance, it has some unique qualities that will make it eligible in the future.
         5. Waiale Gulch Bridge: Same as Pohakuokala Bridge.
         6. Waiale Road Overpass: Note that railings were replaced in-kind in 2010s.
         7. Launiupoko Stream, Olowalu B Stream, Olowalu Stream Bridge: FAI to do more research on what was reconstructed – entire bridge or a portion; Maui District to supply information.
         8. Molokai bridges: (Kamiloloa Bridge, Kawela Bridge and Makakupaia Bridge will be looked at to see if one should be considered High Preservation Value as there are so few historic bridges on Molokai) HDOT to check on what is planned for these bridges; based on information received from HDOT, Kawela is in the process of replacement and Makakupaia is scheduled for replacement in 2015 FY; update Kamiloloa status to High Preservation Value.
11. **Kaunakakai 16-Cell Culvert**: Will be changed to eligible due to unique culvert design and long 16-cell span.
12. **Kalialinui B Stream Bridge**: Will be changed to HPV as one of the best examples of a bridge falling within the program comments criteria.
13. **Waiehu Twin 12 ft. Culvert**: Will change to eligible due to the addition of rock facing.

ii. **Maui County**
1. **Kalialinui No. 2 Gulch**: Will be HPV due to its age and artistry.
2. **Kaupakalua No. 35**: FAI to research its abutments; based on information received from HDOT, it is confirmed that Kaupakalua No.35 has rock wall abutments; status will be changed to eligible.
3. **Paihi No. 25**: Replaced in 2005; will be non-contributing in historic district, FAI to replace photos on the form.
4. **Pauwela No. 39**: Will be HPV due to its age and artistry.
5. **Papahawahawa No. 28, Waiohonu No. 29 and Kaholopo No. 31**: Papahawahawa No. 28 is replaced in 2011, Waiohonu No. 29 is replaced in 2013, and Kaholopo No. 31 is under construction and all will be non-contributing in historic district. No. 31 is also known as Make Man Bridge (pronounced ma-kay).
6. **Makamakaole No. 63**: Change to eligible due to rock wall abutments.
7. **Wailea No. 65**: Change to eligible due to rock wall abutments.
8. **Sam Kalama No. 50 and Kalepa No. 12 Bridges**: Will be noted that not eligible, but abuts a potentially eligible resource (rock wall); Kalepa change construction date to 1993.
9. **Alele No. 13 Bridge**: Change construction date to 1983.
10. **Malliko No. 48**: Change to HPV due to arch construction and rarity of this time period.
11. **Manawainui No. 80**: Change to HPV as it is one of the earliest from Program Comment time period.
12. **Iron Bridge No. 113**: Change to HPV due to use of steel; County to check bridge status.
13. **Iao Stream Bridge No. 59**: Change to HPV due to use of steel; County to check the bridge status.
14. **Kahana Nui No. 93**: Scheduled to be replaced in 2014; in the process of the consultation.
15. **Honokowai No. 91**: Change date to 1988.

IV. Review of Appendices
   a. Significant Persons List – limited list of engineers and designers.

V. Review of Schedule
   a. Committee comments for Draft I due on July 30th.
   b. By August 27th, FAI to update methodology, matrix, inventory sheet set per committee meetings comments and complete the final draft report.
   c. Committee comments for the final electronic draft due on September 17th.
d. FAI to submit the Final report on October 15th.
e. Committee comments for the final report by the end of October 2013.

VI. Other Comments and Questions
   a. Facebook update – FAI requested Maui Cultural Resources Commission input through the facebook link so that they do not need to sit through a 3 hour meeting. Analise will follow through with the commission.
   b. FAI to place photos of the bridges that have been replaced on a separate CD for SHPD.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
July 12th 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
Hawaii Island Bridges

Meeting Date: July 10th 2013

Time: 1:00 AM – 4:00 PM

Location: HDOT Punchbowl, 5th Floor Conference Room;
HDOT Kapolei, Conference Room

Attendees: HDOT Misako Mimura, Neil Hasegawa, Paul Santo,
Sarah Vanapruks
FHWA Domingo Galicinao
SHPD Ross Stephenson
HDOT Hawaii Sal Panem
County of Hawaii DPW Cres Rambayon
Community Member Ron Terry
MKE Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang,
Alison Chiu

I. Introductions
   a. Overview of past meetings and reminder that this is an identification project, not Section
      106 consultation and not a project to discuss treatment of bridges.

II. Review of Summary of Identification and Evaluation Methods
   a. Program comment bridges—FAI reviewed the basic highlights of the program comments
      and how it affected the inventory project.
      i. Post-1945 Bridges that are of common construction types are considered program
         comment bridges:
         1. Steel Multi-Beam or Multi Girder.
         2. Reinforced Concrete Beam and Girder.
         3. Reinforced Concrete Slab.
         4. Culverts and Reinforced Concrete Boxes.
      ii. Through the Program Comment done by FHWA and agreed to by ACHP, no
          further consultation on the eligibility of the bridges need to be done provided that:
          1. The States identify best examples.
          2. It is one of the goals of the project to identify the best examples.
b. Current report has non-contributing bridges within a district as eligible so that reviewers will be aware that the bridge should be consulted upon.
   i. It was agreed by those present that instead of noting these bridges as “eligible”, there will be a note: Non-contributing resource in historic property. This will apply to newer bridges within an historic district and not eligible bridges that are part of other properties such as the Ala Moana Blvd. Bridge over the Ala Wai Canal.

III. Review of Bridge Matrices Hawaii
   a. Summary
      i. Order of bridges will be done alphabetical.
      ii. The field for eligibility for program comments will be noted as “Program Comments”.
         1. Definition for each category will be included (eligible/not eligible/program comments/Non-contributing resource… etc.).
      iii. The matrices will be put at the front of each island chapter to act as an index for the chapter.
      iv. It was agreed that steel stringer bridges that fall under Program Comments status, ex. Ninole and Opea Stream Bridges, will be left as Program Comments (even though many were listed as eligible or high preservation value on other islands) because of the higher number of steel stringer bridges on Hawaii.

IV. Review of Chapter 6 Hawaii
   a. Historic Bridge District:
   b. Reviewed Matrices and eligibility recommendations Hawaii Bridges. Recommended changes as follows (Red indicates action items / Yellow indicates status change):
      i. Hawaii State
         1. **Pahoehoe Stream Bridge**: Change to eligible because of the rarity of an arch as a bridge type. Bridge is scheduled to be replaced; bidding to begin at end of month.
         2. **Aamakoa Stream Bridge**: DOT to check on date of alteration/seismic retrofit completed.
         3. **Paheehee Mauka Bridge**: DOT to check on date of alteration/seismic retrofit completed. Confirmed not eligible but abutments a potentially eligible historic resource.
         4. **Waiaka Stream Bridge**: Scheduled replacement and road realignment project; MOA between the Central Federal Lands and DOT; CFL to complete project.
         5. **Makeahua Stream Bridge**: Hawaii District DOT to provide photograph of abutments prior to confirming eligibility status.
         6. **Kaala Stream Bridge**: DOT to check on date of alteration/seismic retrofit completed.
         7. **Kealakaha Stream Bridge**: Bridge is still standing but not in use as it was replaced by a new one adjacent.
         8. **Honolii Stream Bridge**: DOT to check on date of alteration/seismic retrofit completed. Existing chamfered columns altered from original T-shaped columns.
9. **Hilea Stream Bridge**: considered for replacement, MOA between the Central Federal Lands and DOT to complete.

10. **Keamuku Stream Bridge**: Change to not eligible due to its lack of any features, resembling a concrete box culvert.

11. **Ninole Stream Bridge**: Change to high preservation, one of the last district owned timber bridges. Abutments a potentially eligible historic resource. Bridge is considered for replacement and MOA between the Central Federal Lands and DOT to complete.

12. **Hilo Plantation Flume Overpass**: Bridge is maintained by State although it is not in use and ownership is unknown.

13. **Hilo Plantation Road Overpass**: Bridge is maintained by State although it is not in use and ownership is unknown. FAI to check possible association to sugar industry, used to have the sugar mill on the high side.

14. **Kukiau Stream Bridge**: DOT to check on date of alteration/seismic retrofit completed and painted.

15. **Umauma Stream Bridge**: Altered in 2013 to include concrete pillars inside of trestles.

16. **Hakalau Plantation Road Overpass**: FAI to check association with plantation industry.

17. **Hakalau Stream Bridge**: FAI to check with DOT if the bridge is not in use.

18. **Cane Haul Road Underpass**: FAI to check association with plantation industry.

19. **Kihalani Stream Bridge**: FAI to check association with Cane Haul Road/plantation industry.

20. **Moanalulu Stream Bridge**: FAI to provide additional/better photographs overall and of abutments.

21. **Kalopa Stream Bridge**: Change to high preservation due to longest concrete span bridge.

22. **Ookala Plantation Road Overpass**: FAI to check association with plantation industry.

23. **2-Metal Pipe Culvert (001000110310346)**: FAI to send location info to Sal Panem of Hawaii District in order to verify material.

### ii. Hawaii County

1. **Kawaihui Stream Bridge**: Scheduled replacement in-kind.

2. **Mali Stream Bridge**: Scheduled replacement in-kind.

3. **Waiaha Bridge**: Bridge was damaged in earthquake 2006; wing walls replaced 2007. (More research needed in the future; county to provide with information.)

4. **Waikaumalo Stream Bridge**: Replaced in-kind.

5. **Waiullii Stream Bridge**: Replaced in 1979 (new date).

6. **Relief Elevation 2760 Bridge**: Railings have been replaced.

7. **Waipahoe Stream Bridge**: Change to high preservation value due to rarity of arch bridge type.

8. **Waipunahina Gulch Bridge**: Wing walls repaired on Hamakua side. County to check on date of alteration.
9. **Kaahakini Stream Bridge**: Part of seven-bridge MOA for demolition. 
   UPDATE: Hawaii County sent FAI a copy of original MOA. 
   Seven bridges are Honoum, Kalaa, Opea, Kalopa, Inoino, Waikaalulu and 
   Kaahakini.
10. **Kalopa Kaumoali Gulch Bridge**: Will be removed from inventory list due to 
    replacement in 2003 (new date).
11. **Old Railroad Crossing Bridge**: Abutments a potentially eligible historic 
    resource, FAI check association with plantation industry.
12. **Onomea Camp Road Bridge**: Will be removed from inventory list due to 
    replacement in 2002 (new date). Abutments a potentially eligible historic 
    resource.
    Change status to “Non-contributing element in a historic district.”
14. **Kahului Bridge**: Programmed replacement in 2016. Abutments a 
    potentially eligible historic resource.
15. **Kalopa Allipali Gulch Bridge**: Replaced in 2003 (new date).
16. **Kaluiiki Bridge**: Deck replaced in-kind; abutments and railings replaced in 
    2005.
17. **Oshiro Road Bridge**: Replaced in 2003 (new date).
18. **Reeds Island Bridge**: Currently under construction 2013. Part of six-bridge 
    MOA. Deck to be replaced in-kind under MOA. Will be removed from 
    inventory list due to replacement in 2013 (new date).
19. **51 Mile Bridge**: Abutments potentially eligible historic resource. FAI to 
    check potential association with Saddle Road for this bridge and 53 Mile 
    Bridge.
20. **Waiulaula Gulch Bridges (001620001100001, 001620001100002)**: On 
    county land; in process of turning over ownership to private owner.
21. **Elm Street Bridge**: FAI to check with county if this is a culvert, but 
    abutments are potentially eligible historic resources.
22. **4 Mile Creek Bridge**: County to provide additional photographs re: railings 
    and abutments. Check dates is it replaced/repaired/etc in 1964?
23. **Komohana Street Bridge**: FAI to check with county if the bridge is 
    completely replaced or altered in 2005.
24. **Kawaihale Street Bridge**: Will be removed from inventory list due to 
    replacement in 2005 (new date).

V. Review of Appendices
   a. Significant Persons List – will be limited list that includes significant engineers.

VI. Review of Schedule
   a. Committee comments for Draft I due on July 30th.
   b. By August 27th, FAI to update methodology, matrix, inventory sheet set per committee 
      meetings comments and complete the final draft report.
   c. Committee comments for the final electronic draft due on September 17th.
   d. FAI to submit the Final report on October 15th.
   e. Committee comments for the final report by the end of October 2013.
VII. Other Comments and Questions
   a. Facebook update: FAI to send link to HHF and SHPD to provide link through their websites.
MEETING MINUTES

By: Michelle Cheang and Mayu Ohama
July 25th 2013

Project: HAWAII STATEWIDE BRIDGE INVENTORY AND EVALUATION
Kauai Island Bridges

Meeting Date: July 23rd 2013

Time: 8:00 AM – 10:00 AM

Location: HDOT Punchbowl, 5th Floor Conference Room;
HDOT Kapolei, Conference Room;
HDOT Kauai, Conference Room

Attendees: HDOT Misako Mimura, Neil Hasegawa, Sarah Vanapruks
FHWA Domingo Galicinao, Meesa Otani
HHF Kiersten Faulkner, Tanya Gumpac-McGuire
SHPD Angie Westfall, Mike Gushard
HDOT Kauai District Raymond J. McCormick, Fred Reyes
Planning Kauai County Lee Steinmetz
County of Kauai DPW Wallace Kudo, Kuppusamy Venkatesan
KHPRC Pat Griffin
MKE Brian Kung
FAI Tonia Moy, Mayu Ohama, Michelle Cheang

I. Introductions
   a. Overview of past meetings and reminder that this is an identification project, not Section 106 consultation and not a project to discuss treatment of bridges.

II. Review of Summary of Identification and Evaluation Methods
   a. Program comment bridges—FAI reviewed the basic highlights of the program comments and how it affected the inventory project.
      i. Post-1945 Bridges that are of common construction types are considered program comment bridges:
         1. Steel Multi-Beam or Multi Girder.
         2. Reinforced Concrete Beam and Girder.
         3. Reinforced Concrete Slab.
         4. Culverts and Reinforced Concrete Boxes.
      ii. Through the Program Comment done by FHWA and agreed to by ACHP, no further consultation on the eligibility of the bridges need to be done provided that:
         1. The States identify best examples.
         2. It is one of the goals of the project to identify the best examples.
b. Current report has non-contributing bridges within a district as eligible so that reviewers will be aware that the bridge should be consulted upon.
   i. It was agreed by those present that instead of noting these bridges as “eligible”, there will be a note: Non-contributing resource in historic property. This will apply to newer bridges within an historic district and not eligible bridges that are part of other properties such as the Ala Moana Blvd. Bridge over the Ala Wai Canal.

c. Adjacent properties to all not eligible bridges/culverts may have historic resources or original features associated with the bridge; if these associations remain, then they will be noted on the matrix and form.

d. Totally replaced bridges
   i. Change the construction date of bridges that have been reconstructed and place a note similar to: “Original bridge built in 1914” under Character Defining Features.
   ii. Organize the matrix in alphabetical order including reconstructed bridges with new dates.

e. Culverts in the Historic District
   i. Scope of the project was only to include the bridges/culverts on the NBI list and will not include the bridges/culverts that are less than 20 feet in this report even if they are in the historic district. This will be clarified in the introduction of the report.
   ii. Bridges/culverts that are in the district but less than 20 feet will be mentioned at the beginning of the each island chapter within the narrative on the district.

f. Not eligible bridges/culverts

g. Adjacent properties to all not eligible bridges/culverts may have historic resources or original features associated with the bridge; if these associations remain, then they will be noted on the matrix and form.

III. Review of Bridge Matrices Kauai
   a. Summary
      i. Order of bridges will be done alphabetical.
      ii. The field for eligibility for program comments will be noted as “Program Comments”.
         1. Definition for each category will be included (eligible/not eligible/program comments/Non-contributing resource… etc.).
      iii. The matrices will be put at the front of each island chapter to act as an index for the chapter.
      iv. Bridge status will be altered/changed only for bridges that have already finished the consultation process or is currently in the consultation process. Future replacement or alterations to bridges that have not finished consultation will not be included.

b. Bridge status will be altered/changed only for bridges that have already finished the consultation process or are currently in the consultation process. Future replacement or alterations to bridges that have not finished the consultation process will not be included.

IV. Review of Chapter 3 Kauai
   a. Historic Bridge District.
   b. Reviewed Matrices and eligibility recommendations Kauai Bridges. Recommended changes as follows (Red indicates action items / Yellow indicates status change):
i. Kauai State Bridges

1. **Hanalei River Bridge** (007005600500123): Major alteration in the 1990s; check date with DOT; change the description from the wood to steel railings in the database form.

2. **Waialoli Stream Bridge** (007005600500343), **Waipa Stream Bridge** (007005600500396), **Wailoko Stream Bridge** (007005600500427): All three bridges are a part of an ongoing 2013 design project.

3. **Wainiha Stream Bridge No. 1** (007005600500644): Revise construction date to 2010 as historic bridge is gone, non-contributing, note in character defining feature section: Bridge replaced with the temporary Acrow Bridge.

4. **Haena Bridge No. 1** (007005600500749): Less than 20’ in length; remove from matrix.

5. **Haena Bridge No. 2** (007005600500844): Less than 20’ in length; remove from matrix.

6. **Wainiha River Bridge No. 2** (007005600500670): Non-contributing; add to character defining feature - temporary Acrow bridge.

7. **Wainiha River Bridge No. 3** (007005600500673): Non-contributing; add to character defining feature - temporary Acrow bridge.

8. **Nawiliwili Stream Bridge (Lihue Mill)** (007000500403271): Under construction for significant alteration in 2013; not eligible due to significant change/alteration; Page 3-45 correct description of Lihue Plantation road alignment.

9. **Kapaa Temporary Bypass Road – Kainahola Stream Bridge** (007056000400161): Rock abutments are a potential historic resource; keep as not eligible because of significant change/alteration; committee member will do site visit to determine eligibility status and DOT will provide more photos; associated with Lihue Plantation.

10. **Woeoepilau Stream Bridge** (007000500302671): Check on description – location is northeast of Malahia road or southeast.

11. **Elele Pedestrian** (007000500001694): What is the other pedestrian overpass built post-war?; change the description of the bridge from post-war to pre-war; FAI to check on past report.

12. **Wailua River Bridge** (007000560400572): Change to High Preservation Value; one of earliest post-war bridges and best example of program comments.

13. **Makaweli Flume Overpass** (00700050002033): Change to High Preservation Value for only flume remaining on Kauai.

14. **Kaumakani Pedestrian Overpass** (007000500001419): FAI to check if it is one of two on Kauai (check with Elele) – need to check dates; High Preservation Value for the intact postwar pedestrian bridge; feature Crossed corrected to Kaumualii Highway.

15. **Kalihiwai River Bridge** (007000560302497): High Preservation Value because of the long span.
ii. Kauai County

1. **Kokee Bridge** (007120061112001): Railings replaced in 2005; county to verify construction date.

2. **Mana Bridge No. 1** (007120061112002): Artistic value; county to verify construction date.

3. **Nawiliwili Bridge** (007350011135001): Aka Duke’s Bridge; county to verify construction date.


5. **Opaekaa Bridge** (007420151142001): Bridge was placed in the current location in 1919.

6. **Puuopae Bridge** (007440111144001): Change the construction date to 1915; original construction was a truss bridge which was removed/replaced around 1957/1958, railings altered in 2000.

7. **Wailana Bridge No. 4** (007280500728001): High Preservation Value for age; County to check if it was widened and structure was added to later.


9. **Puukumu Bridge** (007520171152002): High Preservation Value for age; change 1920s → 1910s in character defining features.


11. **Lawai Bridge** (007230411123003): Only arch bridge on the island of Kauai.

12. **Hoomana Overpass** (007380021138001): 2013 alteration to rails; building the new Lihue Mill bridge parallel to the Hoomana bridge will impact the left railing; was notable for providing access to nearby historic residential district; delete the Grove Farm section from the description.

13. **Wailana Bridge No. 2** (007280500728003): Change 1903s → 1930s in character defining features.

14. **Kapahi Bridge** (007460021146001): Bridge deck was altered in 1977 change the database form to “yes” under “alteration?”; in 2012 railings were replaced because they were damaged; change the narrative description from “Kapaa Bridge” to “Kapahi bridge”; will maintain to be eligible but unsure if the steel stringer was installed at the 1977 alteration for the timber deck structural support.

15. **Oloheena Bridge No. 1** (007430200743001): Change construction date to 2005.

16. **Kainahola Bridge** (007440181144002): County will check if bridge still has steel stringers.

V. Review of Appendices

   a. Significant Persons List – will be limited list that includes significant engineers.

VI. Review of Schedule

   a. Committee comments for Draft I due on July 30th.

   b. By August 27th, FAI to update methodology, matrix, inventory sheet set per committee meetings comments and complete the final draft report.
c. Committee comments for the final electronic draft due on September 17th.
d. FAI to submit the Final report on October 15th.
e. Committee comments for the final report by the end of October 2013.

VII. Other Comments and Questions
a. Facebook update: FAI to send link to HHF and SHPD to provide link through their websites.
b. Report will be only in digital when we submit to the committee members. HDOT will provide CDs with pdf of report to all committee members.
c. DOT will check if they can release the simple version of the Access database to the public.