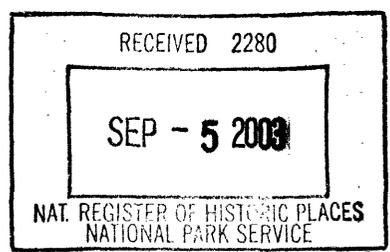


NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018



United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

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

2. Location

street & number Hawai'i Route 560 not for publication ___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

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this 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] 7/30/2003
Signature of certifying official Date

State or Federal agency and bureau

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

Signature of commenting or other official Date

State or Federal agency and bureau

4. National Park Service Certification

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

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

determined eligible for the National Register
 See continuation sheet.

determined not eligible for the National Register

removed from the National Register

other (explain): _____

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

- private
- public-local
- 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

Number of Resources within Property

Contributing	Noncontributing	
_____	_____	buildings
<u> 2 </u>	_____	sites
<u> 13 </u>	<u> 2 </u>	structures (bridges and culverts)
_____	_____	objects
<u> 15 </u>	<u> 2 </u>	Total

Number of contributing resources previously listed in the

National Register N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

Current Functions (Enter categories from instructions)

Cat: Transportation Sub: road-related

7. Description

Architectural Classification
(Enter categories from instructions)

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

Materials
(Enter categories from instructions)

foundation _____

roof _____

walls _____

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

8. Statement of Significance

Applicable National Register Criteria

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

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 _____

Commerce _____

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

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, Wai'oli Bridge, Waipā Bridge

designated a National Historic Landmark

recorded by Historic American Buildings Survey

recorded by Historic American Engineering Record

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

Primary Location of Additional Data

State Historic Preservation Office

Other State agency

Federal agency

Local government

University

Other

Name of repository:

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

10. Geographical Data Acreage of Property 54

UTM References

(Place additional UTM references on a continuation sheet)

Zone	Easting	Northing	Zone	Easting	Northing
104	451000	2456460	304	449820	2456220
204	450980	2456220	404	449280	2455500

See continuation sheet.

Verbal Boundary Description

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

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

Boundary Justification

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

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

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

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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 10 Geographical Data Page _____

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

UTMs continued:

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

11. Form Prepared By

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

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

Continuation Sheets

Maps

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

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

Photographs

Representative black and white photographs of the property.

Additional items

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

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

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

United States Department of the Interior
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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 1

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description

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

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

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

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

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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 2

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description (continued)

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

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

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

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Section 7 Page 3

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

Narrative Description (continued)

EARLY TRANSPORTATION ALONG KAUA'I'S NORTH SHORE

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

Foreigners, among them American missionaries, were the first to travel primarily by land and introduced horses to the Hawaiian Islands in 1803.² The journal of William DeWitt Alexander provides an early written account of a day-long excursion along Kaua'i's North Shore in 1849. Alexander's destination was Hā'ena and its "celebrated caves." His party departed from Wai'oli near Hanalei, "all mounted on good horses and in high spirits." Their six-mile journey was through beautiful scenery and crossed three river valleys. Rivers were crossed by canoes or by fording.³

In 1865, William T. Brigham's account of his sightseeing journey to Hā'ena noted several improvements in river crossings, including scows on the Hanalei and Lumaha'i rivers. Other rivers still had to be forded and were difficult to cross. The trip to Hā'ena took the entire day, much as it had for Alexander in 1849.⁴

¹ E. S. Craighill Handy and Elizabeth Green Handy, *Native Planters in Old Hawai'i: Their Life, Lore, and Environment*. (Honolulu: Bishop Museum Press, 1972), 269.

² Ralph Kuykendall, *The Hawaiian Kingdom, 1854-1874*. V. 2 (Honolulu: University of Hawai'i Press, 1953), 23.

³ Kaua'i Historical Society, *The Kaua'i Papers*. (Lihu'e, Hawai'i: Kaua'i Historical Society, 1991), 126-127.

⁴ *The Kaua'i Papers*, 138.

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Section 7 Page 4

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description (continued)

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

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

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

⁵ *The Kaua'i Papers*, 153-154.

⁶ W. A. Wall, Map of Hanalei, Makai, Kaua'i. (Honolulu: Hawaiian Government Survey Registered Map No. 1833, 1893).

⁷ *The Kaua'i Papers*, 154-155.

⁸ Kuykendall, *The Hawaiian Kingdom, 1854-1874*. V. 2, 25-26.

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Section 7 Page 5

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

Narrative Description (continued)

Early Transportation Improvements on Kaua'i's North Shore

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

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

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

⁹ Superintendent of Public Works, *Report for 1900*, 209.

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

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Section 7 Page 6

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

Narrative Description (continued)

new steel bridge at Lumaha'i in 1905.¹¹ Other public works projects along the North Shore provided for relocating and reconstructing the road between Hā'ena and Hanalei.¹²

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

Building Kaua'i's Belt Road

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

¹¹ Superintendent of Public Works, *Report for 1905*, 31.

¹² Superintendent of Public Works, *Report for 1904*, 66.

¹³ Superintendent of Public Works, *Report for 1904*, 3-5.

¹⁴ Superintendent of Public Works, *Report for 1905*, 79, 65, 75.

¹⁵ Superintendent of Public Works, *Report for 1906*, 23.

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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 7

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description (continued)

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

In 1911 the Loan Fund Commission initiated several major projects for Hanalei, including a new steel bridge over the Hanalei River and improvements to "Hanalei Hill".¹⁷ A major goal in advancing overland travel on Kaua'i was to eliminate sharp curves and steep grades. The new grades replaced steep inclines that had been suitable for carriage roads, but could not be easily negotiated by the automobiles that were introduced to island roads in the early 1900s. Although newspaper accounts provide only a general description of the "Hanalei Grade," the project probably realigned the road by replacing the steep switchbacks that descended to the Hanalei River (as described by Knudsen in 1895) with a new section of road built on an easier grade. Construction of the new Hanalei Hill grade most likely realigned the road to its current route between the Hanalei Bridge and Princeville. The Hanalei Grade was constructed in two sections, the first of which was completed by December 1911.¹⁸ The second section was expected to be ready by March 1912 if the weather cooperated.¹⁹

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

¹⁶ "A Happy Day In Sight," *Garden Island*, July 10, 1917.

¹⁷ "County Fathers in Busy Meeting," *Garden Island*, June 13, 1911.

¹⁸ "Loan Fund Meets," *Garden Island*, December 11, 1911.

¹⁹ "Loan Fund Members Hold Monthly Meet," *Garden Island*, January 16, 1912.

²⁰ "Loan Commission Holds Meeting," *Garden Island*, July 25, 1911.

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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 8

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description (continued)

The advertisement for bids on the Hanalei Bridge called for a Pratt truss steel bridge with "all necessary bolts and rivets for erecting." The 16'-wide structure was to have a floor system of steel beams, wooden stringers, and a wooden floor. The bridge was designed to carry a "16-ton traction engine trailing three 10 ton wagon [sic] on 10 foot wheel bases." The commission demanded that the bridge be delivered "entirely free of rust."²¹ The LFC purchased the bridge, which was prefabricated in New York by Hamilton and Chambers, from the Honolulu Iron Works Company.²² Records do not indicate who installed the bridge; it may have been constructed by LFC or territorial laborers. The new Hanalei Bridge was 113'-feet long with a span of 106' and a horizontal clearance of 17'.²³ The bridge opened to traffic at the end of 1912.²⁴

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

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

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

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

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

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

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

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

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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 7 Page 9

Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Description (continued)

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

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

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

²⁸ "County Work is progressing," *Garden Island*, November 19, 1912.

²⁹ "Hanalei's Bridges," *Garden Island*, January 7, 1913.

³⁰ "Minutes of a Special Meeting of the Members of the Kaua'i Loan Fund Commission Held at Lihu'e, Kaua'i, August 17, 1911," *Garden Island*, August 22, 1911.

³¹ "County Roads Are Getting Into Shape," *Garden Island*, February 6, 1912.

³² "Loan Fund Commissioners in Meet," *Garden Island*, May 14, 1912.

³³ "Chamber of Commerce," *Garden Island*, February 9, 1915.

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County and State Kaua'i County, Hawai'i

Narrative Description (continued)

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

Continuing Progress and Completing the Road to Hā'ena

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

By 1921, three bridges were required to carry the road over the Wainiha River. At least one bridge crossed the Wainiha River between 1904 and 1918, a two-span timber truss structure located on the site of what is today known as Wainiha Bridge #3.³⁵ In 1918, county financial records indicated that \$4,188 was disbursed for the Wainiha Bridge from the "permanent improvement fund."³⁶ That year, J. H. Moragne prepared plans for a two-span Wainiha Bridge, which indicated that the circa 1904 bridge was completely replaced. Moragne's plans provided for new concrete abutments and included a detailed list of lumber, iron, and nails required for construction. The 1918 plans specified a taller truss and larger members than the earlier bridge,

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

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

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

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Narrative Description (continued)

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

In January 1921 the Wainiha River cut a new channel during a storm, which necessitated another bridge, as flooding had carved a "long slim island out of the agricultural land of the valley." The *Garden Island* reported that the new bridge would "make three bridges in the valley, in within [sic] a distance of about 500 yards."³⁸ This third structure at Wainiha became known as Wainiha Bridge #2. Plans for a new single-span bridge of 75' were drawn in 1922. The design was a timber-truss structure that complemented the adjacent timber-truss bridge (Wainiha #3).³⁹ Even though the plans were drawn in February 1922, a construction date was not determined. The Territorial Highway Department records state that the bridge was constructed in 1931.⁴⁰ No information was located to indicate when the original Wainiha Bridge #2 was built, although it may have been built as early as the first decade of the twentieth century.

In 1925, the Kaua'i Board of Supervisors decided to extend the Belt Road from the end of its pavement at Wainiha to the Dry Cave at Hā'ena. The Superintendent of Public Works expected to obtain additional funding to extend the road to the Wet Caves. Since a road already ran to Hā'ena and there was an existing trail from Hā'ena to Kē'ē Beach,⁴¹ the "Hā'ena Road Extension" project probably improved the existing road to Hā'ena and built a new road from Hā'ena to Kē'ē Beach. The road was macadamized in 1926.⁴² Almost \$3,000 in additional funding was

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.

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Narrative Description (continued)

appropriated for the extension in 1927,⁴³ and land was taken in mid 1928.⁴⁴ This additional appropriation and land may have provided for the road to be extended to the Wet Caves/Kē'ē Beach.

The road improvements near Hā'ena included two small concrete-frame bridges with solid concrete parapets constructed in 1926. County appropriations funded the structures, one of which was near the Hā'ena School and the other near the Dry Cave. The Hā'ena bridges were designed by County Engineer R. L. Garlinghouse⁴⁵ and built by contractor George W. Mahikoa.⁴⁶ The structures may have been the first concrete-frame bridges built on Kaua'i.⁴⁷ The Hā'ena bridges reflected the trend towards wider roads and were built approximately 18' wide, significantly wider than most of the other bridges on the North Shore. When Kaua'i began its road-building program in the early 1900s, the average road width was 12', and nearly all the North Shore bridges were less than 14' wide. To meet the needs of increasing traffic, Kaua'i began widening its major roads and bridges to approximately 20' in 1926.

According to Territorial Highway Department reports, the Waipā Bridge was modified and assumed its unusual design of two different bridges in 1925.⁴⁸ The original design plans for the Waipā Bridge indicated there was an existing "old" timber bridge over the river in 1912.⁴⁹ In

⁴³ "Supervisors Hold Regular Meeting," *Garden Island*, January 18, 1927.

⁴⁴ "Supervisors Hold Regular Meeting," *Garden Island*, May 15, 1928.

⁴⁵ R. L. Garlinghouse, plans for "County of Kaua'i, Hā'ena Road Bridge No. 1," March 1926; plans for "County of Kaua'i, Hā'ena Road Bridge No. 2," March 1926.

⁴⁶ Kaua'i County Clerk, Index File: Hā'ena Road Bridges No. 1 & No. 2, Contract for Construction, Geo. W. Mahikoa, n.d.

⁴⁷ R. L. Garlinghouse, plans for Ka'awaloa Bridge, October 1926; Kapāhili Gulch Bridge, May 1927; and Kalāheo Bridges Nos. 1 and 2, March 1928.

⁴⁸ Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i*, 1950. Bridge Data Sheet for Waipā Bridge. No construction plans or other information was located to confirm the 1925 construction date.

⁴⁹ J. H. Moragne, plans for "Waipā Culvert, District of Hanalei," 1912.

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Narrative Description (continued)

addition, a photograph shows that the 1912 concrete bridge served as an extension of the timber bridge and was probably built to span a widened river channel. The photograph shows that one of the timber bridge spans had collapsed, so the second concrete bridge at Waipā apparently became a replacement for the timber bridge.⁵⁰ The Waipā Bridge collapsed in 1919 and a temporary trestle of "light construction" was built to span the washout.⁵¹ No plans were found for the new concrete bridge extension, although County Engineer R. L. Garlinghouse drew a similar concrete-slab bridge design for another structure in 1925.⁵² The Waipā extension bridge had five spans for a total length of 90'.⁵³ It was an unusual structure as it did not match the original bridge's width, wall design, or wall height.

Disasters Strike the North Shore Bridges

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

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

⁵⁰ McKay, Helen, Photograph Album #47b, ca. 1912-1930.

⁵¹ "Meeting of Supervisors," *Garden Island*, April 8, 1919.

⁵² R. L. Garlinghouse, plans for "Ma'ulili Bridge Reinforced Concrete Slab, District of Kōloa," February 1925.

⁵³ Territorial Highway Department, *Bridge Inventory for the Island of Kaua'i*, 1950. Bridge Data Sheet for Waipā Bridge.

⁵⁴ Department of the Army, Corps of Engineers, Pacific Ocean Division. *Flood Hazard Information, Island of Kaua'i, Report R49*. (Honolulu: U.S. Army Corps of Engineers, 1973), 12.

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Narrative Description

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

side.⁵⁵ The bridge settled to rest at an angle of nearly 30 degrees. Several days after the tidal wave, the County Board of Supervisors instructed the county engineer to make plans to rebuild the Wainiha and Waikoko bridges.⁵⁶ The Board of Supervisors minutes noted that repairs on the damaged "main" Wainiha Bridge (#3) had begun by mid April.⁵⁷ Plans drawn in April 1946 illustrated the Wainiha Bridge #1 replacement. The new timber bridge was 38'-6" long and built on two concrete pile bents and new concrete abutments. The bridge was built of 4" x 14" timber stringers and featured wood railings constructed of 6" x 6" posts and 4" x 6" rails braced to the flooring with 3" x 4" lumber.⁵⁸ Waikoko Bridge was repaired by filling the collapsed end of the bridge to a level grade and laying a new roadbed on the bridge. The original bridge still rests on an angle, resulting in a quite unusual looking structure. Rocks were used to rebuild the sunken eastern half of the parapet walls at some point after 1950.⁵⁹

Natural disasters struck the Wainiha bridges on two occasions in 1957. On March 9, three tidal waves struck Wainiha Valley, destroying the west span and small approach span of Wainiha Bridge #3 as well as Wainiha Bridges #1 and #2. The only span that remained after the tidal wave was the east (Hanalei side) span of Wainiha #3.⁶⁰ In December, flooding from Hurricane Nina damaged Wainiha Bridge #3 again, making it impassable to traffic until it was repaired.⁶¹

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

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

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

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

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

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

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

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

CULVERTS

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

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

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Narrative Description (continued)

VISTAS and VIEWS

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

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

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

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

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Alterations

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

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

In order to strengthen the aging Hanalei Bridge, a new steel Warren truss was added to the existing Pratt truss in 1967. Transverse floor beams were also added below the existing floor beams. Additional plates and welds were installed on the Hanalei Bridge in 1973.⁶⁵ In 1988 the Hanalei Bridge was restored, which included strengthening the Warren trusses and adjusting the Pratt trusses; cleaning and painting the structural steel; replacing the timber deck and stringers; installing reinforcing plates and angles; and adjusting the tensioning rods under the floor beams.⁶⁶

⁶³ "Old bridge collapses at Hanalei," *Honolulu Star-Bulletin*, October 20, 1967.

⁶⁴ State of Hawai'i, Department of Transportation, plans for "Lumaha'i Bridge," 1967.

⁶⁵ State Department of Transportation, "Kaua'i Belt Road Kalihawai to Hā'ena: Preliminary Case Report, Hanalei, Wai'oli & Waipā Bridges," 2-3.

⁶⁶ State of Hawai'i, Department of Transportation, "As-Built" Plans for Kūhiō Highway Rehabilitation of the Hanalei Bridge, Project No. 56D-01-87M, 1988.

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

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

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Narrative Description (continued)

Inventory of Contributing and Non-contributing Overlooks, Bridges, and Significant Culverts

Listed in geographical order west from Mile Marker 0 at Princeville:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Narrative Statement of Significance

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

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

Engineering

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

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Narrative Statement of Significance (continued)

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

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

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

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

⁶⁷ "Hanalei Road-Hand Buried Under Cave-In," *Garden Island*, September 5, 1911.

⁶⁸ Jan TenBruggencate, "This Bridge Breathes," *Garden Island*, April 22, 1986.

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Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Statement of Significance (continued)

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

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

Transportation, Commerce, and Social History

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

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

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Narrative Statement of Significance (continued)

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

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

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

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

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

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

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

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

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Name of property Kaua'i Belt Road

County and State Kaua'i County, Hawai'i

Narrative Statement of Significance (continued)

Kaua'i residents enthusiastically noted that their roads were the best in the Territory of Hawai'i. Most of the road between 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 prety [sic] well up to date."⁷⁵ Some considered good roads a community's most valuable asset, especially on Kaua'i where a variety of scenic roads appealed to tourists.⁷⁶ With the belt road completed, a 1918 Hawai'i Tourist Bureau guide to Kaua'i was already promoting activities in the Hanalei area, including "splendid sea bathing," driving and riding trips to the surf at Lumaha'i Beach, the interesting caves at Hā'ena, and even the Wainiha Power House. During the summer, a trip by outrigger canoe was "guaranteed to thrill even the most unimaginative."⁷⁷

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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Name of property Kaua'i Belt Road

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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