APPENDIX A

THE ISLAND OF KAUAI

1. Kauai 2024 Updated State Bridge Matrix
2. Kauai 2013 State Bridge Matrix
3. Kauai 2013 County Bridge Matrix

KAUAI HISTORY

The fourth-largest island, Kauai (called the Garden Island) occupies an area of 552 square miles. Geologically, Kauai is the oldest of the major Hawaiian Islands. It has one central shield volcano which has eroded over millions of years into spectacular landforms. Kauai has fertile valleys, deep fissures, many caves, pinnacles, and waterfalls. Waimea Canyon and the Napali coast, with its awesome cliffs, are products of the rain that fall on Kawaikini (5,243 feet) and Waialeale (5,148 feet). Kauai's heavy rainfall, many streams, and extensive areas of lush vegetation create an image of a green, tropical "paradise."

Kauai's bridges are primarily distributed around the circumference of the island, spanning the streams along the wet north and east coastlines, as well as the gulches and chasms of the drier south and west shores. Many early bridges remain in the Hanalei area, a late nineteenth century center of population on the north shore of the island. Other early bridges were built at the mouths of rivers (at Wailua, Waimea and Hanapepe), also traditional population centers and foci of trade and transportation of goods. Generally, the earliest roads and bridges were constructed as spurs from ports and harbors into the interior valleys, rather than around the island. As with the other principal islands, the development of sugar plantations in the early twentieth century resulted in the construction of the belt road in the 1920s-30s.

FIGURE 1. MAP OF KAUAI (SOURCE: HTTPS://HISTATEGIS.MAPS.ARCGIS.COM/).

Kauai 2024 Updated State Bridge Matrix

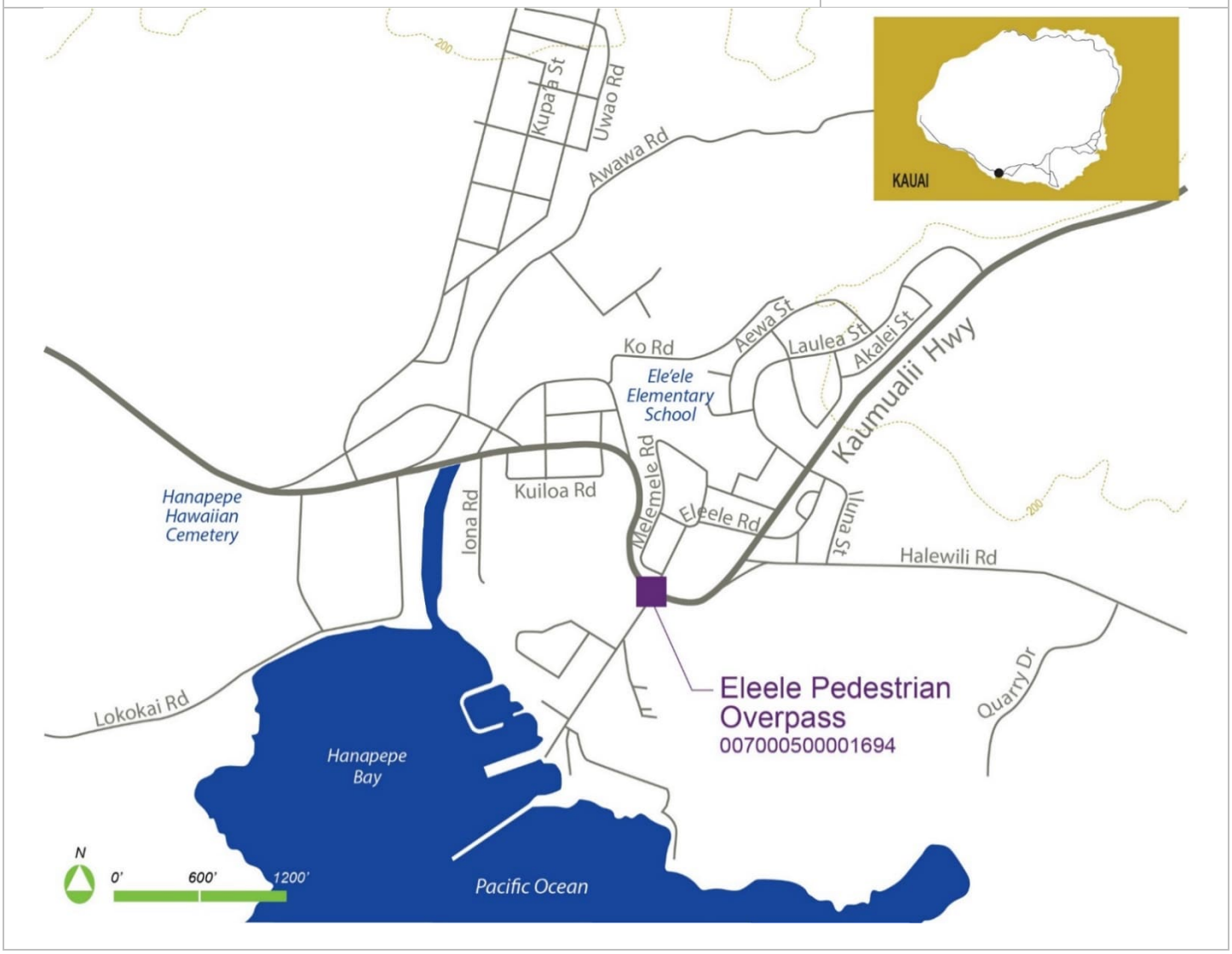
Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)
007000500001694	Eleele Pedestrian Overpass	Kaumualii Highway	Pedestrian	1939, 2022	Steel Trestle	Metal Picket	No	Not Eligible***	This bridge has lost integrity due to its reconstruction in 2022 that raised its height and resulted in the replacement of its original railings and bridge deck.
007056000400161	Kapaa Temporary Bypass Road - Kainahola Stream Bridge	Kainahola Stream	Temporary Kapaa Bypass Road	1937	Concrete Slab	Metal Thrie Beam	No	Not Eligible**	• Associated with early developments in concrete bridge construction in Hawaii • Associated with Lihue Plantation • Good example of a 1930s reinforced concrete bridge • Bridge abutments are a potentially eligible historic resource
007005600500593	Lumahai Stream Bridge	Lumahai Stream	Kuhio Highway	1968	Concrete Girder	Concrete and Metal	Yes	Listed, Non-Contributing**	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1905 bridge that fell in 1967 • See National Register of Historic Places Nomination Form in appendices
007000500002033	Makaweli Flume Overpass	Kaumualii Highway	Waterway	1946	Concrete Girder	Concrete Solid	No	Eligible***	• NRHP/HRS 6E Criteria A/a, C/c • Associated with sugar plantation industry • Good example of reinforced concrete flume that was constructed in the 1940s • Only known flume on Kauai
007000510400023	Nawiliwili Stream Bridge	Nawiliwili Stream	Rice Street	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	• NRHP/HRS 6E Criteria C/c • Associated with early developments in concrete bridge construction in Hawaii • Good example of a 1930s reinforced concrete bridge
007005800600062	Opaekaa Stream Bridge	Opaekaa Stream	Kuamoo Road	1936	Concrete Tee Beam	Concrete Open Arched	No	Eligible***	• NRHP/HRS 6E Criteria C/c • Associated with early developments in concrete bridge construction in Hawaii • Best example of a 1930s reinforced concrete girder bridge
007005600500428	Waikoko Stream Bridge	Waikoko Stream	Kuhio Highway	2019	Reinforced Concrete	Reinforced Concrete Bridge Rail	Yes	Listed, Non-Contributing	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1913 bridge (007005600500427) • See National Register of Historic Places Nomination Form in appendices
007000560400572	Wailua River Bridge (Mayor Bryan J. Baptiste Memorial Bridge)	Wailua River	Kuhio Highway	1945	Concrete Tee Beam	Concrete and Metal	No	Eligible***	• NRHP/HRS 6E Criteria A/a, C/c • Earliest concrete bridge built postwar (1945) and best example of program comments bridges on the island of Kauai in the historic study period prior to 1977
007005600500673	Wainiha River Bridge No. 3	Wainiha River	Kuhio Highway	2007	Steel Truss	Metal Thrie Beam	Yes	Listed, Non-Contributing**	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1931 bridge in 2007 • See National Register of Historic Places Nomination Form in appendices
007005600500343	Waioli Stream Bridge	Waioli Stream	Kuhio Highway	1912	Concrete Girder	Concrete Solid with Cap	Yes	Listed, Contributing***	• NRHP/HRS 6E Criteria A/a, C/c • Contributes to the Kauai Belt Road (North Shore section) District • See National Register of Historic Places Nomination Form in appendices
007005600500397	Waipa Stream Bridge	Waipa Stream	Kuhio Highway	2019	Reinforced Concrete	Reinforced Concrete Bridge Rail	No	Listed, Non-Contributing	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1912 bridge (007005600500396) • See National Register of Historic Places Nomination Form in appendices
007000500302671	Weoweopilau Stream Bridge	Weoweopilau Stream	Kaumualii Highway	1937	Concrete Slab	Concrete Open Greek Cross	No	Eligible	• NRHP/HRS 6E Criteria A/a, C/c • Associated with the development of Kauai's Belt Road system • Good example of a 1930s reinforced concrete bridge • Example of Federal Aid bridges constructed by the Territory in the 1930s

* NRHP or HRS 6E Listed, Eligible, Not Eligible, Contributing, Non-Contributing, or Program Comments.
** Historic resources adjacent to resource.
*** Formerly "High Preservation Value."
Greyed-out cells have no form.

Bridge Inventory Form

General Information

Bridge Number: 007000500001694	**TMK**: 421005042 (adjacent)
Common Name: Eleele Pedestrian Overpass	
Historic Name: Eleele Pedestrian Overpass	
Feature Crossed: Kaumualii Highway/Route 50	
Feature Carried: Pedestrian	
Island: Kauai	**Milepost**: 16.02 mi.
Latitude: 21.90563	**Longitude**: -159.5850
Ownership: State	**Image Date**: 09/01/2024



Bridge Inventory Form

Construction Information

Bridge Type: Steel Trestle	**Construction Date**: 1939, 2022
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s): 2020, 2022	
Alterations: Bridge span removed in 2020 and raised and rebuilt in 2022.	

Design Information

Number of Spans: 1	**Max Span**: 42.0 ft.	**Total Length**: 48.8 ft.	**Deck Width**: 6.5 ft.
Superstructure: Steel Girder			
Substructure: Concrete Abutment Wall and Steel Trestle			
Floor/Decking: Concrete Deck			
Parapets/Railings: Metal Picket			
Other Features:			

Historic Information

NRHP Status: Not Eligible	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**:
HRHP Status: Not Listed	**SIHP No.**: 50-30-09-02329	
6E Status: Not Significant	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☐ Design☐ Setting☐ Materials☐ Workmanship☐ Feeling☐ Association☐		
Historic District:		**Contributing**:
Current Function: Pedestrian Overpass	**Historic Function**: Pedestrian Overpass	
Areas of Significance:		
Period of Significance:		
Supplemental Documentation: HAER No. HI-152		

Narrative Description:

The Eleele Pedestrian Overpass is a single-span steel trestle bridge that carries a pedestrian overpass over the Kaumualii Highway. The bridge deck is concrete, flanked by metal picket parapets, and rests on concrete abutment walls and steel trestle supports. Access to the bridge is gained through concrete staircases on either side of the highway.

Bridge Inventory Form

Statement of Significance:

The Eleele Pedestrian Overpass was previously determined eligible as part of the 2013 SHBIE. It was originally built in 1939 and rebuilt in 2022 as part of Project No. 50C-01-19M, Kaumualii Highway Eleele Pedestrian Overpass Improvements. The 2022 project replaced the original 1939 overpass that was built as part of Federal Aid Project 12J. Two road accidents, one in April 2018 and the other in June 2020, resulted from trucks striking the overpass. The first accident in 2018 resulted in the closure of the overpass to pedestrians while the second resulted in the bridge deck to be completely removed, resulting in a substantial loss of historic integrity. While retaining the steel trestle supports and stairs, the replacement bridge deck was raised for better clearance and new metal picket railings installed on the deck and staircases for safety.

Because the bridge was built as a replacement to a damaged pedestrian overpass, it is not associated with transportation improvements on Kauai during the Territorial period, and it is therefore not significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past, and, therefore, the bridge is not significant under Criterion B.

The bridge is constructed of steel, which is rare in Hawaii's extreme marine environment. While elements of the 1939 bridge are still present, the reconstructed railings and deck have resulted in the loss of character-defining features. Therefore, the bridge is not significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

Therefore, the Eleele Pedestrian Overpass is not eligible for the NRHP.

Bridge Inventory Form

References

"'Ele'ele Detour Monday Night." *The Garden Island*, December 19, 2021, A6. Accessed October 2, 2024, https://www.newspapers.com/image/790993386/.

"'Ele'ele Pedestrian Bridge Reopens After Two Year Closure." *The Garden Island*, March 9, 2022. Accessed October 1st, 2024, https://www.thegardenisland.com/2022/03/09/hawaii-news/eleele-pedestrian-bridge-reopens-after-two-year-closure/.

"'Ele'ele Pedestrian Overpass at Kaumuali'i Highway and Waialo Road, Now Open to Public." Hawaii Department of Transportation, March 8, 2022. Accessed October 1, 2024, https://hidot.hawaii.gov/highways/%CA%BBele%CA%BBele-pedestrian-overpass-at-kaumuali%CA%BBi-highway-and-waialo-road-now-open-to-public/.

"'Ele'ele Pedestrian Overpass on Kaumuali'I Highway Now Open." Kauai News. March 9, 2022. Accessed October 13, 2022. https://kauainownews.com/2022/03/09/%ca%bbele%ca%bbele-pedestrian-overpass-on-kaumuali%ca%bbi-highway-now-open/.

"Eleele Pedestrian Bridge Deck to be Removed Sunday Night." Hawaii Department of Transportation. June 19, 2020. Accessed October 13, 2022. https://hidot.hawaii.gov/administration/eleele-pedestrian-bridge-deck-to-be-removed-sunday-night/.

"Kaumualii Highway, Eleele Pedestrian Overpass Improvements Project No. 50C-01-19M." Sheets 11-19. http://162.221.244.142:8080/As-Built/res/Kauai/Route%200050/0050-1059-D1C1/0050-1059-D1C1.htm.

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

Zedalis, Bethany. "Eleele Pedestrian Bridge, Mile 16.02 Kaumualii Highway (Route 50), Eleele, Kauai County, Hawaii, HAER HI-152." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2020. https://www.loc.gov/item/hi1126/.

Bridge Inventory Form

Figure 1. Eleele Pedestrian Overpass, facing north, 2019 and prior to 2022 modifications. Source: HAER HI-152.

DENNIS FUJIMOTO / THE GARDEN ISLAND

The ‘Ele‘ele pedestrian bridge foundations along Kaumuali‘i Highway at the ‘Ele‘ele Shopping Center are ready to accept the overpass span Tuesday.

Figure 2. Eleele Pedestrian Overpass with deck removed. Source: *The Garden Island*, December 19, 2021, A6, https://www.newspapers.com/image/790993386/.

Bridge Inventory Form

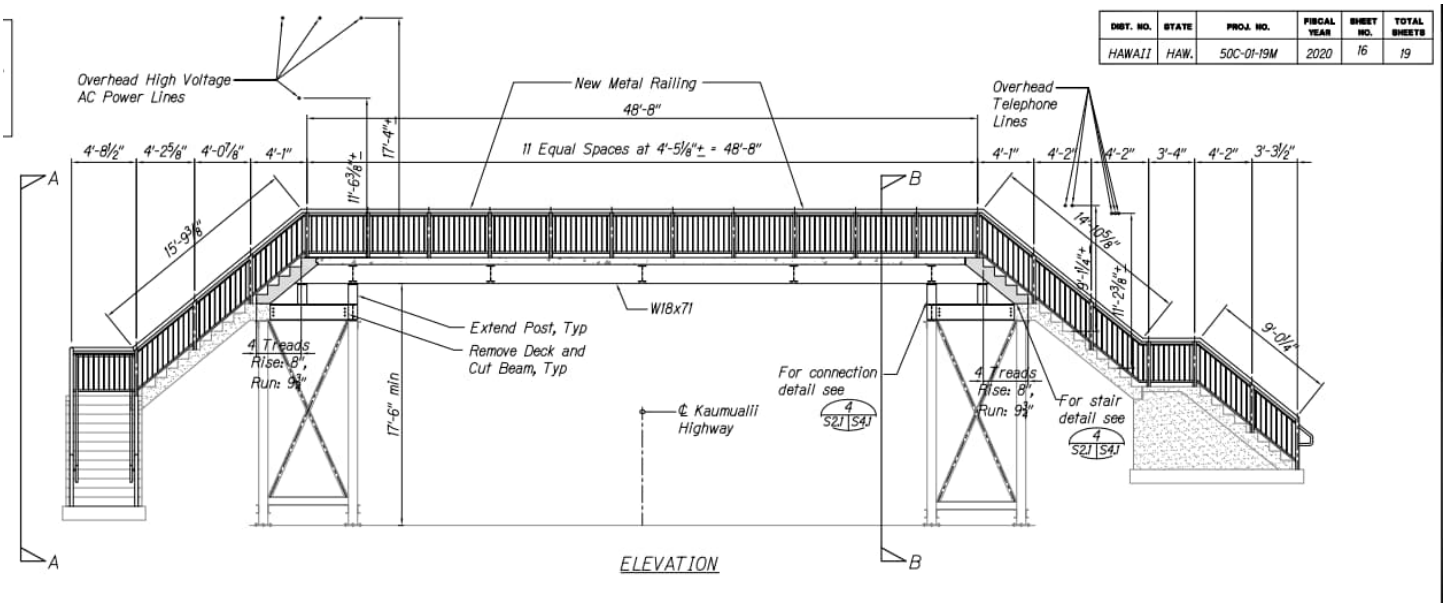


Figure 3. Eleele Pedestrian Overpass, detail of replacement bridge. Source: “Kaumualii Highway, Eleele Pedestrian Overpass Improvements Project No. 50C-01-19M,” Sheet 16.

Bridge Inventory Form

General Information

Bridge Number: 007056000400161	**TMK**: 443003001
Common Name: Kapaa Temporary Bypass Road – Kainahola Stream Bridge	
Historic Name: Kapaa Temporary Bypass Road – Kainahola Stream Bridge	
Feature Crossed: Kainahola Stream	
Feature Carried: Kapaa Temporary Bypass Road/Route 5600	
Island: Kauai	**Milepost**: 1.609
Latitude: 22.07239	**Longitude**: -159.3299
Ownership: State	**Image Date**: 10/25/2023

Bridge Inventory Form

Construction Information

Bridge Type: Concrete Slab	**Construction Date**: 1937
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s): 1995, 2010, 2015	
Alterations: I-beams were previously added to the bridge in 1995 as stiffeners for guardrails, on both sides, and were visually documented in the 2013 bridge survey. In 2010, HDOT substantially altered the bridge's load-bearing capabilities by constructing a new concrete superstructure over the existing superstructure; this new superstructure is not supported by the original CRM abutments and extends beyond the original bridge. In 2015, repairs were made on the Lihue abutment wing wall, downstream side.	

Design Information

Number of Spans: 1	**Max Span**: 48.2 ft.	**Total Length**: 56.1 ft.	**Deck Width**: 24.9 ft.
Superstructure: Reinforced Concrete Slab			
Substructure: Concrete Rubble Masonry (CRM) Abutment			
Floor/Decking: Concrete Deck with Asphalt Concrete (AC) Overlay			
Parapets/Railings: Concrete Solid Panel with Cap and Metal Thrie Beam			
Other Features:			

Historic Information

NRHP Status: Not Eligible	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-08-02333	
6E Status: Not Significant	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☒ Design☐ Setting☐ Materials☒ Workmanship☐ Feeling☐ Association☐		
Historic District: N/A		**Contributing**: N/A
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Transportation		
Period of Significance: 1937		
Narrative Description: The Kapaa Temporary Bypass Road – Kainahola Stream Bridge carries the Kapaa Temporary Bypass Road/Route 5600 over the Kainahola Stream. The original single-span concrete slab bridge rests on concrete rubble masonry		

(CRM) abutments. A later-added reinforced concrete deck carries a two-lane roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete solid panel with cap railings and metal thrie beams.

Statement of Significance:

The Kapaa Temporary Bypass Road – Kainahola Stream Bridge was constructed in 1937 to improve an existing cane haul road located on land managed by Amfac, which acquired control of Lihue Plantation Company in 1922. In 1995, the former cane haul road was redeveloped in Project No. 56A-02-95 as part of a project to bypass congestion at Kapaa town and the bridge was altered with stiffeners and guardrails. In 2010, the bridge was substantially altered in Project No. 5600-01-10M through construction of a new superstructure that spanned the original superstructure and raised the bridge deck height; consequently, the CRM abutments no longer support the span. Its original design, a concrete slab bridge with solid railing and CRM abutments, was a common type of bridge found in Hawaii prior to World War II. Changes to the bridge's design and appearance due to the addition of stiffeners, construction of a new superstructure in 2010 that raised the height of the existing deck, and alterations to parapets, have resulted in a loss of historic integrity.

Although the bridge is associated with Amfac improvements done in the 1930s to an existing cane haul road, it was later substantially altered and no longer appears as a cane haul road following incorporation into the Kapaa Bypass Road. Therefore, it is not significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

The original bridge is a result of early developments in concrete bridge design and construction in Hawaii. It is a good example of a 1930s reinforced concrete bridge with CRM abutments that is typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the use of solid parapets represents a typical rail pattern used in Hawaii at the time. Due to substantial alterations, the bridge has lost much of its historic integrity. Therefore, the bridge is not significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

Therefore, the Kapaa Temporary Bypass Road – Kainahola Stream Bridge is not eligible for the NRHP.

Bridge Inventory Form

References

State of Hawaii. Department of Transportation. Bridge Structures Plans, Temporary Kapaa Bypass Road, Project No. 65A-02-95, 1995.

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

State of Hawaii. Department of Transportation. Kainahola Stream Bridge, Bridge Layout and Typical Sections, Temporary Kapaa Bypass Road, Repairs at Kainahola Stream Bridge, Project No. 5600-01-10M, 2010.

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of bridge and stiffeners, facing north.

Image 2. Detail of patched CRM abutment.

Image 3. View of raised deck and thrie beam railings, facing northwest.

Bridge Inventory Form

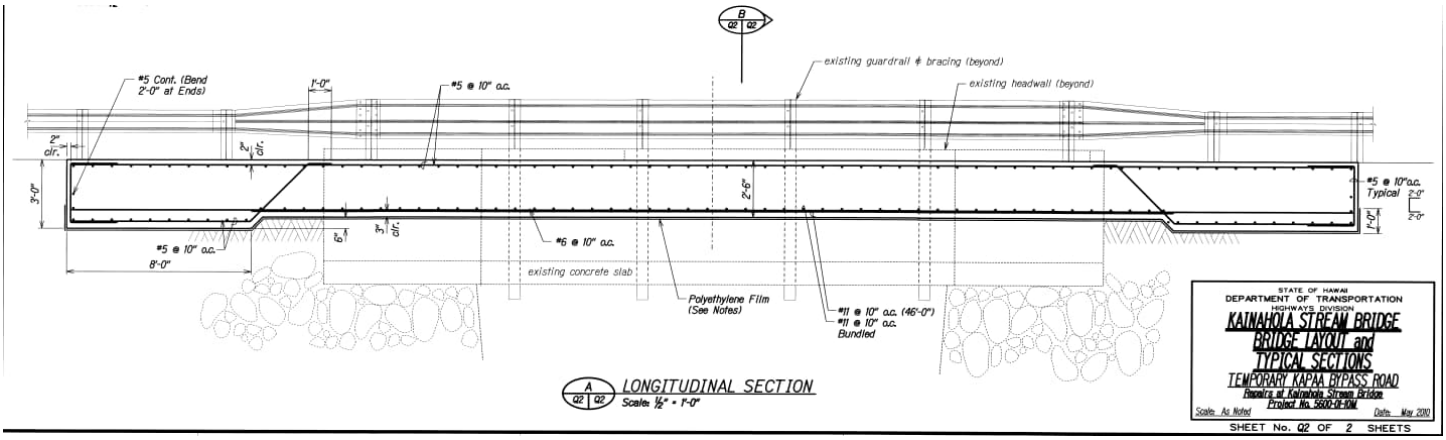
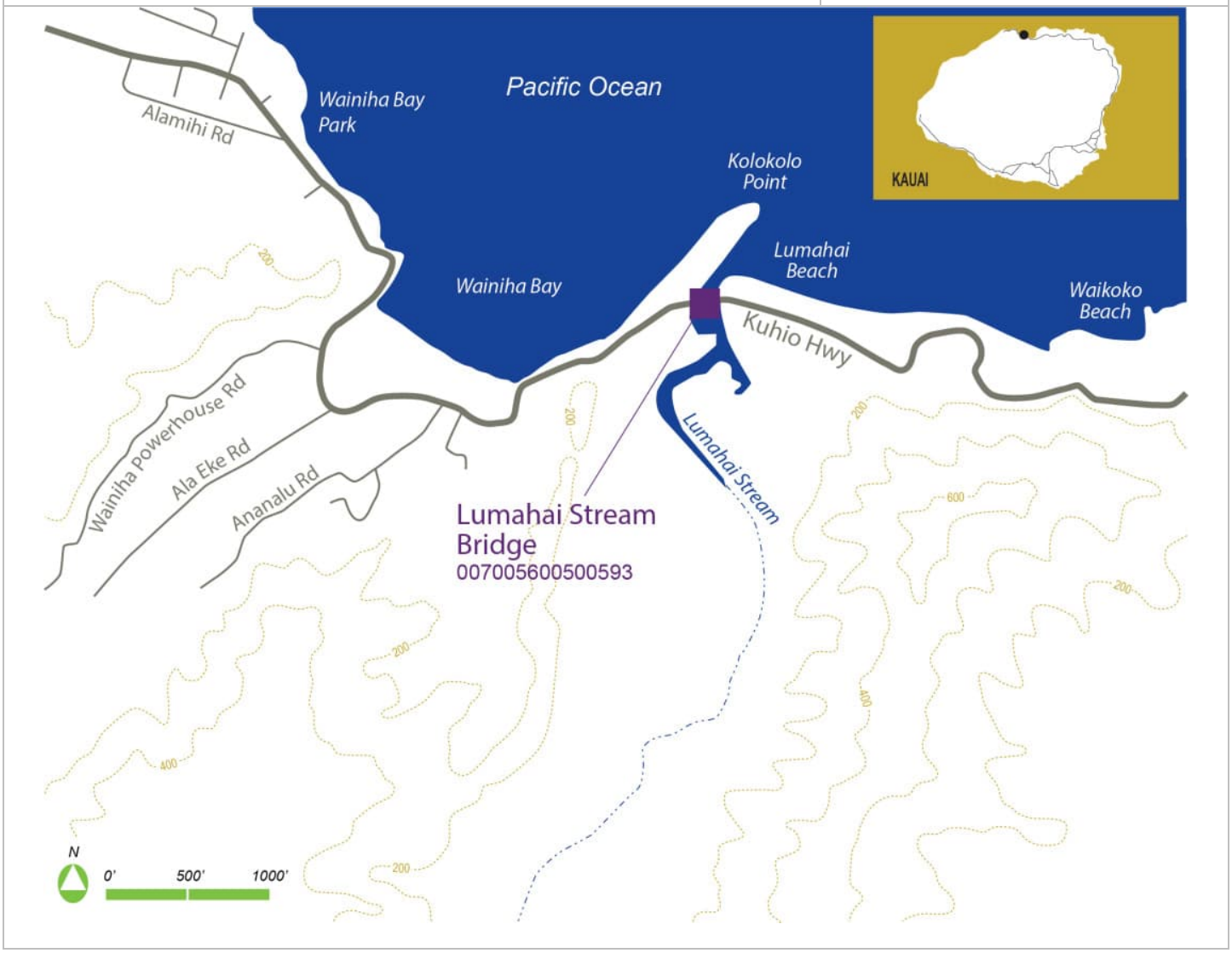


Image 4. Diagram showing new bridge superstructure. Source: Kainahola Stream Bridge, Bridge Layout and Typical Sections, Temporary Kapaa Bypass Road, Repairs at Kainahola Stream Bridge, Project No. 5600-01-10M, 2010.

Bridge Inventory Form

General Information

Bridge Number: 007005600500593	**TMK**: 457003999 (district), 457003011 (adjacent)	
Common Name: Lumahai Stream Bridge		
Historic Name: Lumahai Stream Bridge		
Feature Crossed: Lumahai Stream		
Feature Carried: Kuhio Highway/Route 560		
Island: Kauai	**Milepost**: 5.93	
Latitude: 22.21544	**Longitude**: -159.5333	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Prestressed Concrete Stringer/Multi-Beam	**Construction Date**: 1968
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations:	

Design Information

Number of Spans: 8	**Max Span**: 60.0 ft.	**Total Length**: 538.1 ft.	**Deck Width**: 32.5 ft.
Superstructure: Prestressed Concrete Girder/Beam			
Substructure: Reinforced Concrete Abutment and Reinforced Concrete Double Column Pier			
Floor/Decking: Reinforced Concrete			
Parapets/Railings: Concrete and Metal			
Other Features: Bridge name and construction date incised on end post			

Historic Information

NRHP Status: Listed	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**: 03001048
HRHP Status: Listed	**SIHP No.**: 50-30-03-02335 (bridge), 50-30-02-02334 (district)	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☐ Design☐ Setting☐ Materials☐ Workmanship☐ Feeling☐ Association☐		
Historic District: Kauai Belt Road – North Shore Section		**Contributing**: No
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance:		
Period of Significance:		

Narrative Description:

The Lumahai Stream Bridge carries the Kuhio Highway over the Lumahai Stream. This eight-span, curved, prestressed concrete girder beam bridge rests on reinforced concrete abutments and reinforced concrete double column piers. The reinforced concrete deck carries a two-lane roadway and is flanked by concrete and metal railings. The bridge name and construction date have been incised on the end posts and thrie beams have been attached to the end posts as well.

Bridge Inventory Form

Statement of Significance:

The Lumahai Stream Bridge is a non-contributing structure to the NRHP-listed Kauai Belt Road (North Shore Section).

Lumahai Stream Bridge is one of a series of bridges within the Kauai Belt Road (North Shore Section), which was constructed between 1900 and 1957 to provide access to remote areas of the island, facilitate the transport of sugar, and used later for tourism purposes. As a historic district, the Kauai Belt Road includes approximately 10 miles of roadway between Princeville, Wainiha, and Haena. The Kauai Belt Road (North Shore Section) has suffered damage from tidal waves in 1946 and 1957 as well as from severe storms in 2018, leading to the reconstruction, repair, or replacement of various bridges throughout the historic district.

The original Lumahai Stream Bridge was a steel bridge constructed in 1905, later reinforced in the 1920s, and eventually collapsing in 1967. The replacement bridge, the existing Lumahai Stream Bridge, was constructed off the original Kauai Belt Road alignment and with two lanes. Because it does not follow the original design characteristics of the Kauai Belt Road, it is noncontributing.

This is a typical and standardized postwar bridge. It is not individually significant under NRHP Criteria A, B, C, or D or HRS 6E criteria a, b, c, d, or e; however, the bridge is within the boundaries of the NRHP-listed Kauai Belt Road (North Shore Section).

Bridge Inventory Form

References

Blanchard, Guy V. “Kaua‘i Belt R Belt Road (North Shore Section) (Additional Documentation), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2021. (Hawai‘i SHPD).

Duensing, Dawn E. “Kaua‘i Belt R Belt Road (North Shore Section), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2002. (Hawai‘i SHPD).

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of bridge, facing south.

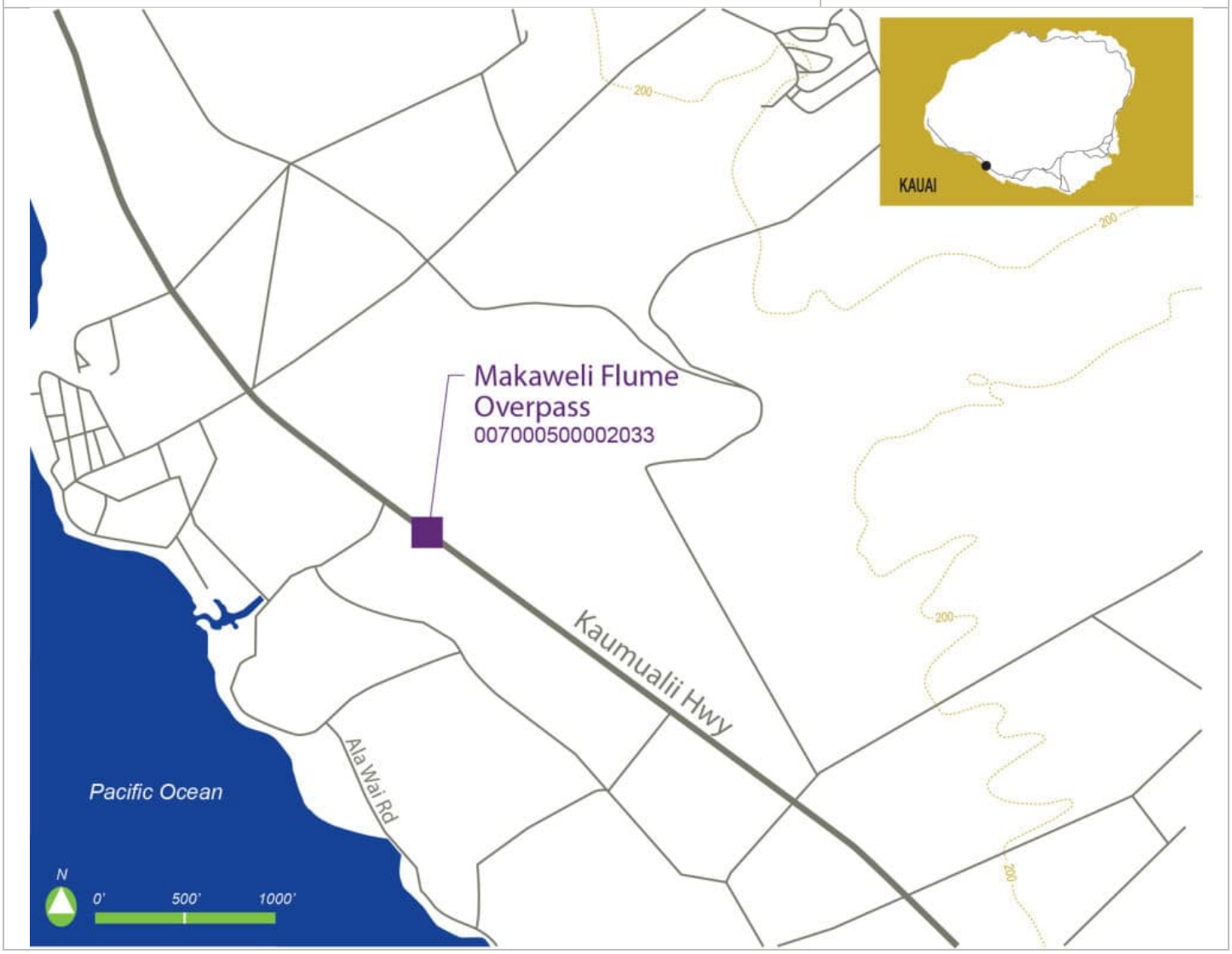
Image 2. View of piers and deck, facing east.

Image 3. View of bridge deck, railings, and partially obscured end post, facing east.

Bridge Inventory Form

General Information

Bridge Number: 007000500002033	**TMK**: 417006001(adjacent)	
Common Name: Makaweli Flume Overpass		
Historic Name: Makaweli Flume Overpass		
Feature Crossed: Kaumualii Highway/Route 50		
Feature Carried: Waterway		
Island: Kauai	**Milepost**: 20.33	
Latitude: 21.93184	**Longitude**: -159.63980	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Girder	**Construction Date**: 1946
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations: The bridge is no longer used as a flume and the deck now includes a 6-inch PVC pipe.	

Design Information

Number of Spans: 3	**Max Span**: 49.9 ft.	**Total Length**: 145.0 ft.	**Deck Width**: 6.6 ft.
Superstructure: Concrete Girder			
Substructure: Concrete Abutment Wall and Concrete Double Column Pier			
Floor/Decking: Concrete Deck			
Parapets/Railings: Concrete Solid			
Other Features:			

Historic Information

NRHP Status: Eligible	Criteria: A☒ B☐ C☒ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-09-02343	
6E Status: Significant Historic Property	Criteria: a☒ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District: N/A		**Contributing**: N/A
Current Function: Flume	**Historic Function**: Flume	
Areas of Significance: Commerce, Engineering		
Period of Significance: 1946		

Narrative Description:

The Makaweli Flume Overpass carries a waterway over the Kaumualii Highway. The triple-span reinforced concrete flume rests on concrete abutments and two concrete double column piers. Solid concrete railings encase the flume, and the waterway remains open on the top of the structure.

Bridge Inventory Form

Statement of Significance:

The Kauai Belt Road, of which the Kaumualii Highway is a part, resulted from a 1932 Federal Aid program to create a series of belt roads and highway improvements across the Territory. These belt roads were designed to accommodate not only military traffic, but also facilitate the archipelago's sugar plantation economy as sugar companies used roads to transport raw sugar cane to be processed at mills and for workers to travel to work. The flume's concrete girder design represents a typical structure for the Territorial Highway Department and is the only remaining flume overpass on Kauai.

Because the Makaweli Flume Overpass is associated with the island's sugar plantation economy as well as transportation improvements during the Territorial period, it is therefore significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

The bridge is a good example of reinforced concrete construction that is typical of its period in its use of materials, method of construction, craftsmanship, and design. This bridge is therefore significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The bridge remains in its original location, situated over a roadway. It retains integrity of design, materials, and workmanship despite the minor addition of a pipe within the flume. Its integrity of setting is intact as development surrounding the bridge is limited and its agricultural surroundings remains. The bridge retains integrity of feeling and association as a post-World War II bridge type and its association with Territorial roadway improvements and Kauai's sugar plantation economy.

Therefore, the Makaweli Flume Overpass is eligible for the NRHP.

Bridge Inventory Form

References

Duensing, Dawn E. *Hawai'i's Scenic Roads: Paving the Way for Tourism in the Islands*. Honolulu: University of Hawai'i Press, 2015. http://www.jstor.org/stable/j.ctt13x1jdz.

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

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of flume. Facing northwest.

Image 2. Detail of pier. Facing northeast.

Image 3. Solid parapet and flume channel. Facing southwest.

Bridge Inventory Form

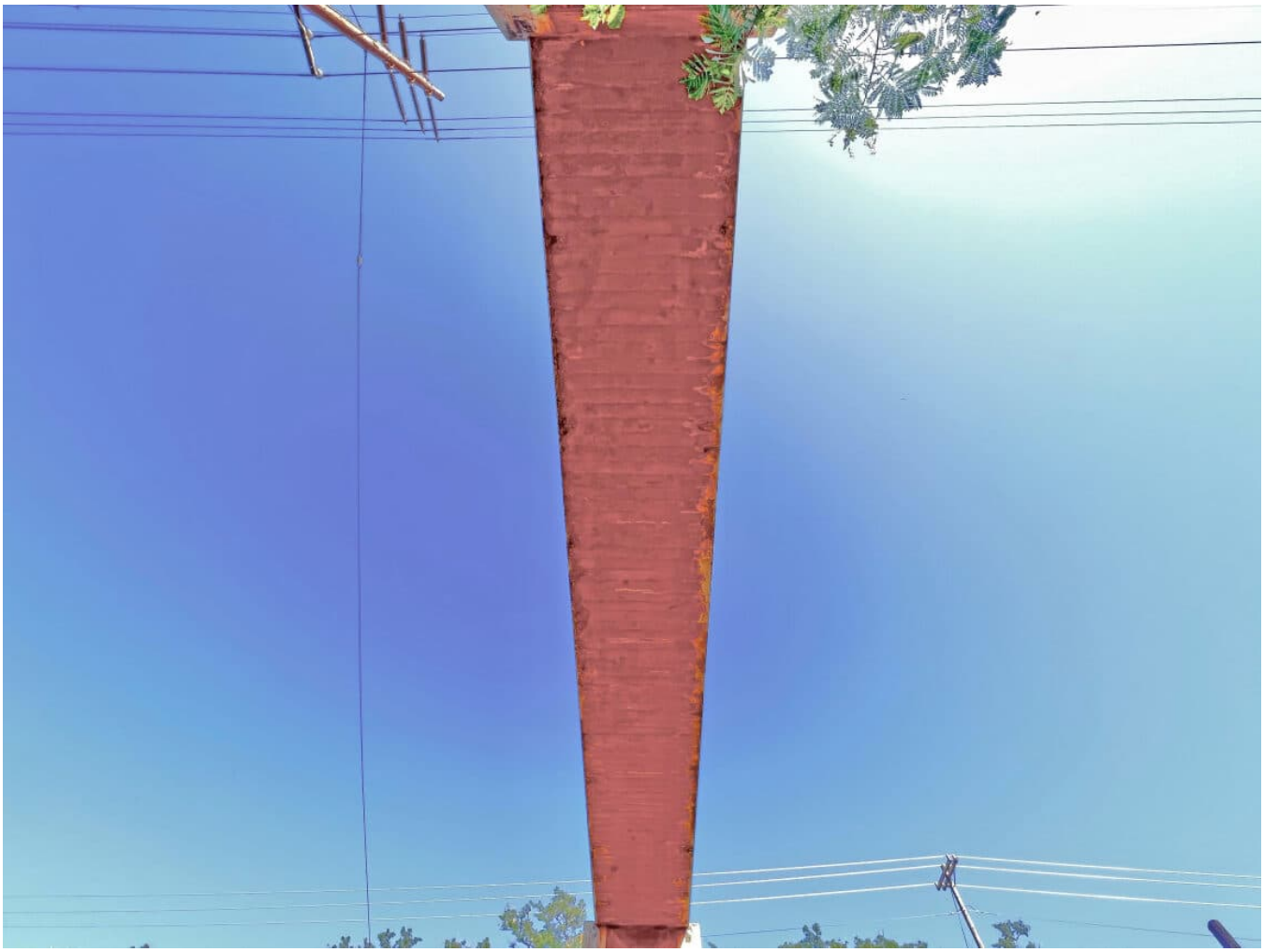
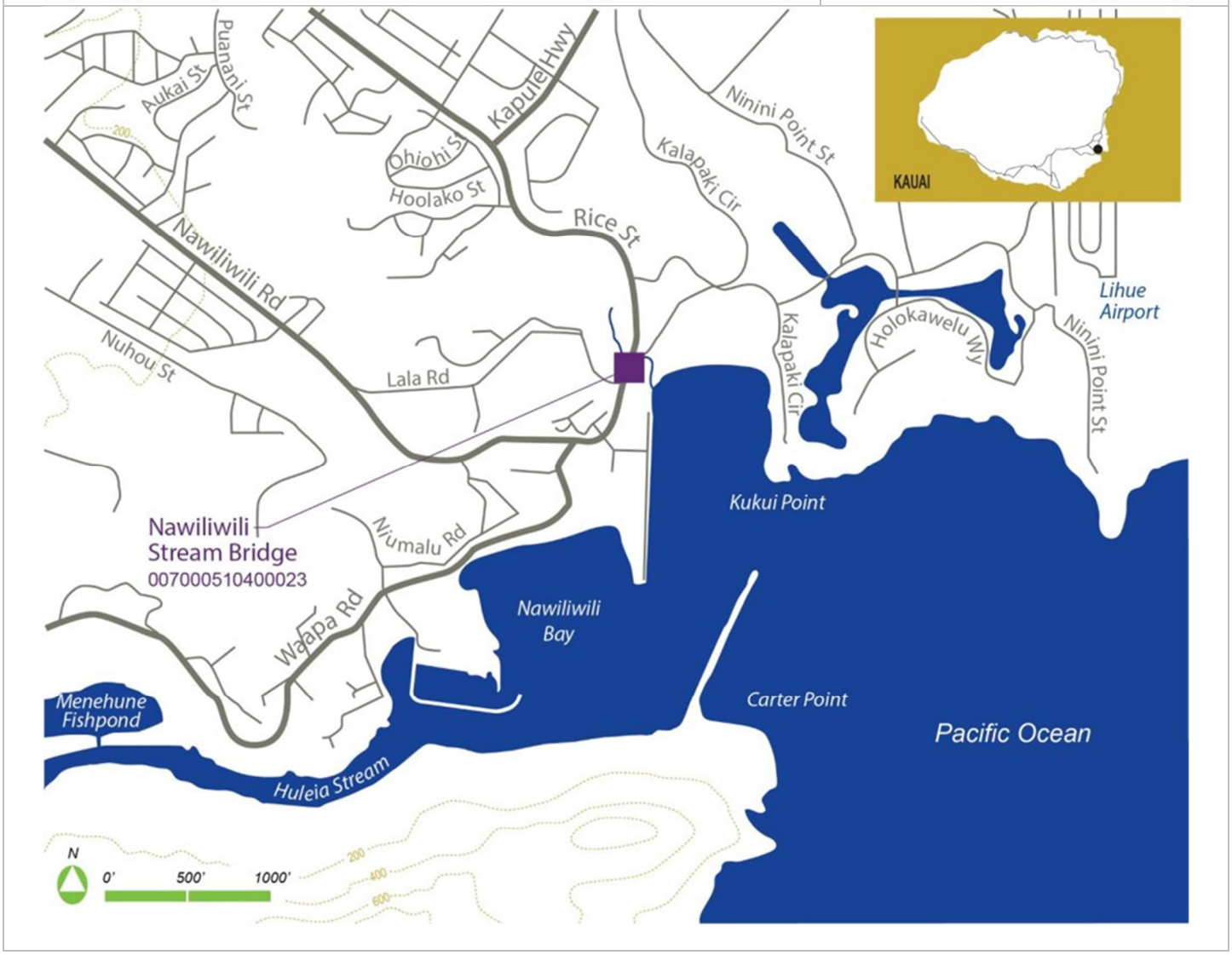


Image 4. View of superstructure from road. Facing northeast.

Bridge Inventory Form

General Information

Bridge Number: 007000510400023	**TMK**: 435002999, 432006001 (adjacent)	
Common Name: Nawiliwili Stream Bridge		
Historic Name: Nawiliwili Stream Bridge		
Feature Crossed: Nawiliwili Stream		
Feature Carried: Rice Street/Route 51		
Island: Kauai	**Milepost**: 0.23	
Latitude: 21.96078	**Longitude**: -159.3529	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date**: 1933
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations: Thrie beams have been added to the bridge.	

Design Information

Number of Spans: 1	**Max Span**: 48.9 ft.	**Total Length**: 49.9 ft.	**Deck Width**: 25.9 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with Asphalt Concrete (AC) Overlay			
Parapets/Railings: Concrete Solid Panel with Cap			
Other Features: Bridge name and construction date incised on end posts			

Historic Information

NRHP Status: Eligible	Criteria: A☐ B☐ C☒ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-11-02344	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District:		**Contributing**:
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Engineering		
Period of Significance: 1933		

Narrative Description:

The Nawiliwili Stream Bridge carries Rice Street over the Nawiliwili Stream. This single-span concrete tee beam bridge rests on concrete abutment walls. The concrete deck carries a two-lane roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete solid panels with cap railings with end posts that feature the bridge's name and date of construction.

Bridge Inventory Form

Statement of Significance:

The Nawiliwili Stream Bridge carries Rice Road to recreational and scenic attractions on the island of Maui. Its design, a concrete tee beam with solid railing, was a common type of bridge found in Hawaii prior to the Second World War.

Research did not indicate the bridge to be associated with major transportation improvements or the tourism industry on Kauai during the Territorial period, it is therefore not significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

The bridge is a result of early developments in concrete bridge design and construction in Hawaii. It is a good example of a 1930s reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the use of solid concrete with cap parapets represents a typical rail pattern used by the Territorial Highway Department. This bridge is therefore significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The bridge remains in its original location, situated over a waterway. It retains integrity of design, materials, and workmanship despite modest alterations to improve vehicular safety through use of thrie beams. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, semi-rural surroundings remains. The bridge retains integrity of feeling and association as a pre-World War II bridge type and its association with Territorial roadway improvements during the 1930s.

Therefore, Nawiliwili Stream Bridge is eligible for the NRHP.

Bridge Inventory Form

References

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

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view. Facing west.

Image 2. Substructure and abutment. Facing north.

Image 3. East parapet, note construction date on endpost. Facing northeast.

Image 4. Detail of west parapet and construction date incised on endpost. Facing west.

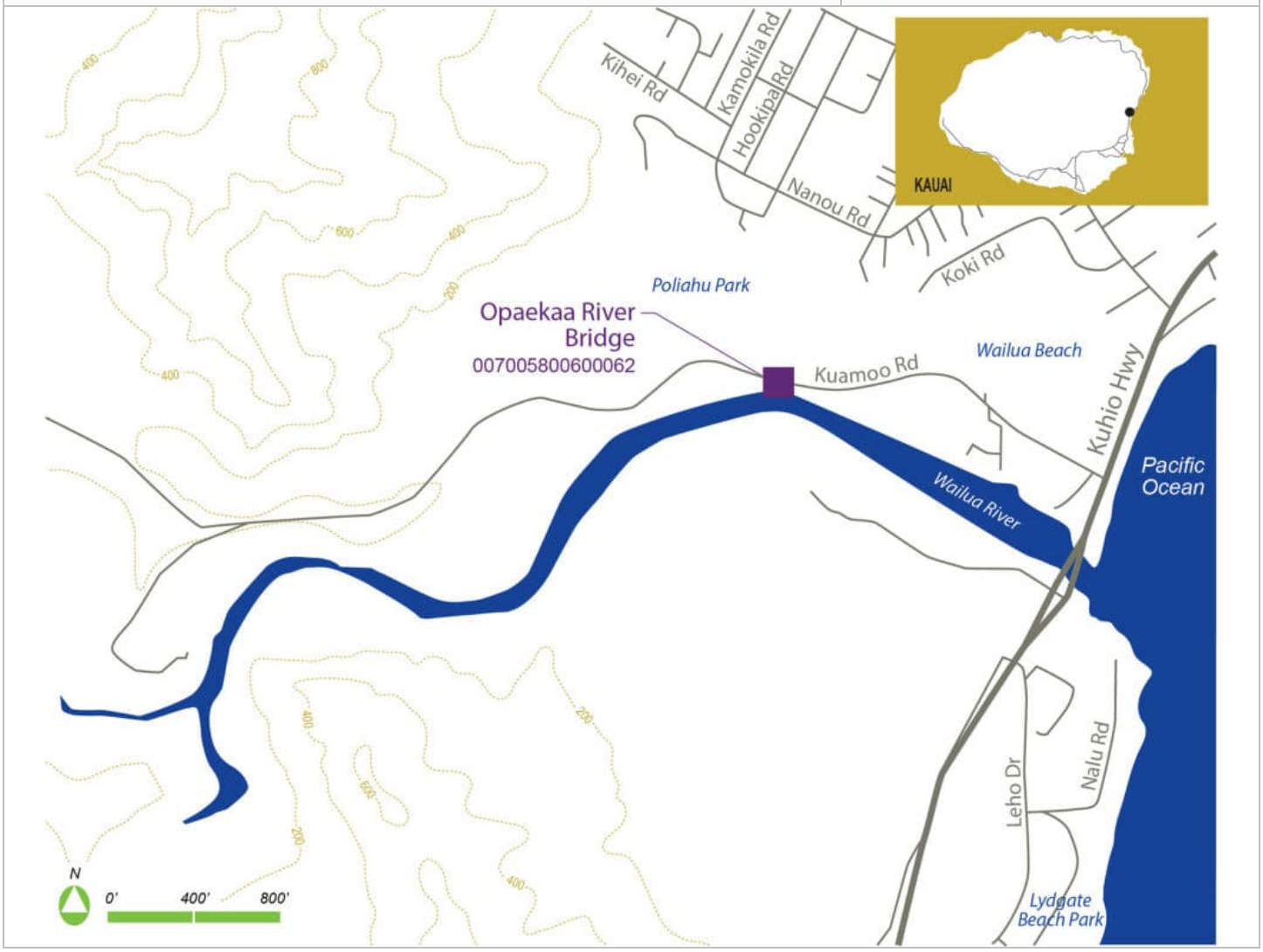
Bridge Inventory Form

Image 5. General view of bridge. Facing north.

Bridge Inventory Form

General Information

Bridge Number: 007005800600062	**TMK**: 441002999, 441002005 (adjacent)	
Common Name: Opaekaa Stream Bridge		
Historic Name: Opaekaa Stream Bridge		
Feature Crossed: Opaekaa Stream		
Feature Carried: Kuamoo Road/Route 580		
Island: Kauai	**Milepost**: 0.62	
Latitude: 22.04975	**Longitude**: -159.3446	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date**: 1936
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations: Thrie beams have been added to the bridge.	

Design Information

Number of Spans: 1	**Max Span**: 49.9 ft.	**Total Length**: 53.1 ft.	**Deck Width**: 35.4 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with Asphalt Concrete (AC) Overlay			
Parapets/Railings: Concrete Open Arched			
Other Features:			

Historic Information

NRHP Status: Eligible	Criteria: A☐ B☐ C☒ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-08-02346	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District:		**Contributing**:
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Engineering		
Period of Significance: 1936		

Narrative Description:

The Opaekaa Stream Bridge carries the Kuamoo Road over the Opaekaa Stream. The single-span concrete tee beam bridge rests on concrete abutment walls. The concrete deck is supported by tee beams and carries a two-way roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete open arch railing with curved end posts. Thrie beams have been attached to all end posts.

Bridge Inventory Form

Statement of Significance:

The Opeakaa Stream Bridge carries the Kuamoo Road to recreational and scenic attractions on the island of Kauai. Its design, a concrete tee beam with ornamental railing, was a common type of bridge found in Hawaii prior to the Second World War.

Research did not indicate the bridge to be associated with major transportation improvements or the tourism industry on Kauai during the Territorial period, it is therefore not significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

The bridge is a result of early developments in concrete bridge design and construction in Hawaii. It is a good example of a 1930s reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the use of open arch parapets represents a typical rail pattern used by the Territorial Highway Department. This bridge is therefore significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The bridge remains in its original location, situated over a waterway. It retains integrity of design, materials, and workmanship despite modest alterations to improve vehicular safety through use of thrie beams. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, semi-rural surroundings remains. The bridge retains integrity of feeling and association as a pre-World War II bridge type and its association with Territorial roadway improvements during the 1930s.

Therefore, Opeakaa Stream Bridge is eligible for the NRHP.

Bridge Inventory Form

References

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

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of bridge, facing south.

Image 2. View of abutment and deck structure.

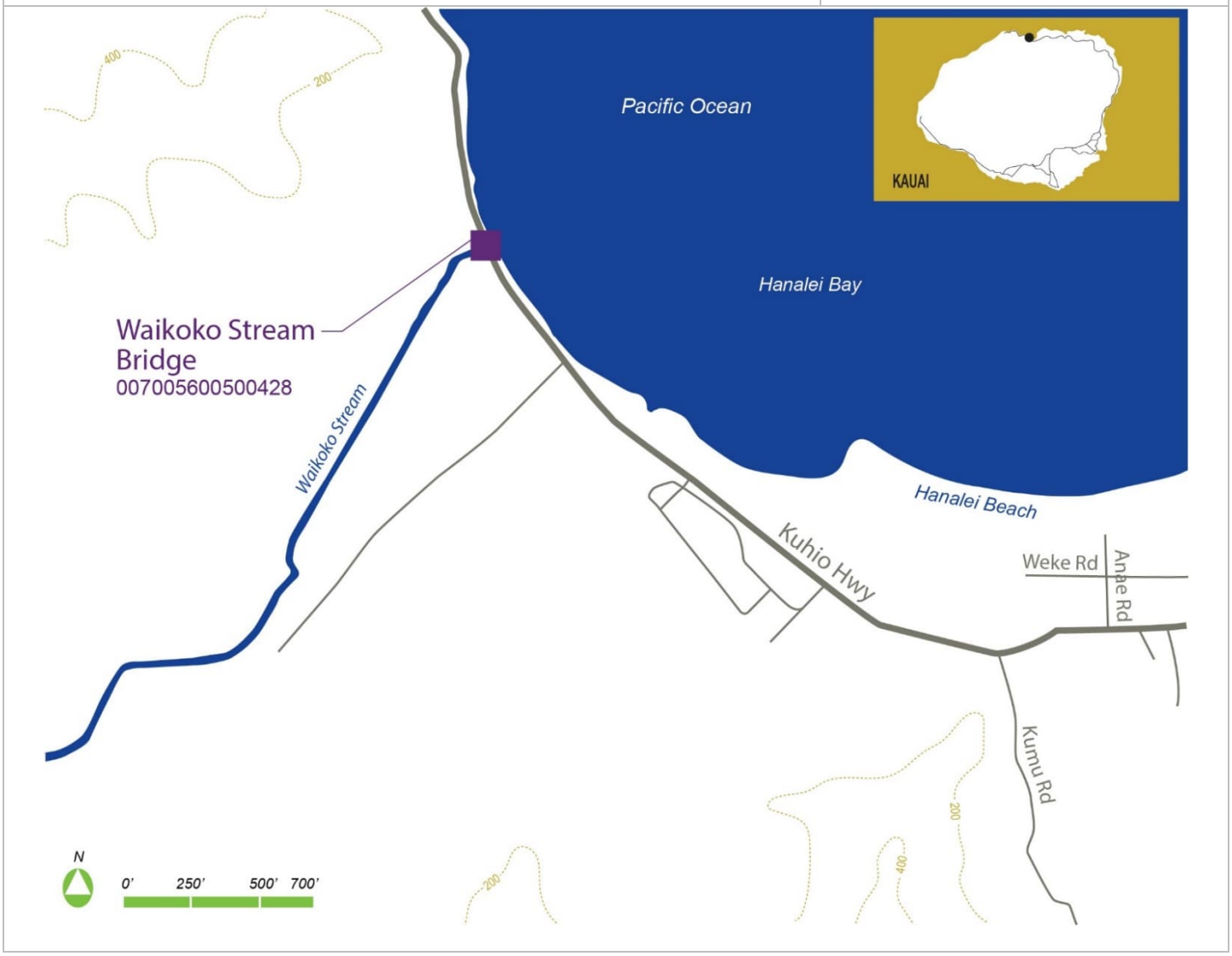
Bridge Inventory Form

Image 3. View of parapet and end post, facing southeast.

Bridge Inventory Form

General Information

Bridge Number: 007005600500428	**TMK**: 456004999 (district), 456003002 (adjacent)	
Common Name: Waikoko Stream Bridge		
Historic Name: Waikoko Stream Bridge		
Feature Crossed: Waikoko Stream		
Feature Carried: Kuhio Highway/Route 560		
Island: Kauai	**Milepost**: 4.27	
Latitude: 22.20716	**Longitude**: -159.51683	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Reinforced Concrete	**Construction Date**: 2019
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations:	

Design Information

Number of Spans: 1	**Max Span**: 69.9 ft.	**Total Length**: 71.9 ft.	**Deck Width**: 21.0 ft.
Superstructure: Reinforced Concrete Girder			
Substructure: Reinforced Concrete Abutment			
Floor/Decking: Prestressed Concrete Deck			
Parapets/Railings: Concrete Solid with Cap			
Other Features:			

Historic Information

NRHP Status: Listed	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**: 0000000000
HRHP Status: Listed	**SIHP No.**: 50-30-03-02336 (bridge), 50-30-02-02334 (district)	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☐ Design☐ Setting☐ Materials☐ Workmanship☐ Feeling☐ Association☐		
Historic District: Kauai Belt Road – North Shore Section		**Contributing**: No
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance:		
Period of Significance:		
Supplemental Documentation: HAER No. HI-142		

Narrative Description:

The Waikoko Stream Bridge carries the Kuhio Highway over the Waikoko Stream. This single-span reinforced concrete girder bridge rests on reinforced concrete abutments. The prestressed concrete deck carries a one-lane roadway and is flanked by concrete solid parapets with caps.

Bridge Inventory Form

Statement of Significance:

The Waikoko Stream Bridge is a non-contributing structure to the NRHP-listed Kauai Belt Road (North Shore Section).

The Waikoko Stream Bridge is one of a series of bridges within the Kauai Belt Road (North Shore Section), which was constructed between 1900 and 1957 to provide access to remote areas of the island, facilitate the transport of sugar, and used later for tourism purposes. As a historic district, the Kauai Belt Road includes approximately 10 miles of roadway between Princeville, Wainiha, and Haena. The Kauai Belt Road (North Shore Section) has suffered damage from tidal waves in 1946 and 1957 as well as from severe storms in 2018, leading to the reconstruction, repair, or replacement of various bridges throughout the historic district.

The original Waikoko Stream Bridge was built in 1904, replaced with a concrete bridge in 1912 (structure number 007005600500427), and repaired after a partial collapse in 1946. The bridge was determined to be contributing to the Kauai Belt Road (North Shore Section) district in 2002. The bridge's design and replacement in 2019 followed consultation with Section 106 consulting parties and adherence to the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*, which balances user safety with historic preservation interests. The result is a new bridge that reflects design considerations of its predecessor, maintains the Kauai Belt Road (North Shore Section) location over Waikoko Stream, and retains the feeling and association of the Kauai Belt Road within the North Shore. Because it is a replacement bridge, it is non-contributing.

This is a replacement of a historical bridge constructed in 2019. It is not individually significant under NRHP Criteria A, B, C, or D or HRS 6E criteria a, b, c, d, or e; however, the bridge is within the boundaries of the NRHP-listed Kauai Belt Road (North Shore Section).

Bridge Inventory Form

References

Blanchard, Guy V. “Kaua‘i Belt R Belt Road (North Shore Section) (Additional Documentation), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2021. (Hawai‘i SHPD).

Duensing, Dawn E. “Kaua‘i Belt R Belt Road (North Shore Section), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2002. (Hawai‘i SHPD).

Fujiwara, David K., Gary T. Iwamoto, and Eric Y, Matsumoto, KSF Inc. “Project: Waikoko Stream Bridge Replacement.” *Aspire – The Concrete Bridge Magazine* (Winder 2023): 16-19. https://www.aspirebridge.com/magazine/2023Winter/Project-WaikokiStreamBridgeReplacement.pdf.

Hibbard, Don. “Waikoko Stream Bridge, Mile 4.2 Kuhio Highway, Hanalei, Kauai County, Hawaii, HAER HI-142.” Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2019. https://www.loc.gov/item/hi1105/.

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Figure 1. Waikoko Stream Bridge, facing northeast.

Figure 2. Waikoko Stream Bridge, southwest parapet facing south.

Bridge Inventory Form

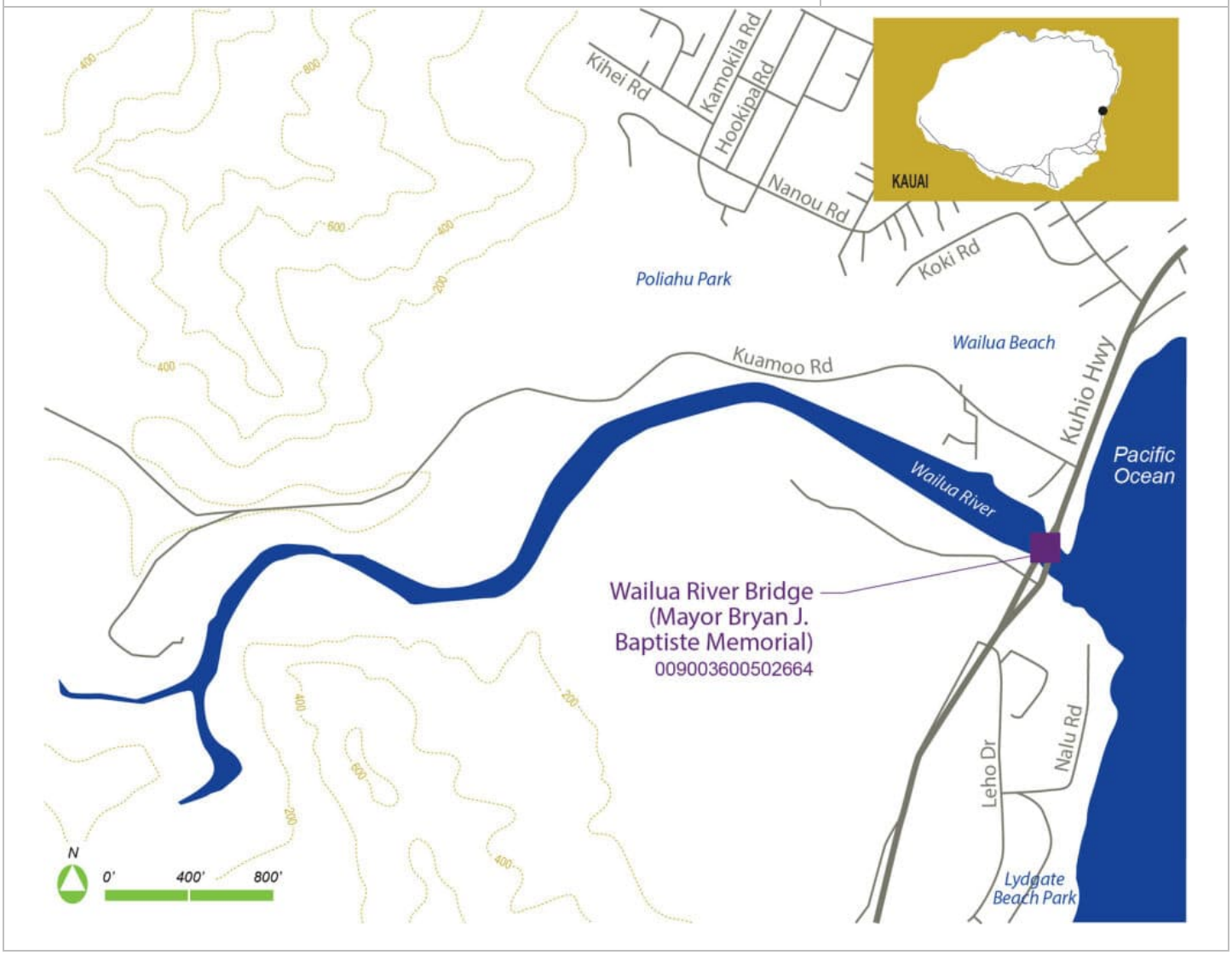
Figure 3. Waikoko Stream Bridge, approach facing northwest.


Figure 4. Waikoko Stream Bridge, detail of girders and abutment.

Bridge Inventory Form

General Information

Bridge Number: 007000560400572	**TMK**: 441004999, 439006012 (adjacent)	
Common Name: Wailua River Bridge (Mayor Bryan J. Baptiste Memorial Bridge)		
Historic Name: Wailua River Bridge		
Feature Crossed: Wailua River		
Feature Carried: Kuhio Highway/Route 56		
Island: Kauai	**Milepost**: 5.72	
Latitude: 22.04536	**Longitude**: -159.3366	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Continuous Tee Beam	**Construction Date**: 1945
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s): 2011, 2015, 2018	
Alterations: Converted to two southbound lanes in 2011 with Waiula Plantation/Cane Haul Bridge (007000560400573) having two northbound lanes. In 2015, repairs were made to the concrete railings at the outlet end traffic side. Following the 2018 flood, concrete-filled grout bags were placed around exposed footings at piers 2 and 3 as scour countermeasures, 2024 substructure replacement ongoing.	

Design Information

Number of Spans: 8	**Max Span**: 60.0 ft.	**Total Length**: 424.9 ft.	**Deck Width**: 37.1
Superstructure: Concrete Continuous Tee Beam			
Substructure: Reinforced Concrete Abutment Wall and Reinforced Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete and Metal Horizontal			
Other Features: Bridge name and construction date incised on end posts, memorial plaque reading Mayor Bryan J. Baptiste Memorial Bridge added 2011			

Historic Information

NRHP Status: Eligible	Criteria: A☒ B☐ C☒ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-08-02350	
6E Status: Significant Historic Property	Criteria: a☒ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District: N/A		**Contributing**: N/A
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Transportation, Engineering		
Period of Significance: 1945		
Narrative Description: The Wailua River Bridge, along with the Wailua Plantation Bridge, carries the Kuhio Highway across the Wailua River. This concrete continuous tee beam bridge rests on seven reinforced concrete piers and abutment walls and features concrete and metal railings. The bridge name and construction date (partially obscured by a thrie beam) are incised on		

the end posts. Thrie beams have been added to all end posts while commemorative plaques to Mayor Bryan J. Baptiste are also featured on the end posts.

Statement of Significance:

The Kuhio Highway forms an essential road link on the island of Kauai. Constructed in 1945 as a two-lane roadway, the Wailua River Bridge is an early example of post-World War II reinforced concrete bridge construction. On the makai side of the Wailua River Bridge is the Wailua Plantation Bridge, originally constructed in 1921 as a railroad trestle and converted to a single-lane roadway following World War II. Together these bridges formed a three-lane complex with differing traffic patterns throughout the day in week. In 2011, a major project took place in which the Wailua Plantation Bridge was replaced with a two-lane road carrying the northbound lanes and bike path, meaning the original bridge lost its historic integrity. The Wailua River Bridge now features two southbound lanes. The Wailua River Bridge piers is currently undergoing substructure renovation and rehabilitation work.

Because the bridge is associated with major transportation improvements on Kauai following World War II, it is significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B. Its association with Mayor Bryan J. Baptiste is purely commemorative in nature.

The bridge is a result of postwar concrete bridge design and construction in Hawaii. It is a good example of a reinforced concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the use of solid concrete parapets with metal horizontal railings represents an early and typical postwar rail pattern. The bridge is therefore significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The bridge remains in its original location, situated over a waterway. It retains integrity of design, materials, and workmanship despite the addition of thrie beams and commemorative plaques. Its integrity of setting is intact as development surrounding the bridge is limited and its semi-rural surroundings remains. The bridge retains integrity of feeling and association as a post-World War II bridge type and its association with roadway improvements during the 1940s.

Therefore, the Wailua River Bridge is eligible for the NRHP.

Bridge Inventory Form

References

"Wailua River Bridge Work to Begin." State of Hawaii Department of Transportation, June 9, 2022. https://hidot.hawaii.gov/blog/2022/06/09/wailua-river-bridge-work-to-begin/

Huylen, Cyrus and Matthew R. Clarke. *An Archaeological Monitoring Plan for the Proposed Modifications to the Wailua River Bridge and Wailua Plantation Bridge*. WSP USA. November 2020.

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

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. Bride superstructure and piers, facing west.

Image 2. Bridge superstructure and piers, facing southeast.

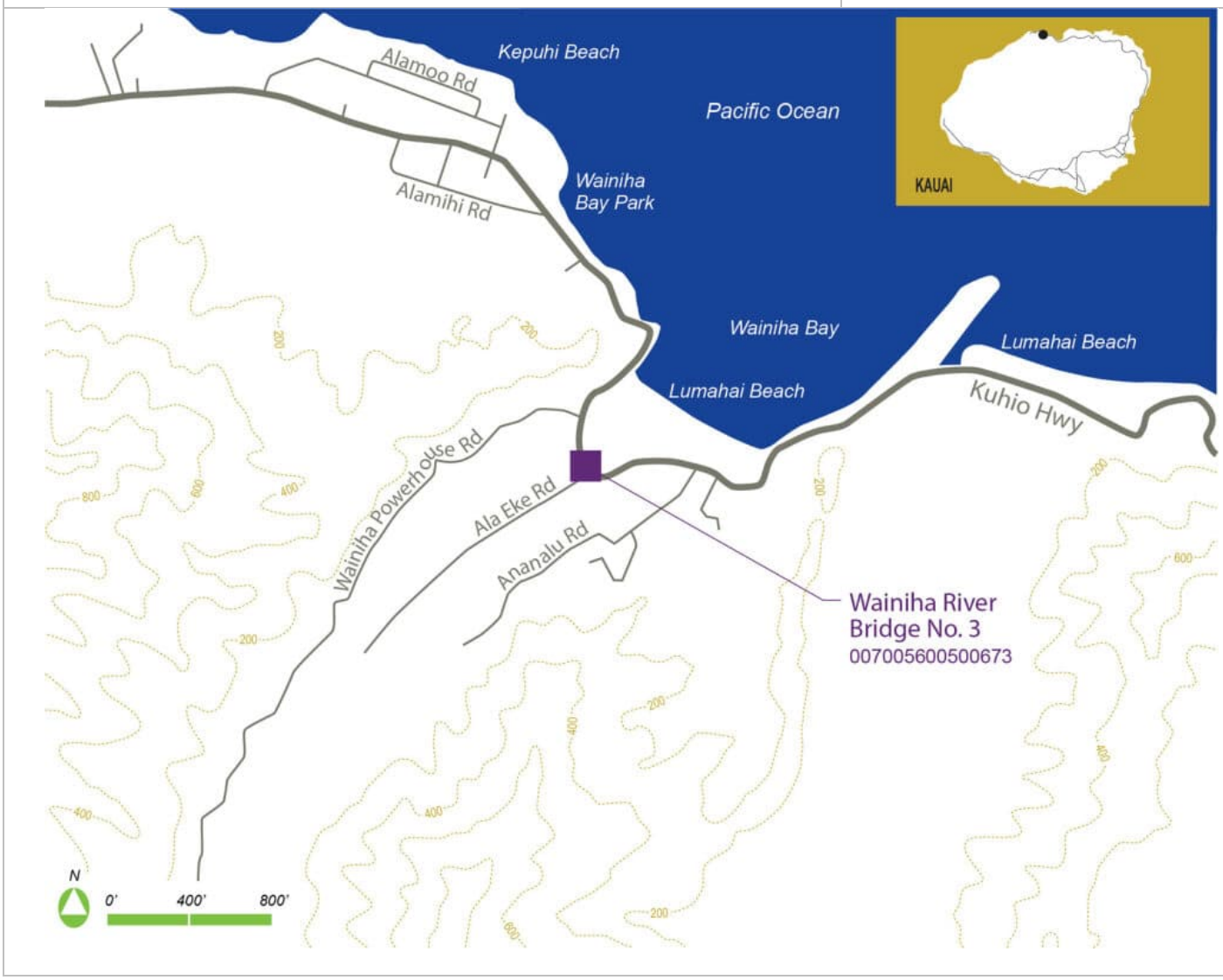
Image 3. Bridge abutment and deck structure, facing north.

Image 4. Bridge deck and end post bearing bridge name, facing southeast.

Bridge Inventory Form

General Information

Bridge Number: 007005600500673	**TMK**: 458007024 (adjacent)	
Common Name: Wainiha River Bridge No. 3		
Historic Name: Wainiha River Bridge No. 3		
Feature Crossed: Wainiha River		
Feature Carried: Kuhio Highway/Route 560		
Island: Kauai	**Milepost**: 6.73	
Latitude: 22.21301	**Longitude**: -159.5437	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Steel Truss	**Construction Date**: 2007
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s): 2007	
Alterations: Temporary ACROW bridge	

Design Information

Number of Spans: 3	**Max Span**: 81.0 ft.	**Total Length**: 185.0 ft.	**Deck Width**: 15.7 ft.
Superstructure: Steel Pony Truss			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Steel Deck			
Parapets/Railings: Metal Thrie Beam			
Other Features:			

Historic Information

NRHP Status: Listed	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**: N/A
HRHP Status: Listed	**SIHP No.**: 50-30-02-02338 (bridge), 50-30-02-02334 (district)	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☐ Design☐ Setting☐ Materials☐ Workmanship☐ Feeling☐ Association☐		
Historic District: Kauai Belt Road – North Shore Section		**Contributing**: No
Current Function: Bridge	**Historic Function**:	
Areas of Significance: N/A		
Period of Significance: N/A		
Narrative Description: The Wainiha River Bridge No. 3 carries the Kuhio Highway over the Wainiha River. This temporary triple-span modular steel truss ACROW bridge rests on concrete abutment walls and two concrete wall piers. The steel truss carries a one-lane steel roadway flanked by thrie beam railings.		

Bridge Inventory Form

Statement of Significance:

Wainiha River Bridge No. 3 is a noncontributing structure to the NRHP-listed Kauai Belt Road (North Shore Section).

Wainiha River Bridge No. 3 is one of a series of bridges within the Kauai Belt Road (North Shore Section), which was constructed between 1900 and 1957 to provide access to remote areas of the island, facilitate the transport of sugar, and used later for tourism purposes. As a historic district, the Kauai Belt Road includes approximately 10 miles of roadway between Princeville, Wainiha, and Haena. The Kauai Belt Road (North Shore Section) has suffered damage from tidal waves in 1946 and 1957 as well as from severe storms in 2018, leading to the reconstruction, repair, or replacement of various bridges throughout the historic district.

Wainiha River Bridge No. 3 was originally built as a timber bridge in 1904 and later replaced in 1918 with reinforced concrete abutments. The 1918 structure was partially destroyed and repaired in 1957 and eventually replaced in 1966. In 2007, the Wainiha River Bridge No. 3 received damage, most likely from an oversized truck that exceeded the bridge's weight limits, that resulted in its replacement by a temporary ACROW structure. The temporary bridge rests on the 1918 piers and abutments.

This is a typical and standardized temporary ACROW bridge. It is not individually significant under NRHP Criteria A, B, C, or D or HRS 6E criteria a, b, c, d, or e; however, the bridge is within the boundaries of the NRHP-listed Kauai Belt Road (North Shore Section).

Bridge Inventory Form

References

Blanchard, Guy V. “Kaua‘i Belt R Belt Road (North Shore Section) (Additional Documentation), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2021. (Hawai‘i SHPD).

Duensing, Dawn E. “Kaua‘i Belt R Belt Road (North Shore Section), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2002. (Hawai‘i SHPD).

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of bridge, facing south.

Image 2. General view of bridge, facing northwest.

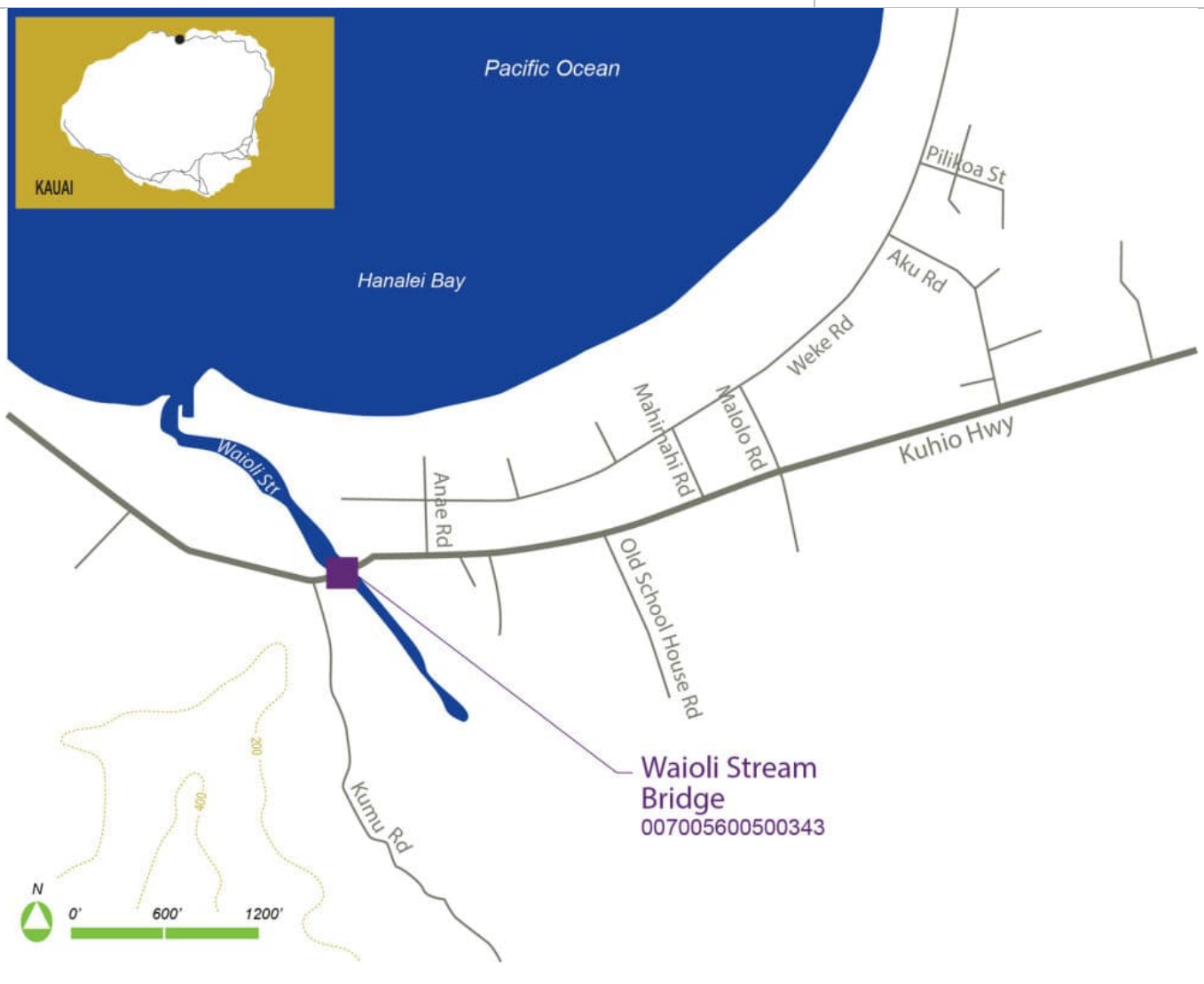
Image 3. Detail of bridge pier.

Image 4. Bridge deck and ACROW structure, facing southwest.

Bridge Inventory Form

General Information

Bridge Number: 007005600500343	**TMK**: 455005021 (adjacent)	
Common Name: Waioli Bridge		
Historic Name: Waioli Bridge		
Feature Crossed: Waioli Stream		
Feature Carried: Kuhio Highway/Route 560		
Island: Kauai	**Milepost**: 3.45	
Latitude: 22.20044	**Longitude**: -159.5071	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Girder	**Construction Date**: 1912
Designer/Engineer: Joseph H. Moragne	
Builder/Contractor: George W. Mahukona	
Alteration Date(s): 2017, 2019, 2021	
Alterations: In 2017, vegetation from the north channel span was removed. In 2019, the contractor was in the process of rehabilitating the bridge. RM-4 markers were installed at the upstream north side and downstream south side of the bridge. New upstream and downstream parapets had been constructed since the March 2017 inspection. In 2020, the bridge was rehabilitated with new concrete bridge railings and new fiberglass wrapped around the existing concrete bridge deck. In 2021, new cut off walls were installed on either side of the pier footings and on the channel side of both abutments.	

Design Information

Number of Spans: 3	**Max Span**: 42.0 ft.	**Total Length**: 102.0 ft.	**Deck Width**: 23.3 ft.
Superstructure: Concrete Through Girder			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Other Features: Date of construction and rehabilitation incised on parapets			

Historic Information

NRHP Status: Listed	Criteria: A☒ B☐ C☒ D☐	**NRHP No.**: 03001048
HRHP Status: Listed	**HRHP No.**: 50-30-03-02340 (bridge), 50-30-02-02334 (district)	
6E Status: Significant Historic Property	Criteria: a☒ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District: Kauai Belt Road (North Shore Section)		**Contributing**: Yes
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Transportation, Engineering, Social History, Commerce, Conservation		
Period of Significance: 1900-1978 (district), 1912 (bridge)		
Narrative Description: Waioli Bridge carries the Kuhio Highway across the Waioli Stream. The bridge is a three-span, single-lane concrete bridge that extends 90 feet across the Waioli Stream atop concrete bents and abutments. Flanking the roadway are		

concrete solid railings with caps. Following storm damage in 2018, the bridge was rehabilitated in 2019 using a fiberglass wrap that allowed the bridge to maintain its concrete appearance. The bridge's construction date and rehabilitation date are incised on the bridge railing.

Statement of Significance:

The Waioli Bridge is listed in the NRHP and HRHP as a contributing resource to the Kauai Belt Road (North Shore Section). It was determined individually NRHP eligible in 1978.

The Waioli Bridge is one of a series of bridges within the Kauai Belt Road (North Shore Section), which was constructed between 1900 and 1957 to provide access to remote areas of the island, facilitate the transport of sugar, and used later for tourism purposes. As a historic district, the Kauai Belt Road includes approximately 10 miles of roadway between Princeville, Wainiha, and Haena. The Kauai Belt Road (North Shore Section) has suffered damage from tidal waves in 1946 and 1957 as well as from severe storms in 2018, leading to the reconstruction, repair, or replacement of various bridges throughout the historic district.

Waioli Bridge was originally built as a timber bridge in 1904, the existing concrete bridge replaced it in 1912. The bridge is a contributing resource to the Kauai Belt Road (North Shore Section), which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Kauai's commercial development. It is therefore significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

As a contributing bridge, the Waioli Bridge is a good example of reinforced-concrete flat slab construction on the Kauai Belt Road. It is one of a number of bridges along the Kauai Belt Road that made use of the latest construction technology available at the time: reinforced concrete. In particular, the solid concrete with cap railing is a typical rail pattern found in early twentieth-century Hawaii bridge construction. The bridge's construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii and is associated with County Engineer Joseph H. Moragane, credited with designing and building the Kauai Belt Road. For these reasons, the bridge is significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The Kauai Belt Road (North Shore Section) retains integrity of location, design, setting, feeling, and association, as described in its NRHP Registration Form: Kauai Belt Road (North Shore Section) (Update) dated July 2021.

The Waioli Bridge remains in its original location, situated over Waioli Stream, as well as within its 1910s alignment. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, semi-rural surroundings remain. Since the Waioli Bridge was determined eligible for listing in the NRHP in 1978 and formally listed as part of the Kauai Belt Road (North Shore Section) in 2004, great effort has been made to retain the bridge's integrity of design, materials, and workmanship. In 2019, the bridge was rehabilitated following the Secretary of the Interior's Standards for the Treatment of Historic Properties using a reinforced fiberglass wrap to provide additional strength to the bridge and increase its load limit while preserving its historic, concrete appearance. The bridge retains integrity of feeling as a common Highway Territorial Bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

Bridge Inventory Form

References

Blanchard, Guy V. “Kaua‘i Belt R Belt Road (North Shore Section) (Additional Documentation), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2021. (Hawai‘i SHPD).

Duensing, Dawn E. “Kaua‘i Belt R Belt Road (North Shore Section), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2002. (Hawai‘i SHPD).

Neal, Julia. “Waioli Bridge – Kuhio Highway (Bridge Number: 41), National Register of Historic Places Inventory Nomination Form.” U.S. National Park Service, U.S. Department of the Interior, 1976.

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

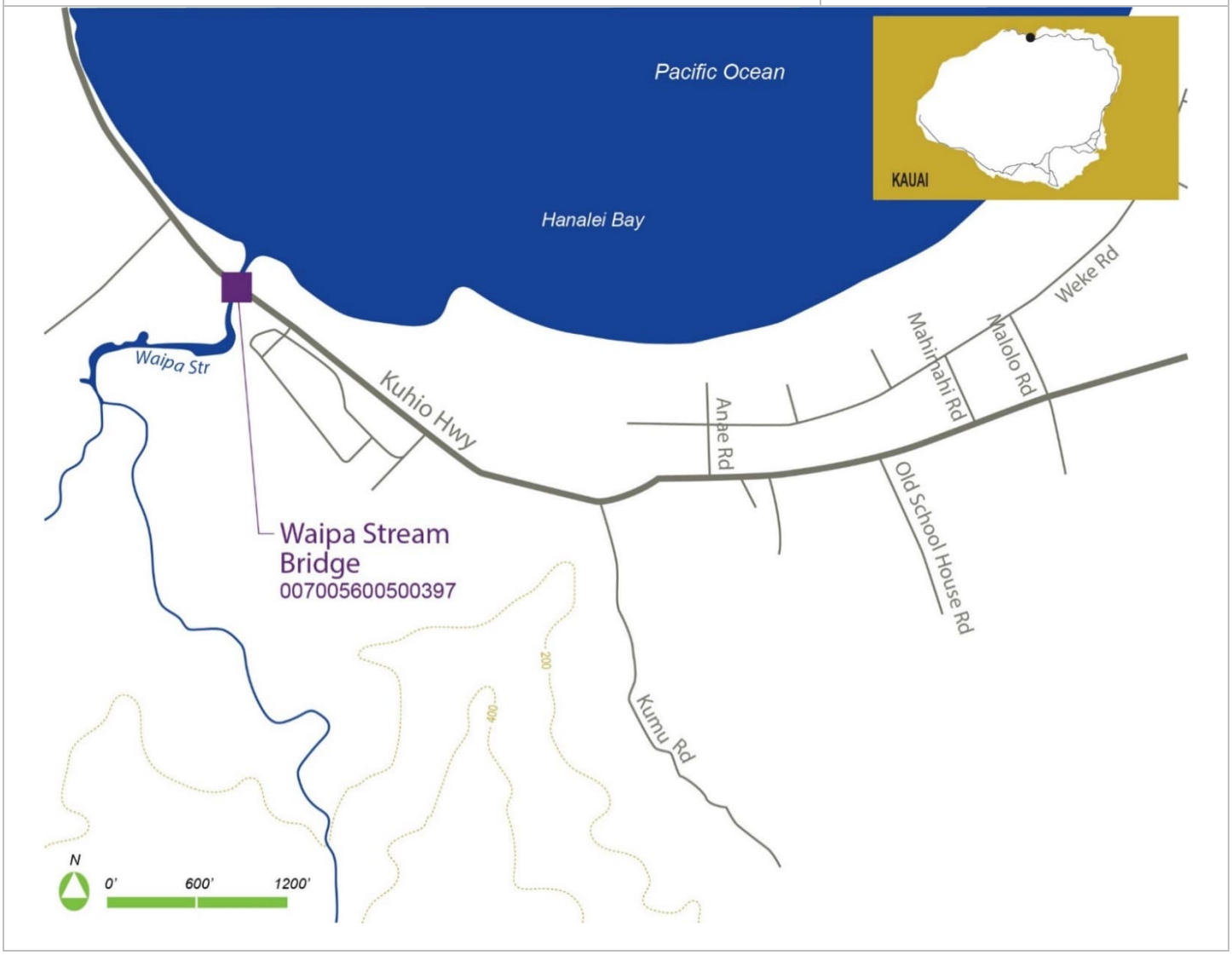
Image 1. General view of bridge, facing south.

Image 2. Bridge railing with end post featuring name, construction date, and rehabilitation date, facing southwest.

Bridge Inventory Form

General Information

Bridge Number: 007005600500397	**TMK**: 456004999 (district), 456004023 (adjacent)	
Common Name: Waipa Stream Bridge		
Historic Name: Waipa Stream Bridge		
Feature Crossed: Waipa Stream		
Feature Carried: Kuhio Highway/Route 560		
Island: Kauai	**Milepost**: 3.96	
Latitude: 22.203844	**Longitude**: -159.51404	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Reinforced Concrete	**Construction Date**: 2019
Designer/Engineer:	
Builder/Contractor:	
Alteration Date(s):	
Alterations:	

Design Information

Number of Spans: 3	**Max Span**: 50.9 ft.	**Total Length**: 142.1 ft.	**Deck Width**: 21.0 ft.
Superstructure: Reinforced Concrete Girder			
Substructure: Reinforced Concrete Abutment and Reinforced Concrete Column			
Floor/Decking: Prestressed Concrete Deck			
Parapets/Railings: Concrete Solid with Cap			
Other Features:			

Historic Information

NRHP Status: Listed	Criteria: A☐ B☐ C☐ D☐	**NRHP No.**: 03001048
HRHP Status: Listed	**SIHP No.**: 50-30-03-02341 (bridge), 50-30-02-02334 (district)	
6E Status: Significant Historic Property	Criteria: a☐ b☐ c☐ d☐ e☐	
Integrity: Location☐ Design☐ Setting☐ Materials☐ Workmanship☐ Feeling☐ Association☐		
Historic District: Kauai Belt Road – North Shore Section		**Contributing**: No
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance:		
Period of Significance:		
Supplemental Documentation: HAER No. HI-141		

Narrative Description:

The Waipa Stream Bridge carries the Kuhio Highway over the Waipa Stream. This three-span reinforced concrete girder bridge rests on reinforced concrete abutments and reinforced concrete columns. The prestressed concrete deck carries a one-lane roadway and is flanked by concrete solid parapets with caps.

Bridge Inventory Form

Statement of Significance:

The Waipa Stream Bridge is a non-contributing structure to the NRHP-listed Kauai Belt Road (North Shore Section).

Waipa Stream Bridge is one of a series of bridges within the Kauai Belt Road (North Shore Section), which was constructed between 1900 and 1957 to provide access to remote areas of the island, facilitate the transport of sugar, and used later for tourism purposes. As a historic district, the Kauai Belt Road includes approximately 10 miles of roadway between Princeville, Wainiha, and Haena. The Kauai Belt Road (North Shore Section) has suffered damage from tidal waves in 1946 and 1957 as well as from severe storms in 2018, leading to the reconstruction, repair, or replacement of various bridges throughout the historic district.

The original Waipa Stream Bridge was a timber bridge constructed in 1904, replaced in 1912 with a concrete bridge (structure number 007005600500396) that collapsed in 1919, and modified through an extension in 1925. The bridge was determined to be individually NRHP-eligible in 1978 and contributing to the Kauai Belt Road (North Shore Section) district in 2002. The bridge's design and replacement in 2019 followed consultation with Section 106 consulting parties and adherence to the 2005 *Kūhiō Highway (Route 560) Historic Roadway Corridor Plan*, which balances user safety with historic preservation interests. The result is a new bridge that reflects design considerations of its predecessor, maintains the Kauai Belt Road (North Shore Section) location over Waipa Stream, and retains the feeling and association of the Kauai Belt Road within the North Shore. Because it is a replacement bridge, it is non-contributing.

This is a replacement of a historical bridge constructed in 2019. It is not individually significant under NRHP Criteria A, B, C, or D or HRS 6E criteria a, b, c, d, or e; however, the bridge is within the boundaries of the NRHP-listed Kauai Belt Road (North Shore Section).

Bridge Inventory Form

References

Blanchard, Guy V. “Kaua‘i Belt R Belt Road (North Shore Section) (Additional Documentation), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2021. (Hawai‘i SHPD).

Duensing, Dawn E. “Kaua‘i Belt R Belt Road (North Shore Section), National Register of Historic Places Registration Form.” U.S. National Park Service, U.S. Department of the Interior, 2002. (Hawai‘i SHPD).

Hibbard, Don. “Waipa Stream Bridge, Mile 3.9 Kuhio Highway, Hanalei, Kauai County, Hawaii, HAER HI-141.” Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2019. https://www.loc.gov/item/hi1104/.

Neal, Julia. “Waipa Bridge – Kuhio Highway (Bridge Number: 42), National Register of Historic Places Inventory Nomination Form.” U.S. National Park Service, U.S. Department of the Interior, 1976.

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Figure 1. General view of Waipa Stream Bridge, facing northeast.

Figure 2. Waipa Stream Bridge general view facing south.

Figure 3. Waipa Stream Bridge, detail of abutment.

Figure 4. Waipa Stream Bridge, detail of pier.

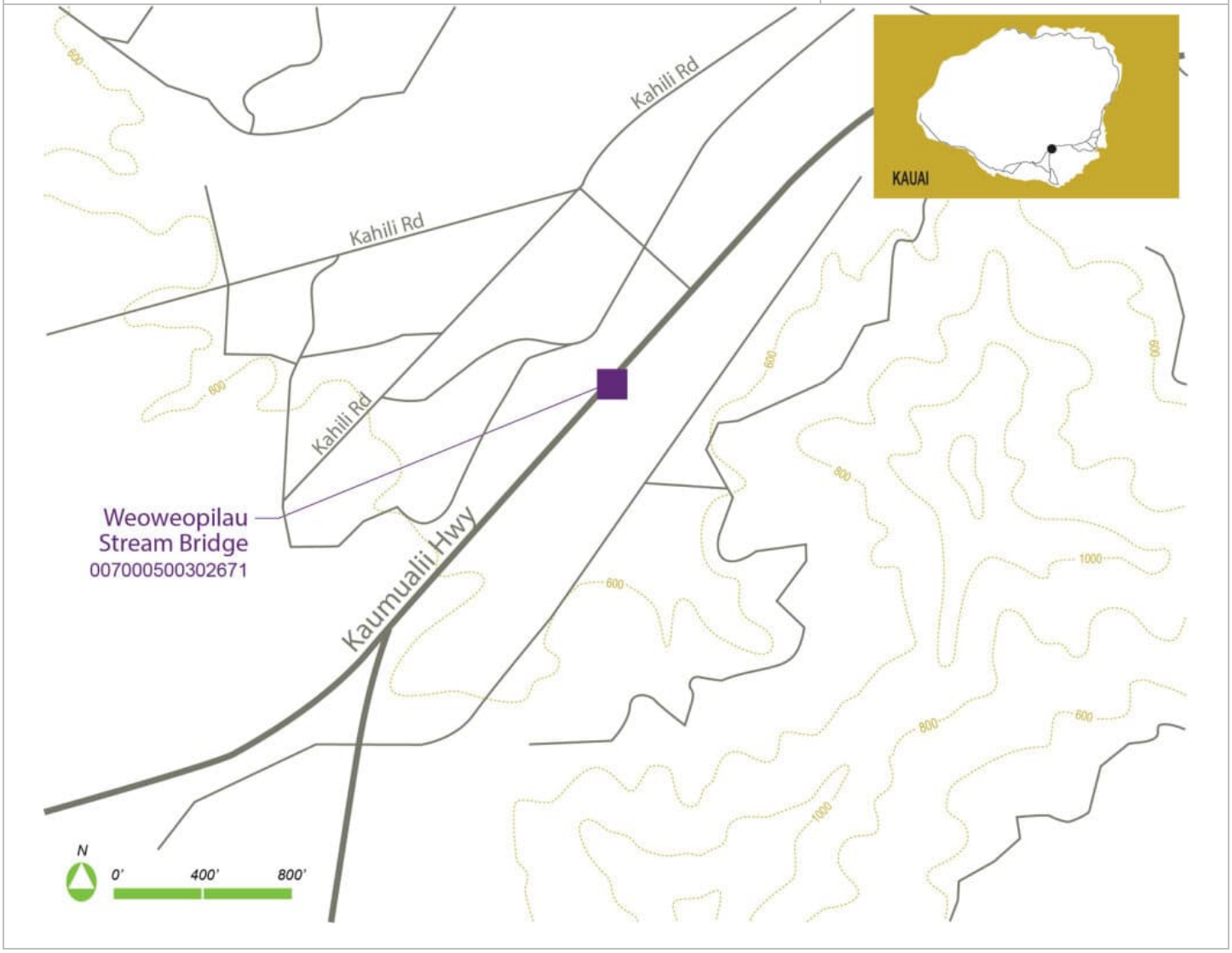
Figure 5. Waipa Stream Bridge, detail of southwest parapet, facing south.

Figure 6. Waipa Stream Bridge, general setting facing northwest.

Bridge Inventory Form

General Information

Bridge Number: 007000500302671	**TMK**: 428001999, 428001003 (adjacent)	
Common Name: Weoweopilau Stream Bridge		
Historic Name: Weoweopilau Stream Bridge		
Feature Crossed: Weoweopilau Stream		
Feature Carried: Kaumualii Highway/Route 50		
Island: Kauai	**Milepost**: 6.26	
Latitude: 21.95558	**Longitude**: -159.4611	
Ownership: State		**Image Date**: 10/25/2023



Bridge Inventory Form

Construction Information

Bridge Type: Concrete Continuous Slab	**Construction Date**: 1937
Designer/Engineer:	
Builder/Contractor: Hawaiian Contracting Company, Limited	
Alteration Date(s): 2016, 2018	
Alterations: In 2016, the AC pavement was replaced, and in 2018, new guardrail posts were installed in downstream Lihue guardrail.	

Design Information

Number of Spans: 2	**Max Span**: 18.0 ft.	**Total Length**: 39.0 ft.	**Deck Width**: 33.1 ft.
Superstructure: Concrete Continuous Slab			
Substructure: Concrete Abutment, Concrete Pier Wall			
Floor/Decking: Concrete Deck with Asphalt Concrete (AC) Overlay			
Parapets/Railings: Concrete Open Greek Cross			
Other Features:			

Historic Information

NRHP Status: Eligible	Criteria: A☒ B☐ C☒ D☐	**NRHP No.**: N/A
HRHP Status: Not Listed	**SIHP No.**: 50-30-10-02352	
6E Status: Significant Historic Property	Criteria: a☒ b☐ c☒ d☐ e☐	
Integrity: Location☒ Design☒ Setting☒ Materials☒ Workmanship☒ Feeling☒ Association☒		
Historic District: N/A		**Contributing**: N/A
Current Function: Bridge	**Historic Function**: Bridge	
Areas of Significance: Transportation, Engineering		
Period of Significance: 1937		

Narrative Description:

The Weoweopilau Stream Bridge carries the Kaumualii Highway over the Weoweopilau Stream. This two-span concrete continuous slab bridge rests on concrete abutments and one concrete pier wall. The concrete deck carries a two-lane roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open Greek Cross railings with curved end posts. Thrie beams have been bolted to each end post.

Bridge Inventory Form

Statement of Significance:

The construction of the Weoweopilau Stream Bridge occurred when the Territory of Hawaii used Federal Aid money to upgrade the Kauai Belt Road using funds from the Works Program Highway (WPH) Fund. The Weoweopilau Stream Bridge was part of project WPH-12-H and appeared in plans as Bridge 7G. The belt road's upgrade saw both the straightening of alignments and replacement of bridges to increase road speeds and capacity. Bridges constructed with Federal Aid money such as the Weoweopilau Stream Bridge featured more elaborate decorative elements and were larger in size than county-financed bridges.

Because the bridge is associated with major transportation improvements on Kauai during the Territorial period, it is therefore significant under Criterion A.

Research did not indicate an association with the lives of persons significant in our past and is therefore not significant under Criterion B.

The bridge is a result of early developments in concrete bridge design and construction in Hawaii. It is a good example of a 1930s reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the use of concrete open Greek Cross parapets represents a typical rail pattern used by the Territorial Highway Department. This bridge is therefore significant under Criterion C.

The bridge was not evaluated under Criterion D as part of this assessment.

The bridge remains in its original location, situated over a waterway. It retains integrity of design, materials, and workmanship despite modest alterations to improve pedestrian and vehicular safety through use of thrie beams. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, semi-rural surroundings remains. The bridge retains integrity of feeling and association as a pre-World War II bridge type and its association with Territorial roadway improvements during the 1930s.

Therefore, the Weoweopilau Stream Bridge is eligible for the NRHP.

Bridge Inventory Form

References

Territory of Hawaii. Territorial Highway Department. *Plans of Kauai Belt Road, U.S. Works Program Highway Project No. WPH 12-H, Hawaii Project No. 12-H, Districts of Koloa and Lihue Kauai, T.H.* Approved November 30, 1935. Retrieved from http://162.221.244.142:8080/As-Built/res/Kauai/Route%200050/0050-005/0050-005.htm.

Territory of Hawaii. Territorial Highway Department. *Report to the Governor of the Territory of Hawaii by the Superintendent of Public Works for the Year Ending June 30, 1936*. Honolulu: The New Freedom Press, n.d. Retrieved from https://catalog.hathitrust.org/Record/100157967.

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

U.S. Department of the Interior. National Park Service. Cultural Resources. *National Register Bulletin no. 15: How to Apply the National register Criteria for Evaluation*. Washington, DC: 1997.

Bridge Inventory Form

Image 1. General view of bridge, parapet, piers, and endposts. Facing northeast.

Image 2. View of parapet. Facing southeast.

Bridge Inventory Form

Image 3. General view from road. Facing northeast.

Image 4. View of abutment. Facing southwest.

Image 5. View of pier. Facing southwest.

Kauai 2013 State Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)
007000500301190	Aakukui Stream Bridge	Aakukui Stream	Kaumualii Highway	1948	Concrete Tee Beam	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000560301489	Aliomanu Stream Bridge	Aliomanu Stream	Kuhio Highway	1960	Concrete Slab	Concrete Solid Decorative	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000560301359	Anahola Stream Bridge	Anahola Stream	Kuhio Highway	1960	Concrete Girder	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500300700	Bridge No. 7E	Unnamed Stream	Kaumualii Highway	1933	Concrete Slab	Metal Thrie Beam	No	Not Eligible	This culvert does not have distinctive engineering or architectural features that depart from standard culvert design.
007000500300135	Drainage Canal No. 1	Drainage Channel	Kaumualii Highway	1957	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500300178	Drainage Canal No. 2	Drainage Channel	Kaumualii Highway	1957	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500300535	Drainage Canal No. 3	Drainage Channel	Kaumualii Highway	1957	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500300570	Drainage Canal No. 4	Drainage Channel	Kaumualii Highway	1957	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007005600500123	Hanalei River Bridge	Hanalei River	Kuhio Highway	1912	Steel Truss	Metal Horizontal	Yes	Eligible, Contributing***	• Contributes to the Kauai Belt Road (North Shore section) District • See National Register of Historic Places Nomination Form in appendices
007000560400123	Hanamaulu Stream (Kapaia) Bridge	Hanamaulu Stream	Kuhio Highway	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	• Associated with early developments in concrete bridge construction in Hawaii • Good example of a 1930s reinforced concrete girder bridge
007005830500004	Hanamaulu Stream (Maalo Road) Bridge	Hanamaulu Stream	Maalo Road	1927	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	• Associated with early developments in concrete bridge construction in Hawaii • Good example of a 1920s reinforced concrete girder bridge
007000500301632	Hanapepe River Bridge	Hanapepe River	Kaumualii Highway	2021	Prestressed Concrete Continuous Girder	Concrete Open	No	Program Comments	Replaced 1938 Bridge (007000500301631)
007000500303031	Hoinakaunalehua Stream Bridge	Hoinakaunalehua Stream	Kaumualii Highway	1950	Concrete Box Culvert	Metal Thrie Beam	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.
007000560302497	Kalihiwai River Bridge	Kalihiwai River	Kuhio Highway	1963	Concrete Girder	Concrete and Metal	No	Eligible***	• Longest concrete span built postwar (1945) on the island of Kauai in the historic study period prior to 1977
007000560300986	Kapaa Stream Bridge	Kapaa Stream	Kuhio Highway	2021	Prestressed Concrete Tee Beam	Concrete and Metal	No	Not Eligible	Replaced 1953 Bridge (007000560300985)
007000500001419	Kaumakani Pedestrian Overpass	Kaumualii Highway	Pedestrian	1948	Concrete Girder	Concrete and Metal	No	Eligible***	• Only post-World War II pedestrian overpasses on Kauai • Associated with early developments in concrete bridge construction in Hawaii • Good example of 1940s reinforced concrete pedestrian bridge
007000560302286	Kilauea Stream Bridge	Kilauea Stream	Kuhio Highway	1970	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1921 bridge in 1970.
007000500302249	Lawai Stream Bridge	Lawai Stream	Kaumualii Highway	1934	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the replacement of the railing on the downstream side and bridge widening in 2002.
007000500301157	Mahaikona Bridge	Kekupa Stream	Kaumualii Highway	1948	Concrete Tee Beam	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500301258	Mahinauli Stream Bridge	Mahinauli Stream	Kaumualii Highway	1948	Concrete Tee Beam	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500301668	McBryde Plantation Road	McBryde Plantation Road	Kaumualii Highway	1939	Concrete Slab	Metal Thrie Beam	No	Not Eligible	This culvert does not have distinctive engineering or architectural features that depart from standard culvert design.
007000560400859	Moikeha Canal Bridge	Moikeha Canal	Kuhio Highway	1948	Concrete Tee Beam	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000560301844	Moloaa Stream Bridge	Moloaa Stream	Kuhio Highway	1965	Concrete Girder	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500403272	Nawiliwili Stream Bridge (Lihue Mill)	Nawiliwili Outbound	Kaumualii Highway	2014	Prestressed Concreted Girder	Reinforced Concrete Bridge Rail	No	Program Comments	Replaced 1936 Steel Stringer Bridge (007000500403271)
007000501101343	Olokele Plantation Highway Overpass	Kaumualii Highway	Plantation Road	1948	Concrete Tee Beam	Metal Chain Link	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500302465	Omao Stream Bridge	Omao Stream	Kaumualii Highway	1934	Concrete Tee Beam	Concrete Open Arched	No	Eligible	• Associated with the development of Kauai's Belt Road system • Good example of a 1930s reinforced concrete bridge • Example of Federal Aid bridges constructed by the Territory in the 1930s
007000560301581	Papaa Stream Bridge	Papaa Stream	Kuhio Highway	1957	Concrete Tee Beam	Concrete Solid	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007005830500334	Railroad Overpass	Maalo Road	Plantation Road	1946	Steel Stringer	Metal Chain Link	No	Eligible***	• Associated with sugar plantation industry and economic development • Uncommon use of steel material in Hawaii's extreme marine environment • Associated with the railroad, and specific federal funding of the U.S. Works Program Grade Crossing Program
007000560400727	Uhelekawawa Canal Bridge	Uhelekawawa Canal	Kuhio Highway	1963	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000560302485	Unnamed Channel Structure No. 4	Unnamed Channel	Kuhio Highway	1963	Concrete Slab	Concrete Solid	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500302388	Unnamed Stream (2-cell Box Culvert)	Unnamed Stream	Kaumualii Highway	1933	Concrete Box Culvert	Metal Thrie Beam	No	Not Eligible	This culvert does not have distinctive engineering or architectural features that depart from standard culvert design.
007000500301595	Unnamed Stream Bridge (5-cell culvert)	Unnamed Stream	Kaumualii Highway	1967	Concrete Box Culvert	Concrete Solid	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.

* NRHP or HRS 6E Listed, Eligible, Not Eligible, Contributing, Non-Contributing, or Program Comments.
** Historic resources adjacent to resource.
*** Formerly "High Preservation Value."
Greyed-out cells have no form.

Kauai 2013 State Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)
007005400500077	Wahiawa Kai Stream Bridge	Waiawa Stream	Halewili Road	1974	Concrete Girder	Concrete and Metal	No	Not Eligible, Program Comments	This bridge has lost integrity due to the complete replacement of the original 1950 bridge in 1974. The replacement bridge is a typical postwar bridge and falls under Program Comments.
007000500301972	Wahiawa Stream Bridge	Wahiawa Stream	Kaumualii Highway	1936	Concrete Rigid Frame	Concrete Open Greek Cross	No	Eligible***	• Example of Federal Aid bridges constructed by the Territory in the 1930s • Significant for innovative engineering and aesthetic merit • First reinforced concrete rigid-frame bridge constructed in the islands • One of only five of this type built prior to World War II • One of the most sophisticated of the pre-World War II bridges from an engineering perspective • Representative of the work of a master: William R. Bartels
007000560302024	Waiakalua Stream Bridge	Waiakalua Stream	Kuhio Highway	1967	Concrete Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000500302613	Waihohonu Stream Bridge	Waihohonu Stream	Kaumualii Highway	1934	Concrete Slab	Concrete Open Arched	No	Eligible	• Associated with the development of Kauai's Belt Road system • Good example of a 1930s reinforced concrete bridge • Example of Federal Aid bridges constructed by the Territory in the 1930s
007000560400804	Waikaea Canal Bridge	Waikakea Canal	Kuhio Highway	1948	Concrete Tee Beam	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
007000560400573	Wailua River Plantation Bridge	Wailua River	Kuhio Highway	2012	Steel Truss	Metal Horizontal	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1920 bridge in 2012.
007000500301039	Waimea River Bridge	Waimea River	Kaumualii Highway	1940	Concrete Tee Beam	Concrete Open Greek Cross	No	Eligible***	• Associated with sugar plantation industry • Significant for economic development • Excellent 20th century example of bridge engineering and construction • Longest extant pre-World War II bridge on Kauai • Representative of the work of a master: William R. Bartels
007005600500670	Wainiha River Bridge No. 2	Wainiha River	Kuhio Highway	2004	Steel Truss	Metal Thrie Beam	Yes	Non-Contributing	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1931 bridge in 2004 • See National Register of Historic Places Nomination Form in appendices
007005600500644	Wainiha Stream Bridge No. 1	Wainiha Stream	Kuhio Highway	2010	Steel Truss	Metal Thrie Beam	Yes	Non-Contributing	• Bridge is non-contributing feature of Kauai Belt Road (North Shore section) due to the complete replacement of the original 1922 bridge in 2010 • See National Register of Historic Places Nomination Form in appendices

* NRHP or HRS 6E Listed, Eligible, Not Eligible, Contributing, Non-Contributing, or Program Comments.
** Historic resources adjacent to resource.
*** Formerly "High Preservation Value."
Greyed-out cells have no form.

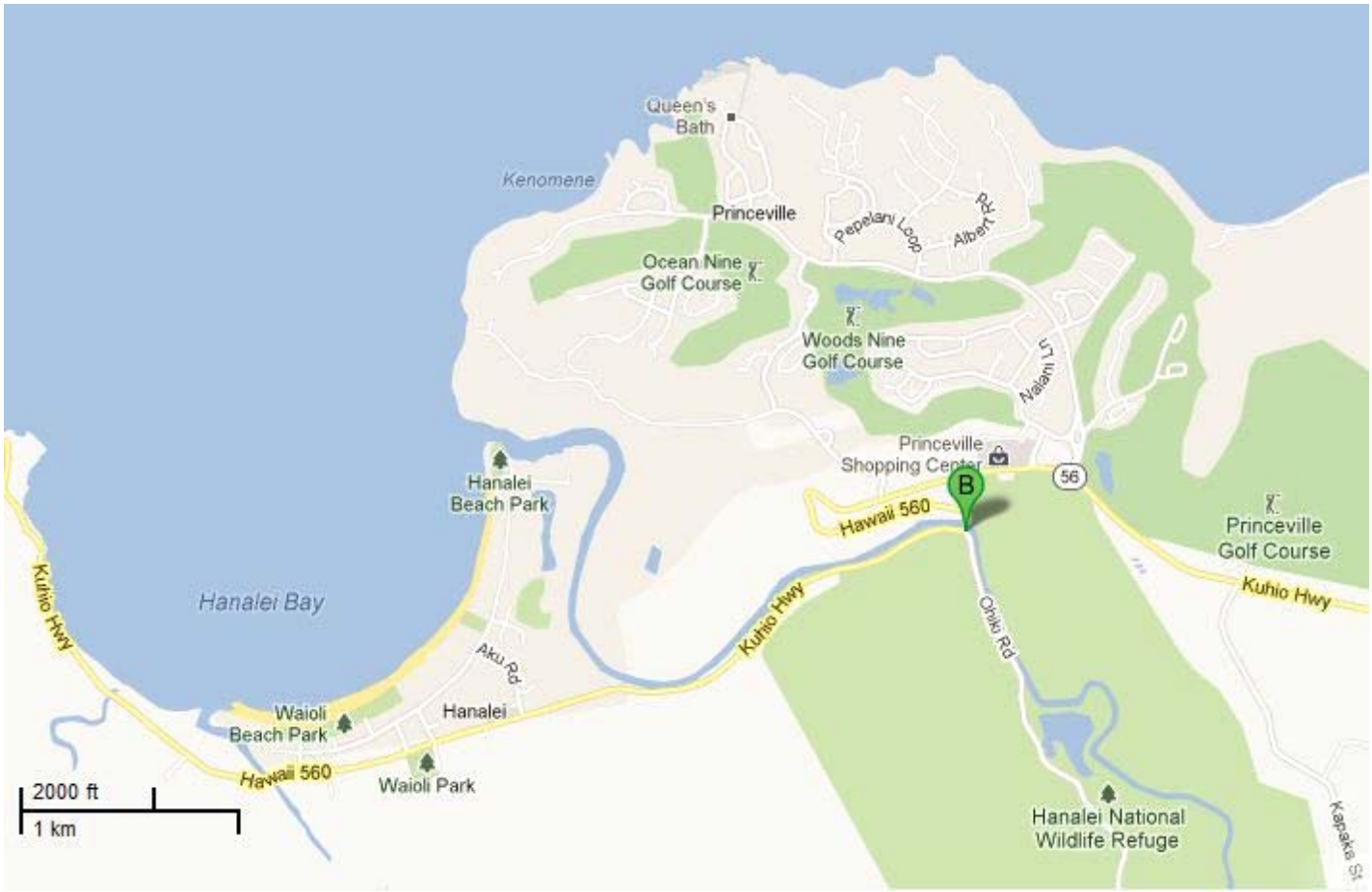
Inventory Form
(State)

General Information

Bridge Number: 007005600500123	**Route No:** 560
Popular Name: Hanalei River Bridge	
Feature Crossed: Hanalei River	
Feature Carried: Kuhio Highway	
Milepost: 1.23 mi.	**Island:** Kauai
Longitude: 159d-28m-33.87s	**Latitude:** 22d-12m-38.99s

Location: 0.81 Miles West of Honu Road
Historic Name: Hanalei River Bridge
Designer/Engineer: Joseph H. Moragne
Builder/Contractor: Honolulu Iron Works, Co. - Fabricator: Hamilton and Chamber, N. Y.

Location Map:



Construction Information

Bridge Type: Steel Truss	**Construction Date:** 1912	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 1934, 1967, 1973, 2003	
Alteration Type(s):		
Alteration Description(s): Maintenance repairs (1934); new steel Warren pony trusses added (1967); strengthened members and connections (1973); bridge replaced with new Pratt trusses and repaired existing Warren pony trusses (2003)		

Bridge Information

Number of Spans: 1	**Max Span:** 106.0 ft.	**Total Length:** 112.9 ft.	**Deck Width:** 23.6 ft.
Superstructure: Steel Through Truss			
Substructure: Concrete Abutment Wall			
Floor/Decking: Timber Deck			
Parapets/Railings: Metal Horizontal			
Setting:			
Other Features: Commemorative plaque with name of builder, fabricator and date of construction			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** Yes
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering, Society History, Transportation, Commerce		

Narrative Description:

The bridge had a major alteration to remove, repair, and replace metal members of the bridge. The contractor of the project was Abhe & Svobonda, Inc. who completed the project in 2003.(1)

See linked documents for National Register of Historic Places Nomination Form.

(1) Information was provided by Fred Reyes at HDOT Kauai District.

Significance Statement:

This bridge contributes to the Kauai Belt Road (North Shore section) district. However it went through various major alterations in 1967, 1973, and most recently September 2003. For the latest alteration the consultation process began in 1998 and was completed in 2000. It included HAER documentation of the bridge which was prepared in September 1999.

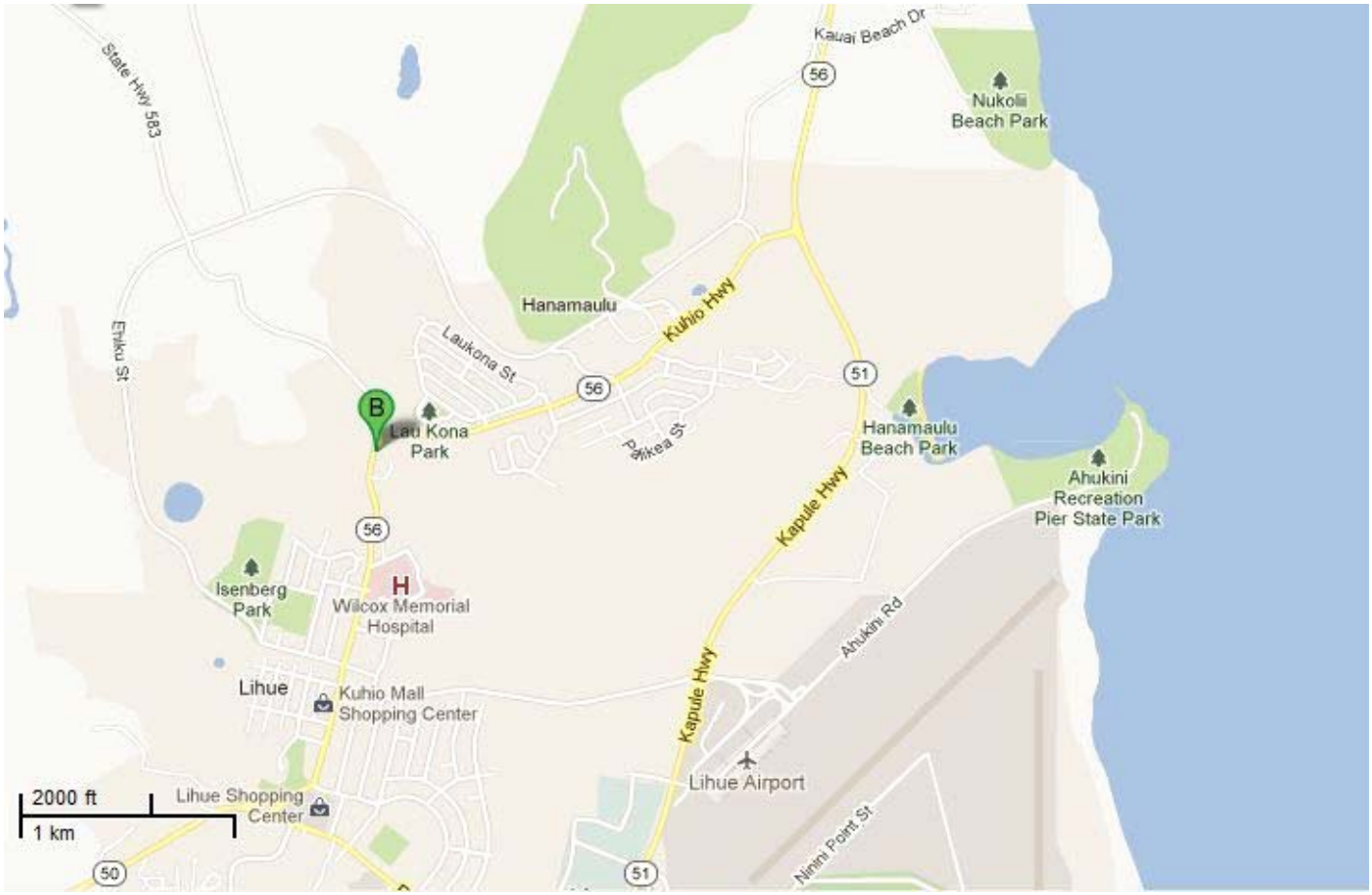
See National Register of Historic Places Nomination Form.

Inventory Form
(State)

General Information

Bridge Number: 007000560400123	**Route No:** 56
Popular Name: Hanamaulu Stream (Kapaia) Bridge	
Feature Crossed: Hanamaulu Stream	
Feature Carried: Kuhio Highway	
Milepost: 1.23 mi.	**Island:** Kauai
Longitude: 159d-21m-53.87s	**Latitude:** 21d-59m-31.03s
Location: 0.06 Miles Northeast of Maalo Road	
Historic Name: Hanamaulu Stream (Kapaia) Bridge	
Designer/Engineer:	
Builder/Contractor:	

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1933	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 3	**Max Span:** 51.8 ft.	**Total Length:** 157.2 ft.	**Deck Width:** 30.2 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid Panel with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Hanamaulu Stream Bridge carries Kuhio Highway across the Hanamaulu Stream. This curved reinforced concrete girder bridge is in its original location, but in poor condition. The bridge has concrete parapet with flat caps and end posts. Thrie beams were bolted to the end posts however, the workmanship of the bridge has not beed obscured. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of a 1930's reinforced concrete girder bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

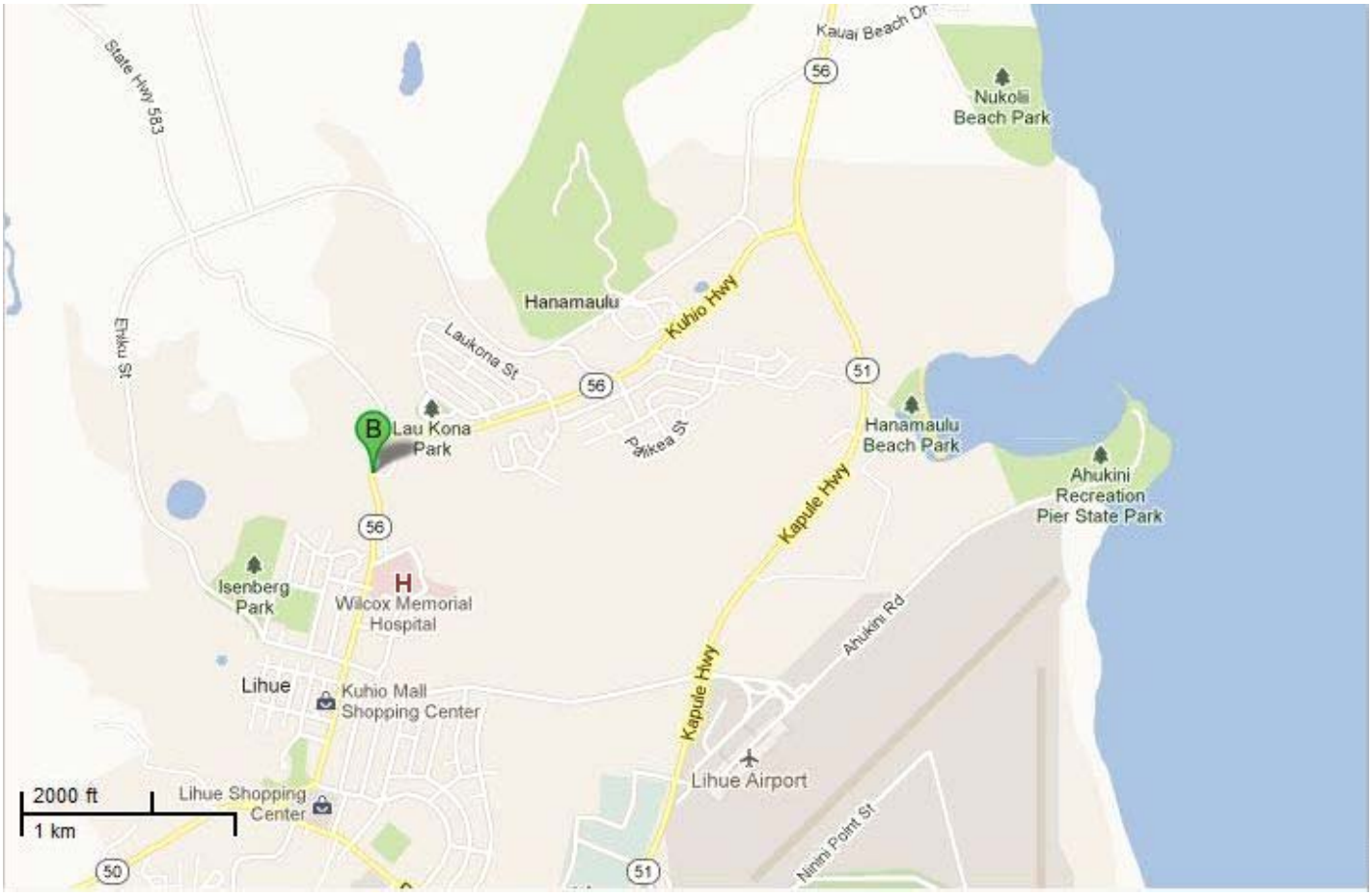
Inventory Form
(State)

General Information

Bridge Number: 007005830500004 **Route No:** 583	
Popular Name: Hanamaulu Stream (Maalo Road) Bridge	
Feature Crossed: Hanamaulu Stream	
Feature Carried: Maalo Road	
Milepost: 0.04 mi. **Island:** Kauai	
Longitude: 159d-21m-57.36s **Latitude:** 21d-59m-30.95s	

Location: 0.04 Miles North of Kuhio Highway (Route 56)
Historic Name: Hanamaulu Stream (Maalo Road) Bridge
Designer/Engineer:
Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1927	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 32.2 ft.	**Total Length:** 35.1 ft.	**Deck Width:** 26.2 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid Panel with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Hanamaulu Stream Bridge carries Maalo Road across the Hanamaulu Stream. This reinforced concrete girder bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has concrete solid parapets with flat caps. On one of the end caps had the date of construction engraved. The concrete deck is supported by concrete abutments. Some bottom section of the parapets were covered with the asphalt. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the period.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of a 1920's reinforced concrete girder bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

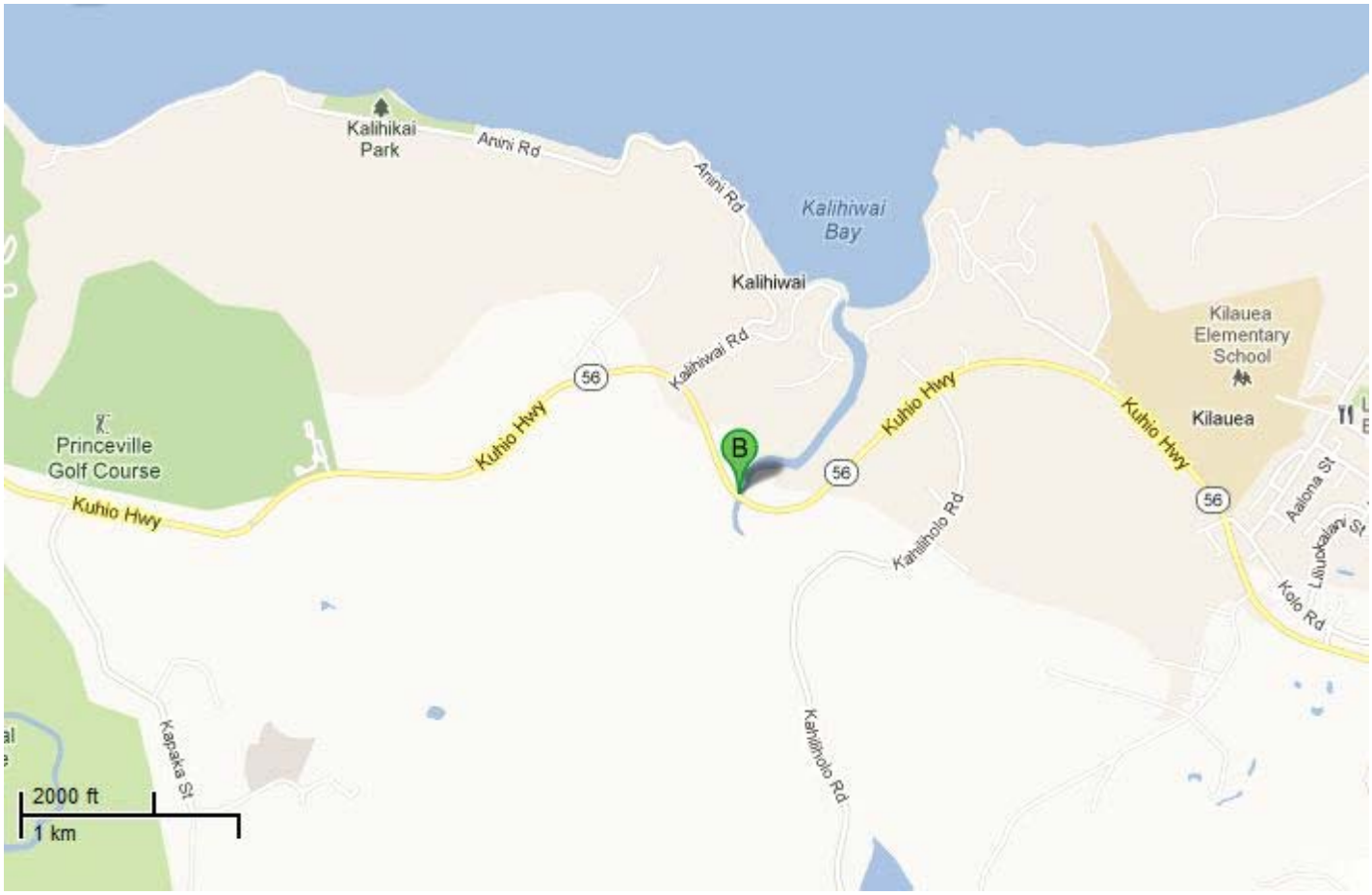
Inventory Form
(State)

General Information

Bridge Number: 007000560302497	**Route No:** 56
Popular Name: Kalihiwai River Bridge	
Feature Crossed: Kalihiwai River	
Feature Carried: Kuhio Highway	
Milepost: 24.97 mi.	**Island:** Kauai
Longitude: 159d-26m-02.27s	**Latitude:** 22d-12m-31.66s

Location: 1.14 Miles North of Kalihiwai Road
Historic Name: Kalihiwai River Bridge
Designer/Engineer:
Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Girder	**Construction Date:** 1963	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 8	**Max Span:** 119.1 ft.	**Total Length:** 797.9 ft.	**Deck Width:** 34.1 ft.
Superstructure: Prestressed Concrete I-Girder			
Substructure: Concrete Abutment Wall and Concrete Double Column Pier			
Floor/Decking: Concrete Deck			
Parapets/Railings: Concrete and Metal			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

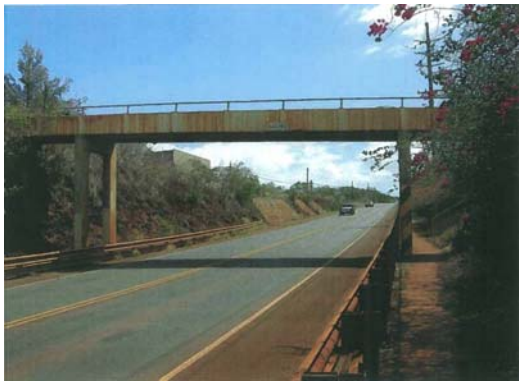
The Kalihiwai River Bridge carries Kuhio Highway across the Kalihiwai River. This prestressed concrete bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has concrete solid panel parapets with a metal rail running horizontally above the concrete. The concrete deck is supported by concrete abutments. The solid parapet extends to the end posts and thrie beams are bolted to the approaches.

Significance Statement:

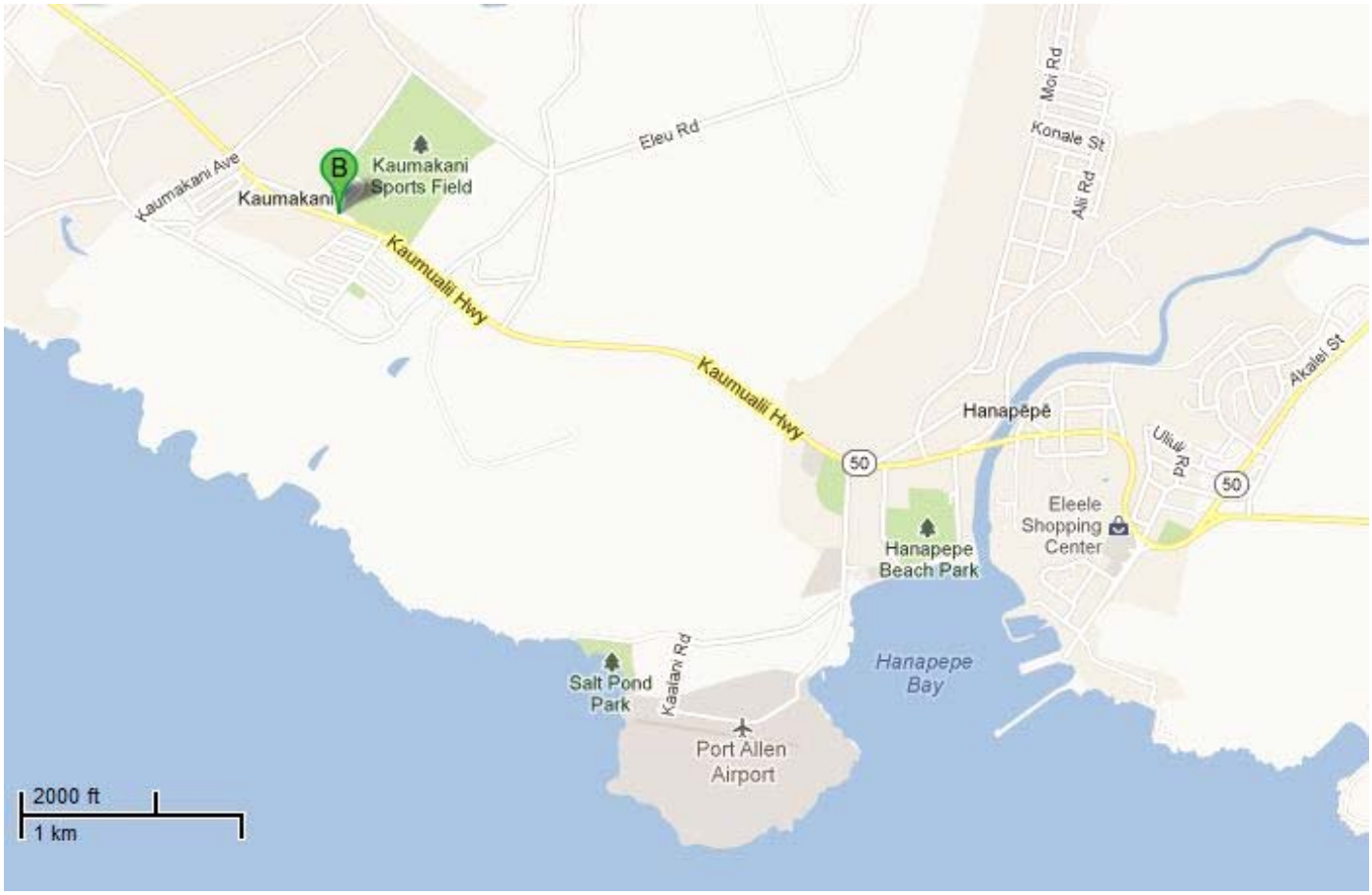
This bridge is eligible under Criterion C for being the longest concrete bridge with the longest concrete span built post-war (1945) on the island of Kauai in the historic study period prior to 1969.

Inventory Form
(State)

General Information

Bridge Number: 007000500001419 **Route No:** 50	
Popular Name: Kaumakani Pedestrian Overpass	
Feature Crossed: Kaumualii Highway	
Feature Carried: Pedestrian	
Milepost: 18.77 mi. **Island:** Kauai	
Longitude: 159d-37m-15.65s **Latitude:** 21d-55m-06.07s	
Location: 0.22 Miles Southeast of Kaumakani School Road	
Historic Name: Kaumakani Pedestrian Overpass	
Designer/Engineer:	
Builder/Contractor:	

Location Map:



Construction Information

Bridge Type: Concrete Girder	**Construction Date:** 1948	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 3	**Max Span:** 40.0 ft.	**Total Length:** 84.0 ft.	**Deck Width:** 7.5 ft.
Superstructure: Concrete Through Girder			
Substructure: Concrete Abutment Wall and Concrete Double Column Pier			
Floor/Decking: Concrete Deck			
Parapets/Railings: Concrete and Metal			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Kaumakani Pedestrian Overpass is a reinforced concrete pedestrian bridge that crosses over the two lane Kamualii Highway. The bridge is 14 feet 8 inches above the highway and approximately 84 feet long. It is supported by a pair of concrete bents, each with two piers. It is supported by a pair of concrete bents, each with two piers. It has concrete abutments and steps at both ends and a 6 feet wide concrete deck. A concrete parapet, surmounted by a pipe railing traverses the length of the deck. The bridge retains its original setting that connects Kaumakani School and the residential area. The material remains intact and the workmanship of the bridge has not been obscured by additions or repairs. The bridge is highly visible from the highway.

Significance Statement:

The Kaumakani Pedestrian Overpass is the first post-World War II pedestrian overpass built on Kauai. The bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of the 1940's reinforced concrete pedestrian bridge that is typical of its period in its use of materials, method of constriction, craftsmanship, and design.

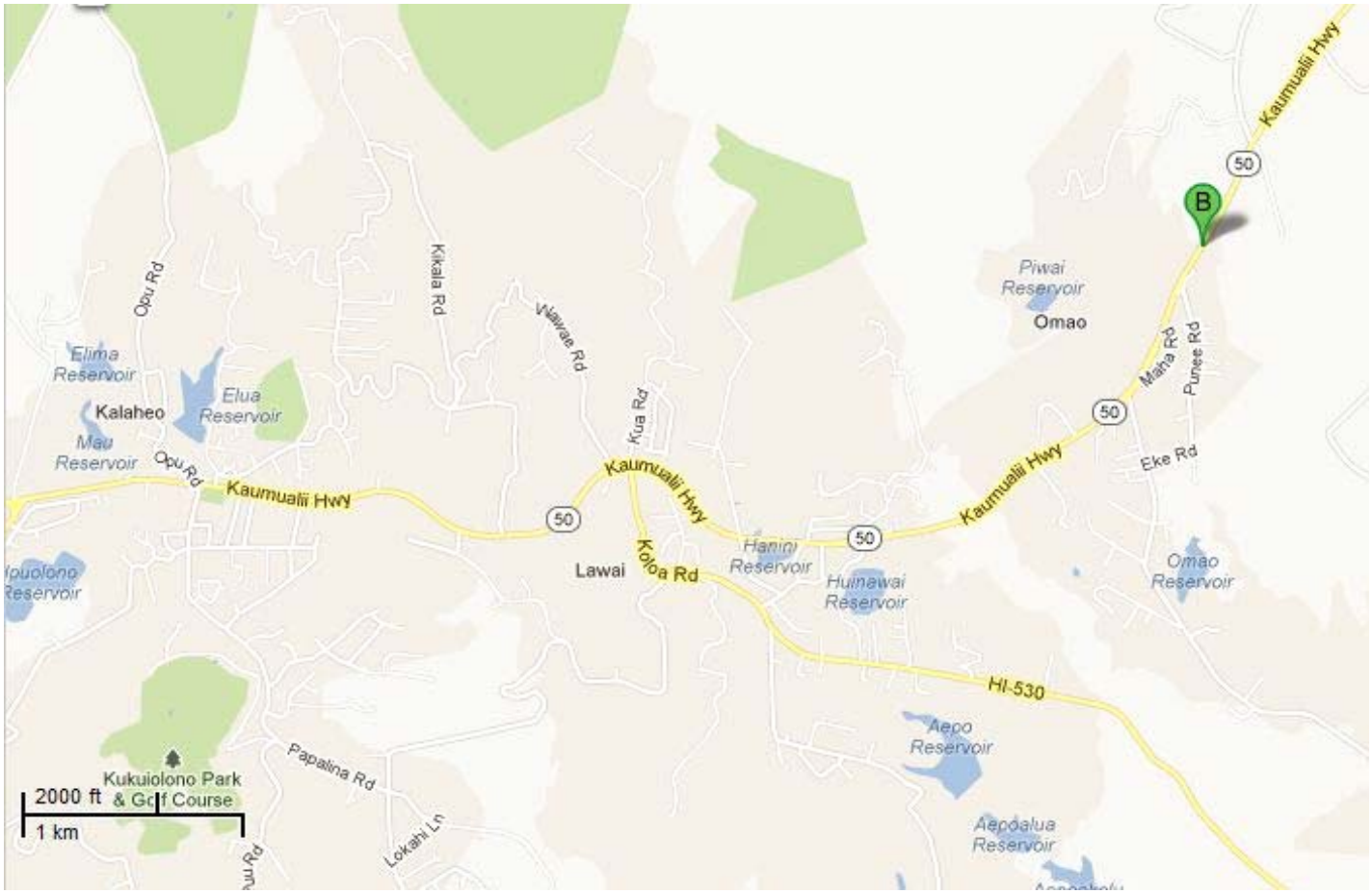
Inventory Form
(State)

General Information

Bridge Number: 007000500302465	**Route No:** 50
Popular Name: Omao Stream Bridge	
Feature Crossed: Omao Stream	
Feature Carried: Kaumualii Highway	
Milepost: 8.31 mi.	**Island:** Kauai
Longitude: 159d-28m-58.84s	**Latitude:** 21d-56m-07.87s

Location: 0.48 Miles Southeast of Omao Road
Historic Name: Omao Stream Bridge
Designer/Engineer:
Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1934	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 3	**Max Span:** 58.1 ft.	**Total Length:** 140.1 ft.	**Deck Width:** 32.2 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Double Column Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Arched			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Omao Stream Bridge carries Kaumualii Highway across the Omao Stream within the Koloa District. This reinforced concrete bridge is in its original location, is generally in good condition, and its material remain intact. The bridge has open arched parapets with wide end posts. The concrete deck is supported by concrete piers and abutments. Thrie beams were bolted to the end posts however, the workmanship of the bridge has not been obscured.

The bridge’s historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.

Significance Statement:

The Omao Stream Bridge has made contributions to the transportation and engineering in Kauai. The reinforced concrete bridge is eligible under Criterion A for its associations with the development of Kauai's Belt Road system. It is also eligible under Criterion C as a good example of a 1930's reinforced concrete bridge. The Omao Stream Bridge was constructed as part of the upgrading of the Kauai Belt Road undertaken by the Territory in the 1930s utilizing Federal funds. Bridges were a special concern of the federal highway system, and the Territorial Highway Department began to straighten out the belt roads and replace narrow and hazardous bridges. New bridges constructed with Federal Aid dollars were generally larger and more decorative than county financed bridges.

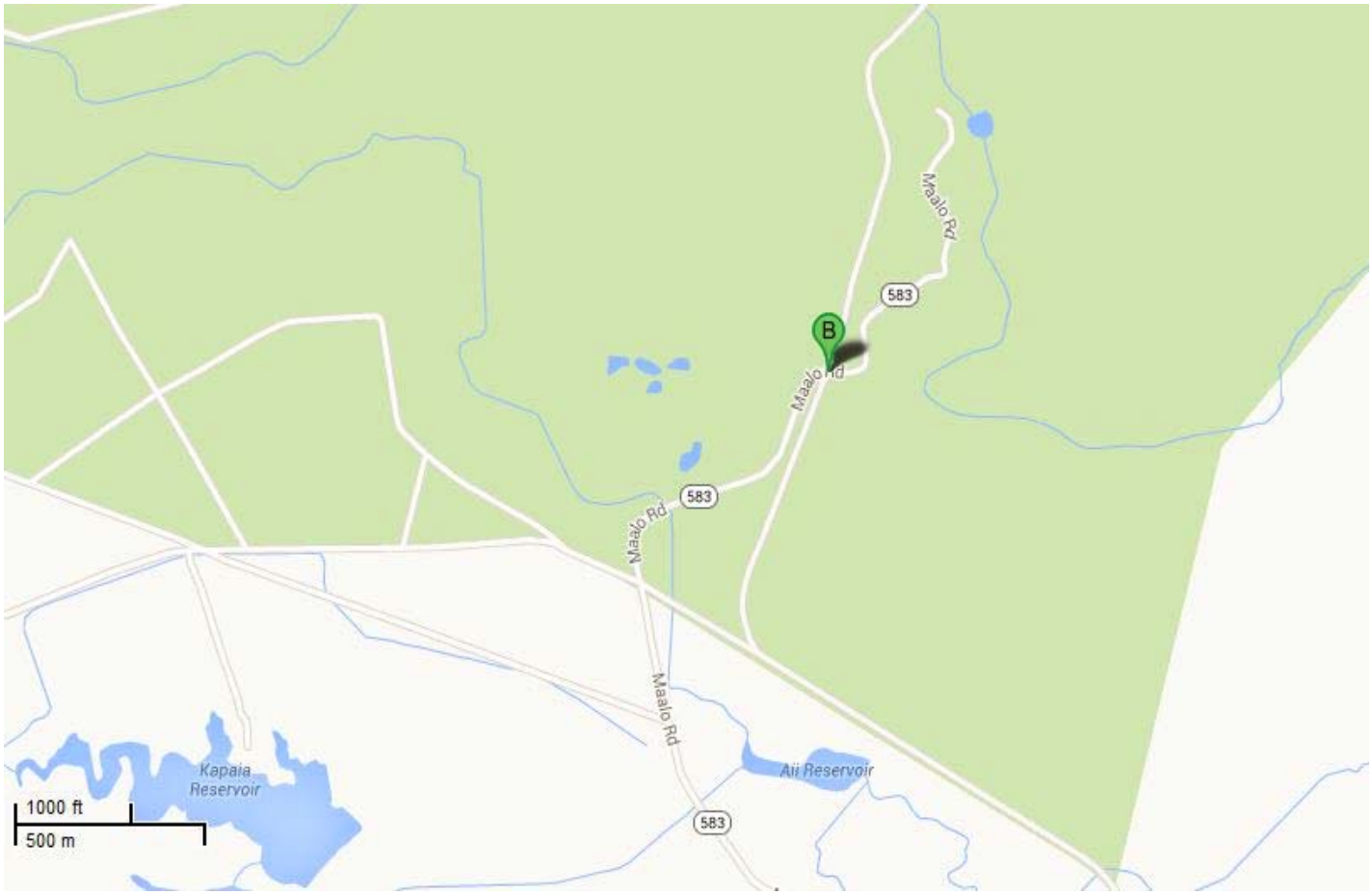
Inventory Form
(State)

General Information

Bridge Number: 007005830500334	**Route No:** 583
Popular Name: Railroad Overpass	
Feature Crossed: Maalo Road	
Feature Carried: Plantation Road	
Milepost: 3.34 mi.	**Island:** Kauai
Longitude: 159d-22m-55.96s	**Latitude:** 22d-01m-42.92s

Location: 3.34 Miles North of Kuhio Highway (Route 56)
Historic Name: Railroad Overpass
Designer/Engineer:
Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Steel Stringer	**Construction Date:** 1946	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 26.9 ft.	**Total Length:** 28.9 ft.	**Deck Width:** 22.0 ft.
Superstructure: Steel Multi-Girder			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Metal Chain Link			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Commerce, Transportation, Engineering		

Narrative Description:

The Lihue Plantation Road Railroad Overpass was constructed in 1946 as part of the plantation railroad system. The overpass remains in its original location although the plantation and railroad are now defunct. The plantation setting and rural/agricultural surroundings are still intact and there has been no visible design changes made to the overpass. Workmanship is evident in the concrete work, but there are no ornamental details on the structure. The overpass is easily interpreted from the Lihue Plantation Road.

Significance Statement:

This bridge is associated with the primary economic endeavor of the islands – sugar production (c. 1850-1950). 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 irrigation, cultivation and transportation of sugar cane – changed the face of the islands forever. Many of the bridges constructed along belt roads were intended to aid in the overland transport of raw cane to mills for processing, as well as to provide reasonable access for workers to sugar lands.(1) Steel stringers were constructed in Hawaii primarily for industrial and railroad bridges. Ornamentation, if any, was usually limited to the pattern of the railings. The use of steel was uncommon in Hawaii due to the extreme marine environment. Since very little steel is used for bridge construction in Hawaii, this bridge is eligible under criterion C for its distinctive structural type. Bridges of this type noted in earlier surveys are all associated with the railroad, and specific federal funding of the U.S. Works Program Grade Crossing Program.

(1) 1996 Spencer Mason Architects Report, P. V-8.

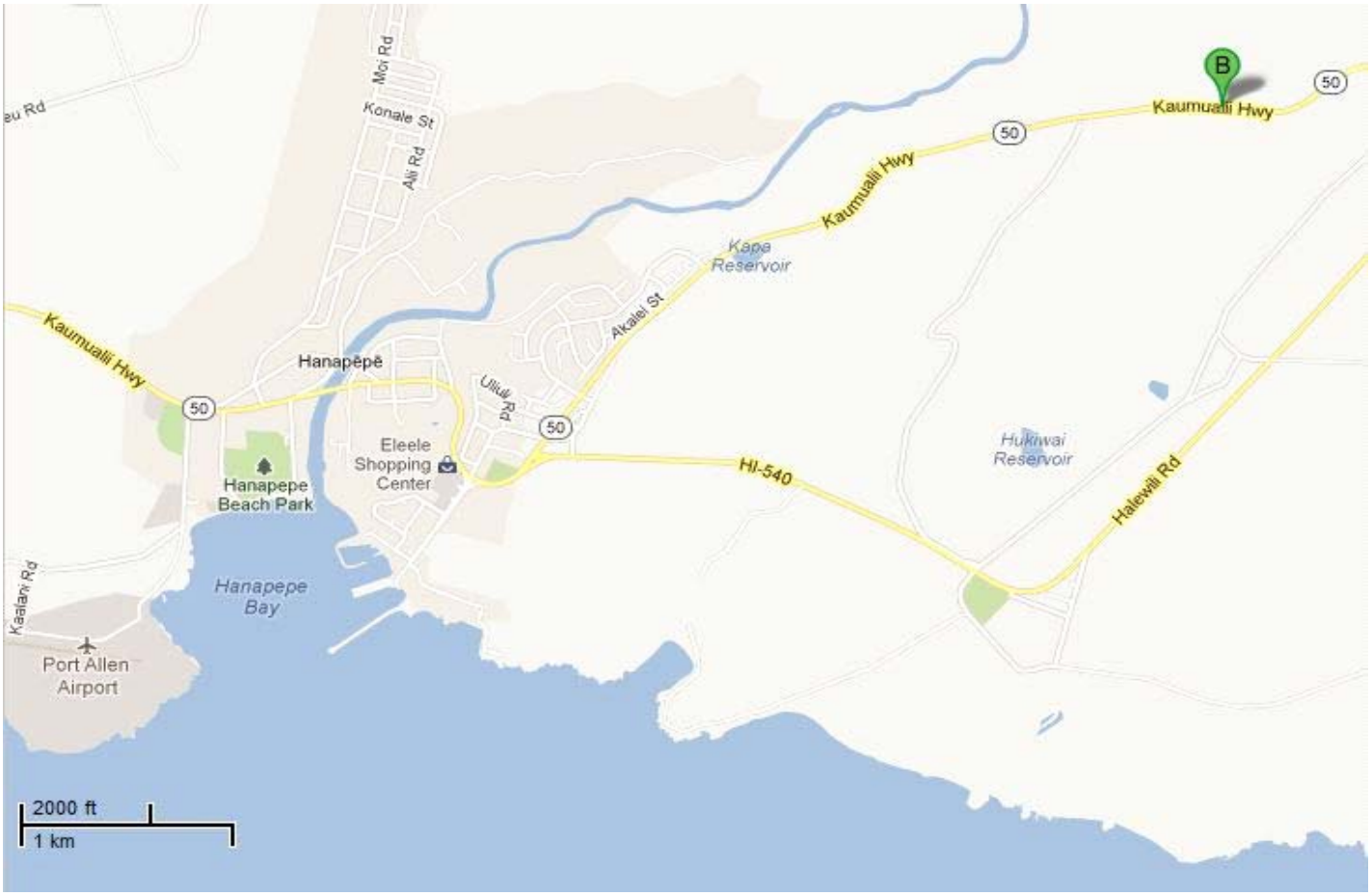
Inventory Form
(State)

General Information

Bridge Number: 007000500301972	**Route No:** 50
Popular Name: Wahiawa Stream Bridge	
Feature Crossed: Wahiawa Stream	
Feature Carried: Kaumualii Highway	
Milepost: 13.24 mi.	**Island:** Kauai
Longitude: 159d-32m-56.43s	**Latitude:** 21d-55m-18.02s

Location: 2.45 Miles Southeast of Mehana Road
Historic Name: Wahiawa Stream Bridge
Designer/Engineer: William R. Bartels
Builder/Contractor: Kalihi Contracting Co., Ltd.

Location Map:



Construction Information

Bridge Type: Concrete Rigid Frame	**Construction Date:** 1936	**Replaced?** No
Altered? Yes	**Alteration Date(s):** Unknown	
Alteration Type(s):		
Alteration Description(s): One of the end piers appears to have been reconstructed		

Bridge Information

Number of Spans: 3	**Max Span:** 120.1 ft.	**Total Length:** 180.1 ft.	**Deck Width:** 30.8 ft.
Superstructure: Concrete Rigid Frame			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Greek Cross			
Setting:			
Other Features: Stepped conrete railing posts and support piers; incised bridge name and date of construction on end piers			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Wahiawa Bridge carries Kaumualii Highway across the Wahiawa Stream within the Koloa District on the island of Kauai. This bridge was the first reinforced concrete rigid frame bridge constructed in the islands and one of only five reinforced concrete rigid frame bridges built prior to WW II (the others are the Kaahumanu Avenue-Naniloa Drive Overpass in Wailuku, Maui; Date Street Bridge on Oahu; and the Hionomoa and Moaula Bridges in Kau on the island of Hawaii). The bridge remains in its original location and its rural setting is unchanged. The original concrete material of the bridge is in generally good condition and has not been altered by major repairs. The bridge's technologically innovative rigid-frame design has not been altered. Overall, the bridge exhibits a high degree of workmanship, particularly the attention given to detailing the decorative stepped concrete end and intermediate piers. However, one railing end appears to have been reconstructed, and the workmanship does not match the original. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.

Significance Statement:

The Wahiawa Bridge has made significant contributions to the areas of engineering and transportation in Hawaii. The reinforced concrete rigid frame bridge is eligible under Criterion A for its associations with the development of Kauai's Belt Road system. It is eligible under Criterion C as an innovative example of bridge design utilizing new engineering technology, as well as for its aesthetic merit. Moreover, the Wahiawa Bridge is representative of the "work of a master": William R. Bartels, Chief Designer for the Territorial Highways Department.

The Wahiawa Bridge was constructed as part of the upgrading of the Kauai Belt Road undertaken by the Territory in the 1930s utilizing Federal funds. Bridges were a special concern of the federal highway system, and the Territorial Highway Department began to straighten out the belt roads and replace narrow and hazardous bridges. New bridges constructed with Federal Aid dollars, such as the Wahiawa Bridge, were generally larger and more decorative than county financed bridges.(1)

This bridge is the first reinforced concrete rigid frame bridge constructed in the islands, and one of only five of this type built prior to WWII. The reinforced concrete rigid-frame bridge demonstrates the rapid advances in engineering technology in the early decades of the twentieth century and are the most sophisticated of the pre-WWII bridges from an engineering perspective. The abutments and deck of rigid frame bridges are constructed as one solid piece of concrete enabling the slab to double or triple the previous achievable span of twenty feet. The technology was not used in Hawaii until 1936, when William R. Bartels of the Territorial Highways Department developed the plans for the Wahiawa Bridge on Kauai and the Kaahumanu Avenue-Naniloa Drive Overpass in Wailuku, Maui. These were followed by the construction of two concrete rigid frame bridges on Hawaii Island and one on Oahu.

Bartels was responsible for the design of all major Territorial bridge projects between 1932 and his retirement from the department in 1956. His bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.(2) Robert M. Belt, the Resident Engineer for the Department on Kauai, supervised its construction and wrote a poem about the Wahiawa Bridge and its designer, which was published in Pacific Builder and Engineer magazine.

(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): 73.

(2) "Obituaries," Honolulu Advertiser (October 9, 1969): C3.

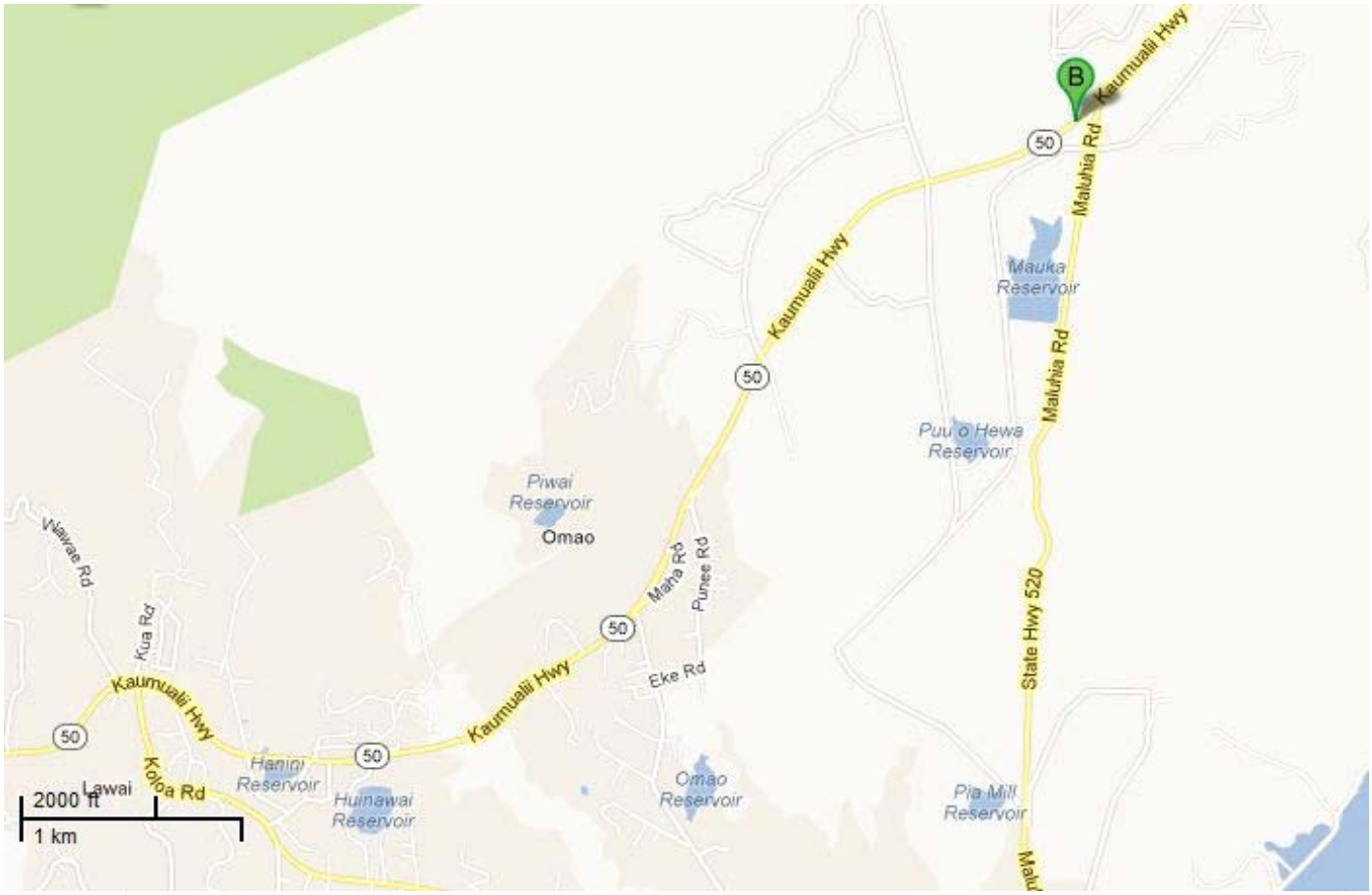
Inventory Form
(State)

General Information

Bridge Number: 007000500302613	**Route No:** 50
Popular Name: Waihohonu Stream Bridge	
Feature Crossed: Waihohonu Stream	
Feature Carried: Kaumualii Highway	
Milepost: 6.84 mi.	**Island:** Kauai
Longitude: 159d-28m-01.98s	**Latitude:** 21d-56m-58.14s

Location: 2.08 Miles Southeast of Omao Road
Historic Name: Waihohonu Stream Bridge
Designer/Engineer:
Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Slab	**Construction Date:** 1934	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 20.0 ft.	**Total Length:** 22.0 ft.	**Deck Width:** 31.8 ft.
Superstructure: Concrete Slab			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Arched			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Waihohonu Stream Bridge carries Kaumualii Highway across the Waihohonu Stream within the Koloa District. This reinforced concrete bridge is in its original location, is generally in good condition, and its material remain intact. The bridge has open arched parapets with wide end posts. The concrete deck is supported by concrete abutments. Thrie beams were bolted to the end posts however, the workmanship of the bridge has not been obscured. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.

Significance Statement:

The Waihohonu Stream Bridge has made contributions to the transportation and engineering in Kauai. The reinforced concrete bridge is eligible under Criterion A for its associations with the development of Kauai's Belt Road system. It is also eligible under Criterion C as a good example of a 1930's reinforced concrete bridge.

The Waihohonu Stream Bridge was constructed as part of the upgrading of the Kauai Belt Road undertaken by the Territory in the 1930s utilizing Federal funds. Bridges were a special concern of the federal highway system, and the Territorial Highway Department began to straighten out the belt roads and replace narrow and hazardous bridges. New bridges constructed with Federal Aid dollars were generally larger and more decorative than county financed bridges.

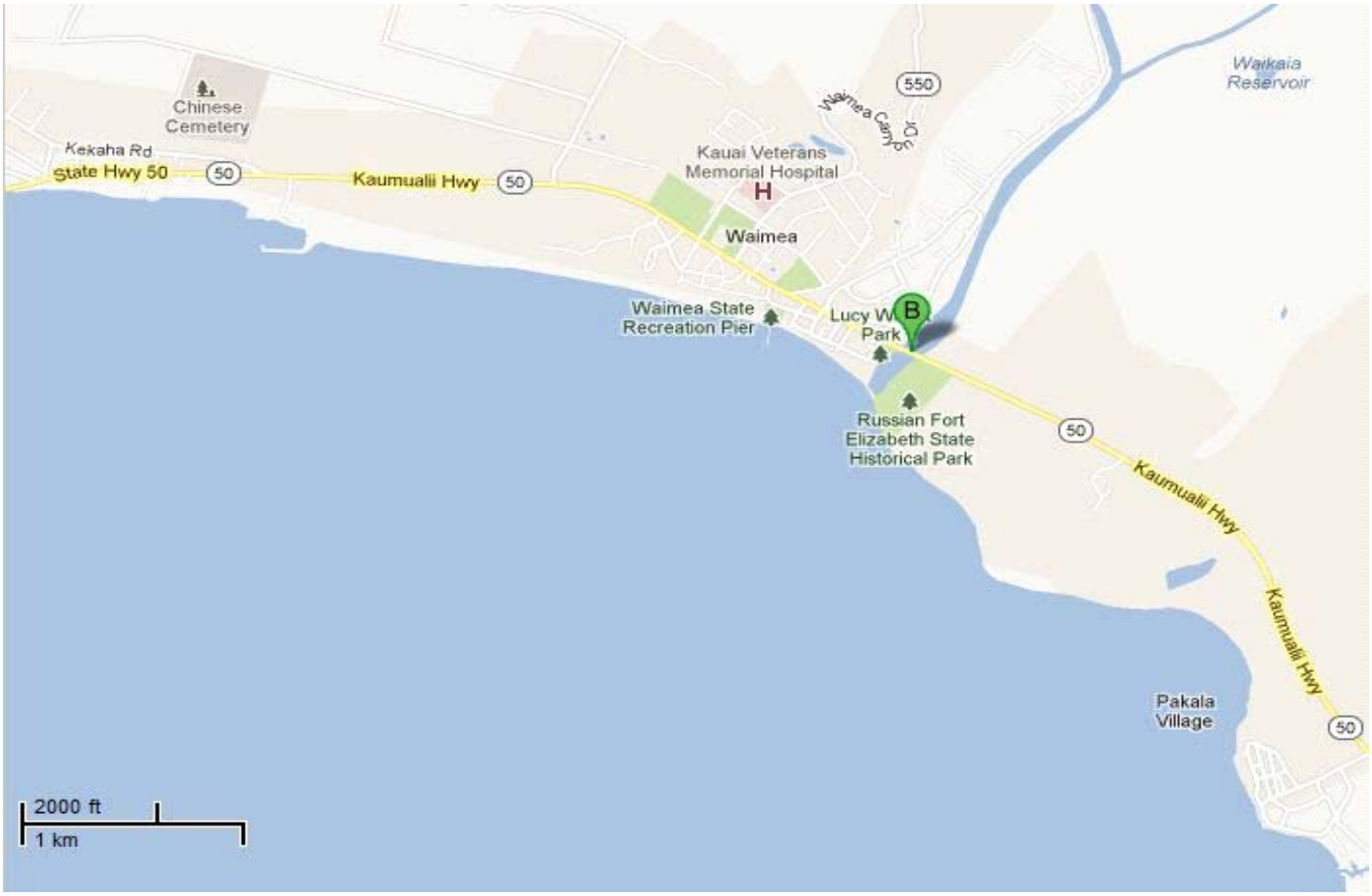
Inventory Form
(State)

General Information

Bridge Number: 007000500301039	**Route No:** 50
Popular Name: Waimea River Bridge	
Feature Crossed: Waimea River	
Feature Carried: Kaumualii Highway	
Milepost: 22.54 mi.	**Island:** Kauai
Longitude: 159d-39m-51.41s	**Latitude:** 21d-57m-11.80s

Location: 0.05 Miles East of Ala Wai Road
Historic Name: Waimea River Bridge
Designer/Engineer: William R. Bartels
Builder/Contractor: E. E. Black, Ltd.

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1940	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 4	**Max Span:** 105.0 ft.	**Total Length:** 365.2 ft.	**Deck Width:** 33.1 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Greek Cross			
Setting:			
Other Features: Stepped railing posts and support piers; incised bridge name and date of construction on end piers			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Waimea Bridge, a concrete tee beam structure, was constructed in 1940 to carry Kaumualii Highway across the Waimea River on the south coast of the island of Kauai. It is an excellent example of the late 1930s period bridges in Hawaii. The bridge retains its original location and setting except for the construction of flood protection walls on the west side of the river. The reinforced concrete tee beam materials and design have not been altered, although repairs were made to the bridge in 1967. The quality of the workmanship in the cast concrete decorative elements is quite good. At 365 feet in length, the Waimea Bridge was a long bridge for Kauai and the engineering of this bridge would be considered complex for its time. The artistic value of the bridge is high, due especially to the decorative design of the rail, the triangular cap design of the central piers, and the curved lines of the end posts. The curved lines of the concrete substructure, as well as decorative supporting piers, give the bridge a graceful appearance. The bridge retains its historic feeling, due to its decorative design and relatively narrow width. Its association with the first decade of Federal Aid bridges on Kauai could be interpreted by an informed observer. Interpretation is aided by the inscription of the bridge name and date of construction on the concrete end piers.

Significance Statement:

The Waimea Bridge has made significant contributions to the areas of engineering and transportation in Hawaii. The bridge is eligible under Criterion A for its associations with the development of Kauai's Belt Road system. The bridge has also played a significant role in the history of Waimea town. It is eligible under Criterion C as an excellent example of later developments in concrete bridge construction on Kauai and represents the "work of a master": William R. Bartels, Chief Highway Bridge Engineer for the Territorial Highway Department.

The Waimea Bridge was constructed as part of the upgrading of the Kauai Belt Road undertaken by the Territory in the 1930s utilizing Federal funds. The road and bridge contributed to the economic development of west Kauai by providing economical transportation to the harbor for the sugar cane plantations located in that region. This Federal Aid project was a significant event for Waimea town since the new alignment of the bridge and road altered the flow of traffic through the town. The bridge was designed in November 1938 according to plans in the State DOT Bridge Design Section. It was officially opened on April 16, 1940, when County Chairman William Ellis "cut the ribbon across the Waimea end of the bridge." (1) The Waimea Bridge demonstrates the rapid advances in engineering technology in the early decades of the twentieth century. At 365' the bridge is the longest extant pre-WW II bridge on Kauai. In the article about the opening of the bridge, the newspaper stated that "from an engineer's point of view . . . it has been one of the most satisfactory construction jobs on the island." (2) The newspaper described its engineering design:

The piers on the Makaweli side are of coffer dam construction, similar to the Golden Gate bridge. The abutments and piers on the Makaweli side end on solid rock. One of which is 30 feet below the surface. The two piers and abutments on the Waimea side rest on piles driven to bearings in the river bed. The bridge itself is a suspended span with fixed bearings at the abutment ends and concrete rocker bearings over the piers. (3)William Bartels was responsible for the design of many major Territorial bridge projects between 1932 and his retirement from the department in 1956. His bridges evidence a refined aesthetic sensibility which make them distinctive from the works of other engineers. The contractor was E.E. Black, Limited.

(1) "Ellis Opens New Bridge at Waimea," Honolulu Star Bulletin (16 April 1940): 8.

(2) Honolulu Star Bulletin (18 April 1940): 8.

(3) Honolulu Star Bulletin (18 April 1940): 8.

Inventory Form
(State)

General Information

Bridge Number: 007005600500670	**Route No:** 560
Popular Name: Wainiha River Bridge No. 2	
Feature Crossed: Wainiha River	
Feature Carried: Kuhio Highway	
Milepost: 6.70 mi.	**Island:** Kauai
Longitude: 159d-32m-35.69s	**Latitude:** 22d-12m-45.69s

Location: 0.13 Miles East of Wainiha Road
Historic Name: Wainiha River Bridge No. 2
Designer/Engineer:
Builder/Contractor:

Location Map:

Construction Information

Bridge Type: Steel Truss	**Construction Date:** 2004	**Replaced?** Yes
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 100.1 ft.	**Total Length:** 100.1 ft.	**Deck Width:** 12.8 ft.
Superstructure: Steel Pony Truss			
Substructure: Concrete Abutment Wall			
Floor/Decking: Steel Deck			
Parapets/Railings: Metal Thrie Beam			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Non-Contributing	**Criteria:** n/a	**State/National Registered?** Yes
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: n/a		

Narrative Description:

This 2004 bridge is a temporary modular prefabricated steel truss bridge. See National Register of Historic Places Nomination Form.

Significance Statement:

This bridge is a non-contributing feature of the Kauai Belt Road (North Shore section) district due to the complete replacement of the original 1931 bridge in 2004. It was replaced with a temporary modular prefabricated steel truss bridge. See National Register of Historic Places Nomination Form.

Inventory Form
(State)

General Information

Bridge Number: 007005600500644	**Route No:** 560
Popular Name: Wainiha Stream Bridge No. 1	
Feature Crossed: Wainiha Stream	
Feature Carried: Kuhio Highway	
Milepost: 6.44 mi.	**Island:** Kauai
Longitude: 159d-32m-21.90s	**Latitude:** 22d-12m-44.58s

Location: 0.39 Miles East of Wainiha Road
Historic Name: Wainiha Stream Bridge No. 1
Designer/Engineer:
Builder/Contractor:

Location Map:

Construction Information

Bridge Type: Steel Truss	**Construction Date:** 2010	**Replaced?** Yes
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 40.0 ft.	**Total Length:** 42.0 ft.	**Deck Width:** 15.7 ft.
Superstructure: Steel Pony Truss			
Substructure: Concrete Abutment Wall			
Floor/Decking: Steel Deck			
Parapets/Railings: Metal Thrie Beam			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Non-Contributing	**Criteria:** n/a	**State/National Registered?** Yes
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: n/a		

Narrative Description:

This 2010 bridge is a temporary modular prefabricated steel truss bridge. See National Register of Historic Places Nomination Form.

Significance Statement:

This bridge is a non-contributing feature of the Kauai Belt Road (North Shore section) district due to the complete replacement of the original 1922 bridge in 2010. It was replaced with a temporary modular prefabricated steel truss bridge. See National Register of Historic Places Nomination Form.

Kauai 2013 County Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)
007190071119004	Hanapepe Bridge	Hanapepe River	Hanapepe Road	1911	Concrete Girder	Concrete Solid with Cap	No	Eligible***	• Excellent example of early 20th century reinforced concrete deck girder • Prominent product of early territorial government's public works program • Significant contribution to development of Kauai's transportation system and history of Hanapepe town • Associated with early developments in concrete bridge construction in early reinforced concrete deck girder technology • Representative of work of a master: Kauai County Engineer Joseph H. Moragne • Part of belt road plan and connected previously isolated communities with a paved highway and series of concrete bridges
007380021138001	Hoomana Overpass	Cane Haul Road	Hoomana Road	1928	Concrete Rigid Frame	Concrete Solid Panel	No	Eligible***	• Built by Lihue Plantation in 1928 to accommodate new railroad line from the fields to the mill • Contributed to economic success of Lihue Plantation and the town by shortening the distance to the mill and by eliminating a grade crossing in plantation's skilled worker housing area • One of the few remaining bridges that was originally built by private enterprise • One of two bridges remaining in Kauai that was originally built as a railroad crossing • Has paneled rail design typical of period
007440181144002	Kainahola Bridge	Kainahola Stream	Kainahola Road	1950	Steel Stringer	No Parapet/Railing	No	Eligible	• Uncommon use of steel material in Hawaii's extreme marine environment • Good example of 1950s concrete and steel stringer bridge that is atypical of its period
007460021146001	Kapahi Bridge	Kapaa Stream	Kawaihau Road	1937	Steel Stringer	Wood	No	Eligible	• Was an important transportation link for residents of Kapaa Homestead lands • Associated with early developments in steel bridge construction in Hawaii • Uncommon use of steel material in Hawaii's extreme marine environment • Good example of 1930s steel bridge that is typical of its period
007510011151001	Kiaki Bridge	Waipake Stream	Koolau Road	1913	Concrete Tee Beam	Concrete Open Decorative	No	Eligible***	• Significant for contributions to development of Kauai's transportation system, early history of Kilauea town, and early developments of concrete bridge construction in Hawaii • Unique three-part railing design demonstrates builder's creative adaptation of academic plan to site conditions • Excellent example of new reinforced concrete bridge construction technology in early 20th century in Kauai
007520201152001	Kilauea Bridge	Kilauea Stream	Kolo Road	2008	Concrete Girder	Concrete and Metal	No	Not Eligible	The bridge has lost integrity due to the complete replacement of the original 1913 bridge in 2008.
007340011134001	Kipu Bridge	Huleia Stream	Kipu Road	1914	Concrete Tee Beam	Concrete Solid with Cap	No	Eligible***	• Early development in concrete bridge construction in Hawaii • One of the earliest concrete bridges • Good example of 1910s reinforced concrete bridge • Typical of its period in use of materials, method of construction, craftsmanship, and design
007120061112001	Kokee Bridge	Waipa Stream	Kokee Road	1920	Concrete Slab	Metal Thrie Beam	No	Eligible	• Good example of 1920s reinforced concrete bridge • Typical of its period in use of materials, method of construction, craftsmanship, and design
007270100828001	Koloa Road Bridge	Waikomo Stream	Koloa Road	1928	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible***	• Funded under the Territorial Loan Fund program • Construction of the bridge was a part of belt road system and eased traffic for Koloa Town • At the time of construction, the bridge was fifty feet wide and was the widest on Kauai
007230411123003	Lawai Bridge	Lawai Stream	Lauoho Road	1919	Closed Spandrel Arch	Concrete Solid with Cap	No	Eligible***	• Only concrete closed spandrel arch concrete on Kauai • Arch bridges are an uncommon bridge type • One of approximately five remaining in Hawaii (design is identical to bridges on the island of Hawaii: Mamalahoa-Puuokalepa and Mamalahoa-Waiaama, and the island of Oahu: Waipahu Street-Waikele Stream arch) • Significant contributions to the development of Kauai's transportation system and the early history of Lawai • Associated with 20th century developments in early reinforced concrete arch bridge construction • 1929 alteration by work of a master: Kauai County Engineer Joseph H. Moragne • A part of a series of concrete arch bridges that ushered in new era in bridge development after 1904 – previously bridges were constructed of timber, stone, or metal
007120061112002	Mana Bridge No. 1	Mana Stream	Kokee Road	1930	Concrete Slab	Concrete Open Horizontal	No	Eligible***	• Associated with early developments in concrete bridge construction • Good example of 1930s reinforced concrete bridge with post and beam • Artistic value for craftsmanship and design • Apparent wooden form work from poured in place concrete

* NRHP or HRS 6E Listed, Eligible, Not Eligible, Contributing, Non-Contributing, or Program Comments.
** Historic resources adjacent to resource.
*** Formerly "High Preservation Value."
Greyed-out cells have no form.

Kauai 2013 County Bridge Matrix

Bridge Number	Bridge Name	Feature Crossed	Feature Carried	Construction Date	Bridge Type	Parapet/Railing Type	Listed on National/Hawaii Register	Eligibility Status*	Character Defining Feature (Significance)
007350011135001	Nawiliwili Bridge	Nawiliwili Stream	Paena Loop	1920	Concrete Girder	Concrete Solid Panel with Cap	No	Eligible***	• One of two remaining reinforced concrete deck girder bridges on Kauai and is the longest span of its type on the island • Also known as a Duke's bridge • Is a prominent product of County of Kauai's public works program • Significant contributions to development of island's transportation system and history of Nawiliwili Harbor • Representative of work of a master: Kauai County Engineer Joseph H. Moragne
007430200743001	Olohena Bridge No. 1	Olohena Stream	Olohena Road	2005	Concrete Tee Beam	Concrete and Metal	No	Not Eligible	The bridge has lost integrity due to the complete replacement of the original 1941 bridge in 2005.
007270011127001	Omao Road Bridge	Omao Stream	Omao Road	2004	Concrete Girder	Concrete and Metal	No	Not Eligible	The bridge has lost integrity due to the complete replacement of the original 1941 bridge in 2004.
007420201142006	Opaekaa Bridge	Opaekaa Stream	Opaekaa Road	2021	Steel Stringer	Steel Bridge Rail	No	Not Eligible	Replaced 1900 Bridge (007420151142001). See National Register of Historic Places Nomination Form in appendices.
007520171152002	Puukumu Bridge	Puukumu Stream	Kalihiwai Road	1913	Concrete Tee Beam	Concrete Solid with Cap	No	Eligible***	• Early development in concrete bridge construction in Hawaii • One of the earliest concrete bridges • Good example of 1910s concrete tee beam bridge • Typical of its period in use of materials, method of construction, craftsmanship, and design
007420201144002	Puuopae Bridge	Kalama Stream	Puuopae Road	2020	Steel Stringer	Steel Bridge Rail	No	Not Eligible	Replaced 1915 Puuopae Bridge (007440111144001). See National Register of Historic Places Nomination Form in appendices.
007280500728003	Wailana Bridge No. 2	Wailana Stream	Maluhia Road	1936	Concrete Tee Beam	Concrete Solid with Cap	No	Eligible	• Early development in concrete bridge construction in Hawaii • Good example of 1930s reinforced concrete girder bridge • Typical of its period in use of materials, method of construction, craftsmanship, and design
007280500728001	Wailana Bridge No. 4	Wailana Stream	Maluhia Road	1910	Concrete Slab	Concrete Solid with Cap	No	Eligible***	• Early development in concrete bridge construction in Hawaii • Good example of 1910s reinforced concrete slab bridge • Typical of its period in use of materials, method of construction, craftsmanship, and design

* NRHP or HRS 6E Listed, Eligible, Not Eligible, Contributing, Non-Contributing, or Program Comments.
** Historic resources adjacent to resource.
*** Formerly "High Preservation Value."
Greyed-out cells have no form.

Inventory Form
(County/Private)

General Information

Bridge Number: 007190071119004

Popular Name: Hanapepe Bridge

Feature Crossed: Hanapepe River

Feature Carried: Hanapepe Road

Milepost: **County Private:** Kauai

Longitude: 159d-35m-24.30s **Latitude:** 21d-54m-36.37s

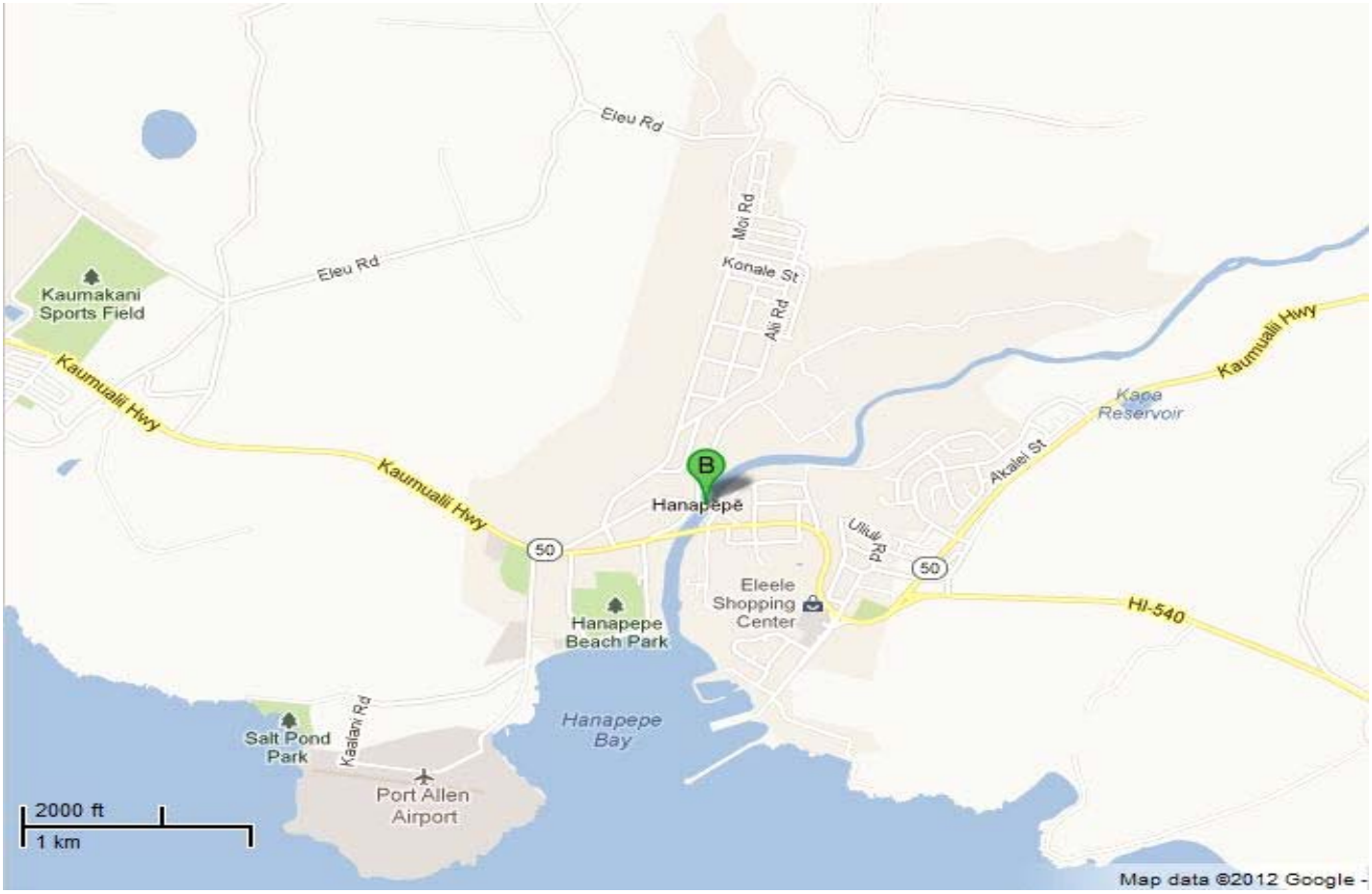
Location: TMK: 1-9-04 & 1-9-10

Historic Name: Hanapepe Bridge

Designer/Engineer: Joseph H. Moragne

Builder/Contractor: George R. Ewart, Jr. and T. Brandt

Location Map:



Construction Information

Bridge Type: Concrete Girder	**Construction Date:** 1911	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 1927	
Alteration Type(s):		
Alteration Description(s): Addition of cantilevered concrete walkway at south parapet wall		

Bridge Information

Number of Spans: 4	**Max Span:** 49.0 ft.	**Total Length:** 200.0 ft.	**Deck Width:** 23.9 ft.
Superstructure: Concrete Through Girder			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features: Pipe railing at sidewalk; date of brige (1911) incised on north parapet wall			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Hanapepe Bridge, a reinforced concrete deck girder structure, was constructed in 1911 to carry Hanapepe Road over the Hanapepe River. The Kauai Belt Road was constructed in the 1930s bypassing the town and the majority of traffic utilized the new Hanapepe Highway Bridge, thus Hanapepe Road became a secondary transportation artery.

The Hanapepe Bridge retains its integrity of location. The setting has undergone moderate change, with the erection of levees along the Hanapepe River. In 1927, a reinforced concrete sidewalk was added to the original structure. Since this change is more than fifty years old, it is considered part of the history of the design, and does not impact the historic integrity of the original bridge. The original reinforced concrete material of the bridge remains intact, however there has been some deterioration in the concrete parapet walls as a result of collisions. The workmanship of the original bridge is quite high and is not substantially obscured by additions or repairs. The historic quality of the bridge is obvious to travelers due to its early twentieth-century design and narrowness, as well as its physical relationship to the new bridge constructed downstream.

Significance Statement:

The Hanapepe Bridge is significant for its contributions to the fields of transportation and engineering in Hawaii. The bridge is an excellent example of an early twentieth-century reinforced concrete deck girder bridge. The Hanapepe Bridge is eligible under Criterion A as a prominent product of the early territorial government's public works program, and for its significant contributions to the development of Kauai's transportation system and the early history of Hanapepe town. The bridge is also eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. The bridge is also representative of the "work of a master": Joseph Moragne of the County of Kauai Engineer's Office.

The Hanapepe Bridge is one of the early examples of the progressive Territorial Highway System in Hawaii and is one of the first examples of the use of formal engineering expertise in bridge making by the new territorial government after the annexation of Hawaii by the United States. The 1911 Territorial Legislature had appropriated, in Act 166, $100,000 for Kauai's Belt Road and bridges. This bridge was the first erected on Kauai with these funds. (1) The bridge played a major role in the development of the county's belt road plan which connected previously isolated communities with a paved highway and a series of concrete bridges. The 1911 Hanapepe Bridge is the third bridge erected in that location, replacing an earlier metal truss. (2) The Hanapepe Bridge is an excellent example of bridge construction on Kauai in the early twentieth century, employing new reinforced concrete technology. The bridge is one of the oldest reinforced concrete deck girder bridges in the islands and the longest bridge of its type in the state pre-WWII. With a maximum span of forty-eight feet and a total length of two hundred feet, the bridge was significantly larger and more technically complex than other bridges constructed during this period. County Engineer, J. H. Moragne was instructed to draw up plans and specifications and call for bids for the bridge's reinforced concrete superstructure and piers. (3) The contract was awarded to George R. Ewart, Jr. and T. Brandt for the low bid of $11,950. The 1927 sidewalk addition was designed by the County Engineer of that time, R. L. Garlinghouse at a cost of $2,600.42. (4)

(1) "Loan Com. in Busy Meeting," Garden Isle (September 26, 1911): 1, 6.
(2) "Work Begins at Hanapepe Bridge," Garden Island (16 May 1911): 1.
(3) "Tenders, concrete Bridge," Garden Island (August 8, 1911): 1.
(4) Spencer Mason Architects, Historic Bridge Inventory: Island of Kauai, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration, (Honolulu, 1989), 143.

Inventory Form
(County/Private)

General Information

Bridge Number: 007380021138001

Popular Name: Hoomana Overpass

Feature Crossed: Cane Haul Road

Feature Carried: Hoomana Road

Milepost: **County Private:** Kauai

Longitude: 159d-22m-25.11s **Latitude:** 21d-58m-33.13s

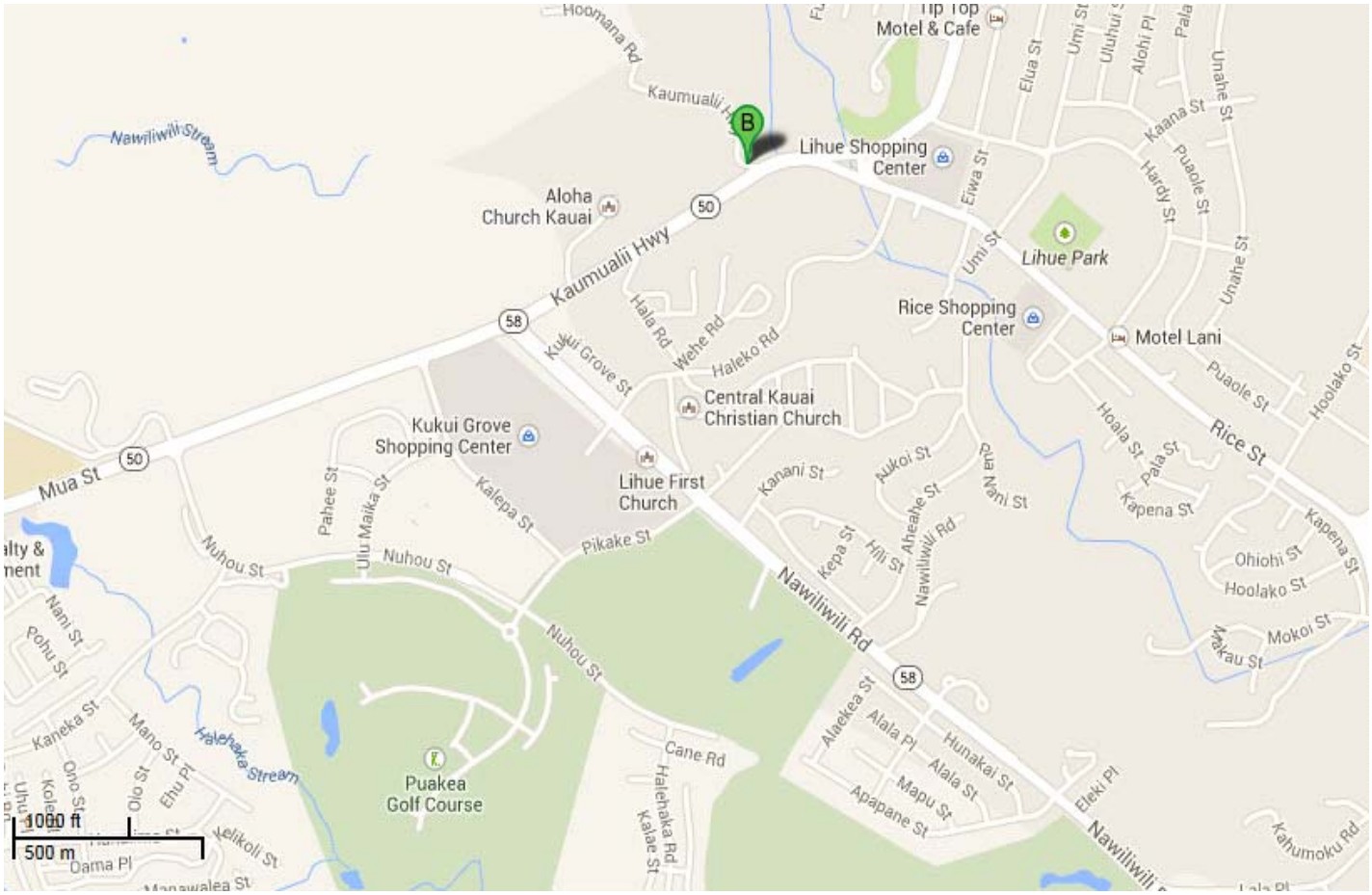
Location: TMK: 3-8-04 & 3-8-05

Historic Name: Hoomana Overpass

Designer/Engineer:

Builder/Contractor: Lihue Plantation, Kauai

Location Map:



Construction Information

Bridge Type: Concrete Rigid Frame	**Construction Date:** 1928	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 2013	
Alteration Type(s):		
Alteration Description(s): Alteration to railings		

Bridge Information

Number of Spans: 1	**Max Span:** 20.0 ft.	**Total Length:** 24.0 ft.	**Deck Width:** 20.8 ft.
Superstructure: Concrete Rigid Frame			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid Panel			
Setting:			
Other Features: Date of bridge (1928) incised on outside of the top of railing on both sides			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

Hoomana Overpass was built over the Lihue Plantation railroad alignment to the Lihue Sugar Mill in 1928.(1) This bridge is a common structural type, reinforced concrete flat slab. The year of construction is inscribed on each outer parapet. The bridge retains its original location and carrying Hoomana Road over the now defunct railroad alignment. In 2013 the new Lihue Mill Bridge will be build parallel to the Hoomana Overpass and the left side of the railings will be majorly impacted. It was associated with a mill access crossing and when it was built it crossed a part of the railroad line.

(1) Spencer Mason Architects, Historic Bridge Inventory: Island of Kauai, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1989), 74.

Significance Statement:

The Hoomana Overpass is significant for its contributions to the areas of engineering and transportation in Hawaii. The concrete slab overpass is eligible under Criterion A for its associations with Lihue Mill. The bridge is eligible under Criterion C as a representative example of a reinforced concrete flat slab bridge and a rare remaining example of a railroad overpass built by private enterprise.

The structure was built by Lihue Plantation in 1928 to accommodate the "new railroad line from their mauka (upslope) fields to the mill which eliminates the long haul via the hotel."(1) The Hoomana Overpass contributed to the economic success of the Lihue Plantation and hence, the town by shortening of the distance to the mill, and by eliminating a grade crossing in the heavily populated German town, the plantation's skilled-worker housing area.

Hoomana Overpass is one of the few remaining bridges in the state currently in public service that was originally built by private enterprise. It is one of two bridges remaining on Kauai (along with the adjacent Lihue Mill Bridge) that was originally built as a railroad crossing. The bridge's paneled rail design is typical of the period.

(1) "Reconstruction of Lihue Mill," Garden Island (Aug. 19, 1919): 1; "Lihue Plantation Completes New Rail Road Line to Mill," Garden Island (March 13, 1928): 1.

Inventory Form
(County/Private)

General Information

Bridge Number: 007440181144002

Popular Name: Kainahola Bridge

Feature Crossed: Kainahola Stream

Feature Carried: Kainahola Road

Milepost: **County Private:** Kauai

Longitude: 159d-22m-15.32s **Latitude:** 22d-05m-25.07s

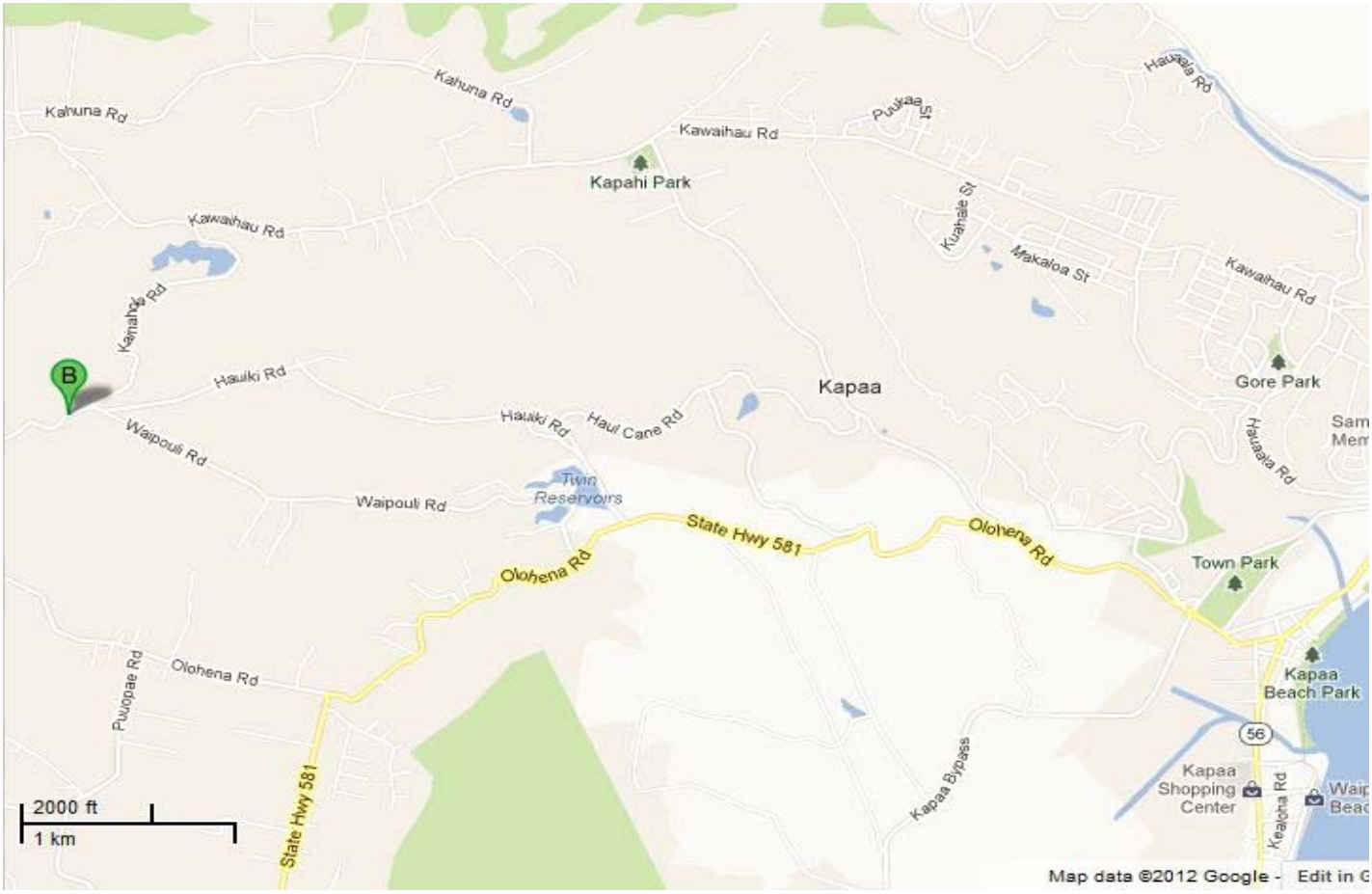
Location: TMK: 4-4-04

Historic Name: Kainahola Bridge

Designer/Engineer:

Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Steel Stringer	**Construction Date:** 1950	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 31.0 ft.	**Total Length:** 38.0 ft.	**Deck Width:** 17.0 ft.
Superstructure: Steel Multi-Girder			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: No Parapet/Railing			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Kainahola Stream Bridge No. 1 carries Kainahola Road across Kainahola Stream. This single-span steel stringer bridge is in its original location, is in fair condition, and its materials remain intact. The bridge has no parapets but it has a concrete curb and at the ends of the approaching curbs are thrie beams. The reinforced concrete deck is supported by reinforced concrete abutments. The workmanship of the bridge has not been obscured by additions or repairs.

Significance Statement:

The use of steel was uncommon in Hawaii due to the extreme marine environment. Since very little steel is used for bridge construction in Hawaii, this bridge is eligible under Criterion C for its distinctive structural type. It is a good example of a 1950's steel stringer and reinforced concrete bridge atypical of its period in its use of materials and design.

Inventory Form
(County/Private)

General Information

Bridge Number: 007460021146001

Popular Name: Kapahi Bridge

Feature Crossed: Kapaa Stream

Feature Carried: Kawaihau Road

Milepost: **County Private:** Kauai

Longitude: 159d-22m-32.62s **Latitude:** 22d-06m-03.71s

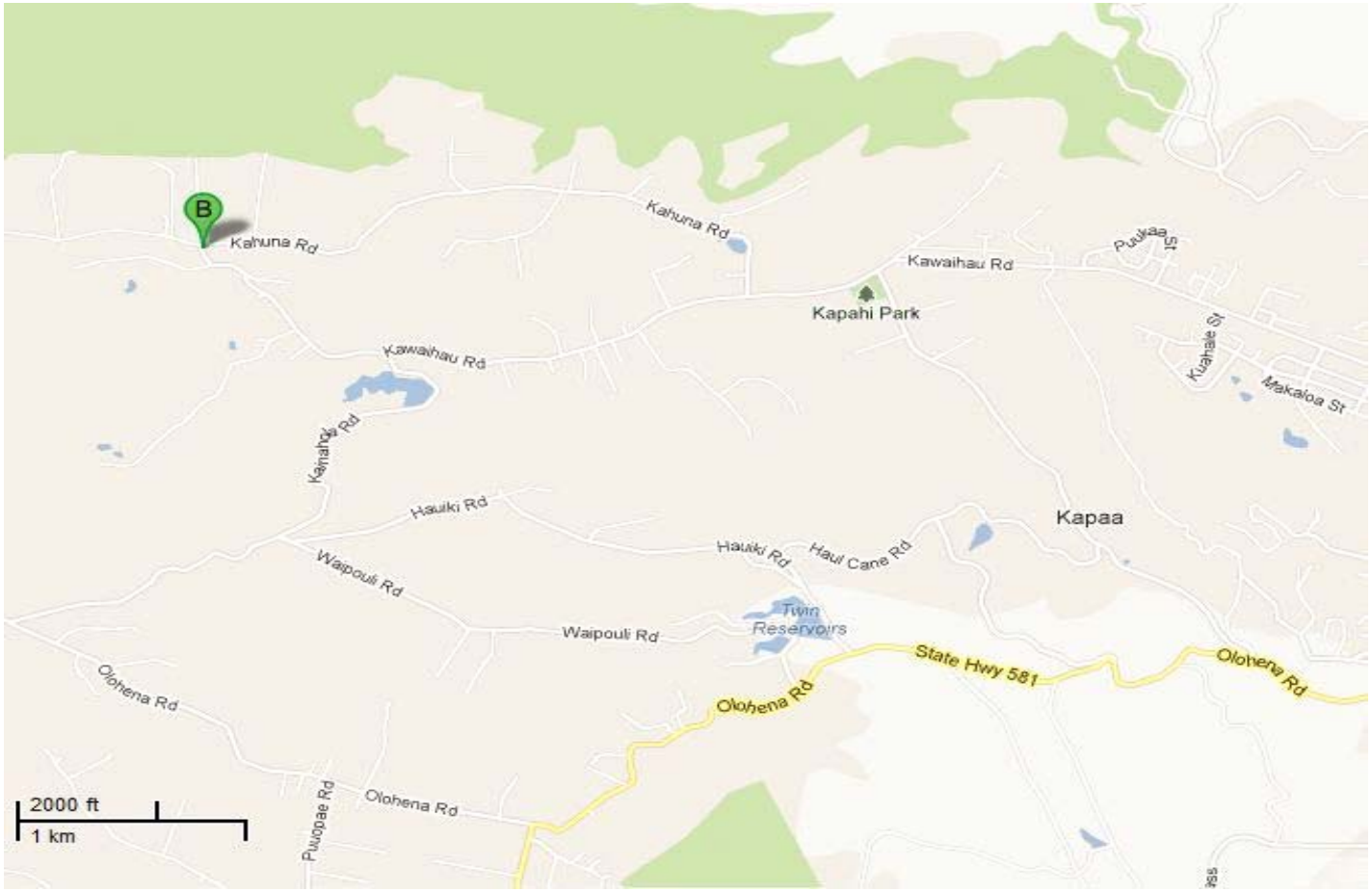
Location: TMK: 4-6-04

Historic Name: Kapahi Bridge

Designer/Engineer:

Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Steel Stringer	**Construction Date:** 1937	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 1977, 2012	
Alteration Type(s):		
Alteration Description(s): Bridge deck was altered in 1977, railings were replaced in 2012		

Bridge Information

Number of Spans: 1	**Max Span:** 36.0 ft.	**Total Length:** 38.0 ft.	**Deck Width:** 16.3 ft.
Superstructure: Steel Multi-Girder			
Substructure: Concrete Abutment Wall			
Floor/Decking: Timber Deck			
Parapets/Railings: Wood			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Community Planning and Development, Engineering		

Narrative Description:

The Kapahi Stream Bridge carries Kawaihau Road across the Kapaa Stream. This steel bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has timber railings. The timber deck is supported by concrete abutments. The Kapahi Bridge has undergone several design modifications over the years, including the addition of five steel girders in 1977 and the railings were replaced in 2012.

Significance Statement:

The present Kapahi Bridge appears to have its origins in 1937, when an earlier, 1907, bridge was widened. It performed an important transportation link for residents of Kapaa Homestead lands. The bridge represents a strong relationship with early to mid-twentieth century land use in the Kapaa Homesteads area. The bridge is also eligible under criterion C for its association with early developments in steel bridge construction in Hawaii. The use of steel was uncommon in Hawaii due to the extreme marine environment. Since very little steel is used for bridge construction in Hawaii, this bridge is eligible under Criterion C for its distinctive structural type. It is a good example of the 1930's steel bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

Inventory Form
(County/Private)

General Information

Bridge Number: 007510011151001

Popular Name: Kiaki Bridge

Feature Crossed: Waipake Stream

Feature Carried: Koolau Road

Milepost: **County Private:** Kauai

Longitude: 159d-21m-23.24s **Latitude:** 22d-12m-02.84s

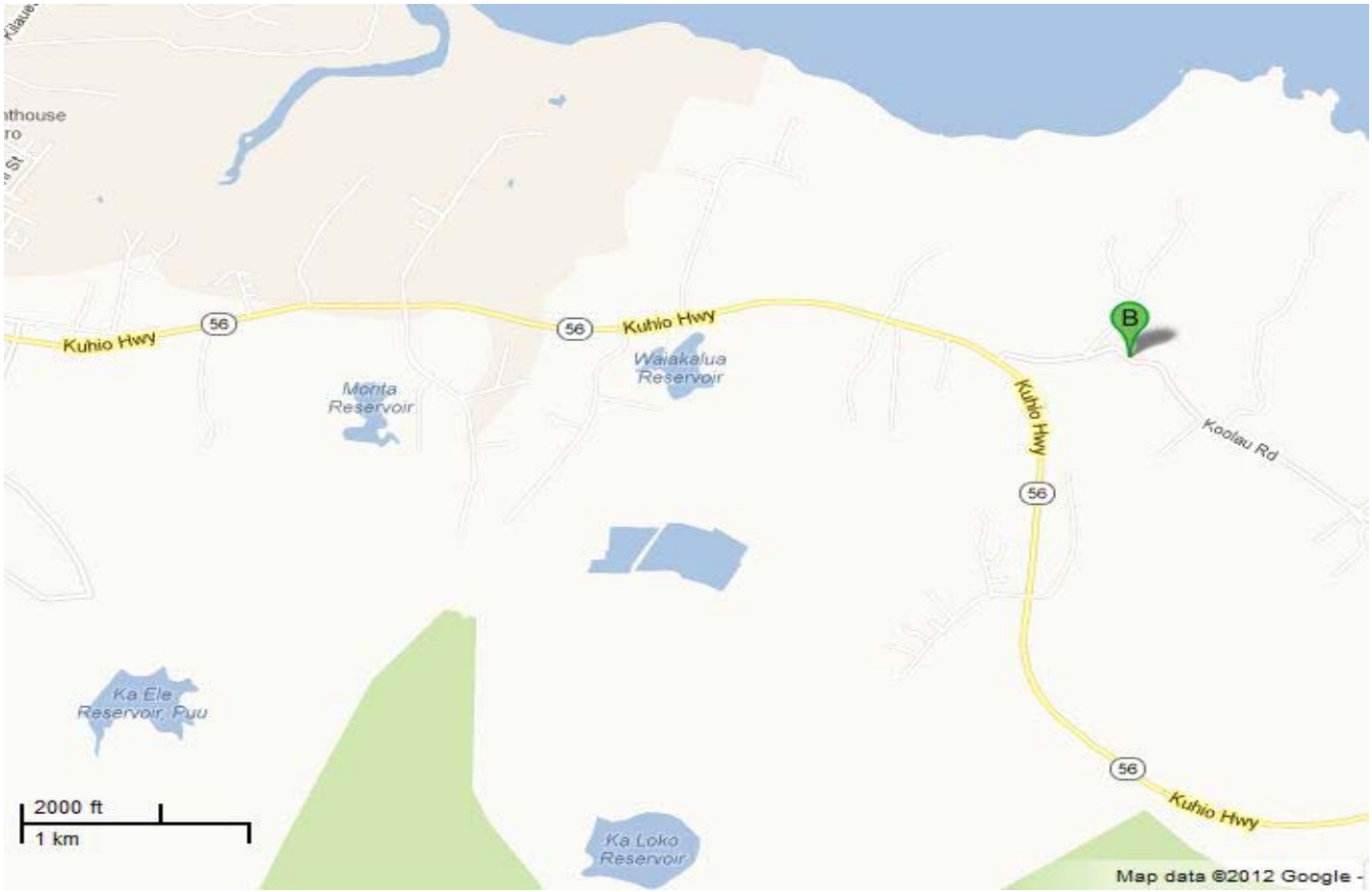
Location: TMK: 5-1-03

Historic Name: Kiaki Bridge

Designer/Engineer: R. F. Middleton

Builder/Contractor: George Mahukona

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1913	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 3	**Max Span:** 38.0 ft.	**Total Length:** 78.0 ft.	**Deck Width:** 20.6 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Decorative			
Setting:			
Other Features: Date of bridge (1921) incised on parapet wall			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Waipake Bridge, a reinforced concrete tee-beam structure, was constructed in 1921 to carry Koolau Road over the Waipake Stream. At the time of its construction, the Waipake Bridge was located on the original circum-island belt road. In the 1930s, Kuhio Highway was constructed to by-pass and straighten out the old belt road. The original bridge design, in three parts or sections, is very unusual, retains its integrity and has not been altered. The rural setting remains unchanged as there is no development nearby, however the original circum-island road was by-passed by a new highway in the 1930s. The original concrete material of the bridge has not been changed by major repairs but has been damaged by weathering and collisions. White paint has been applied to the concrete and has worn off unevenly. However, the high-quality workmanship of this bridge is still evident in the formwork and simple decorative elements. The feeling of historic quality is strong, due largely to its unusual three-part design. The association of this bridge with the first Belt Road and early County bridge building on Kauai is readily interpreted.

Significance Statement:

The Waipake Bridge is significant for its contributions to the fields of transportation and engineering in Hawaii. The Waipake Bridge is eligible under Criterion A as a prominent product of the early territorial government's public works program, and for its significant contributions to the development of Kauai's transportation system and the early history of Kilauea town. The bridge is also eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii.

The Waipake Bridge is a distinguishable entity because it is the only bridge on Kauai with such an unusual railing design. It is an unusual resource because it demonstrates the builder's creative adaptation of the academic plan to the site conditions. This bridge was built by the County, without involvement by the territorial government. The County Engineer, R. F. Middleton, designed the bridge.(1) G.W. Mahukona began work on the bridge on October 1, 1921, and it was opened to traffic by December 26, 1921, although it was not completed until February 1922.(2) Because it was built during the rainy season, the detour road became quite a bog and the Garden Island noted that "complaints have been piling up."(3) This was probably the reason the bridge was opened to traffic before work was complete.

The Waipake Bridge is an excellent example of bridge construction in the early twentieth century period on Kauai, employing new reinforced concrete technology. The bridge is one of the oldest reinforced concrete tee-beam bridges in the island of Kauai. The Waipake Bridge is of a common structural type on Kauai, reinforced concrete-tee beam. It is an excellent example of its period largely due to its unique three-part railing design. The engineering of the bridge was complex, due to its skewed plan. There is definite artistic value in the three-part railing design, with the central paneled portion and alternating blocks and voids in the outer sections of the railings. Reflecting the skew, or slant, in the overall plan, all of the elements are also rhombus-shaped in plan, including the paneled piers, hipped caps, and blocks. This skewing was apparently the builders' response to the angle the bridge makes with the road, since the plan drawing shows right-angled piers and posts.

(1) "Tenders for Concrete Bridge," Garden Island (August 2, 1921): 7.
(2) "Supervisors Hold Regular Monthly Meeting," Garden Island (October 18, 1921): 2; (January 17, 1922): 2; (Feb. 7, 1922): 5.
(3) "Autoists Complain About Detour," Garden Island (December 13, 1921): 8.

Inventory Form
(County/Private)

General Information

Bridge Number: 007340011134001

Popular Name: Kipu Bridge

Feature Crossed: Huleia Stream

Feature Carried: Kipu Road

Milepost: **County Private:** Kauai

Longitude: 159d-25m-12.86s **Latitude:** 21d-57m-08.95s

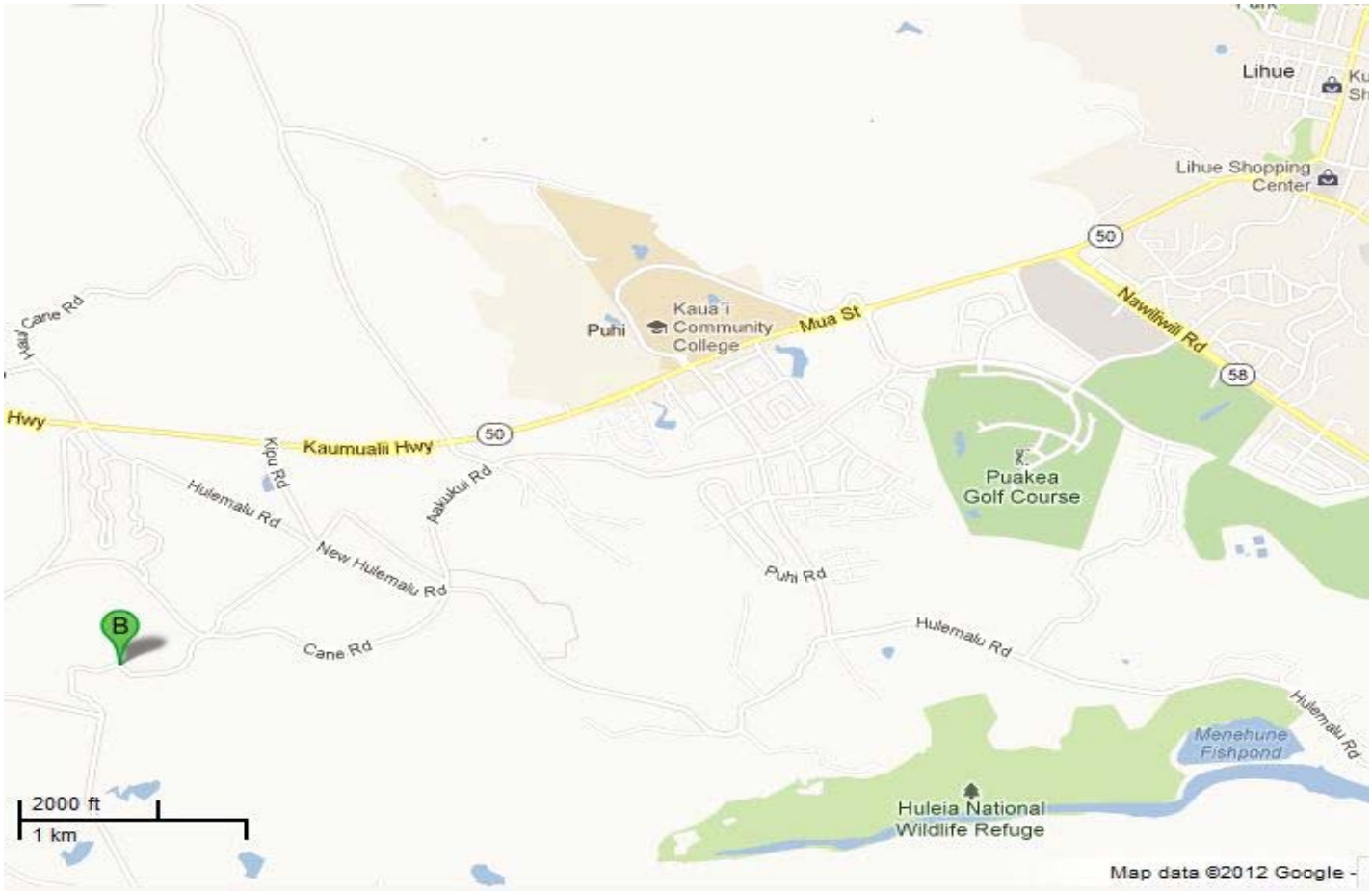
Location: TMK: 3-1-03

Historic Name: Kipu Bridge

Designer/Engineer:

Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1914	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 4	**Max Span:** 37.0 ft.	**Total Length:** 148.0 ft.	**Deck Width:** 19.3 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Huleia Stream Bridge carries Kipu road across the Huleia Stream. This reinforced concrete bridge is in its original location, the material remains intact but in the poor condition. The bridge has concrete solid parapets with tapered caps. The workmanship of the bridge has not been obscured by additions or repairs. The simple design of the bridge and solid parapet retains its historic feeling.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example and one of the oldest of the 1910's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

Inventory Form
(County/Private)

General Information

Bridge Number: 007120061112001	
Popular Name: Kokee Bridge	
Feature Crossed: Waipa Stream	
Feature Carried: Kokee Road	
Milepost:	**County Private:** Kauai
Longitude: 159d-42m-01.04s	**Latitude:** 22d-00m-21.85s

Location: TMK: 1-2-02:23
Historic Name: Kokee Bridge
Designer/Engineer:
Builder/Contractor:

Location Map:

Construction Information

Bridge Type: Concrete Slab	**Construction Date:** 1920	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 2005	
Alteration Type(s):		
Alteration Description(s): Replaced railings		

Bridge Information

Number of Spans: 1	**Max Span:** 20.0 ft.	**Total Length:** 23.0 ft.	**Deck Width:** 26.7 ft.
Superstructure: Concrete Slab			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Metal Thrie Beam			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Kokee Bridge carries Kokee Road across the Waipa Stream. This concrete flat slab bridge is in its original location and is generally in fair condition. The bridge has original solid panel parapets with flat caps on the upstream side and thrie beams on downstream side. In 2005 the parapets were replaced. The concrete deck is supported by concrete abutments. The simple design of the bridge and original parapet retains its historic feeling.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of an early 1920's reinforced concrete slab bridge that is typical of its period in its use of materials, method of constriction, craftsmanship, and design.

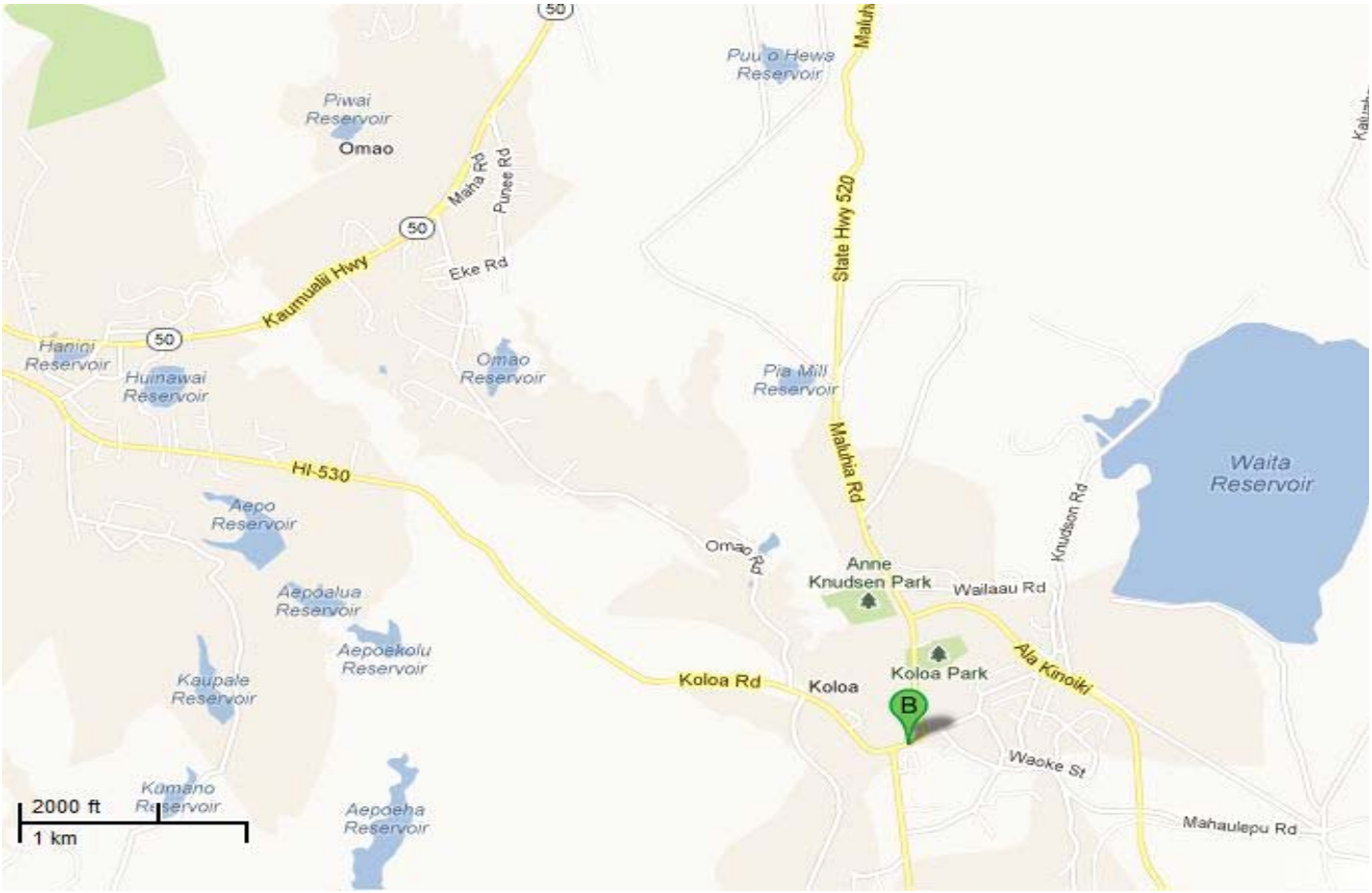
Inventory Form
(County/Private)

General Information

Bridge Number: 007270100828001	
Popular Name: Koloa Road Bridge	
Feature Crossed: Waikomo Stream	
Feature Carried: Koloa Road	
Milepost:	**County Private:** Kauai
Longitude: 159d-27m-56.50s	**Latitude:** 21d-54m-14.45s

Location: TMK: 2-8-07
Historic Name: Koloa Road Bridge
Designer/Engineer: R. L. Garlinghouse
Builder/Contractor: S. Honjiyo

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1928	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 2	**Max Span:** 19.0 ft.	**Total Length:** 43.0 ft.	**Deck Width:** 49.2 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid Panel with Cap			
Setting:			
Other Features: Date of bridge (1928) incised on parapet ends			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Koloa Bridge, a reinforced concrete tee-beam structure, was constructed in 1928 to carry Koloa Road over the Waikomo Stream. It is wider than most bridges constructed around the same time. At the time of its construction, the Koloa Bridge was located on the original circum-island belt road. In the 1930s, Koloa Highway was constructed to by-pass and straighten out the old belt road. The Koloa Bridge is in its original location in historic Koloa town. At the time of the bridge's construction, the adjacent sugar mill was already a ruin. The town now depends on tourism, rather than sugar, for its economic support, but most of the buildings in the vicinity of the bridge have been retained and renovated. The bridge's original design retains its integrity and has not been altered. The setting remains unchanged, however the original circum-island road was by-passed by a new highway in the 1930s. The original concrete material of the bridge has not been changed by major repairs but has been damaged by weathering and collisions. Koloa Bridge is one of many concrete tee-beam type on Kauai. The engineering complexity could be considered standard for the period. However, the high-quality workmanship of this bridge is still evident in the formwork and simple decorative elements, such as the paneled parapet. There is a definite historic feeling, due largely to the bridge's location in historic Koloa Town. The association of this bridge with early county bridge building on the first belt road, as well as with the history of Koloa Town can easily be interpreted.

Significance Statement:

The Koloa Bridge is significant for its contributions to the fields of transportation and engineering in Hawaii. The Koloa Bridge is eligible under Criterion A as a prominent product of the territorial government and the County of Kauai's public works program, and for its significant contributions to the development of the island's transportation system and the early history of Koloa town. The bridge is also eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii.

The Koloa Bridge was funded under the Territorial Loan Fund program. On the plans drawn by R. L. Garlinghouse, the Kauai County Engineer, there is a notation, "Item 52, Act 271, S.L. 1927." This item in the Loan Fund Act of the 1927 Session Laws lists an appropriation of $75,000 for concrete bridges on Kauai. The County Engineer was instructed to draw up plans in June 1928, and these were approved by the Board of Supervisors in August 1928.(1) Since Territorial Loan funds were involved, the approval of the Territory's Superintendent of Public Works was also necessary, so the contract was not awarded until November 1928.(2) S. Honjiyo had the low bid of $7,692.95.(3) The construction of the bridge was very rapid; despite flooding during its progress, the concrete work was completed by the end of December 1928.(4) The Garden Island noted, "When finished it will be one of the outstanding concrete bridges on the island and it will greatly improve traffic conditions in a highly growing traffic center."(5) Thus, it appears that the construction of this bridge was a significant event for Koloa. At that time, this bridge was part of the belt road system.(6) The bridge it was replacing probably dated from 1919. (7) The plans for the existing bridge show the previous bridge in this location was only thirty-two feet wide, which apparently was too narrow. When the bridge was opened to traffic, the Garden Island stated that the fifty-foot [outside-to-outside measurement] bridge "is the widest on the island," with room for three cars to pass and a sidewalk on one side.(8)

(1) "Supervisors Hold Regular Meeting," Garden Isle (June 19, 1928): 3.
(2) Spencer Mason Architects, Historic Bridge Inventory: Island of Kauai, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1989), 118.
(3) "Honjiyo Awarded Contract for Koloa Mill Bridge," Garden Isle (November 13, 1928): 1.
(4) "Work Progresses on Koloa Bridge," Garden Isle (December 4, 1928): 1.
(5) "Concrete Work on Koloa Mill Bridge Complete," Garden Island (December 25, 1928): 1.
(6) Ethel Damon, Koamalu, 2 vols. (Honolulu: Star-Bulletin Press, 1931).
(7) "Meeting of Supervisors: A Record of Progress," Garden Isle (September 9, 1919): 1 & 4.
(8) "Koloa Bridge Open for Traffic Sunday," Garden Island (January 22, 1929): 1.

Inventory Form
(County/Private)

General Information

Bridge Number: 007230411123003

Popular Name: Lawai Bridge

Feature Crossed: Lawai Stream

Feature Carried: Lauoho Road

Milepost: **County Private:** Kauai

Longitude: 159d-30m-26.94s **Latitude:** 21d-55m-15.21s

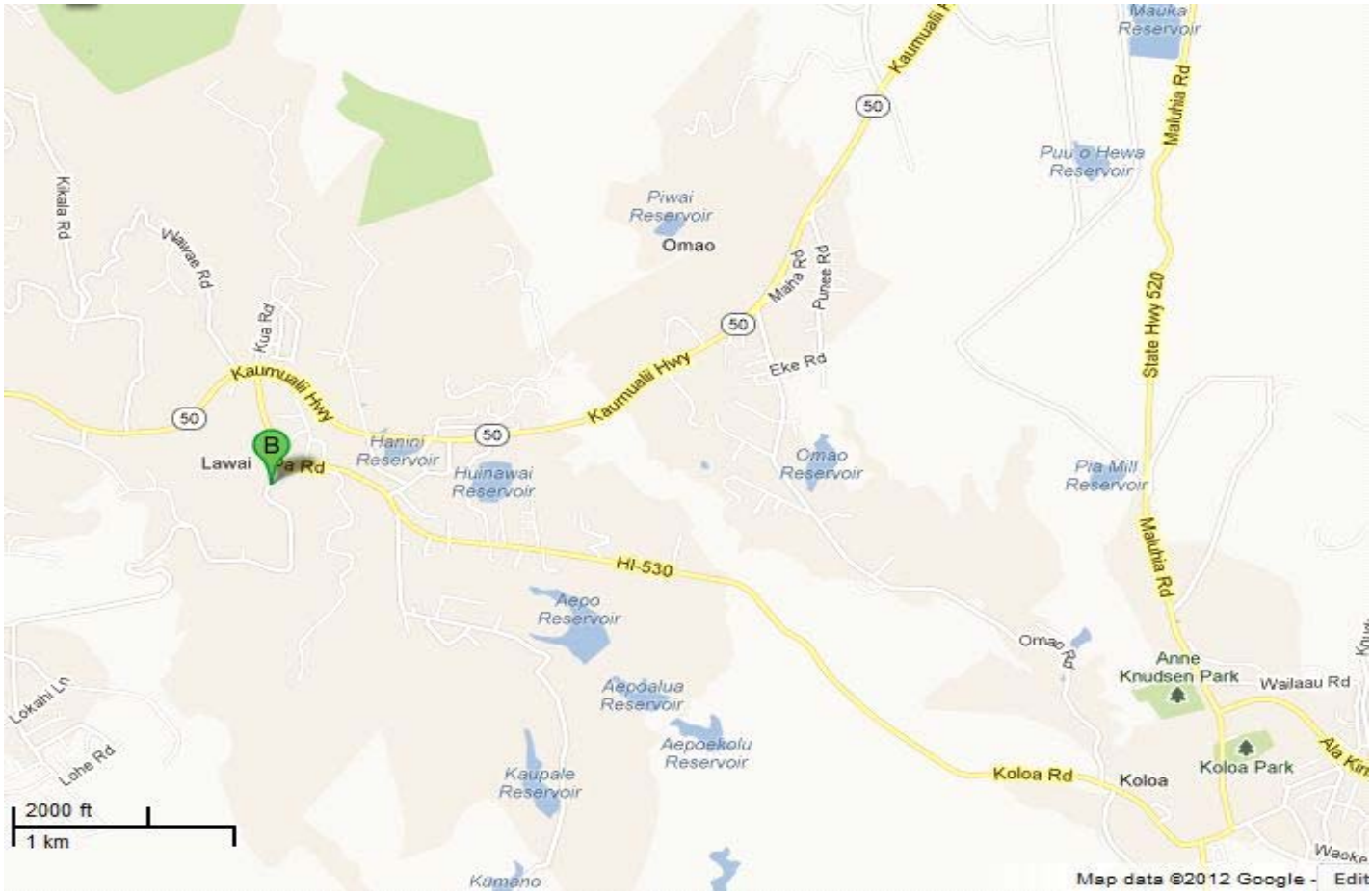
Location: TMK: 2-5-04

Historic Name: Lawai Bridge

Designer/Engineer: Joseph H. Moragne (1929)

Builder/Contractor: S. Honjiyo (1929)

Location Map:



Construction Information

Bridge Type: Closed Spandrel Arch	**Construction Date:** 1919	**Replaced?** No
Altered? Yes	**Alteration Date(s):** 1929, 1964	
Alteration Type(s):		
Alteration Description(s): Widening and straightening of bridge with a 4-foot sidewalk (1929); replacement of damaged concrete parapet with metal piperail (1964)		

Bridge Information

Number of Spans: 1	**Max Span:** 40.0 ft.	**Total Length:** 63.0 ft.	**Deck Width:** 32.6 ft.
Superstructure: Concrete Closed Spandrel Arch			
Substructure: Concrete Abutment Wall			
Floor/Decking: AC Pavement			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Lawai Stream Bridge, a reinforced concrete solid-spandrel arch deck bridge, was constructed (circa 1907) to carry Lauoho Road over the Lawai Stream near the old pineapple cannery. In 1929, the bridge was widened by the addition of a four-foot wide concrete sidewalk and widened again in 1964. The date of construction for the original bridge has not been definitely established; however it is identical to bridges built on the islands of Hawaii and Oahu from standard plans issued by the territorial government in 1904-05. The cannery was built in 1907 and, most likely, the improved road and bridge date from that time. The bridge is the only remaining arch deck structure on Kauai. The Lawai Stream Bridge retains its integrity of location. The setting has not changed substantially since the construction of the cannery in 1907. The bridge has been seriously damaged by storms at least twice. County records indicate that the bridge was rebuilt in 1964 after approximately “one-third of the Lawai Stream Bridge was demolished by floodwaters.”(2) However, most of the damage appears to have been sustained by the approach and parapet rails; the concrete arch appears intact and unaltered. A metal pipe rail has replaced the damaged parapets. The workmanship of the original bridge is quite good and is not obscured by the later additions and repairs. The historic quality of the bridge is obvious to travelers due to its unusual construction type; its historic associations with the cannery are probable, and cannot be confirmed without further research.

(1) Spencer Mason Architects, Historic Bridge Inventory: Island of Kauai, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1989), 39.

Significance Statement:

The Lawai Stream Bridge is significant for its contributions to the fields of transportation and engineering in Hawaii. The Lawai Stream Bridge is eligible under Criterion A as a prominent product of the early territorial government's public works program, and for its significant contributions to the development of Kauai's transportation system and the early history of Lawai. The bridge is also eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii, and as a rare remaining example of a once-common bridge type. Arch bridges are also an uncommon bridge type. The bridge was among the first reinforced concrete arch bridges in the islands and it is the only arch bridge remaining on Kauai. The design was technically innovative and the construction of the bridge can be considered a milestone design. The 1929 alteration of the bridge is representative of the "work of a master": Joseph Moragne of the County of Kauai Engineer's Office.

The Lawai Stream Bridge is one of the early examples of the progressive Territorial Highway System in Hawaii and is one of the earliest examples of the use of formal engineering expertise in bridge making by the new territorial government after the annexation of Hawaii by the United States. The arch bridge is an excellent example of bridge construction in the early twentieth century period on Kauai, employing new reinforced concrete technology. The Lawai Stream Bridge was one of a series of concrete arch bridges that ushered in a new era in bridge development after 1904. Bridges heretofore had been constructed of timber, stone or metal, but the new Territorial Superintendent of Public Works, C. S. Holloway, strongly recommended concrete arches for small spans. His assistant, J.H. Howland, sent prints of several of this type of bridge to each island's Road Engineer to encourage the Road Boards to adopt this type of bridge.(1) The bridge is the only reinforced concrete arch deck bridge on the island and one of only approximately five of this type remaining in the state. The design of the Lawai arch is identical to bridges constructed on Hawaii island (including Mamalahoa-Puuokalepa and Mamalahoa-Waiaama Bridges), as well as the Waipahu Street-Waikele Stream arch on Oahu.(2)

(1) Patricia Alvarez, Historic Bridge Inventory and Evaluation: Island of Hawaii and A History of Road and Bridge Development on the Island of Hawaii, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1987b), 193.
(2) Patricia Alvarez, Historic Bridge Inventory and Evaluation: Island of Hawaii and A History of Road and Bridge Development on the Island of Hawaii, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1987b), 193.

Inventory Form
(County/Private)

General Information

Bridge Number: 007120061112002

Popular Name: Mana Bridge No. 1

Feature Crossed: Mana Stream

Feature Carried: Kokee Road

Milepost: **County Private:** Kauai

Longitude: 159d-42m-53.58s **Latitude:** 21d-58m-22.61s

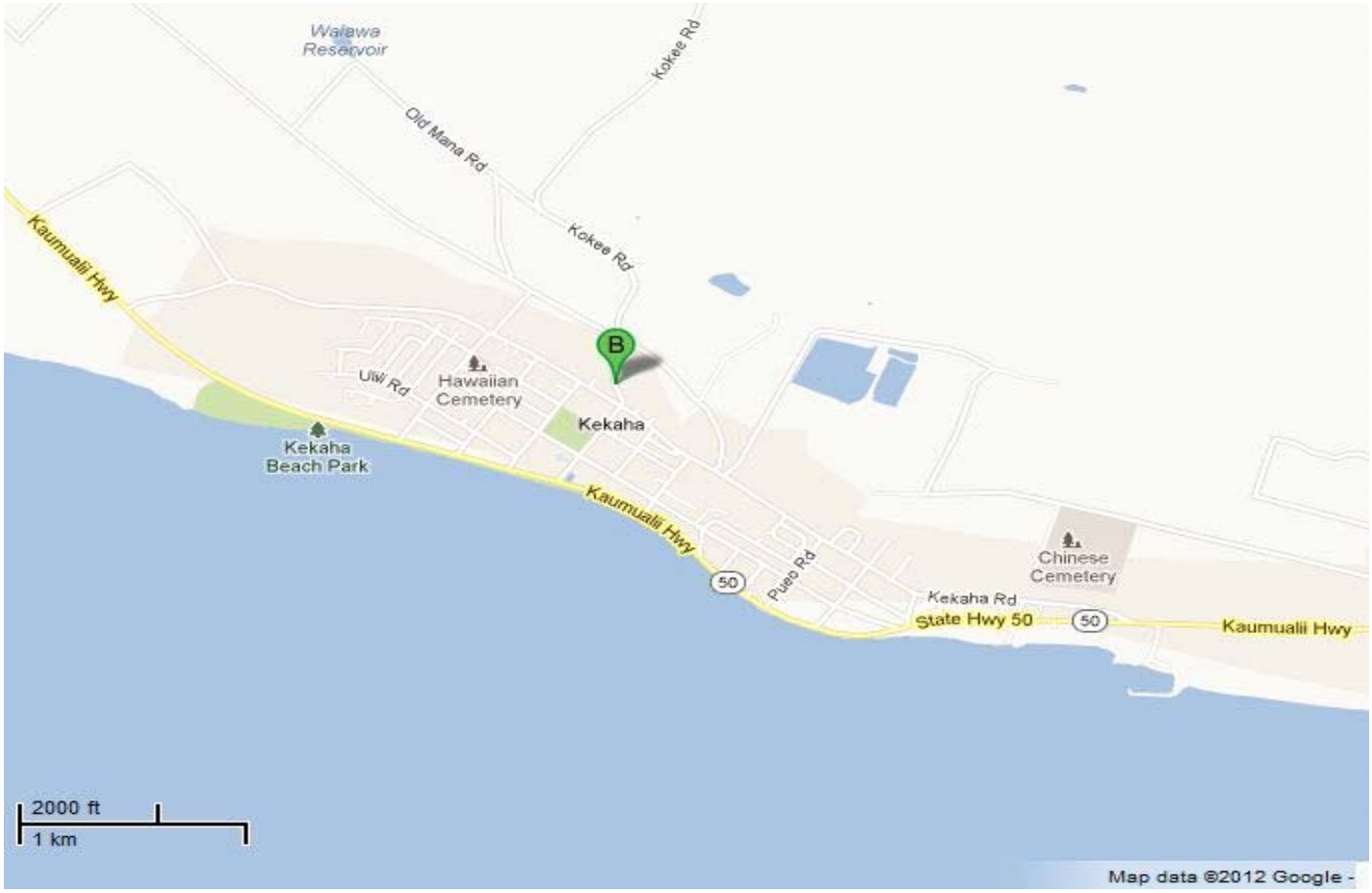
Location: TMK: 1-2-02

Historic Name: Mana Bridge No. 1

Designer/Engineer:

Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Slab	**Construction Date:** 1930	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 22.0 ft.	**Total Length:** 22.0 ft.	**Deck Width:** 26.7 ft.
Superstructure: Concrete Slab			
Substructure: Masonry Abutment			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Open Horizontal			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Mana Bridge carries Kokee Road across the Mana Stream. This reinforced concrete flat slab bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has open horizontal parapets with flat caps. The concrete deck is supported by concrete rubble masonry abutments. The parapet has been painted white. The workmanship of the bridge has not been obscured by additions or repairs. The simple beam and post design of the parapet with the single horizontal opening retains its historic feeling.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of a 1930's reinforced concrete bridge that is typical of its period in its use of materials and method of constriction. The bridge has artistic value for craftsmanship and design. This is one of the only 1930s bridges to have a beam and post design. The wooden form work of this poured in place concrete bridge is apparent, unlike pre-cast concrete features on newer bridges.

Inventory Form
(County/Private)

General Information

Bridge Number: 007350011135001

Popular Name: Nawiliwili Bridge

Feature Crossed: Nawiliwili Stream

Feature Carried: Paena Loop

Milepost: **County Private:** Kauai

Longitude: 159d-21m-09.51s **Latitude:** 21d-57m-38.59s

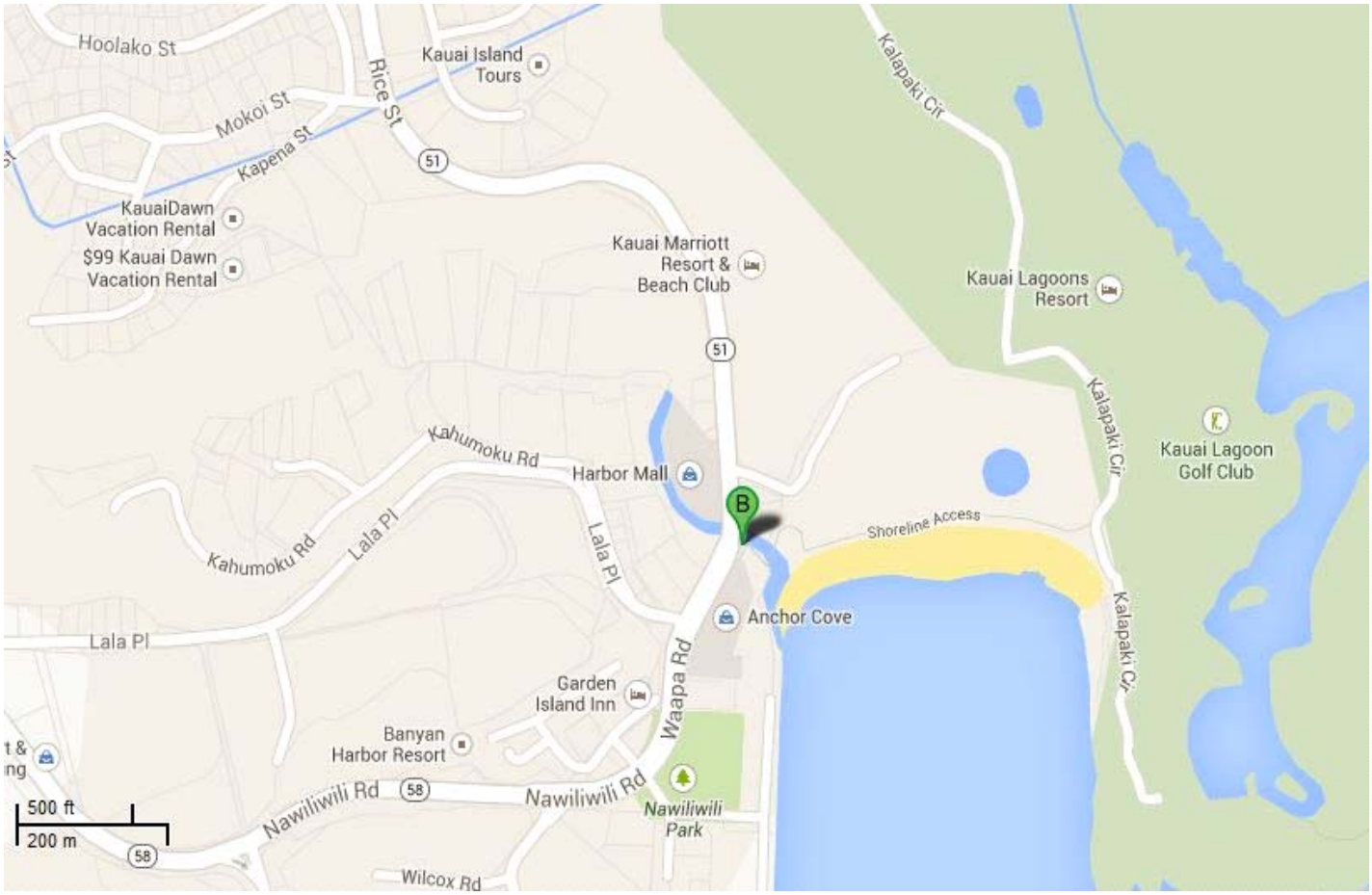
Location: TMK: 3-2-06:1

Historic Name: Nawiliwili Bridge

Designer/Engineer: Joseph H. Moragne

Builder/Contractor:

Location Map:



Construction Information

Bridge Type: Concrete Girder	**Construction Date:** 1930	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 50.0 ft.	**Total Length:** 53.0 ft.	**Deck Width:** 29.0 ft.
Superstructure: Concrete Through Girder			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid Panel with Cap			
Setting:			
Other Features: Date of bridge construction (1920) incised on mauka parapet			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** A, C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Transportation, Engineering		

Narrative Description:

The Nawiliwili Stream Bridge, a reinforced concrete deck girder structure, was constructed in 1920 to carry the Old Government Road over the Nawiliwili Stream. At the time of its construction, the Nawiliwili Stream Bridge was located on the primary road to Nawiliwili Harbor. The bridge is also known as a “Duke’s Bridge”. The Nawiliwili Stream Bridge is in its original location near Nawiliwili Harbor. The setting has changed substantially, since the original county road was by-passed by a new roadway. Further, the shoreline area has become extensively developed for resort use in the last decade. The bridge’s original design retains its integrity and has not been altered. The original concrete material of the bridge has not been changed by major repairs but has been affected by spalling and other types of deterioration in small areas. The Nawiliwili Stream Bridge is one of two reinforced concrete deck girder bridges on Kauai (the other is the 1911 Hanapepe Bridge). The engineering complexity could be considered standard for the period. However, the workmanship of this bridge is still evident in the formwork and simple decorative elements, such as the paneled parapet. There is a definite historic feeling, due largely to the bridge’s unusual medial parapet. The association of this bridge with early county bridge building, as well as with the development of shipping in Lihue can be interpreted by an informed observer.

Significance Statement:

The Nawiliwili Stream Bridge is significant for its contributions to the fields of transportation and engineering in Hawaii. The Nawiliwili Stream Bridge is eligible under Criterion A as a prominent product of the County of Kauai's public works program, and for its significant contributions to the development of the island's transportation system and the history of Nawiliwili Harbor. The bridge is also eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. Moreover, the bridge is representative of the "work of a master": Joseph H. Moragne of the Kauai County Engineer's Office. It is also the longest concrete bridge with the longest concrete span built post-war (1945) on the island of Kauai in the historic study period prior to 1969.

The Nawiliwili Stream Bridge is a good example of county bridge construction in the early twentieth century period on Kauai. The bridge is one of two remaining reinforced concrete deck girder bridges on the island and has the longest span of its type pre-WWII. With a maximum span of fifty feet, the bridge was more technically complex than other bridges constructed during this period. The Nawiliwili Stream Bridge was funded entirely by the County of Kauai. (1) The plans were drawn by Joseph H. Moragne, the Kauai County Engineer; the builder is unknown.

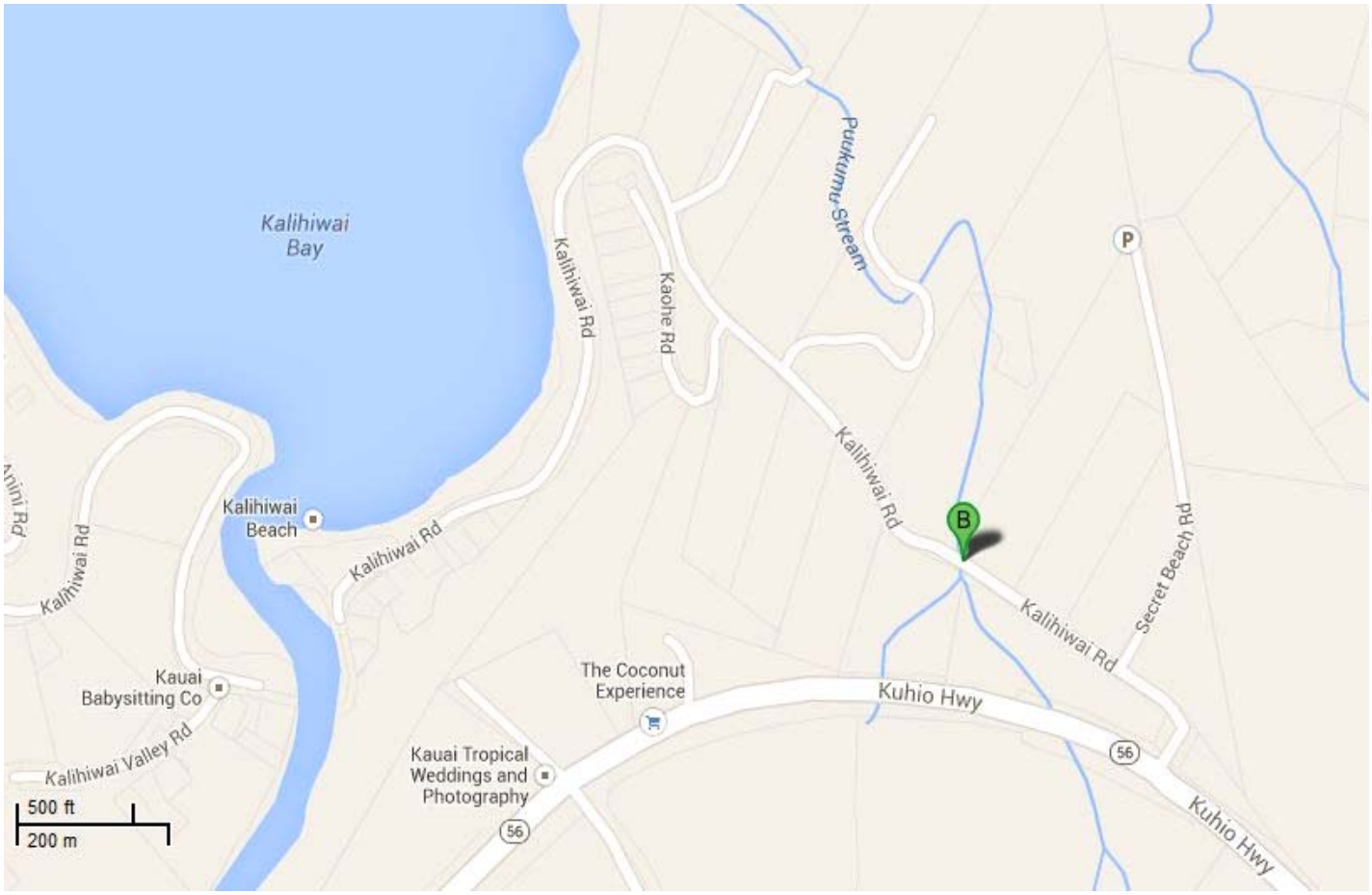
(1) Spencer Mason Architects, Historic Bridge Inventory: Island of Kauai, prepared for the State of Hawaii Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation Federal Highway Administration (Honolulu, 1989), 163.

Inventory Form
(County/Private)

General Information

Bridge Number: 007520171152002	
Popular Name: Puukumu Bridge	
Feature Crossed: Puukumu Stream	
Feature Carried: Kalihiwai Road	
Milepost: **County Private:** Kauai	
Longitude: 159d-25m-12.72s **Latitude:** 22d-12m-56.44s	
Location: TMK: 5-2-02	
Historic Name: Puukumu Bridge	
Designer/Engineer:	
Builder/Contractor:	

Location Map:



Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1913	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 1	**Max Span:** 22.0 ft.	**Total Length:** 25.0 ft.	**Deck Width:** 19.5 ft.
Superstructure: Concrete Tee Beam			
Substructure: Masonry Abutment			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Puukumu Stream Bridge carries Kalihiwai Road across the Puukumu Stream. This reinforced concrete bridge is in its original location, but the setting has undergone little change. The bridge has concrete solid panel parapets with tapered caps. The concrete deck is supported by concrete rubble masonry abutments. The original reinforced concrete material of the bridge remains intact, however there has been some deterioration in the concrete parapet walls and cap as a result of collisions. The workmanship of the original bridge is quite high and is not substantially obscured by additions or repairs. The historic quality of the bridge is obvious to travelers due to its early twentieth-century design and narrowness.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of an early 1910's concrete tee beam bridge that is typical of its period in its use of materials, method of constriction, craftsmanship, and design.

Inventory Form
(County/Private)

General Information

Bridge Number: 007280500728003	
Popular Name: Wailana Bridge No. 2	
Feature Crossed: Wailana Stream	
Feature Carried: Maluhia Road	
Milepost: 3.11 mi.	**County Private:** Kauai
Longitude: 159d-27m-56.44s	**Latitude:** 21d-54m-23.03s

Location: TMK: 2-8-04 & 2-8-06
Historic Name: Wailana Bridge No. 2
Designer/Engineer:
Builder/Contractor:

Location Map:

Construction Information

Bridge Type: Concrete Tee Beam	**Construction Date:** 1936	**Replaced?** No
Altered? Yes	**Alteration Date(s):** Unknown	
Alteration Type(s):		
Alteration Description(s): Pedestrian bridge added.		

Bridge Information

Number of Spans: 1	**Max Span:** 25.0 ft.	**Total Length:** 28.0 ft.	**Deck Width:** 25.6 ft.
Superstructure: Concrete Tee Beam			
Substructure: Concrete Abutment Wall			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: Eligible	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Wailana Stream Bridge #2 carries Maluhia road across the Wailana Stream. This reinforced concrete girder bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has concrete solid parapets with flat caps. A pedestrian walkway with a timber deck and chain link fence was added to the upstream side of the bridge. The construction date of the bridge, 1936 is engraved on the parapet but half of the text is embedded under the heavy asphalt layer.

Significance Statement:

The bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of a 1930's reinforced concrete girder bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

Inventory Form
(County/Private)

General Information

Bridge Number: 007280500728001	
Popular Name: Wailana Bridge No. 4	
Feature Crossed: Wailana Stream	
Feature Carried: Maluhia Road	
Milepost: 0.80 mi.	**County Private:** Kauai
Longitude: 159d-28m-03.98s	**Latitude:** 21d-56m-20.41s

Location: TMK: 2-7-02
Historic Name: Wailana Bridge No. 4
Designer/Engineer:
Builder/Contractor:

Location Map:

Construction Information

Bridge Type: Concrete Slab	**Construction Date:** 1910	**Replaced?** No
Altered? No	**Alteration Date(s):**	
Alteration Type(s):		
Alteration Description(s):		

Bridge Information

Number of Spans: 2	**Max Span:** 17.0 ft.	**Total Length:** 46.0 ft.	**Deck Width:** 31.4 ft.
Superstructure: Concrete Slab			
Substructure: Concrete Abutment Wall and Concrete Wall Pier			
Floor/Decking: Concrete Deck with AC Overlay			
Parapets/Railings: Concrete Solid with Cap			
Setting:			
Other Features:			

Historic Association

Eligibility Status: High Preservation Value	**Criteria:** C	**State/National Registered?** No
Current Function: Bridge	**Historic Function:** Bridge	
Area of Significance: Engineering		

Narrative Description:

The Wailana Stream carries Maluhia road across the Wailana Stream. This reinforced concrete bridge is in its location, is generally in good condition, and its materials remain intact. The bridge has concrete solid parapets with flat caps. The concrete deck is supported by the concrete abutment. The northeast corner of the parapet is damaged however, the bridge retains its historic feeling.

Significance Statement:

This bridge is eligible under Criterion C for its association with early developments in concrete bridge construction in Hawaii. It is a good example of a 1910's reinforced concrete slab bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.