

# APPENDIX C

## THE ISLANDS OF MAUI AND MOLOKAI

1. Maui and Molokai 2024 Updated State Bridge Matrix
2. Maui and Molokai 2013 State Bridge Matrix
3. Maui and Molokai 2013 County Bridge Matrix

## MAUI AND MOLOKAI HISTORY

The second largest island, Maui (also called The Valley Island) is 728.8 square miles in land area. It is composed of two shield volcanoes, which constitute east and west Maui. Lava flows from the two volcanoes have formed a connecting isthmus which is the location of the contiguous port of Kahului and the county seat of Wailuku, the center of population and the seat of government, as well as some of the most fertile and productive agricultural land in the state. The highest peak, Haleakala (10,025 feet), is the largest extinct volcanic crater in the world.

The County of Maui is comprised of the islands of Maui, Molokai, Kahoolawe and Lanai. However, Kahoolawe and Lanai do not have any bridges which have been categorized as “historic”. The majority of Maui’s historic bridges are located in wet, windward (northeastern) Maui; these represent the county’s efforts to forge a road through the “wilderness of the ditch country” to the rural community of Hana. The “ditch” was East Maui Irrigation Company’s extraordinary late-nineteenth century engineering effort which brought water from the East Maui mountains to the dry central plain. For the most part, road construction paralleled the course of the irrigation ditch. More than eighty bridges were constructed along the east end of Maui between 1908 and 1940, assuring overland access to the previously isolated Hana district from the rest of the island.



FIGURE 1. MAP OF MAUI (SOURCE: [HTTPS://HISTATEGIS.MAPS.ARCGIS.COM/](https://histategis.maps.arcgis.com/)).



The last surviving piece of the old rural Hawaii, Molokai (also called The Friendly Island) is the fifth largest island with only 38 miles from end to end and just 10 miles wide, comprising 260 square miles in total. It was born from three volcanic eruptions that occurred 1.5 million years ago and was mainly formed in two parts: One side is a flat, austere, arid desert; the other is a lush, green, steeped tropical Eden. The last eruption produced the island's "thumb"—a peninsula jutting out of the steep cliffs of the north shore. Those 3,250-foot-high sea cliffs, the highest in the world, stand along Mount Kamakou (4961 feet), stretching 14 majestic miles along Molokai's north shore.

Most highways and roads were newly constructed after the 1930s, with the earliest roads mainly designed for horse-drawn wagons. Molokai does not have any bridges constructed prior to 1959 which have been categorized as "historic."



**FIGURE 2. MAP OF MOLOKAI (SOURCE: [HTTPS://HISTATEGIS.MAPS.ARCGIS.COM/](https://histategis.maps.arcgis.com/)).**

# Maui and Molokai 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)
009003600502419	East Hanawi Stream Bridge	East Hanawi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502131	East Wailuaiki Stream Bridge	East Wailuaiki Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501145	Haipuaena Stream Bridge	Haipuaena Stream	Hana Highway	1912	Concrete Tee Beam	Concrete Solid with Cap	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502402	Hanawi Stream Bridge	Hanawi Stream	Hana Highway	1926	Closed Spandrel Arch	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003770500255	Hapapa Bridge	Hapapa Gulch	Kekaulike Avenue	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Significant for economic development</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Good example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>
009003600502795	Heleleikeoha Stream Bridge	Heleleikeoha Stream	Hana Highway	1917	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600500509	Hoalua Stream Bridge	Hoalua Stream	Hana Highway	1929	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000300300346	Honolua Stream Bridge	Honolua Stream	Honoapiilani Highway	1924	Concrete Tee Beam	Concrete Solid	No	Eligible	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Intact example of 1920s reinforced concrete bridge</li> </ul>
009003600502958	Honomaele Stream Bridge	Honomaele Stream	Hana Highway	1924	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501372	Honomanu Stream Bridge	Honomanu Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000321200060	Kaahumanu Avenue Underpass-Naniloa Drive Overpass	Kaahumanu Avenue	Naniloa Drive	1936	Concrete Tee Beam	Concrete Open Greek Cross	Yes	Eligible***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• One of the earliest rigid-frame bridges built in Hawaii, and one of only two grade-separation structures on Maui</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Representative of work of a master: William R. Bartels</li> </ul>
009003600500858	Kaaiea Stream Bridge	Kaaiea Stream	Hana Highway	1928	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>

\* 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.

# Maui and Molokai 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)
009003600502664	Kahawaihapapa Stream Bridge	Kahawaihapapa Stream	Hana Highway	1922	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502339	Kapaula Stream Bridge	Kapaula Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009004600501611	Kaunakakai 16-Cell Culvert	Kaunakakai Stream	Maunaloa Highway	1953	Concrete Pipe Culvert	Metal Thrie Beam	No	Eligible	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria C/c</li> <li>• Only sixteen cell culvert in the state</li> <li>• Unique culvert because most culverts in state are two to five cells</li> </ul>
009003600503347	Kawaipapa Stream Bridge	Kawaipapa Stream	Hana Highway	1947	Concrete Tee Beam	Concrete Open Horizontal	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Bridge was not listed as a part of the Hana Highway Historic Bridge District nomination form; however, it is within the boundaries of and is a contributing feature to the historic district</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502681	Keaiki Stream Bridge	Keaiki Stream	Hana Highway	1921	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501317	Kolea (Punalau Stream) Bridge	Punalau Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502189	Kopiliula Stream Bridge	Kopiliula Stream	Hana Highway	1926	Concrete Girder	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502523	Kuhiwa Stream Bridge	Kuhiwa Stream	Hana Highway	1926	Closed Spandrel Arch	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502546	Kupukoi Stream Bridge	Kupukoi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502779	Lanikele Stream Bridge	Lanikele Stream	Hana Highway	1917	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600500824	Makanali Stream Bridge	Makanali Stream	Hana Highway	1928	Concrete Slab	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>

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\*\* Historic resources adjacent to resource.

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# Maui and Molokai 2024 Updated State Bridge Matrix

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009003600502502	Makapipi Stream Bridge	Makapipi Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502835	Mokulehua Stream Bridge	Mokulehua Stream	Hana Highway	1908	Concrete Slab	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600500624	Nailiilhaele Bridge	Nailiilhaele Stream	Hana Highway	1930	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501540	Nuaailua Bridge	Nuaailua Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502922	Oilowai Stream Bridge	Oilowai Stream	Hana Highway	1914	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600500797	Oopuola Bridge	Oopuola Stream	Hana Highway	1925	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502301	Paakea Stream-Unnamed Bridge No.3	Paakea Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501679	Palauhulu Stream Bridge	Palauhulu Stream	Hana Highway	1916	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000300304184	Papanahoa Bridge	Papanahoa Stream	Kahekili Highway	1924	Concrete Slab	Metal Thrie Beam	No	Not Eligible	Loss of integrity due to replacement parapets in 1980
009003600501662	Piinaau Stream Bridge	Piinaau Stream	Hana Highway	1916	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502231	Puakaa Stream Bridge	Puakaa Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501098	Puohokamoa Bridge	Puohokamoa Stream	Hana Highway	1912	Concrete Tee Beam	Concrete Solid with Cap	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>

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\*\* Historic resources adjacent to resource.

\*\*\* Formerly "High Preservation Value."

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# Maui and Molokai 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)
009003600502652	Pupape Stream Bridge	Pupape Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502801	Ulaino Stream Bridge	Ulaino Stream	Hana Highway	1914	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502298	Unnamed Bridge No.1 (Waiohuolua Bridge)	Unnamed Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid with Cap	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502300	Unnamed Bridge No.2	Unnamed Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Solid with Cap	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003400500004	Waiehu Twin 12 ft. Culvert	Waiehu Stream	Kahekili Highway	1967	Metal Corrugated Culvert	Metal Thrie Beam	No	Not Eligible**	Research did not indicate significance under NRHP Criteria A, B, C, or D or HRS 6E criteria a, b, c, d, or e.
009003600500990	Waikamoi Stream Bridge	Waikamoi Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501942	Waikani Stream Bridge	Waikani Stream	Hana Highway	1926	Open Spandrel Arch	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Constructed by prominent native Hawaiian contractor Moses Akiona and skilled builders</li> <li>• Only example of a continuous concrete arch deck bridge on Maui</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000300303404	Waikapu Stream Bridge	Waikapu Stream	Honoapiilani Highway	1937	Concrete Slab	Concrete Open Greek Cross	No	Eligible	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Significant for economic development</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Good example of Federal Aid bridges constructed by the Territory in the 1930s</li> <li>• Representative of work of a master: William R. Bartels</li> </ul>
009003600502250	Waiohue Stream Bridge	Waiohue Stream	Hana Highway	1937	Concrete Tee Beam	Concrete Solid with Cap	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600501811	Waiokamilo Stream Bridge	Waiokamilo Stream	Hana Highway	1921	Concrete Tee Beam	Concrete Open Greek Cross	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600502702	Waioni Stream Bridge	Waioni Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"> <li>• NRHP/HRS 6E Criteria A/a, C/c</li> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>

\* 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.

# Maui and Molokai 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)
009003600502086	West Wailuaiki Stream Bridge	West Wailuaiki Stream	Hana Highway	1937	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"><li>• NRHP/HRS 6E Criteria A/a, C/c</li><li>• Contributes to the Hana Highway Historic Bridge District</li><li>• Part of best remaining intact example of a belt road system in the state</li><li>• 20th century example of bridge engineering and construction</li><li>• Significant for commerce and social history</li><li>• See National Register of Historic Places Nomination Form in appendices</li></ul>
009003600502697	West Waioni Stream Bridge	West Waioni Stream	Hana Highway	1920	Concrete Tee Beam	Concrete Open Vertical	Yes	Listed, Contributing***	<ul style="list-style-type: none"><li>• NRHP/HRS 6E Criteria A/a, C/c</li><li>• Contributes to the Hana Highway Historic Bridge District</li><li>• Part of best remaining intact example of a belt road system in the state</li><li>• 20th century example of bridge engineering and construction</li><li>• Significant for commerce and social history</li><li>• See National Register of Historic Places Nomination Form in appendices</li></ul>

\* 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

<b>Bridge Number:</b> 009003600502419		<b>TMK:</b> 212999999, 212001001 (adjacent)	
<b>Common Name:</b> East Hanawi Stream Bridge			
<b>Historic Name:</b> East Hanawi Stream Bridge			
<b>Feature Crossed:</b> East Hanawi Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui		<b>Milepost:</b> 24.159	
<b>Latitude:</b> 20.809879		<b>Longitude:</b> -156.107573	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 18.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Rock Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b> Bridge name incised on cap			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The East Hanawi Stream Bridge is a single-span, concrete tee beam bridge that carries the Hana Highway across the East Hanawi Stream. The reinforced concrete deck slab is supported by four concrete tee beams, and rests on concrete rock masonry abutments that bear directly on natural rock formations. The bridge deck carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete open vertical railings with caps that have the bridge's name incised on them.		



## Bridge Inventory Form

### Statement of Significance:

The East Hanawi Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The East Hanawi Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, it is not significant under Criterion B.

The East Hanawi Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. South parapet, facing southwest.



## Bridge Inventory Form



Image 3. West CRM abutment and deck girders, facing west.




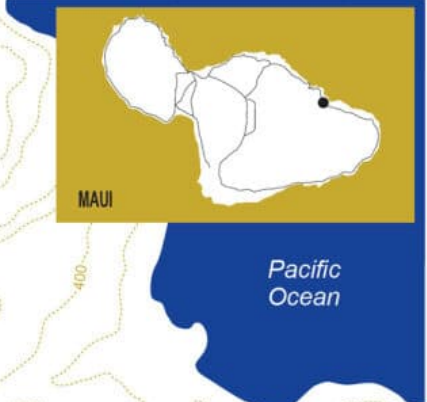
## Bridge Inventory Form

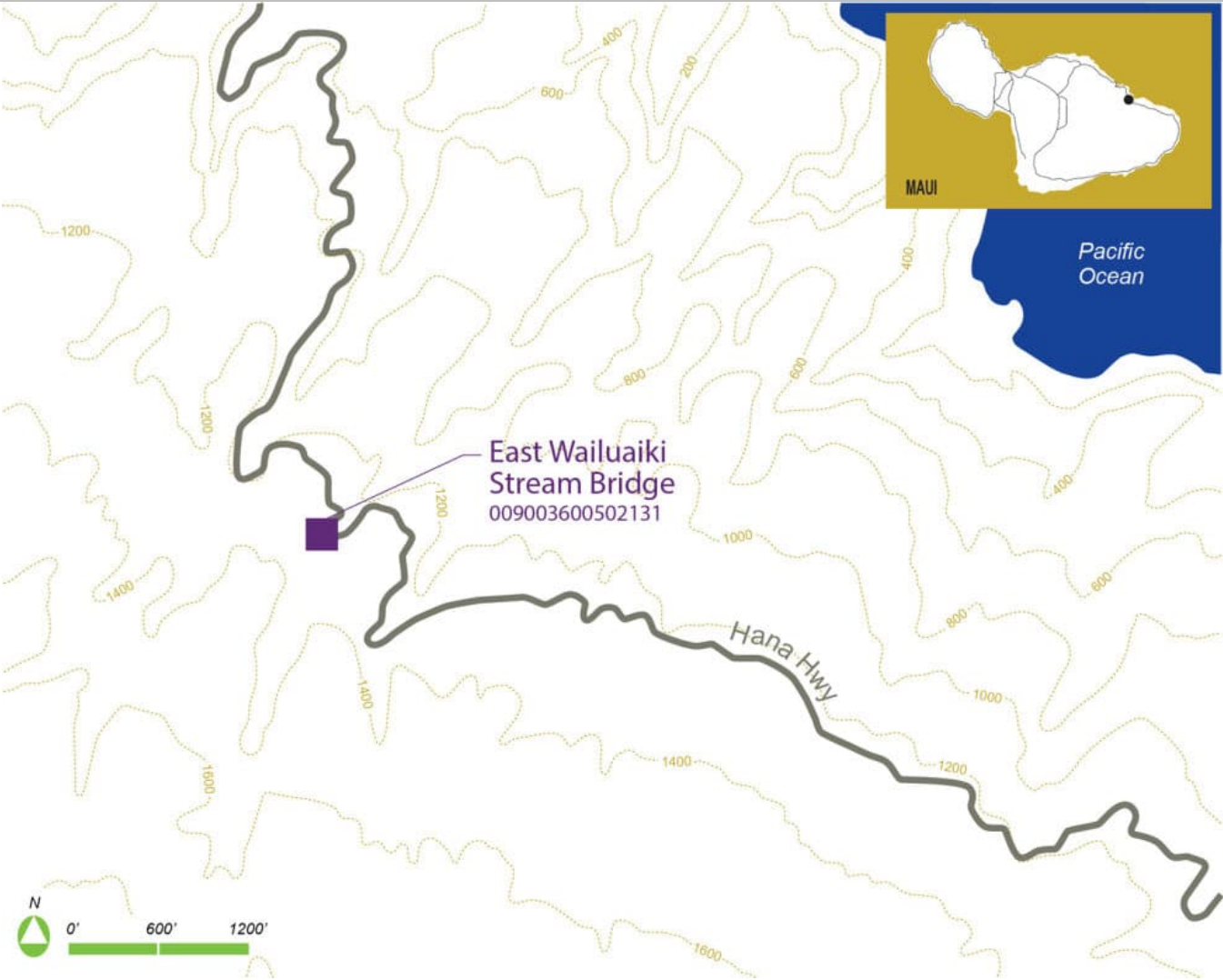


Image 4. East abutment and deck girders, facing east.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502131		<b>TMK:</b> 211999999, 211002001 (adjacent)	
<b>Common Name:</b> East Wailuaiki Stream Bridge			
<b>Historic Name:</b> East Wailuaiki Stream Bridge			
<b>Feature Crossed:</b> East Wailuaiki Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 21.269		
<b>Latitude:</b> 20.82024	<b>Longitude:</b> -156.1358		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015	
<b>Alterations:</b> Repaired spalls and delaminations on upstream and downstream bridge railings, repaired spalls and delamination on concrete girders, asphalt concrete (AC) surface has been repaved.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 30.8 ft.	<b>Total Length:</b> 34.1 ft.	<b>Deck Width:</b> 20.3 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The East Wailuaiki Stream Bridge carries Hana Highway across East Wailuaiki Stream. This single span concrete tee beam bridge rests on rock masonry abutments, which themselves bear directly on natural rock formations. A concrete deck with asphalt concrete (AC) overlay supports a single-lane road, flanked by concrete open vertical parapets. Approach walls constructed in rock masonry are found adjacent to all end posts.		



# Bridge Inventory Form

## Statement of Significance:

The East Wailuaiki Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The East Wailuaiki Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Wailuaiki Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach view of bridge, facing south.



Image 3. View of northeast parapet, facing north.



## Bridge Inventory Form



Image 4. View of northwest CRM abutment and deck girders, facing northwest.

## Bridge Inventory Form


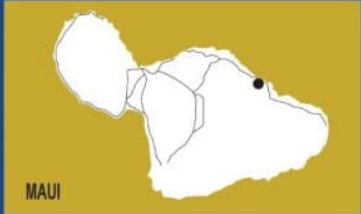


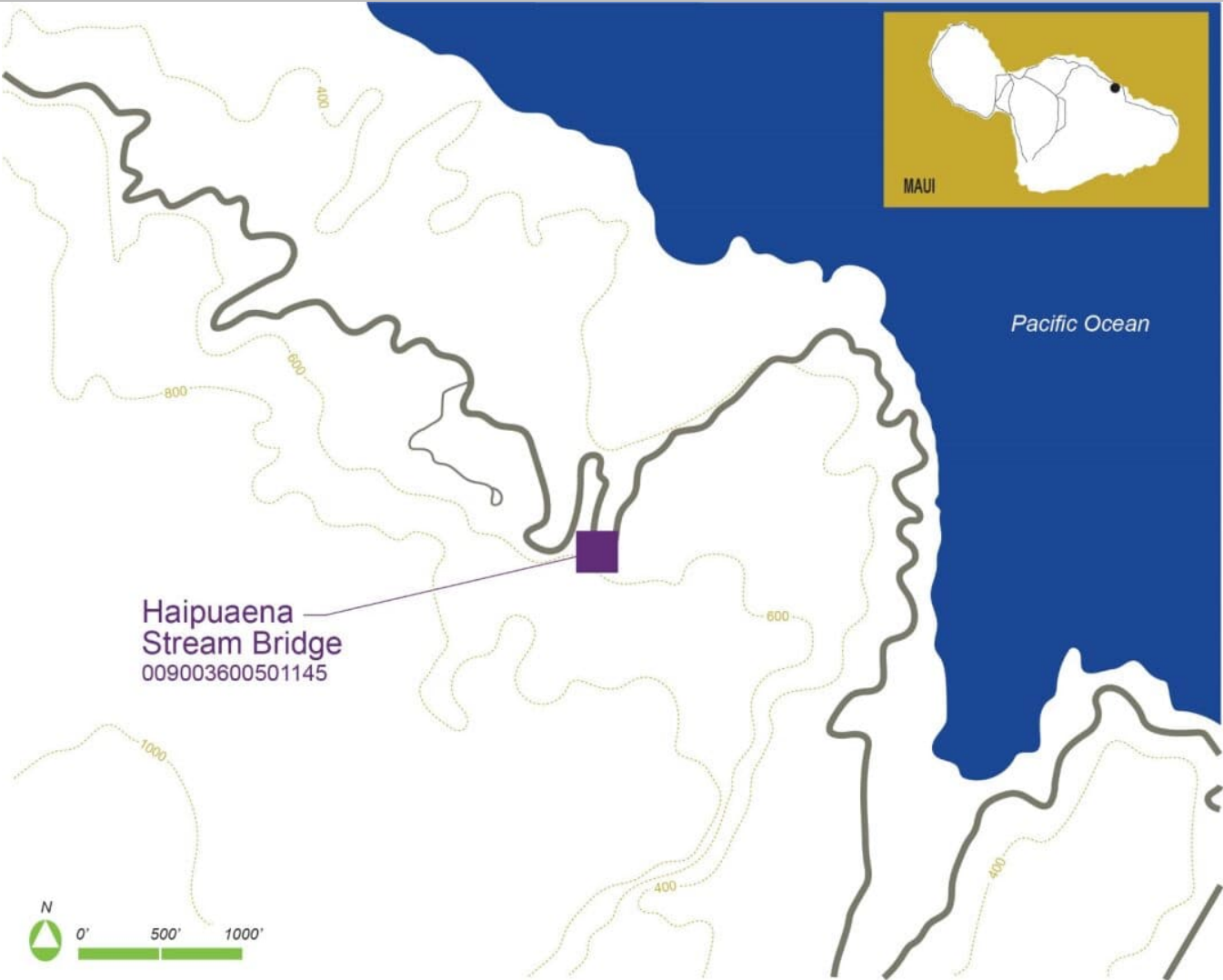
Image 5. View of southeast CRM abutment and deck girders, facing southwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501145		<b>TMK:</b> 211999999, 211001052 (adjacent)	
<b>Common Name:</b> Haipuaena Stream Bridge			
<b>Historic Name:</b> Haipuaena Stream Bridge			
<b>Feature Crossed:</b> Haipuaena Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 11.439		
<b>Latitude:</b> 20.86649	<b>Longitude:</b> -156.1763		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



Haipuaena Stream Bridge  
009003600501145

Pacific Ocean

MAUI

0' 500' 1000'

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1912
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 16.1 ft.	<b>Total Length:</b> 34.1 ft.	<b>Deck Width:</b> 14.4 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Double Column Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Other Features:</b> Construction date (A.D. 1911) incised on makai parapet			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Haipuaena Stream Bridge carries the Hana Highway over the Haipuaena Stream. This double-span concrete continuous tee beam bridge rests on concrete abutments and one concrete double column pier. The abutments and pier columns bear directly on natural rock formations. The reinforced concrete deck rests on four concrete tee beams and supports a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete solid		



## Bridge Inventory Form

railings with caps, with the bridge construction date (A.D. 1911) incised on the makai parapet. Due to weathering of this parapet, the inscription can only be confirmed by original construction plans.

### Statement of Significance:

The Haipuaena Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Haipuaena Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Haipuaena Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete solid with cap parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1910s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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. Note construction date faintly incised on parapet as "AD 1912."



## Bridge Inventory Form



Image 2. General view of roadway and bridge approach, facing southwest.



Image 3. View of southern parapet, facing southeast.



## Bridge Inventory Form

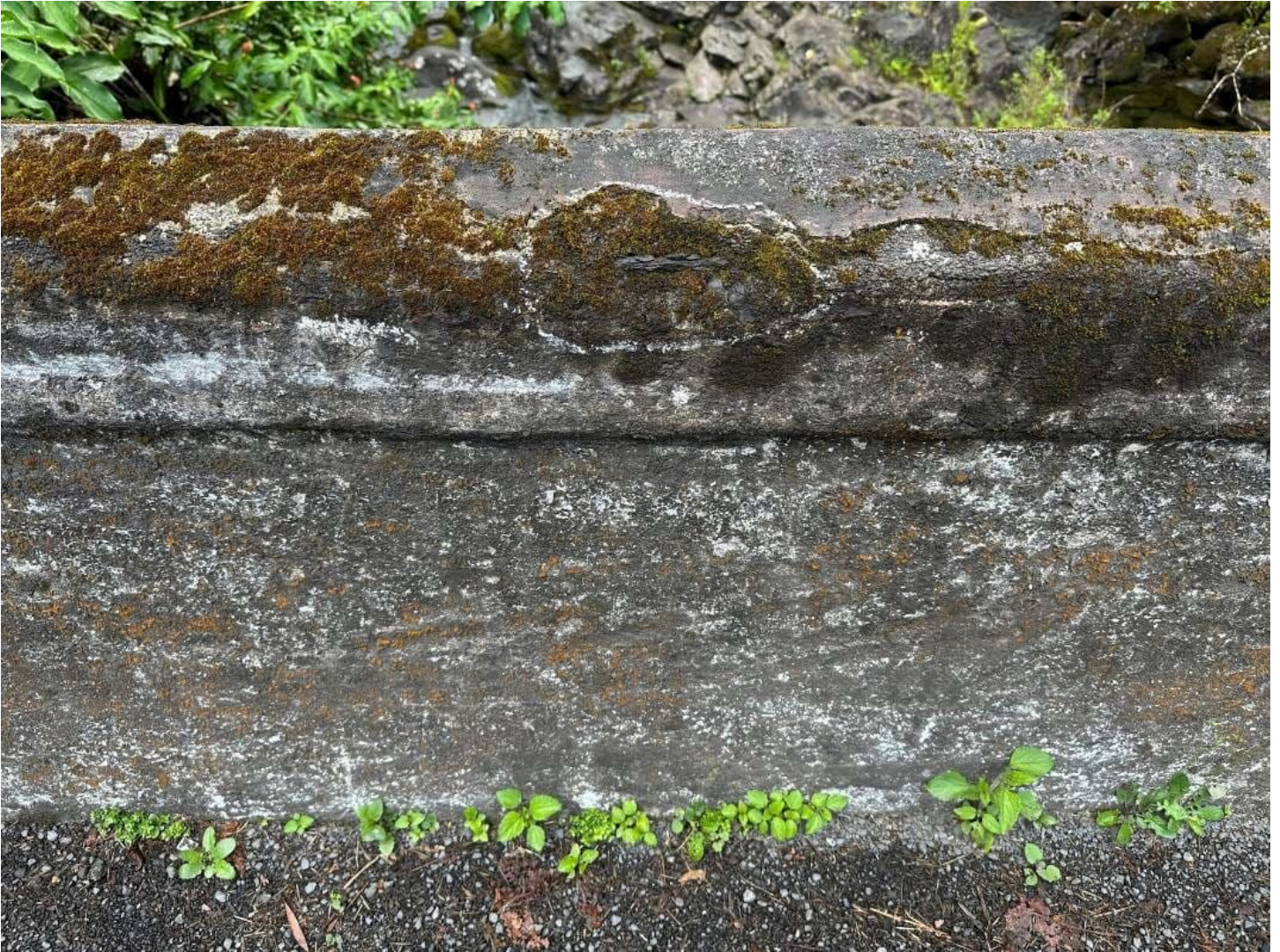


Image 4. Detail of southern parapet, facing south.



## Bridge Inventory Form



Image 5. View of northern parapet, facing northwest.



## Bridge Inventory Form



Image 6. View of pier, western abutment, and deck girders, facing west.



## Bridge Inventory Form


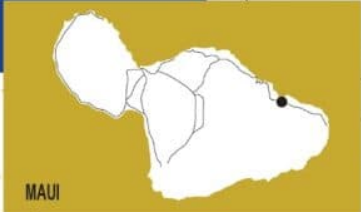


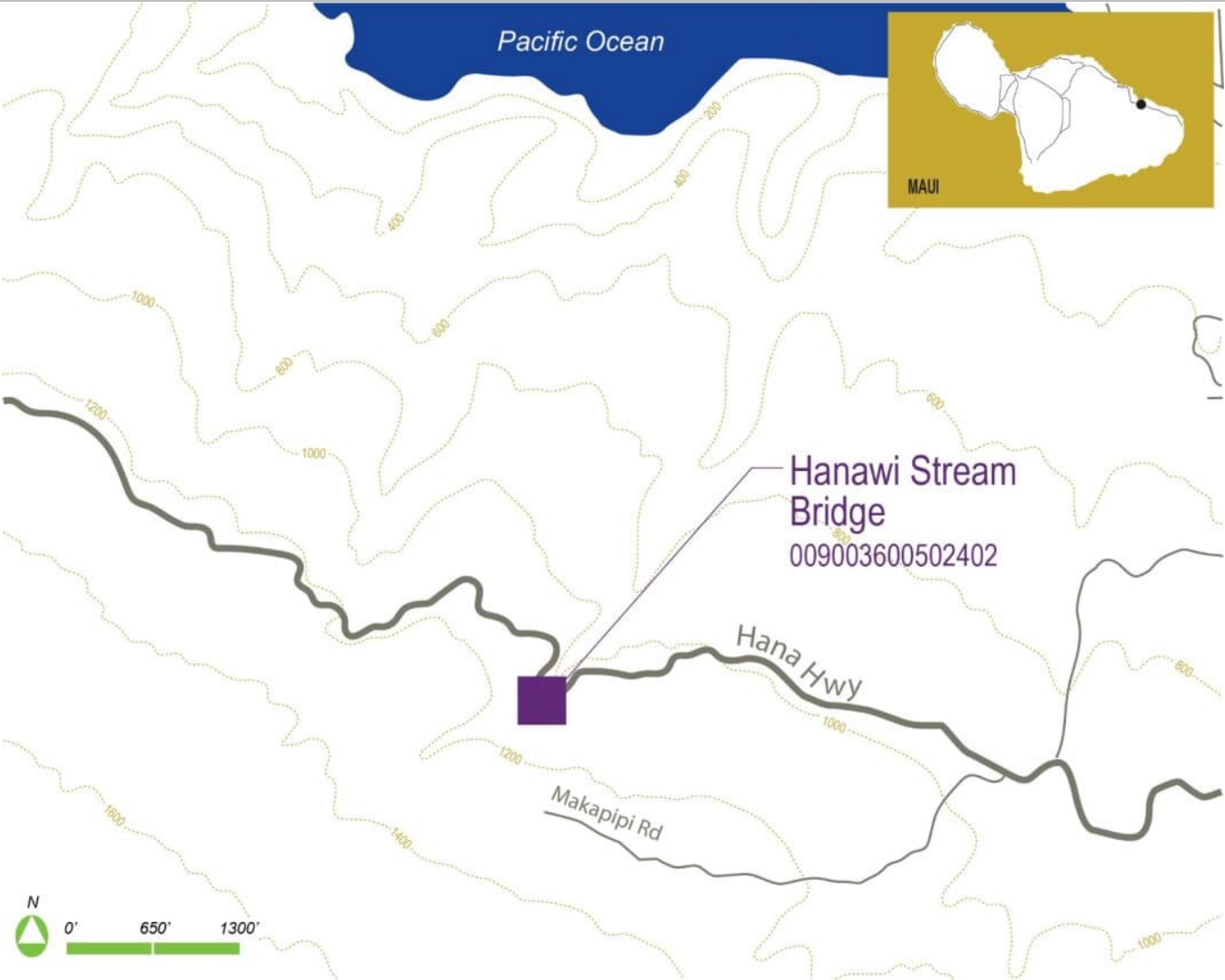
Image 7. View of pier, eastern abutment, and deck girders, facing east.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502402		<b>TMK:</b> 212999999, 212004006 (adjacent)	
<b>Common Name:</b> Hanawi Stream Bridge			
<b>Historic Name:</b> Hanawi Stream Bridge			
<b>Feature Crossed:</b> Hanawi Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 24.02		
<b>Latitude:</b> 20.80939	<b>Longitude:</b> -156.1094		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

**Hanawi Stream Bridge**  
009003600502402

Hana Hwy

Makapipi Rd

Pacific Ocean

MAUI

N  
0' 650' 1300'

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Closed Spandrel Arch	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 36.1 ft.	<b>Total Length:</b> 60.0 ft.	<b>Deck Width:</b> 23.6 ft.
<b>Superstructure:</b> Reinforced Concrete Closed Spandrel Arch			
<b>Substructure:</b> Reinforced Concrete Abutment			
<b>Floor/Decking:</b> Asphalt Concrete (AC) Pavement			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Hanawi Stream Bridge carries the Hana Highway over the Hanawi Stream. This single-span closed spandrel arch bridge rests on concrete abutments. A narrow roadway paved in asphalt concrete (AC) covers the deck and is flanked by concrete open vertical railings.		

## Bridge Inventory Form

### Statement of Significance:

The Hanawi Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Hanawi Stream Bridge is a rare arched bridge that is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards. The same 2015 preservation plan noted the presence of a bridge pier wall located downstream of the bridge but concluded there was no connection between that and the Hanawi Stream Bridge.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Hanawi Stream Bridge is significant under Criterion C as a good example of a rare arched bridge, but it was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is rare in type, but typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 east. Note presence of remnant of earlier bridge unconnected to the Hanawi Stream Bridge.

## Bridge Inventory Form



Image 2. Approach to bridge and view of southwest parapet, facing south.



## Bridge Inventory Form



Image 3. Northeast parapet, facing north.



## Bridge Inventory Form



Image 4. General view of bridge, facing southwest.



## Bridge Inventory Form



Image 5. View of northwest parapet, facing northwest.



## Bridge Inventory Form

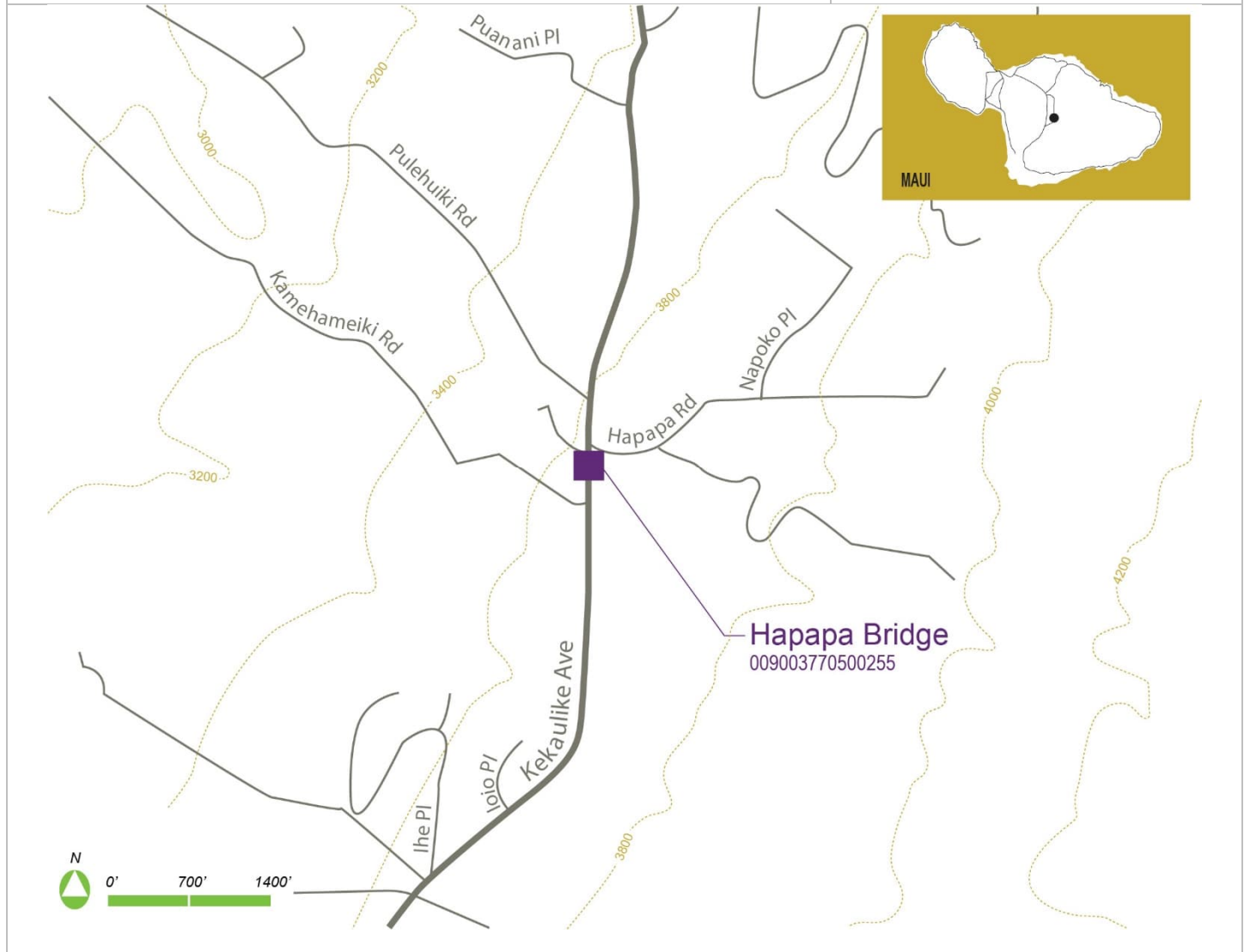


Image 6. View of southeast parapet, facing southeast.

# Bridge Inventory Form

## General Information

Bridge Number: 009003770500255		TMK: 223012999	
Common Name: Hapapa Bridge			
Historic Name: Hapapa Bridge			
Feature Crossed: Hapapa Gulch			
Feature Carried: Kekaulike Avenue/Route 377			
Island: Maui		Milepost: 6.62	
Latitude: 20.76033		Longitude: -156.3072	
Ownership: State			Image Date: 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1972, 1986	
<b>Alterations:</b> Thrie beams added to end posts (1972) and across parapets (1986).	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 23.0 ft.	<b>Total Length:</b> 24.9 ft.	<b>Deck Width:</b> 24.6 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Other Features:</b> Bridge construction date and name incised on end posts.			

## Historic Information

<b>NRHP Status:</b> Eligible	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>SIHP No.:</b> N/A	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b>		<b>Contributing:</b>
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1933		
<b>Narrative Description:</b>  The Hapapa Bridge carries Kekaulike Avenue over Hapapa Gulch. This single-span concrete tee beam bridge rests on reinforced concrete abutments. The concrete deck carries a two-lane roadway paved in asphalt concrete (AC) overlay, and is flanked by solid concrete panel parapets with cap railings and curved end posts. The bridge's construction date and name are incised on the end posts. Thrie beams are located in front of the parapets.		

# Bridge Inventory Form

## Statement of Significance:

The Hapapa Bridge is one of four bridges constructed on Kekaulike Avenue in 1933, followed by two more in 1934, as part of Federal Aid Project No. F.A.P. 13A and indicated in plans as Bridge No. 11. The bridge was constructed over the Hapapa Gulch along Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated, but the roadway and bridges were much needed to accommodate major economic activities, such as ranching and small vegetable and flower farming. Once completed, this road allowed for the economic development of the area by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. This bridge is an example of Federal Aid bridges that were constructed in the Territory with funds designated for secondary roads. Its design, a concrete tee beam with ornamental railing, was a common type of bridge found in Hawaii prior to World War II. In 1972 as part of Project No. HWY-M-02-72, three beams were added to the bridge's end posts. In 1986 as part of Federal Aid Project No. RS-0377(2) three beams were added in front of the bridge parapets.

Because the bridge is associated with major transportation improvements on Maui during the Territorial period, it is 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 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 solid panels 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. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 Hapapa 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 east.



Image 2. View of west parapet with thrie beam.



## Bridge Inventory Form




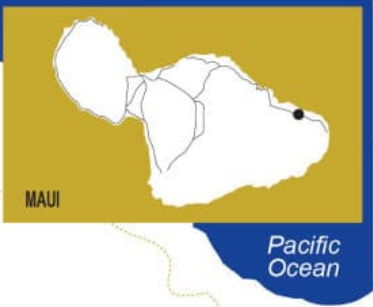
Image 3. View of east parapet, note bridge name incised on end post.

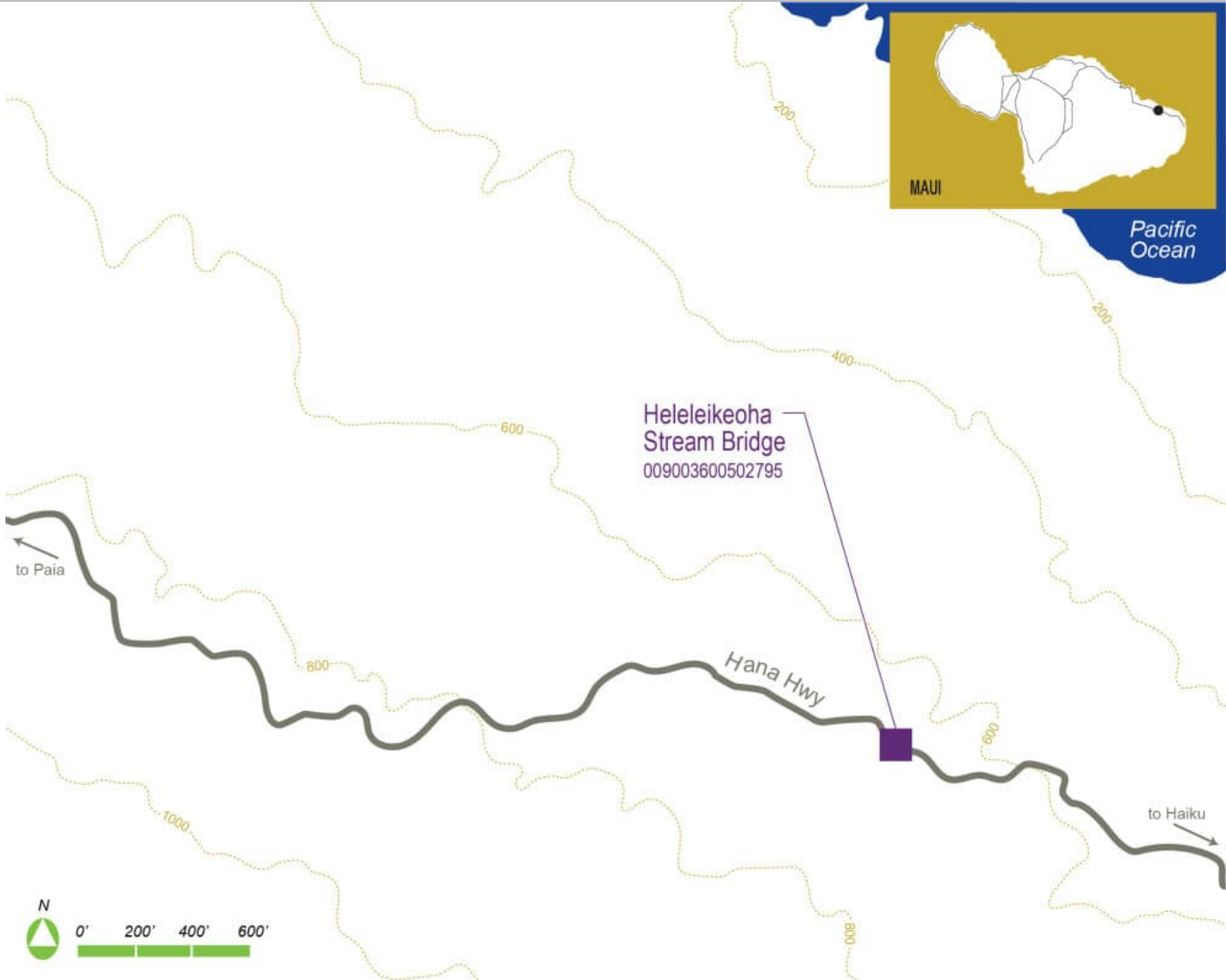


Image 4. View of north abutment.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502795		<b>TMK:</b> 212999999, 212003001 (adjacent)	
<b>Common Name:</b> Heleleikeoha Stream Bridge			
<b>Historic Name:</b> Heleleikeoha Stream Bridge			
<b>Feature Crossed:</b> Heleleikeoha Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 27.919		
<b>Latitude:</b> 20.79823	<b>Longitude:</b> -156.0615		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1917
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2020, 2022	
<b>Alterations:</b> Repairs made to Kahului, upstream CRM approach wall.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 23.0 ft.	<b>Total Length:</b> 27.9 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Rubble Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b> Bridge name painted on cap			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1917, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Heleleikeoha Stream Bridge carries the Hana Highway over the Heleleikeoha Stream. The single span, concrete tee beam bridge rests on concrete rubble abutments which bear directly on natural rock formations. The concrete deck is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete open vertical railings with the bridge name painting on the makai railing.		



## Bridge Inventory Form

### Statement of Significance:

The Heleleikeoha Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Heleleikeoha Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Heleleikeoha Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. Northern parapet, facing north.

## Bridge Inventory Form



Image 3. West parapet, facing west.



## Bridge Inventory Form


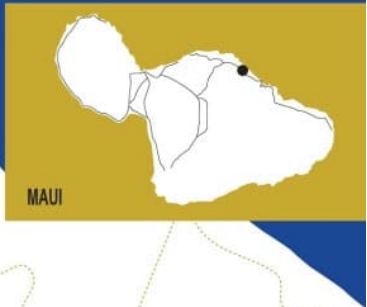



Image 4. East parapet, facing east.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500509		<b>TMK:</b> 229999999, 229010021 (adjacent)	
<b>Common Name:</b> Hoalua Stream Bridge			
<b>Historic Name:</b> Hoalua Stream Bridge			
<b>Feature Crossed:</b> Hoalua Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 5.09		
<b>Latitude:</b> 20.89493	<b>Longitude:</b> -156.2197		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1929
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2021	
<b>Alterations:</b> Upstream Hana CRM wall has been repaired.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 47.9 ft.	<b>Total Length:</b> 48.9 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-06-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Hoalua Stream Bridge carries the Hana Highway over the Hoalua Stream. This single-span concrete tee beam bridge rests on concrete abutments. The reinforced concrete deck is supported by three concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete open vertical railings.		

## Bridge Inventory Form

### Statement of Significance:

The Hoalua Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Hoalua Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Hoalua Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship and research indicates no major alterations to the bridge. However, these elements of integrity are diminished due to damage on the makai parapet end post. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 roadway, facing north.



Image 2. General view of bridge substructure and parapets, facing west.



## Bridge Inventory Form



Image 3. View of west parapet.



Image 4. Detail of west parapet, central span.



## Bridge Inventory Form



Image 5. View of east parapet, facing southeast.



Image 6. General view of bridge deck and girders, facing north.



## Bridge Inventory Form



Image 7. General view of bridge deck and girders, facing south.



## Bridge Inventory Form



Image 8. View of southern abutment.



## Bridge Inventory Form





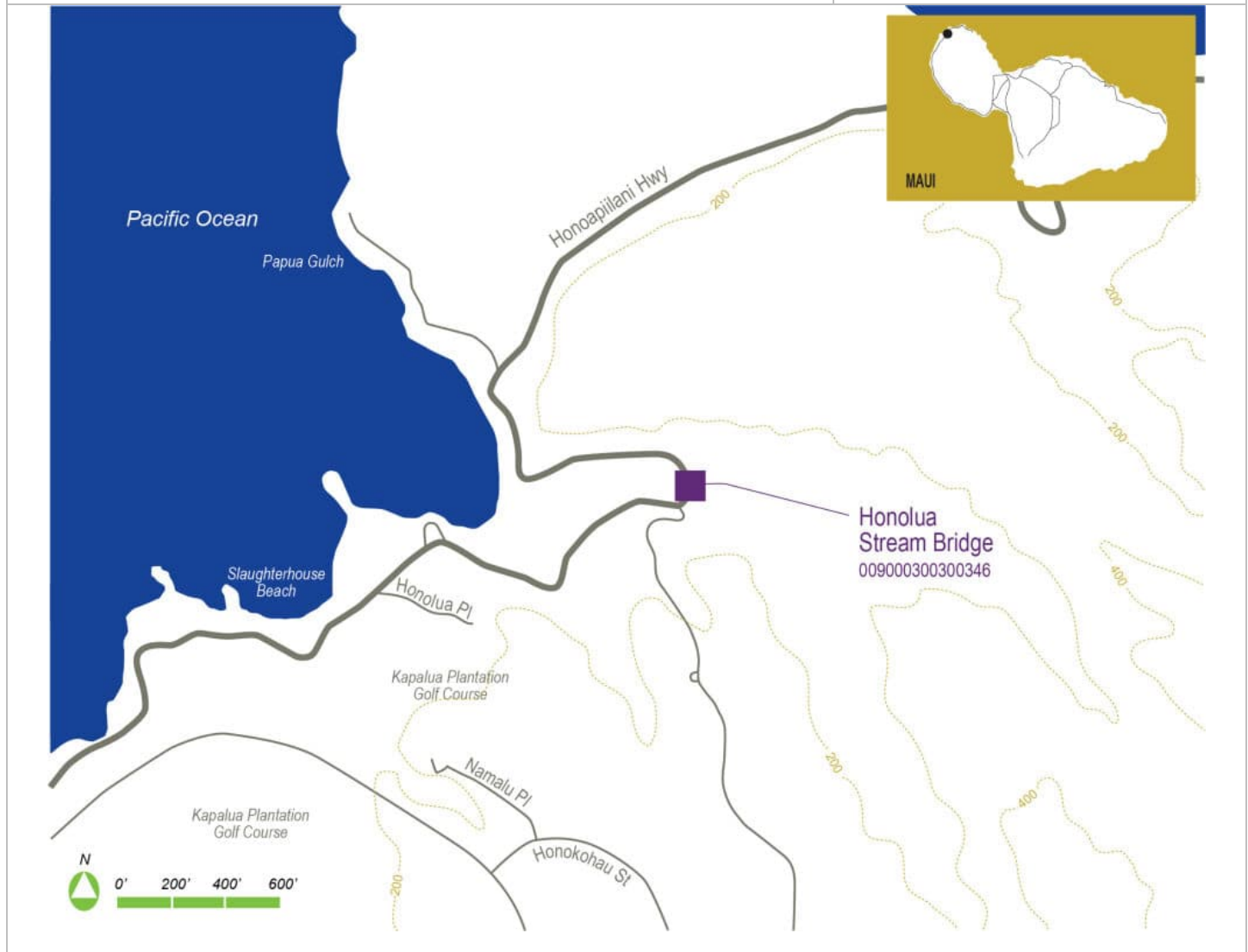
Image 9. View of northern abutment.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009000300300346		<b>TMK:</b> 242999999, 242004032 (adjacent)	
<b>Common Name:</b> Honolua Stream Bridge			
<b>Historic Name:</b> Honolua Stream Bridge			
<b>Feature Crossed:</b> Honolua Stream			
<b>Feature Carried:</b> Honoapiilani Highway/Route 30			
<b>Island:</b> Maui	<b>Milepost:</b> 32.41 mi.		
<b>Latitude:</b> 21.01361	<b>Longitude:</b> -156.6337		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1924
<b>Designer/Engineer:</b> Unknown	
<b>Builder/Contractor:</b> Unknown	
<b>Alteration Date(s):</b> 1974, 2020, 2022	
<b>Alterations:</b> Bridge spall repairs done in 1974. New upstream and downstream Lahaina and upstream Wailulu guardrail transitions were installed in 2020. The downstream Lahaina guardrail end was replaced in 2022.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 23.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 18.0 ft
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Eligible	Criteria: A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>SIHP No.:</b> N/A	
<b>6E Status:</b> Significant Historic Property	Criteria: a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> N/A		<b>Contributing:</b> N/A
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering		
<b>Period of Significance:</b> 1924		
<b>Narrative Description:</b>  The Honolua Stream Bridge carries Honoapiilani Highway across Honolua Stream. This single-span concrete tee beam bridge is supported by concrete rubble masonry (CRM) abutments. The narrow roadway, paved in asphalt concrete (AC) overlay, sits on a concrete deck and is flanked by solid concrete railings. Thrie beams have been attached to the parapet ends.		



## Bridge Inventory Form

### Statement of Significance:

The Honolua Stream Bridge forms part of the Honoapiilani Highway, which facilitated Maui's development in the sugar cane plantation economy. Because the bridge is associated with major transportation improvements during the Territorial period, it is eligible under Criteria 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 1920s 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 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 the use of three beams and spall repairs, which were completed in 1974. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1920s.

Therefore, Honolua 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.



## Bridge Inventory Form



Image 1. General view of bridge, facing east.



Image 2. Detail of CRM abutment and deck girders.



## Bridge Inventory Form




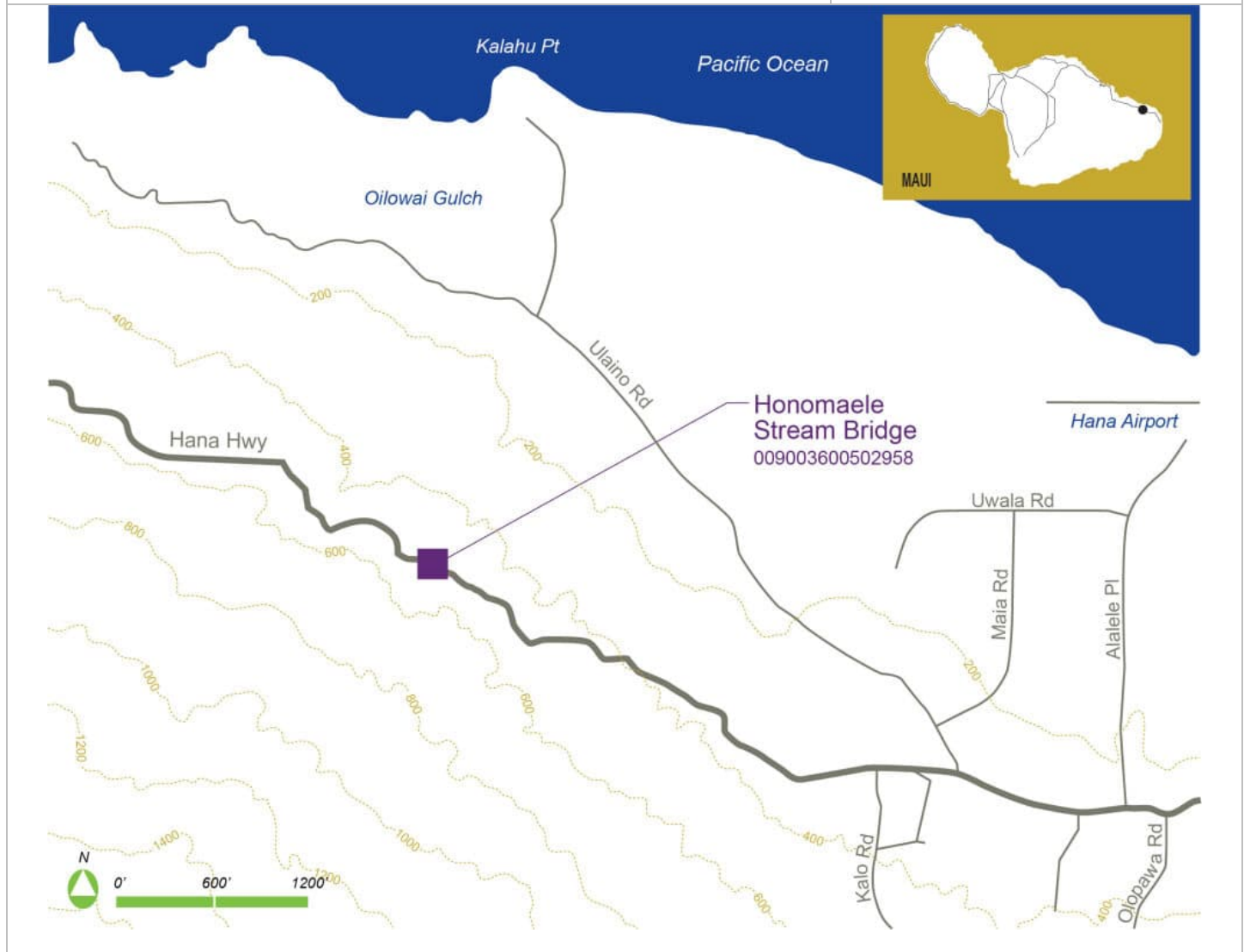
Image 3. Bridge parapet, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502958	<b>TMK:</b> 213999999, 213002005 (adjacent)	
<b>Common Name:</b> Honomaele Stream Bridge		
<b>Historic Name:</b> Honomaele Stream Bridge		
<b>Feature Crossed:</b> Honomaele Stream		
<b>Feature Carried:</b> Hana Highway/Route 360		
<b>Island:</b> Maui	<b>Milepost:</b> 29.539	
<b>Latitude:</b> 20.79013	<b>Longitude:</b> -156.0418	
<b>Ownership:</b> State		<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1924
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 38.1 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Concrete Rubble Masonry Abutment and Concrete Pier Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1924, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Honomaele Stream Bridge carries the Hana Highway over the Honomaele Stream. This two-span, concrete continuous tee beam bridge rests on concrete rubble masonry abutments and a single concrete pier wall. The abutments and pier bear directly on natural rock formations. The concrete deck, supported by four concrete continuous tee beams, carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open vertical railings.		



## Bridge Inventory Form

### Statement of Significance:

The Honomaele Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Honomaele Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Honomaele Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. Northern parapet, facing northeast.



## Bridge Inventory Form



Image 3. East abutment, facing east.



## Bridge Inventory Form



Image 4. Bridge pier, facing east.





## Bridge Inventory Form

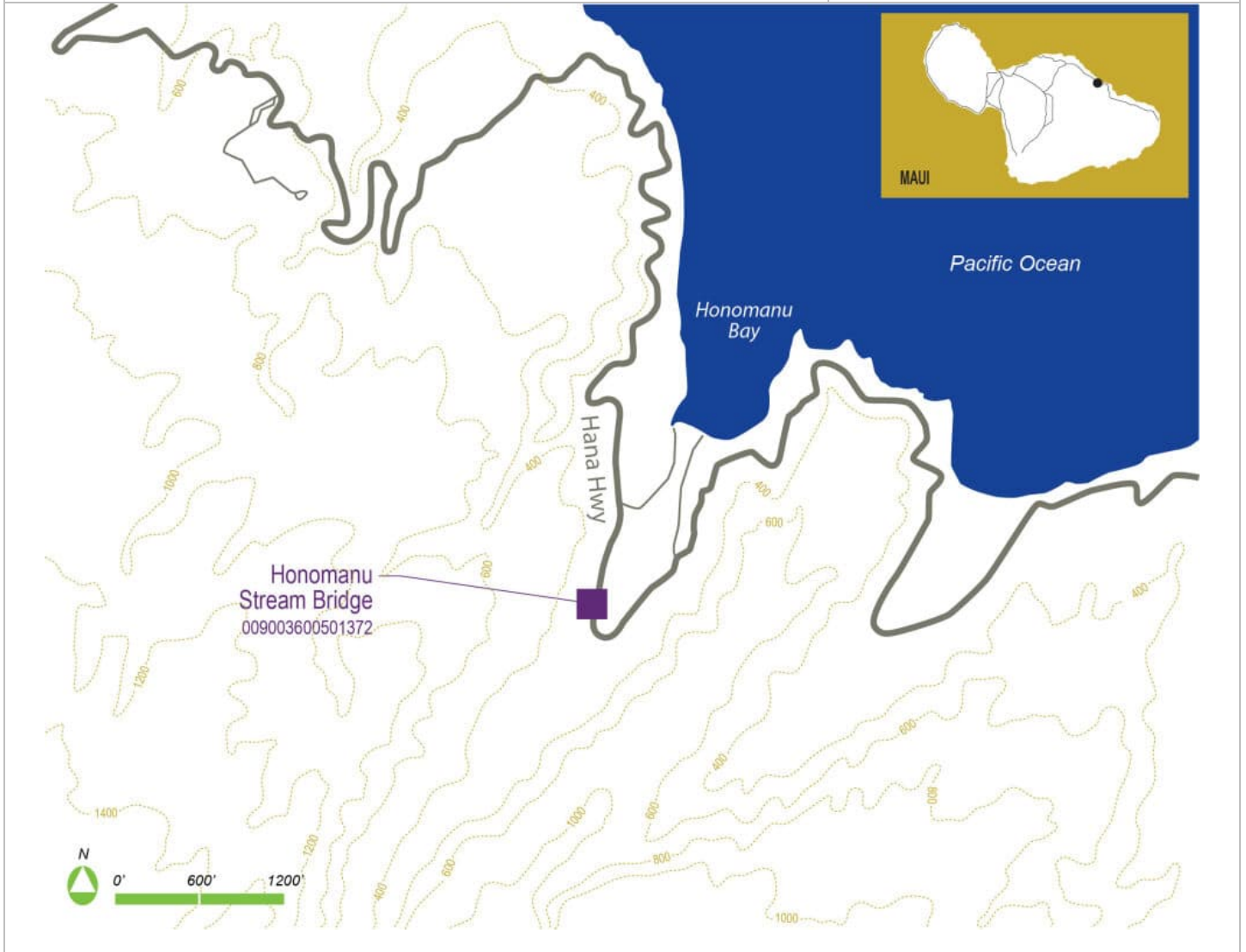


Image 5. West abutment, facing west.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501372		<b>TMK:</b> 211999999, 211001010 (adjacent)	
<b>Common Name:</b> Honomanu Stream Bridge			
<b>Historic Name:</b> Honomanu Stream Bridge			
<b>Feature Crossed:</b> Honomanu Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui		<b>Milepost:</b> 13.71 mi.	
<b>Latitude:</b> 20.85477		<b>Longitude:</b> -156.1695	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911
<b>Designer/Engineer:</b> Hugh Howell, Senior Engineer	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1978	
<b>Alterations:</b> Rehabilitated with prestressed concrete bridge planks placed on top of original bridge deck.	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 23.0 ft.	<b>Total Length:</b> 47.9 ft.	<b>Deck Width:</b> 14.1 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1911, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Honomanu Stream Bridge carries the Hana Highway over the Honomanu Stream. The double-span bridge, supported by four reinforced concrete tee beams, rests on a reinforced concrete pier and reinforced concrete abutments. The concrete deck is overlaid with prestressed concrete bridge planks from a 1978 rehabilitation project, and both elements support a narrow roadway paved in asphalt concrete (AC) overlay. Solid concrete railings flank the roadway.		

## Bridge Inventory Form

### Statement of Significance:

The Honomanu Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Honomanu Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Honomanu Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, despite its 1978 rehabilitation that saw prestressed concrete planks added over the original deteriorated bridge deck. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. General view of approach to bridge, facing south.



Image 3. View of northeast parapet, facing south.



## Bridge Inventory Form



Image 4. View of southeast abutment and deck girders, facing south.



## Bridge Inventory Form



Image 5. View of pier, southeast abutment, and deck girders, facing south.



## Bridge Inventory Form



Image 6. View of northwest abutment, facing west.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009000321200060		<b>TMK:</b> 234038999, 234001999 (adjacent)	
<b>Common Name:</b> Kaahumanu Avenue Underpass-Naniloa Drive Overpass			
<b>Historic Name:</b> Kaahumanu Avenue Underpass-Naniloa Drive Overpass			
<b>Feature Crossed:</b> Kaahumanu Avenue/Route 32			
<b>Feature Carried:</b> Naniloa Drive			
<b>Island:</b> Maui	<b>Milepost:</b> 0.6		
<b>Latitude:</b> 20.88885	<b>Longitude:</b> -156.496		
<b>Ownership:</b> State		<b>Image Date:</b> 10/30/2023	


# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Frame	<b>Construction Date:</b> 1936
<b>Designer/Engineer:</b> William R. Bartels	
<b>Builder/Contractor:</b> Hawaiian Contracting Company	
<b>Alteration Date(s):</b> 2018	
<b>Alterations:</b> AC wearing surface appears to have been repaved since the previous inspection in 2018.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 50.9 ft.	<b>Total Length:</b> 63.0 ft.	<b>Deck Width:</b> 26.9 ft.
<b>Superstructure:</b> Reinforced Concrete Girder			
<b>Substructure:</b> Reinforced Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Greek Cross			
<b>Other Features:</b> Bridge construction date incised on end pier; 2'-6" wide sidewalks on each side of roadway; Concrete Rubble Masonry (CRM) wing walls on road approaches.			

## Historic Information

<b>NRHP Status:</b> Listed	Criteria: A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 8001065
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-04-01541	
<b>6E Status:</b> Significant Historic Property	Criteria: a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b>		<b>Contributing:</b>
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Transportation		
<b>Period of Significance:</b> 1936		
<b>Narrative Description:</b>  The Kaahumanu Avenue Underpass-Naniloa Drive Overpass carries Naniloa Drive over Kaahumanu Avenue. The bridge is a single-span concrete rigid frame bridge with cantilever ends. The rigid frame arch structure of reinforced concrete and reinforced deck carries a two-lane roadway, which is paved in asphalt concrete (AC) overlay. Flanking the roadway are sidewalks and concrete open Greek Cross railings with stepped end posts. The railings are painted in contrasting colors – white and pink – to emphasize the bridge's architectural details. Incised on the parapet end post is the bridge construction date. The road approaches feature Concrete Rubble Masonry (CRM) wing walls.		



# Bridge Inventory Form

**Statement of Significance:**

The Kaahumanu Avenue Underpass-Naniloa Drive Overpass is listed on the NRHP.

Constructed in 1936 by the Hawaiian Contracting Company as part of Project No. WPMH – 13-I following plans drawn up by engineer William R. Bartells, the Kaahumanu Avenue Underpass-Naniloa Drive Overpass was part of the Wailuku-Kahului Road (later renamed Kaahumanu Avenue). This 1.9-mile stretch of road cut through the island's "Sand Hills" and connected the island's main port of Kahului with the county seat of Wailuku. This was one of five reinforced concrete rigid frame bridges constructed in the Territory prior to World War II. With the bridge abutments and deck constructed as one solid piece of concrete, the design enabled engineers to have single-spans double or triple the length of a typical concrete slab or tee beam bridge span and was the most sophisticated prewar design from an engineering perspective. Project plans show CRM abutments as part of the larger roadway grade separations. The completed grade separation project is also emblematic of Federal Aid financing of Territorial Roadway projects during the 1930s.

Because the bridge is associated with major transportation improvements in Maui, it is significant under Criterion A.

The bridge's reinforced concrete rigid frame construction is an example of a distinctive and rare structural type on the archipelago, and its aesthetics are a good example of Art Deco design. While a rare structural type, the bridge is typical of its period in its use of materials, craftsmanship, and design. In particular, the concrete open Greek Cross parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is also associated with master engineer William R. Bartels. For these reasons, the bridge is significant under Criterion C.

The bridge remains in its original location, situated over a roadway. It retains integrity of design, materials, and workmanship. Its integrity of setting remains. Although the area surrounding the bridge has become more urbanized, the bridge remains a distinctive entryway for Wailuku. 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.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Ka'ahumanu Drive – Naniloa Drive Overpass, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2008. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816024/content/electronic-records/rg-079/NPS\\_HI/08001065.pdf](https://catalog.archives.gov/OpaAPI/media/63816024/content/electronic-records/rg-079/NPS_HI/08001065.pdf).
- 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 west.



Image 2. General view of bridge facing east.



## Bridge Inventory Form



Image 3. Bridge setting facing south.



Image 4. View of east parapet, note construction date incised on end post.



## Bridge Inventory Form

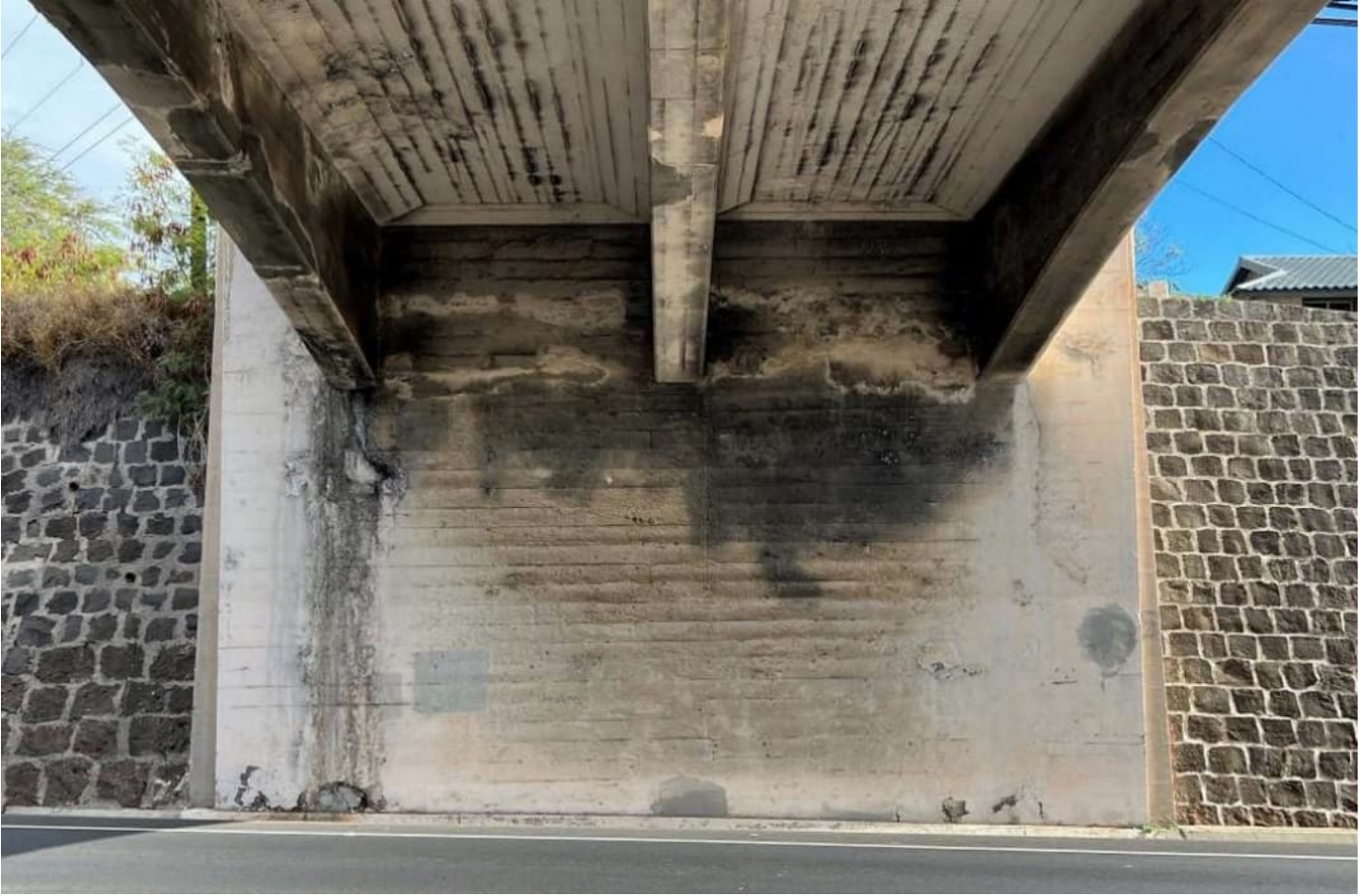



Image 5. Detail of north parapet.

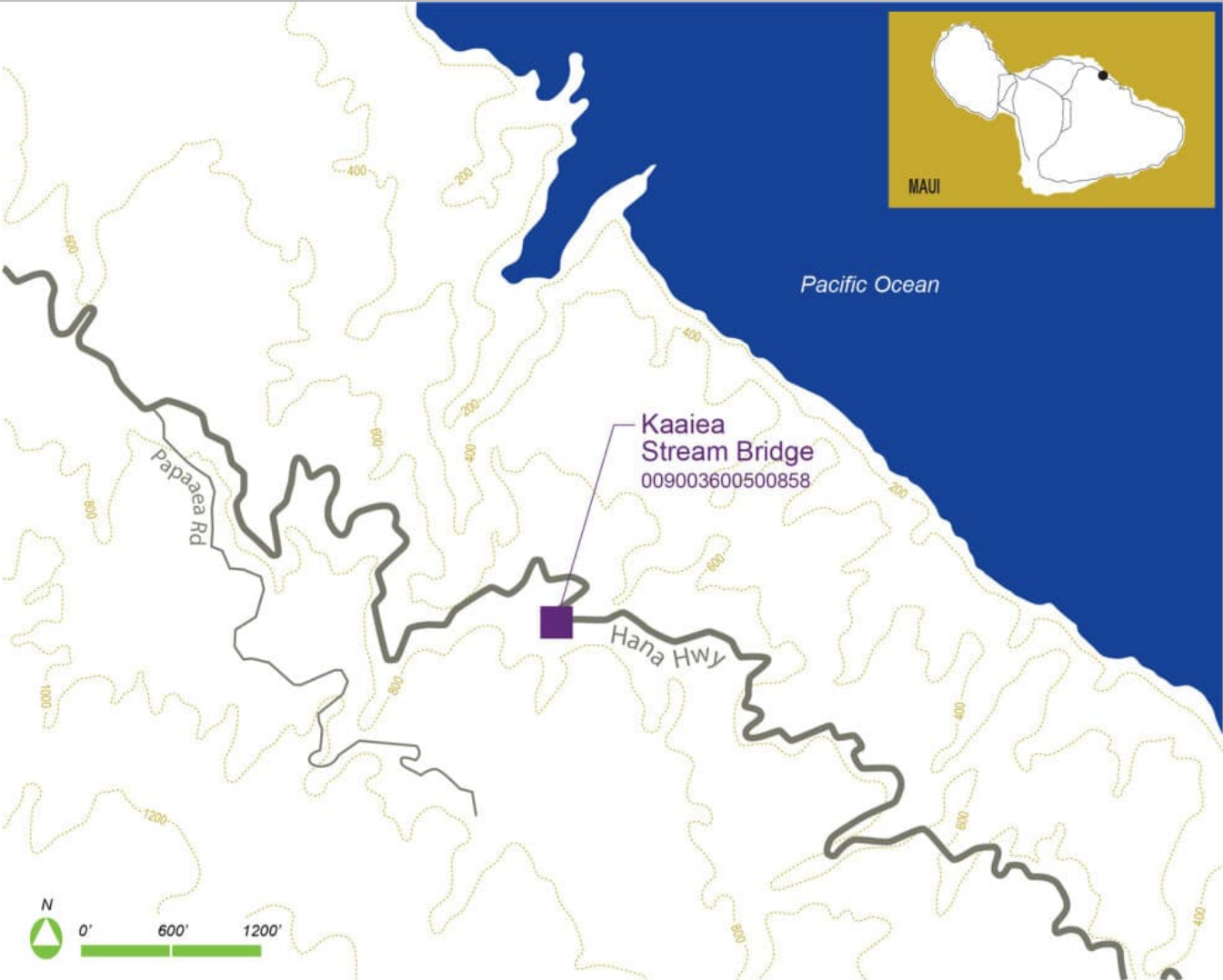


Image 6. View of superstructure underside and south parapet.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500858		<b>TMK:</b> 211999999, 211001036 (adjacent)	
<b>Common Name:</b> Kaaiea Stream Bridge			
<b>Historic Name:</b> Kaaiea Stream Bridge			
<b>Feature Crossed:</b> Kaaiea Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 8.57		
<b>Latitude:</b> 20.87836	<b>Longitude:</b> -156.1954		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1928
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 22.0 ft.	<b>Deck Width:</b> 17.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1928, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kaaiea Stream Bridge carries the Hana Highway over the Kaaiea Stream. This single-span bridge rests on rock masonry abutments. The concrete deck is supported by four concrete tee beams and features an asphalt concrete (AC) overlay roadway flanked by concrete open vertical parapets. The bridge name and part of its NBI number (360 005) have been painted on the makai railing cap.		

## Bridge Inventory Form

### Statement of Significance:

The Kaaiea Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kaaiea Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kaaiea Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. General view of bridge, facing northeast.



Image 3. Approach to bridge and general setting, facing south.



## Bridge Inventory Form



Image 4. Northeast railing and end posts, facing north.



## Bridge Inventory Form



Image 5. Southeast abutment and girders, facing southeast.



## Bridge Inventory Form



Image 6. Northwest abutment and girders, facing northwest.




## Bridge Inventory Form

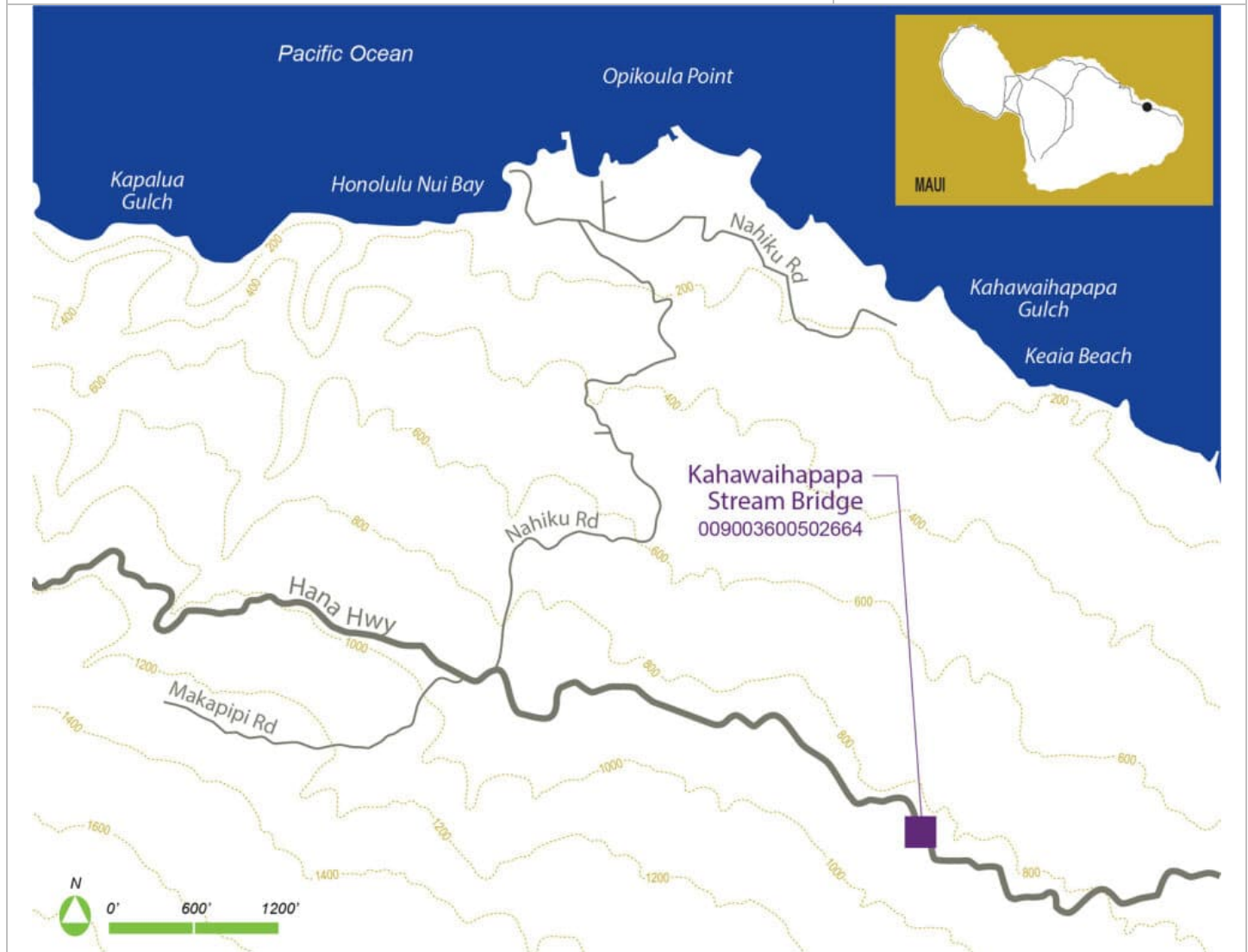


Image 7. View of girders, facing southwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502664		<b>TMK:</b> 212999999, 212003004 (adjacent)	
<b>Common Name:</b> Kahawaihapapa Stream Bridge			
<b>Historic Name:</b> Kahawaihapapa Stream Bridge			
<b>Feature Crossed:</b> Kahawaihapapa Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 26.599		
<b>Latitude:</b> 20.80113	<b>Longitude:</b> -156.0775		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1922
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b> County Engineer's Office	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 17.1 ft.	<b>Total Length:</b> 60.0 ft.	<b>Deck Width:</b> 17.7 ft.
<b>Superstructure:</b> Reinforced Concrete Girder/Beam			
<b>Substructure:</b> Reinforced Concrete Column, Reinforced Concrete Pier Wall, Masonry Abutment, Reinforced Concrete Pier Cap			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1922, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kahawaihapapa Stream Bridge carries the Hana Highway over the Kahawaihapapa Stream. This reinforced concrete tee beam structure is supported by two reinforced concrete piers – one solid and one three-column – and rests on masonry abutments. Flanking the one lane road, which is paved in asphalt concrete (AC) overlay, are concrete open vertical railings.		

## Bridge Inventory Form

### Statement of Significance:

The Kahawaihapapa Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kahawaihapapa Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road with was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan recommended the bridge's preservation and rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kahawaihapapa Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. 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 1920s.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing north.

## Bridge Inventory Form



Image 3. Southeast parapet, facing south.



## Bridge Inventory Form



Image 4. Northwest abutment, facing northwest.



## Bridge Inventory Form




Image 5. Bridge piers and deck girders, facing west.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502339		<b>TMK:</b> 212999999, 212004009 (adjacent)	
<b>Common Name:</b> Kapaula Stream Bridge			
<b>Historic Name:</b> Kapaula Stream Bridge			
<b>Feature Crossed:</b> Kapaula Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 23.39		
<b>Latitude:</b> 20.81131	<b>Longitude:</b> -156.1147		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023


# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 21.0 ft.	<b>Total Length:</b> 48.9 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Reinforced Concrete Pier Wall, Reinforced Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1926		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kapaula Stream Bridge carries the Hana Highway over the Kapaula Stream. This double-span bridge features concrete, open vertical parapets with caps and squared end posts. The concrete deck is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. The deck sits on a reinforced concrete pier and reinforced concrete abutments, and both pier and abutments bear directly on natural rock formations.		



# Bridge Inventory Form

## Statement of Significance:

The Kapaula Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kapaula Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kapaula Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.

## Bridge Inventory Form



Image 2. Approach the bridge, facing northwest.



## Bridge Inventory Form



Image 3. Southwest parapet, looking south.



## Bridge Inventory Form



Image 4. View of northwest abutment, facing north.



## Bridge Inventory Form



Image 5. View of southeast abutment, facing southeast.



## Bridge Inventory Form


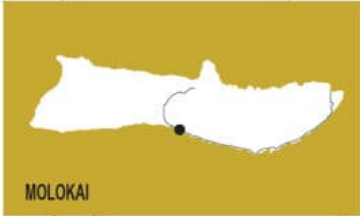


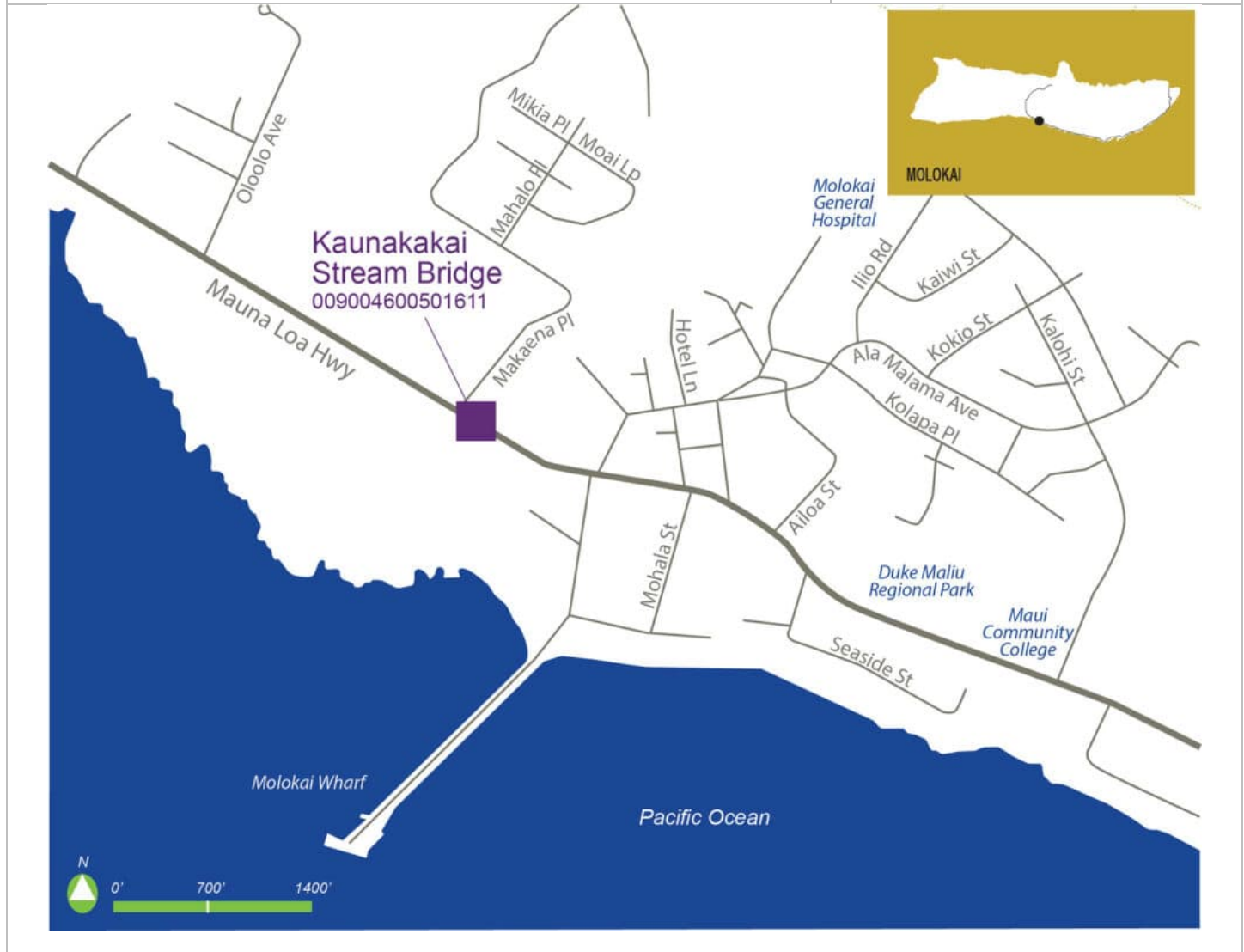
Image 6. View of pier and deck girders, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009004600501611		<b>TMK:</b> 253005010	
<b>Common Name:</b> Kaunakakai 16-Cell Culvert			
<b>Historic Name:</b> Kaunakakai 16-Cell Culvert			
<b>Feature Crossed:</b> Kaunakakai Stream			
<b>Feature Carried:</b> Mauna Loa Highway/Route 460			
<b>Island:</b> Molokai		<b>Milepost:</b> 0.43	
<b>Latitude:</b> 21.09049		<b>Longitude:</b> -157.0252	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Culvert	<b>Construction Date:</b> 1953
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 16	<b>Max Span:</b> 3.0 ft.	<b>Total Length:</b> 73.2 ft.	<b>Deck Width:</b> 42.0 ft.
<b>Superstructure:</b>			
<b>Substructure:</b> Concrete Pipe Culvert			
<b>Floor/Decking:</b> Asphalt-Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Thrie Beam			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Eligible	<b>Criteria:</b> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>SIHP No.:</b> N/A	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b>		<b>Contributing:</b>
<b>Current Function:</b> Culvert	<b>Historic Function:</b> Culvert	
<b>Areas of Significance:</b> Engineering		
<b>Period of Significance:</b> 1953		
<b>Narrative Description:</b>  The Kaunakakai 16-Cell Culvert carries the Mauna Loa Highway over the Kaunakaka Stream. This 16-cell concrete culvert carries a two-lane roadway paved in asphalt-concrete (AC) overlay and is flanked by metal thrie beam railings.		



## Bridge Inventory Form

### Statement of Significance:

The Kaunakakai 16-Cell Culvert is a unique culvert, as it is the only one with 16 cells in the state of Hawaii. Its unique design and construction sets it apart from more typical culverts that are generally 2 to 5 cells.

Research did not indicate the culvert to be associated with highway improvements during the Territorial era. 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 culvert is not significant under Criterion B.

The Kaunakakai 16-Cell Culvert is a unique example of a typical postwar concrete culvert. At 16 cells, it is the only culvert of its kind in Hawaii. It is therefore significant under Criterion C.

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

The culvert remains in its original location, situated over a waterway. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. The culvert retains integrity of feeling and association as a post-World War II culvert type.

Therefore, the Kaunakakai 16-Cell Culvert 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 culvert, facing southwest.



Image 2. General view of culvert, facing northeast.



## Bridge Inventory Form



Image 3. View of northeast three beam railing and general setting of culvert.






Image 4. Detail of culvert cell.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600503347		<b>TMK:</b> 214999999, 214003052 (adjacent)	
<b>Common Name:</b> Kawaipapa Stream Bridge			
<b>Historic Name:</b> Kawaipapa Stream Bridge			
<b>Feature Crossed:</b> Kawaipapa Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 33.439		
<b>Latitude:</b> 20.7662	<b>Longitude:</b> -155.9953		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1947
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1991, 2022	
<b>Alterations:</b> Double-Cell Reinforced Concrete Culvert added in 1991, downstream Kahului guardrail replaced in 2022	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 33.1 ft.	<b>Total Length:</b> 79.1 ft.	<b>Deck Width:</b> 31.5 ft.
<b>Superstructure:</b> Reinforced Concrete Tee Beam			
<b>Substructure:</b> Reinforced Concrete Pier Wall, Reinforced Concrete Abutment, Reinforced Concrete Culvert			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Horizontal			
<b>Other Features:</b> Bridge name and construction dates incised on end posts			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1947, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  <p>The Kawaipapa Stream Bridge carries the Hana Highway over the Kawaipapa Stream. This two-span concrete tee beam bridge rests on a reinforced concrete pier and reinforced concrete abutments. The reinforced concrete deck carries a two-lane road paved in asphalt-concrete (AC) overlay and is flanked by concrete open horizontal railings that feature the bridge name and construction date – though these are partially obscured by thrie beams. A 1991 alteration of the bridge resulted in the addition of a double cell reinforced concrete culvert to the northbound end of the bridge</p>		



## Bridge Inventory Form

constructed in the same style as the 1947 bridge, also with the name and construction date featured in the end posts. Thrie beams have been attached to all end posts of the bridge and culvert addition.

### Statement of Significance:

The Kawaipapa Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kawaipapa Stream Bridge is an exceptional bridge within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original roadwith was 16 feet though has been widened to 22 feet in most areas. The Kawaipapa Stream Bridge is the only post-Second World War bridge on the historic Hana Belt Road. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's preservation and rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kawaipapa Stream Bridge is significant under Criterion C as it represents a unique post-World War II reinforced concrete tee beam bridge. It is typical of its period in its use of materials, method of construction, craftsmanship, and design. However, its open concrete horizontal railings are a unique style compared to other bridges on the Hana Highway. For these reasons, the bridge is 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. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, semi-rural surroundings remain. 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 1910s, despite the 1991 culvert addition and modifications to improve vehicular safety with the addition of thrie beams.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 west.

## Bridge Inventory Form



Image 2. Bridge approach, facing north.



## Bridge Inventory Form



Image 3. East parapet, facing northeast.



## Bridge Inventory Form



Image 4. South abutment, facing south.




## Bridge Inventory Form

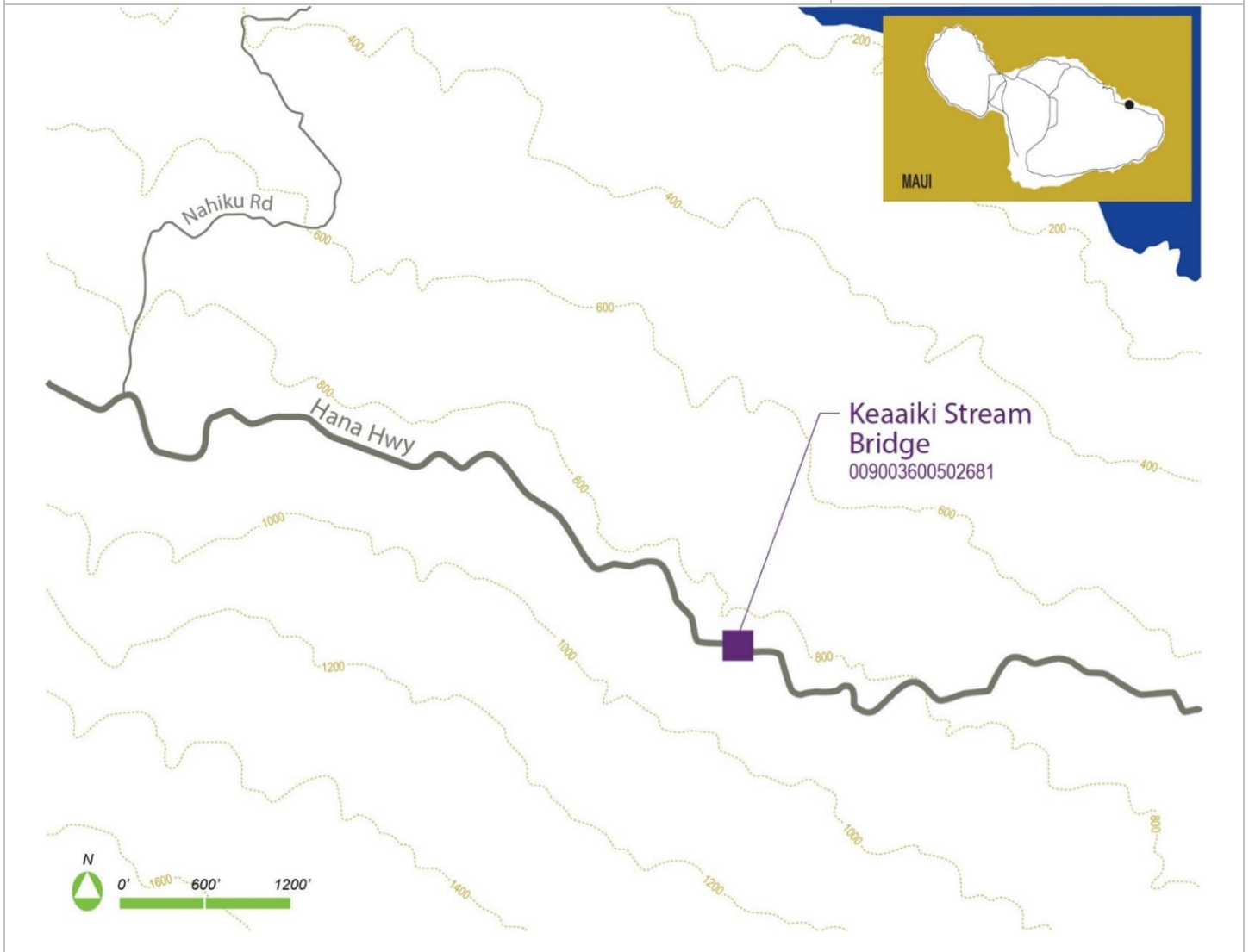


Image 5. Bridge cell, facing west.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502681		<b>TMK:</b> 212999999, 212003055 (adjacent)	
<b>Common Name:</b> Keaiki Stream Bridge			
<b>Historic Name:</b> Keaiki Stream Bridge			
<b>Feature Crossed:</b> Keaiki Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 26.769		
<b>Latitude:</b> 20.80029	<b>Longitude:</b> -156.0756		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1921
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b> County Engineer's Office	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 21.0 ft.	<b>Total Length:</b> 22.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Reinforced Concrete Girder/Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1921, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Keaaiki Stream Bridge carries the Hana Highway over the Keaaiki Stream. The reinforced concrete girder/beam superstructure rests on masonry abutments that bear directly on natural rock formations. The single lane deck, paved in asphalt concrete (AC) overlay, is flanked by concrete open vertical railings.		

# Bridge Inventory Form

## Statement of Significance:

Keaiki Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

Keaiki Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet though it has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan recommended the bridge's preservation and rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Keaiki Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1920s.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. Approach to bridge, facing northeast.

## Bridge Inventory Form



Image 3. North abutment, facing north.



## Bridge Inventory Form



Image 4. West abutment, facing west.



## Bridge Inventory Form





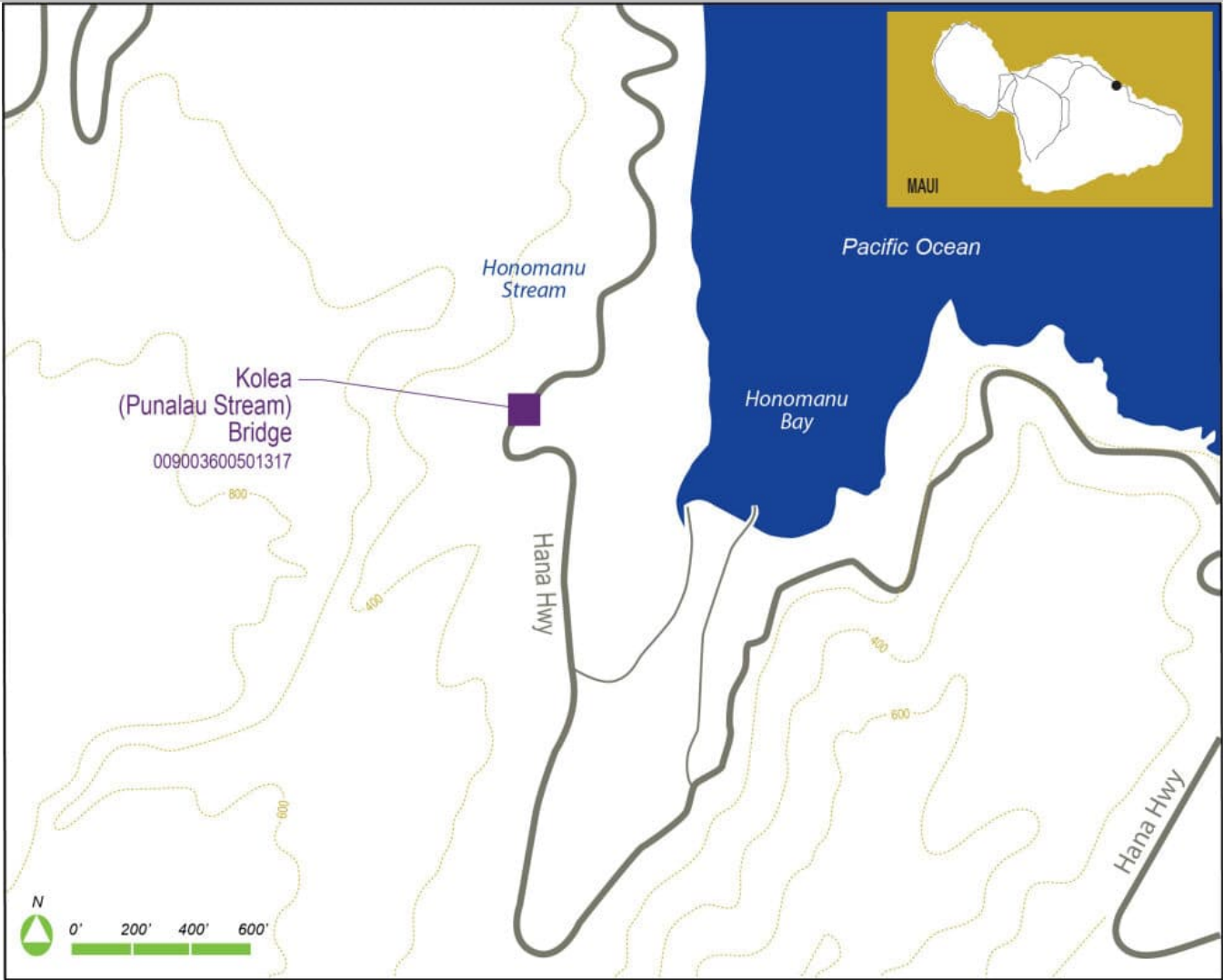
Image 5. East abutment, facing northeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501317		<b>TMK:</b> 211999999, 211001019 (adjacent)	
<b>Common Name:</b> Kolea (Punalau Stream) Bridge			
<b>Historic Name:</b> Kolea (Punalau Stream) Bridge			
<b>Feature Crossed:</b> Punalau Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 13.16 mi.		
<b>Latitude:</b> 20.8623	<b>Longitude:</b> -156.1699		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911
<b>Designer/Engineer:</b> Hugh Howell, Senior Engineer	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 29.9 ft.	<b>Total Length:</b> 34.1 ft.	<b>Deck Width:</b> 14.1 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b> Construction date incised on makai parapet face			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1911, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kolea (Punalau Stream) Bridge carries the Hana Highway over the Punalau Stream. This single-span bridge, supported by four concrete tee beams, rests on concrete abutments. The reinforced concrete deck carries a narrow roadway paved in asphalt concrete overlay flanked by solid concrete railings. The makai parapet, facing outward, features the bridge's construction date.		



## Bridge Inventory Form

### Statement of Significance:

The Kolea (Punalau Stream) Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kolea (Punalau Stream) Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kolea (Punalau Stream) Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is also an early example of master engineer Hugh Howell's work as both County Engineer and private roads contractor for Maui between 1905 and 1921. For these reasons, the bridge is 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, as well as within its original 1910s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest. Note construction date 1911 faintly incised on northeast parapet.



## Bridge Inventory Form



Image 2. General approach to bridge, facing south.



Image 3. View of northeast parapet, facing east.



## Bridge Inventory Form



Image 4. View of northwest abutment and deck girders, facing northwest.



## Bridge Inventory Form




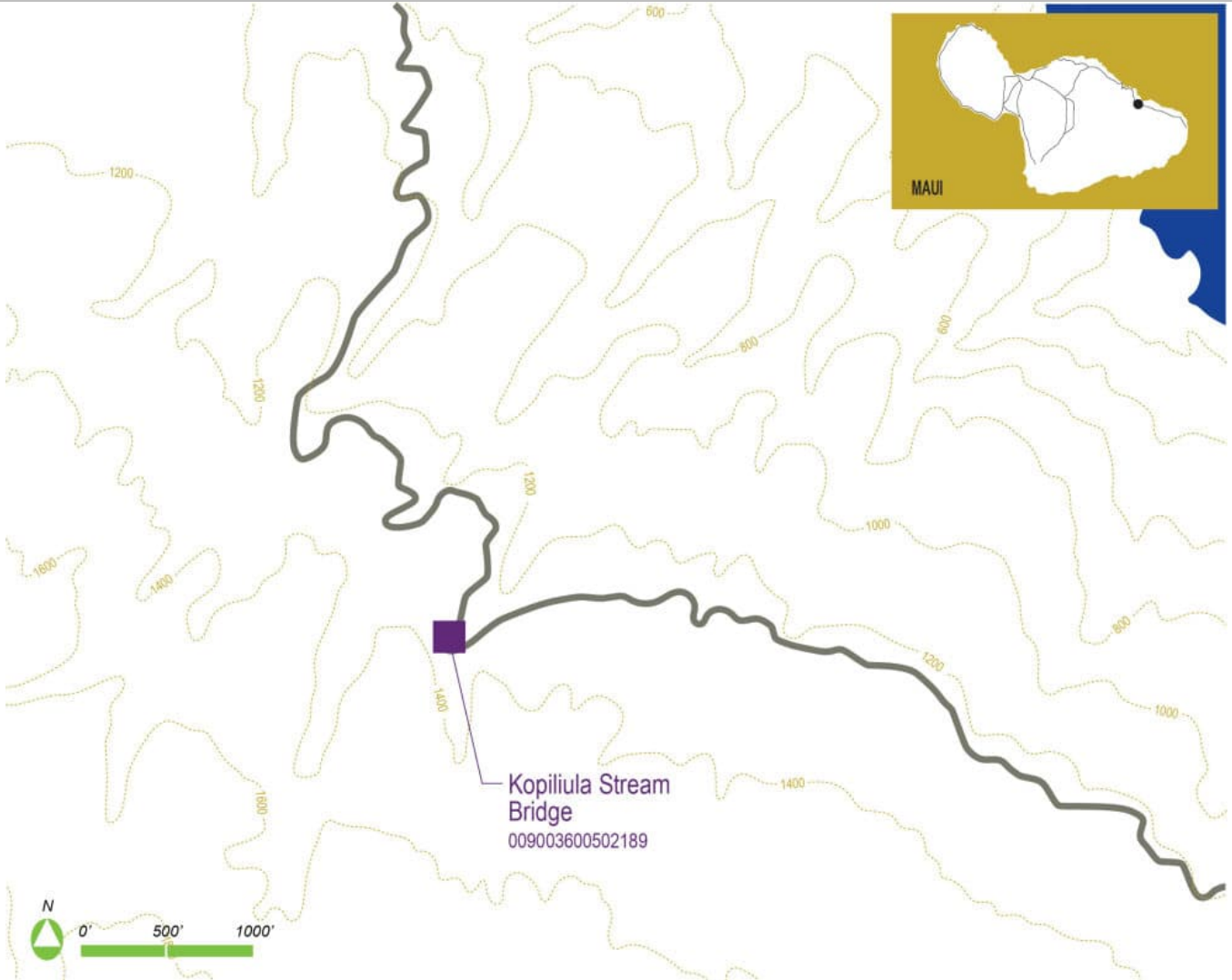
Image 5. View of southeast abutment and deck girders, facing southeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502189		<b>TMK:</b> 212999999, 212001003 (adjacent)	
<b>Common Name:</b> Kopiliula Stream Bridge			
<b>Historic Name:</b> Kopiliula Stream Bridge			
<b>Feature Crossed:</b> Kopiliula Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 21.78 mi.		
<b>Latitude:</b> 20.81719	<b>Longitude:</b> -156.134		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Girder	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> No dates provided on alteration notes	
<b>Alterations:</b> Repaired spalls and delamination on upstream and downstream bridge railings, repaired spalls and delamination on deck soffit, repaired spalls, delamination, and cracks on concrete girders and floor beams.	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 33.1 ft.	<b>Total Length:</b> 77.1 ft.	<b>Deck Width:</b> 17.7 ft.
<b>Superstructure:</b> Concrete Through Girder			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Double Column Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b> Pulley and sluice gate part of the East Maui Irrigation System, attached to mauka parapet and integrated into foundation of bridge support system			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75, HAER No. HI-77		
<b>Narrative Description:</b>  The Kopiliula Stream Bridge carries the Hana Highway over the Kopiliula Stream. The two-span, concrete girder bridge rests on one reinforced double-column pier and two reinforced concrete abutments. These abutments bear directly on natural rock formations. The concrete deck carries a narrow roadway paved in asphalt concrete (ac) overlay and lays		



## Bridge Inventory Form

on reinforced concrete girder and floor beam system and is flanked by solid concrete railings. The bridge's concrete through girders act as the bridge's parapets. Pulleys feature on the mauka parapet and are attached to a sluice gate. These two features indicate the Kopiliula Stream Bridge as attached to the East Maui Irrigation System.

### Statement of Significance:

The Kopiliula Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kopiliula Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's preservation, as any rehabilitation plan must take into account that the bridge is an integral part of the East Maui Irrigation System – the only bridge on the Hana Highway for which that is the case

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui's commercial development. The bridge's integration with the East Maui Irrigation System associates the structure with Maui's sugar plantation economy. It is therefore 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 Kopiliula Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete parapet is representative of a typical rail pattern used by the Territorial Highway Department. While typical in construction materials and methods, the Kopiliula Stream Bridge demonstrates great individuality as an integral part of the East Maui Irrigation System, as seen with the pulley, sluice, and dam features that were incorporated into the bridge's design. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- "Hamakua Ditch Company, East Maui Irrigation Company, Hana Belt Road Documentation Project, Between Nahiku and Puunene, Haiku Vicinity, Maui County, Hawaii, HAER No. HI-77." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, n.d.
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 north. Note pulleys and sluice gate on the left for the East Maui Irrigation System.

## Bridge Inventory Form



Image 2. Approach view to bridge, facing southwest.



## Bridge Inventory Form



Image 3. View of south parapet/truss, facing southeast. Note East Maui Irrigation system sluice pulleys in foreground.

## Bridge Inventory Form



Image 4. West abutment, facing west. Note East Maui Irrigation System sluice and channel in image foreground.




## Bridge Inventory Form

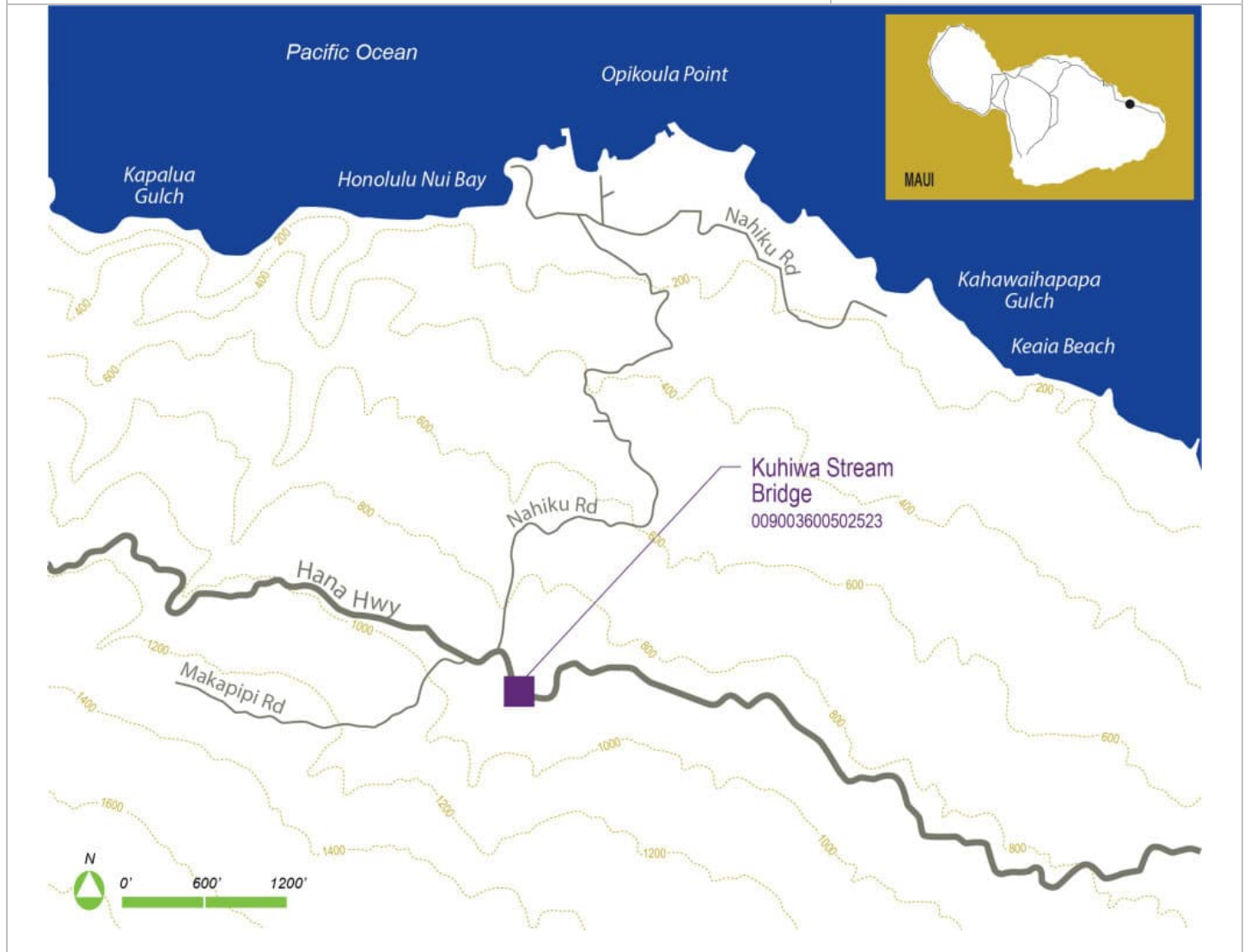


Image 5. View of east abutment, deck girders, and piers, facing east.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502523	<b>TMK:</b> 212999999, 212004002 (adjacent)	
<b>Common Name:</b> Kuhiwa Stream Bridge		
<b>Historic Name:</b> Kuhiwa Stream Bridge		
<b>Feature Crossed:</b> Kuhiwa Stream		
<b>Feature Carried:</b> Hana Highway/Route 360		
<b>Island:</b> Maui	<b>Milepost:</b> 25.199	<b>Image Date:</b> 10/30/2023
<b>Latitude:</b> 20.80607	<b>Longitude:</b> -156.0944	
<b>Ownership:</b> State		





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Closed Spandrel Arch	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b> County Engineer's Office	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 36.1 ft.	<b>Total Length:</b> 60.0 ft.	<b>Deck Width:</b> 18.4 ft.
<b>Superstructure:</b> Concrete Closed Spandrel Arch			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Asphalt Concrete (AC) Pavement			
<b>Parapets/Railings:</b> Concrete Open Vertical with Cap			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kuhiwa Stream Bridge carries the Hana Highway over the Kuhiwa Stream. This single-span concrete closed spandrel arch bridge rests on skewbacks that bear directly on natural rock formations. The concrete deck supports a narrow roadway paved in asphalt concrete (AC). Flanking the roadway are concrete open vertical railings.		

## Bridge Inventory Form

### Statement of Significance:

The Kuhiwa Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kuhiwa Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Kuhiwa Stream Bridge is significant under Criterion C as a rare example of an uncommon bridge type on the Hana Highway – a closed spandrel arch bridge. The Kuhiwa Stream Bridge was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Northeast parapet and roadway, facing east.

## Bridge Inventory Form



Image 3. Southeast abutment, facing south.




## Bridge Inventory Form

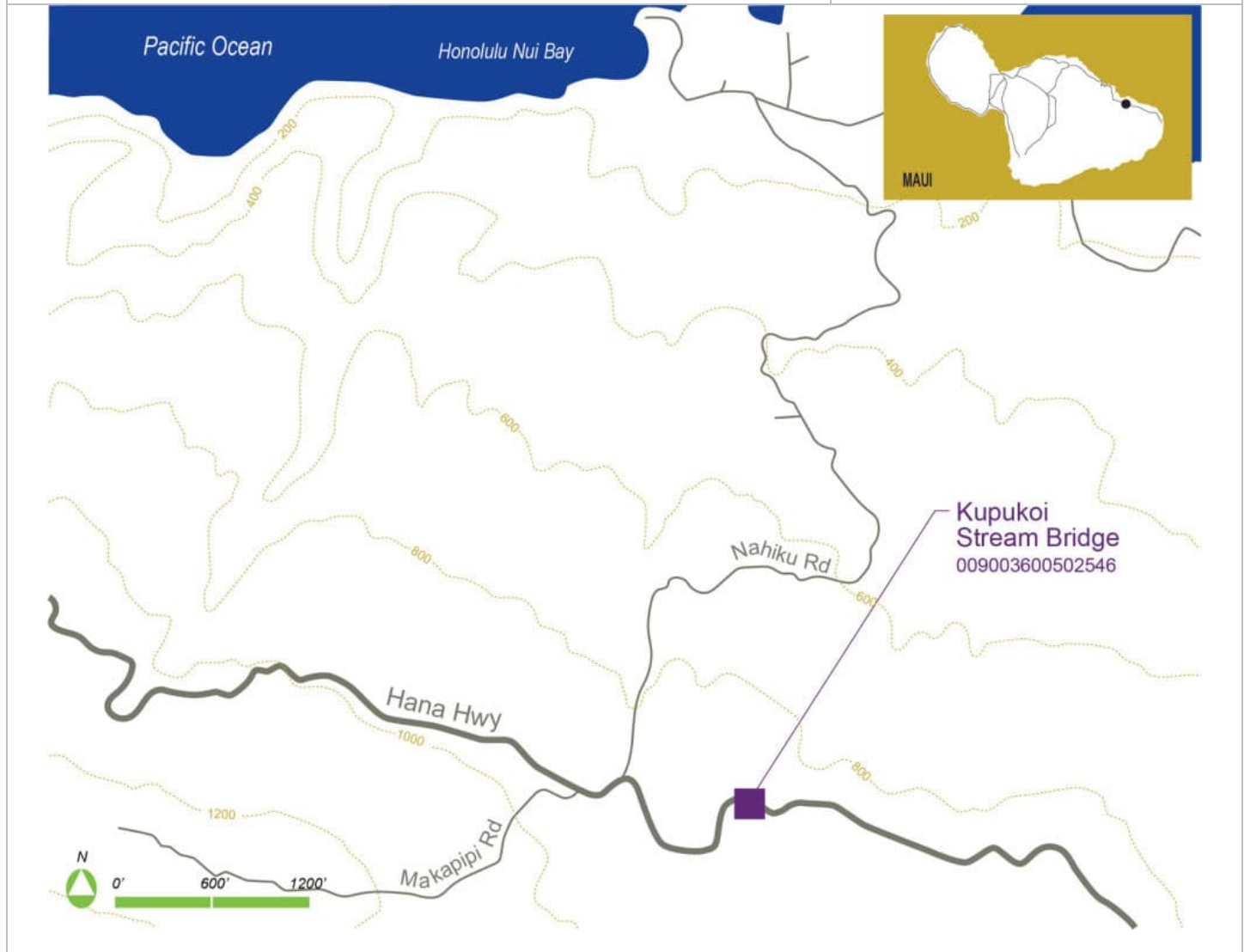


Image 4. Northwest abutment, facing northwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502546		<b>TMK:</b> 212999999, 212003017 (adjacent)	
<b>Common Name:</b> Kupukoi Stream Bridge			
<b>Historic Name:</b> Kupukoi Stream Bridge			
<b>Feature Crossed:</b> Kupukoi Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui		<b>Milepost:</b> 25.419	
<b>Latitude:</b> 20.80708		<b>Longitude:</b> -156.0919	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2016	
<b>Alterations:</b> Repaired damaged downstream Kahului CRM wall.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 21.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Kupukoi Stream Bridge carries the Hana Highway over the Kupukoi Stream. This single-span concrete tee bridge rests on four tee beams and is supported by rock masonry abutments. These abutments bear directly on natural rock formations. The concrete deck supports a single-lane road paved in asphalt concrete (AC) overlay and is flanked by concrete open vertical parapets.		

## Bridge Inventory Form

### Statement of Significance:

The Kupukoi Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Kupukoi Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui's commercial development. It is 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 Kupukoi Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing east.

## Bridge Inventory Form



Image 3. Northeast parapet, facing north.



## Bridge Inventory Form



Image 4. Northwest CRM abutment and deck girders, facing northwest.



## Bridge Inventory Form




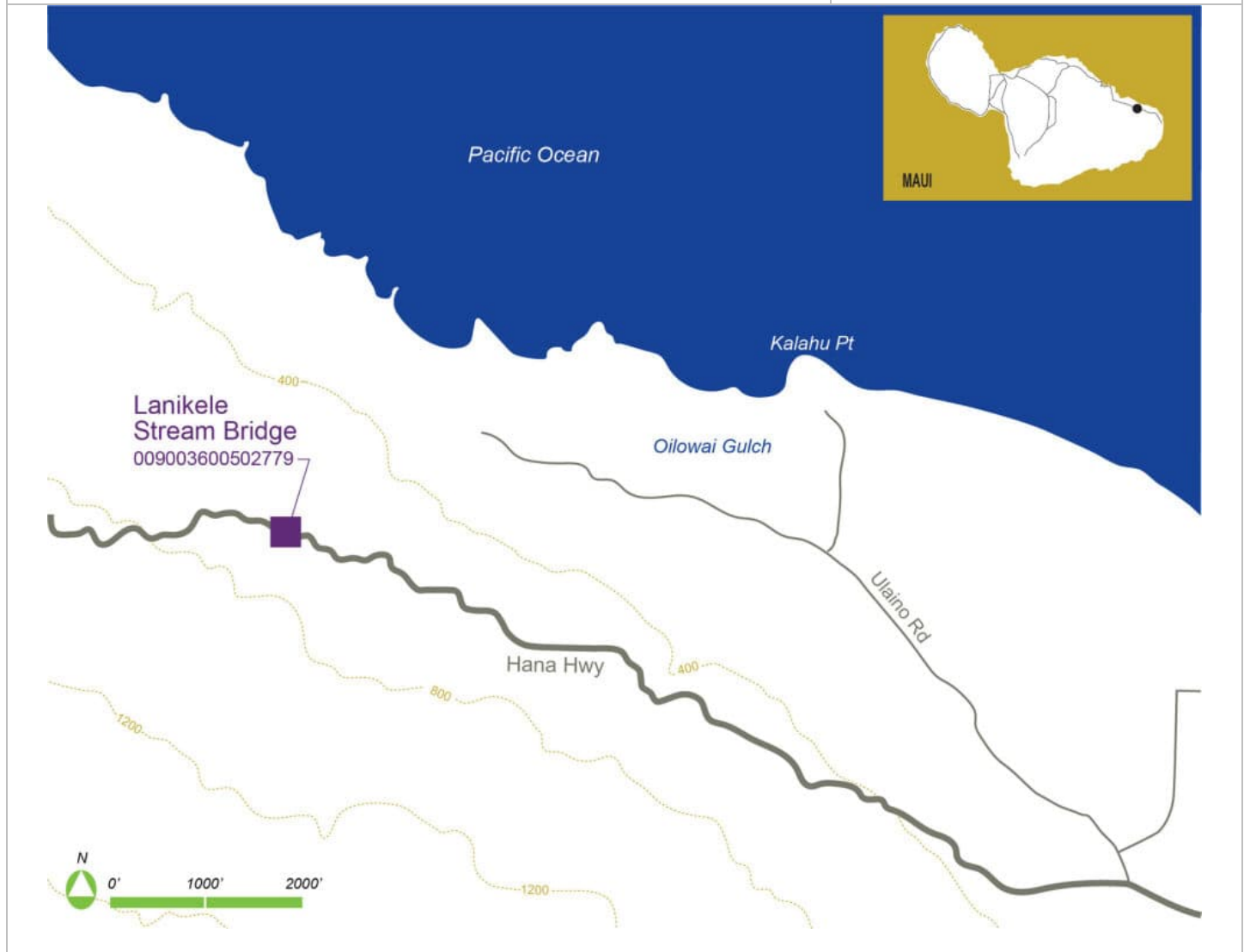
Image 5. Southeast CRM abutment and deck girders, facing southeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502779		<b>TMK:</b> 212999999, 212003040 (adjacent)	
<b>Common Name:</b> Lanikele Stream Bridge			
<b>Historic Name:</b> Lanikele Stream Bridge			
<b>Feature Crossed:</b> Lanikele Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 27.759		
<b>Latitude:</b> 20.79896	<b>Longitude:</b> -156.0635		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1917
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 22.0 ft.	<b>Total Length:</b> 50.9 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Reinforced Concrete Girder/Beam			
<b>Substructure:</b> Reinforced Concrete Pier Wall, Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1917, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Lanikele Stream Bridge carries the Hana Highway over the Lanikele Stream. This two-span reinforced concrete bridge rests on a reinforced concrete pier and rock masonry abutments. The abutments bear directly on natural rock formations. The single-lane roadway, paved in asphalt concrete (AC) overlay sits on a reinforced concrete deck slab and features concrete open vertical railings. Rock masonry railings are present on all end posts.		



## Bridge Inventory Form

### Statement of Significance:

The Lanikele Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Lanikele Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road with was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. A 2015 HDOT report recommended the bridge's renovation and rehabilitation to meet current safety standards while still remaining a single-lane bridge on a two-way road.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Lanikele Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. 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 1910s.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing northwest.



## Bridge Inventory Form



Image 3. Southwest parapet, facing south.



## Bridge Inventory Form



Image 4. Southeast abutment, facing southeast.



## Bridge Inventory Form



Image 5. Bridge pier, facing northwest.



## Bridge Inventory Form





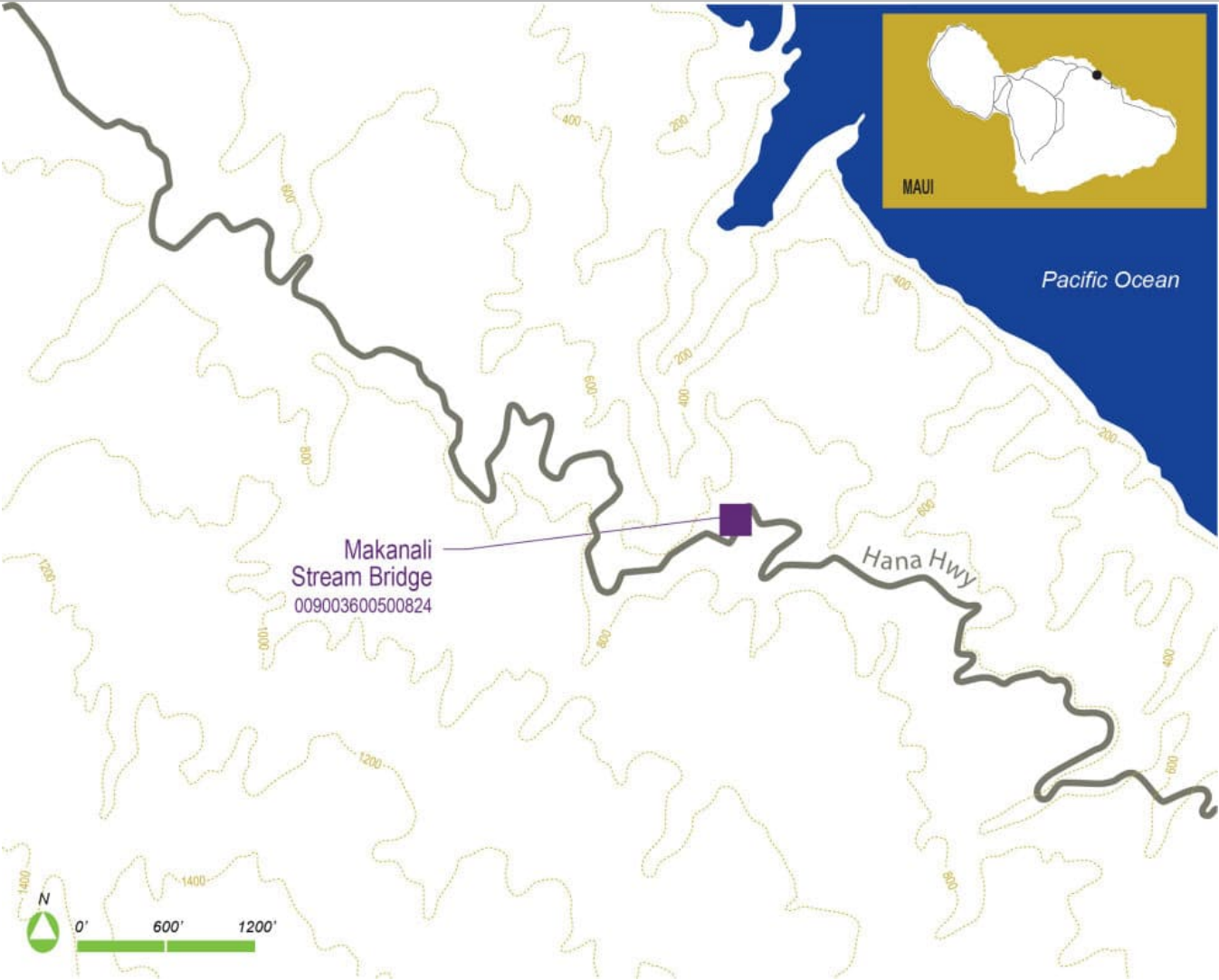
Image 6. Northwest abutment, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500824		<b>TMK:</b> 211999999, 211001036 (adjacent)	
<b>Common Name:</b> Makanali Stream Bridge			
<b>Historic Name:</b> Makanali Stream Bridge			
<b>Feature Crossed:</b> Makanali Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 8.24 mi.		
<b>Latitude:</b> 20.880	<b>Longitude:</b> -156.196		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1928
<b>Designer/Engineer:</b> Department of Public Works	
<b>Builder/Contractor:</b> Department of Public Works	
<b>Alteration Date(s):</b> 2019	
<b>Alterations:</b> CRM approach walls have been repaired	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 13.1 ft.	<b>Total Length:</b> 18.0 dt.	<b>Deck Width:</b> 17.7 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  Makanali Stream Bridge is a single-span, concrete slab bridge that spans Makanali Stream. The bridge's superstructure comprises of a concrete deck paved in asphalt concrete (AC) overlay. Two concrete open vertical railings flank the narrow roadway. The superstructure rests on rock masonry abutments that bear directly on natural rock formations.		



# Bridge Inventory Form

## Statement of Significance:

The Makanali Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Makanali Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Makanali Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 northwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing northeast.



## Bridge Inventory Form



Image 3. View of southeastern parapet, facing southeast.



## Bridge Inventory Form



Image 4. Detail of southeast parapet, facing northwest.



## Bridge Inventory Form



Image 5. View of bridge deck underside, facing northwest.



## Bridge Inventory Form




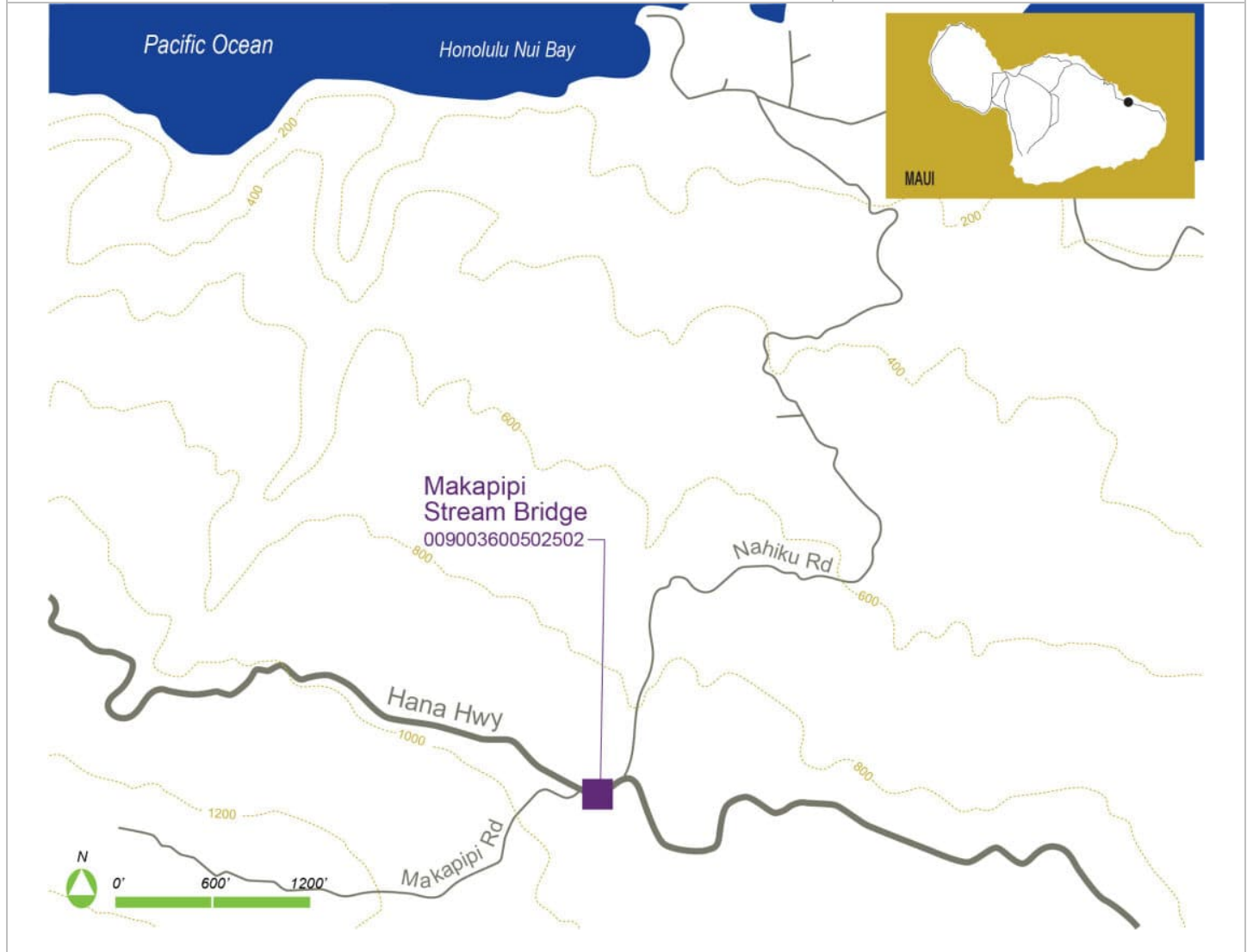
Image 6. View of northern CRM abutment, facing northeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502502		<b>TMK:</b> 212999999, 212004002 (adjacent)	
<b>Common Name:</b> Makapipi Stream Bridge			
<b>Historic Name:</b> Makapipi Stream Bridge			
<b>Feature Crossed:</b> Makapipi Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 24.979		
<b>Latitude:</b> 20.80723	<b>Longitude:</b> -156.0962		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 22.0 ft.	<b>Total Length:</b> 40.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Reinforced Concrete Continuous Tee Beam			
<b>Substructure:</b> Reinforced Concrete Abutment, Reinforced Concrete Pier Cap and Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Makapipi Stream Bridge carries the Hana Highway over the Makapipi Stream. This two-span concrete continuous tee beam bridge rests on reinforced concrete abutments and one reinforced concrete multi-column pier. Both the abutments and pier bear directly upon natural rock formations. The reinforced concrete deck, supported by four concrete continuous tee beams, carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are concrete open vertical railings with end posts.		



## Bridge Inventory Form

### Statement of Significance:

The Makapipi Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Makapipi Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Makapipi Stream Bridge is significant under Criterion C as a good example of a concrete continuous tee-beam bridge and was one among one a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 north.



## Bridge Inventory Form



Image 2. Approach to bridge, facing west.



## Bridge Inventory Form



Image 3. North parapet, facing northeast.

## Bridge Inventory Form



Image 4. East abutment, facing east.



## Bridge Inventory Form



Image 5. Pier and deck girders, facing west.



## Bridge Inventory Form





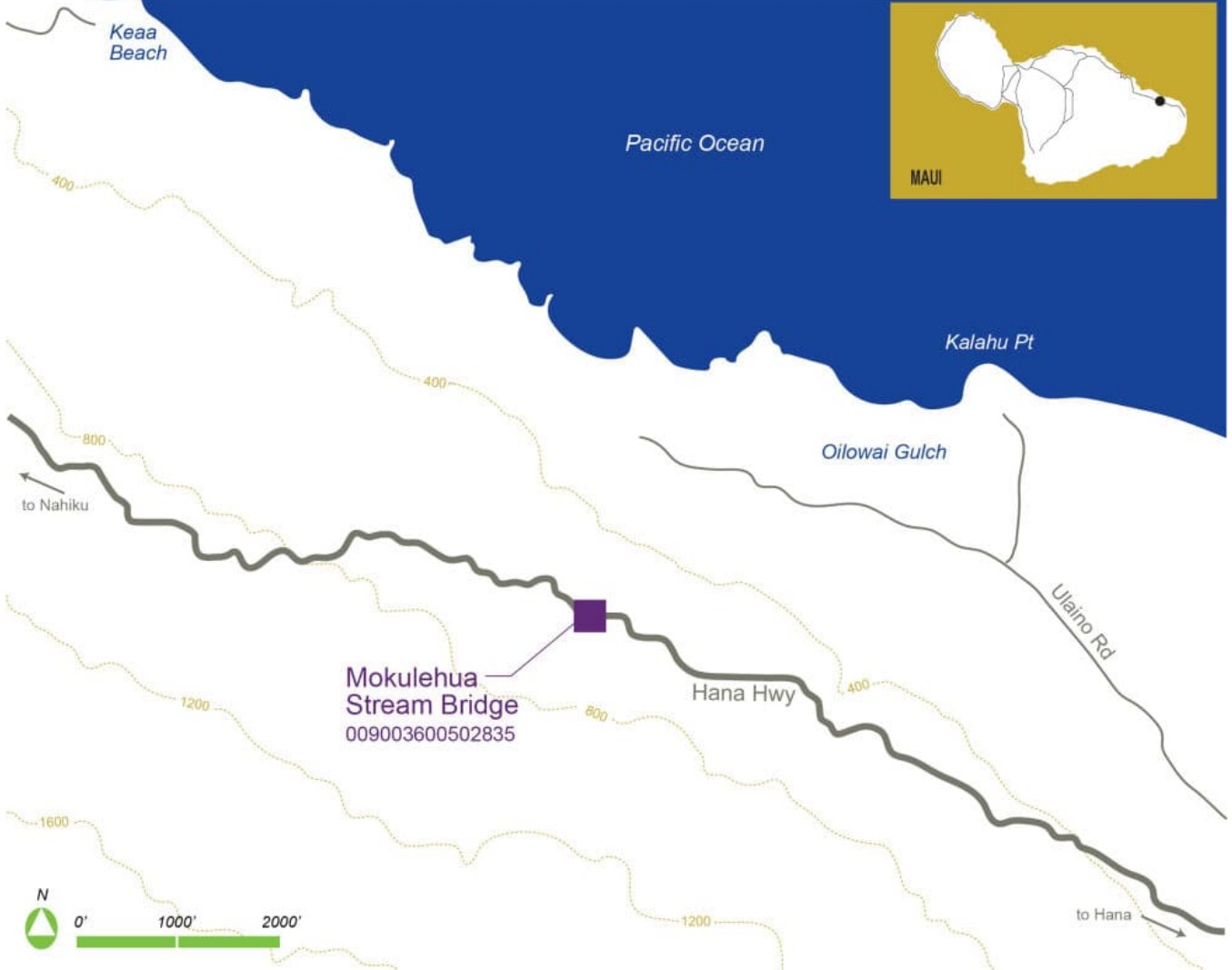
Image 6. West abutment and deck girders, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502835		<b>TMK:</b> 212999999, 212003005 (adjacent)	
<b>Common Name:</b> Mokulehua Stream Bridge			
<b>Historic Name:</b> Mokulehua Stream Bridge			
<b>Feature Crossed:</b> Mokulehua Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui		<b>Milepost:</b> 28.309	
<b>Latitude:</b> 20.7963		<b>Longitude:</b> -156.0568	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Reinforced Concrete Slab	<b>Construction Date:</b> 1908
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2020	
<b>Alterations:</b> Concrete patch in Kahului end of downstream bridge parapet.	

## Design Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 14.1	<b>Total Length:</b> 47.9	<b>Deck Width:</b> 15.1
<b>Superstructure:</b> Reinforced Concrete Slab			
<b>Substructure:</b> Reinforced Concrete Pier Wall, Concrete Rubble Masonry Abutments			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Mokulehua Stream Bridge carries the Hana Highway over the Mokulehua Stream. This three-span reinforced concrete slab bridge rests on two reinforced concrete pier walls and concrete rubble masonry abutments. Both the abutments and piers bear directly on natural rock formations. The reinforced concrete deck carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete solid railings.		



## Bridge Inventory Form

### Statement of Significance:

The Mokulehua Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Mokulehua Stream Bridge is the third-oldest bridge in the state after the Mamalahoa Highway Bridge (1904) on Hawaii and the Waipahu Street Bridge (1905) on Oahu. The bridge is also the first reinforced concrete bridge within the Hana Belt Road, which consists of a series of bridges constructed between 1900 and 1947 to provide access to remote areas of the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Mokulehua Stream Bridge is significant under Criterion C as a good early example of a concrete slab bridge and was the first bridge along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete solid parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 northeast.

## Bridge Inventory Form



Image 2. View of roadway and parapets, facing northwest.




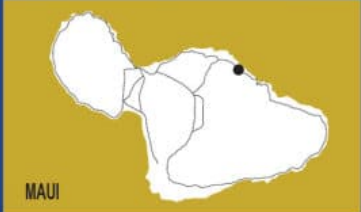
## Bridge Inventory Form

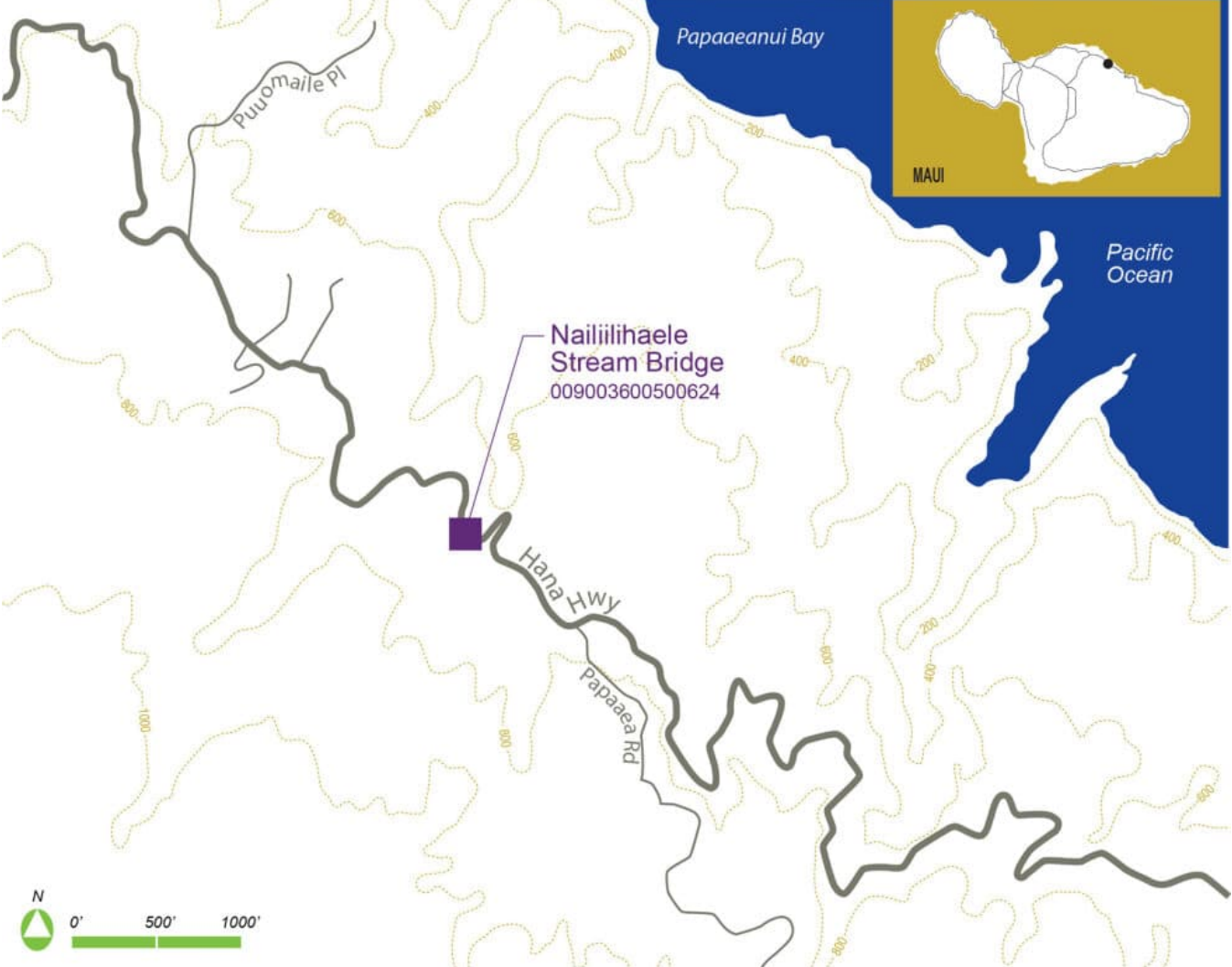


Image 3. Bridge piers, facing north.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500624		<b>TMK:</b> 229999999, 229013019 (adjacent)	
<b>Common Name:</b> Nailililihaele Bridge			
<b>Historic Name:</b> Nailililihaele Bridge			
<b>Feature Crossed:</b> Nailililihaele Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 6.22		
<b>Latitude:</b> 20.88684	<b>Longitude:</b> -156.2102		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1930
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b> Yes; Repaired collision damage to upstream CRM wall on Hana end (2015). Missing OM-3 markers have been installed (2021/05/13). Timber debris was removed from upstream face of piers (2021/10/07).	

## Design Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 21.0 ft.	<b>Total Length:</b> 64.0 ft.	<b>Deck Width:</b> 23.0 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Concrete Abutment, Masonry Abutment, Concrete Pier Wall and Multi-Column Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>HRHP No.:</b> 50-50-06-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Nailiilihaele Bridge carries the Hana Highway over the Nailiilihaele Stream. This triple-span concrete continuous tee beam bridge, built in curved form, rests on one concrete abutment, one masonry abutment, and two concrete multi-column pier walls. The concrete deck is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are curved concrete open vertical railings.		

# Bridge Inventory Form

## Statement of Significance:

The Nailiilihaele Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Nailiilihaele Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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 therefore the bridge is not significant under Criterion B.

The Nailiilihaele Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is a rare example of curved deck and parapet construction, and is one of four curved bridges found along the Hana 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 bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, County Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



Image 2. View of bridge deck, facing south.



## Bridge Inventory Form



Image 3. Southwest parapet.



## Bridge Inventory Form



Image 4. Detail of southwest parapet, facing west.



## Bridge Inventory Form



Image 5. Detail of northeast parapet.



## Bridge Inventory Form



Image 6. Detail of northwest abutment, bridge girders, and pier.



## Bridge Inventory Form



Image 7. View of northwest abutment, facing north.



## Bridge Inventory Form



Image 8. Detail of pier, facing northwest.




## Bridge Inventory Form

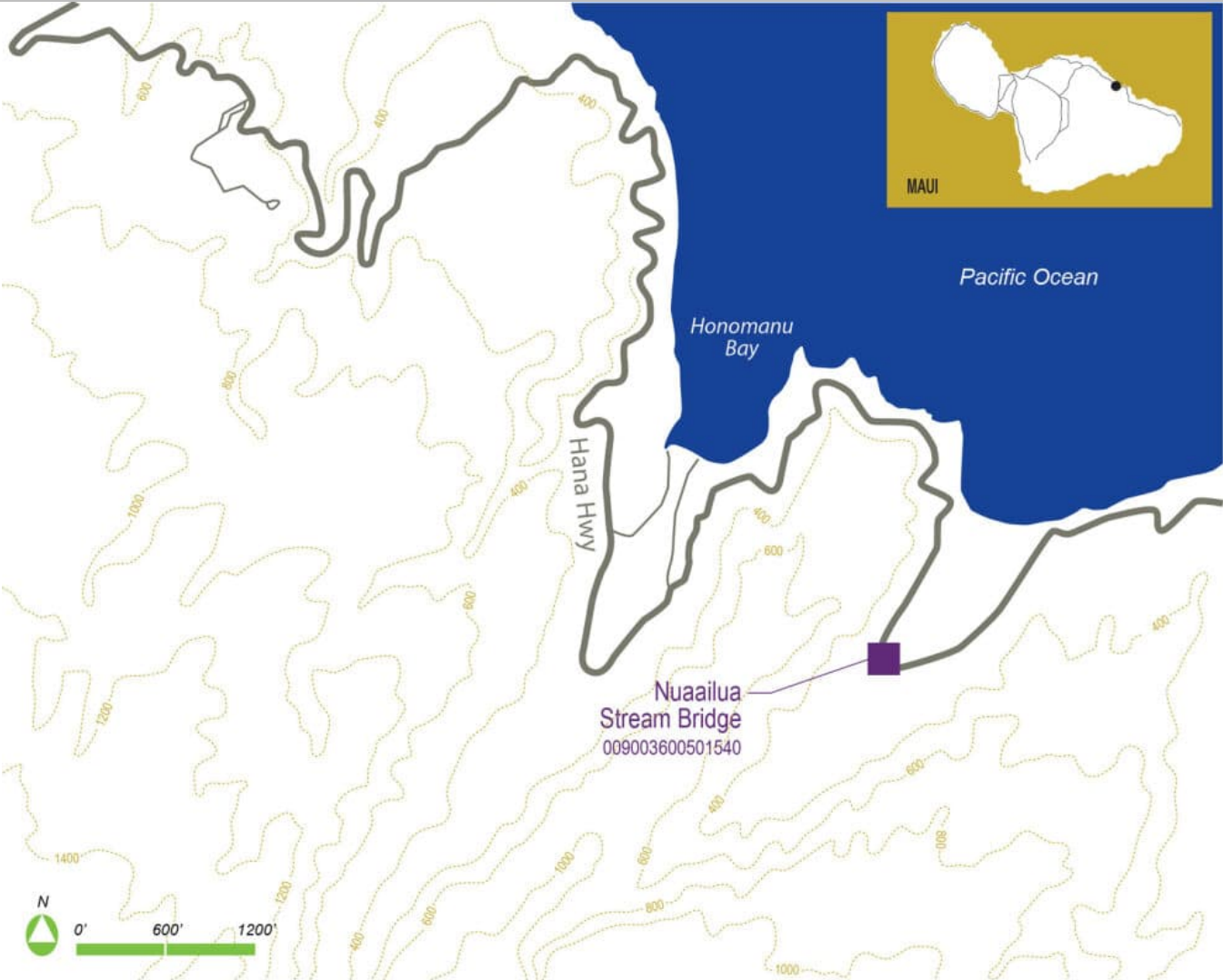


Image 9. View of southeast abutment and CRM wall.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501540		<b>TMK:</b> 211999999, 211002007 (adjacent)	
<b>Common Name:</b> Nuaailua Bridge			
<b>Historic Name:</b> Nuaailua Bridge			
<b>Feature Crossed:</b> Nuaailua Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 15.38		
<b>Latitude:</b> 20.85526	<b>Longitude:</b> -156.1606		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

The map displays the Nuaailua area on Maui, showing the Hana Highway (Route 360) and the Pacific Ocean. The Nuaailua Stream Bridge is marked with a purple square and labeled. The map includes contour lines and an inset map of Maui showing the location of the bridge. A scale bar and north arrow are also present.



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911
<b>Designer/Engineer:</b> Joseph Matson (1940)	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1940	
<b>Alterations:</b> Widened in 1940 on makai side, all deficiencies in deck soffit and girders have been repaired (undated), delaminations in cement finish in Hana abutment have been repaired (undated), repairs have been made to spalls in bridge parapet (undated).	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 29.9 ft.	<b>Total Length:</b> 35.1 ft.	<b>Deck Width:</b> 27.6 ft.
<b>Superstructure:</b> Reinforced Concrete Girder/Beam			
<b>Substructure:</b> Reinforced Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical (makai) and Concrete Solid Panel (mauka)			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1911		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  Nuaailua Stream Bridge is a single span reinforced concrete tee beam bridge built in 1911 and widened in 1940. It carries the Hana Highway over the Nuaailua Stream. The superstructure consists of a two-lane concrete deck slab with asphalt concrete (AC) overlay supported on eight concrete tee beams and resting on reinforced concrete abutments.		

## Bridge Inventory Form

Parapets consist of two different patterns, a concrete open vertical on the makai side and concrete solid panel on the mauka side. The mauka parapet is original to the bridge while the makai parapet is the result of the 1940 widening.

### Statement of Significance:

The Nuaailua Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Nuaailua Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's preservation and rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Nuaailua Stream bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good early example reinforced concrete bridge that would become typical of its period in its use of materials, method of construction, craftsmanship, and design. While the use of two different parapets is unique, each parapet is representative of a typical rail pattern used by the Territorial Highway Department. Additionally, construction activities utilized local engineers and contractors. For instance, county engineer Joseph Matson, Jr. supervised the bridge's 1940 widening. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1910s despite its 1940 widening and application of modern pavement to the bridge deck.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 showing northeast parapet constructed in 1940, facing southwest.



## Bridge Inventory Form



Image 2. General view of approach road and southwest parapet constructed in 1911, facing south.

## Bridge Inventory Form



Image 3. View of southwest parapet constructed in 1911, facing south.



## Bridge Inventory Form



Image 4. View of northeast parapet constructed in 1940, facing north.

## Bridge Inventory Form



Image 5. View of northwest abutment and deck girders, facing north. Note the different girder depths indicating construction in 1911 (mauka) and 1940 (makai).




## Bridge Inventory Form

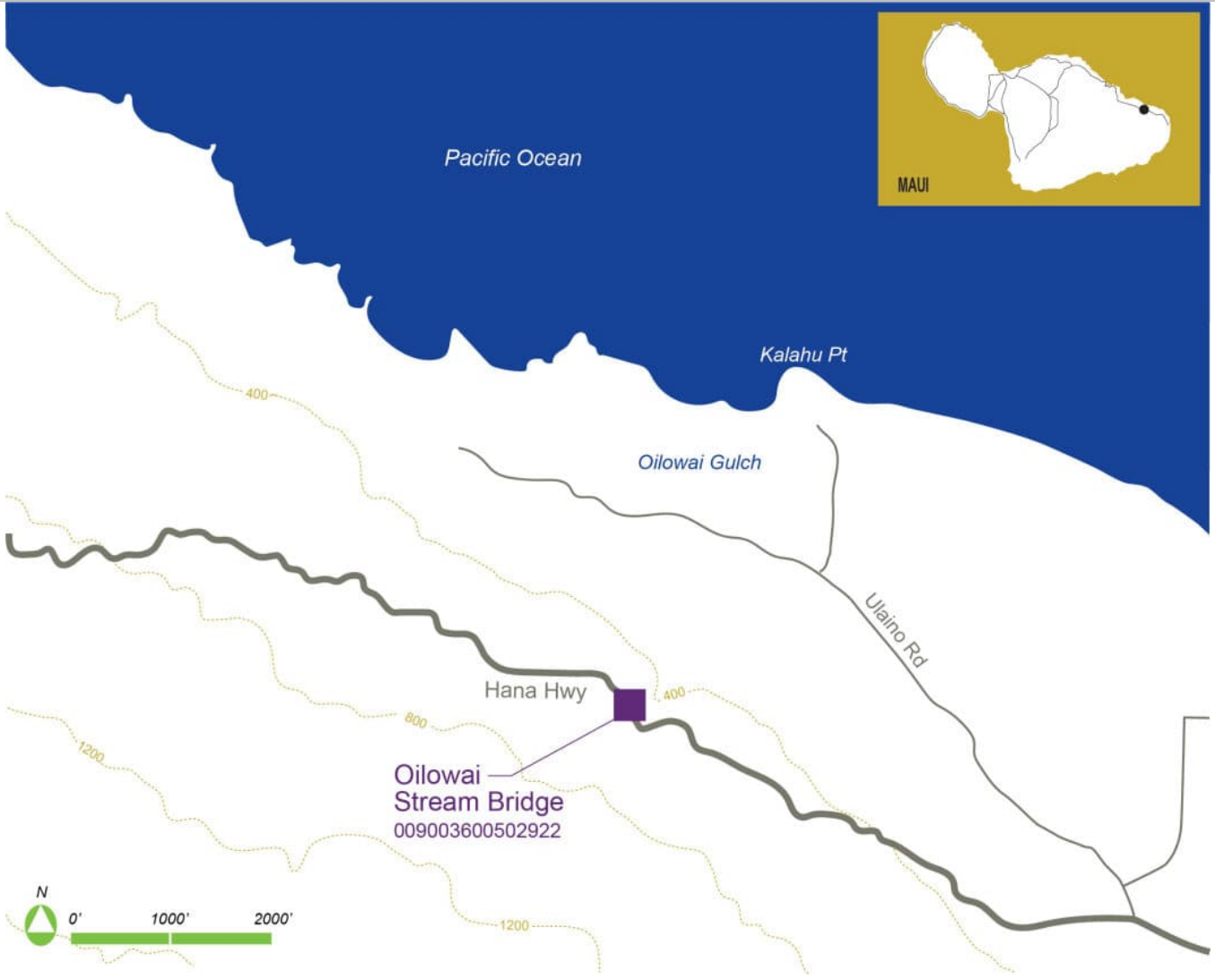


Image 6. View of southeast abutment and deck girders, facing south. Note the different girder depths indicating construction in 1911 (mauka) and 1940 (makai).

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502922		<b>TMK:</b> 213999999, 213002006 (adjacent)	
<b>Common Name:</b> Oilowai Stream Bridge			
<b>Historic Name:</b> Oilowai Stream Bridge			
<b>Feature Crossed:</b> Oilowai Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 29.179		<b>Image Date:</b> 10/30/2023
<b>Latitude:</b> 20.79204	<b>Longitude:</b> -156.0461		
<b>Ownership:</b> State			



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1914
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 22.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Oilowai Stream Bridge carries the Hana Highway over the Oilowai Stream. This concrete tee beam bridge rests on masonry abutments that bear directly onto natural rock formations. The reinforced concrete deck is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open vertical railings.		

# Bridge Inventory Form

## Statement of Significance:

The Oilowai Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Oilowai Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Oilowai Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing northwest.

## Bridge Inventory Form



Image 3. Northeast parapet, facing northeast.




## Bridge Inventory Form

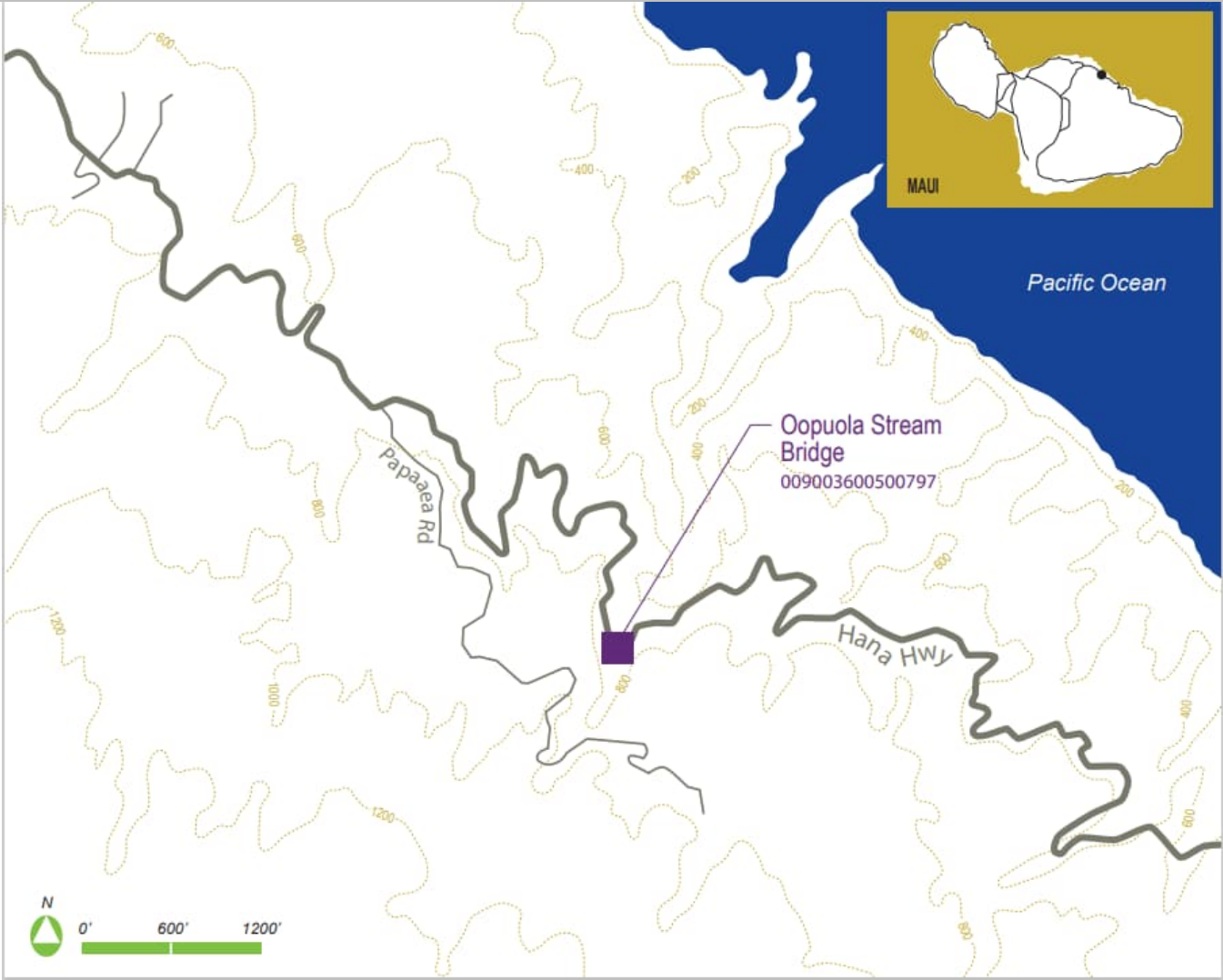


Image 4. Northwest abutment, facing northwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500797		<b>TMK:</b> 229999999, 229014002 (adjacent)	
<b>Common Name:</b> Oopuola Stream Bridge			
<b>Historic Name:</b> Oopuola Stream Bridge			
<b>Feature Crossed:</b> Oopuola Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 7.94		
<b>Latitude:</b> 20.87796	<b>Longitude:</b> -156.2003		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



Oopuola Stream Bridge  
009003600500797

Papae Rd

Hana Hwy

Pacific Ocean

MAUI

0' 600' 1200'



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1925
<b>Designer/Engineer:</b> County Engineer Office	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1931, 2015	
<b>Alterations:</b> The road appears to have been repaved, some mortar joints in CRM abutment walls appear to have been repaired and vegetation removed, and fallen tree and most vegetation has been removed from upstream and downstream channels in 2015.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 28.9 ft.	<b>Total Length:</b> 28.9 ft.	<b>Deck Width:</b> 21.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Rubble Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Eligible	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1925, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Oopuola Stream Bridge carries the Hana Highway over the Oopuola Stream. This single-span reinforced concrete tee beam bridge, built in a curved form, rests on rock masonry abutments. The asphalt concrete roadway is supported by four concrete tee beams. Curved concrete open vertical railings flank each side of the roadway. While		

## Bridge Inventory Form

documentation indicates the bridge was modified in 1931, research has not indicated any specific alterations made to the structure.

### Statement of Significance:

The Oopuola Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Oopuola Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road with was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's preservation and rehabilitation to meet current highway standards and reclassification from a two-lane bridge to a one-lane bridge.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Oopuola Stream bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good early example reinforced concrete bridge that would become typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is a rare example of curved deck and parapet construction, and is one of four curved bridges found along the Hana 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 bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1910s despite its 1940 widening and application of modern pavement to the bridge deck.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. View of road approach and southwest parapet, facing south.



Image 3. View of southwest parapet, facing west.



## Bridge Inventory Form



Image 4. View of northeast parapet, facing north.



## Bridge Inventory Form



Image 5. Detail of northeast parapet, facing east.



## Bridge Inventory Form



Image 6. View of substructure and girders, facing southwest.



## Bridge Inventory Form




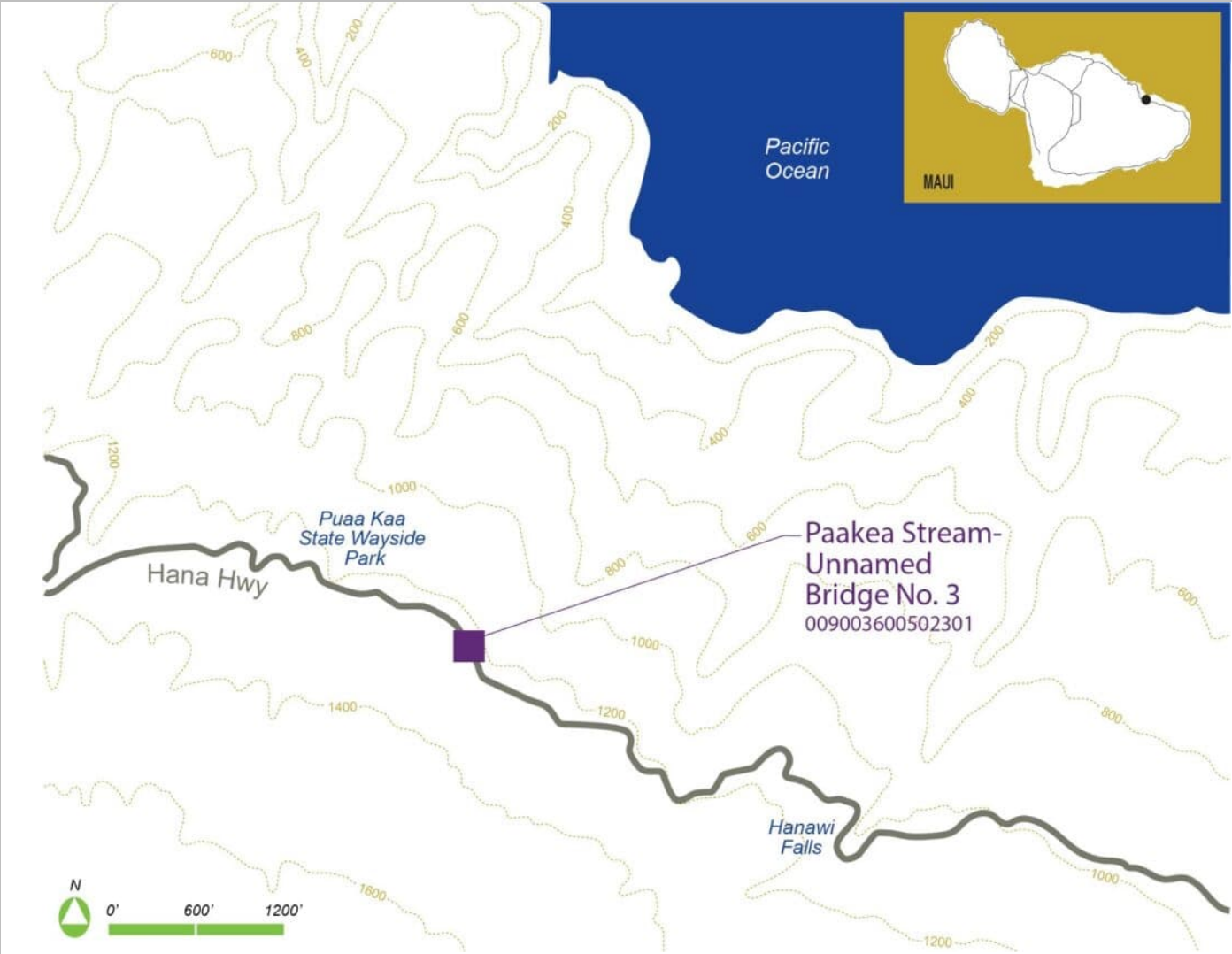
Image 7. View of CRM abutment, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502301		<b>TMK:</b> 212999999, 212001002 (adjacent)	
<b>Common Name:</b> Paakea Stream-Unnamed Bridge No.3			
<b>Historic Name:</b> Paakea Stream-Unnamed Bridge No.3			
<b>Feature Crossed:</b> Paakea Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 22.97 mi.		
<b>Latitude:</b> 20.815	<b>Longitude:</b> -156.121		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1920
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015	
<b>Alterations:</b> All deficiencies in deck soffit and girders have been repaired, roadway has been repaved since the previous inspection, and exposed rebars on upstream face at the upstream parapet has been repaired.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 15.1 ft.	<b>Total Length:</b> 19.0 ft.	<b>Deck Width:</b> 14.1 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Paakea Stream-Unnamed Bridge No.3 carries the Hana Highway over the Paakea Stream. This single-span reinforced concrete tee beam bridge rests on concrete rock masonry (CRM) abutments that bear directly on natural rock formations. The concrete deck slab is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete solid railings.		

## Bridge Inventory Form

### Statement of Significance:

The Paakea Stream-Unnamed Bridge No.3 is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Paakea Stream-Unnamed Bridge No.3 is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Paakea Stream-Unnamed Bridge No.3 is significant under Criterion C as a good example of a concrete tee-beam bridge and was among one of a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete solid parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship and research indicates few alterations to the bridge. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 north.



## Bridge Inventory Form



Image 2. Approach to bridge, facing east.

## Bridge Inventory Form



Image 3. Southern parapet, facing southeast.



## Bridge Inventory Form



Image 4. Western abutment, facing northwest.

## Bridge Inventory Form


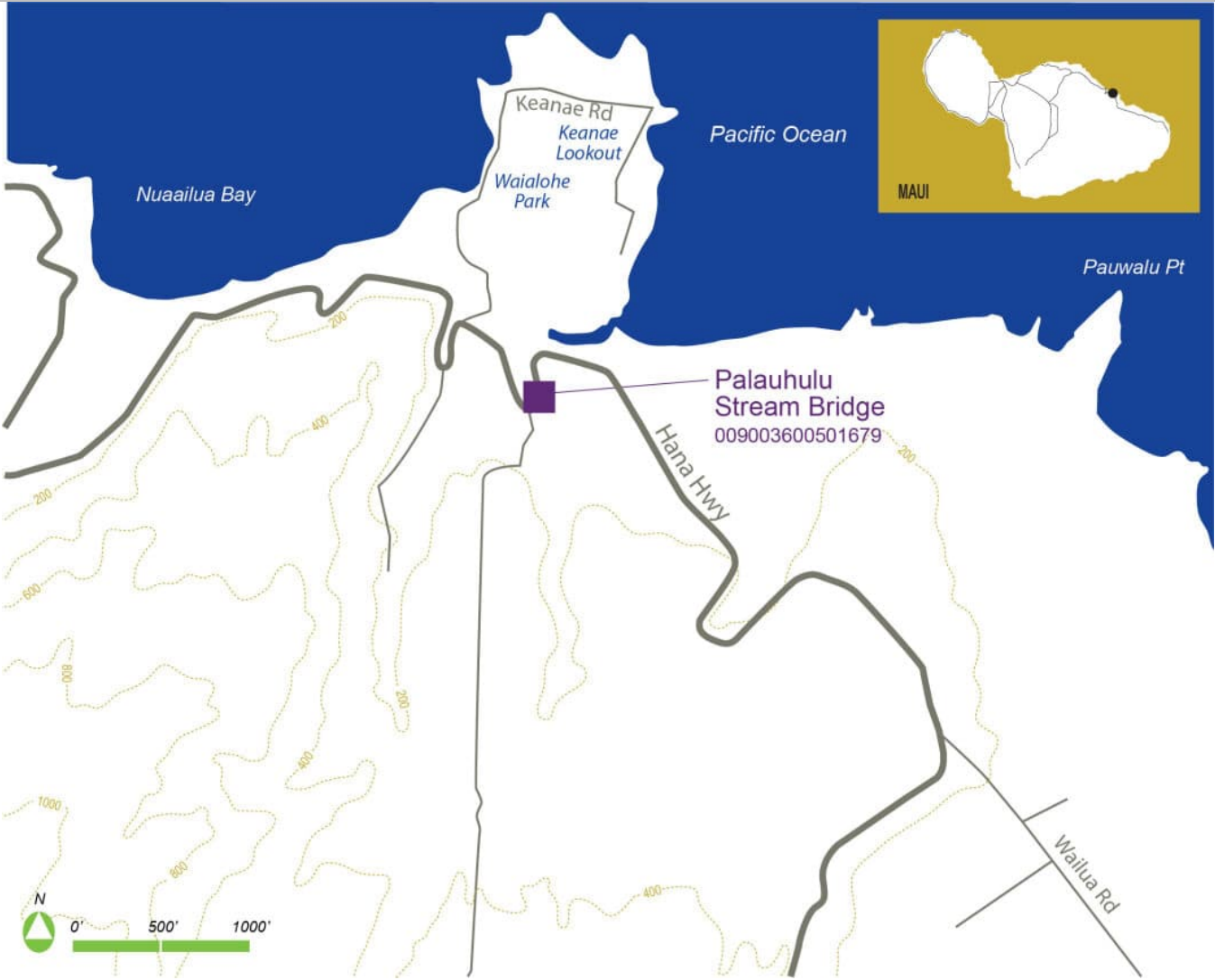


Image 5. Eastern abutment, facing northeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501679	<b>TMK:</b> 211007003, 211008008 (adjacent)	
<b>Common Name:</b> Palauhulu Stream Bridge		
<b>Historic Name:</b> Palauhulu Stream Bridge		
<b>Feature Crossed:</b> Palauhulu Stream		
<b>Feature Carried:</b> Hana Highway/Route 360		
<b>Island:</b> Maui	<b>Milepost:</b> 16.77	
<b>Latitude:</b> 20.85663	<b>Longitude:</b> -156.1466	
<b>Ownership:</b> State		<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1916
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015	
<b>Alterations:</b> Repair spall and delamination in deck soffit and girder.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 29.9 ft.	<b>Total Length:</b> 30.8 ft.	<b>Deck Width:</b> 21.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Reinforced Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  <p>The Palauhulu Stream Bridge carries the Hana Highway over the Palauhulu Stream. This single span reinforced concrete tee beam bridge, built in curved form, rests on reinforced concrete abutments which bear directly on natural rock formations. The reinforced concrete deck is supported by four tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two curved concrete open vertical railings.</p>		



## Bridge Inventory Form

### Statement of Significance:

The Palauhulu Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Palauhulu Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Palauhulu Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is a rare example of curved deck and parapet construction, and is one of four curved bridges found along the Hana 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 bridge remains in its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 setting, facing east.



## Bridge Inventory Form



Image 2. View of approach road to bridge, facing southeast.



Image 3. View of west parapet, facing northeast.



## Bridge Inventory Form



Image 4. View of southern abutment and deck girders, facing west.

## Bridge Inventory Form



Image 5. View of northern abutment and deck girders, facing north.




## Bridge Inventory Form

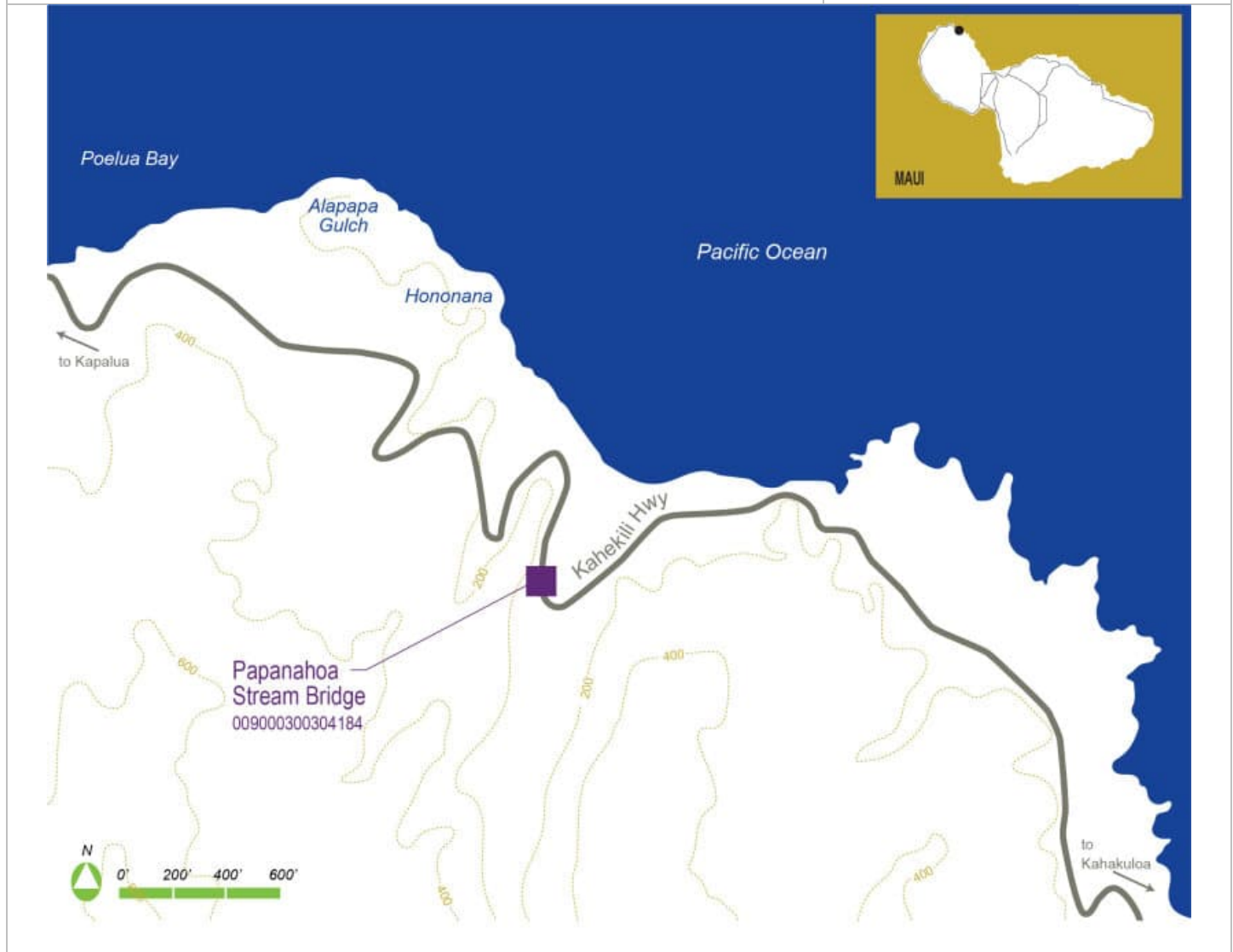


Image 6. Detail of deck girders, facing south.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009000300304184		<b>TMK:</b> 231003006	
<b>Common Name:</b> Papanahoa Bridge			
<b>Historic Name:</b> Papanahoa Bridge			
<b>Feature Crossed:</b> Papanahoa Stream			
<b>Feature Carried:</b> Kahekili Highway/Route 340			
<b>Island:</b> Maui		<b>Milepost:</b> 41.32	
<b>Latitude:</b> 21.00931		<b>Longitude:</b> -156.5679	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1924
<b>Designer/Engineer:</b> Unknown	
<b>Builder/Contractor:</b> Unknown	
<b>Alteration Date(s):</b> 1980	
<b>Alterations:</b> Bridge railing and possibly slab.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 19.7 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Other Features:</b> Unique three faceted abutments support the bridge over the stream.			

## Historic Information

<b>NRHP Status:</b> Not Eligible	<b>Criteria:</b> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>SIHP No.:</b> N/A	
<b>6E Status:</b> Not Significant	<b>Criteria:</b> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input type="checkbox"/> Design <input type="checkbox"/> Setting <input type="checkbox"/> Materials <input type="checkbox"/> Workmanship <input type="checkbox"/> Feeling <input type="checkbox"/> Association <input type="checkbox"/>		
<b>Historic District:</b> No		<b>Contributing:</b> N/A
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering		
<b>Period of Significance:</b> 1924		
<b>Narrative Description:</b>  The Papanahoa Bridge carries Kahekili Highway across Papanahoa Stream 10.03 miles north of Camp Maluhia Road. This concrete slab bridge remains intact, but it is in poor condition. The concrete rock masonry abutments are original. In 1980, the bridge railings were replaced with metal thrie beam railings. Unique, three faceted abutments support the Papanahoa Bridge over the stream.		

## Bridge Inventory Form

### Statement of Significance:

The Papanahoa Bridge was built in 1924 along the King Kahekili Trail named after King Kahekili, the last King of Maui who ruled between 1783 and 1794. Following the bridge's construction, the trail began to be paved though it remained a modest roadway. In 1938 Supervisor H.L. Holstein designated the roadway the Kahekili Highway and during World War II, the military made modest improvements for vehicle movements. The Kahekili Highway remained an isolated roadway on the island; the Papanahoa Bridge suffered from lack of maintenance and its railings were replaced with metal thrie beams in 1980. The entire highway was not completely paved until the 1990s. At an unknown date, its concrete slab deck underwent substantial repairs.

The bridge is not associated with Territorial highway improvements. 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.

This bridge is not significant under Criterion C. While an example of a concrete slab bridge with rock abutments, the loss of the original railing and substantial concrete repairs to the deck make this bridge not a good example of this type.

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

Therefore, the Papanahoa Bridge is not eligible for the NRHP.



# Bridge Inventory Form

## References

"Holstein Digs Into History to Christen Maui's Roads." *Honolulu Star-Bulletin*, August 19, 1938.  
<https://www.newspapers.com/image/275140856/>.

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.

Young, Peter T. "A Line on a Map." Images of Old Hawai'i, September 7, 2024. <https://imagesofoldhawaii.com/kahekili-highway/>.

## Bridge Inventory Form



Image 1. General view of bridge, facing northeast.



Image 2. View of bridge deck and three beam railings, facing southeast.



## Bridge Inventory Form



Image 3. View of bridge deck underside and CRM abutment.



Image 4. View of CRM abutment.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501662		<b>TMK:</b> 211999999, 211003031 (adjacent)	
<b>Common Name:</b> Piinaau Stream Bridge			
<b>Historic Name:</b> Piinaau Stream Bridge			
<b>Feature Crossed:</b> Piinaau Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 16.599		<b>Image Date:</b> 10/30/2023
<b>Latitude:</b> 20.85833	<b>Longitude:</b> -156.1479		
<b>Ownership:</b> State			




# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1916
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015, 2021	
<b>Alterations:</b> In 2015, repairs were made to spall and delamination in girders G4, G5, and G6. In 2021, CRM approach walls at downstream Kahului and downstream Hana approaches have been replaced.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 26.9 ft.	<b>Total Length:</b> 27.9 ft.	<b>Deck Width:</b> 20.3
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Piinaau Stream Bridge carries the Hana Highway over the Piinaau Stream. This single-span concrete tee beam bridge rests on concrete abutments that bear directly on natural rock formations. The reinforced concrete deck is supported by seven concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open vertical railings. Constructed in 1916, the bridge was widened in 1940.		

## Bridge Inventory Form

### Statement of Significance:

The Piinaau Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Piinaau Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Piinaau Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates no major alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 northeast.



## Bridge Inventory Form



Image 2. View from roadway, facing northwest.



Image 3. View of northeast parapet, facing north.



## Bridge Inventory Form



Image 4. View of southeast abutment and deck girders, facing south.



## Bridge Inventory Form



Image 5. View of northwest abutment and deck girders, facing north.

## Bridge Inventory Form


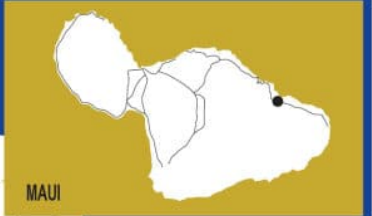


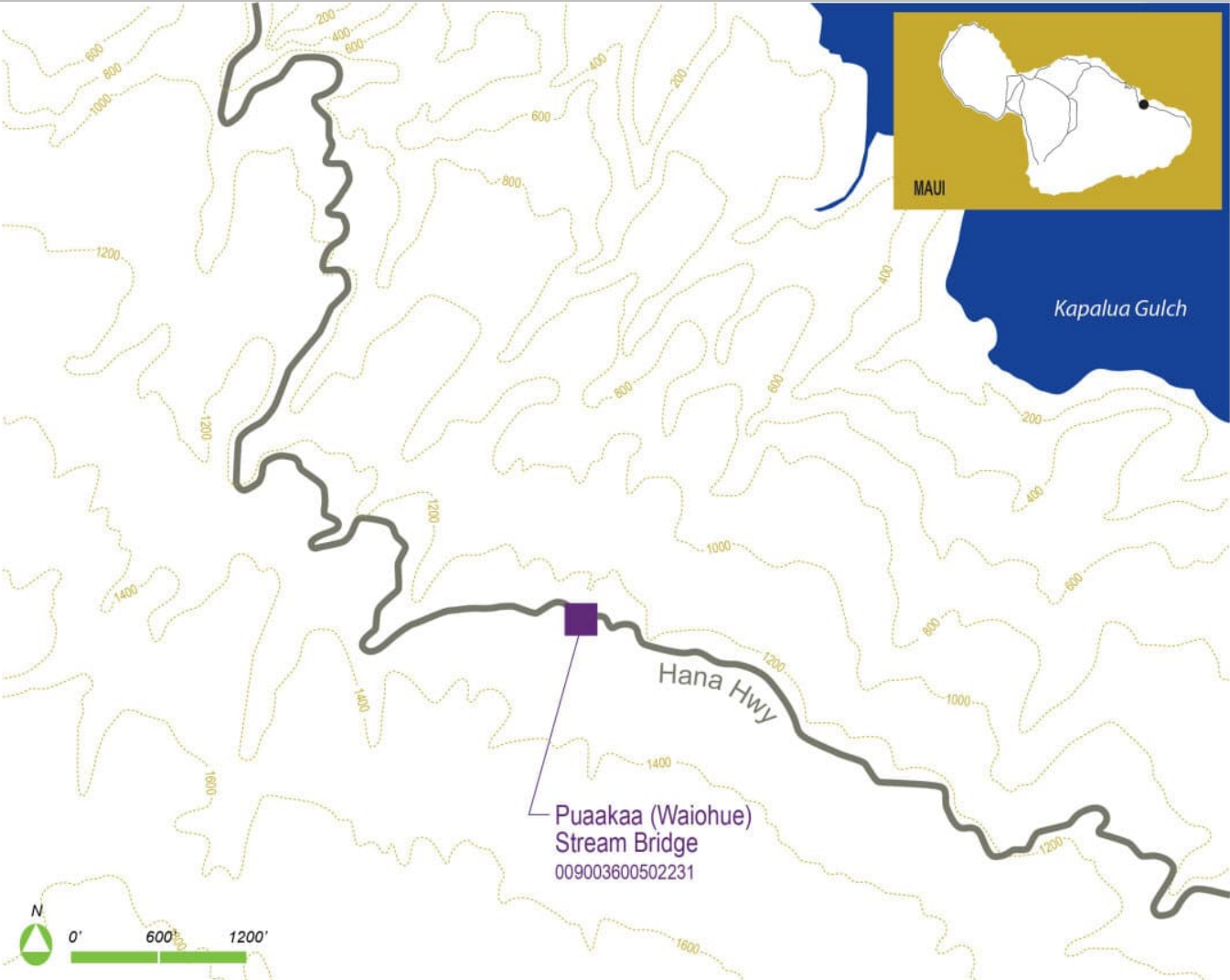
Image 6. Detail of deck girders, facing southeast. Note irregular girder width marking 1911 construction (right) and 1940 widening (left).



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502231		<b>TMK:</b> 212999999, 212001003 (adjacent)	
<b>Common Name:</b> Puaakaa (Waiohue) Stream Bridge			
<b>Historic Name:</b> Puaakaa (Waiohue) Stream Bridge			
<b>Feature Crossed:</b> Puaakaa Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 22.279		
<b>Latitude:</b> 20.81757	<b>Longitude:</b> -156.1276		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

The map displays the Hana Highway (Route 360) winding through a mountainous area. The bridge is located at a point where the highway crosses a stream. Contour lines indicate elevations ranging from 200 to 1600 feet. A scale bar shows distances up to 1200 feet, and a north arrow is present in the bottom left corner. An inset map of Maui shows the location of the bridge on the eastern coast, near the Hana Highway. The map also labels the 'Kapalua Gulch' and the 'Puaakaa (Waiohue) Stream Bridge' with its ID number 009003600502231.

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015	
<b>Alterations:</b> Two deck drains at downstream bridge railing have been unclogged, undermining at the upstream Hana CRM wingwall (identified in previous inspection report) was not observed, repaired spalls and delamination on deck soffit and girders.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 19.0 ft.	<b>Total Length:</b> 20.0 ft.	<b>Deck Width:</b> 24.3 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Puaakaa (Waiohue) Stream Bridge carries the Hana Highway over the Puaakaa Stream. This single-span concrete tee beam bridge rests on concrete abutment walls, with the abutment walls bearing directly on natural rock formations.		



## Bridge Inventory Form

The concrete deck rests on seven tee beams and carries a two-lane roadway paved in asphalt concrete (AC) overlay. Concrete open vertical railings with end posts flank the roadway.

### Statement of Significance:

The Puaakaa (Waiohue) Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Puaakaa (Waiohue) Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's preservation and rehabilitation to meet current highway standards. While the bridge is designated as a two-lane roadway, two cars cannot safely pass one another, and the report recommends the bridge be restriped as a one lane roadway, since widening the bridge would compromise its integrity.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Puaakaa (Waiohue) Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. Due to the bridge's location on a curve, its seven concrete tee beam width is a unique use of standard materials, as other bridges on the Hana Highway consist of four tee beam decks. Its width also allows the bridge to be two lanes instead of one. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 north.



## Bridge Inventory Form



Image 2. Approach to bridge, facing southeast.



## Bridge Inventory Form



Image 3. View of northern parapet, facing north.

## Bridge Inventory Form



Image 4. Western parapet and deck girders, facing southwest.



## Bridge Inventory Form



Image 5. Eastern parapet and deck girders, facing northeast.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501098		<b>TMK:</b> 211999999, 211001999 (adjacent)	
<b>Common Name:</b> Puohokamoa Stream Bridge			
<b>Historic Name:</b> Puohokamoa Stream Bridge			
<b>Feature Crossed:</b> Puohokamoa Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 10.97 mi.		
<b>Latitude:</b> 20.86719	<b>Longitude:</b> -156.1784		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1912
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 24.9 ft.	<b>Total Length:</b> 56.1 ft.	<b>Deck Width:</b> 17.1 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Other Features:</b> Construction date incised on makai parapet face			

## Historic Information

<b>NRHP Status:</b> Eligible	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01509 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1912, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Puohokamoa Stream Bridge carries the Hana Highway over the Puohokamoa Stream. The concrete tee beam bridge is two spans in length and rests on a concrete wall pier and concrete abutments. The concrete slab deck supports a narrow roadway paved in asphalt concrete (AC) overlay and is flanked by solid concrete railings with caps. The bridge construction date is incised on the makai railing facing outwards, though it is faded.		

## Bridge Inventory Form

### Statement of Significance:

The Puohokamoa Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Puohokamoa Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Puohokamoa Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete parapet with cap is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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, looking upstream, facing southwest. Bridge construction date "AD 1912" incised on outside parapet, though faintly.



## Bridge Inventory Form



Image 2. General view of bridge approach, facing west.



Image 3. View of southwest parapet, facing south.



## Bridge Inventory Form



Image 4. View of northeast parapet, facing north.



Image 5. Detail of northeast parapet.



## Bridge Inventory Form



Image 6. View of southeast span girders, facing southeast.



## Bridge Inventory Form



Image 7. View of northwest abutment, facing northwest.



## Bridge Inventory Form



Image 8. View of pier, facing northwest.



## Bridge Inventory Form


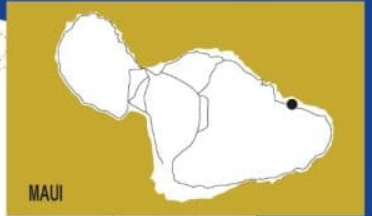



Image 9. View of southeast abutment, facing southeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502652		<b>TMK:</b> 212999999, 212003054 (adjacent)	
<b>Common Name:</b> Pupape Stream Bridge			
<b>Historic Name:</b> Pupape Stream Bridge			
<b>Feature Crossed:</b> Pupape Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 26.479		
<b>Latitude:</b> 20.80268	<b>Longitude:</b> -156.0781		
<b>Ownership:</b> State			<b>Image Date:</b> 10/23/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Pupape Stream Bridge carries the Hana Highway over the Pupape Stream. This single-span concrete tee beam bridge rests on concrete abutments that bear directly on natural rock formations. The concrete deck slab is supported by four concrete tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open vertical railings.		



## Bridge Inventory Form

### Statement of Significance:

The Pupape Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Pupape Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Pupape Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing north.



## Bridge Inventory Form



Image 3. Northeast parapet, facing north.



## Bridge Inventory Form



Image 4. Northwest abutment and deck girders, facing north.




## Bridge Inventory Form

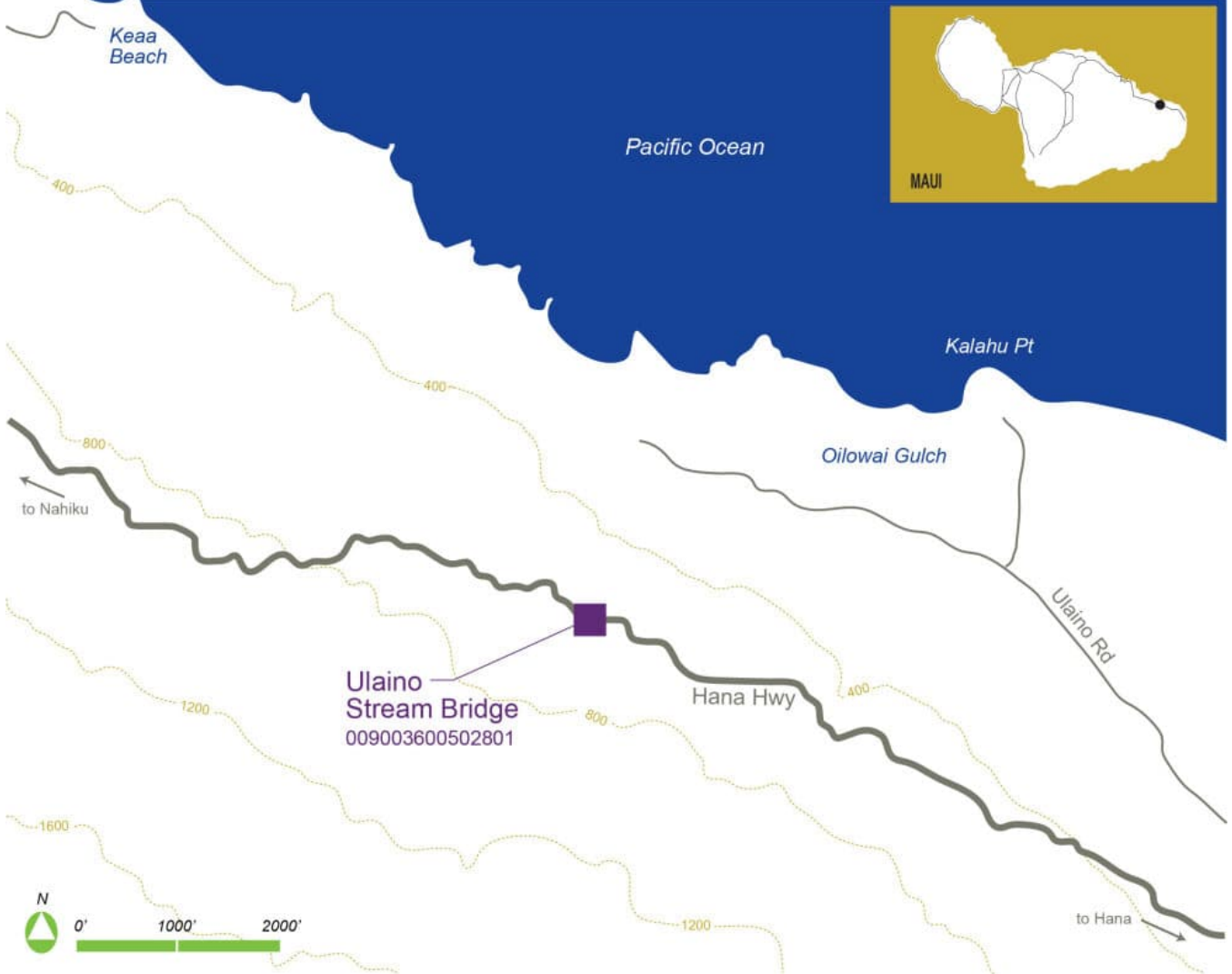


Image 5. Southeast parapet and deck girders, facing southeast.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502801		<b>TMK:</b> 212999999, 212003005 (adjacent)	
<b>Common Name:</b> Ulaino Stream Bridge			
<b>Historic Name:</b> Ulaino Stream Bridge			
<b>Feature Crossed:</b> Ulaino Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 27.979		
<b>Latitude:</b> 20.79779	<b>Longitude:</b> -156.0607		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

Map details: The map shows the island of Maui with the Pacific Ocean to the north. Key locations labeled include Keaa Beach, Kalahu Pt, Oilowai Gulch, and Ulaino Rd. The Hana Hwy is shown as a thick black line. The Ulaino Stream Bridge is marked with a purple square on Hana Hwy. Elevation contours are shown at 400, 800, 1200, and 1600 feet. A scale bar indicates 0, 1000, and 2000 feet. An inset map shows the location of the bridge on the island of Maui.



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1914
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 18.0 ft.	<b>Total Length:</b> 39.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Concrete Rubble Masonry Abutment, Concrete Pier Wall, and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1914, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Ulaino Stream Bridge carries the Hana Highway over the Ulaino Stream. This two-span, concrete continuous tee beam bridge rests on concrete rubble masonry abutments and a single concrete multi-column pier with bent. The abutments and pier bear directly on natural rock formations. The concrete deck is supported by four concrete continuous tee beams and carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are two concrete open vertical railings with caps and end posts.		

# Bridge Inventory Form

## Statement of Significance:

The Ulaino Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Ulaino Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

Ulaino Stream Bridge is significant under Criterion C as a good example of a concrete continuous tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing northwest.

## Bridge Inventory Form



Image 3. Southwest parapet, facing south.



## Bridge Inventory Form



Image 4. Southeast abutment, facing southeast.



## Bridge Inventory Form



Image 5. Bridge pier and deck girders, facing southeast.





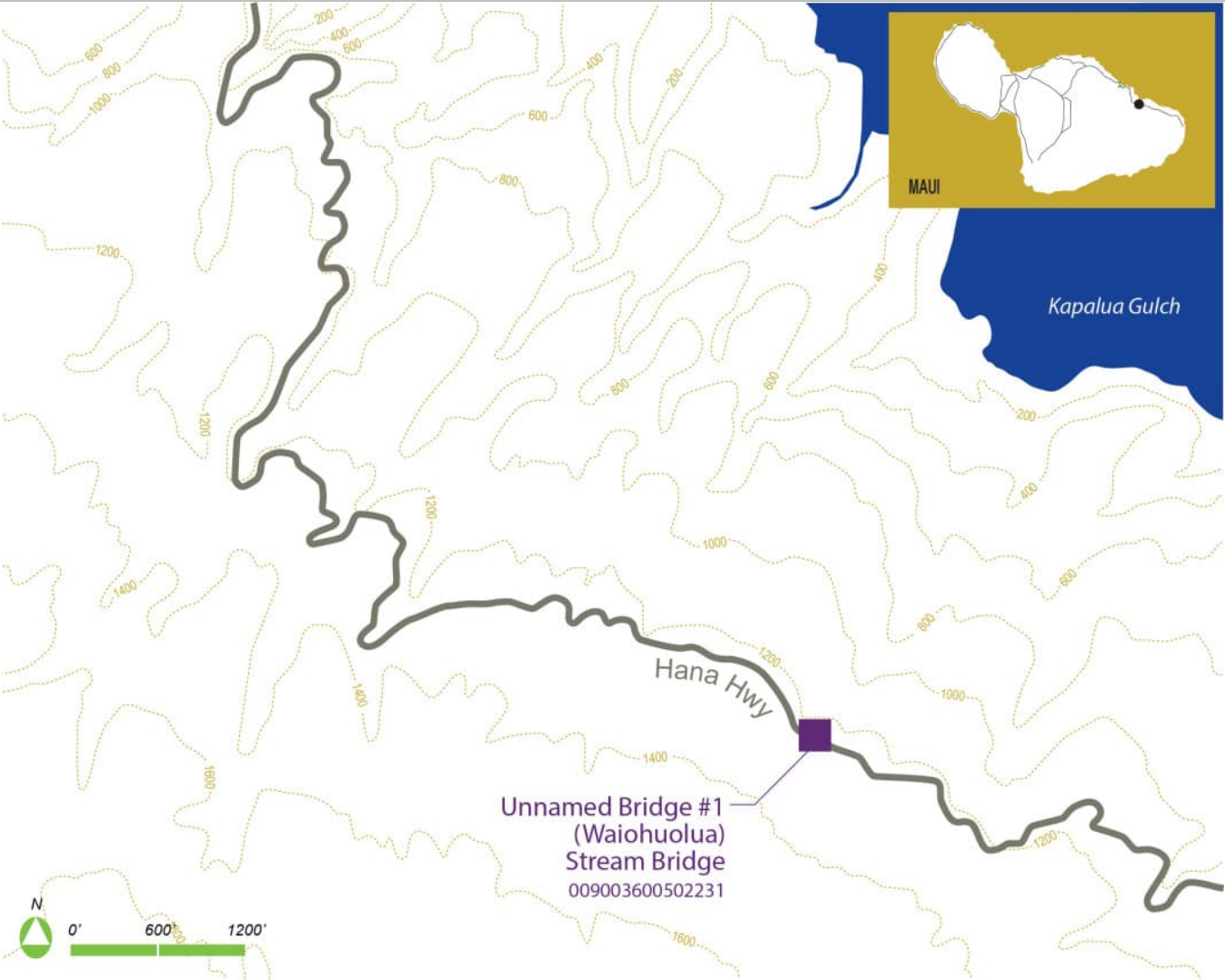
## Bridge Inventory Form



Image 6. Northwest abutment, facing northwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502298		<b>TMK:</b> 212999999, 212001002 (adjacent)	
<b>Common Name:</b> Unnamed Bridge No. 1 (Waiohuolua)			
<b>Historic Name:</b> Unnamed Bridge No. 1 (Waiohuolua)			
<b>Feature Crossed:</b> Unnamed Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 22.90		
<b>Latitude:</b> 20.81433	<b>Longitude:</b> -156.1197		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023
			



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1920
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1974, 2015	
<b>Alterations:</b> Yes, new parapets added in 1974. In 2015, repaired spalls with exposed rebar and unsound shotcrete patches in deck soffit and girders, worn asphalt concrete (AC) wearing surface repaired.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 18.0 ft.	<b>Total Length:</b> 19.0 ft.	<b>Deck Width:</b> 13.8 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Yes
<b>Areas of Significance:</b> Engineering, Transportation		
<b>Period of Significance:</b> 1920		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  Unnamed Bridge No. 1 (Waiohuolua) carries the Hana Highway over an unnamed stream. It is a concrete tee beam bridge that rests on masonry abutments. Its one lane deck is laid in concrete with asphalt concrete (AC) overlay and is flanked by Concrete Solid with Cap railings. Thrie beams have been added to the railing end posts.		

# Bridge Inventory Form

## Statement of Significance:

Unnamed Bridge No. 1 (Waiohuolua) is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

Unnamed Bridge No. 1 (Waiohuolua) is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road with was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 1974, the bridge's railings were replaced in Project No. HWY-M-01-74. In 2015 HDOT's Hana Belt Road preservation plan recommended the bridge to be widened to two lanes in its rehabilitation project.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

Unnamed Bridge No. 1 (Waiohuolua) is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete panel with cap parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, despite its reconstruction in 1974. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. The bridge retains integrity of feeling and association as a pre-World War II bridge type, despite slight alterations to enhance vehicular safety through the addition of thrie beams, as well as its association with Territorial roadway improvements during the 1920s.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 north.



## Bridge Inventory Form



Image 2. Approach to bridge, facing west.



Image 3. Northern parapet, facing northeast.



## Bridge Inventory Form



Image 4. View of eastern abutment, facing northeast.




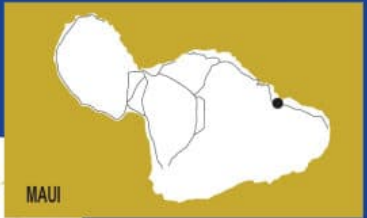
## Bridge Inventory Form

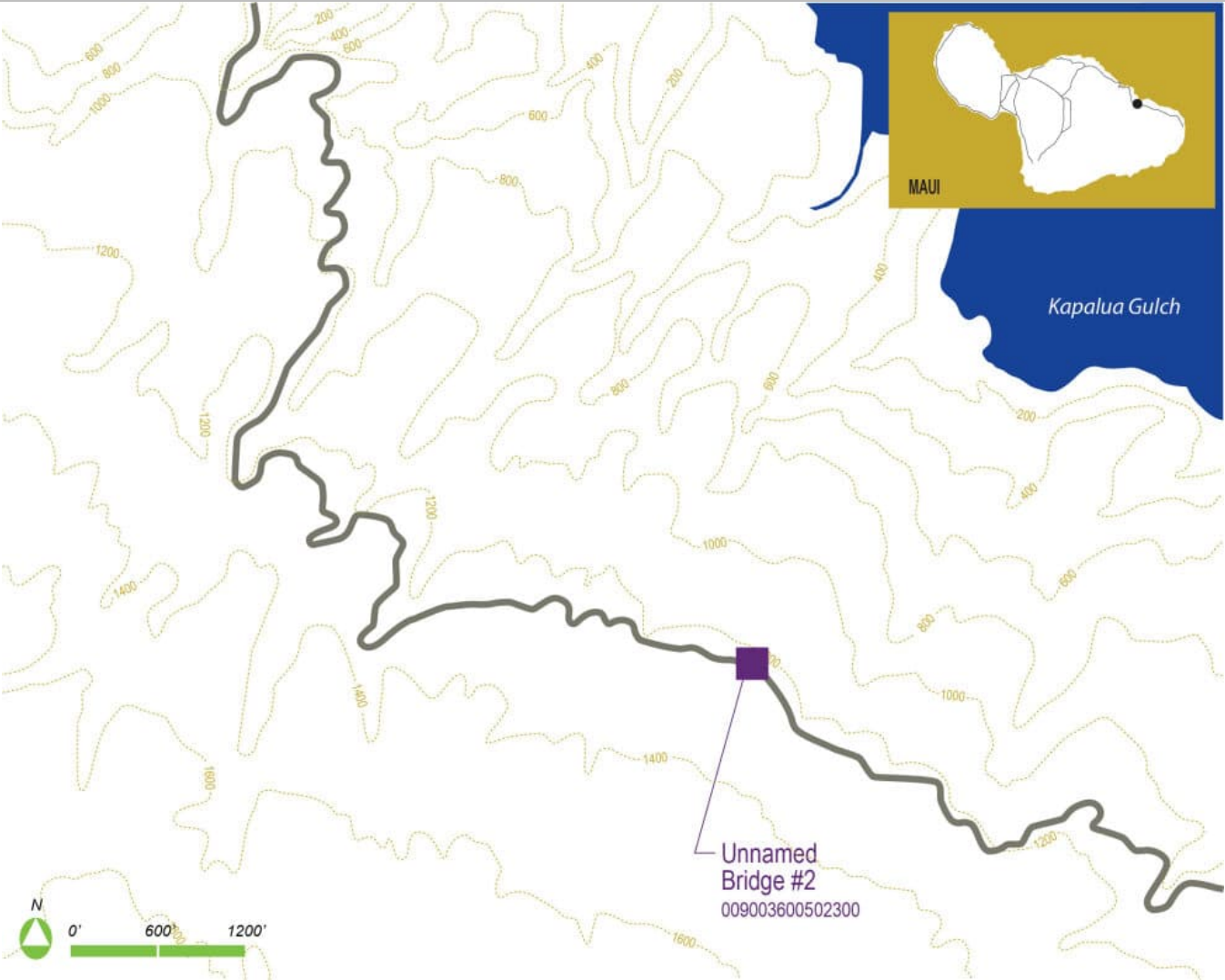


Image 5. View of western abutment, facing northwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502300		<b>TMK:</b> 212999999, 212001002 (adjacent)	
<b>Common Name:</b> Unnamed Bridge No.2			
<b>Historic Name:</b> Unnamed Bridge No.2			
<b>Feature Crossed:</b> Unnamed Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 22.96 mi.		
<b>Latitude:</b> 20.814213	<b>Longitude:</b> -156.119812		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

MAUI

Kapalua Gulch

Unnamed Bridge #2  
009003600502300

0' 600' 1200'



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1920
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2015	
<b>Alterations:</b> All deficiencies in deck soffit have been repaired, roadway has been repaved since previous inspection, and exposed rebar on upstream face of parapet has been repaired.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 16.1 ft.	<b>Total Length:</b> 20.0 ft.	<b>Deck Width:</b> 14.4 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Masonry Abutments			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1920, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  Unnamed Bridge No. 2 carries the Hana Highway over an unnamed stream. The single-span reinforced concrete tee beam bridge rests on concrete masonry abutments, the abutments themselves bearing directly on natural rock formation. The reinforced concrete deck, supported by four concrete tee beams, carries a narrow roadway paved in		

## Bridge Inventory Form

asphalt concrete (AC) overlay and is flanked by capped concrete solid railings. Thrie beams have been attached to the mauka parapets, while thrie beams abut, but are not attached to, the makai parapets.

### Statement of Significance:

Unnamed Bridge No.2 is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

Unnamed Bridge No.2 is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards and to be widened to a minimum of 16 feet on the makai side of the bridge.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Unnamed Bridge No.2 is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the capped concrete solid parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 northeast.



## Bridge Inventory Form



Image 2. Approach to bridge, facing southeast.



Image 3. Northeast parapet, facing north.



## Bridge Inventory Form



Image 4. Northwest abutment, facing west.



## Bridge Inventory Form

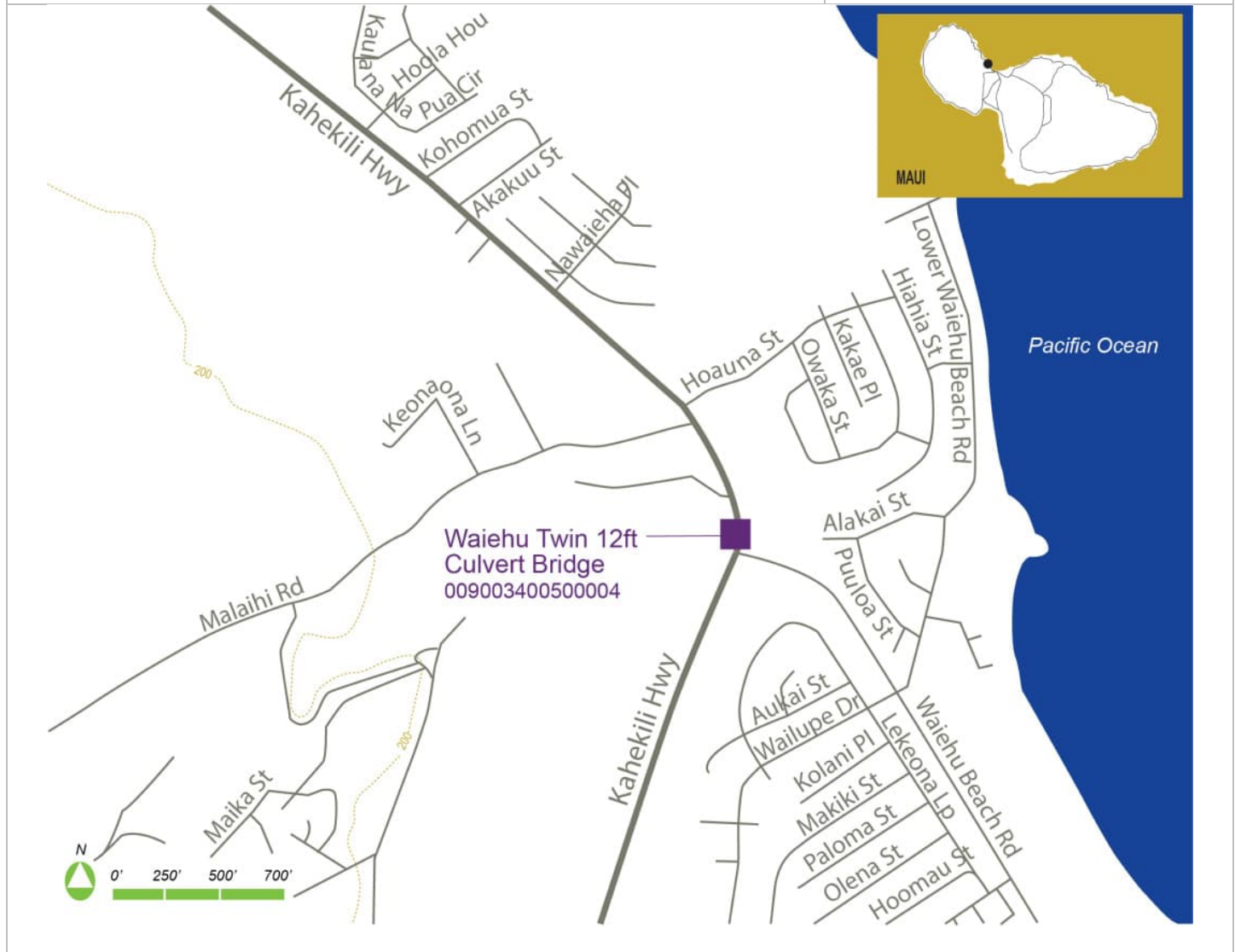


Image 5. View of southeast abutment, facing east.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003400500004		<b>TMK:</b> 232999999	
<b>Common Name:</b> Waiehu Twin 12 ft. Culvert			
<b>Historic Name:</b> Waiehu Twin 12 ft. Culvert			
<b>Feature Crossed:</b> Waiehu Stream			
<b>Feature Carried:</b> Kahekili Highway/Route 340			
<b>Island:</b> Maui		<b>Milepost:</b> 0.02	
<b>Latitude:</b> 20.91793		<b>Longitude:</b> -156.4977	
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Steel Culvert	<b>Construction Date:</b> 1967
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 2020	
<b>Alterations:</b> Upstream Wailuku guardrail has been replaced (2020).	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 12.1 ft.	<b>Total Length:</b> 34.1	<b>Deck Width:</b> 44.9
<b>Superstructure:</b>			
<b>Substructure:</b> Metal Corrugated Culvert			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Not Eligible	<b>Criteria:</b> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>HRHP No.:</b> N/A	
<b>6E Status:</b> Not Significant	<b>Criteria:</b> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input type="checkbox"/> Design <input type="checkbox"/> Setting <input type="checkbox"/> Materials <input type="checkbox"/> Workmanship <input type="checkbox"/> Feeling <input type="checkbox"/> Association <input type="checkbox"/>		
<b>Historic District:</b>		<b>Contributing:</b>
<b>Current Function:</b> Culvert	<b>Historic Function:</b> Culvert	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1967		
<b>Narrative Description:</b>  The Waiehu Twin 12 ft. Culvert carries Kahekili Highway across the Waiehu Stream. This two-cell concrete culvert remains intact and is generally in good condition. The culvert has thrie beam parapets, concrete rock masonry elevations, and wingwalls. The twin cells are made of circular corrugated metal.		

## Bridge Inventory Form

### Statement of Significance:

Named after Kahekili, King of north Maui, the roadway was part of a realignment project completed in 1967 (Federal Aid Project No. S-0341(3)) to facilitate beach access and improve drainage by realigning the Waiehu Stream. The typical postwar corrugated metal culvert features lava rock facing and was constructed by Land and Construction Co., Inc.

Because the culvert is not associated with major transportation improvements on Maui after statehood, 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 culvert is not significant under Criterion B.

The culvert makes use of local basalt rock (lava rock) and prefabricated corrugated steel tubes. It is typical of its period in its use of materials, method of construction, craftsmanship, and design. The culvert is therefore not significant under Criterion C.

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

Therefore, Waiehu Twin 12 ft. Culvert 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.

State of Hawaii. Department of Transportation. *Year Ending June 30, 1967*. N.p., n.d. Retrieved from <https://catalog.hathitrust.org/Record/000548436>.

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.

"Waiehu Beach Road: Federal Aid Project No. S-0341 (3)," As-Built, accessed September 24, 2024, <http://162.221.244.142:8080/As-Built/res/Maui/Multi-Routes/0340-001,%203400-005/0340-001,%203400-005.htm>.

## Bridge Inventory Form



Image 1. View of culvert facing west.



Image 2. General view of three beam railing, facing west.




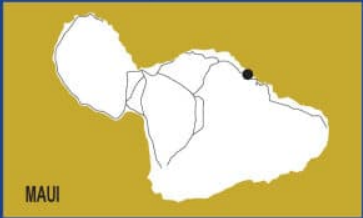
## Bridge Inventory Form

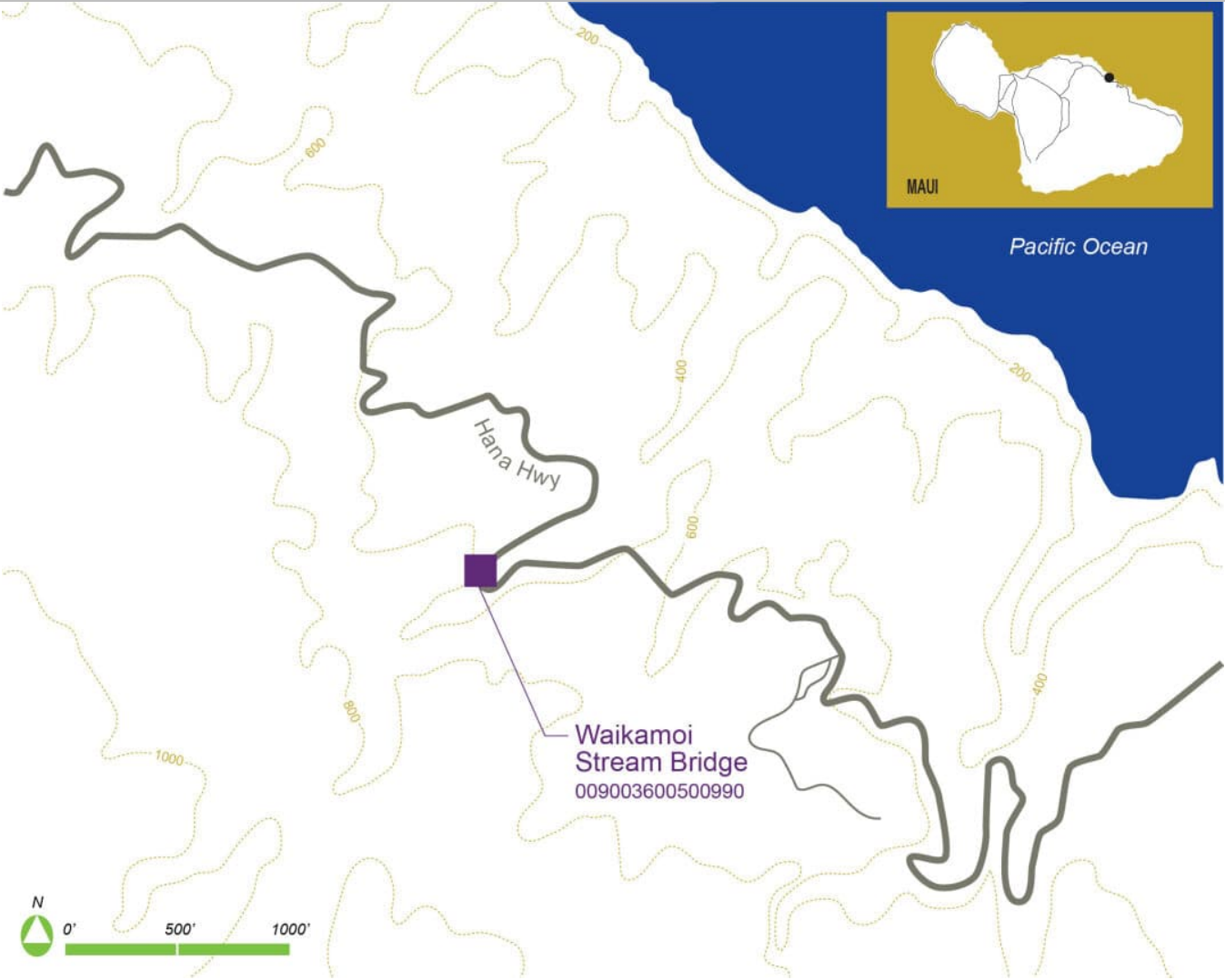


Image 3. Detail of culvert cell.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600500990		<b>TMK:</b> 211999999, 211001031 (adjacent)	
<b>Common Name:</b> Waikamoi Stream Bridge			
<b>Historic Name:</b> Waikamoi Stream Bridge			
<b>Feature Crossed:</b> Waikamoi Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 9.88 mi.		
<b>Latitude:</b> 20.8722	<b>Longitude:</b> -156.187		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023





# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1912
<b>Designer/Engineer:</b> Hugh Howell, Senior Engineer	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> None	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 19.0 ft.	<b>Total Length:</b> 41.0 ft.	<b>Deck Width:</b> 14.4 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Double Column Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1912, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  Waikamoi Stream Bridge is a two-span, concrete tee beam bridge that spans Waikamoi Stream and carries the Hana Highway. The bridge's superstructure is comprised of a concrete deck with asphalt concrete (AC) overlay. The narrow roadway, supported by four concrete tee beams, is flanked by concrete solid railings. The superstructure sits on one reinforced concrete double column pier as well as rock masonry abutments. The abutments and pier columns bear directly on natural rock formations.		

## Bridge Inventory Form

### Statement of Significance:

The Waikamoi Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Waikamoi Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Waikamoi Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the solid concrete parapet is representative of a typical rail pattern used by the Territorial Highway Department. The bridge is also an early example of master engineer Hugh Howell's work as both County Engineer and private roads contractor for Maui between 1905 and 1921. For these reasons, the bridge is 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, as well as within its 1910s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 northeast.



## Bridge Inventory Form



Image 2. View of bridge approach, facing south.



Image 3. View of northeast parapet, facing north.



## Bridge Inventory Form



Image 4. Detail of northeast parapet, facing northeast.



## Bridge Inventory Form



Image 5. Detail of northeast parapet, facing north.



## Bridge Inventory Form



Image 6. Detail of bridge girders, facing northwest.



## Bridge Inventory Form



Image 7. View of bridge girders, facing northeast.



## Bridge Inventory Form



Image 8. View of northwest abutment, facing northwest.



## Bridge Inventory Form


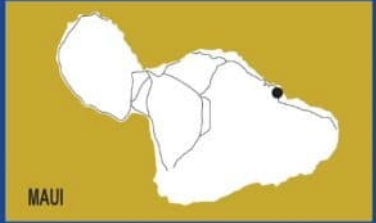


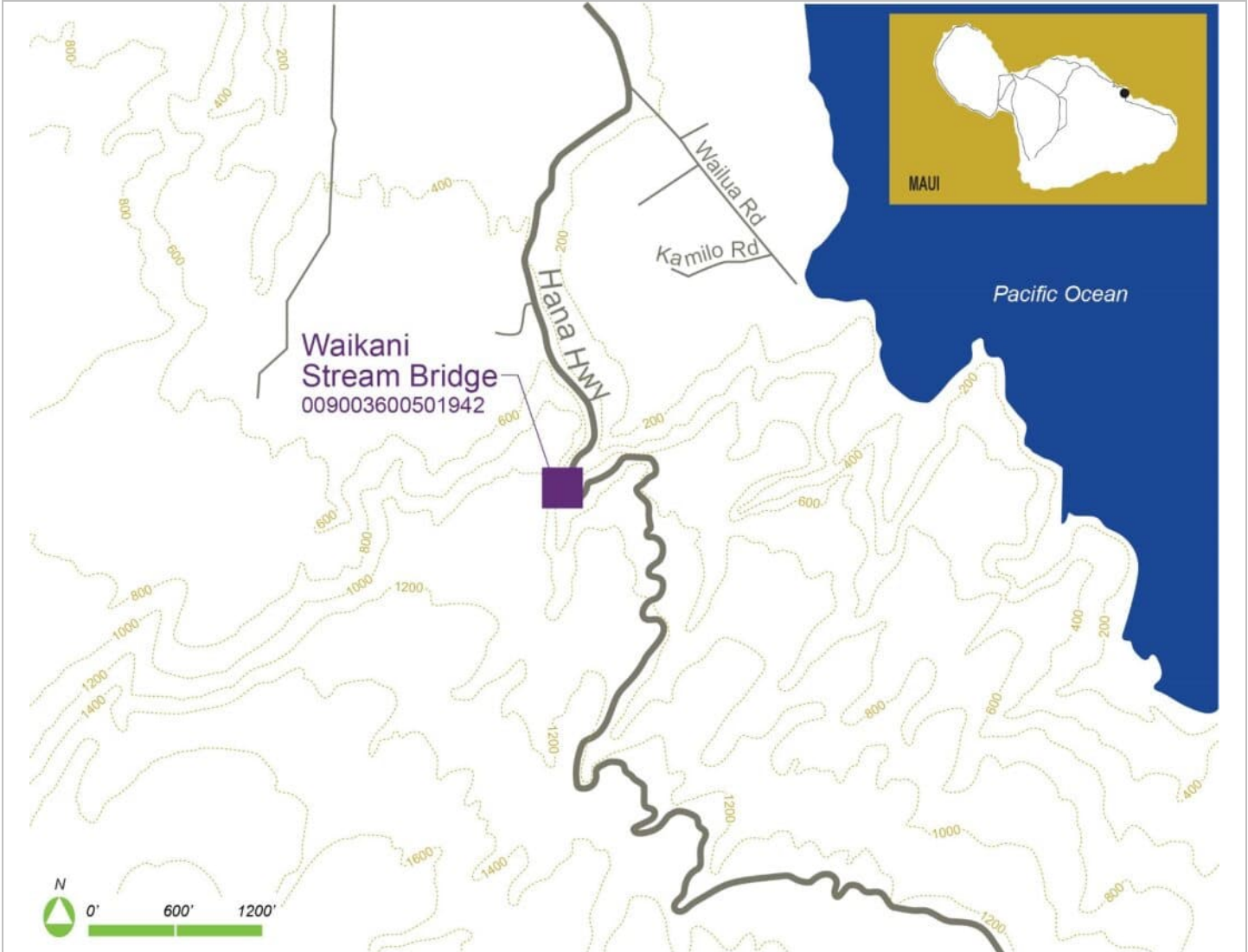
Image 9. View of southeast abutment and bridge pier, facing southeast.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501942		<b>TMK:</b> 211999999, 211002002 (adjacent)	
<b>Common Name:</b> Waikani Stream Bridge			
<b>Historic Name:</b> Wailua Nui Bridge			
<b>Feature Crossed:</b> Wailua Nui Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 19.389		
<b>Latitude:</b> 20.83278	<b>Longitude:</b> -156.1386		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

The map displays the Waikani Stream Bridge (009003600501942) as a purple square on Hana Hwy. The surrounding area is characterized by steep, hilly terrain with contour lines ranging from 200 to 1600 feet. To the east, the Pacific Ocean is visible. Key roads shown include Wailua Rd and Kamilo Rd. An inset map in the top right corner shows the island of Maui with a black dot indicating the bridge's location on the eastern coast.



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Open Spandrel Arch	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b> A.P. "Paul" Low (engineer), William d'Esmond (architect)	
<b>Builder/Contractor:</b> Moses Akiona (contractor)	
<b>Alteration Date(s):</b> No dates provided on alteration notes	
<b>Alterations:</b> a. damaged concrete wall on upstream Hana end of bridge repaired, b. damaged CRM wall on upstream-Kahului end of bridge repaired, c. spalls on upstream and downstream concrete bridge railings have been repaired.	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 83.0 ft.	<b>Total Length:</b> 107.9 ft.	<b>Deck Width:</b> 20.0 ft.
<b>Superstructure:</b> Concrete Continuous Open Spandrel Arch			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01516 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Waikani Stream Bridge carries the Hana Highway over the Wailua Nui Stream. This single-span reinforced concrete open spandrel arch bridge rests on concrete abutments, which themselves bear directly onto natural rock formations. The concrete deck, supported by concrete spandrel bents, carries a narrow roadway paved in asphalt concrete (AC) overlay and is flanked by concrete open vertical railings		

## Bridge Inventory Form

### Statement of Significance:

The Waikani Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually listed in the NRHP.

The Waikani Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The Waikani Stream bridge's designer, Maui County engineer A. P. "Paul" Low was Honolulu-born of Chinese ancestry, making him one of the few non-white engineers on the archipelago. The completion of the Waikani Stream bridge in 1926 allowed for the roadway opened to traffic. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Waikani Stream Bridge is significant under Criterion C as a rare example of an arch bridge, though it made use of the latest in construction technology, reinforced concrete, which characterizes the bridges on the Hana Belt Road. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. The bridge is associated with master A. P. "Paul" Low. While it is a rare type of bridge, it is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing south.



Image 3. Southwest parapet, facing south.



## Bridge Inventory Form



Image 4. View of open spandrel arch and support girders, facing southeast.



## Bridge Inventory Form



Image 5. View of southeastern abutment, facing southeast.

## Bridge Inventory Form


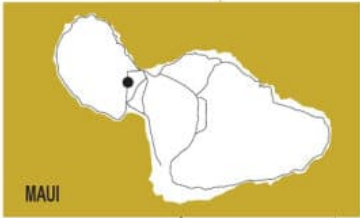


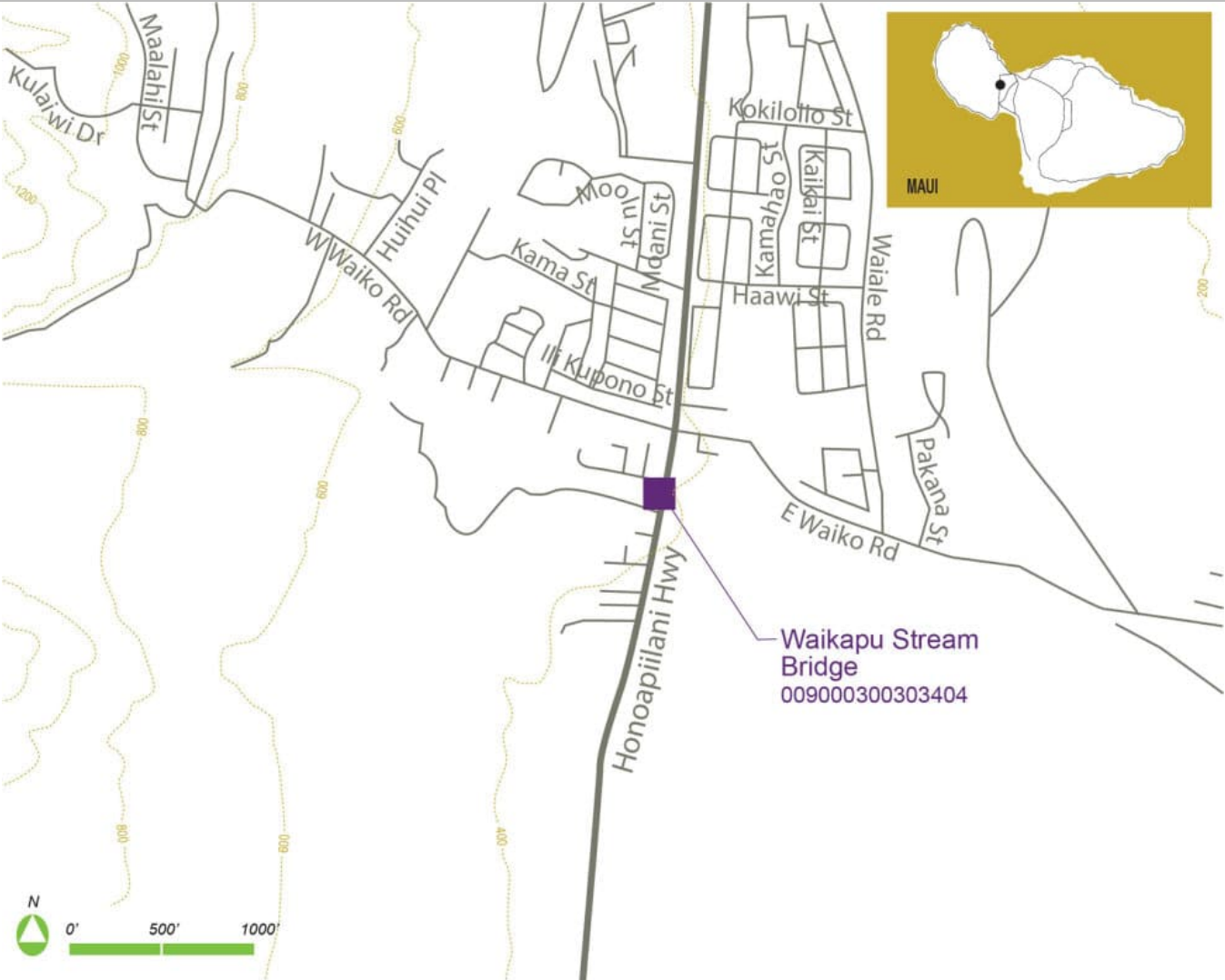
Image 6. View of arch and northwestern abutment, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009000300303404		<b>TMK:</b> 235999999, 235011049 (adjacent)	
<b>Common Name:</b> Waikapu Stream Bridge			
<b>Historic Name:</b> Waikapu Stream Bridge			
<b>Feature Crossed:</b> Waikapu Stream			
<b>Feature Carried:</b> Honoapiilani Highway/Route 30			
<b>Island:</b> Maui	<b>Milepost:</b> 2.32		
<b>Latitude:</b> 20.85332	<b>Longitude:</b> -156.5038		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

**Waikapu Stream Bridge**  
009000300303404

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Slab	<b>Construction Date:</b> 1937
<b>Designer/Engineer:</b> William R. Bartels	
<b>Builder/Contractor:</b> Clarke Transportation Company	
<b>Alteration Date(s):</b> 2014, 2016, 2020, 2022	
<b>Alterations:</b> Dense vegetation was removed upstream of the bridge in 2014 and 2016. A new QuadGuard guardrail end was installed at the downstream Wailuku end of bridge railing in 2020 and 2022.	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 18.0 ft.	<b>Total Length:</b> 39.0 ft.	<b>Deck Width:</b> 36.1 ft.
<b>Superstructure:</b> Reinforced Concrete Continuous Slab			
<b>Substructure:</b> Reinforced Concrete Pier, Reinforced Concrete Abutments			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Greek Cross			
<b>Other Features:</b> Bridge name and construction date incised on end piers			

## Historic Information

<b>NRHP Status:</b> Eligible	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> N/A
<b>HRHP Status:</b> Not Listed	<b>SIHP No.:</b> N/A	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b>		<b>Contributing:</b>
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering		
<b>Period of Significance:</b> 1937		
<b>Narrative Description:</b>  The Waikapu Stream Bridge carries the Honoapiilani Highway over the Waikapu Stream, south of Waikapu village. It is a concrete slab bridge, featuring concrete, open Greek cross parapets, stepped caps, and curved, wide end posts. The southern end posts have the bridge name and construction date incised into them. The concrete deck is supported by a reinforced concrete pier and reinforced concrete abutments. Short concrete approach walls flank the end posts and have short thrie beams attached to them.		



## Bridge Inventory Form

### Statement of Significance:

The Honoapiilani Highway resulted from 1932 Federal Aid road legislation and was approved by the Bureau of Public Roads, which expanded upon 1925 legislation for a system of highways and belt roads across the archipelago. On Maui, the 1932 road program called for a link from Lahaina to Ulupalakua via Wailuku-Kahului. The resulting Waikapu Stream Bridge, constructed under contract by the Clarke Transportation company and using a design of Territorial Highways Department Chief Engineer William R. Bartels, was completed in 1937.

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

Research did not indicate an association with the lives of persons significant in our past. National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, provides additional guidance for evaluating individuals under Criterion B. While the bridge is associated with William R. Bartels, master engineers are represented by their works and evaluated under Criterion C. Therefore, the bridge is 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 concrete open Greek cross parapets represent a typical rail pattern used by the Territorial Highway Department. The bridge is associated with master engineer William R. Bartels and possesses high artistic value, as it represents Territorial Highway Department design more fully than other structures of its type. For these reasons, this bridge is 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 construction of a wood walkway and the addition of three beams. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 Waikapu Stream Bridge is eligible for the NRHP.

# Bridge Inventory Form

## References

Duensing, Dawn E. *Hawaii'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 bridge, facing east.



Image 2. View of bridge setting, facing north.



## Bridge Inventory Form



Image 3. View of east parapet and end posts, note bridge construction date incised on southern end post.



Image 4. Detail of north abutment.




## Bridge Inventory Form

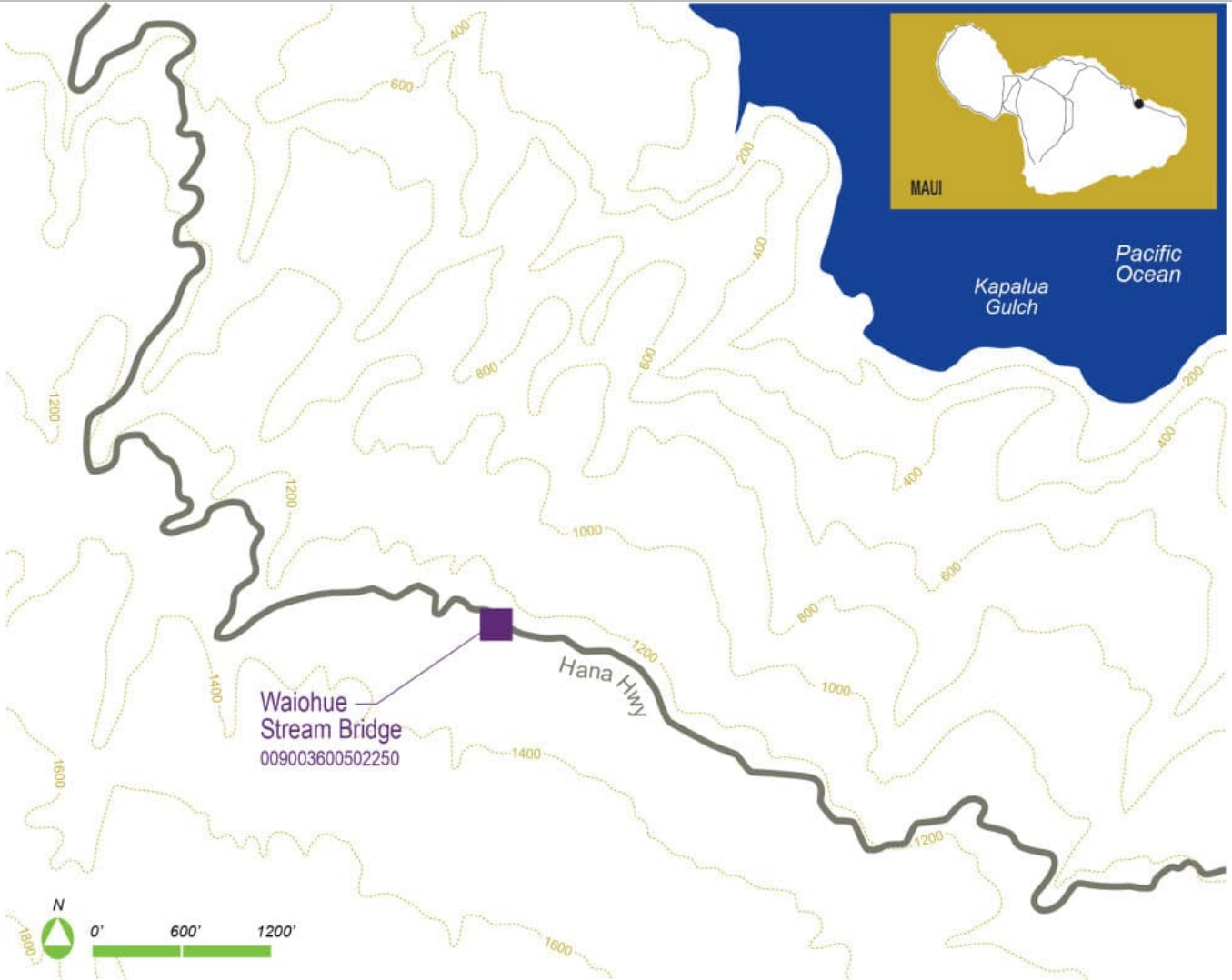


Image 5. View of pier, facing southwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502250		<b>TMK:</b> 212999999, 212001003 (adjacent)	
<b>Common Name:</b> Waiohue Stream Bridge			
<b>Historic Name:</b> Waiohue Stream Bridge			
<b>Feature Crossed:</b> Waiohue Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 22.469 mi.		
<b>Latitude:</b> 20.81744	<b>Longitude:</b> -156.1255		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1937, 2015	
<b>Alterations:</b> Widened in 1937, repaired spalls and delamination on deck soffit, repaired spalls, delamination, and cracking on concrete girders, asphalt concrete (AC) wearing surface has been repaved.	

## Design Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 16.1 ft.	<b>Total Length:</b> 40.0 ft.	<b>Deck Width:</b> 14.8 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment and Concrete Rubble Masonry (CRM) Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Solid (makai) and Solid Concrete with Cap (mauka)			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Period of Significance:</b> 1926, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Waiohue Stream Bridge carries the Hana Highway over the Waiohue Stream. This double-span reinforced concrete tee beam bridge rests on rock masonry abutments and one concrete rubble masonry pier. Both the abutments and pier bear directly on natural rock formations. The reinforced concrete deck is supported by four concrete tee beams		

## Bridge Inventory Form

and carries a narrow roadway paved in asphalt concrete (AC) overlay. The bridge features two different railing types, concrete solid on the makai side of the bridge and concrete solid with cap on the mauka side.

### Statement of Significance:

The Waiohue Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Waiohue Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. Originally constructed in 1926, the bridge underwent alterations in 1937, though research does not indicate what specific alterations were done. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Waiohue Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the makai solid concrete panel and mauka solid concrete panel with cap are both representative of typical rail patterns used by the Territorial Highway Department. The Waiohue Stream Bridge also demonstrates variation of construction material use, design, and workmanship, with the two different parapets and pier construction. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. General view of bridge, facing northeast.



## Bridge Inventory Form



Image 3. Approach to bridge, facing south.



## Bridge Inventory Form



Image 4. View of southwest abutment, facing west.

## Bridge Inventory Form



Image 5. View of northwest CRM abutment and deck girders, facing northwest.



## Bridge Inventory Form



Image 6. View of bridge pier, facing west.



## Bridge Inventory Form




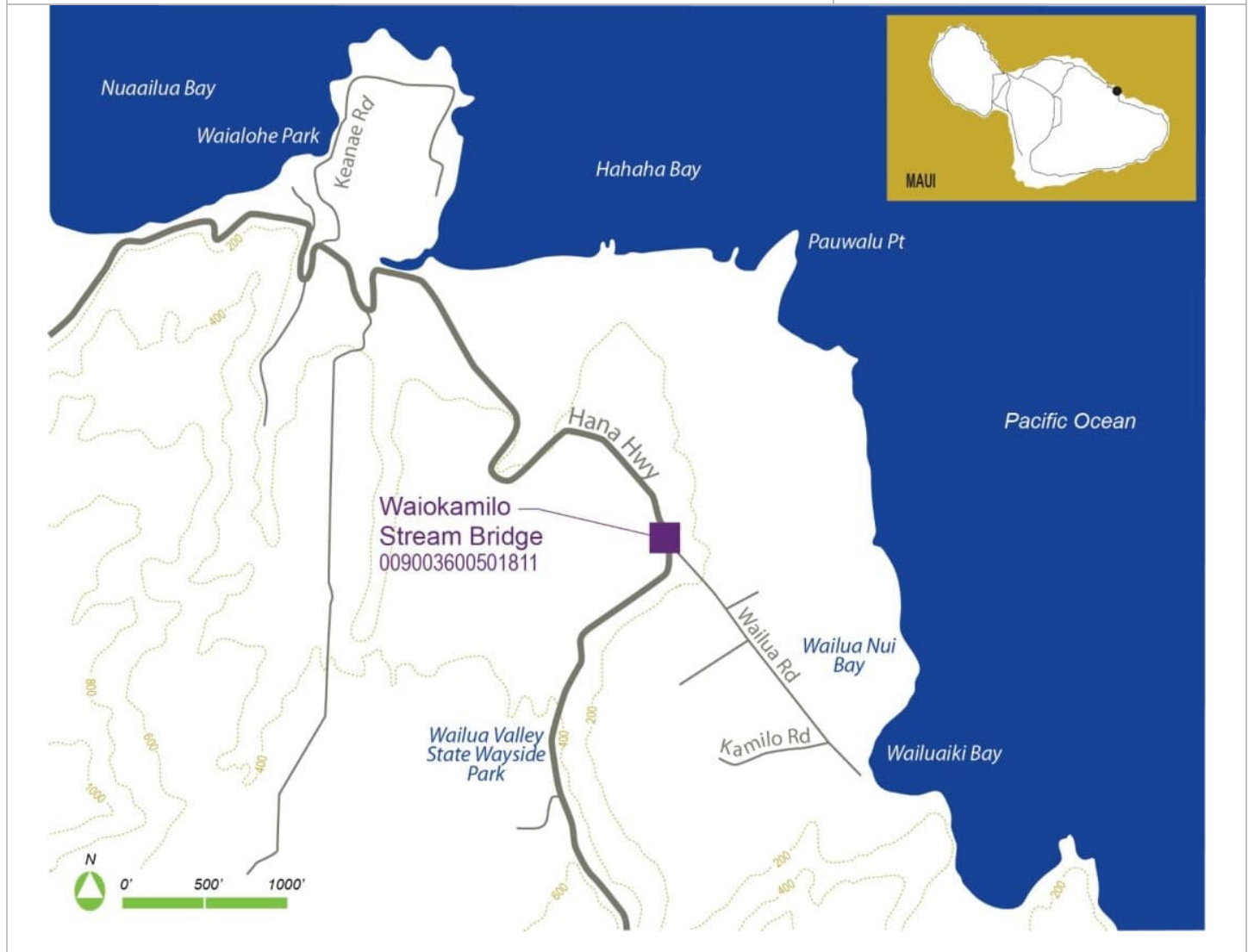
Image 7. View of southeast pier and deck girders, facing east.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600501811	<b>TMK:</b> 211999999, 211008015 (adjacent)	
<b>Common Name:</b> Waiokamilo Stream Bridge		
<b>Historic Name:</b> Waiokamilo Stream Bridge		
<b>Feature Crossed:</b> Waiokamilo Stream		
<b>Feature Carried:</b> Hana Highway/Route 360		
<b>Island:</b> Maui	<b>Milepost:</b> 18.069	
<b>Latitude:</b> 20.84896	<b>Longitude:</b> -156.1362	
<b>Ownership:</b> State		<b>Image Date:</b> 10/30/2023



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1921
<b>Designer/Engineer:</b> County Engineer's Department, D. K. Kapohakimohewa, Designer, Plans approved by Joseph Matson, Jr., County Engineer (1937 alteration plan)	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> 1937, 2015	
<b>Alterations:</b> Widened and new parapets installed in 1937, Spalls repaired on girders and slab soffit, AC wearing surface has been repaved in 2015	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 36.1 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Greek Cross			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	Criteria: A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-07-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	Criteria: a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge		<b>Historic Function:</b> Bridge
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Waiokamilo Stream Bridge carries the Hana Highway over the Waiokamilo Stream. This single-span concrete tee beam bridge rests on concrete abutments that bear directly on natural rock formations. The concrete deck rests on eight concrete girders and carries a two-lane roadway paved in asphalt concrete (AC) overlay. Flanking the roadway		



## Bridge Inventory Form

are two concrete open Greek Cross parapets with squared end posts. The bridge was originally constructed in 1921 and widened in 1937, and the open Greek Cross parapets date from this alteration.

### Statement of Significance:

The Waiokamilo Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Waiokamilo Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards.

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 a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui's commercial development. It is therefore significant under Criterion A.

The Waiokamilo Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge that is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open Greek Criss parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s-1930s alignment. It retains integrity of design, materials, and workmanship, and research indicates few alterations to the bridge. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 west.



## Bridge Inventory Form



Image 2. General approach to bridge, facing south.



## Bridge Inventory Form



Image 3. West parapet, facing west.

## Bridge Inventory Form



Image 4. East parapet, facing east.




## Bridge Inventory Form

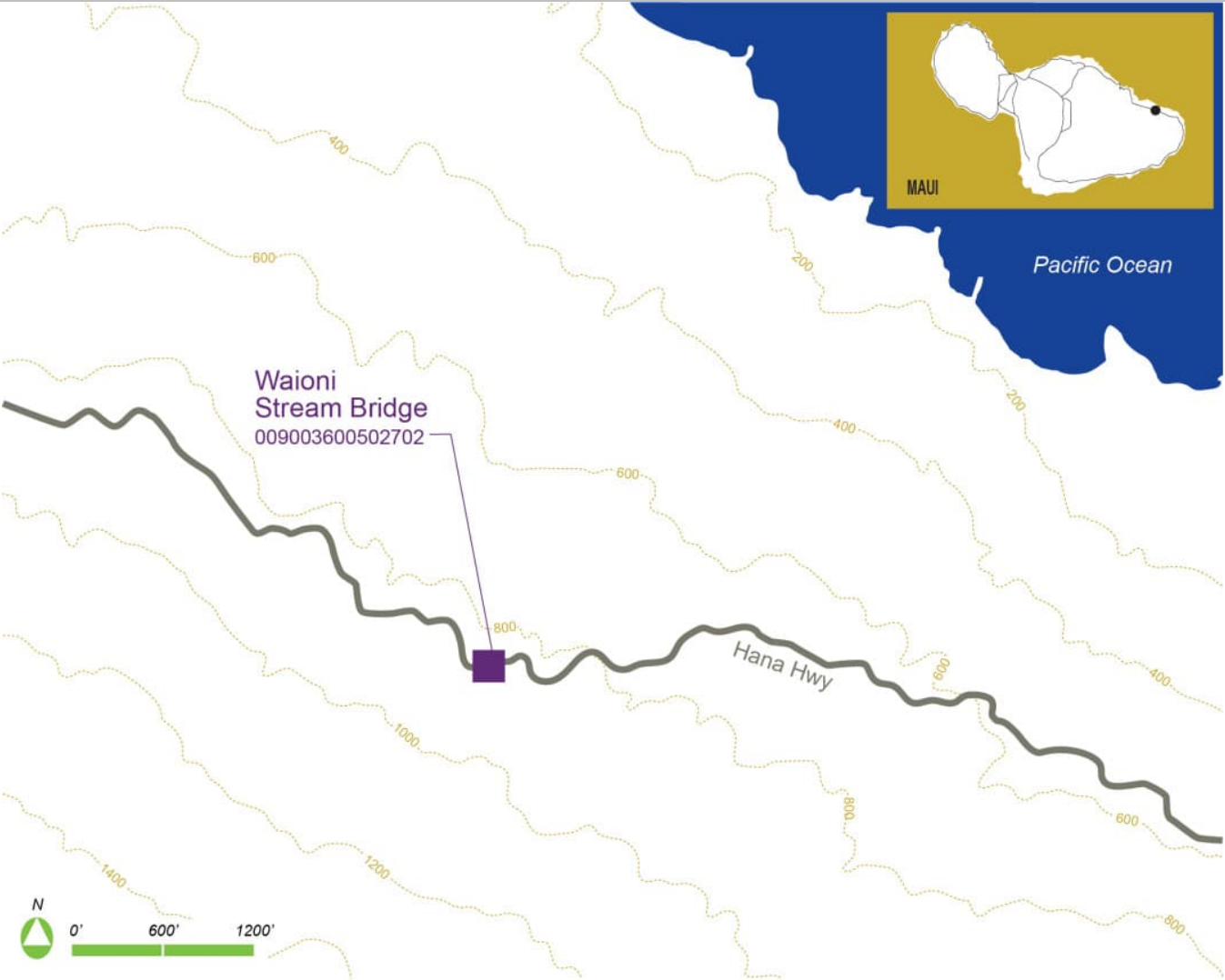


Image 5. North parapet and deck girders, facing northwest.

# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502702		<b>TMK:</b> 212999999, 212003037 (adjacent)	
<b>Common Name:</b> Waioni Stream Bridge			
<b>Historic Name:</b> Waioni Stream Bridge			
<b>Feature Crossed:</b> Waioni Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 26.979		
<b>Latitude:</b> 20.79885	<b>Longitude:</b> -156.0735		<b>Image Date:</b> 10/30/2023
<b>Ownership:</b> State			



# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1920
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Reinforced Concrete Girder/Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1920, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The Waioni Stream Bridge carries the Hana Highway over the Waioni Stream. It is a single-span reinforced concrete tee beam bridge built in 1920. The superstructure consists of a concrete deck slab with asphalt concrete (AC) overlay supported on four concrete tee beams, which are spaced approximately 4.5 feet on-center. The substructure consists of rock masonry abutments. The abutments bear directly on natural rock formations. The two-lane roadway is flanked by concrete open vertical railings.		

## Bridge Inventory Form

### Statement of Significance:

The Waioni Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The Waioni Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet though it has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan recommended the bridge's preservation and rehabilitation to meet current highway standards. This includes reclassifying the number of lanes from two to one and creating a one-lane two-way traffic lane bridge in order to preserve the original structure width that does not meet two-lane roadway width standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The Waioni Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example of a reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1920s.



# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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.



## Bridge Inventory Form



Image 2. Approach to bridge, facing east.

## Bridge Inventory Form



Image 3. Northern parapet, facing north.



## Bridge Inventory Form



Image 4. East abutment, facing east.



## Bridge Inventory Form





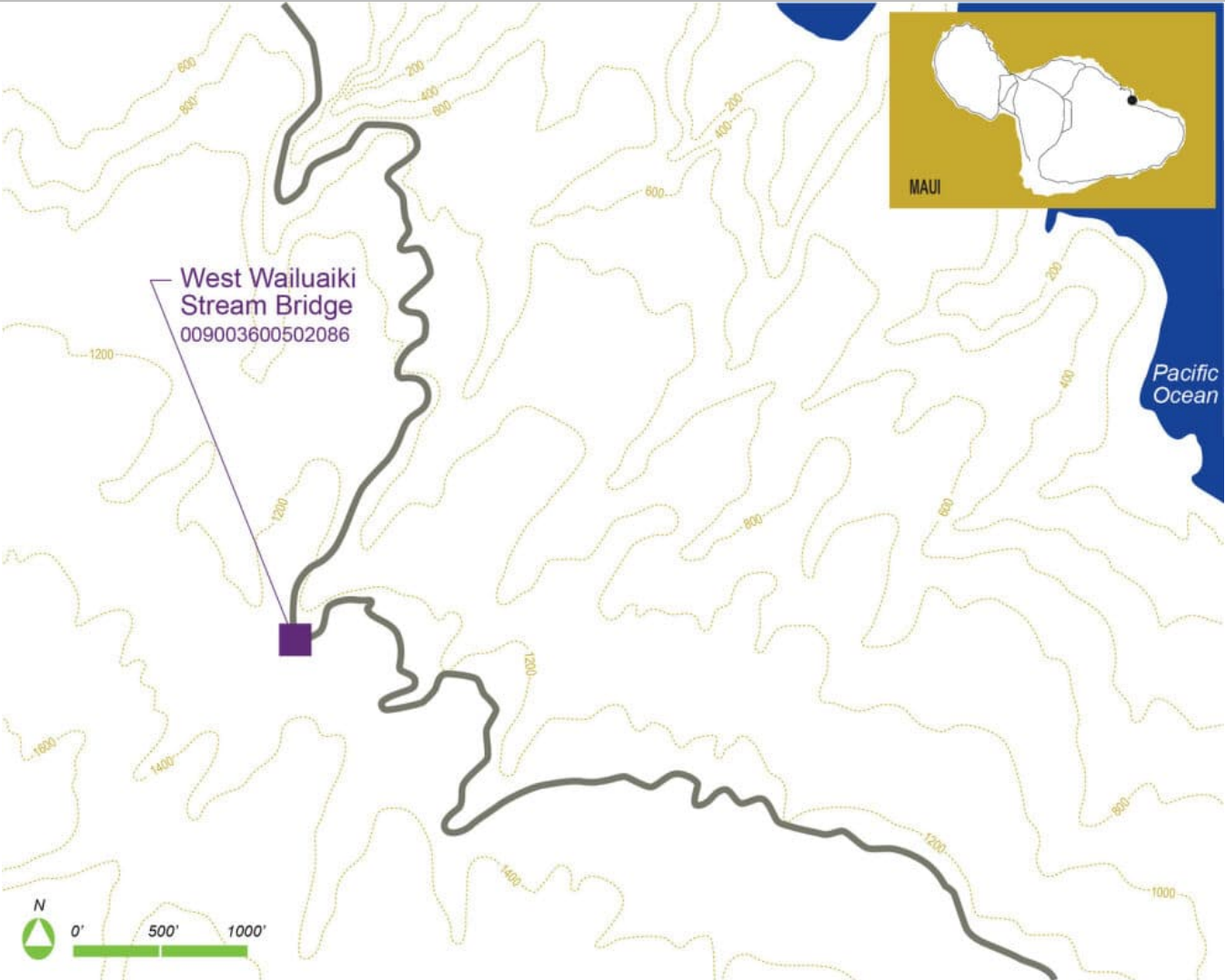
Image 5. West abutment, facing west.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502086		<b>TMK:</b> 211999999, 211002001 (adjacent)	
<b>Common Name:</b> West Wailuaiki Stream Bridge			
<b>Historic Name:</b> West Wailuaiki Stream Bridge			
<b>Feature Crossed:</b> West Wailuaiki Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 20.83		
<b>Latitude:</b> 20.82192	<b>Longitude:</b> -156.1381		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Continuous Tee Beam	<b>Construction Date:</b> 1926
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b> No dates provided in alteration notes	
<b>Alterations:</b> Deck drains have been cleared, rail post at Kahului end of bridge has been repaired, cracks and spalls in slab soffit and girders have been repaired.	

## Design Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 28.9 ft.	<b>Total Length:</b> 70.9 ft.	<b>Deck Width:</b> 22.0 ft.
<b>Superstructure:</b> Concrete Continuous Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-12-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1900-1947 (district)		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The West Wailuaiki Stream Bridge carries the Hana Highway over the West Wailuaiki Stream. This triple-span reinforced concrete continuous tee beam bridge, built in curved form, rests on concrete abutments and two irregularly spaced concrete wall piers. The piers and abutments bear directly onto natural rock formations. The reinforced		



## Bridge Inventory Form

concrete deck, supported by four tee beams on each span, carries a narrow roadway paved in asphalt concrete (AC) overlay. Flanking the roadway are curved concrete open vertical railings.

### Statement of Significance:

The West Wailuaiki Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The West Wailuaiki Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobiles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet but has been widened to 22 feet in most areas. As a historic district, the Hana Belt Road includes approximately 42 miles of roadway, over 59 bridges, and numerous culverts. In 2015, HDOT's Hana Belt Road preservation plan called for the bridge's rehabilitation to meet current highway standards. The bridge is a rare example of curved deck and parapet construction, and is one of four curved bridges found along the Hana Belt Road. For these reasons, the bridge is significant under Criterion C.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that improved transportation and expanded vehicular access across the island and directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The West Wailuaiki Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among one of a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is typical of its period in use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department.

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

The bridge remains on its original location, situated over a waterway, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship and research indicates no major alterations to the bridge. Its integrity of setting is intact as development surrounding the bridge is limited and its lush, rural surroundings remain. The bridge retains integrity of feeling as a common Territorial Highway Department bridge type and its integrity of association with Territorial roadway improvements during the early twentieth century.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing west.



Image 3. View of southwest parapet, facing south.



## Bridge Inventory Form



Image 4. View of piers, deck girders, and eastern abutment, facing northeast.

## Bridge Inventory Form




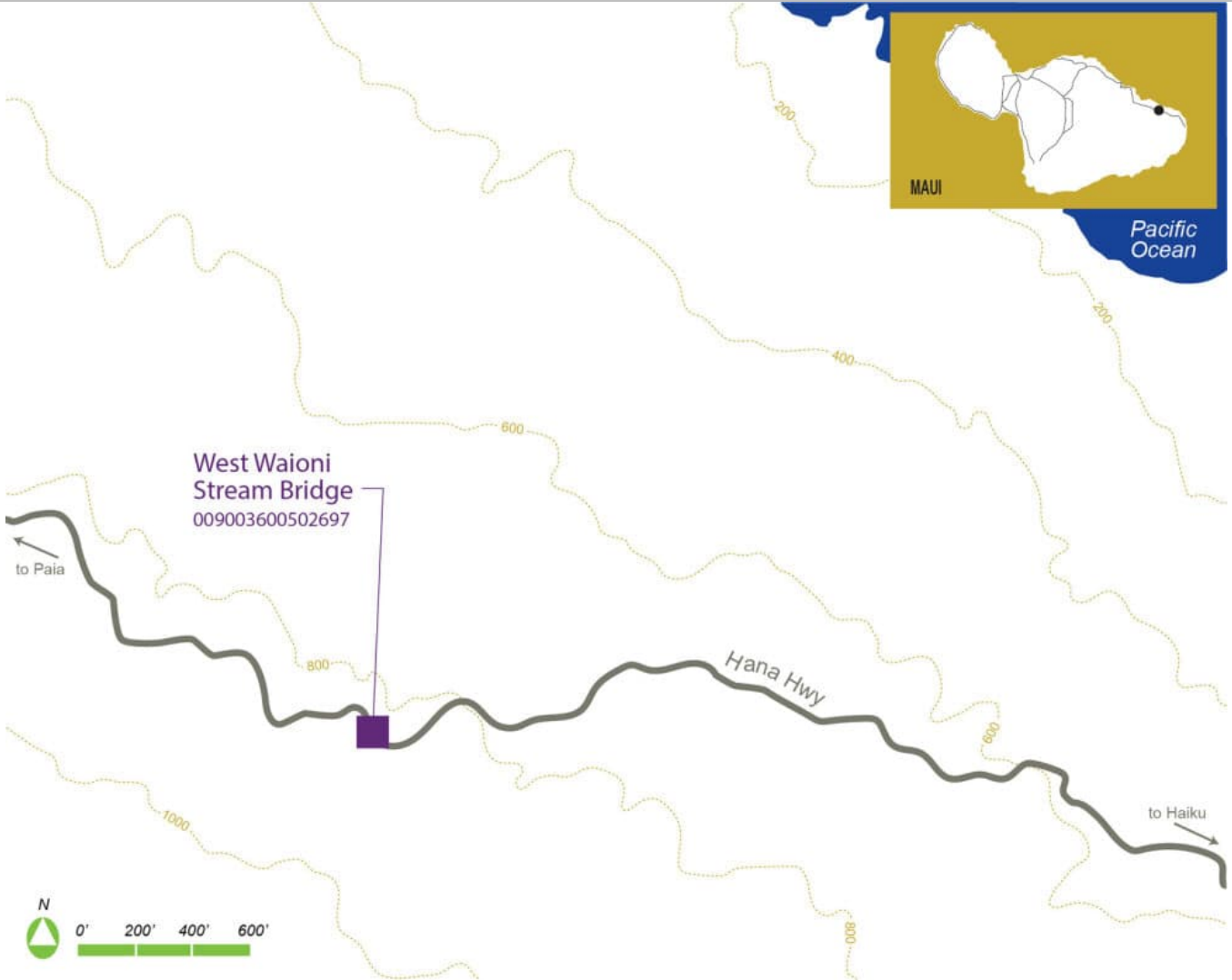
Image 5. View of northwestern abutment, facing northwest.



# Bridge Inventory Form

## General Information

<b>Bridge Number:</b> 009003600502697		<b>TMK:</b> 212999999, 212003007 (adjacent)	
<b>Common Name:</b> West Waioni Stream Bridge			
<b>Historic Name:</b> West Waioni Stream Bridge			
<b>Feature Crossed:</b> West Waioni Stream			
<b>Feature Carried:</b> Hana Highway/Route 360			
<b>Island:</b> Maui	<b>Milepost:</b> 26.939		
<b>Latitude:</b> 20.79879	<b>Longitude:</b> -156.0741		
<b>Ownership:</b> State			<b>Image Date:</b> 10/30/2023

# Bridge Inventory Form

## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1920
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	
<b>Alteration Date(s):</b>	
<b>Alterations:</b>	

## Design Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 24.0 ft.	<b>Total Length:</b> 28.9 ft.	<b>Deck Width:</b> 18.4 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with Asphalt Concrete (AC) Overlay			
<b>Parapets/Railings:</b> Concrete Vertical Open			
<b>Other Features:</b>			

## Historic Information

<b>NRHP Status:</b> Listed	<b>Criteria:</b> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D <input type="checkbox"/>	<b>NRHP No.:</b> 01000615
<b>HRHP Status:</b> Listed	<b>SIHP No.:</b> 50-50-13-01638 (bridge), 50-50-va-01638 (district)	
<b>6E Status:</b> Significant Historic Property	<b>Criteria:</b> a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input checked="" type="checkbox"/> d <input type="checkbox"/> e <input type="checkbox"/>	
<b>Integrity:</b> Location <input checked="" type="checkbox"/> Design <input checked="" type="checkbox"/> Setting <input checked="" type="checkbox"/> Materials <input checked="" type="checkbox"/> Workmanship <input checked="" type="checkbox"/> Feeling <input checked="" type="checkbox"/> Association <input checked="" type="checkbox"/>		
<b>Historic District:</b> Hana Belt Road		<b>Contributing:</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Areas of Significance:</b> Transportation, Engineering, Commerce, Social History		
<b>Period of Significance:</b> 1920, 1900-1947		
<b>Supplemental Documentation:</b> HAER No. HI-75		
<b>Narrative Description:</b>  The West Waioni Stream Bridge carries the Hana Highway over the West Waioni Stream. This is a single-span reinforced concrete tee beam bridge, constructed in 1920, rests on masonry abutments that bear directly on natural rock formations. The single lane roadway, paved in asphalt concrete (AC) overlay, is flanked by concrete vertical open railings.		



# Bridge Inventory Form

## Statement of Significance:

The West Waioni Stream Bridge is listed in the NRHP and HRHP as a contributing resource to the Hana Belt Road. The bridge is also individually eligible for the NRHP.

The West Waioni Stream Bridge is one of a series of bridges within the Hana Belt Road, constructed between 1900 and 1947 to provide access to remote areas on the island. A portion of the belt road is the Hana Highway/State Route 360 along Maui's north and east coast. Many of the concrete bridges were constructed between 1908 and 1911 in anticipation of roadway improvements that would make the route suitable for automobile vehicles. The road's alignment dates from 1926 and is the only overland automobile route that connects East Maui communities with the rest of the island. The original road width was 16 feet though has been widened to 22 feet in most areas. The Hana Belt Road is registered as a historic district that includes approximately 42 miles of road, over 59 bridges, and numerous culverts. In 2015 HDOT's Hana Belt Road preservation plan recommended the bridge's preservation and rehabilitation to meet current highway standards.

The bridge is a contributing resource to the Hana Belt Road, which is associated with Territorial highway improvements that expanded vehicular access across the island directly aided Maui'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, therefore, the bridge is not significant under Criterion B.

The West Waioni Stream Bridge is significant under Criterion C as a good example of a concrete tee-beam bridge and was one among a number of bridges along the Hana Belt Road using the latest in construction technology, reinforced concrete. The bridges' construction occurred when formal engineering expertise in bridge building was first introduced in Hawaii, and they are good examples of the Territory of Hawaii's progressive highway system. It is a good example reinforced concrete bridge typical of its period in its use of materials, method of construction, craftsmanship, and design. In particular, the concrete open vertical parapet is representative of a typical rail pattern used by the Territorial Highway Department. For these reasons, the bridge is 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, as well as within its 1920s alignment. It retains integrity of design, materials, and workmanship. Its integrity of setting is intact, as development surrounding the bridge is limited, and its lush, semi-rural surroundings remain. 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 1920s.

# Bridge Inventory Form

## References

- Duensing, Dawn E. "Hana Belt Road, Hana Highway, State Route 36, Couty Route 31, Hana Belt Road Documentation Project, Between Haiku and Kaipahulu, Hana Vicinity, Maui County, Hawaii, HAER No. HI-75." Historic American Engineering Record, National Park Service, U.S. Department of the Interior, Washington, DC, 2005.
- Duensing, Dawn E. "Hāna Belt Road, National Register of Historic Places Registration Form." U.S. National Park Service, U.S. Department of the Interior, 2001. (Hawai'i SHPD). Retrieved from [https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS\\_HI/01000615.pdf](https://catalog.archives.gov/OpaAPI/media/63816022/content/electronic-records/rg-079/NPS_HI/01000615.pdf16022/content/electronic-records/rg-079/NPS_HI/01000615.pdf).
- 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. Highways Division. *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Nagamine Okawa Engineers, Inc. and Fung Associates, Inc. November, 2015. Accessed October 3, 2022, <http://hidot.hawaii.gov/highways/files/2019/03/FINAL-HANA-BRIDGE-PRESERVATION-REPORT.pdf>.
- 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 southwest.



## Bridge Inventory Form



Image 2. Approach to bridge, facing southeast.



## Bridge Inventory Form



Image 3. Northeast parapet, facing northeast.

## Bridge Inventory Form



Image 4. Abutments and girders, facing southwest.



# Maui and Molokai 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)
009003770500058	Alae Bridge-Naalee Gulch	Naalee Gulch	Kekaulike Avenue	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible***	<ul style="list-style-type: none"> <li>• Significant for economic development</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Striking example of Federal Aid bridges constructed by the Territory in the 1930s</li> <li>• One of the longer and taller bridges in Maui County, with two twin-arch reinforced concrete piers</li> <li>• May represent work of a master: (drawings are unsigned but attributed to) William R. Bartels</li> </ul>
009000300303899	Anakaluahine Stream Bridge	Anakaluahine Stream	Kahekili Highway	1924	Concrete Tee Beam	Metal Thrie Beam	No	Eligible	<ul style="list-style-type: none"> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Fair example of 1920s reinforced concrete bridge</li> </ul>
009000370301511	Haakakai Stream Bridge	Haakakai Stream	Kula Highway	1964	Metal Corrugated Culvert	Metal Thrie Beam	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.
009000300303640	Honokohau Stream Bridge	Honokohau Stream	Honoapiilani Highway	1966	Concrete Tee Beam	Concrete Open Horizontal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009000300301046	Honokowai Stream Bridge	Honokowai Stream	Honoapiilani Highway	1977	Concrete Frame	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments. It has been potentially altered in 1999.
009004500901040	Honouliwai Stream-3-Cell Culvert	Honouliwai Stream	Kamehameha V Highway	1965	Metal Corrugated Culvert	No Parapet/Railing	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.
009034001400162	Iao Bridge	Iao Stream	Waiehu Beach Road	1953	Concrete Tee Beam	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003600502598	Kahalaowaka Stream Bridge	Unnamed Stream	Hana Highway	1926	Concrete Tee Beam	Concrete Open Vertical	Yes	Eligible, Contributing***	<ul style="list-style-type: none"> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600500588	Kailua Stream Bridge	Kailua Stream	Hana Highway	1929	Concrete Tee Beam	Concrete Open Vertical	Yes	Eligible, Contributing***	<ul style="list-style-type: none"> <li>• Contributes to the Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000370300900	Kaipoi Stream Bridge	Kaipoi Stream	Kula Highway	1933	Concrete Tee Beam	Concrete and Metal	No	Eligible	<ul style="list-style-type: none"> <li>• Significant for economic development</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Intact example of Federal Aid bridge constructed by the Territory in the 1930s</li> </ul>
009003600500045	Kakipi-Halehaku Gulch Culvert	Halehaku Gulch	Hana Highway	1966	Metal Corrugated Culvert	Metal Thrie Beam	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.
009000370301383	Kaliainui B Stream Bridge	Kaliainui Stream	KULA HWY	1964	Concrete Girder	Concrete and Metal	No	Eligible***	• Longest concrete bridge with the longest concrete span built postwar (1945) on the island of Maui in the historic study period prior to 1977
009000360300228	Kaliainui Stream Bridge	Kaliainui Stream	Hana Highway	1944	Concrete Girder	Concrete and Metal Picket	No	Not Eligible	This bridge has lost integrity due to the bridge being extended in 1990.
009004500500200	Kamiloa Bridge	Unnamed Stream	Kamehameha V Highway	1940	Concrete Slab	Concrete Solid	No	Eligible***	<ul style="list-style-type: none"> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Good example of 1940s reinforced concrete flat slab bridge</li> <li>• One of the few historic bridges located on Molokai</li> </ul>
009003770500053	Kanoulu Bridge	Kanoulu Stream	Kekaulike Avenue	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>• Significant for economic development</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Intact example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>
009000360301364	Kaupakalua Stream Bridge	Kaupakalua Stream	Hana Highway	2003	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1941 bridge in 2003.
009004500900778	Kawaikapu Bridge	Kawaikapu Stream	Kamehameha V Highway	2007	Concrete Girder	Concrete and Metal	No	Not Eligible	The bridge has lost integrity due to the complete replacement of the original 19150 bridge in 2007.
009004500500511	Kawela Bridge	Kawela Stream	Kamehameha V Highway	2013	Concrete Slab	Concrete Solid	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1940 bridge in 2013.
009000370301125	Keahuaiwi B Bridge	Keahuaiwi Stream	Kula Highway	1964	Concrete Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009372001100001	Kealia Pond Outlet No. 72	Kealia Pond	North Kihei Road	1911	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.
009000300301907	Launiupoko Stream Bridge	Launiupoko Stream	Honoapiilani Highway	1938	Concrete Slab	Concrete Solid	No	Not Eligible	This bridge has lost integrity due to significant road widening in 1990.
009004500500394	Makakupua Bridge	Unnamed Stream	Kamehameha V Highway	1940	Concrete Slab	Concrete Solid	No	Eligible	<ul style="list-style-type: none"> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Good example of the 1940s reinforced concrete flat slab bridge</li> <li>• Bridge is undergoing consultation process in 2013 for replacement in 2015</li> </ul>
009000360301008	Maliko Stream Bridge	Maliko Stream	Hana Highway	1961	Concrete Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009004500900536	Mapulehu Bridge	Mapulehu Stream	Kamehameha V Highway	1950	Concrete Slab	Metal Thrie Beam	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009000300301971	Olowalu B Stream Bridge	Olowalu Stream	Honoapiilani Highway	1938	Concrete Slab	Concrete Solid	No	Not Eligible	This bridge has lost integrity due to significant road widening in 1990.
009000300302100	Olowalu Stream Bridge	Olowalu Stream	Honoapiilani Highway	1938	Concrete Slab	Concrete Solid	No	Not Eligible	This bridge has lost integrity due to significant road widening in 1990.

\* 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.

# Maui and Molokai 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)
009000300302596	Olowalu Tunnel	Mountain Range	Honoapiilani Highway	1950	Concrete Arch Culvert	No Parapet/Railing	No	Eligible***	<ul style="list-style-type: none"> <li>First highway tunnel constructed in Hawaii</li> <li>Only tunnel on the island of Maui</li> <li>Representative of work of a master: William R. Bartels</li> </ul>
009003780500770	Pohakuokala Bridge	Pohakuokala Gulch	Haleakala Highway	1934	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the replacement of the original railings with new railings and bridge widening in 1970. The widened bridge has unique features that may be considered eligible in the future (approximately 2020).
009003770500349	Pohakuokala Bridge-Pulehu Gulch	Pulehu Gulch	Kekaulike Avenue	1934	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>Significant for economic development</li> <li>20th century example of bridge engineering and construction</li> <li>Intact example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>
009003770500217	Pulehu Bridge-Keahuaiwi Gulch (Kekaulike Avenue)	Keahuaiwi Gulch	Kekaulike Avenue	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>Significant for economic development</li> <li>20th century example of bridge engineering and construction</li> <li>Intact example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>
009000300302351	Ukumehame Stream Bridge	Ukumehame Stream	Honoapiilani Highway	1950	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009004600501402	Unnamed Stream-Kalamaula No. 1	Unnamed Stream	Maunaloa Highway	1954	Concrete Slab	Concrete Solid	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009004600501425	Unnamed Stream-Kalamaula No. 2	Unnamed Stream	Maunaloa Highway	1954	Concrete Slab	Concrete Solid	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009004600501473	Unnamed Stream-Kalamaula No. 3	Unnamed Stream	Maunaloa Highway	1954	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009004600501489	Unnamed Stream-Kalamaula No. 4	Unnamed Stream	Maunaloa Highway	1954	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003770500540	Waiale Bridge	Waiale Gulch	Kekaulike Avenue	1934	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>Significant for economic development</li> <li>20th century example of bridge engineering and construction</li> <li>Striking example of Federal Aid bridges constructed by the Territory in the 1930s</li> <li>One of the longer and taller bridges in Maui County, with two twin-arch reinforced concrete piers</li> <li>Representative of work of a master: William R. Bartels</li> </ul>
009003780500850	Waiale Gulch Bridge	Waiale Gulch	Haleakala Highway	1934	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the replacement of the original railings with new railings and bridge widening in 1970. The widened bridge has unique features that may be considered eligible in the future (approximately 2020).
009000320400050	Waiale Road Overpass	Waiale Drive	Kaahumanu Avenue	1936	Steel Stringer	Metal Picket	Yes	Eligible***	<ul style="list-style-type: none"> <li>Associated with sugar plantation industry</li> <li>Contributed to economic development of Maui by providing transportation</li> <li>Unique example of a steel stringer bridge in Hawaii</li> <li>Rare example of vernacular materials (lava rock abutments) on a Federal Aid bridge</li> <li>Only bridge on Maui associated with the U.S. Works Program Grade Crossing funding</li> <li>Representative of work of a master: William R. Bartels</li> </ul>
009000370300802	Waiohuli A Stream Bridge	Waiohuli Stream	Kula Highway	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>Significant for economic development</li> <li>20th century example of bridge engineering and construction</li> <li>Intact example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>
009000370300759	Waiohuli B Stream Bridge	Waiohuli Stream	Kula Highway	1933	Concrete Tee Beam	Concrete Solid Panel with Cap	No	Eligible	<ul style="list-style-type: none"> <li>Significant for economic development</li> <li>20th century example of bridge engineering and construction</li> <li>Intact example of Federal Aid bridges constructed by the Territory in the 1930s</li> </ul>

\* 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

<b>Bridge Number:</b> 009003770500058	<b>Route No:</b> 377
<b>Popular Name:</b> Alae Bridge-Naalaе Gulch	
<b>Feature Crossed:</b> Naalaе Gulch	
<b>Feature Carried:</b> Kekaulike Avenue	
<b>Milepost:</b> 8.57 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-19m-33.87s	<b>Latitude:</b> 20d-44m-32.11s
<b>Location:</b> 0.21 Miles North of Waipoli Road	
<b>Historic Name:</b> Alae Bridge-Naalaе Gulch	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b> Hawaiian Contracting Co.	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 49.9 ft.	<b>Total Length:</b> 149.9 ft.	<b>Deck Width:</b> 24.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b> Bridge name and date of construction incised on end piers			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Alae (Naalae Gulch) Bridge carries Kekaulike Avenue (State Highway 377) over Naalae Gulch, south of the Kula Botanical Gardens. Alae Gulch Bridge, a reinforced concrete tee beam structure, is the most impressive of the six bridges built in Kula by the Hawaiian Contracting Company under contract to the Territorial Highways Department in 1933-34.</p> <p>The Alae Bridge remains in its original location and has retained its rural setting on the upper Kula Road. The bridge's original concrete tee-beam design is unaltered, however modern steel guardrails have been attached to the end piers thus obscuring the paneled surface detail. The original reinforced concrete material of the bridge remains intact, with the exception of minor concrete spalling on the parapets. The workmanship is typical of bridges of this period. The bridge is easily visible from the Kula Botanical Gardens. The bridge's historic associations with Federal Aid highway improvements and advances in concrete technology are apparent to informed observers. The bridge retains its historic feeling due to its rural location, sharp approach and narrow width.</p>		



**Significance Statement:**

The Alae Gulch Bridge is significant for its contributions to the areas of engineering and transportation in Hawaii. The bridge is eligible under Criterion A as a representative of an important public works project initiated by the territorial government and constructed with federal work relief programs funds during the Depression era. The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century. Further, the bridge may also represent the “work of a master”: William R. Bartels of the Territorial Highways Department.

The Alae Gulch Bridge is one of four built in 1933 on the Kekaulike Avenue, followed by two more bridges built on that same highway in 1934. The bridge is a striking example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the deep Naalae Gulch along the Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.

The Alae Gulch Bridge with its three spans is one of the longer and taller bridges in Maui County. Its substructure is distinguished by the two twin-arch reinforced concrete piers.(1) Although the drawings for the Alae Gulch Bridge (dated September 1932) are unsigned. Bartels was responsible for the design of many major Territorial bridge projects between 1932 and his retirement from the department in 1956.(2) His work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

(1) Hawaii Heritage Center, 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, 1990), 97.

(2) Patricia Alvarez, “A History of Road and Bridge Development on the Island of Hawaii” in Historic Bridge Inventory and Evaluation: Island of Hawaii, prepared for the State of Hawaii, Department of Transportation Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

# Inventory Form

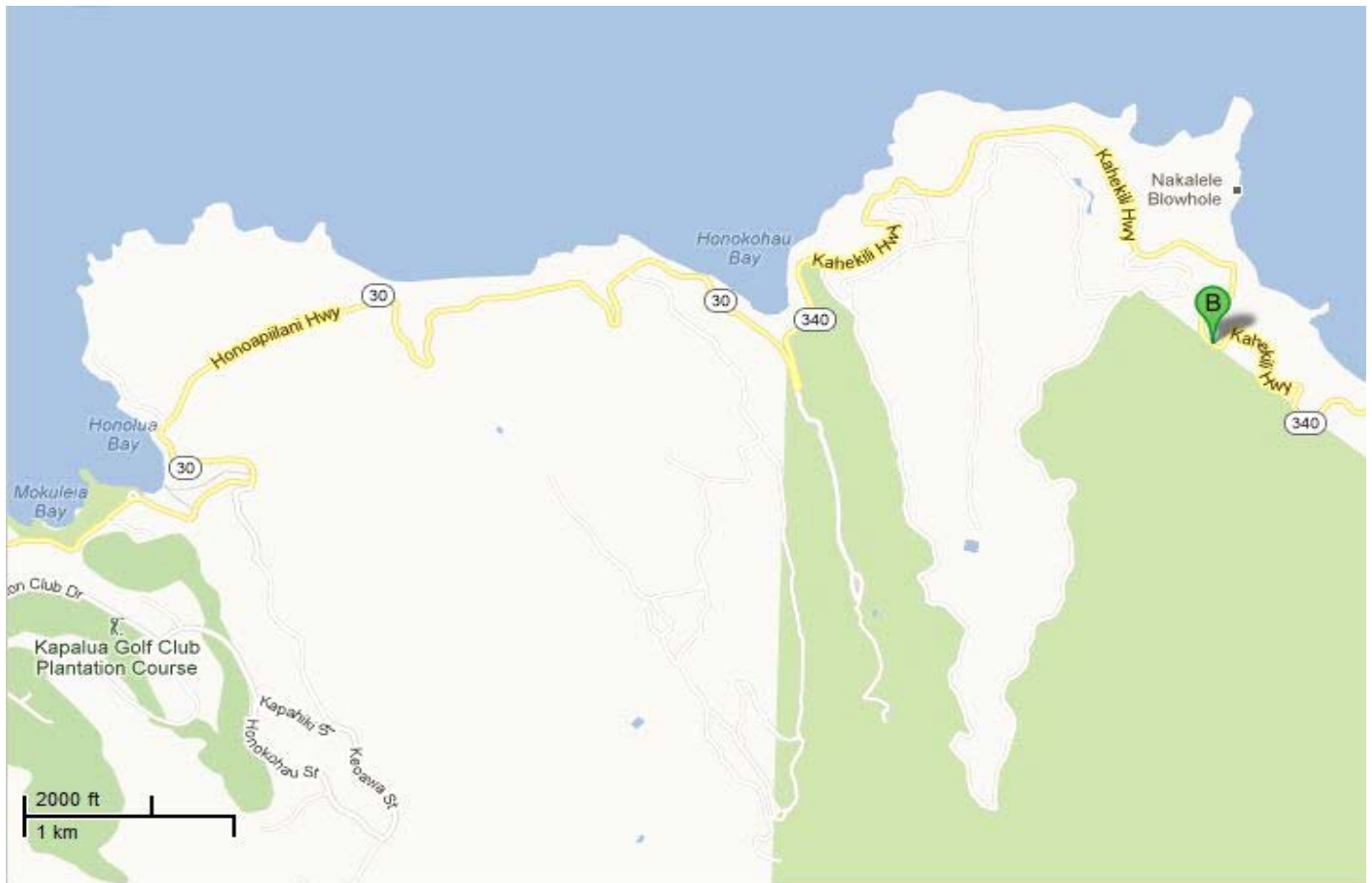
(State)

## General Information

<b>Bridge Number:</b> 009000300303899	<b>Route No:</b> 30
<b>Popular Name:</b> Anakaluahine Stream Bridge	
<b>Feature Crossed:</b> Anakaluahine Stream	
<b>Feature Carried:</b> Kahekili Highway	
<b>Milepost:</b> 38.46 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-35m-23.65s	<b>Latitude:</b> 21d-01m-12.24s
<b>Location:</b> 13.00 Miles North of Camp Maluhia Road	
<b>Historic Name:</b> Anakaluahine Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1924	<b>Replaced?</b> Yes
<b>Altered?</b> Yes <b>Alteration Date(s):</b> 1976		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> Significant alteration to superstructure in 1976		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 18.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 17.4 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Anakaluahine Stream Bridge carries Kahekili Highway across Anakaluahine Stream. This concrete tee beam bridge remains intact and is in fair condition. Metal thrie beam railings have replaced the original parapets. The concrete rock masonry abutments are original. In 1976 the bridge had undergone significant alterations that could've included the replacement of the superstructure.</p>		

**Significance Statement:**

This bridge is eligible under Criterion C for its associations with early developments in concrete bridge construction in Hawaii. It is a fair example of a 1920s concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. The rock abutments are a potentially eligible historic resource.



# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009003600502598	<b>Route No:</b> 360
<b>Popular Name:</b> Kahalaowaka Stream Bridge	
<b>Feature Crossed:</b> Unnamed Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 25.95 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-05m-04.08s	<b>Latitude:</b> 20d-48m-20.10s
<b>Location:</b> 0.93 Miles East of Lower Nahiku Road	
<b>Historic Name:</b> Kahalaowaka Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1926	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 22.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

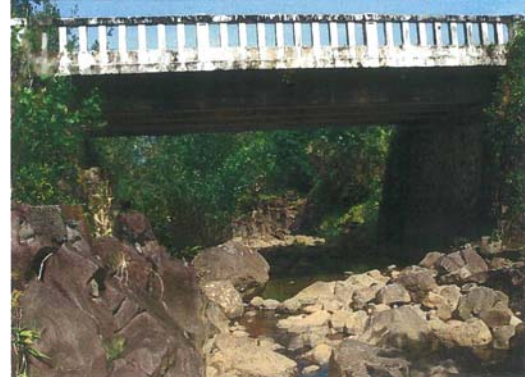
This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

# Inventory Form

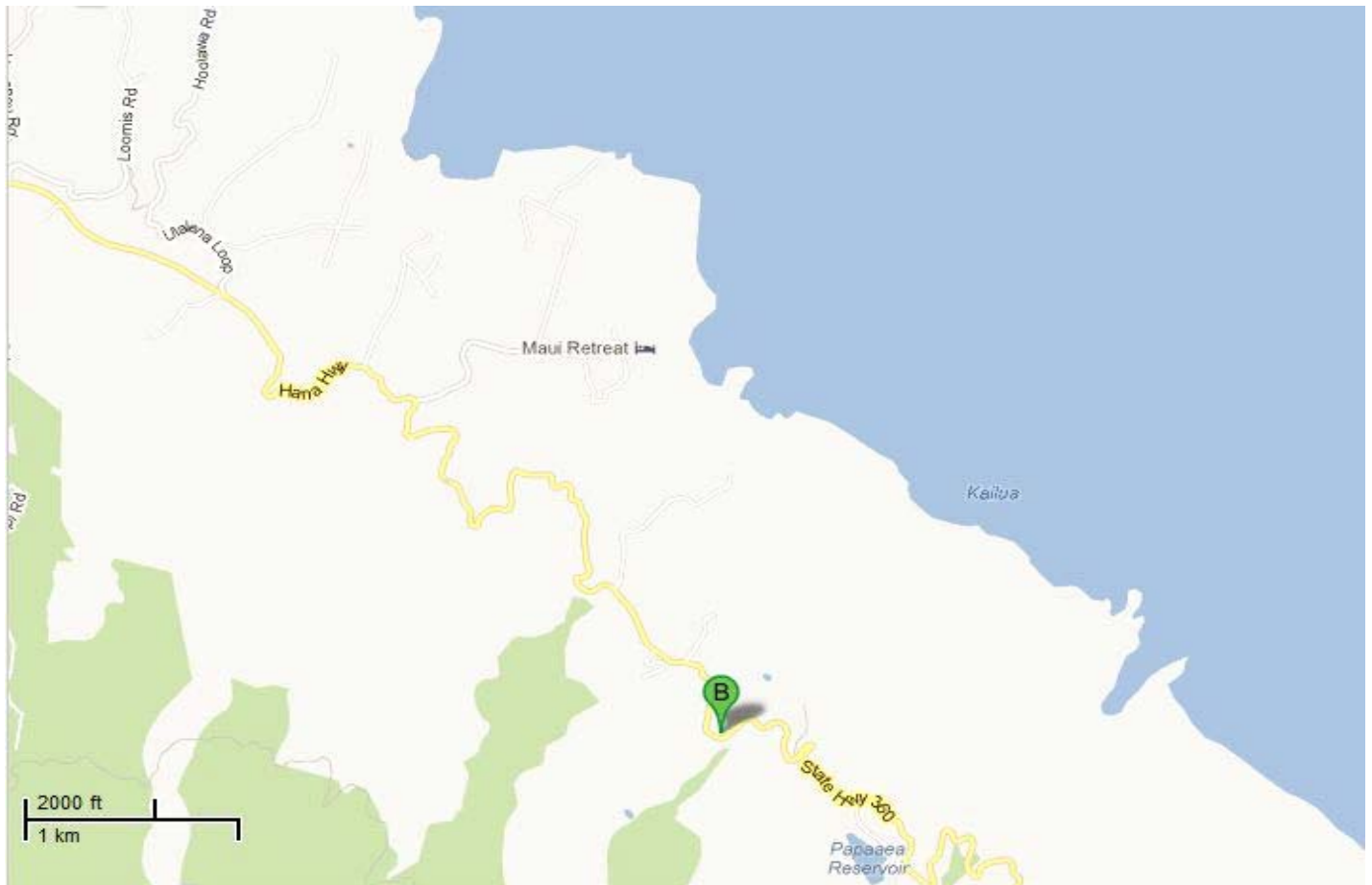
(State)

## General Information

<b>Bridge Number:</b> 009003600500588	<b>Route No:</b> 360
<b>Popular Name:</b> Kailua Stream Bridge	
<b>Feature Crossed:</b> Kailua Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 5.86 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-12m-48.51s	<b>Latitude:</b> 20d-53m-16.26s
<b>Location:</b> 6.26 Miles West of Kaumahina State Wayside Park Road	
<b>Historic Name:</b> Kailua Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1929	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 39.0 ft.	<b>Total Length:</b> 40.0 ft.	<b>Deck Width:</b> 21.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		

**Significance Statement:**


This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.



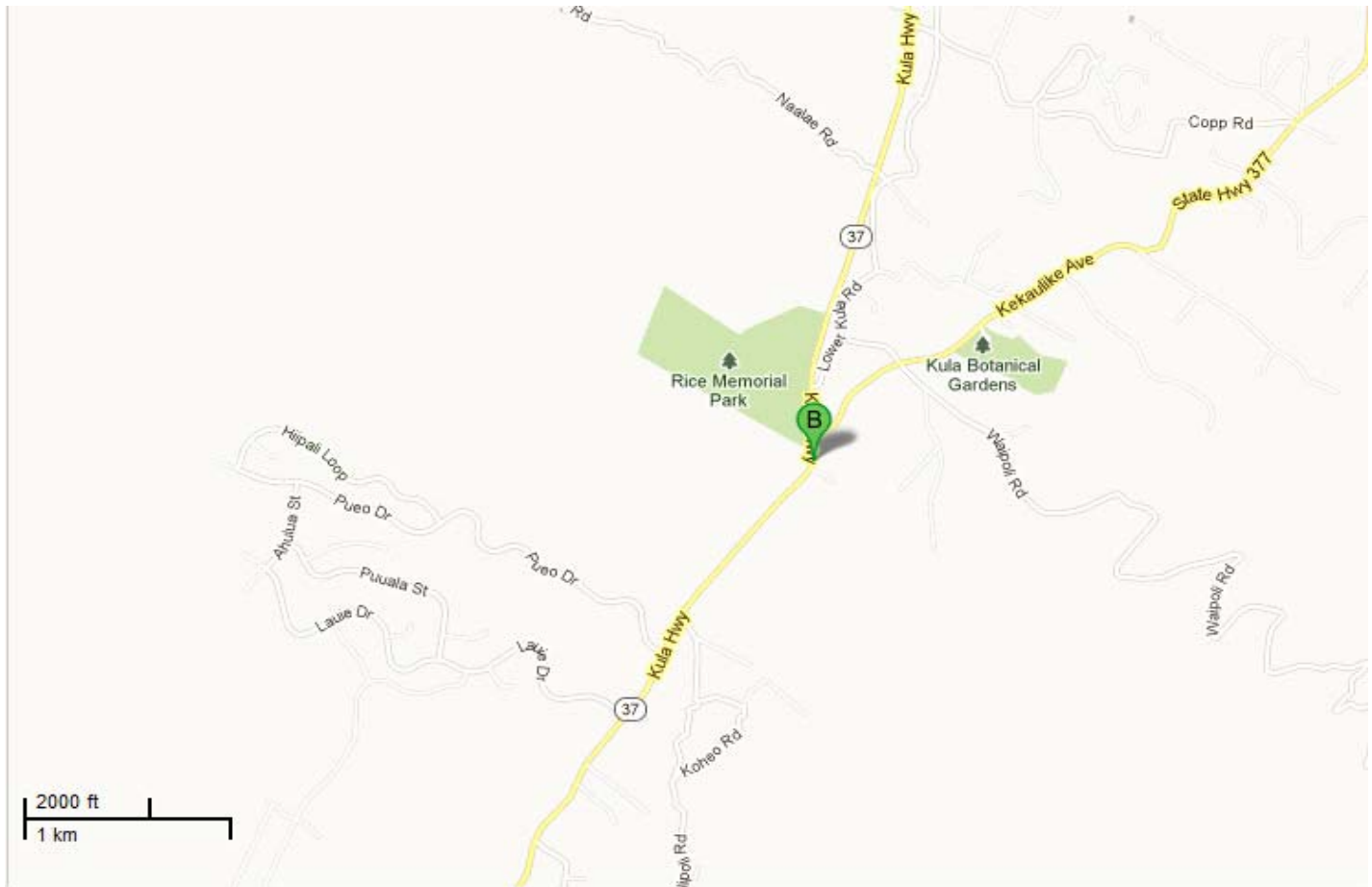
# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009000370300900	<b>Route No:</b> 37	
<b>Popular Name:</b> Kaipoioi Stream Bridge		
<b>Feature Crossed:</b> Kaipoioi Stream		
<b>Feature Carried:</b> Kula Highway		
<b>Milepost:</b> 14.33 mi.	<b>Island:</b> Maui	
<b>Longitude:</b> 156d-19m-59.56s	<b>Latitude:</b> 20d-44m-11.33s	
<b>Location:</b> 0.05 Miles South of Kekaulike Avenue (Route 377)		
<b>Historic Name:</b> Kaipoioi Stream Bridge		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b>		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 24.9 ft.	<b>Total Length:</b> 75.1 ft.	<b>Deck Width:</b> 27.6 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete and Metal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Kaipoi Stream Bridge carries Kula Highway across the Kaipoi Stream within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. The workmanship of the parapet has been obscured by three beam guardrails on both sides of the bridge. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.</p>		



**Significance Statement:**

The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century.

The Kaipoi Stream Bridge is a part of the 6 bridges built in Kula on Kekaulike Avenue and Kula Highway between 1933 and 1934. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Kaipoi Stream along the Kula Highway, a major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.

# Inventory Form

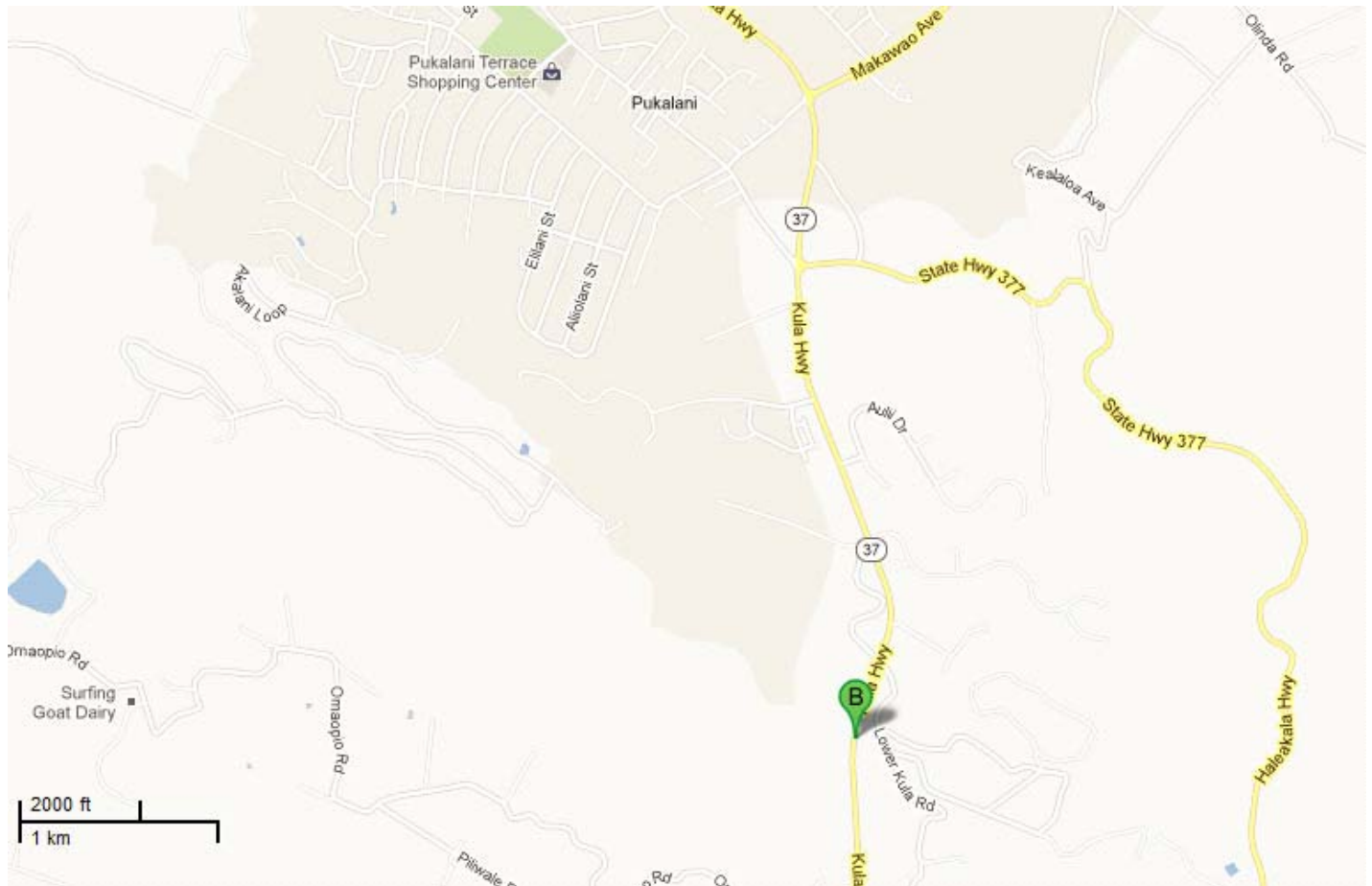
(State)

## General Information

<b>Bridge Number:</b> 009000370301383	<b>Route No:</b> 37
<b>Popular Name:</b> Kalialinui B Stream Bridge	
<b>Feature Crossed:</b> Kalialinui Stream	
<b>Feature Carried:</b> Kula Highway	
<b>Milepost:</b> 9.40 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-19m-39.38s	<b>Latitude:</b> 20d-48m-22.10s
<b>Location:</b> 0.57 Miles North of Omaopio Road	
<b>Historic Name:</b> Kalialinui B Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Girder	<b>Construction Date:</b> 1964	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 6	<b>Max Span:</b> 80.1 ft.	<b>Total Length:</b> 324.1 ft.	<b>Deck Width:</b> 36.1 ft.
<b>Superstructure:</b> Prestressed Concrete I-Girder			
<b>Substructure:</b> Concrete Abutment Wall and Concrete T-Shaped Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete and Metal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Kaliaui B Bridge carries Kula Highway across the Kalialinui Gulch. This prestressed and reinforced concrete bridge remains intact and is generally in good condition. The bridge has solid concrete parapets with a metal rail running horizontally above the concrete. The concrete deck is supported by concrete abutments. Three beams have been placed in front of the solid concrete and metal parapets and obscure the original parapet.</p>		

**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 Maui in the historic study period prior to 1969.



# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009004500500200	<b>Route No:</b> 450
<b>Popular Name:</b> Kamiloloa Bridge	
<b>Feature Crossed:</b> Unnamed Stream	
<b>Feature Carried:</b> Kamehameha V Highway	
<b>Milepost:</b> 1.99 mi.	<b>Island:</b> Molokai
<b>Longitude:</b> 156d-59m-39.62s	<b>Latitude:</b> 21d-04m-43.11s
<b>Location:</b> 0.36 Miles East of Kahinani Place	
<b>Historic Name:</b> Kamiloloa Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1940	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 24.9 ft.	<b>Deck Width:</b> 27.9 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>Located on the island of Molokai, the Kamiloloa Bridge is a simple reinforced concrete, flat slab bridge with lava rock abutments. The form work is evident in its parapets.</p> <p>The Kamiloloa Bridge carries Kamehameha V Highway Street across Kamiloloa Stream. Located on the island of Molokai, the Makakupaia Bridge is a single-span reinforced concrete, flat slab bridge in its original location, is generally in good condition, and its materials remain intact. The form work is evident on its solid concrete parapets and the bridge has CRM abutments. Metal thrie beams are integrated to the approaches of the parapets however, workmanship of the bridge has not been obscured by additions or repairs.</p>		



**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 the 1940's reinforced concrete flat slab bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. This is one of the few historic bridges on the island of Molokai.

# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009003770500053	<b>Route No:</b> 377
<b>Popular Name:</b> Kanoulu Bridge	
<b>Feature Crossed:</b> Kanoulu Stream	
<b>Feature Carried:</b> Kekaulike Avenue	
<b>Milepost:</b> 8.63 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-19m-36.05s	<b>Latitude:</b> 20d-44m-30.03s
<b>Location:</b> 0.16 Miles North of Waipoli Road	
<b>Historic Name:</b> Kanoulu Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 27.9 ft.	<b>Total Length:</b> 29.9 ft.	<b>Deck Width:</b> 24.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Kanoulu Stream Bridge carries Kekaulike Avenue across the Kanoulu Stream within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. The workmanship of the parapet has been obscured by three beam guardrails on both sides of the bridge. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.</p>		

**Significance Statement:**


The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century. The Kanoulu Stream Bridge is one of four built in 1933 on the Kekaulike Avenue, followed by two more bridges built on that same highway in 1934. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Kanoulu Stream along the Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.



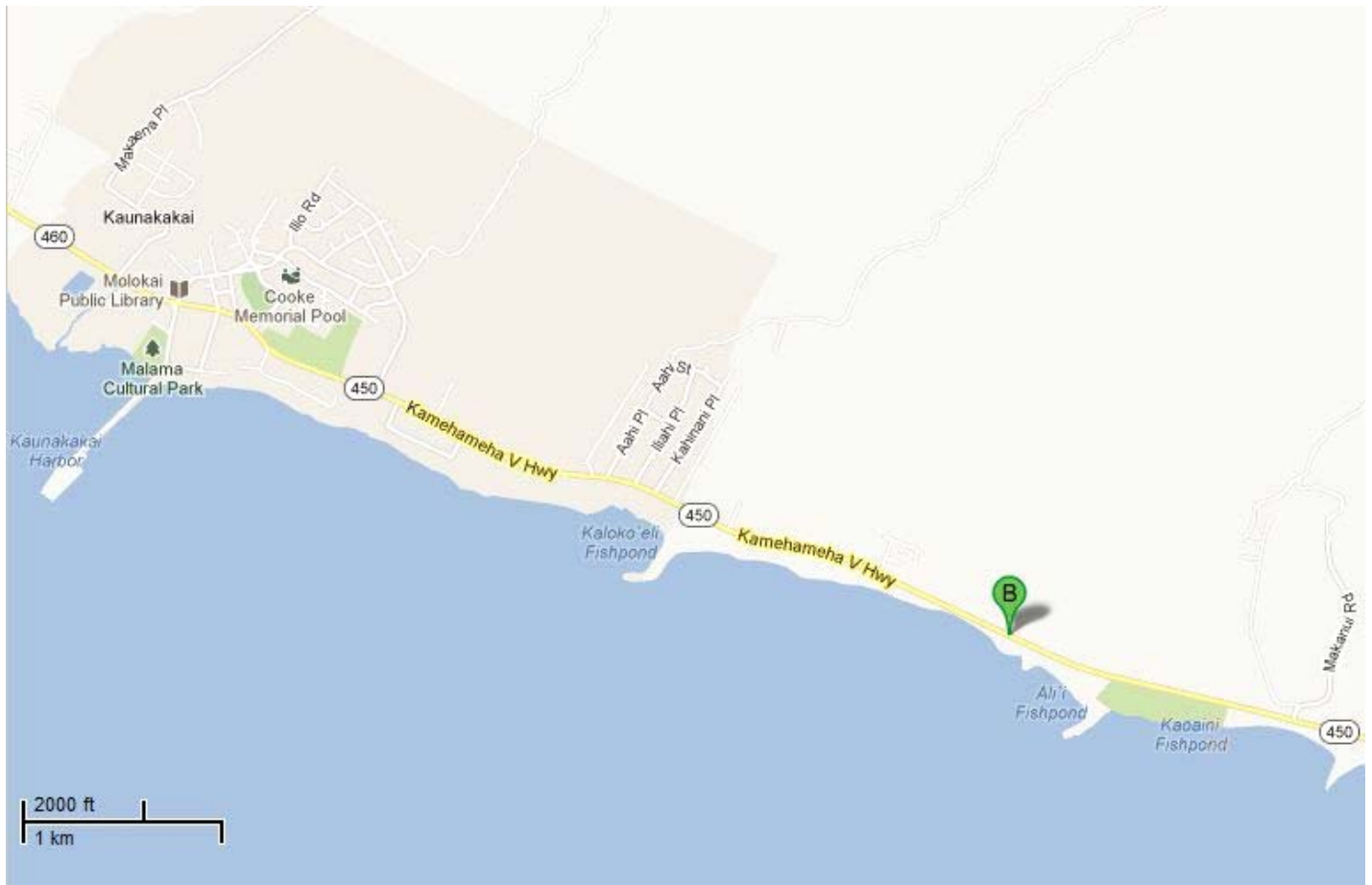
# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009004500500394	<b>Route No:</b> 450	
<b>Popular Name:</b> Makakupaia Bridge		
<b>Feature Crossed:</b> Unnamed Stream		
<b>Feature Carried:</b> Kamehameha V Highway		
<b>Milepost:</b> 3.94 mi.	<b>Island:</b> Molokai	
<b>Longitude:</b> 156d-57m-57.02s	<b>Latitude:</b> 21d-04m-11.48s	
<b>Location:</b> 0.36 Miles West of Hooulu Place		
<b>Historic Name:</b> Makakupaia Bridge		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b>		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1940	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 27.9 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Makakupaia Bridge carries Kamehameha V Highway Street across Makakupaia Stream. Located on the island of Molokai, the Makakupaia Bridge is a single-span reinforced concrete, flat slab bridge in its original location, is generally in good condition, and its materials remain intact. The form work is evident on its solid concrete parapets and the bridge has CRM abutments. Metal thrie beams are integrated to the approaches of the parapets however, workmanship of the bridge has not been obscured by additions or repairs. The bridge is scheduled for replacement in 2015.</p>		



**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 the 1940's reinforced concrete flat slab bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design. However this bridge is scheduled for reconstruction in 2015.

# Inventory Form

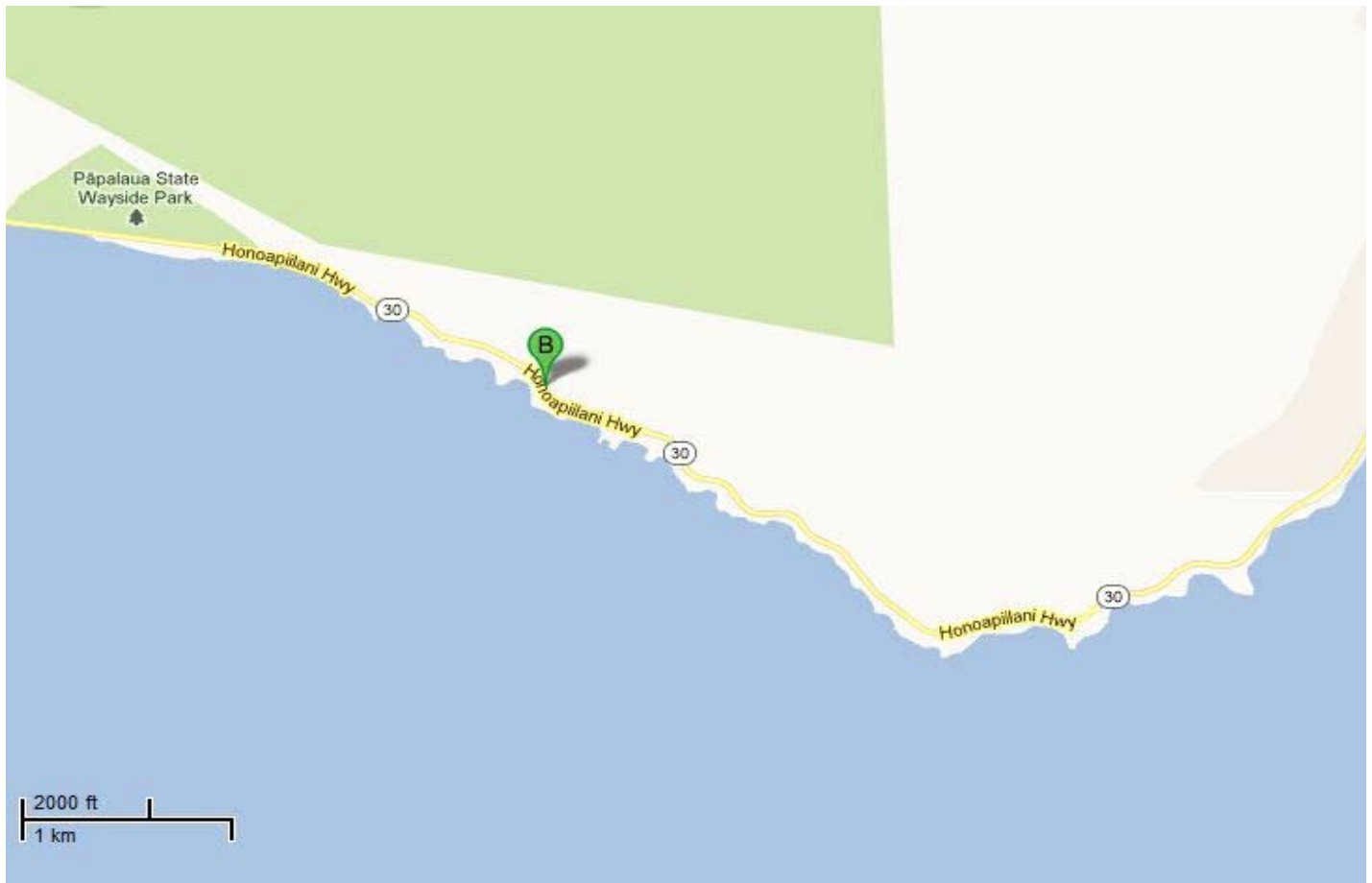
(State)

## General Information

<b>Bridge Number:</b> 009000300302596	<b>Route No:</b> 30
<b>Popular Name:</b> Olowalu Tunnel	
<b>Feature Crossed:</b> Mountain Range	
<b>Feature Carried:</b> Honoapiilani Highway	
<b>Milepost:</b> 10.34 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-33m-24.30s	<b>Latitude:</b> 20d-47m-17.98s
<b>Location:</b> 3.51 Miles Southwest of Road to Maalaea Boat Harbor	
<b>Historic Name:</b> Olowalu Tunnel	
<b>Designer/Engineer:</b> William R. Bartels	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Arch Culvert	<b>Construction Date:</b> 1950	<b>Replaced?</b> No
<b>Altered?</b> Yes	<b>Alteration Date(s):</b> Unknown	
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> Concrete post and guardrails		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 25.9 ft.	<b>Total Length:</b> 317.9 ft.	<b>Deck Width:</b> 32.2 ft.
<b>Superstructure:</b>			
<b>Substructure:</b> Concrete Arch Culvert			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> No Parapet/Railing			
<b>Setting:</b>			
<b>Other Features:</b> Walkways both sides; date incised			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Work of a Master		
<b>Narrative Description:</b> <p>The Olowalu Tunnel was constructed in 1950 so that the Honoapiilani Highway could pass through the rocky foothills which extend to the coast. The tunnel remains in its original location as an integral part of the well-traveled coastal highway. Despite an increase in tourist traffic, the surrounding area has changed very little since the tunnel was built. The Art Deco detailing and the construction date incised at each entry portal are evidence of skilled workmanship and aid in historical interpretation of the bridge. A current construction project inside the tunnel is adding concrete parapets between the small shoulder and the exposed rock interior. This safety addition does not detract substantially from the design of the tunnel. The setting along the rural south coastline has remained unchanged and adds to the historic feeling to the structure.</p>		

**Significance Statement:**

The TUNNEL: There is only one tunnel on Maui and it is where the 'Menehunes' (our little mischievous imps) live during the day (They only come on at night). Please honk your horn a couple of times when driving through our tunnel so you will not accidentally hit them.(1)

The tunnel is the work of a person of significance - William R. Bartels, Chief Engineer for the Territorial Highways Department, who was responsible for many major territorial bridge projects from 1932-1956. Bartels was considered a "cracker-jack" engineer who enjoyed the challenge of difficult assignments and his work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges show refined aesthetic sensibility which makes them distinctive from work of other engineers. Bartels was a German born engineer who worked briefly for a sugar plantation on Maui before being hired by the Territorial Highway Department in 1932. He designed most territorial bridges from then until 1957. Bartels was responsible for the largest and most sophisticated bridge construction projects in Hawaii during this time and there was a marked shift to large deck girder and rigid frame bridges.(2)(3) He ended his tenure as Chief of the Bridge Division at age 70. This was well past the standard retirement age but he was kept on by special permission and out of necessity because his abilities were so great. Bridges designed by Bartels have often been hailed for their accomplishment of engineering as well as aesthetics.(4)

The tunnel remains the only tunnel on the island of Maui, and was the first highway tunnel constructed in Hawaii, pre-dating both the Wilson Tunnel and the Pali Highway tunnels on Oahu.

(1) <http://mauigateway.com/~rw/driving.html>, retrieved Dec 2, 2005.

(2) Spencer Mason Architects, "Historic Highway Bridges of Hawaii, 1894-1941," prepared for the State of Hawaii Department of Transportation (Honolulu, 1996), V-6.

(3) Spencer Mason Architects, "Historic Highway Bridges of Hawaii, 1894-1941," prepared for the State of Hawaii Department of Transportation (Honolulu, 1996).

(4) <http://www.hookele.com/crc/bridge1.html>



# Inventory Form

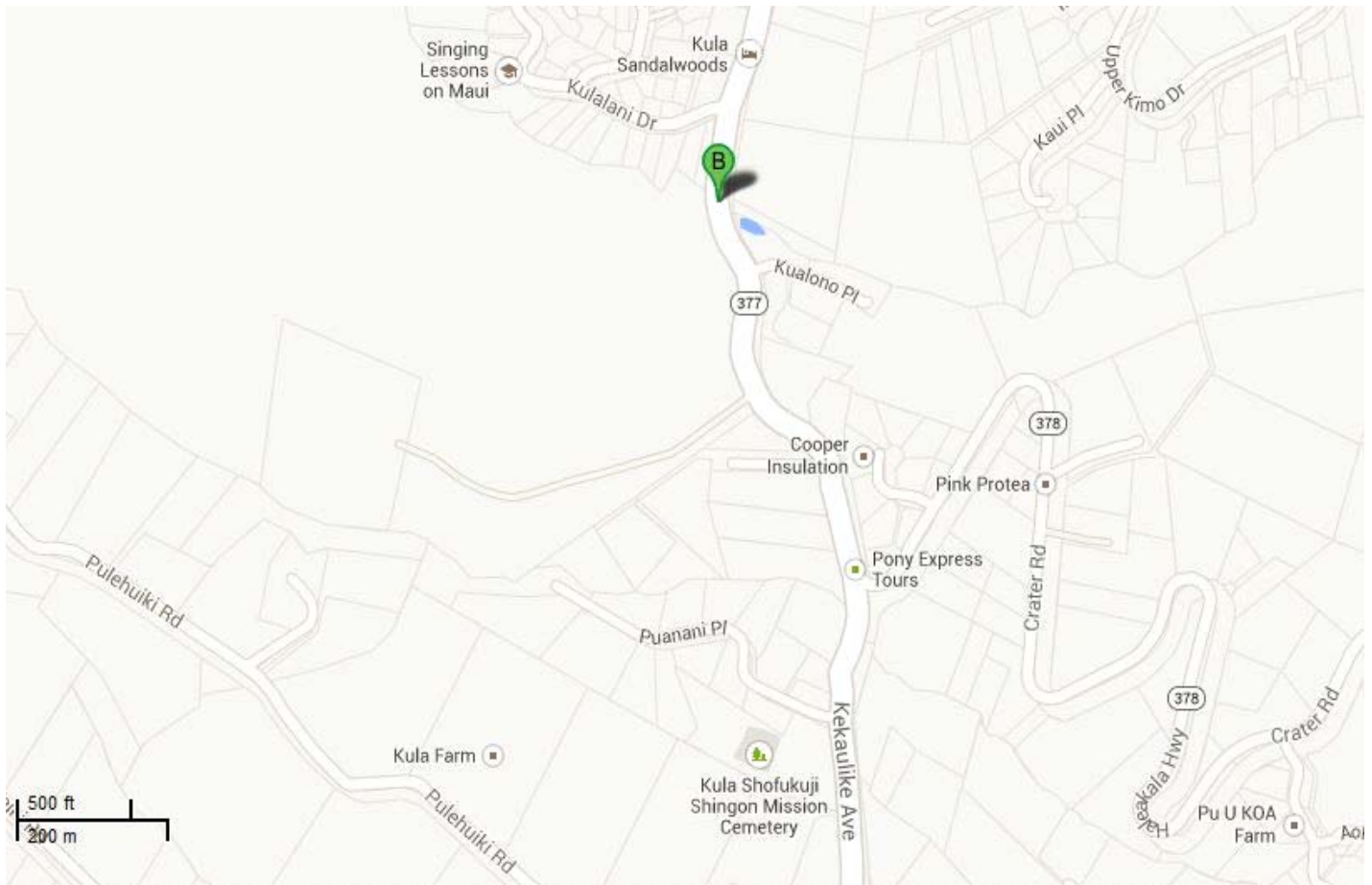
(State)

## General Information

<b>Bridge Number:</b> 009003770500349	<b>Route No:</b> 377
<b>Popular Name:</b> Pohakuokala Bridge-Pulehu Gulch	
<b>Feature Crossed:</b> Pulehu Gulch	
<b>Feature Carried:</b> Kekaulike Avenue	
<b>Milepost:</b> 5.66 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-18m-28.17s	<b>Latitude:</b> 20d-46m-23.91s
<b>Location:</b> 0.08 Miles South of Kulalani Drive	
<b>Historic Name:</b> Pohakuokala Bridge-Pulehu Gulch	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1934	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 36.1 ft.	<b>Total Length:</b> 109.9 ft.	<b>Deck Width:</b> 24.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Pulehu Gulch Bridge carries Kekaulike Avenue across the Pulehu Gulch within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. The workmanship of the parapet has been obscured by additions of modern steel guardrails attached to the end piers thus obscuring the paneled surface detail. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.</p>		



**Significance Statement:**

The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century. The Pulehu Gulch Bridge is one of two built in 1934 on the Kekaulike Avenue; it was preceded by four bridges constructed the year before under the same contract. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Pulehu Gulch along Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.

# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009003770500217	<b>Route No:</b> 377
<b>Popular Name:</b> Pulehu Bridge-Keahuaiwi Gulch (Kekaulike Avenue)	
<b>Feature Crossed:</b> Keahuaiwi Gulch	
<b>Feature Carried:</b> Kekaulike Avenue	
<b>Milepost:</b> 6.99 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-18m-26.87s	<b>Latitude:</b> 20d-45m-17.80s
<b>Location:</b> 0.26 Miles North of Ihe Place	
<b>Historic Name:</b> Pulehu Bridge-Keahuaiwi Gulch (Kekaulike Avenue)	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 33.1 ft.	<b>Total Length:</b> 36.1 ft.	<b>Deck Width:</b> 26.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Keahuaiwi Gulch Bridge carries Kekaulike Avenue across the Keahuaiwi Gulch within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. The workmanship of the parapet has been obscured by three beam guardrails on both sides of the bridge. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.</p>		

**Significance Statement:**

The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century.


The Keahuaiwi Gulch Stream Bridge is one of four built in 1933 on the Kekaulike Avenue, followed by two more bridges built on that same highway in 1934. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Keahuaiwi Gulch along Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.



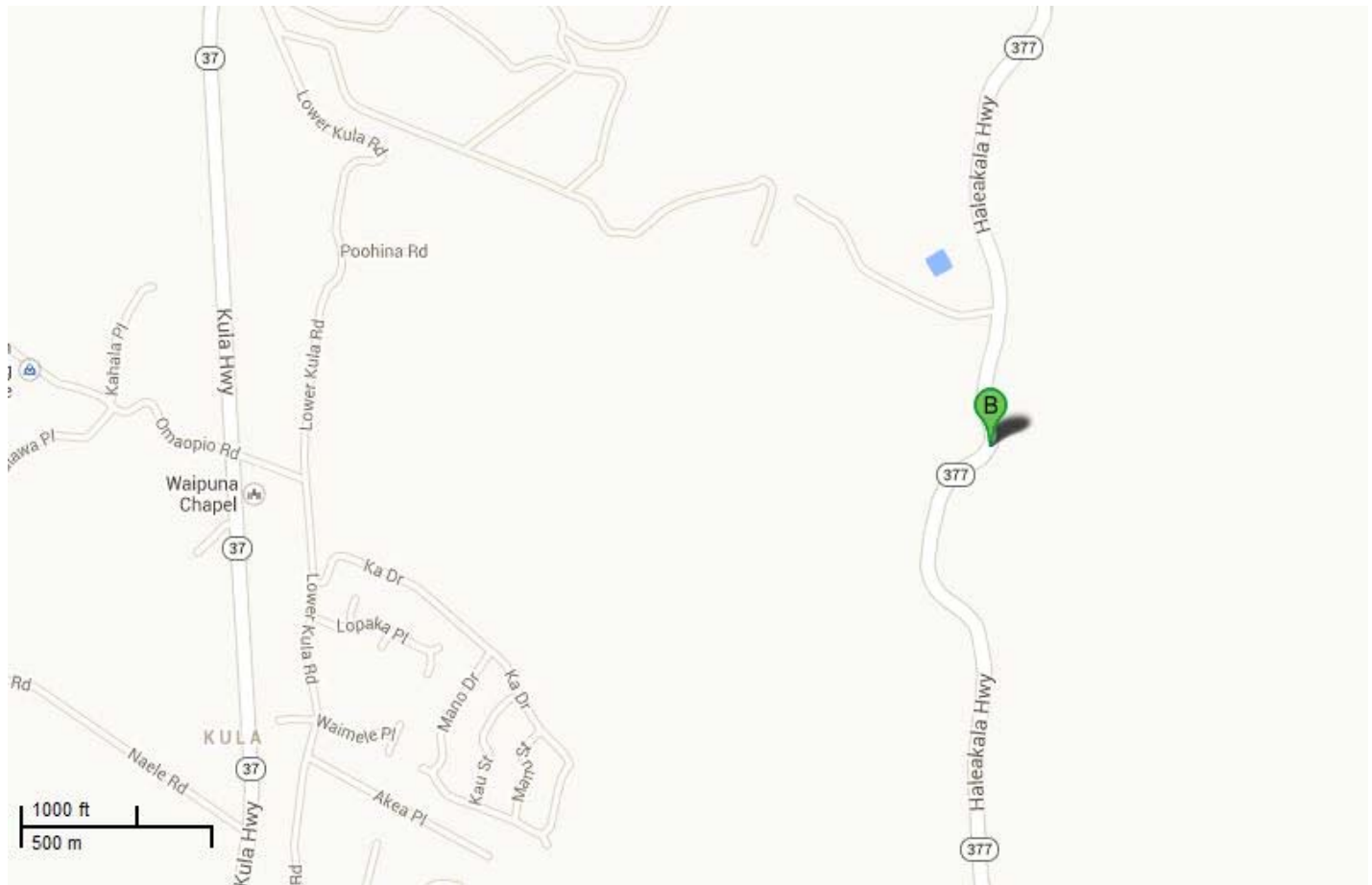
# Inventory Form

(State)

## General Information

<b>Bridge Number:</b> 009003770500540	<b>Route No:</b> 377	
<b>Popular Name:</b> Waiale Bridge		
<b>Feature Crossed:</b> Waiale Gulch		
<b>Feature Carried:</b> Haleakala Highway		
<b>Milepost:</b> 3.74 mi.	<b>Island:</b> Maui	
<b>Longitude:</b> 156d-18m-28.55s	<b>Latitude:</b> 20d-47m-51.64s	
<b>Location:</b> 1.44 Miles North of Lower Kimo Drive		
<b>Historic Name:</b> Waiale Bridge		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b> Hawaiian Contracting Co.		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1934	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 49.9 ft.	<b>Total Length:</b> 149.9 ft.	<b>Deck Width:</b> 27.2 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b> Bridge name and date of construction incised on end piers			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Waiale Gulch Bridge carries Kekaulike Avenue (State Highway 377) over Waiale Gulch. Waiale Gulch Bridge, a curved reinforced concrete tee beam structure, is one of the most impressive of the six bridges built in Kula by the Hawaiian Contracting Company under contract to the Territorial Highways Department in 1933-34.</p> <p>The Waiale Gulch Bridge remains in its original location and has retained its rural setting on the upper Kula Road. The bridge's original concrete tee beam design is unaltered. However, modern steel guardrails have been attached to the end piers thus obscuring the paneled surface detail. The original reinforced concrete material of the bridge remains intact, with the exception of minor concrete spalling on the parapets. The workmanship is typical of bridges of this period. The bridge's historic associations with Federal Aid highway improvements and advances in concrete technology are apparent to informed observers. The bridge retains its historic feeling due to its rural location, sharp approach and narrow width.</p>		



**Significance Statement:**

The Waiale Gulch Bridge is significant for its contributions to the areas of engineering and transportation in Hawaii. The bridge is eligible under Criterion A as a representative of an important public works project initiated by the territorial government and constructed with federal work relief programs funds during the Depression era. The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century. Further, the bridge may also represent the “work of a master”: William R. Bartels of the Territorial Highways Department.

The Waiale Gulch Bridge is one of two built in 1934 on Kekaulike Avenue; it was preceded by four bridges constructed the year before under the same contract. The bridge is a striking example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the deep Waiale Gulch along Kekaulike Avenue, the major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, small vegetable and flower farming.

The Waiale Gulch Bridge has a length of 150 feet, with a maximum span length of approximately 50 feet, making it one of the longer and taller bridges in Maui County. Its substructure is distinguished by the two twin-arch reinforced concrete piers.(1) It is likely that William R. Bartels designed this bridge, as well as the Alae Gulch Bridge and the others in the contract. Bartels was responsible for the design of all major Territorial bridge projects between 1932 and his retirement from the department in 1956.(2) His work characteristically utilized the latest technology and involved a high degree of engineering complexity. Nonetheless, his bridges evidence a refined aesthetic sensibility which makes them distinctive from the works of other engineers.

(1) Hawaii Heritage Center, 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, 1990), 107.

(2) Patricia Alvarez, “A History of Road and Bridge Development on the Island of Hawaii” in Historic Bridge Inventory and Evaluation: Island of Hawaii, prepared for the State of Hawaii, Department of Transportation, Highways Division in cooperation with the U.S. Department of Transportation, Federal Highways Administration (Honolulu, 1987a), 72.

# Inventory Form

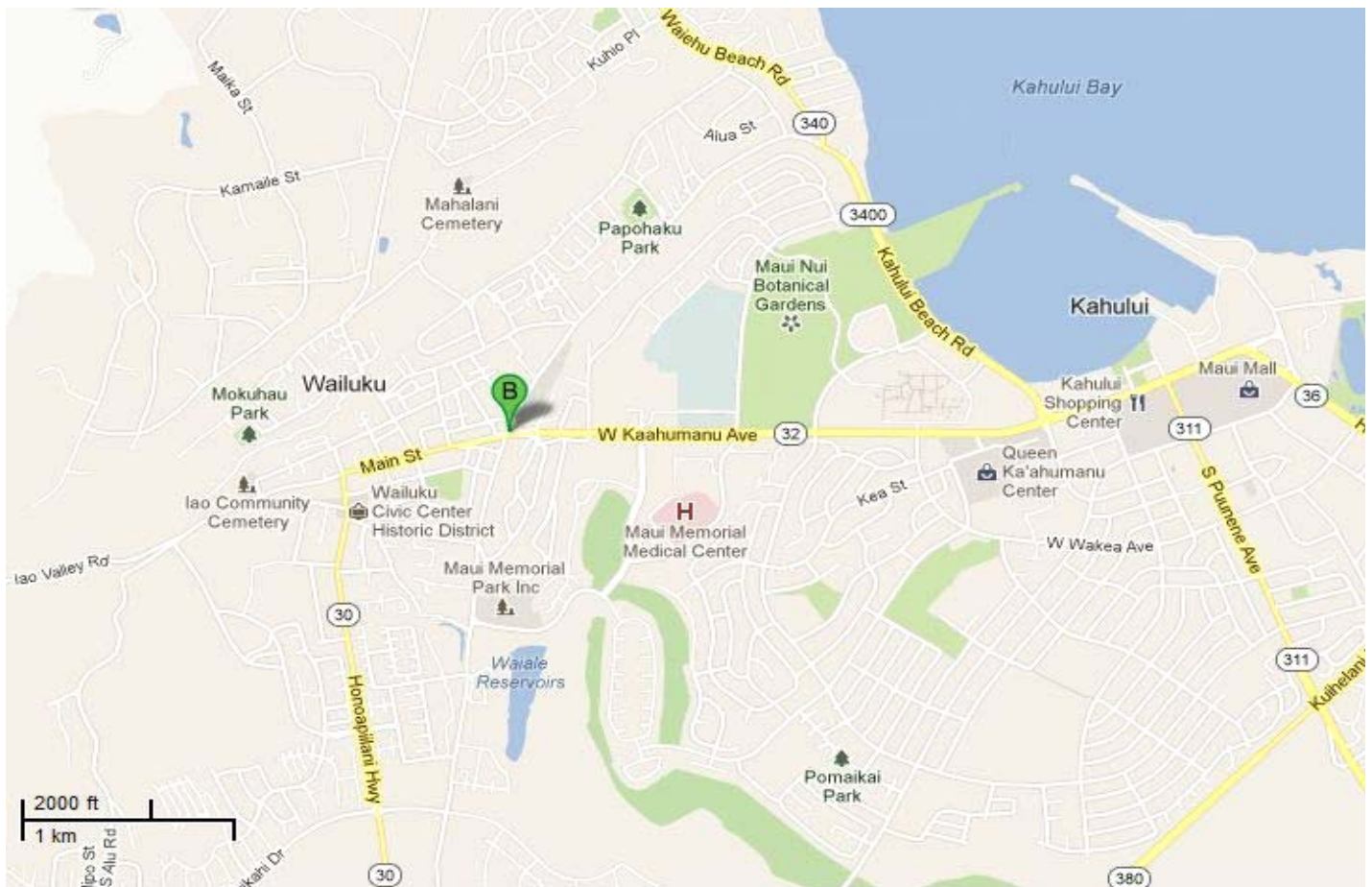
(State)

## General Information

<b>Bridge Number:</b> 009000320400050	<b>Route No:</b> 32
<b>Popular Name:</b> Waiale Road Overpass	
<b>Feature Crossed:</b> Waiale Drive	
<b>Feature Carried:</b> Kaahumanu Avenue	
<b>Milepost:</b> 0.50 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-29m-50.61s	<b>Latitude:</b> 20d-53m-19.30s
<b>Location:</b> 0.10 Miles East of Kinipopo Street	
<b>Historic Name:</b> Waiale Road Overpass	
<b>Designer/Engineer:</b> William R. Bartels	
<b>Builder/Contractor:</b> Hawaiian Contracting Co.	



## Location Map:





## Construction Information

<b>Bridge Type:</b> Steel Stringer	<b>Construction Date:</b> 1936	<b>Replaced?</b> No
<b>Altered?</b> Yes <b>Alteration Date(s):</b> 2010		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> Bridge parapets replaced in kind in 2010		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 50.9 ft.	<b>Total Length:</b> 79.1 ft.	<b>Deck Width:</b> 49.5 ft.
<b>Superstructure:</b> Steel Multi-Girder			
<b>Substructure:</b> Masonry Abutment and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Metal Picket			
<b>Setting:</b>			
<b>Other Features:</b> Bridge name and date incised on end piers; sidewalks on both sides of roadway; masonry and concrete pedestrian stair to road below			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		

**Significance Statement:**

See National Register of Historic Places Nomination Form.



# Inventory Form

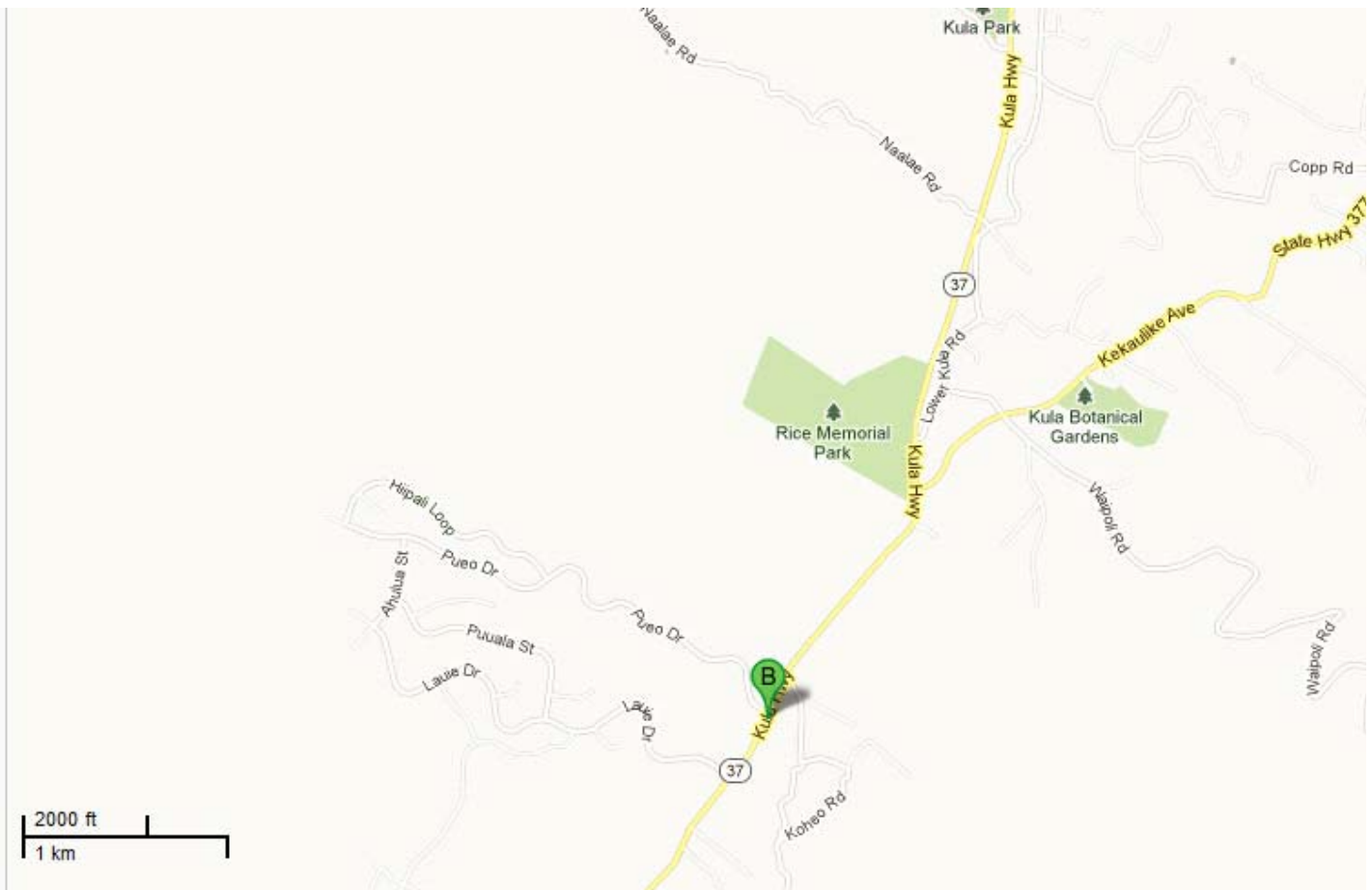
(State)

## General Information

<b>Bridge Number:</b> 009000370300802	<b>Route No:</b> 37
<b>Popular Name:</b> Waiohuli A Stream Bridge	
<b>Feature Crossed:</b> Waiohuli Stream	
<b>Feature Carried:</b> Kula Highway	
<b>Milepost:</b> 15.28 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-20m-29.08s	<b>Latitude:</b> 20d-43m-31.09s
<b>Location:</b> 0.31 Miles South of Polipoli Road	
<b>Historic Name:</b> Waiohuli A Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b>	Concrete Tee Beam	<b>Construction Date:</b>	1933	<b>Replaced?</b>	No
<b>Altered?</b>	Yes	<b>Alteration Date(s):</b>	2008		
<b>Alteration Type(s):</b> Railings					
<b>Alteration Description(s):</b> Bridge railings were replaced in 2008.					

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 22.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 24.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b>  The Waiohuli “A” Stream Bridge carries Kula Highway across the Waiohuli Stream within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. As a part of the Kula Highway Flood Damage Repairs in 2008, the bridge railings were replaced. The bridge’s historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.		



**Significance Statement:**

The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century.

The Waiohuli "A" Stream Bridge is a part of the 6 bridges built in Kula on Kekaulike Avenue and Kula Highway between 1933 and 1934. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Waiohuli Stream along the Kula Highway, a major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.

# Inventory Form

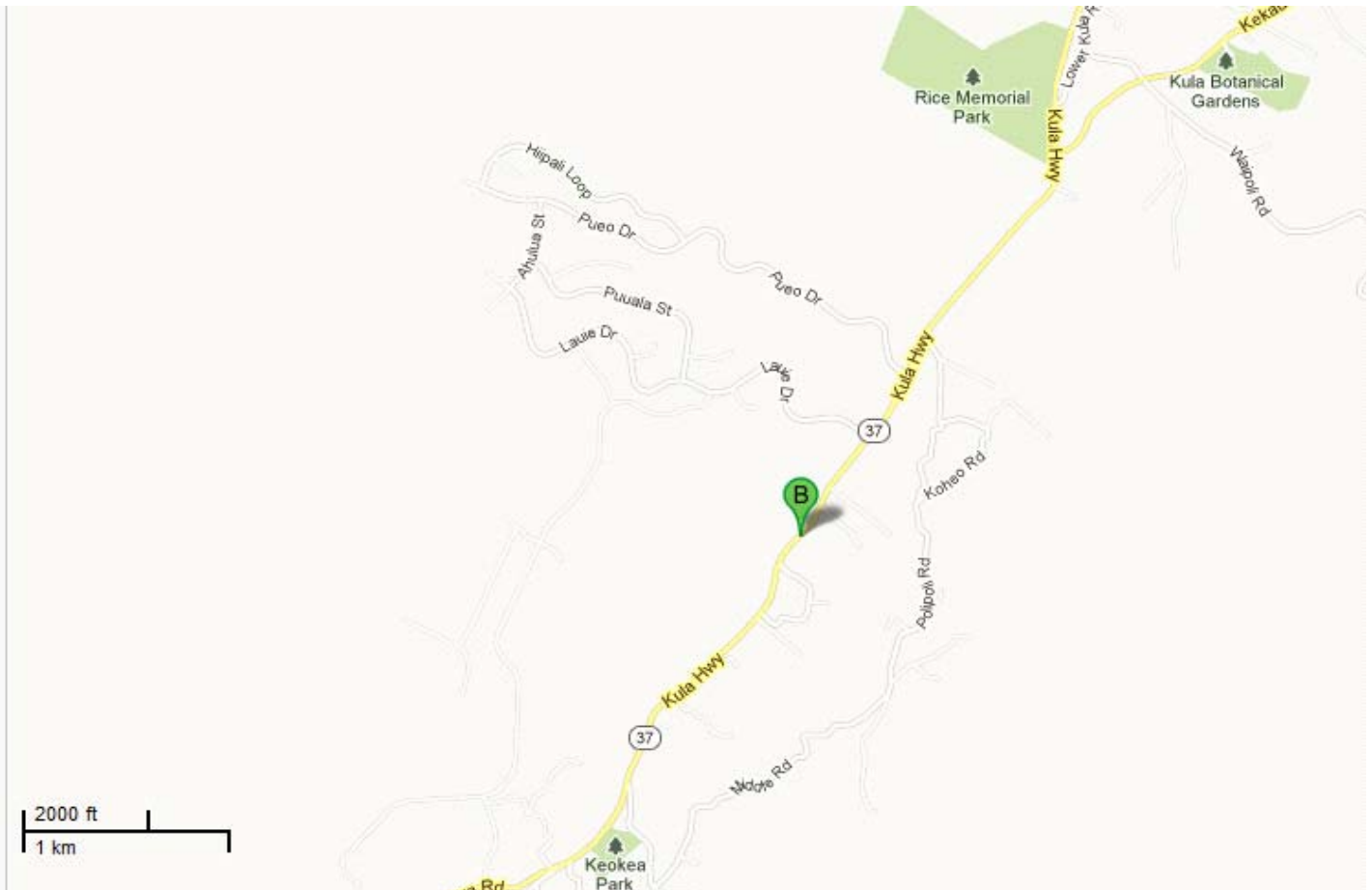
(State)

## General Information

<b>Bridge Number:</b> 009000370300759	<b>Route No:</b> 37
<b>Popular Name:</b> Waiohuli B Stream Bridge	
<b>Feature Crossed:</b> Waiohuli Stream	
<b>Feature Carried:</b> Kula Highway	
<b>Milepost:</b> 15.71 mi.	<b>Island:</b> Maui
<b>Longitude:</b> 156d-20m-43.08s	<b>Latitude:</b> 20d-43m-12.67s
<b>Location:</b> 0.11 Miles South of Malamahale Place	
<b>Historic Name:</b> Waiohuli B Stream Bridge	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1933	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 24.0 ft.	<b>Total Length:</b> 24.9 ft.	<b>Deck Width:</b> 24.9 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid Panel with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> A, C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Transportation		
<b>Narrative Description:</b> <p>The Waiohuli "B" Stream Bridge carries Kula Highway across the Waiohuli Stream within the Makawao District on the island of Maui. This reinforced concrete bridge remains intact and is generally in good condition. The workmanship of the parapet has been obscured by three beam guardrails on both sides of the bridge. The bridge's historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930s.</p>		



**Significance Statement:**

The bridge and roadway contributed to the economic development of the region by providing reliable vehicular access between Kula farms and the markets in Wailuku and Makawao. The bridge is eligible under Criterion C for its associations with the rapid advances in engineering technology in the early decades of the twentieth century.

The Waiohuli "B" Stream Bridge is a part of the 6 bridges built in Kula on Kekaulike Avenue and Kula Highway between 1933 and 1934. The bridge is an example of the Federal Aid bridges constructed by the Territory in the 1930s with funds designated for secondary roads. The bridge was constructed over the Waiohuli Stream along the Kula Highway, a major transportation route in the Kula area. This entire region is sparsely populated but the roadway and bridges were much needed to accommodate the major economic activities, such as ranching, and small vegetable and flower farming.

# Maui and Molokai 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)
009003600904579	Alaalua No. 27	Alaalua Stream	Hana Highway	1915	Concrete Tee Beam	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600903873	Alelele No. 13	Alelele Stream	Hana Highway	1983	Concrete Girder	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1937 bridge in 1983.
009003600904304	Hahalawe No. 19	Hahalawe Stream	Hana Highway	1910	Masonry Arch	Concrete Solid	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> <li>• One of nine remaining masonry arch bridges in the state</li> <li>• Has cut basalt rock abutments and arch ring</li> </ul>
009000300001193	Honoapiilani Highway	Honoapiilani Highway	Kaulapa Loop Bridge	1969	Concrete Stringer/Multi-beam or Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009030801100001	Honokowai No. 91	Honokowai Stream	Lower Honoapiilani Road	1988	Concrete Slab	Concrete and Metal	No	Not Eligible	This bridge has lost integrity due to the complete replacement of the original 1967 bridge in 1988.
009003201100001	Iao Stream Bridge No. 59	Iao Stream	Iao Valley Road	1955	Steel Stringer	Metal Horizontal	No	Eligible***	<ul style="list-style-type: none"> <li>• Longest metal bridge built postwar (1945) on Maui island in the historic study period prior to 1977</li> <li>• Uncommon use of steel material in Hawaii's extreme marine environment</li> <li>• Good example of 1940s steel stringer bridge that is typical of its period</li> </ul>
009311301200001	Iron Bridge No. 113	Iao Stream	North Market Street	1949	Steel Stringer	Metal Horizontal	No	Eligible***	<ul style="list-style-type: none"> <li>• Longest metal bridge built postwar (1945) on Maui island in the historic study period prior to 1977</li> <li>• Uncommon use of steel material in Hawaii's extreme marine environment</li> <li>• Good example of 1940s steel stringer bridge that is typical of its period</li> </ul>
009030801100003	Kahana Nui No. 93	Kahana Nui Stream	Lower Honoapiilani Road	1964	Concrete Tee Beam	Concrete Solid with Cap	No	Eligible	<ul style="list-style-type: none"> <li>• Exceptional 1960s concrete bridge because of uncommon use of solid parapet with masonry rubble concrete abutments during this period</li> <li>• Bridge is undergoing consultation process in 2013 for scheduled replacement in 2014</li> </ul>
009004500900886	Kahawaiiki Stream (Waialua)	Kahawaiiki Stream (Waialua)	Kamehaha V Highway	1970	Concrete Stringer/Multi-beam or Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003600904864	Kahawaiokapia No. 30	Kapia Stream	Hana Highway	1915	Concrete Tee Beam	Concrete Solid	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600904984	Kaholopo No. 31	Haneoo Stream	Hana Highway	1917	Concrete Slab	Metal Thrie Beam	Yes	Non-Contributing	<ul style="list-style-type: none"> <li>• Bridge is a non-contributing feature in the Hana Highway Historic Bridge District due for replacement in 2013</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009000310903847	Kalepa No. 12	Kalepa Stream	Piilani Highway	1993	Concrete Slab	Metal Thrie Beam	No	Not Eligible**	This bridge has lost integrity due to the complete replacement of the original 1937 bridge in 1993. The rock abutments are a potentially eligible historic resource.
009332001100001	Kaliialinui No. 2	Kaliialinui Gulch	Lower Kula Road	1911	Concrete Slab	Concrete Open Horizontal	No	Eligible***	• Good example of a 1910s reinforced concrete bridge with lava rock abutments, piers, and wing walls
009358001100001	Kaohu No. 58	Spreckelsville Ditch	Kaohu Street	1911	Concrete Slab	Concrete Open Vertical	No	Eligible	<ul style="list-style-type: none"> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Good example of 1910s reinforced concrete bridge</li> </ul>
009000300401675	Kauaula Stream	Kauaula Stream	Honoapiilani Highway	1971	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009335001100001	Kaupakalua No. 35	Kaupakalua Stream	Peahi Road	1911	Timber Stringer	Metal Thrie Beam	No	Eligible	• Intact example of a 1910s timber bridge with rock abutments and concrete and timber piers
009003600904058	Koukouai No. 16	Koukouai Stream	Hana Highway	1911	Open Spandrel Arch	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Constructed by prominent native Hawaiian contractor Moses Akiona and skilled builders</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600903947	Kukuila Stream	Kukuila Stream	Hana Highway	1969	Concrete Tee Beam	Metal Thrie Beam	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009000310900001	Kulanihokoa No. 76	Kulanihokoa Ditch	South Kihei Road	2015	Steel Girder	Thrie Beams and Metal Horizontal	No	Not Eligible	This bridge replaced a 1911 concrete box culvert with the same number. The 2013 SHBIE evaluated the 1911 culvert as not eligible as it did not have distinctive engineering or architectural features that depart from standard culvert design. The 2015 replacement is not eligible.

\* 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.

# Maui and Molokai 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)
009003600903922	Lelekea No. 81	Lelekea Stream	Hana Highway	1947	Metal Corrugated Culvert	Metal Thrie Beam	No	Eligible	<ul style="list-style-type: none"> <li>• Super structure has arched corrugated metal pipe for main support with partial reinforced concrete and concrete rubble masonry footings</li> <li>• Unique example of culvert that has been reclassified into a bridge</li> </ul>
009000370301976	Lowrie Ditch	Lowrie Ditch	Haleakala Highway	1972	Concrete Stringer/Multi-beam or Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003600904329	Mahalawa No. 20	Kakiweka Stream	Hana Highway	1910	Concrete Tee Beam	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003400900277	Makamakaole No. 63	Makamakaole Stream	Kahekili Highway	1980	Concrete Slab	Metal Thrie Beam	No	Not Eligible**	This bridge has lost integrity due to the complete replacement of the original 1927 bridge in 1980. The rock abutments are a potentially eligible historic resource.
009003650700299	Maliko No. 48	Maliko Gulch	Makawao Avenue	1945	Closed Spandrel Arch	Concrete Open Vertical	No	Eligible***	<ul style="list-style-type: none"> <li>• Only county bridge built during WWII</li> <li>• Rare to find arched bridge from this period</li> <li>• Arch bridges are an uncommon bridge type</li> <li>• Features a parapet with closely set rectangular balusters</li> </ul>
009000310903514	Manawainui No. 80	Manawainui Stream	Piilani Highway	1947	Concrete Tee Beam	Concrete Open Horizontal	No	Eligible***	<ul style="list-style-type: none"> <li>• Earliest concrete bridge built postwar (1945) on Maui island in the historic study period prior to 1977</li> </ul>
009003600904358	Paehala No. 21	Wailele Stream	Hana Highway	1910	Masonry Arch	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Arch bridges are an uncommon bridge type</li> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• One of nine remaining masonry arch bridges in the state</li> <li>• Has cut basalt rock abutments and arch ring</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600904494	Paihi No. 25	Paihi Stream	Hana Highway	2005	Concrete Girder	Concrete Solid	Yes	Non-Contributing	<ul style="list-style-type: none"> <li>• Bridge is a non-contributing feature in the Hana Highway Historic Bridge District due to the complete replacement of the original 1911 bridge in 2005</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003800500062	Paleaahu Gulch	Paleaahu Gulch	Kuihelani Highway	1970	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003600904636	Papahawahawa No. 28	Papahawahawa Stream	Hana Highway	2011	Concrete Tee Beam	Concrete Solid with Cap	Yes	Non-Contributing	<ul style="list-style-type: none"> <li>• Bridge is a non-contributing feature in the Hana Highway Historic Bridge District due to the complete replacement of the original 1915 bridge in 2011</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009339001100001	Pauwela No. 39	Pauwela Gulch	Haiku Road	1911	Concrete Tee Beam	Concrete Open Vertical	No	Eligible***	<ul style="list-style-type: none"> <li>• Associated with early developments in concrete bridge construction in Hawaii</li> <li>• Good example of early 1900s reinforced concrete T-beam bridge</li> </ul>
009003600904386	Puuhaoa No. 22	Unnamed Stream	Hana Highway	1910	Concrete Tee Beam	Concrete Open Decorative	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003650700070	Sam Kalama No. 50	Kailua Gulch	Makawao Avenue	1930	Concrete Tee Beam	Concrete and Metal	No	Not Eligible**	This bridge has lost integrity due to widening of the bridge in 1980. The rock abutments are a potentially eligible historic resource.
009003600904464	South Wailua No. 23	Honolewa Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003800500180	Unnamed Stream (7 Cells)	Unnamed Stream (7 Cells)	Kuihelani Highway	1970	Concrete Continuous Culvert	Concrete and Metal	No	Program Comments	This is a typical postwar culvert and falls under Program Comments.
009003800500306	Waihee Ditch	Waihee Ditch	Kuihelani Highway	1970	Concrete Slab	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003400500233	Waihee Stream	Waihee Stream	Kahekili Highway	1969	Concrete Stringer/Multi-beam or Girder	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003600904542	Waikakoi No. 26	Waikakoi Stream	Hana Highway	1911	Concrete Tee Beam	Concrete Solid with Cap	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003800500205	Waikapu Stream	Waikapu Stream	Kuihelani Highway	1970	Concrete Tee Beam	Concrete and Metal	No	Program Comments	This is a typical postwar bridge and falls under Program Comments.
009003400900584	Wailena No. 65	Wailena Gulch	Kahekili Highway	1987	Concrete Slab	Metal Thrie Beam	No	Not Eligible**	This bridge has lost integrity due to the complete replacement of the 1927 bridge in 1987. The original rock abutments from 1927 are a potentially eligible historic resource.

\* 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.



# Maui and Molokai 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)
009003600904475	Wailua No. 24	Wailua Stream	Hana Highway	1947	Concrete Tee Beam	Concrete Open Horizontal	Yes	Eligible***	<ul style="list-style-type: none"> <li>• Contributes to Hana Highway Historic Bridge District</li> <li>• Part of best remaining intact example of a belt road system in the state</li> <li>• 20th century example of bridge engineering and construction</li> <li>• Significant for commerce and social history</li> <li>• postwar Public Works Project</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>
009003600904803	Waiohonu No. 29	Waiohonu Stream	Hana Highway	2013	Concrete Tee Beam	Concrete Open Vertical	Yes	Non-Contributing	<ul style="list-style-type: none"> <li>• Bridge is a non-contributing feature in the Hana Highway Historic Bridge District due for replacement in 2013</li> <li>• See National Register of Historic Places Nomination Form in appendices</li> </ul>

\* 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

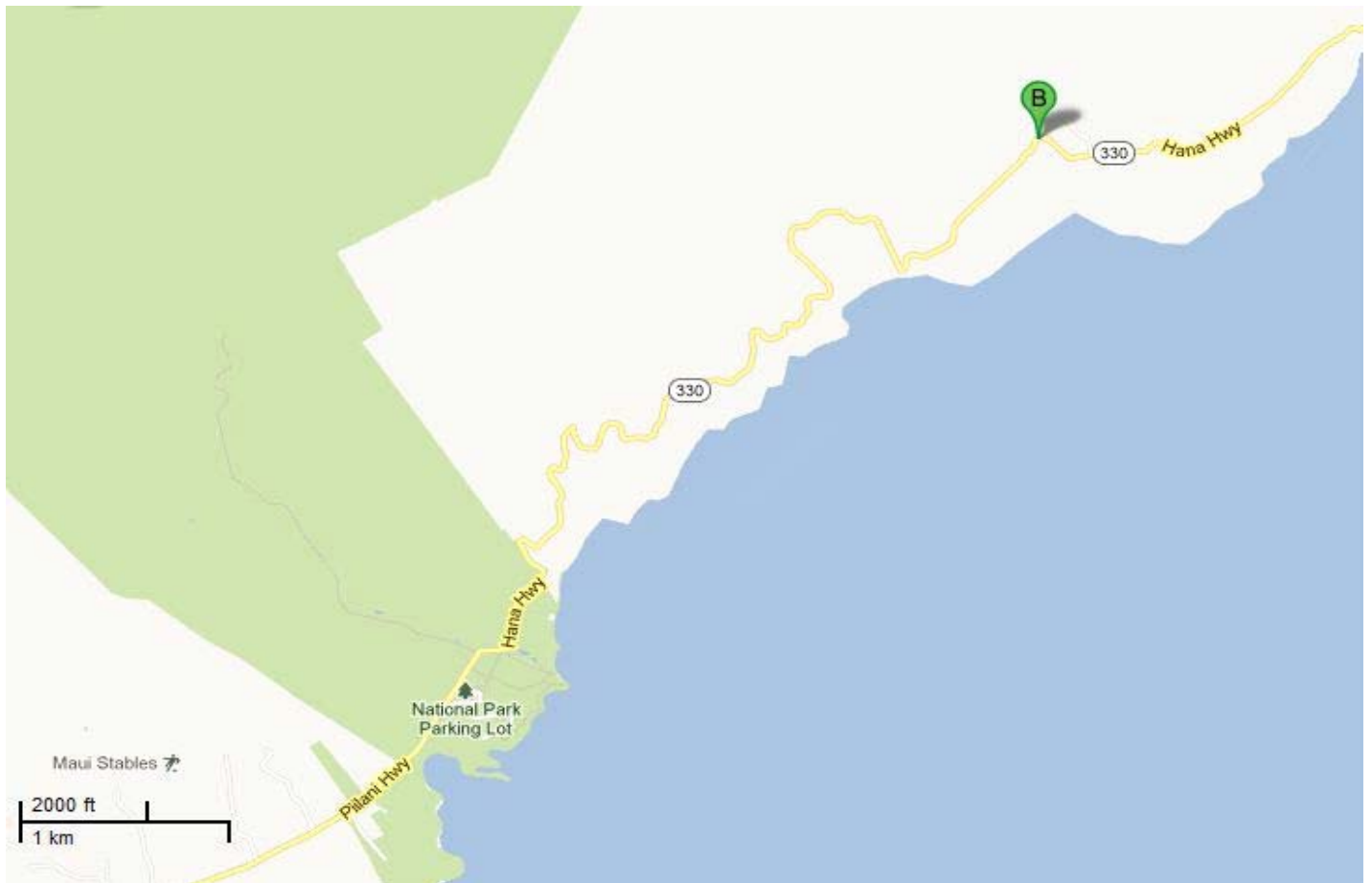
(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904579
<b>Popular Name:</b> Alaalua No. 27
<b>Feature Crossed:</b> Alaalua Stream
<b>Feature Carried:</b> Hana Highway
<b>Milepost:</b> 45.78 mi. <b>County Private:</b> Maui
<b>Longitude:</b> 156d-01m-08.23s <b>Latitude:</b> 20d-41m-14.47s
<b>Location:</b> 3.14 Miles South of Haneoo Road (Road to Hamoa)
<b>Historic Name:</b> Alaalua No. 27
<b>Designer/Engineer:</b>
<b>Builder/Contractor:</b>



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1915	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 30.0 ft.	<b>Total Length:</b> 54.0 ft.	<b>Deck Width:</b> 14.4 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

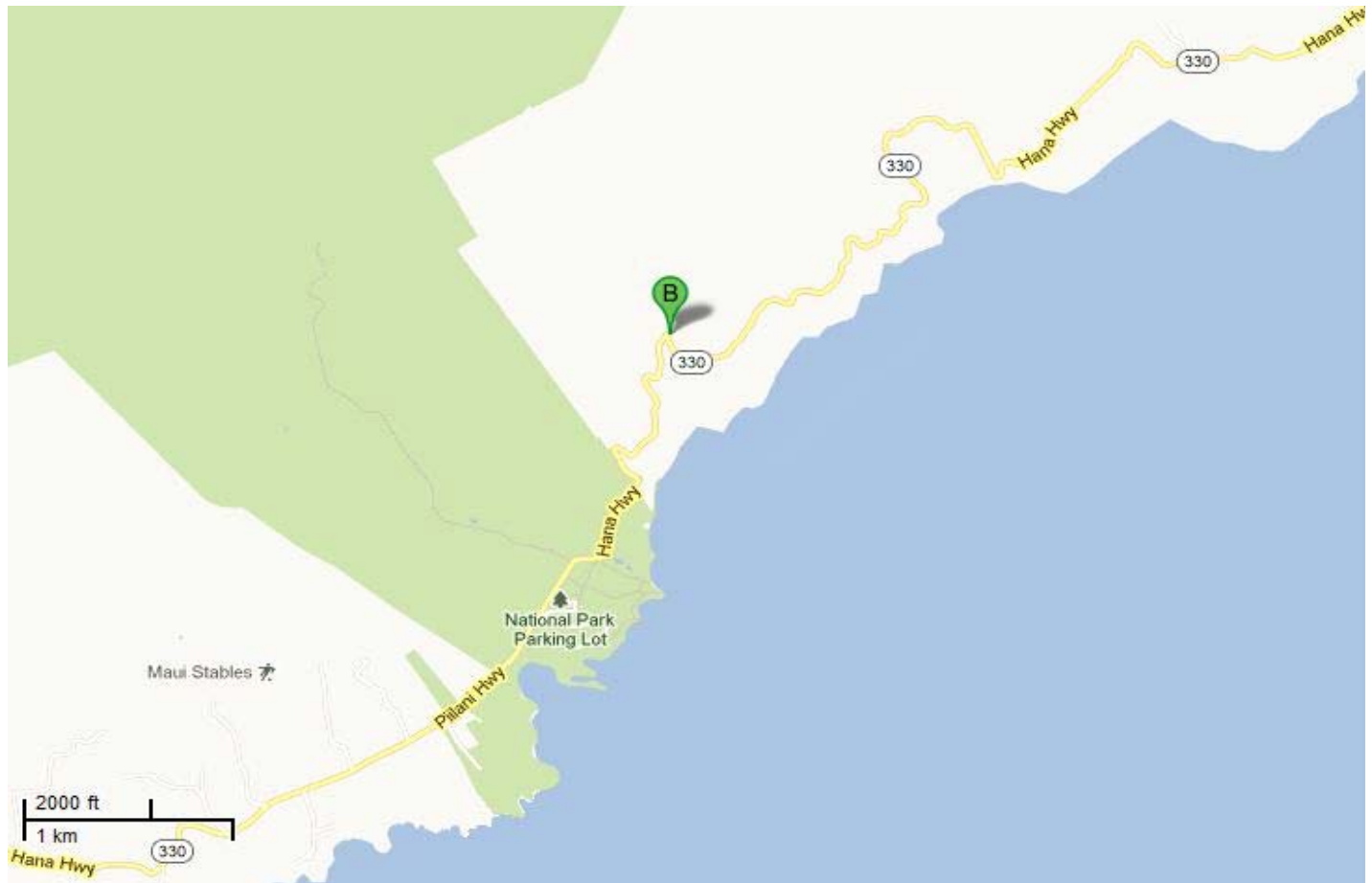
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904304	
<b>Popular Name:</b> Hahalawe No. 19	
<b>Feature Crossed:</b> Hahalawe Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 43.04 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-02m-25.44s <b>Latitude:</b> 20d-40m-26.43s	
<b>Location:</b> 5.89 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Hahalawe No. 19	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Masonry Arch	<b>Construction Date:</b> 1910	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 25.0 ft.	<b>Deck Width:</b> 16.0 ft.
<b>Superstructure:</b>			
<b>Substructure:</b> Masonry Arch Culvert			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

Hahalawe Stream Bridge and Waiele (Paehala Stream Bridge) are two of the nine remaining masonry arch bridges in the state and are located along the Hana Highway north of Haleakala National Park. These bridges, constructed by the county in 1910, are small, single-span circular masonry arch deck bridges with solid spandrels. Both bridges utilize cut basalt blocks for the abutments and arch ring; solid reinforced concrete was utilized for the parapets and rail caps. The dates "A.D. 1910" are inscribed on the outer parapet of each bridge. The masonry arches are typical of earlier structures constructed by the Kingdom or Republic of Hawaii (prior to 1898) and appear to date from an earlier period than the parapets. Arch bridges are also an uncommon bridge type.


The masonry arch bridges on the Hana Highway remain in their original locations and have retained their rural settings. The bridges retain their original design features and materials, although the concrete parapets appear to date from later period than the masonry arch. Generally, early masonry arch bridges were constructed by prisoners or day labor. Later masonry arch bridges were constructed by skilled masons. It is unknown who constructed Hana's masonry arch bridges. The bridges' historic associations with public works improvements of the early Territorial period and as rare survivors of this once common bridge type are apparent to the informed observer. The bridges retain their historic feeling due to their finely-detailed, and now uncommon materials.

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

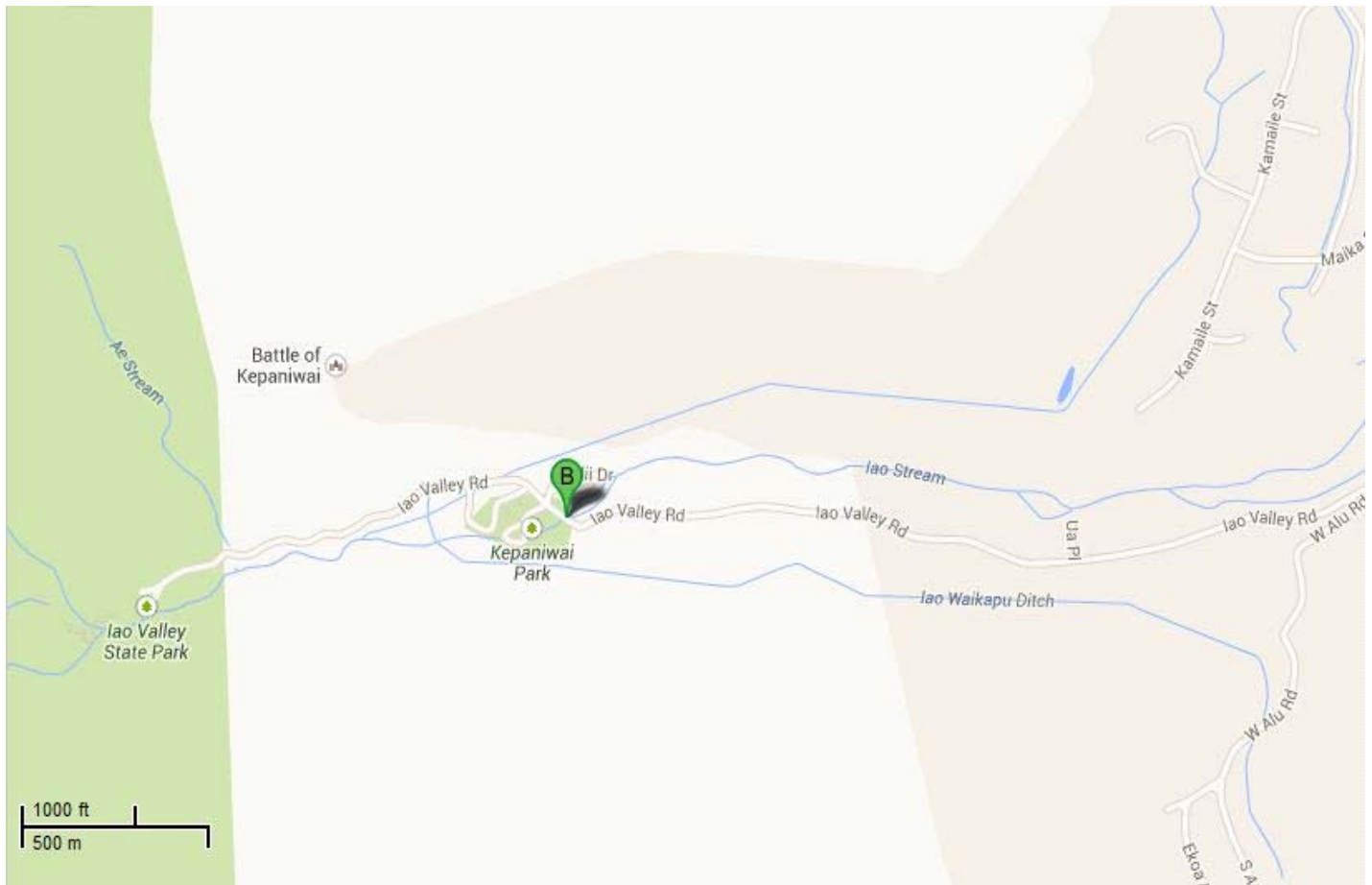
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003201100001	
<b>Popular Name:</b> Iao Stream Bridge No. 59	
<b>Feature Crossed:</b> Iao Stream	
<b>Feature Carried:</b> Iao Valley Road	
<b>Milepost:</b> <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-32m-01.60s <b>Latitude:</b> 20d-52m-58.50s	
<b>Location:</b> Before Heritage Gardens Kepaniwai Park	
<b>Historic Name:</b> Iao Stream Bridge No. 59	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Steel Stringer	<b>Construction Date:</b> 1955	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 40.0 ft.	<b>Total Length:</b> 122.0 ft.	<b>Deck Width:</b> 27.8 ft.
<b>Superstructure:</b> Steel Multi-Girder			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Metal Horizontal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The lao Stream Bridge #59 carries lao Valley Road over the lao Stream. This three span steel stringer bridge is in its original location, is generally in good condition, and its materials remain intact. It has horizontal metal railings with concrete end posts and a concrete curb. The reinforced concrete deck is supported by reinforced concrete abutments and piers. This bridge can be interpreted by the name and construction date incised on the concrete end posts.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C for being the longest metal bridge built post-war (1945) on the island of Maui in the historic study period prior to 1969. The use of steel was uncommon in Hawaii due to the extreme marine environment. It is a good example of a 1940's steel stringer bridge atypical of its period in its use of materials and design.

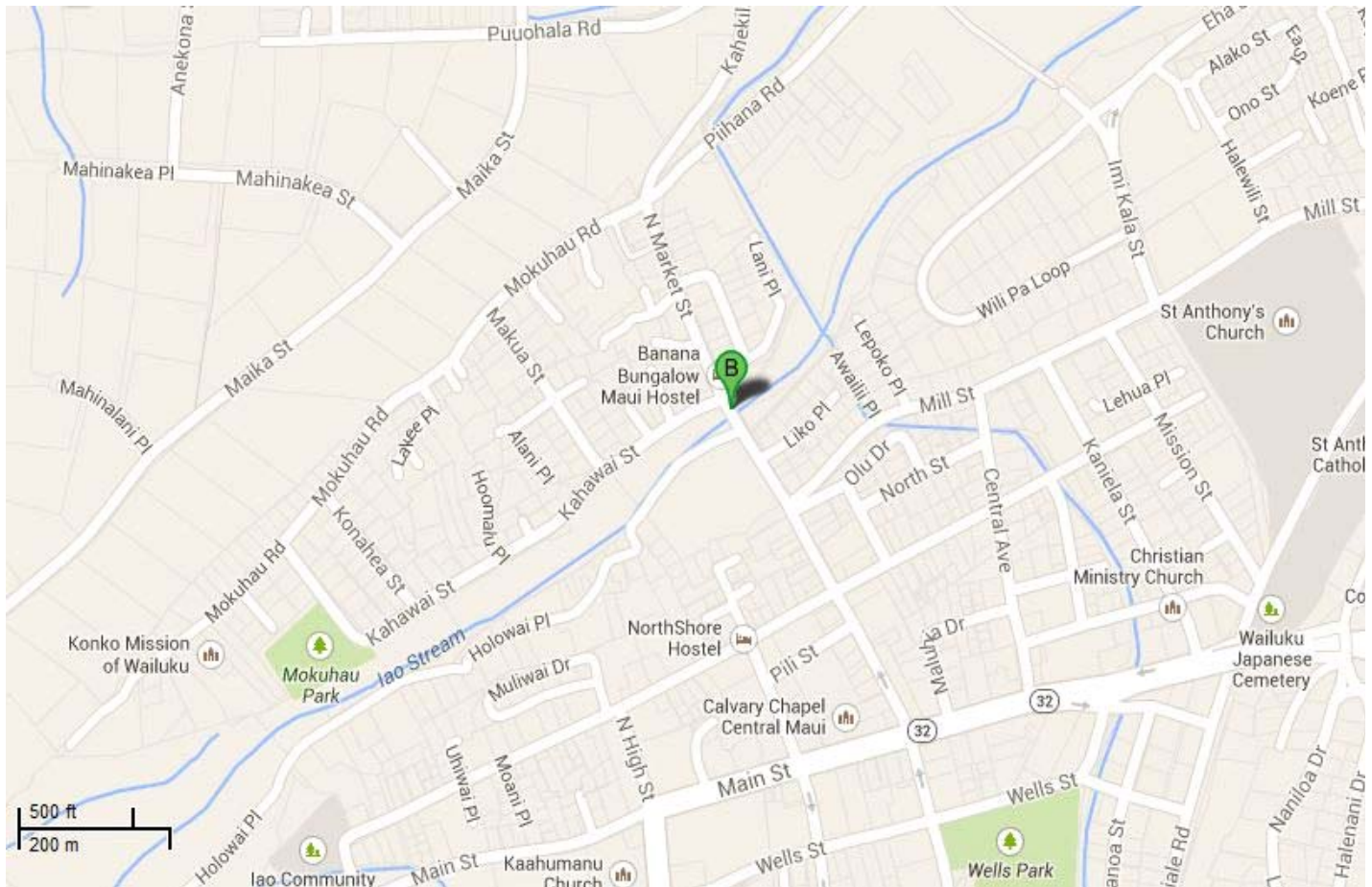
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009311301200001		
<b>Popular Name:</b> Iron Bridge No. 113		
<b>Feature Crossed:</b> Iao Stream		
<b>Feature Carried:</b> North Market Street		
<b>Milepost:</b>	<b>County Private:</b> Maui	
<b>Longitude:</b> 156d-30m-13.90s <b>Latitude:</b> 20d-53m-29.57s		
<b>Location:</b> Intersection with Kahawai Street		
<b>Historic Name:</b> Iron Bridge No. 113		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b>		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Steel Stringer	<b>Construction Date:</b> 1949	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 57.0 ft.	<b>Total Length:</b> 62.0 ft.	<b>Deck Width:</b> 37.9 ft.
<b>Superstructure:</b> Steel Multi-Girder			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Metal Horizontal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Iron Bridge #113 carries North Market Street across Iao Stream. This one span steel stringer bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has horizontal metal railings with concrete end caps. Attached to the approaches of the bridge are rubble masonry parapets that are a part of North Market Street. The concrete deck is supported by reinforced concrete abutments.</p>		




**Significance Statement:**

This bridge is eligible under Criterion C for being the longest metal span built post-war (1945) on the island of Maui in the historic study period prior to 1969. The use of steel was uncommon in Hawaii due to the extreme marine environment. It is a good example of a 1940's steel stringer bridge atypical of its period in its use of materials and design.

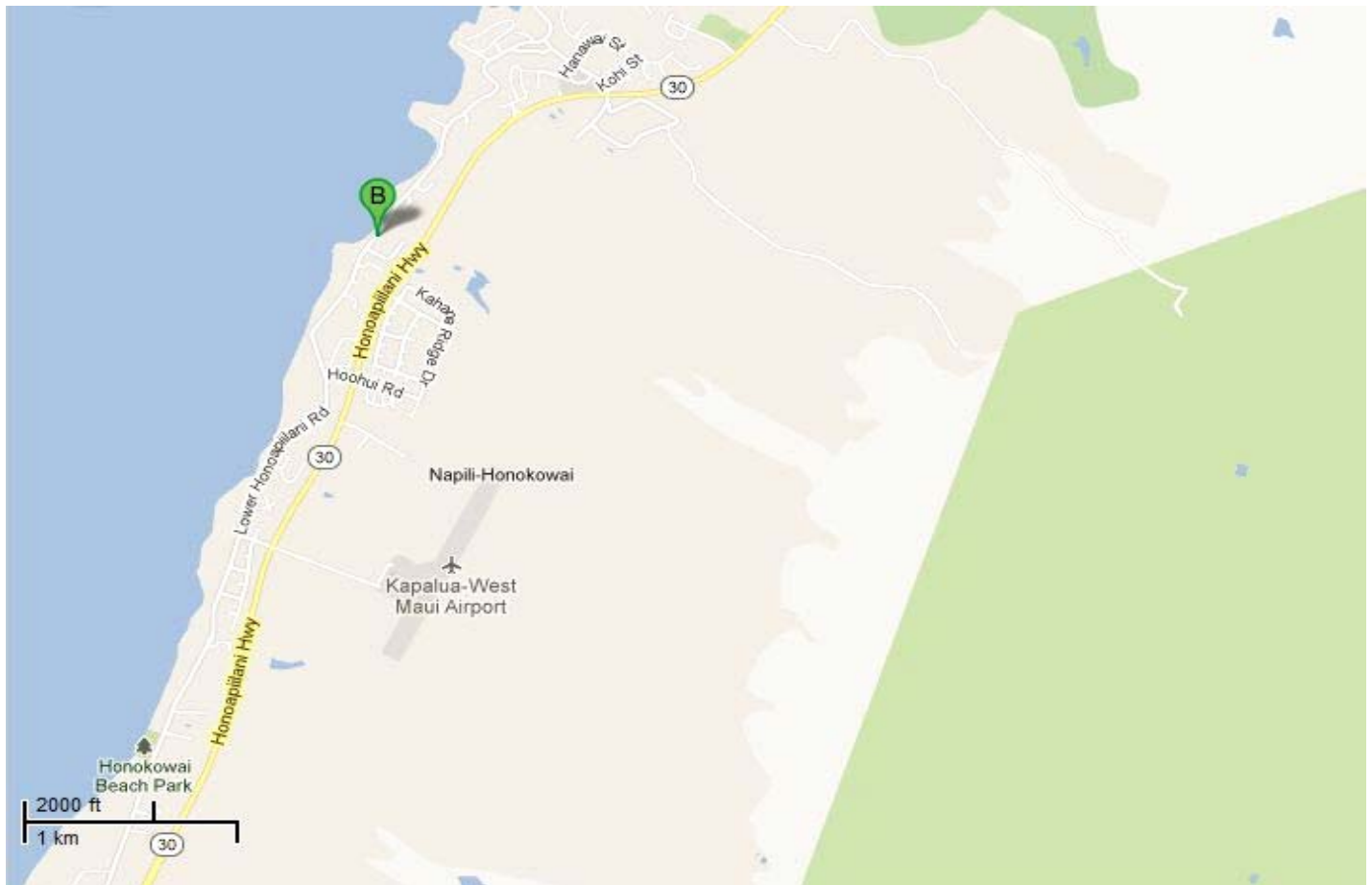
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009030801100003	
<b>Popular Name:</b> Kahana Nui No. 93	
<b>Feature Crossed:</b> Kahana Nui Stream	
<b>Feature Carried:</b> Lower Honoapiilani Road	
<b>Milepost:</b> <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-40m-36.39s <b>Latitude:</b> 20d-58m-37.98s	
<b>Location:</b> 0.40 Miles North of Hoohui Road	
<b>Historic Name:</b> Kahana Nui No. 93	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1964	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 26.0 ft.	<b>Total Length:</b> 29.0 ft.	<b>Deck Width:</b> 28.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Kahana Nui Stream Bridge carries Lower Honoapilani Road across Kahana-nui 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 panel parapets with flat caps. The concrete deck is supported by masonry rubble concrete abutments. The workmanship of the bridge has not been obscured by the addition or repair and the simple design of the parapet retains its historic feeling. This bridge is undergoing the consultation process in 2013 for scheduled replacement in 2014.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C as an exceptional type of 1960's concrete bridge construction in Hawaii. It is uncommon to use a solid parapet design with masonry rubble concrete abutments for bridges constructed in this period. This bridge is scheduled to be replaced in 2014.

# Inventory Form

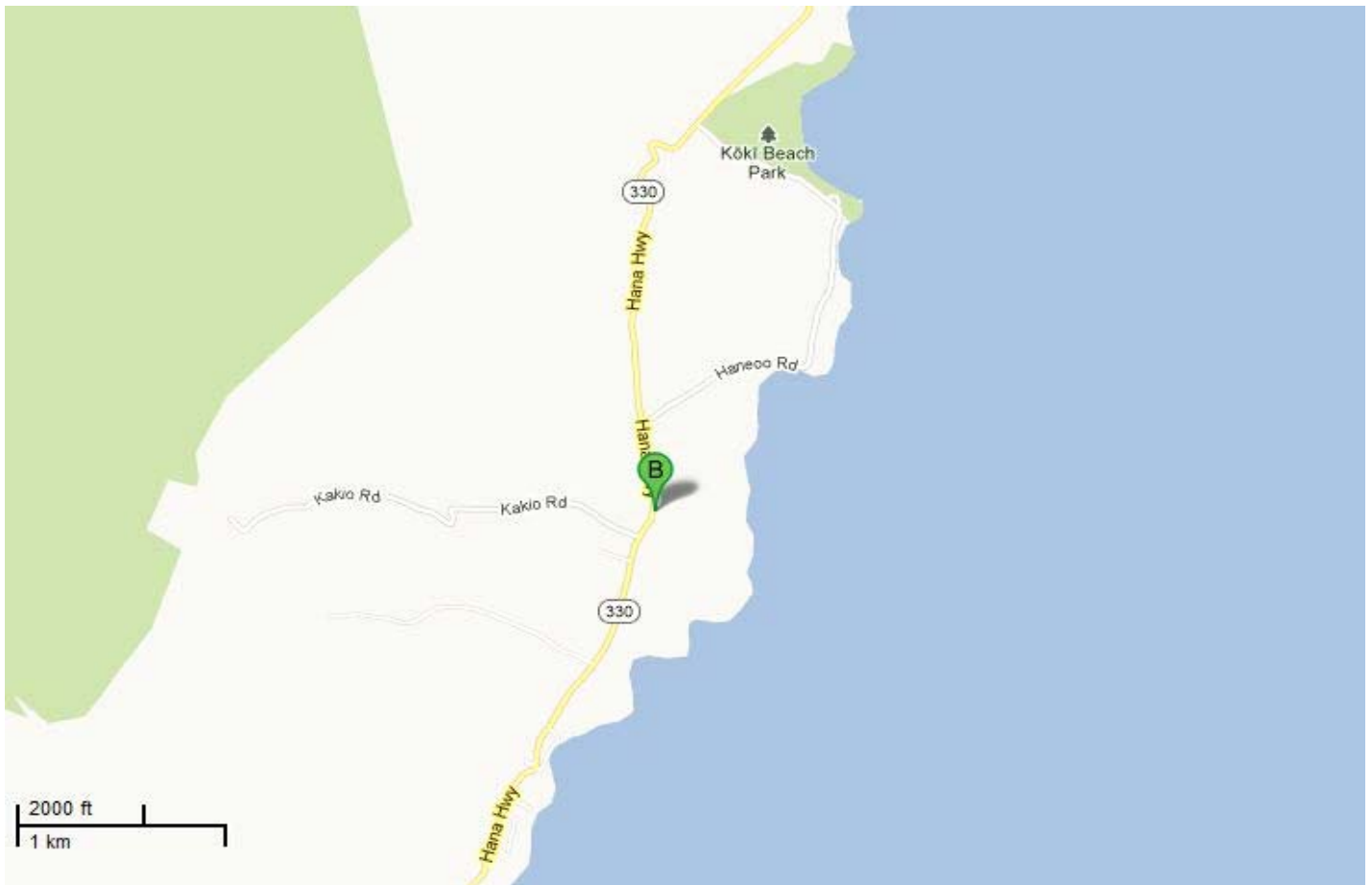
(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904864
<b>Popular Name:</b> Kahawaiokapia No. 30
<b>Feature Crossed:</b> Kapia Stream
<b>Feature Carried:</b> Hana Highway
<b>Milepost:</b> 48.64 mi. <b>County Private:</b> Maui
<b>Longitude:</b> 155d-59m-34.61s <b>Latitude:</b> 20d-42m-47.08s
<b>Location:</b> 0.29 Miles South of Haneoo Road (Road to Hamoa)
<b>Historic Name:</b> Kahawaiokapia No. 30
<b>Designer/Engineer:</b>
<b>Builder/Contractor:</b>



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1915	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 17.0 ft.	<b>Total Length:</b> 59.0 ft.	<b>Deck Width:</b> 15.8 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		




**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

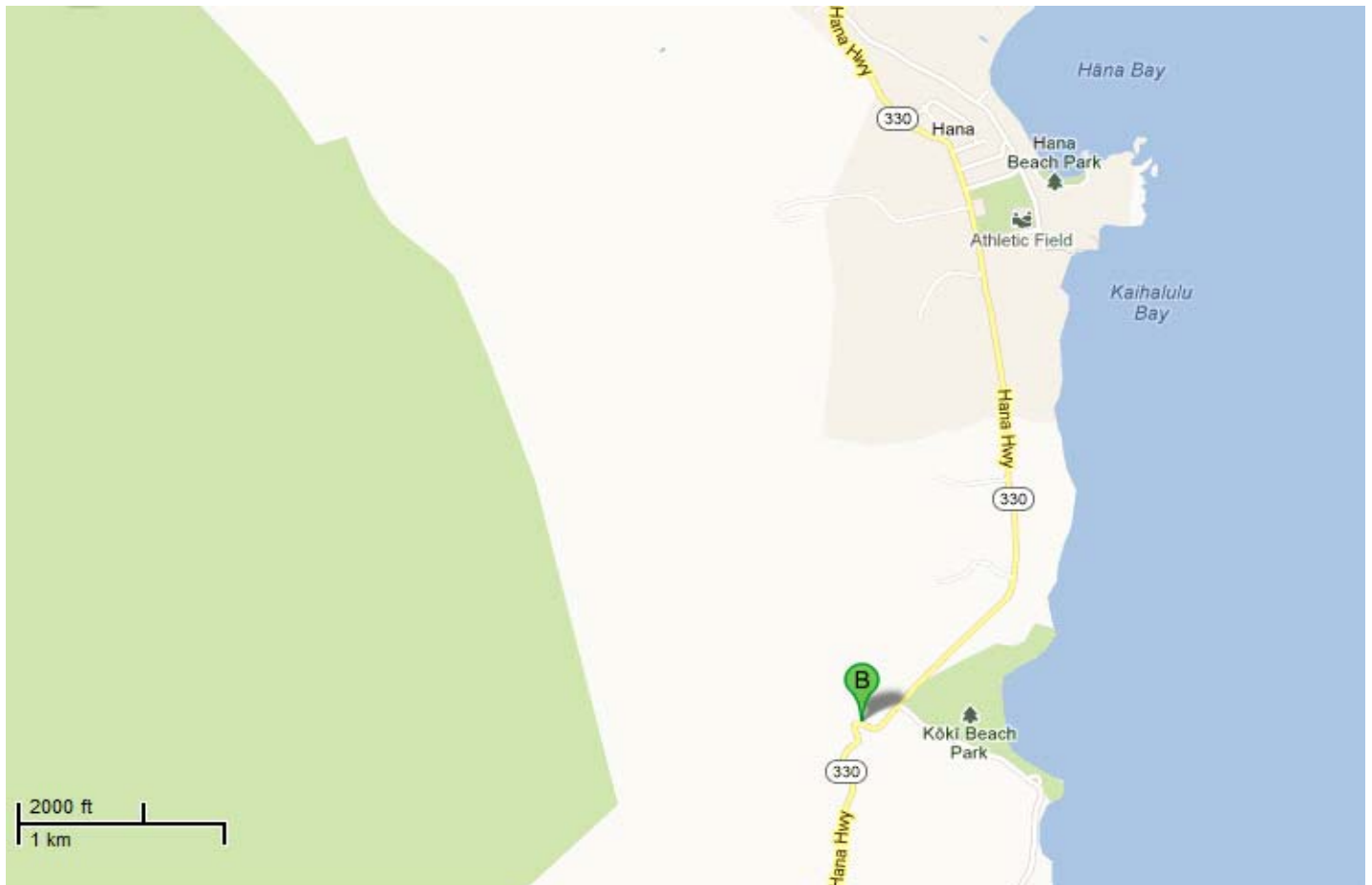
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904984	
<b>Popular Name:</b> Kaholopo No. 31	
<b>Feature Crossed:</b> Haneoo Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 49.84 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 155d-59m-34.44s <b>Latitude:</b> 20d-43m-48.42s	
<b>Location:</b> 0.91 Miles North of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Kaholopo No. 31	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1917	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 10.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 17.0 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment and Concrete Rubble Masonry Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Non-Contributing	<b>Criteria:</b> n/a	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> n/a		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		




**Significance Statement:**

This bridge is a non-contributing feature in the Hana Highway Historic Bridge. See National Register of Historic Places Nomination Form. This bridge is scheduled for replacement in 2013.

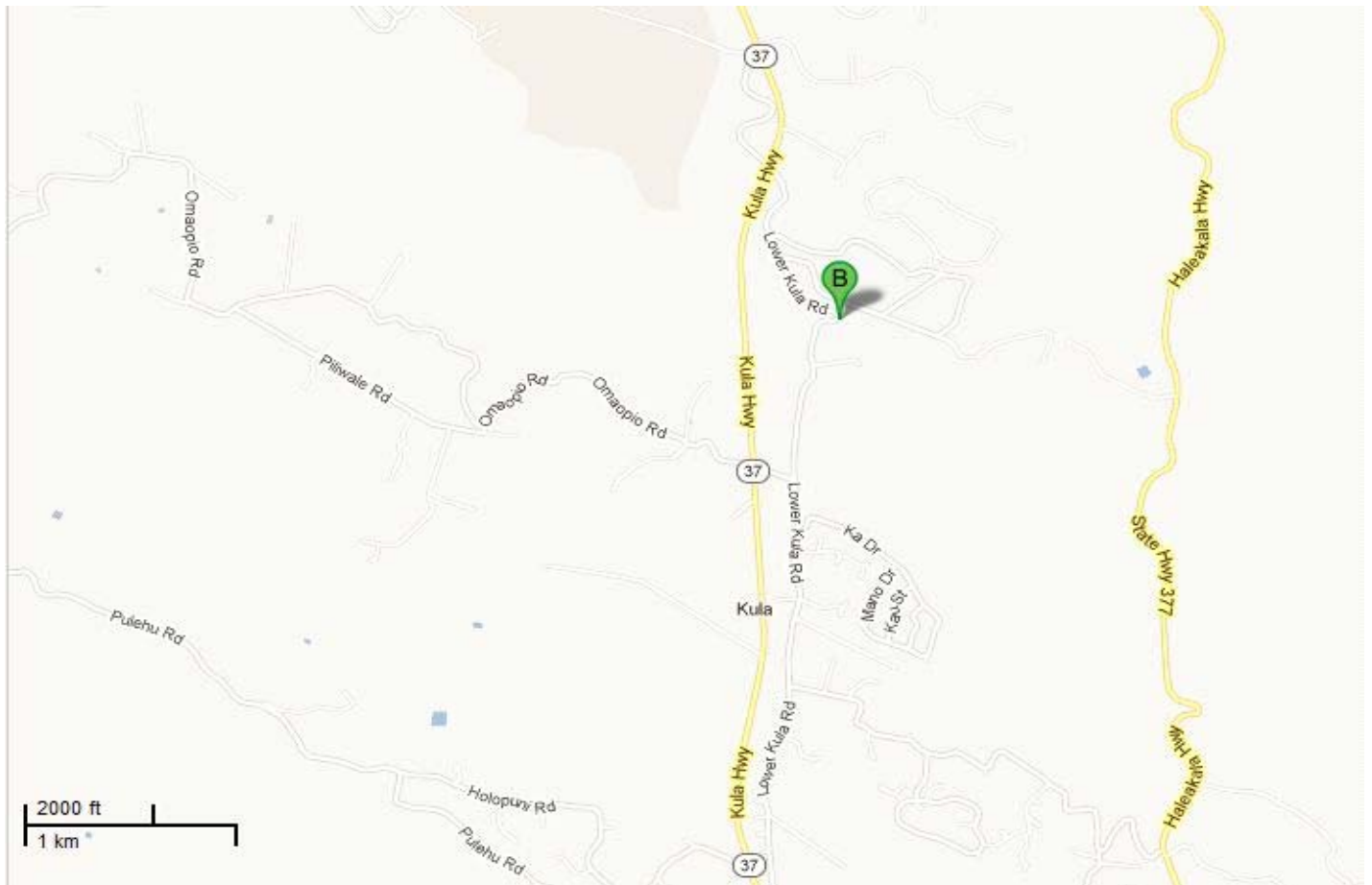
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009332001100001		
<b>Popular Name:</b> Kalialinui No. 2		
<b>Feature Crossed:</b> Kalialinui Gulch		
<b>Feature Carried:</b> Lower Kula Road		
<b>Milepost:</b>	<b>County Private:</b> Maui	
<b>Longitude:</b> 156d-19m-23.43s <b>Latitude:</b> 20d-48m-15.32s		
<b>Location:</b> 0.57 Miles North of Omaopio Road		
<b>Historic Name:</b> Kalialinui No. 2		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b>		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 11.0 ft.	<b>Total Length:</b> 38.0 ft.	<b>Deck Width:</b> 21.0 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment and Concrete Rubble Masonry Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Horizontal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Kalialinui #2 Bridge carries Lower Kula Road across Kalialinui Stream. This reinforced concrete bridge is in its original location, is in satisfactory condition, and its materials remain intact. The bridge has concrete open vertical parapets with flat caps and end posts. The concrete deck is supported by concrete rubble masonry piers and abutments. The concrete solid parapet was extended to the original parapets on the inner curve side and a thrie beam was added to the outer side of the curve.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C for Engineering as a good example of a reinforced concrete bridge with lava rock abutments, piers and wing walls, built in the 1910s. It is an excellent example of its period in its use of materials, method of construction, craftsmanship, design and artistry.

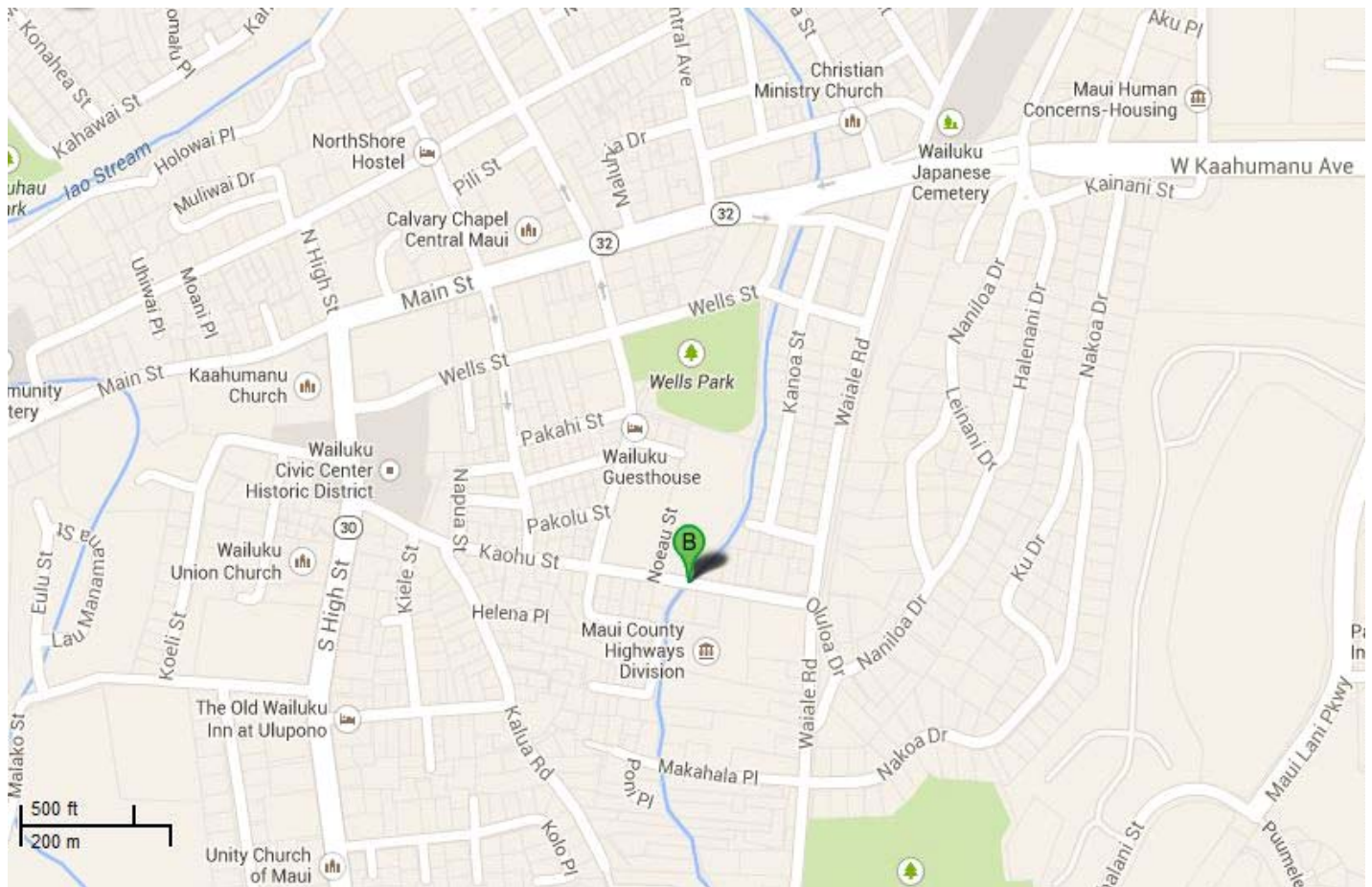
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009358001100001		
<b>Popular Name:</b> Kaohu No. 58		
<b>Feature Crossed:</b> Spreckelsville Ditch		
<b>Feature Carried:</b> Kaohu Street		
<b>Milepost:</b>	<b>County Private:</b> Maui	
<b>Longitude:</b> 156d-30m-01.12s	<b>Latitude:</b> 20d-53m-02.23s	
<b>Location:</b> 0.10 Miles West of Waiale Road		
<b>Historic Name:</b> Kaohu No. 58		
<b>Designer/Engineer:</b>		
<b>Builder/Contractor:</b>		

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Slab	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 21.0 ft.	<b>Total Length:</b> 24.0 ft.	<b>Deck Width:</b> 34.0 ft.
<b>Superstructure:</b> Concrete Slab			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Kaohu #58 bridge carries Kaohu Street across the Spreckelsville ditch. This reinforced concrete bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has concrete open vertical parapets with flat caps and end posts. The concrete deck is supported by concrete rubble masonry abutments. The concrete walkway was added to the upstream side and the bottom of the parapets were covered by the asphalt. However, the workmanship of the bridge has not been obscured. The simple design of the parapet retains its historic feeling.</p>		




**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 the 1910's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

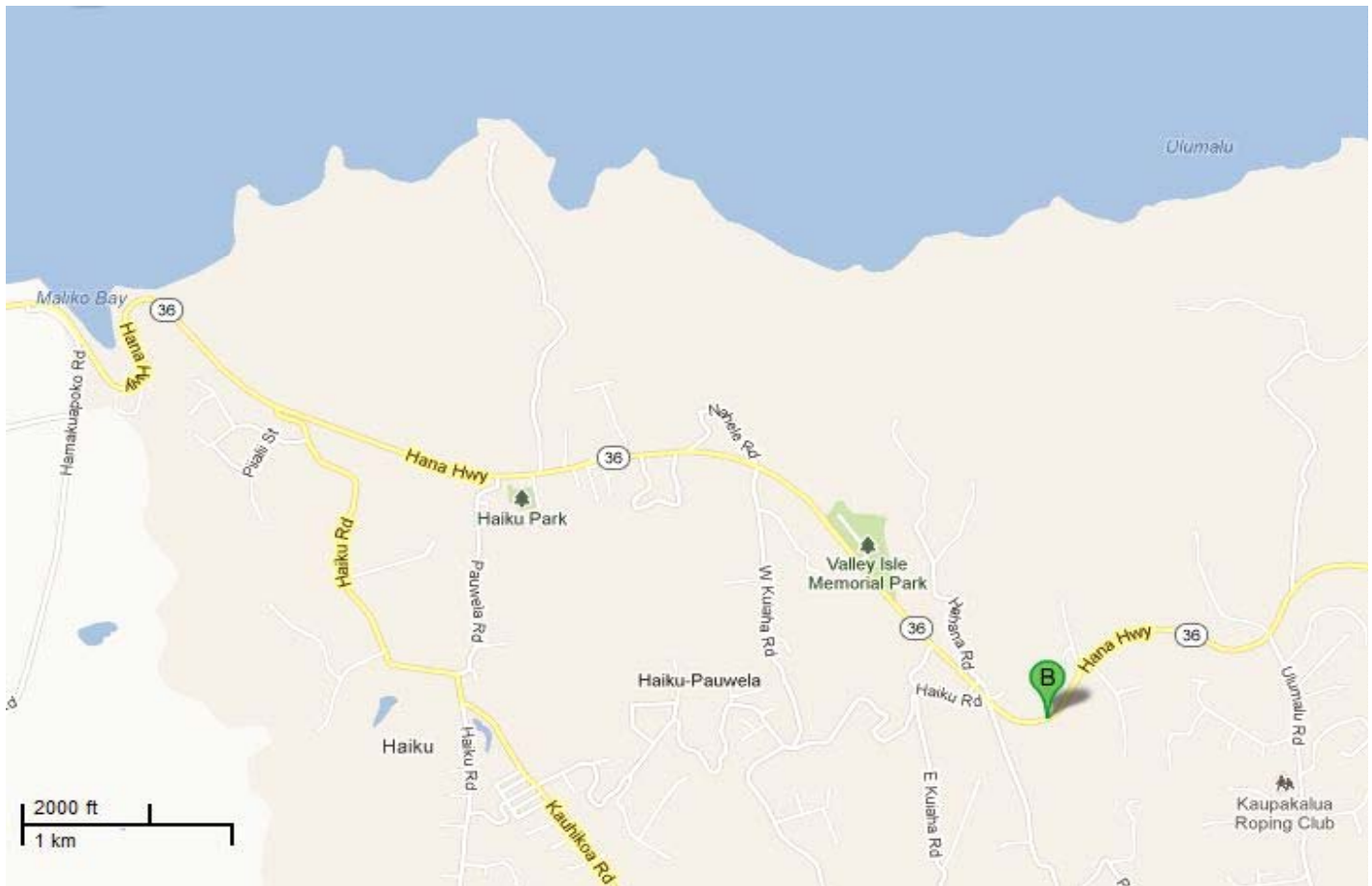
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009335001100001	
<b>Popular Name:</b> Kaupakalua No. 35	
<b>Feature Crossed:</b> Kaupakalua Stream	
<b>Feature Carried:</b> Peahi Road	
<b>Milepost:</b> <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-17m-45.35s <b>Latitude:</b> 20d-54m-36.79s	
<b>Location:</b> 0.70 Miles South of Haiku Road	
<b>Historic Name:</b> Kaupakalua No. 35	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Timber Stringer	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> Yes <b>Alteration Date(s):</b> 2004-2005		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> The bridge was rehabilitated in 2004-2005.		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 16.0 ft.	<b>Total Length:</b> 39.0 ft.	<b>Deck Width:</b> 19.5 ft.
<b>Superstructure:</b> Timber Stringer			
<b>Substructure:</b> Masonry Abutment and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Timber Deck			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> n/a	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> n/a		
<b>Narrative Description:</b> <p>The Kaupakalua Stream Bridge carries Peahi Road across Kaupakalua Stream. This timber stringer bridge is in its original location and is in satisfactory condition however, it is not fully intact. The original railings have been replaced with thrie beam railings. The timber deck is supported by concrete and timber piers and original rock wall abutments. From 2004 to 2005 the bridge was rehabilitated.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C for Engineering as an example of a timber stringer bridge with rock abutments and concrete and timber piers built in the 1910s. It is an example of its period in its use of materials, method of construction, craftsmanship, design and artistry.

# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904058	
<b>Popular Name:</b> Koukouai No. 16	
<b>Feature Crossed:</b> Koukouai Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 39.54 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-03m-37.08s <b>Latitude:</b> 20d-39m-03.78s	
<b>Location:</b> 8.35 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Koukouai No. 16	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Open Spandrel Arch	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 32.0 ft.	<b>Total Length:</b> 58.0 ft.	<b>Deck Width:</b> 16.6 ft.
<b>Superstructure:</b> Concrete Open Spandrel Arch			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

The Koukouai Gulch and Waikani Stream Bridges are open-spandrel arch deck bridges along Hana Highway. The Koukouai Gulch Bridge, a single semi-circular open-spandrel arch spanning thirty-two feet with a shallow rise, is located in the Kipahulu district. The spandrel wall utilizes arched spandrel columns of varying heights. Concrete arch bridges, with filled spandrels up to thirty-five or fifty feet, have been built in Hawaii since 1904. The Koukouai Bridge was constructed in 1911, the same year as the Mamalahoa-Honolii Bridge, an open spandrel bridge located north of Hilo on the island of Hawaii. These bridges are technologically sophisticated for their time and mark the evolution of concrete technology toward lighter, yet larger structures.

The Koukouai Gulch Bridge was the first open-spandrel arch bridge on the island. It is an excellent example of bridge construction in the early twentieth-century period in Hawaii. The design was technically innovative and the construction of the bridge was considered to be a major engineering feat. The road bridge played a major role in the development of the county's belt road plan which connected Hana with the rest of Maui by a paved highway and a series of bridges. The bridge is one of five built in 1910-1911 along the Hana Highway.

This open-spandrel arch bridge remains in its original location and retain its rural settings. The bridge's original design and materials remain intact, with the exception of minor concrete repairs to the parapets. Progressive repaving has obstructed from view the lower portion of the railing from the roadway. The bridge is obviously the work of skilled builders, such as Moses Akiona. Akiona was a prominent native Hawaiian contractor who was born in the Keanae district of Maui and later established the Moses Akiona Contracting Company in Honolulu. The bridge's historic associations with the rapid advances in engineering technology in the early decades of the twentieth century and as a representative example of public works efforts by the County of Maui, is readily apparent to travelers on the Hana Highway. The bridge retains its historic feeling due to its location, sharp approach, and narrow width.

This bridge contributes to the Hana Highway Historic Bridge District. This bridge contributes to the Hana Highway Historic Bridge District. Arch bridges are also an uncommon bridge type. See National Register of Historic Places Nomination Form. See National Register of Historic Places Nomination Form.

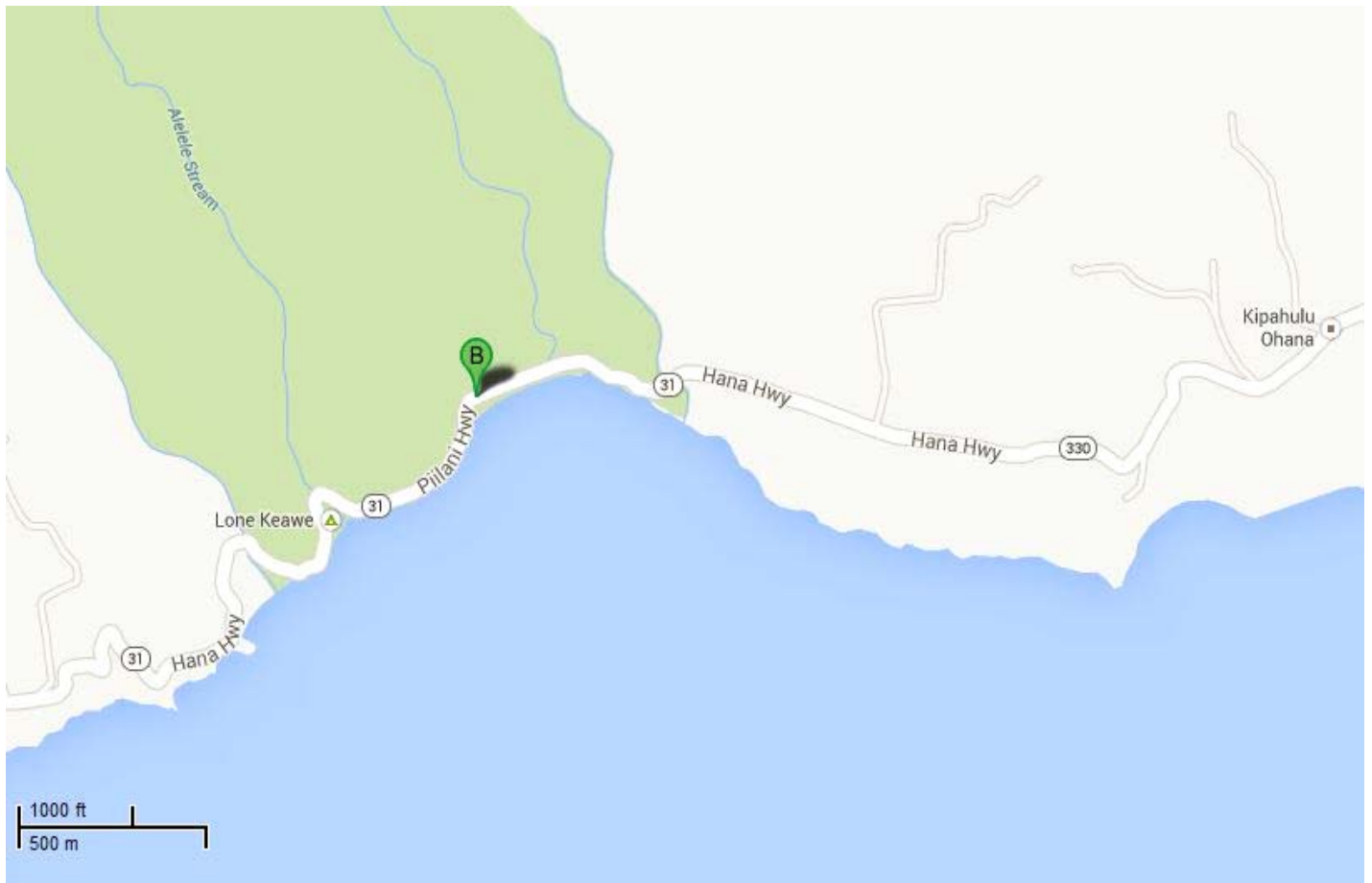
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600903922	
<b>Popular Name:</b> Lelekea No. 81	
<b>Feature Crossed:</b> Lelekea Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 39.22 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-04m-51.24s <b>Latitude:</b> 20d-39m-02.67s	
<b>Location:</b> 9.92 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Lelekea No. 81	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Metal Corrugated Culvert	<b>Construction Date:</b> 1947	<b>Replaced?</b> No
<b>Altered?</b> Yes <b>Alteration Date(s):</b> 1968		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> The bridge was rehabilitated in 1968.		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 12.0 ft.	<b>Total Length:</b> 42.0 ft.	<b>Deck Width:</b> 19.0 ft.
<b>Superstructure:</b>			
<b>Substructure:</b> Metal Corrugated Culvert			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> Metal Thrie Beam			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Eligible	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Lelekea Stream Structure #81 Bridge carries Hana Highway across the Lelekea Stream. This arched corrugated metal pipe design structure with reinforced concrete and concrete rubble masonry footings was reclassified from a culvert to a bridge. It is in its original location but in poor condition. The bridge has thrie beam railings, three round arched corrugated metal pipe cells, and concrete rubble masonry piers and dividing walls. The concrete deck is supported by concrete rubble masonry abutments. The structure was rehabilitated in 1968 from the rust and scaling due to the close proximity (100 feet) to the ocean.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C for its unique structure. The super structure has an arched corrugated metal pipe for main support with partial reinforced concrete and concrete rubble masonry footings. It is a unique example of a culvert that has been reclassified into a bridge.

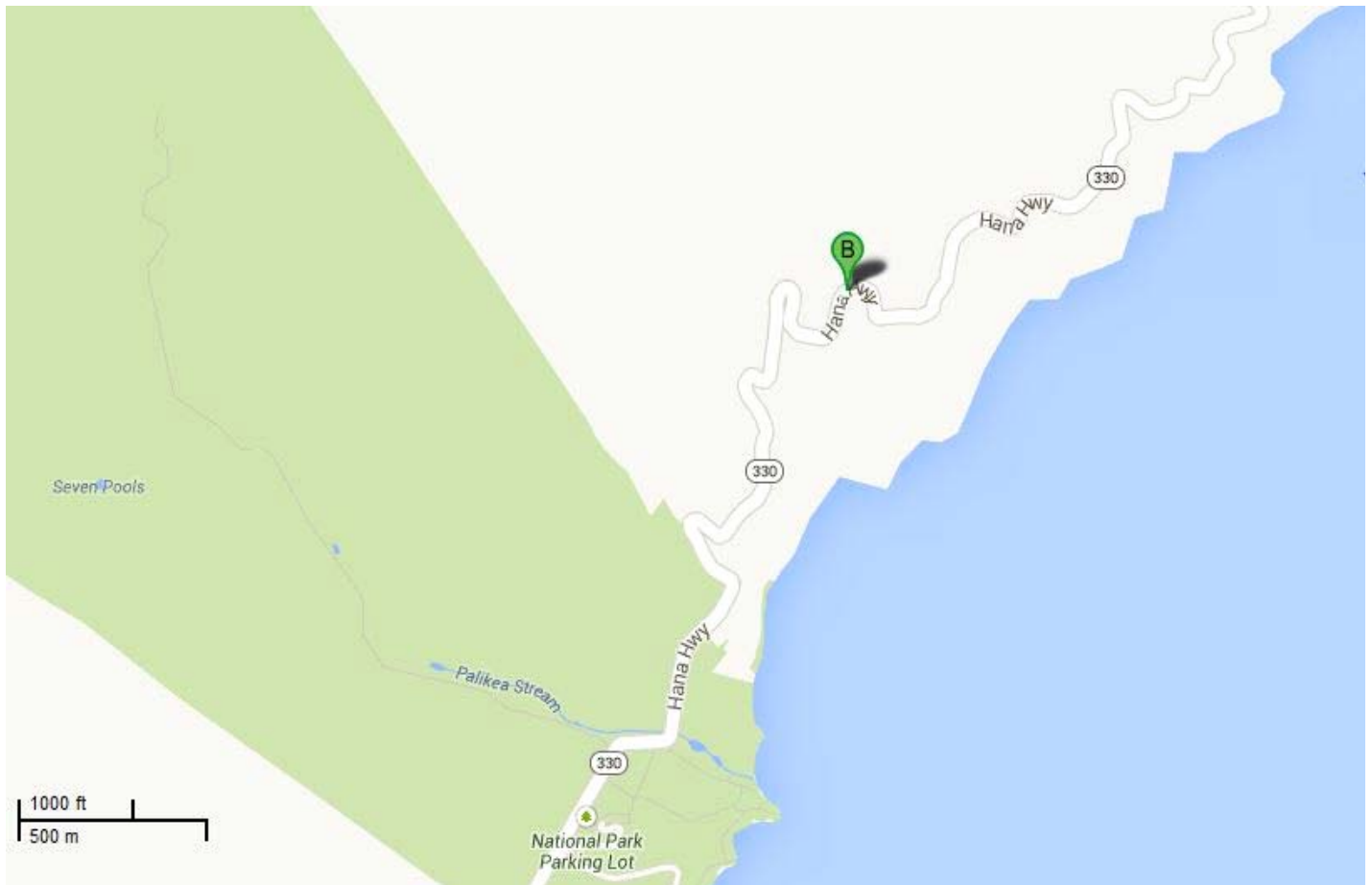
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904329	
<b>Popular Name:</b> Mahalawa No. 20	
<b>Feature Crossed:</b> Kakiweka Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 43.29 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-02m-20.04s <b>Latitude:</b> 20d-40m-26.90s	
<b>Location:</b> 5.64 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Mahalawa No. 20	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1910	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 29.0 ft.	<b>Total Length:</b> 31.0 ft.	<b>Deck Width:</b> 15.5 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		




**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

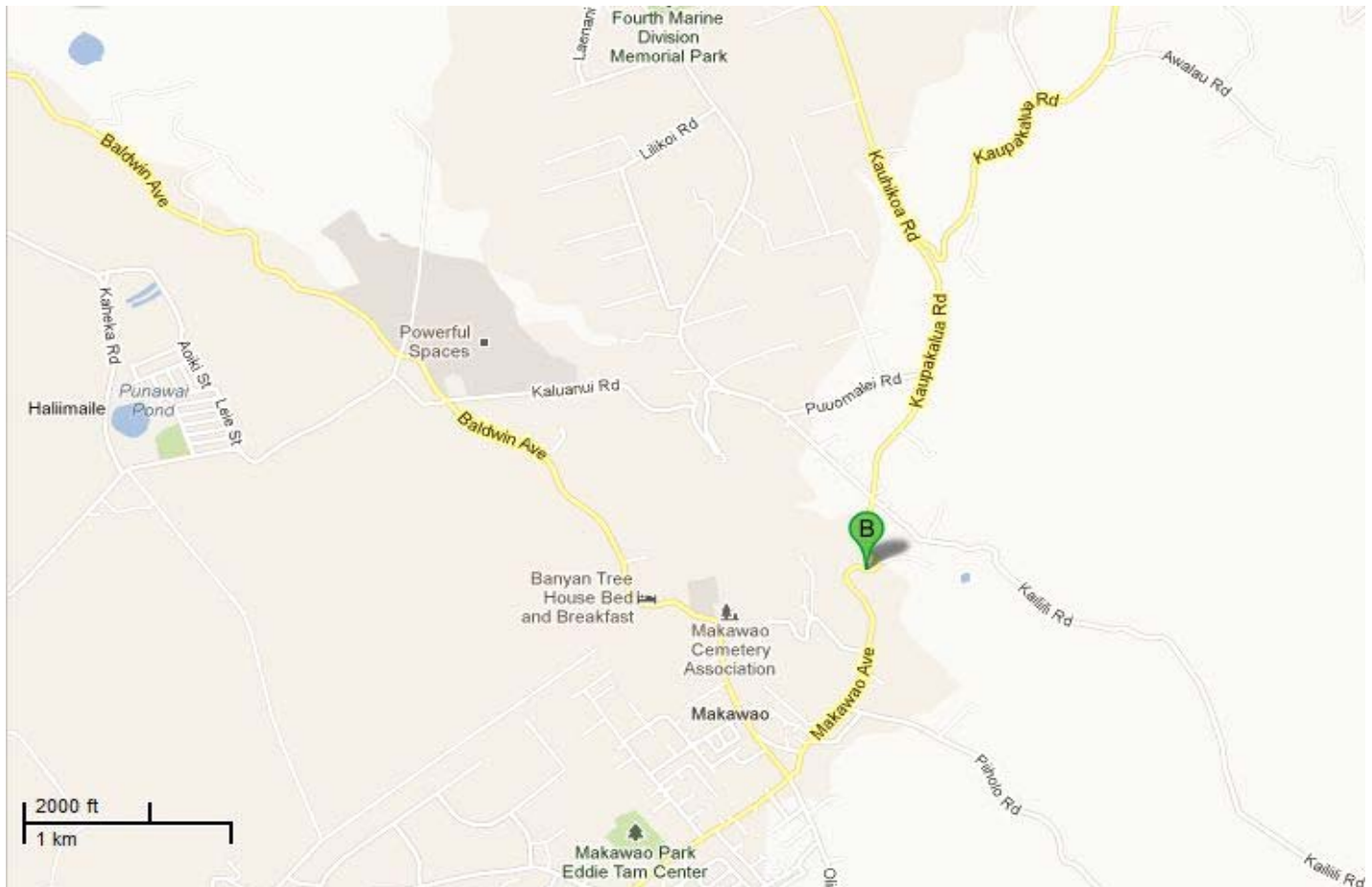
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003650700299	
<b>Popular Name:</b> Maliko No. 48	
<b>Feature Crossed:</b> Maliko Gulch	
<b>Feature Carried:</b> Makawao Avenue	
<b>Milepost:</b> 2.96 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-18m-22.09s <b>Latitude:</b> 20d-51m-49.65s	
<b>Location:</b> 0.21 Miles South of Kokomo Road	
<b>Historic Name:</b> Maliko No. 48	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Closed Spandrel Arch	<b>Construction Date:</b> 1945	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 36.0 ft.	<b>Total Length:</b> 38.0 ft.	<b>Deck Width:</b> 32.2 ft.
<b>Superstructure:</b> Concrete Closed Spandrel Arch			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Maliko Gulch Bridge #48 carries Makawao Ave. across the Maliko Gulch. This reinforced concrete closed spandrel arch bridge is in its original location, is generally in fair condition, and its materials remain intact. The bridge has concrete open vertical parapets with flat caps and end posts. The concrete deck is supported by concrete abutments. The concrete solid parapets were extended to the end posts to bolt the thrie beams however, the workmanship of the bridge has not been obscured. The simple design of the parapet retains its historic feeling.</p>		




**Significance Statement:**

This bridge is eligible under Criterion C for Engineering as a good example of a reinforced concrete closed spandrel arch bridge. Arch bridges are also an uncommon bridge type. It was built during World War II and features a parapet with closely set rectangular balusters. It is the only county bridge which was built during this period; most bridges were built before or after the war. The bridges built around this time have a flat slab deck and do not have significant features so it is rare to find an arched bridge from this period, especially with features such as the railing with rectangular balusters.

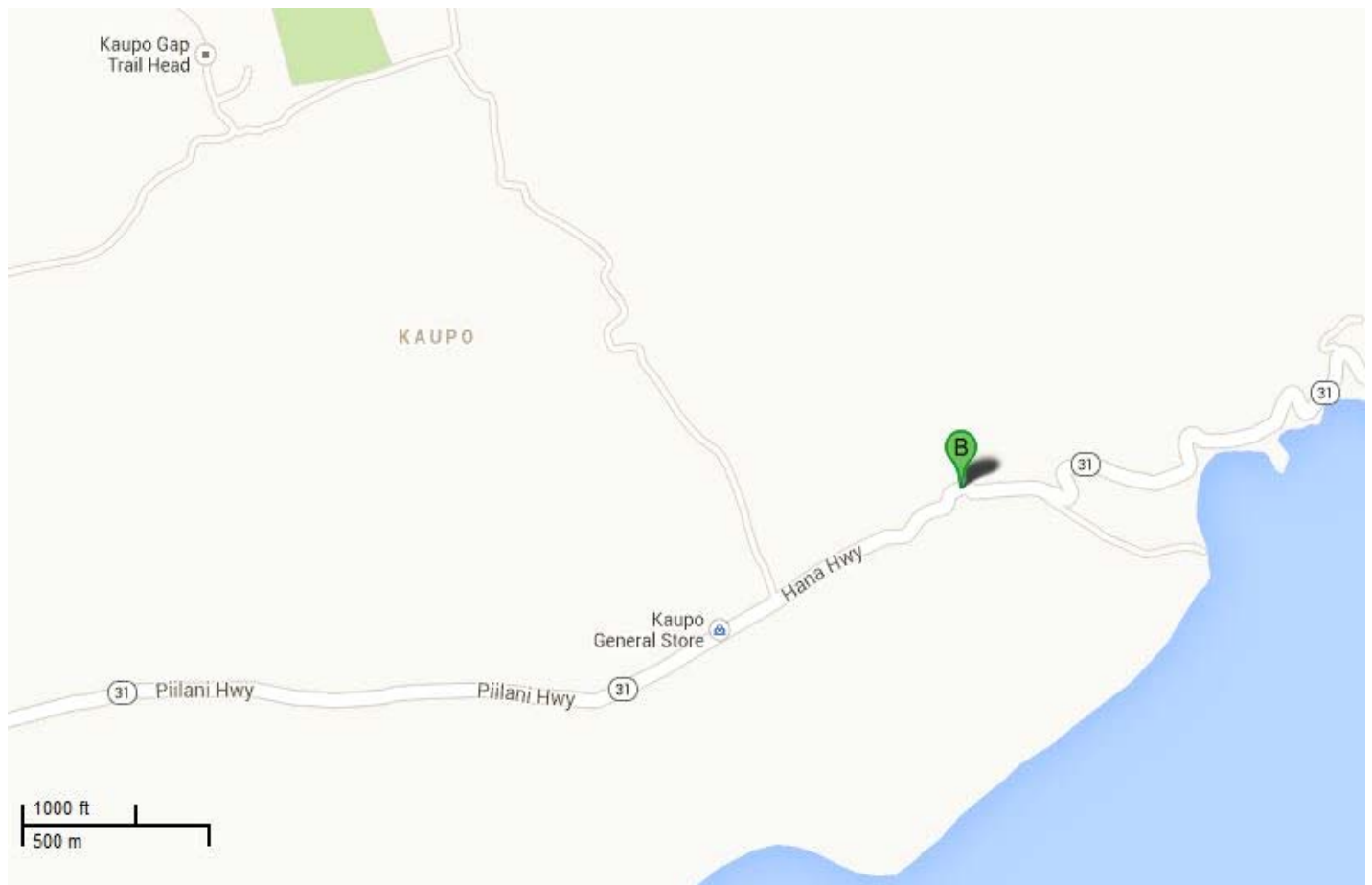
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009000310903514	
<b>Popular Name:</b> Manawainui No. 80	
<b>Feature Crossed:</b> Manawainui Stream	
<b>Feature Carried:</b> Piilani Highway	
<b>Milepost:</b> 35.14 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-07m-02.90s <b>Latitude:</b> 20d-38m-20.77s	
<b>Location:</b> 13.79 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Manawainui No. 80	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1947	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 3	<b>Max Span:</b> 40.0 ft.	<b>Total Length:</b> 111.0 ft.	<b>Deck Width:</b> 19.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Multi-Column Bent			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Horizontal			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Manawainui Bridge #80 carries Piilani Highway over Manawainui Stream. This three span concrete tee beam bridge is in its original location, is generally in good condition, and its materials remain intact. It has horizontal parapets with rectangular voids, intermittent posts, and end posts. The reinforced concrete deck is supported by reinforced concrete abutments and piers.</p>		



**Significance Statement:**

This bridge is eligible under Criterion C for its unique structure. The super structure has an arched corrugated metal pipe for main support with partial reinforced concrete and concrete rubble masonry footings. It is a unique example of a culvert that has been reclassified into a bridge.

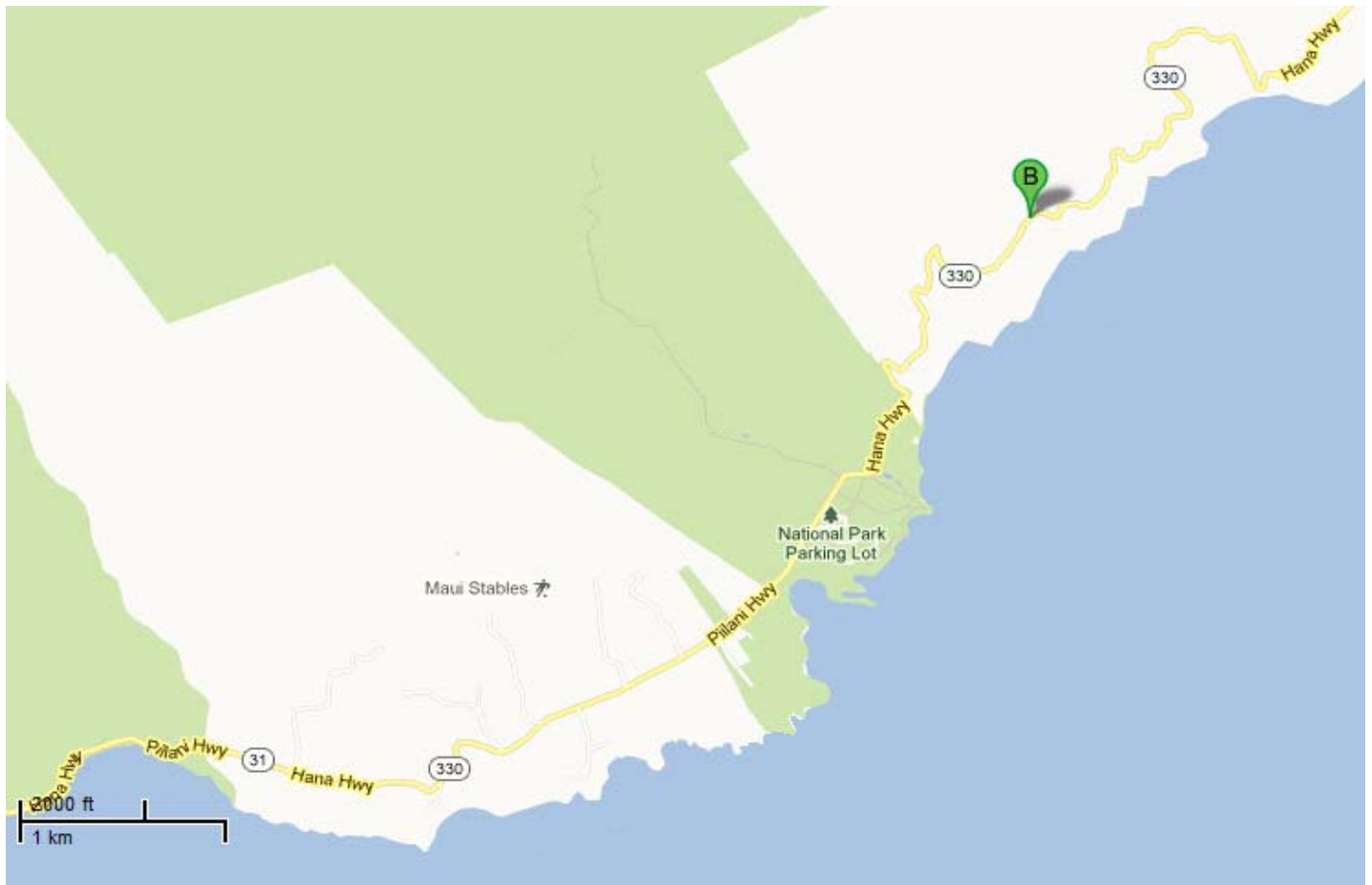
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904358	
<b>Popular Name:</b> Paehala No. 21	
<b>Feature Crossed:</b> Waiele Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 43.58 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-02m-09.85s <b>Latitude:</b> 20d-40m-31.08s	
<b>Location:</b> 5.35 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Paehala No. 21	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Masonry Arch	<b>Construction Date:</b> 1910	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 25.0 ft.	<b>Deck Width:</b> 13.7 ft.
<b>Superstructure:</b>			
<b>Substructure:</b> Masonry Arch Culvert			
<b>Floor/Decking:</b> AC Pavement			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

Hahalawe Stream Bridge and Waiele (Paehala Stream Bridge) are two of the nine remaining masonry arch bridges in the state and are located along the Hana ighway north of Haleakala National Park. These bridges, constructed by the county in 1910, are small, single-span circular masonry arch deck bridges with solid spandrels. Both bridges utilize cut basalt blocks for the abutments and arch ring; solid reinforced concrete was utilized for the parapets and rail caps. The dates "A.D. 1910" are inscribed on the outer parapet of each bridge. The masonry arches are typical of earlier structures constructed by the Kingdom or Republic of Hawaii (prior to 1898) and appear to date from an earlier period than the parapets. Arch bridges are also an uncommon bridge type.

The masonry arch bridges on the Hana Highway remain in their original locations and have retained their rural settings. The bridges retain their original design features and materials, although the concrete parapets appear to date from later period than the masonry arch. Generally, early masonry arch bridges were constructed by prisoners or day labor. Later masonry arch bridges were constructed by skilled masons. It is unknown who constructed Hana's masonry arch bridges. The bridges' historic associations with public works improvements of the early Territorial period and as rare survivors of this once common bridge type are apparent to the informed observer. The bridges retain their historic feeling due to their finely-detailed, and now uncommon materials.

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

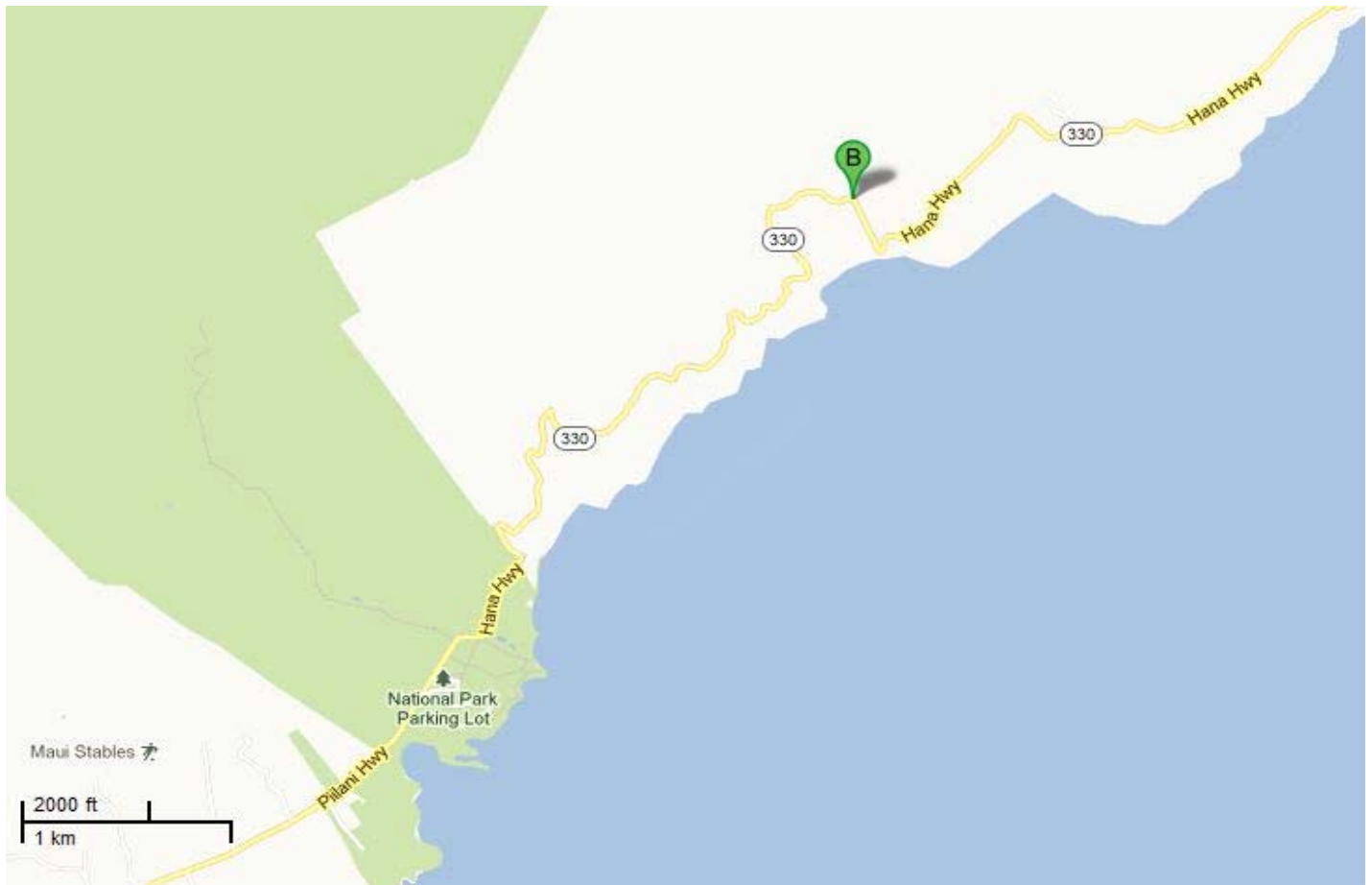
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904494	
<b>Popular Name:</b> Paihi No. 25	
<b>Feature Crossed:</b> Paihi Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 44.95 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-01m-34.84s <b>Latitude:</b> 20d-41m-00.86s	
<b>Location:</b> 3.99 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Paihi No. 25	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Girder	<b>Construction Date:</b> 2005	<b>Replaced?</b> Yes
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 36.0 ft.	<b>Total Length:</b> 42.0 ft.	<b>Deck Width:</b> 17.8 ft.
<b>Superstructure:</b> Concrete Through Girder			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Non-Contributing	<b>Criteria:</b> n/a	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> n/a		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form. This bridge has been completely replaced in 2005.		



**Significance Statement:**

This bridge is a non-contributing feature in the Hana Highway Historic Bridge District due to the complete replacement of the original 1911 bridge in 2005. See National Register of Historic Places Nomination Form.

# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904636	
<b>Popular Name:</b> Papahawahawa No. 28	
<b>Feature Crossed:</b> Papahawahawa Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 46.36 mi.	<b>County Private:</b> Maui
<b>Longitude:</b> 156d-00m-39.73s	<b>Latitude:</b> 20d-41m-13.50s
<b>Location:</b> 2.57 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Papahawahawa No. 28	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	



## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 2011	<b>Replaced?</b> Yes
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 22.0 ft.	<b>Total Length:</b> 41.0 ft.	<b>Deck Width:</b> 16.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Rubble Masonry Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Non-Contributing	<b>Criteria:</b> n/a	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> n/a		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form. This bridge has been completely replaced in 2011.		



**Significance Statement:**

This bridge is a non-contributing feature in the Hana Highway Historic Bridge District due to the complete replacement of the original 1915 bridge in 2011. See National Register of Historic Places Nomination Form.

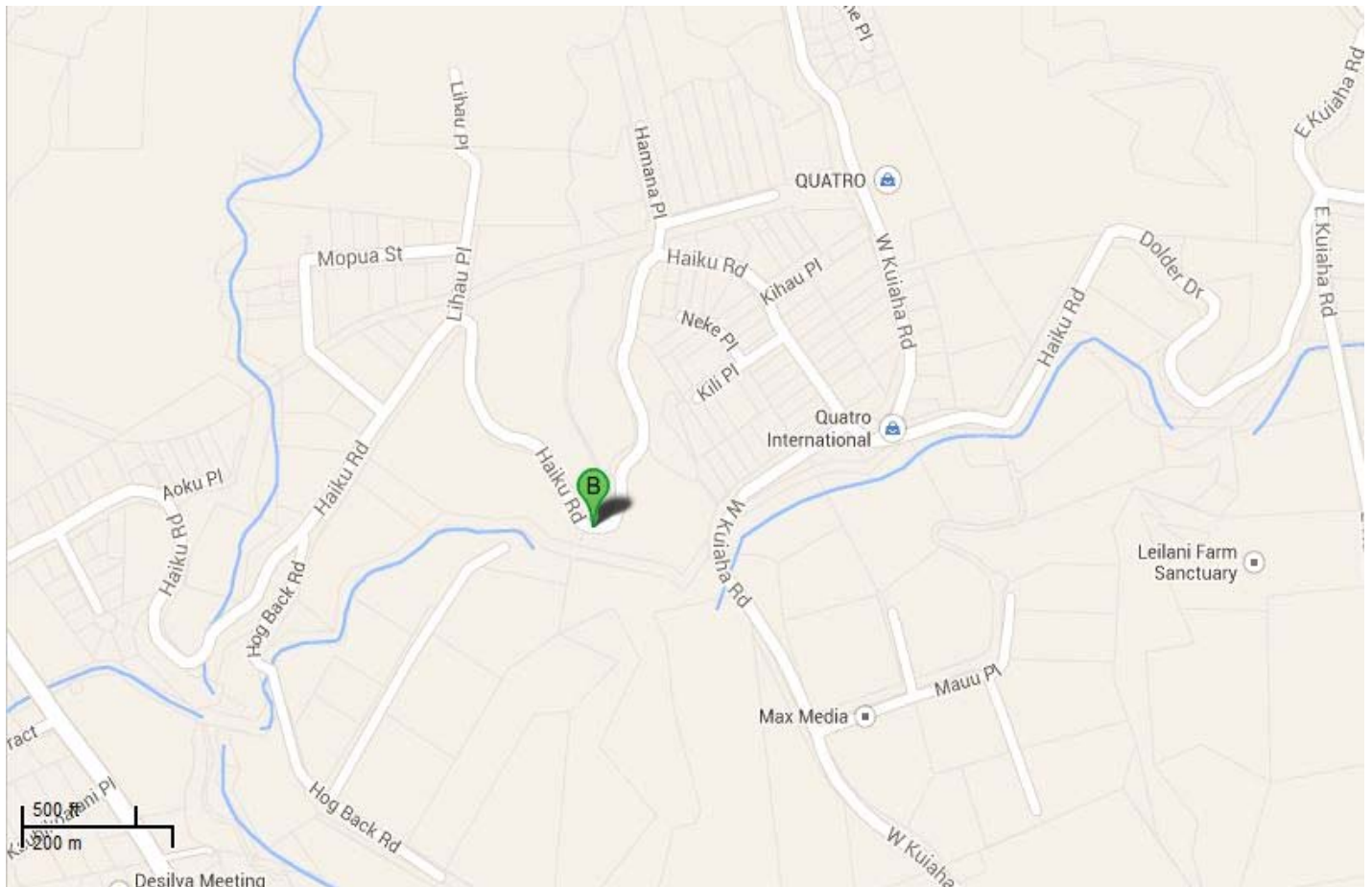
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009339001100001	
<b>Popular Name:</b> Pauwela No. 39	
<b>Feature Crossed:</b> Pauwela Gulch	
<b>Feature Carried:</b> Haiku Road	
<b>Milepost:</b> <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-18m-42.75s <b>Latitude:</b> 20d-54m-58.73s	
<b>Location:</b> 0.80 Miles East of Kauhikoa Road	
<b>Historic Name:</b> Pauwela No. 39	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 26.0 ft.	<b>Deck Width:</b> 18.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> C	<b>State/National Registered?</b> No
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering		
<b>Narrative Description:</b> <p>The Pauwela Stream Bridge carries Haiku Road across Pauwela Stream. This reinforced concrete tee beam bridge is in its original location, is generally in good condition, and its materials remain intact. The bridge has concrete open vertical parapets with flat caps. The concrete deck is supported by concrete rubble masonry abutments. The bottom of the parapets were covered by a heavy layer of asphalt and a thrie beam covers one side of the parapet. The other side of the parapet is visible and the simple design of the parapet retains its historic feeling.</p>		



**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 1900's reinforced concrete tee beam bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design.

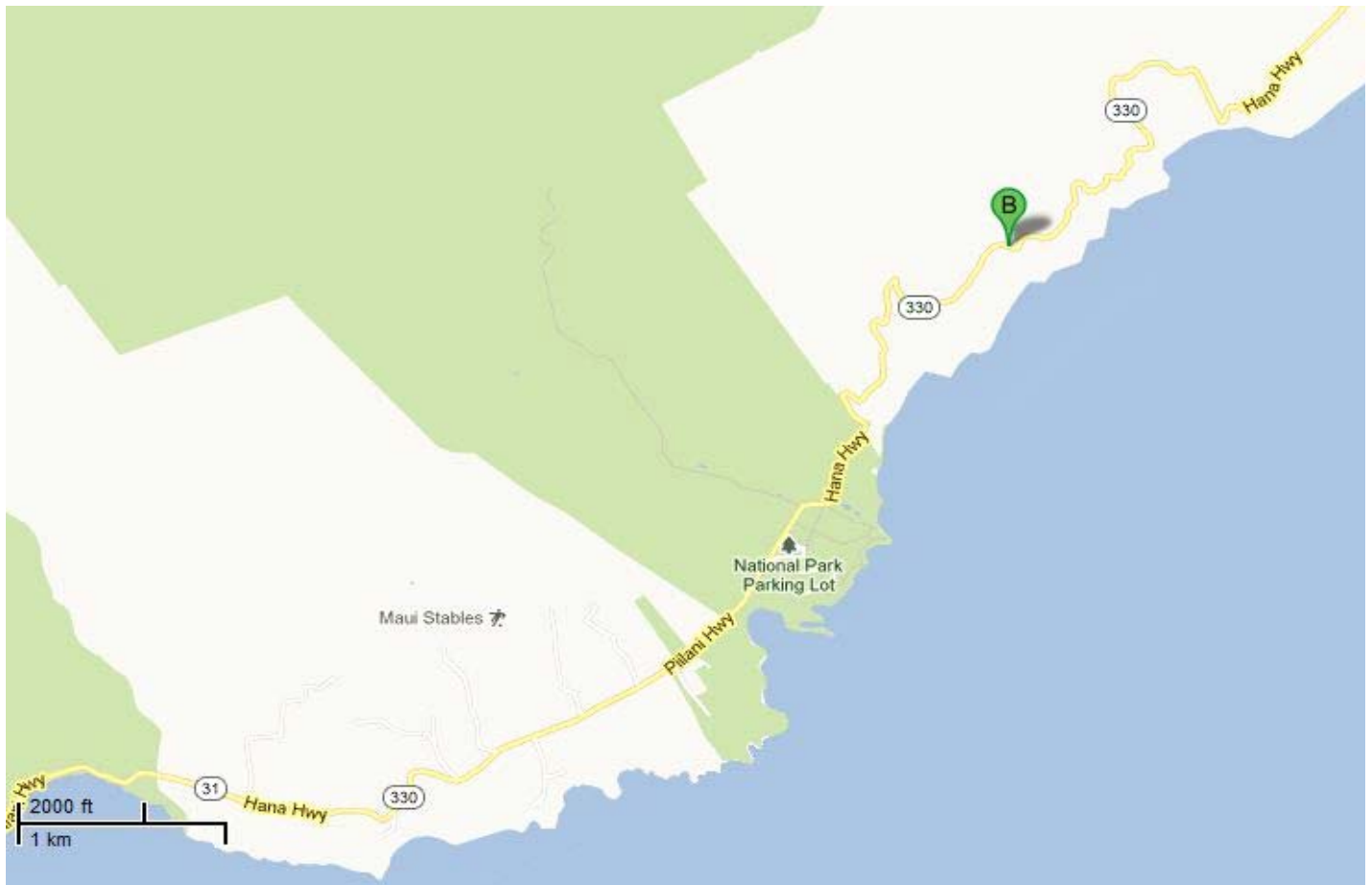
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904386	
<b>Popular Name:</b> Puuhaoa No. 22	
<b>Feature Crossed:</b> Unnamed Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 43.86 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-01m-57.96s <b>Latitude:</b> 20d-40m-34.75s	
<b>Location:</b> 5.07 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Puuhaoa No. 22	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1910	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 23.0 ft.	<b>Deck Width:</b> 16.3 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Decorative			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

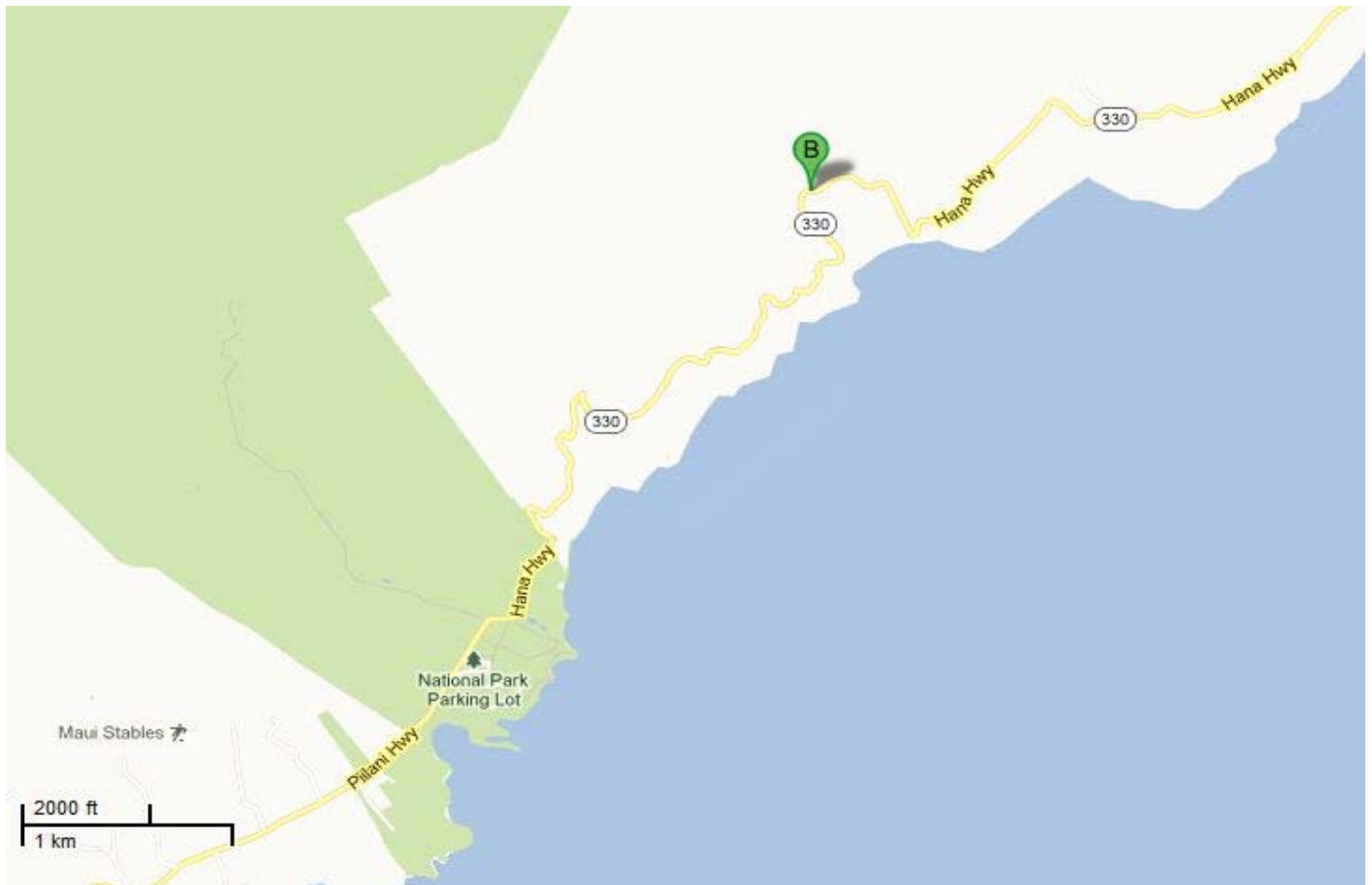
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904464	
<b>Popular Name:</b> South Wailua No. 23	
<b>Feature Crossed:</b> Honolewa Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 44.63 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-01m-48.94s <b>Latitude:</b> 20d-40m-59.31s	
<b>Location:</b> 4.29 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> South Wailua No. 23	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 26.0 ft.	<b>Total Length:</b> 57.0 ft.	<b>Deck Width:</b> 16.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall and Concrete Double Column Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

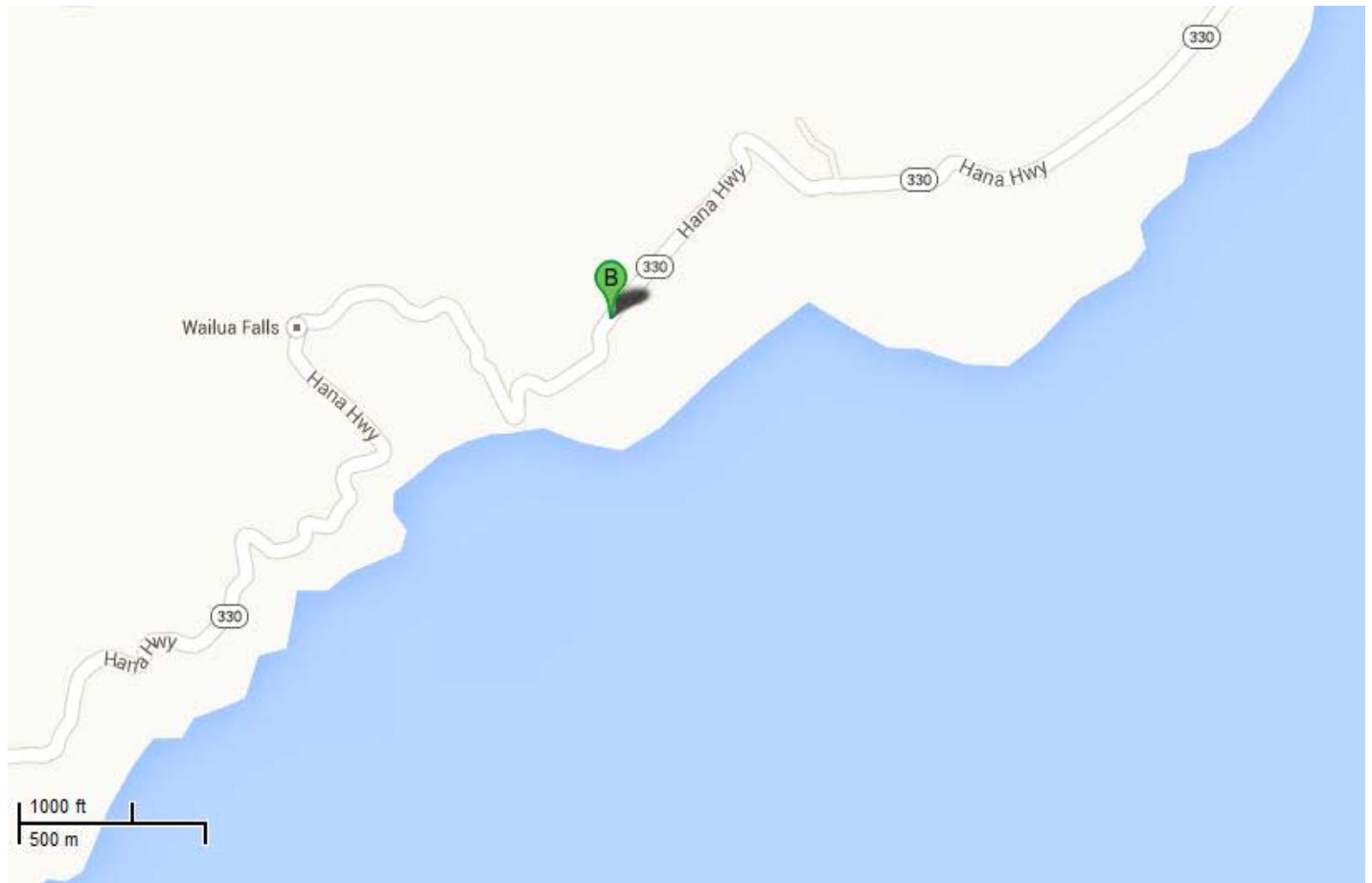
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904542	
<b>Popular Name:</b> Waikakoi No. 26	
<b>Feature Crossed:</b> Waikakoi Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 45.45 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-01m-20.97s <b>Latitude:</b> 20d-41m-00.97s	
<b>Location:</b> 3.51 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Waikakoi No. 26	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1911	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 2	<b>Max Span:</b> 14.0 ft.	<b>Total Length:</b> 33.0 ft.	<b>Deck Width:</b> 16.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment and Concrete Double Column Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Solid with Cap			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form.		



**Significance Statement:**

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

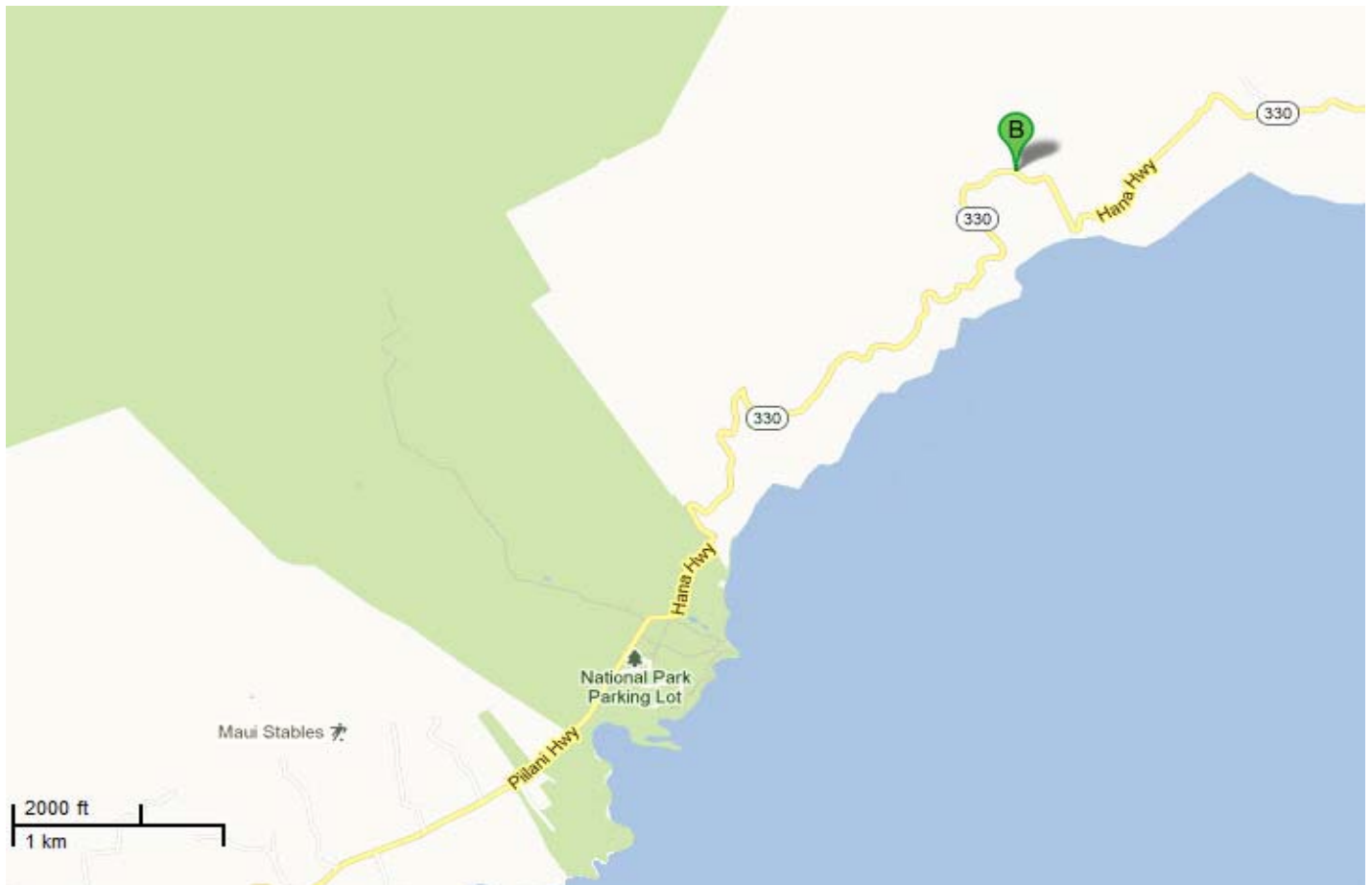
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904475	
<b>Popular Name:</b> Wailua No. 24	
<b>Feature Crossed:</b> Wailua Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 44.74 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 156d-01m-44.69s <b>Latitude:</b> 20d-41m-02.38s	
<b>Location:</b> 4.18 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Wailua No. 24	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1947	<b>Replaced?</b> No
<b>Altered?</b> Yes <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b> Metal guardrails		

## Bridge Information

<b>Number of Spans:</b> 1	<b>Max Span:</b> 60.0 ft.	<b>Total Length:</b> 66.0 ft.	<b>Deck Width:</b> 19.0 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Concrete Abutment Wall			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Horizontal			
<b>Setting:</b>			
<b>Other Features:</b> Name and date incised			

## Historic Association

<b>Eligibility Status:</b> High Preservation Value	<b>Criteria:</b> A, C	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> Engineering, Social History, Transportation, Commerce		
<b>Narrative Description:</b> <p>The Wailua Stream Bridge #24 was built in 1947 to replace a temporary wooden structure which carried the Hana Highway over the Wailua stream near Hana on Maui. The bridge remains in its original location and the setting is unchanged and extremely rural. The workmanship of the bridge is good but is slightly obscured by repairs with the later of addition of metal guardrails and concrete posts. The original concrete tee beam design and material remain intact. The decking is asphalt over concrete. This bridge feels extremely historic due to its remote location, surrounding vegetation, scale and design of the bridge. This bridge can be interpreted by the name and construction date incised on the end cap.</p> <p>See National Register of Historic Places Nomination Form.</p>		



**Significance Statement:**

This bridge was a Post-War Public Works Project undertaken by the Postwar Planning Division of the Department of Public Works. Because ample materials and equipment, held by the Army and navy were available in the Territory of Hawaii for several years, every effort was made to obtain the required materials and equipment for local public works projects. The public works projects were carefully planned not only to tie in with private employment but to provide employment when necessary.(1)

Each county was tasked with proposing public works projects including reasons for project, sketches, estimated cost and estimated man hours required. These were submitted to the Department of Postwar Planning to be compiled into a statewide report and priority list.(2)

The 1947 Wailua Bridge was proposed as an important project during the Postwar Planning era in order to replace the temporary wooden structure which was erected after the initial concrete bridge was washed away.

This bridge contributes to the Hana Highway Historic Bridge District. See National Register of Historic Places Nomination Form.

(1) Postwar Planning Construction Projects, 1944.

(2) Postwar Planning Construction Projects, 1944.

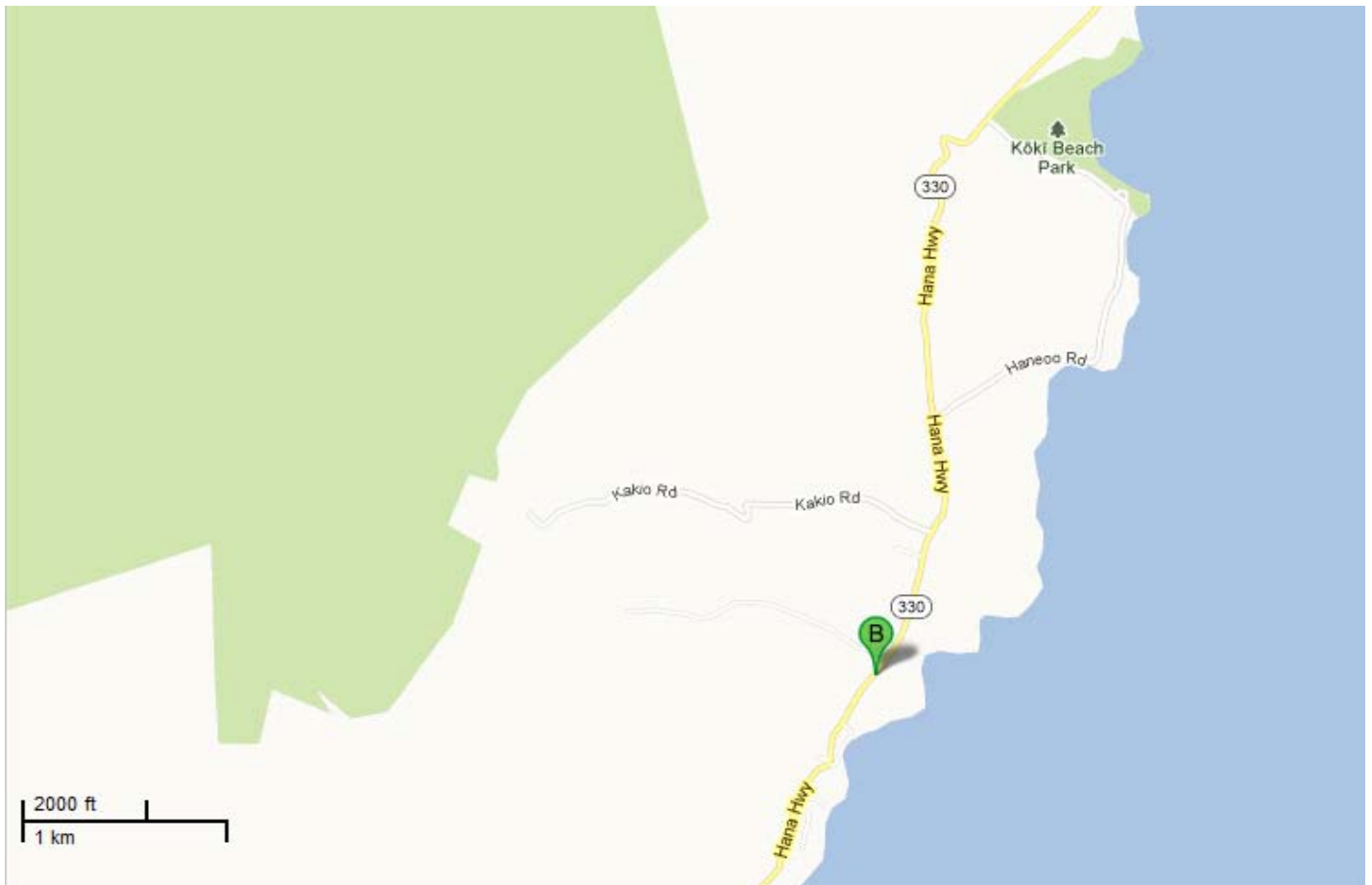
# Inventory Form

(County/Private)

## General Information

<b>Bridge Number:</b> 009003600904803	
<b>Popular Name:</b> Waiohonu No. 29	
<b>Feature Crossed:</b> Waiohonu Stream	
<b>Feature Carried:</b> Hana Highway	
<b>Milepost:</b> 48.03 mi. <b>County Private:</b> Maui	
<b>Longitude:</b> 155d-59m-47.01s <b>Latitude:</b> 20d-42m-19.20s	
<b>Location:</b> 0.90 Miles South of Haneoo Road (Road to Hamoa)	
<b>Historic Name:</b> Waiohonu No. 29	
<b>Designer/Engineer:</b>	
<b>Builder/Contractor:</b>	

## Location Map:



## Construction Information

<b>Bridge Type:</b> Concrete Tee Beam	<b>Construction Date:</b> 1915	<b>Replaced?</b> No
<b>Altered?</b> No <b>Alteration Date(s):</b>		
<b>Alteration Type(s):</b>		
<b>Alteration Description(s):</b>		

## Bridge Information

<b>Number of Spans:</b> 5	<b>Max Span:</b> 20.0 ft.	<b>Total Length:</b> 97.0 ft.	<b>Deck Width:</b> 16.7 ft.
<b>Superstructure:</b> Concrete Tee Beam			
<b>Substructure:</b> Masonry Abutment and Concrete Wall Pier			
<b>Floor/Decking:</b> Concrete Deck with AC Overlay			
<b>Parapets/Railings:</b> Concrete Open Vertical			
<b>Setting:</b>			
<b>Other Features:</b>			

## Historic Association

<b>Eligibility Status:</b> Non-Contributing	<b>Criteria:</b> n/a	<b>State/National Registered?</b> Yes
<b>Current Function:</b> Bridge	<b>Historic Function:</b> Bridge	
<b>Area of Significance:</b> n/a		
<b>Narrative Description:</b> See National Register of Historic Places Nomination Form. This bridge has been scheduled for replacement in 2013.		



**Significance Statement:**

The bridge is a non-contributing feature in the Hana Highway Historic Bridge District due for replacement in 2013. See National Register of Historic Places Nomination Form.