



HAWAII STATE HISTORIC PRESERVATION DIVISION  
HISTORIC RESOURCE INVENTORY FORM – Reconnaissance Level

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**GENERAL INFORMATION**

Common / Present Name: Franklin D. Roosevelt Bridge

Historic Name: Kipapa Bridge

Address: Kamehameha Highway (Rt. 99) at Kipapa Gulch

City/ Town/ Location: Mililani

County: Honolulu

TMK [(X)-X-X-XXX:XXX]: between (1)-9-4-005:052 on north and (1)-9-4-005:079 on south

Subdivision/Neighborhood: [Click here to enter text.](#)

Latitude: 21d-25m-37.25s

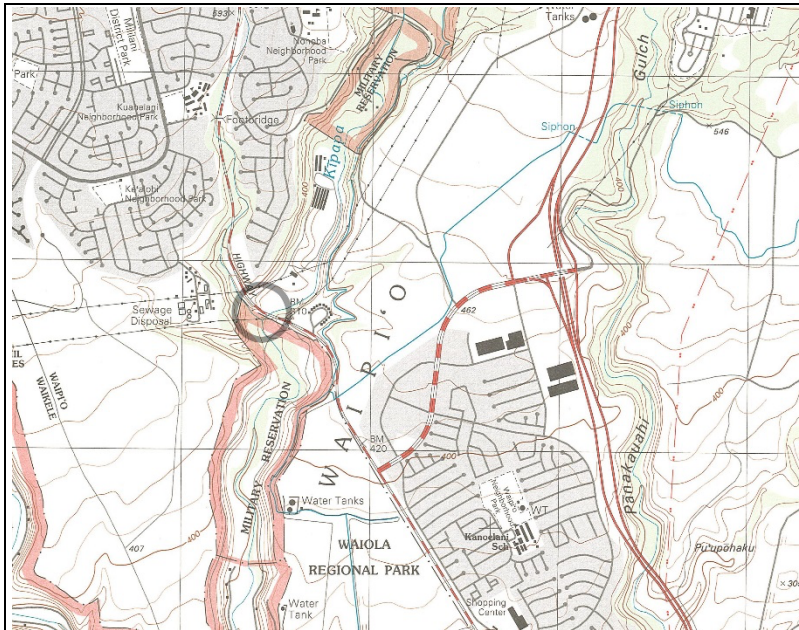
Longitude: 158d-00m-41.20s

Original Use: Vehicular bridge

Current Use: Vehicular bridge

Architect/ Builder (if known): William R. Bartels, designer.  
Hawaiian Contracting Co., builder.

Date of Construction (if known): 1933



**LOCATION MAP**

Prepared By: Dee Ruzicka

Consulting Firm: Mason Architects, Inc.



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Address: 119 Merchant St. Suite 501 Honolulu, HI 96813  
Telephone Number: 808-536-0556 Email: dr@masonarch.com Date: 08OCT2014

**CONDITION ASSESSMENT**

Category (select all that apply):

- Building(s)
  - Residential
  - Commercial
  - Educational
  - Public/Civic
  - Religious
- Structure(s)
- Object(s)
- Site(s)/Landscape(s)
- Archaeology or potential for archaeology

Describe: \_\_\_\_\_

Alterations (additions, etc.) if known: In late 1971 repairs were carried out that included reconstructing short sections of concrete guardrail, cleaning existing drain holes and drilling 10 new drain holes through the bridge deck, clearing silt and repairing washouts at the south end of the bridge, repairing surface cracks at the south abutment, and surface cracks and spalls in the underside curtain wall near the south abutment. In 1991 the roadway was resurfaced. At an unknown date, three metal light poles were added to stanchions on the south side of the bridge. These light poles have a brushed metal finish with arms that extend the light out over the traffic lanes and are less than 50 years old. One was added at each end of the south parapet and one was added near the middle of the bridge.



Original Location, if moved: \_\_\_\_\_

Reason for move (if known): \_\_\_\_\_

Condition:

- Excellent
- Good
- Fair
- Deteriorated

Condition Explanation: Some spalling of concrete at parapets

Eligibility (select all that apply):

- National Register of Historic Places
- State Register of Historic Places
- Not Eligible
- Eligible



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- Listed
- Contributing to Historic District:
- Name of District:
- Unknown

Criteria of Significance (select all that apply)

A: Associated with Events

Event: Territorial public works project, Federally funded during the Depression era. Economic development of central Oahu.

B: Associated with Significant Person(s)  
Person(s): \_\_\_\_\_

C: Distinctive characteristics of a type, period or method of construction; work of a master; possess high artistic values (Architecture, Engineering, Design)

D: Have yielded or may be likely to yield information important to history or prehistory. Explain: \_\_\_\_\_



**DESCRIPTION**

Materials (please check those materials that are visible):

Height

- Stories: \_\_\_\_\_
- Below Ground
- N/A
- Other: 70' high bridge

Exterior Walls (siding):

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Aluminum Siding        | <input type="checkbox"/> Log                  | <input type="checkbox"/> Vinyl Siding      |
| <input type="checkbox"/> Asbestos               | <input type="checkbox"/> Metal                | <input type="checkbox"/> Engineered Siding |
| <input type="checkbox"/> Brick                  | <input type="checkbox"/> Shingles-Asphalt     | <input type="checkbox"/> Plywood           |
| <input type="checkbox"/> Ceramic                | <input type="checkbox"/> Shingles-Wood        | <input type="checkbox"/> OSB               |
| <input checked="" type="checkbox"/> Concrete    | <input type="checkbox"/> Stone                | <input type="checkbox"/> Fiberboard        |
| <input type="checkbox"/> Horizontal Wood Siding | <input type="checkbox"/> Stucco               | <input type="checkbox"/> Fiber Cement      |
|   | <input type="checkbox"/> Vertical Wood Siding | <input type="checkbox"/> Other: _____      |

Roof:

- |   |                                   |  |
|---|-----------------------------------|--|
| <input type="checkbox"/> Asphalt, shingle | <input type="checkbox"/> Metal    | <input type="checkbox"/> Ceramic Tile    |
| <input type="checkbox"/> Asphalt, roll    | <input type="checkbox"/> Slate    | <input type="checkbox"/> Wood Shingle    |
| <input type="checkbox"/> Other: _____     | <input type="checkbox"/> Built Up | <input checked="" type="checkbox"/> None |

Foundation:

- |   |   |                                       |
|---|---|---------------------------------------|
| <input type="checkbox"/> Brick          | <input type="checkbox"/> None – on earth            | <input type="checkbox"/> Stone        |
| <input type="checkbox"/> Concrete Block | <input checked="" type="checkbox"/> Poured Concrete | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Concrete Slab  | <input type="checkbox"/> Raised/Pile                |                                       |

Structural Support:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Baled Hay      | <input checked="" type="checkbox"/> Concrete Framed | <input type="checkbox"/> Frame-wood        |
| <input type="checkbox"/> Concrete Block | <input type="checkbox"/> Concrete Poured            | <input type="checkbox"/> Frame-metal/steel |



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- Brick-load bearing
- Stone-load bearing

- Puddled Clay
- Rammed Earth

- Sod
- Other: \_\_\_\_\_

Windows:

- Double Hung Sash
- Single Hung Sash
- Casement
- Fixed
- Stained Glass

- Replacement
  - Aluminum
  - Vinyl
- Jalousie
- Ribbon

- Glass Block
- None/Unknown
- Other: \_\_\_\_\_

Lanai(s)

- Arcade
- Balcony
- Porte-Cochere
- Recessed

- Stoop
- Portico
- Verandah
- Wrap-around

- None
- Other: \_\_\_\_\_

Chimney

- Brick
- Concrete
- Stuccoed Masonry

- Stone
- Stove Pipe
- Siding

- None
- Other: \_\_\_\_\_



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**Narrative Description**

Narrative Description.

The Franklin D. Roosevelt [Kipapa] Bridge is a 483' long reinforced concrete tee beam bridge that carries the two traffic lanes of Kamehameha Highway (Route 99) over Kipapa Gulch on Oahu. The roadway of the bridge is about 70' above Kipapa Stream, which has a natural channel upstream and downstream of the bridge. The end stanchions of the bridge are larger and more ornate than is typical for Oahu bridges. The tiered, vertically oriented form with central pylon gives the end stanchions an Art-Deco feeling.

The immediate setting of the bridge is rural. Vegetation covers the sides of the gulch and the edges of the highway along both approaches. The gulch floor on the north (upstream) side, has a concentration of light industrial buildings or a base yard. No buildings are visible from the south (downstream) side of the bridge. Both approaches have been cut into the earth to improve the grade. Along the south approach, a driveway about 500' southeast of the bridge leads to a small cluster of buildings set back from the highway. On the north approach, a driveway adjacent to the end stanchion leads to the base yard and buildings below the bridge on the upstream side.

The four end stanchions of the Kipapa Bridge are rendered in a restrained Art-Deco Style. Each is about 7' tall and rectangular in plan. The 7' high central pylon portion of each end stanchion is 3'-3" long and 2'-3" deep and is set on a 3'-11" high base that is longer (7') but thinner (1'-9") than the pylon. The upper edges of both the central pylon and the base are stepped and chamfered and are capped with a low slope hip. The central pylon has a 2'-3" wide x 1'-2" high recessed panel with either "KIPAPA" or "1933" inscribed in 3" high letters. Above this panel each pylon has a decoration of three vertically oriented rectangular projections. The center segment is 1'-1" high x 3" wide and projects 3". It is flanked by two, 9" high x 2" wide segments that project about 2". Each central pylon and its base are both set on a plinth with a chamfered top edge that is about 9" high and is continued laterally to form the base of the parapet.

The concrete parapet of the Kipapa Bridge has arched openings that are common to Oahu bridges of the 1930s. The 1'-2" high x 6" wide, arched openings are set in the center section of the parapet between the approximate 9" high base and the 9" high x 6" thick top rail. Along the length of the parapet, 3'-2" long stanchions are located at the bents. These stanchions are thicker (1'-9") than the top rail and are slightly taller (about 3"). The stanchions have a low-slope hipped cap and a recessed panel (no inscription) facing the traffic lanes.

The asphalt-surfaced roadway of the bridge is 30' wide between the concrete parapets, two 12' wide traffic lanes and a 3' wide shoulder at each side. At the northwest end, the bridge has a gentle curve of an approximate 800' radius that begins about 150' from that end.

The 16 spans of the bridge are typically 30' long with transverse bents of 4' high concrete beams supported on tapering concrete columns. The two columns of each bent are joined about 31' below the bridge deck by a transverse beam. About 180' from the east end, the typical 30' span is interrupted by spans of 42' and 24' that



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allow for three diagonal bents above Kipapa Stream. These diagonal bents have struts that rise diagonally to the centerline of the bridge from the tapering columns at the point of the transverse beam (31' below the deck). The change in span of these two bents and the accompanying diagonal bents allow the bent columns to straddle the stream instead of having to place columns in the stream. The bridge has concrete abutments and short (6' or less) concrete wingwalls that rest on concrete rubble masonry footings.

Kipapa Bridge is bridge number 003000990301447 in the National Bridge Inventory database. It was last inspected on November 7, 2013 by the State of Hawaii, Department of Transportation, Highways Division.

#### Nearby Resources

During the field inspection of Kamehameha Highway for a distance of approximately ½ mile on either side of the Kipapa Bridge, the following four features were noted.

Feature: Lava rock masonry entry pylons. Location: East side of Kamehameha Highway about ½ mile south of Kipapa Bridge. Description and evaluation: This pair of pylons appear to flank an abandoned driveway entry. They are constructed of lava rock masonry with concrete mortar in a y-shaped plan about 12' long and about 7' high. About 50' separates the pair. A metal post with a ring to secure a gate is imbedded in concrete at the midpoint between them and near the corner of each pylon. Each pylon has a suspended lighting fixture aimed to illuminate the front (Kamehameha Highway-facing) surface. These pylons are provisionally evaluated as not eligible for the Hawaii or National Register of Historic places due to their appearance of being less than 50 years old and having no discernable historic significance. They will need further research to verify this evaluation.

Feature: Quarry-faced masonry retaining walls. Location. East and west sides of Kamehameha Highway about 1050' south of Kipapa Bridge. Description and evaluation: These lava rock retaining walls are built of roughly squared and faced stones set in rough courses with concrete mortar. The wall on the east side of the highway is about 125' long and the wall on the west side of the highway is about 200' long. These retaining walls are provisionally evaluated as eligible for the Hawaii or National Register of Historic Places for their association with the construction of this segment of Kamehameha Highway and as an example of lava rock retaining walls built as part of a Federal Aid Highway Project.

Feature: Quarry-faced masonry retaining walls. Location: West side of Kamehameha Highway about 125' north of Kipapa Bridge. Description and Evaluation: This lava rock retaining wall is built of roughly squared and faced stones set in rough courses with concrete mortar. This retaining wall is about 40' long. This retaining wall is provisionally evaluated as eligible for the Hawaii or National Register of historic Places for its association with the construction of this segment of Kamehameha Highway and as an example of lava rock retaining walls built as part of a Federal Aid Highway Project. This retaining wall appears on original 1933 construction drawings (drawing # 4276.4) for the Kipapa Bridge and Kamehameha Highway.

Feature: Quarry-faced masonry retaining walls. Location: West side of Kamehameha Highway about 450' north of Kipapa Bridge. Description and Evaluation: This lava rock retaining wall is built of roughly squared and faced



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stones set in rough courses with concrete mortar. This retaining wall is about 152' long. This retaining wall is provisionally evaluated as eligible for the Hawaii or National Register of historic Places for its association with the construction of this segment of Kamehameha Highway and as an example of lava rock retaining walls built as part of a Federal Aid Highway Project. This retaining wall appears on original 1933 construction drawings (drawing # 4276.4) for the Kipapa Bridge and Kamehameha Highway.

### Statement of Significance

Historical Context.

The Kipapa Bridge was part of Federal Aid Highway Project (FAP) No. 7F of 1933 that constructed the section of Kamehameha Highway from near the intersection of present day Ka Uka Boulevard to near the intersection of present day Lanikuhana Avenue. The Kipapa Bridge was named the Franklin D. Roosevelt Bridge on the day it opened, April 21, 1934. Under FAP 7F, construction of the Kipapa Bridge was covered as Emergency Construction Highway Project No. E7F. On original drawings the bridge is referenced as under FAP No. E7F.

FAP 7F built the new section of Kamehameha Highway, about 1.8 miles long, to eliminate a longer, winding portion of the highway that crossed Kipapa Gulch by extending down into the gulch north and east of the new alignment before crossing Kipapa Stream and climbing back up. The new section shortened the route by about 1¼ miles and eliminated a number of sharp, dangerous curves on the narrow roadway.

Original drawings for the Kipapa Bridge were prepared by the Hawaii Territorial Highway Department and are dated December 1932. Construction began on the bridge on February 14, 1933. Although the bridge was completed on June 10 of that year, further construction on the FAP 7F Kamehameha Highway roadway portion of the project was not finished until April 9, 1934. The bridge (under FAP E7F) was built by the Hawaiian Contracting Company for a total cost of about \$90,811, which included \$87,648 in Federal funds and \$3,127 in funding from Territorial sources. The official completion date for FAP E7F was June 10, 1933. Hawaiian Contracting Co. also built the new roadway portion of Kamehameha Highway (under FAP 7F) for a cost of about \$190,000.

William R. Bartels, designer of the Kipapa Bridge, was a bridge engineer for the Hawaii Territorial Highway Department. He received his education and training in Germany and immigrated to Hawaii in 1932 when he commenced working with the Highway Department during the latter half of that year. He continued his career there until his retirement in 1958. During that period he was a prolific designer, responsible for large and sophisticated bridge construction projects in Hawaii, including many tee-beam and rigid-frame concrete bridges.



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During the 1930s the Hawaii Territorial Highway Department was under the supervision of the Superintendent of Public Works, who was also the Territorial Highway Engineer. Although each island (Maui and Molokai were combined) had its own District Civil Engineer to supervise construction, all Territorial highway projects for all islands were accomplished under the direction of the Oahu branch, which had jurisdiction over all activities of the Highway Department on all of the islands of the Territory. The engineers on Oahu handled all designs, plans, specifications, and inspection of construction of all Territorial highways and bridges. Bartels, as an engineer attached to the Oahu branch, would have had this oversight on all bridge and roadway projects throughout the Territory.

Prior to the construction of the Kipapa Bridge and its associated section of Kamehameha Highway, the route of the highway went about 1½ miles up Kipapa Gulch in order to make the crossing of Kipapa Stream. Traveling north, the highway made a sharp bend of almost 90 degrees to the northeast about ¼ mile north of the present day intersection of Ka Uka Boulevard. Running northeast about ½ mile it made another bend to take it northwest and to the edge of the gulch. Another sharp turn to the northeast and the highway began to descend, following the contour of the side of the gulch for about ½ mile. Another abrupt turn to the northwest at the bottom of the gulch took the highway across the stream before it sharply turned southwest and, following the contour of the gulch, ascended. The highway reached the rim of the gulch near the present day intersection of Ahaula and Anania Drive. Here it turned sharply again to follow the approximate curve of Anania Drive, bending northward to join the present day route of Kamehameha Highway near Lanikuhana Avenue.

Plans for the elimination of the twisting portion of Kamehameha Highway were being made by the Territory of Hawaii as early as November 1931. On November 3 of that year the Honolulu Advertiser reported that the process of obtaining a 70-foot wide right of way for the new section was nearly complete. Hawaii had been receiving Federal Aid Project money for highway and bridge construction since 1925. With this federal funding the Territorial Highway Department began to work on completing and straightening belt roads. Improving bridges was included with road improvements under the FAP, and bridges constructed under it were typically longer, higher and more decorative than county-financed bridges.

In December 1932, the Territorial Highway Department prepared plans for the Kipapa Bridge and the 1.8 mile section of Kamehameha Highway that would bypass the section down in Kipapa Gulch. The title sheet for the original set of 46 drawings was signed on January 6, 1933 by Lyman H. Bigelow, Territorial Highway Engineer. Drawing sheet number 15A "End Post Detail" has a note at the left margin reading "Architectural Design by B.C.D. 3/33; Engineering Design by W.R. B.; Traced by W.C.V." The initials W.R.B. indicate that Bartels was responsible for the engineering design of this tee-beam bridge. The contract for the bridge and highway was awarded to Hawaiian Contracting Co. for \$275,654.10 and the bridge completed in June 1933. Federal appropriations paid for almost the entire contract amount, with only about \$6,396 used from Territorial funds.

The Kipapa Bridge was dedicated as the Franklin D. Roosevelt Bridge when it was opened on April 21, 1934. Thousands of spectators watched and hundreds of automobiles waited to cross the 483' long, 30' wide, three-lane bridge as acting governor Raymond C. Brown opened the bridge. The bridge was promoted as a military



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asset, cutting the travel time between Schofield Barracks and Honolulu. Much was also made of the improved safety of the new section of highway and the bridge, eliminating the narrow and curving road into and out of the gulch. The picturesque setting of the bridge with the wide gulch extending in both directions and the beautiful surroundings were also noted by a keynote speaker, Ernest W. Greene, Manager of Oahu Sugar Co. Another speaker at the dedication was Rear Admiral Harry Yarnell, Commandant of the 14<sup>th</sup> Naval District at Pearl Harbor. He called the new bridge an asset to the military, bringing Schofield Barracks at Wahiawa and Honolulu closer. He stated that a problem for the military in Hawaii was mobility, and a solution was good highways.

### Significance

The following three paragraphs of material are from page 4-111 of the November 2013 Hawaii State Historic Bridge Inventory and Evaluation by MKE Associates, LLC, and Fung Associates, Inc.

#### Significance Statement:

The Kipapa Gulch Bridge is significant for its contribution to the fields of engineering and transportation in Hawaii. The 1933 bridge is an excellent example of reinforced concrete tee beam construction with an open concrete rail typical of 1930s bridges. The Kipapa Gulch Bridge is eligible under Criterion A for its associations with important public works project initiated by the territorial government and constructed with Federal work relief programs funds during the Depression era. Moreover, the bridge contributed to the economic development of central Oahu by providing reliable vehicular access to the area. It is eligible under Criterion C as a representative example of a 1930s-era Federal Aid bridge utilizing an advanced engineering technology: continuous reinforced concrete tee beam construction. Further, the bridge is representative of the work of a master: William R. Bartels, chief designer for the Territorial Highway Department.

The Kipapa Bridge was constructed in 1933 during the general upgrading of Kamehameha Highway, the belt road around Oahu which serviced the sugar lands on the North Shore. The structure is an important transportation link for the central Oahu community. Its construction spanned the wide Kipapa Gulch and spared travelers from the previous long, circuitous route through the ravine. The bridge was associated with many prominent military and civilian men of Honolulu during its construction and was named after our thirty-first president, Franklin Delano Roosevelt.

The bridge is a striking example of the Federal Aid bridges constructed by the Territory in the 1930s. The design and height of the bridge are representative of the rapid advances made in engineering technology in the early decades of the twentieth century. Engineer W. R. Bartels was responsible for the design of all major territorial bridge projects from 1932 until his retirement from the department in 1956 [sic]. 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 work of other engineers. The builder was W.F. Dillingham, a prolific Honolulu builder and owner of the Hawaiian Contracting Co.

It should be noted that in addition to the above conclusions from the 2013 Hawaii Historic Bridge Inventory, the Kipapa Bridge is considered eligible under Criterion A for its association with the development of military infrastructure on Oahu.



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### References

#### Drawings

Historic drawings are available at the Hawaii Department of Transportation, Highway Design Section database as electronic scans. These include:

Project 7F                      dated 1932

Project 0-01072              dated 1972

Project 99C 01 90M        dated 1990

Some historic photos of the Kipapa Bridge are available at the Hawaii State Archives. These are located in the Photograph Collection, Folder PP 59-2, "Oahu, Ke-Ku."

#### Superintendent of Public Works Reports

Superintendent of Public Works, Territory of Hawaii. *Report to the Governor, Territory of Hawaii by the Superintendent of Public Works.* Honolulu: Advertiser Publishing Co., LTD. Various dates. .

#### Bridge Inventories (Chronological order)

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

Heritage Center, School of Architecture, University of Hawaii at Manoa. *State of Hawaii Historic Bridge Inventory and Evaluation.* Honolulu: State of Hawaii, Department of Transportation, Highways Division. Final Draft, May 2008.

Thompson, Bethany. *Historic Bridge Inventory, Island of Oahu.* Honolulu: State of Hawaii, Department of Transportation, Highways Division. June 1983.

Hawaii Highway Planning Survey, Territorial Highway Department. *Bridge Inventory for the Island of Oahu.* Honolulu: Hawaii Territorial Highway Department. September 1950.

The current bridge inspection report for this bridge is available at the Hawaii Department of Transportation, Highway Division, Bridge Design Office.



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Newspaper Articles (Chronological order)

"Wide Roadway Obtained for Kipapa Area." *Honolulu Advertiser*. November 3, 1931. P. 3.

"Ceremonies Arranged for Opening Of Kipapa Bridge." *Honolulu Star Bulletin*. April 18, 1934. P. 3.

"The Dedication of the New Roosevelt Bridge." *Honolulu Star Bulletin*. April 21, 1934. P. 9.

"Roosevelt Bridge Opened in Midst of Exotic Setting." *Honolulu Advertiser*. April 22, 1934. P. 1.

"Motorists to Save Much by Kipapa Bridge." *Honolulu Star Bulletin*. April 23, 1934. P. 3.

"TH Honors 4 Veteran Employees." *Honolulu Advertiser*. July 1, 1958. From microfiche titled "Bartels" at the University of Hawaii at Manoa Hamilton Library, Honolulu Newspapers clippings file.