

HISTORIC AMERICAN ENGINEERING RECORD

MAPLE STREET OVERPASS  
(St. Louis-San Francisco Railway Viaduct)

HAER No. AR-68

LOCATION: Spanning former St. Louis & San Francisco Railroad at Maple Street (State Highway 16), Fayetteville, Washington County, Arkansas  
UTM: 15.394904.3992380, Fayetteville, Arkansas, Quad.

AHTD #: 01940

STRUCTURAL TYPE: Reinforced concrete open-spandrel deck arch

DATE OF CONSTRUCTION: 1936

DESIGNER: Arkansas State Highway Department

CONTRACTOR: Fred Luttjohann Construction Company, Topeka, Kansas

OWNER: Arkansas State Highway & Transportation Department

USE: Vehicular bridge

SIGNIFICANCE: Constructed in 1936 to replace a timber bridge at this site, Maple Street Overpass was built through the cooperative efforts of private, federal, state and local agencies. It is significant for its association with the development of Fayetteville and noteworthy for its Art Deco ornamentation.

HISTORIAN: Researched and written by Lola Bennett, Summer 2005

PROJECT INFORMATION: The Arkansas Historic Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program that documents and interprets historically significant engineering sites and structures in the United States. HAER is administered by the Heritage Documentation Programs Division of the National Park Service, United States Department of the Interior. The Arkansas State Highway and Transportation Department (AHTD) cosponsored and funded the project.

**Chronology**

- 1828 Fayetteville settled
- 1830 Fayetteville population totals 75
- 1836 Arkansas admitted to the Union
- 1850 Fayetteville population totals 600
- 1871 Arkansas Industrial University opens at Fayetteville
- 1872 America's first plain concrete bridge built at Brooklyn, New York
- 1876 St. Louis & San Francisco Railroad chartered
- 1881 First train arrives at Fayetteville
- 1884 East Maple Street laid out by this date
- 1885 Fayetteville population totals 2,300
- 1889 America's first reinforced concrete arch bridge built at San Francisco
- 1894 West Maple Street laid out by this date
- 1904 Timber viaduct spans Maple Street by this date
- 1913 Arkansas State Highway Department created
- 1927 1,000 automobiles registered in Fayetteville
- 1930 Fayetteville population totals 7,000
- 1932 Arkansas State Highway Department eliminates 150 grade crossings from 1927 to 1932<sup>1</sup>
- 1936 Maple Street Overpass built
- 1938 Lafayette Street Overpass built
- 1995 Maple Street Overpass listed on National Register of Historic Places
- 2005 Maple Street Overpass recorded by the Historic American Engineering Record

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<sup>1</sup> Arkansas State Highway Department, *Tenth Biennial Report*, 1931-32: 38.

## Description

Maple Street Overpass is a single-span, reinforced concrete, open-spandrel deck arch bridge on reinforced concrete abutments. The bridge is 82'-6" long and 42'-10" wide overall, with a clear span of 69'-0" and a roadway width of 30'-0". There is a raised 6'-5" wide sidewalk on each side of the roadway. The bridge is skewed at an angle of roughly 30 degrees, resulting in an offset of 10'-3". The segmental arch springs from abutments on natural rock ledge and rises 11'-0" to the crown. Track clearance is 30'-0".

The arch has two 6'-0" wide ribs, tapered in thickness from 4'-0" at the spring line to 2'-0" at the crown. The spandrel columns measure 11"x 6'-0" and range in height from 3'-0" high near the crown to 7'-0" high near the ends of the span. They are spaced 10'-3" apart. The reinforced concrete deck is 2'-9" thick and covered with an asphalt wearing surface.

There are 3'-0" high concrete railings on both sides of the bridge. They feature Art Deco motifs and are curved outward along the approaches. Lighting units are installed in concrete posts near the ends of the railings at each corner of the bridge. A builder's plate in the parapet wall at the southwest corner of the bridge reads as follows:

ST. LOUIS-SAN FRANCISCO RY.  
FRED. LUTTJOHANN CONTRACTOR.  
ARKANSAS  
STATE HIGHWAY COMMISSION  
AND THE  
UNITED STATES  
BUREAU OF PUBLIC ROADS  
1936

## History

In 1881, the St. Louis-San Francisco Railway completed part of its proposed rail line from Missouri to Texas via Fayetteville, Arkansas. Construction required two major excavation projects in Washington County: a tunnel through the Boston Mountain Range at Winslow and a deep cut through rock ledge in the center of downtown Fayetteville.<sup>2</sup> On June 8, 1881, 5,000 people gathered to witness the arrival of the first train in Fayetteville, a local journalist observed:

*Fayetteville and Northwest Arkansas are exuberant with joy. We are entering a new era; the humdrum of the stage coach is past, we are out of the old grooves;*

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<sup>2</sup> J.C. Branner, *Annual Report of the Geological Survey of Arkansas*, Volume 1 (Little Rock, Arkansas: 1888).

*the steam is up, the bell is ringing and we plunge into the stirring active scenes of the new life.*<sup>3</sup>

The railroad brought increased prosperity and an influx of new residents to the region. Meanwhile, on the hilltop on the west side of town, the Arkansas Industrial University (later, the University of Arkansas) was growing rapidly. East Maple Street was laid out sometime prior to 1884, when it appears on S.B. Robertson's map of Fayetteville. West Maple Street was laid out sometime prior to 1894, when it appears on the *Atlas Map of Washington County*. By 1904, a timber viaduct spanned the railroad cut at Maple Street.

In the 1920s, Maple Street became part of State Highway 16, and with an ever-increasing volume of automobile traffic, there was a need for a wider and more permanent bridge at this location. In 1935, the City of Fayetteville and the Arkansas State Highway Department applied for federal funds for a new bridge at Maple Street.

The Arkansas State Highway Department completed plans under the supervision of N.B. Garver, Chief Engineer in January 1936.<sup>4</sup> On March 19, the contract was awarded to Fred Luttjohann Construction Company of Topeka, Kansas, for \$14,154.<sup>5</sup> Construction began April 13 and was completed October 10, 1936.<sup>6</sup> The local newspaper described the new bridge as follows:

*The overpass with its approaches is 430 feet long. The roadway proper is 30 feet wide and is flanked by 5-foot concrete walks. The bridge arches rise to a height of 30 feet above the railroad tracks.*

*One of the most attractive features of the overpass is its unusual lighting. The lights are recessed in the end posts to diffuse a soft glow over the entire bridge through heavy glass globes. ...*

*Virginia creeper donated by the horticultural department of the University of Arkansas has been planted about the overpass and the site has been sodded with grass. The structure as a whole promises to be one of the most attractive spots in the city.*<sup>7</sup>

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<sup>3</sup> *Arkansas Sentinel*, 8 June 1881.

<sup>4</sup> Arkansas State Highway Department, "Plan of Proposed Bridge: Over St. Louis-San Francisco Railway at Maple Street, Fayetteville, Bridge No. 1940," 1935.

<sup>5</sup> "Fayetteville Overpass Bid is Received," *Fayetteville Democrat*, 19 March 1936.

<sup>6</sup> Arkansas Highway & Transportation Department, *Bridge Record: Bridge No. 01940, Maple Street Overpass Bridge*.

<sup>7</sup> "New Overpass Opens Today," *Fayetteville Democrat*, 10 October 1936.

## Design

Concrete bridges first appeared in Europe in 1840 and in the United States in 1871, but the technology remained largely experimental until the end of the nineteenth century.<sup>8</sup> Concrete, or “*artificial stone*,” has little tensile strength, so early concrete bridges were constructed as solid barrel, filled arches that worked solely in compression and relied on a substantial mass of material to carry loads. Beginning in 1854, when William Wilkinson obtained a British patent for reinforcing concrete with wire rope, European and American inventors experimented with ways of combining the compressive properties of concrete with the tensile strength of iron, to produce stronger, lighter, more cost efficient structures. In 1875, French gardener Joseph Monier (1823-1906) became the first individual to apply reinforced concrete technology to bridges.<sup>9</sup>

In 1889, a decade and a half after Monier’s pioneering experiments, concrete contractor Ernest L. Ransome (1844-1917) built America’s first concrete-steel span, the Alvord Lake Bridge at Golden Gate Park in San Francisco.<sup>10</sup> The modest 20' span was scored and roughened to imitate a traditional masonry bridge and even had artificial stalactites on the intrados, but beneath the facade was a modern concrete structure, with twisted iron rods embedded in the specific zones where tension forces occur. Though not immediately popular, Ransome’s concrete reinforcing system was widely used throughout the United States in the twentieth century.

Throughout the 1890s and early 1900s, other engineers, including Joseph Melan (1853-1941), Fritz von Emperger (1862-1942), Edwin Thacher (1840-1920) and Daniel Luten (1869-1945), aggressively developed and promoted the new technology. Reinforced concrete bridges were durable, aesthetic and cost effective. They used readily available materials, could be built by local laborers and did not require extensive maintenance. With the advent of the automobile and subsequent demand for good roads and bridges, reinforced concrete bridges came into their own. By 1905, reinforced concrete was the preferred material for bridges in the United States.

As builders gained experience with the structural properties of reinforced concrete and sought to use the material ever more efficiently, they developed bold new bridge designs. By attenuating the arch ribs and using columns to open up the spandrel walls, they were able to create increasingly lighter, more elegant structures that were vastly different from their stone counterparts. In addition, the plasticity of concrete offered seemingly limitless possibilities for decorative treatment, and reinforced concrete bridge construction reached its height in the 1930s, when teams of engineers and architects produced bridges that were both functional and beautiful.

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<sup>8</sup> The 39' Caronne Canals Bridge is believed to be the world’s first concrete bridge. The first concrete bridge built in the United States was the Cleft Ridge Span (1871-72) at Prospect Park in Brooklyn, New York. Landscape architect Calvert Vaux designed the bridge, and the New York & Long Island Coignet Stone Company built it.

<sup>9</sup> The Pont de Chazelet (1875), a 52' reinforced concrete pedestrian bridge, still survives in France.

<sup>10</sup> See HAER No. CA-33, Alvord Lake Bridge.

**Builder**

After World War I, bridge contracts were often let to general contractors who subcontracted for materials and labor. Little is known about Fred Luttjohann of Topeka, Kansas, although he served as general contractor for a number of Arkansas bridges in the 1920s and 30s and regularly advertised in *Arkansas Highways* that his bridges are “*built for the ages.*”<sup>11</sup> Maple Street Bridge is one of four bridges attributed to Fred Luttjohann in the Arkansas State Highway & Transportation Department Historic Bridges Database.

HAER AR-22	01597	Big Piney Creek Bridge	Johnson County	1931	Warren thru truss
HAER AR-23	01689	Buffalo River Bridge	Newton County	1931	Pennsylvania thru truss
	01198	Horsehead Creek Bridge	Johnson County	1933	Parker pony truss
HAER AR-68	01940	Maple Street Overpass	Washington County	1936	concrete deck arch

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<sup>11</sup> *Arkansas Highways*, 1931.

**Appendix A: Field Photographs**



Perspective view of bridge above. Detail of railing to right. Field photographs taken by Lola Bennett.



**Sources**

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