LAFAYETTE STREET OVERPASS
Spanning former St. Louis & San Francisco Railway at Lafayette Street
Fayetteville
Washington County
Arkansas

HAER AR-90
AR-90

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

LAFAYETTE STREET OVERPASS

HAER No. AR-90

Location:	Spanning former St. Louis & San Francisco Railway at Lafayette Street, Fayetteville, Washington County, Arkansas
UTM:	15.395013.3991970, Fayetteville, Arkansas Quad.
AHTD #:	01941
Structural Type:	Reinforced concrete girder
Construction Date:	1938
Designer:	Arkansas State Highway Commission
Builder:	Edward B. Mooney Inc., Hot Springs, Arkansas
Owner:	State of Arkansas
Use:	Vehicular and pedestrian bridge
Significance:	The Lafayette Street Overpass, one of numerous grade crossing projects undertaken in 1938, was built to replace a narrow wooden bridge at this site. Like the nearby Maple Street Bridge (1936), this structure was a cooperative effort of federal, state, local and private agencies and is significant for its association with the historical development of Fayetteville.
Project Information:	The Arkansas Historic Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program that documents 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, Richard O'Connor, Manager. The Arkansas State Highway and Transportation Department sponsored this project. Lola Bennett, HAER Historian, 2007

Chronology

1803 Louisiana Purchase doubles size of the United States

1819 Arkansas Territory created from part of Louisiana Purchase

1828 Fayetteville settled

1836 Arkansas becomes 25th state to join the Union

1852 Fayetteville population 600

1855 First railroad built in Arkansas

1868 Arkansas Industrial University founded at Fayetteville

1872 Fayetteville described as "*a straggling village of less than a thousand people.*"[1]

1880 St. Louis & San Francisco Railroad completed

1881 First train arrives at Fayetteville

1884 Lafayette Street appears as "*Proposed Street*" on S.B. Robertson's map of Fayetteville

1885 Fayetteville population 2,300

1894 Lafayette Avenue appears on *Atlas Map of Washington County, Arkansas*

1896 Railroad reorganized as the St. Louis & San Francisco Railway Company

1900 Wooden bridges located at Lafayette Street and Maple Street by this date

1930 Fayetteville population 7,000

1936 Maple Street Bridge constructed (see HAER No. AR-68)

1938 Lafayette Street Overpass constructed

1995 Lafayette Street Overpass listed in National Register of Historic Places

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[1] "Then and Now," *Fayetteville Democrat*, 12 June 1922, 2-4.

Description

Located adjacent to the old Fayetteville Depot and railroad yard, the Lafayette Street Overpass is a three-span, reinforced concrete girder bridge on concrete abutments and piers. The bridge is 120'-0" long and 34'-4" wide overall, with a main span of 45'-0" and a roadway width of 24'-0". There is a raised 4'-0" wide sidewalk on each side of the roadway. Track clearance is 21'-6". A 100' concrete approach is located at the east end of the bridge.

The continuous concrete girder deck is 2'-9" thick, except where it is haunched at the piers and abutments. The deck is covered with an asphalt wearing surface. Ornamental metal balustrades flank the deck. Lighting units are installed in concrete posts at the center of the span and each end of the bridge. There is a builder's plate installed at the southwest corner of the bridge.

Both primary and secondary sources state that the Lafayette Street Overpass is "similar in construction" to the neighboring Maple Street Bridge, but the two bridges are actually distinctly different structural types. Located just one city block apart, these two structures clearly illustrate how site topography can determine bridge design. At Maple Street, the deep, narrow cut allowed the economical construction of an arch, but at Lafayette Street, the lower elevation and wider right-of-way necessitated construction of a simple continuous girder span. The latter type of span was described by engineer John Edward Kirkham in 1924 as "*the most economic structure possible*" for low, flat crossings.[2]

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.[3] On June 8, 1881, as 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; the steam is up, the bell is ringing and we plunge into the stirring active scenes of the new life.*[4]

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 (now, the University of Arkansas) was growing rapidly. Lafayette Avenue was laid out between the university and commercial area sometime prior to 1884, when it appears as a "*proposed street*" on S.B. Robertson's map of Fayetteville. Sometime prior to 1900, the railroad erected wooden

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[2] John Edward Kirkham, *Highway Bridges: Design and Cost* (New York: McGraw Hill Book Co., 1932).
[3] J.C. Branner, *Annual Report of the Geological Survey of Arkansas,* Volume 1 (Little Rock, Arkansas: 1888).
[4] *Arkansas Sentinel*, 8 June 1881.

bridges over the railroad cut at Maple Street and Lafayette Street to accommodate vehicular and pedestrian traffic between the university and the city's business district.

By the 1930s, Lafayette Street was carrying an ever-increasing volume of automobile traffic and there was a need for a wider, more permanent bridge at this location. The City of Fayetteville and the Arkansas State Highway Department applied for Federal Aid Grade Crossing Project funds for new overpasses at Maple Street and Lafayette Street. The Maple Street Bridge was completed in 1936, and Lafayette Street was built two years later.

Structural engineer N.B. Garner of the Arkansas State Highway Commission supervised the design phase of the Lafayette Street project during the spring and summer of 1938.[5] The Arkansas State Highway Commission advertised the project in late July and awarded the contract to Edward B. Mooney Inc. of Hot Springs, Arkansas, on August 5. Construction began late in August under the supervision of engineer J.P. Clayton and was completed approximately five months later, at a cost of $37,400.64.[6]

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.[7] Concrete 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.[8]

In 1889, a decade and a half after Monier's pioneering experiments, Ernest L. Ransome (1844-1917) built America's first concrete-steel span, the Alvord Lake Bridge, at Golden Gate Park in San Francisco.[9] 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.

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[5] Arkansas State Highway Commission, "Layout of Viaduct over St. Louis-San Francisco Ry., Lafayette Street, Fayetteville, Arkansas," 1938.
[6] "New Overpass Work Started on Lafayette," *Northwest Arkansas Times*, 1 September 1938, 1.
[7] The 39' Caronne Canals Bridge at Grisoles, France, is reportedly the world's first concrete bridge. Designed by landscape architect Calvert Vaux and built by the New York & Long Island Coignet Stone Company, the Cleft Ridge Span (1871-72) at Prospect Park in Brooklyn, New York, was the first concrete bridge in the United States (see HAER No. NY-336).
[8] Monier's Pont de Chazelet (1875), a 52' reinforced concrete pedestrian bridge, still survives in France.
[9] See HAER No. CA-33, Alvord Lake Bridge.

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 didn't 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 1910, reinforced concrete was the preferred material for bridges in the United States.

Builder

Edward Benedict Mooney (1879-1954) was born at St. Louis, Missouri, where his father, John Joseph (J.J.) Mooney, was a contractor for the St. Louis Waterworks. In 1884, J.J. Mooney organized the Mooney Construction Company and one year later, moved his family to Hot Springs, Arkansas, where his company would build a dam for the Hot Springs Water Company.

Edward Mooney spent his formative years in Hot Springs and began his own contracting business, Ed. B. Mooney, Inc., at the age of 18. He purchased some of the first construction equipment in the region, including a gasoline engine, concrete mixer and steam shovel and became an influential figure in the city's development. Mooney's firm specialized in excavation, well-drilling and the construction of sewers and foundations, but other more visible projects, like the Lafayette Street Overpass, demonstrate the company's skill in reinforced concrete construction. After Edward Mooney's retirement in 1943, the firm continued general contracting work for another two decades under the leadership of Mooney's daughter and son-in-law, Bernice McRae and Joseph G. McRae.[10]

[10] *Hot Springs City Directories*, 1954-1960.

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Jet Lowe, photographer, April 2008

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