

HARRIS CREEK BRIDGE
(Humpback Road Bridge)
Spanning Harris Creek at Humpback Road (CR 52)
Dardanelle vicinity
Yell County
Arkansas

HAER AR-94
AR-94

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

HARRIS CREEK BRIDGE (Humpback Road Bridge) HAER No. AR-94

Location: Spanning Harris Creek at Humpback Road (CR 52),
Dardanelle vicinity, Yell County, Arkansas

UTM: 15.482049.3890028, Dardanelle, Arkansas, Quad.

AHTD #: 17729

Structural Type: Reinforced concrete arch

Construction Date: 1912

Builder: J.C. Wilson

Owner: Yell County, Arkansas

Use: Vehicular bridge

Significance: Harris Creek Bridge is an intact example of an early reinforced concrete arch bridge. It is the oldest of three pre-1920 concrete bridges identified in the Arkansas Highway and Transportation Department historic bridges database.¹

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

¹ The others are: Miller Creek Bridge (1914), Independence County (HAER No. AR-105) and Spring River Bridge (1916), Fulton County (HAER No. AR-99).

Chronology

- 1803 Louisiana Purchase doubles size of the United States
- 1804 William Dunbar and George Hunter explore "*the Hot Springs of the Washita*"
Health-seekers begin making pilgrimages to Hot Springs, Arkansas
- 1816 World's first major concrete arch bridge built at Souillac, France
- 1818 Canvass White discovers hydraulic cement near Syracuse, New York
- 1819 Arkansas Territory created from part of Louisiana Purchase
Erie Canal creates first demand for concrete in the United States
- 1824 Joseph Aspdin receives British patent for Portland cement
- 1832 Federal Government designates "Hot Springs Reservation"
- 1836 Arkansas becomes 25th state to join the Union
- 1838 R.M. Roberts discovers mineral springs near present-day Dardanelle, Arkansas
- 1839 Dardanelle Springs resort developed
- 1840 World's first concrete bridge built at Grisoles, France
Yell County formed
- 1848 Proprietors of Dardanelle Springs build Dardanelle-Hot Springs Road
- 1849 J.H. Brearley and George Williams plat the Town of Dardanelle
- 1857 Francois Coignet experiments with artificial stone in France
- 1867 Joseph Monier experiments with reinforced concrete in France
- 1871 David O. Saylor begins manufacture of Portland cement at Coplay, Pennsylvania
- 1872 America's first concrete bridge built at Brooklyn, New York
- 1873 Arkansas Legislature authorizes counties to build and maintain bridges
- 1889 America's first reinforced concrete arch bridge built at San Francisco
- 1892 National League for Good Roads founded at Chicago
- 1910 J.W. Fairchild constructs a "cement" bridge across swamp near Danville
- 1911 First automobile registered in Arkansas
- 1912 J.C. Wilson builds Harris Creek Bridge

Description

Harris Creek Bridge is a single-span, closed-spandrel reinforced concrete deck arch bridge. The bridge is 42' long and 14' wide overall, with a clear span of 38', a roadway width of 12'-6" and 10' wing walls at each end. The segmental arch springs from a point about 8' above the creek and rises approximately 6'-6" to the crown. Reinforcing is described in the contractor's specifications.²

History

In 1804, President Thomas Jefferson sent William Dunbar and George Hunter to explore a part of Louisiana Territory known as "*The Hot Springs of the Washita*." Their widely published report on the area's many thermal springs generated public interest and Americans began making pilgrimages to present-day Arkansas to "*take the cure*" by bathing and drinking the therapeutic waters.³

In 1838, R.M. Roberts discovered several mineral springs near present-day Dardanelle, Arkansas. Within a few months, a group of entrepreneurs purchased the property, erected a resort hotel and began advertising their "*cold-water-cure*" as a complement to the hot-water therapies available at Hot Springs.⁴ By 1848, the resort's proprietors laid out a 65-mile road between Dardanelle and Hot Springs, "*so that gentlemen at either place can conveniently and comfortably visit the other by a direct and short route, over a good road.*"⁵

Present-day Humpback Road (CR 52) was originally part of the Dardanelle-Hot Springs Road, although no information has been found concerning its subsequent history or previous bridges at this location. The present concrete bridge was built in 1912. It may have been the second concrete bridge in Yell County, the first being a \$150 "*cement bridge*" near Danville built by J.W. Fairchild in 1911.⁶

On October 25, 1911, the Yell County Quorum Court recommended a "*reasonable appropriation*" for county improvements, including \$750 for a bridge "*across Harris Creek on the Hot Springs Road.*"⁷ The county awarded the contract for a concrete bridge across Harris Creek Bridge to J.C. Wilson for \$500. Accordingly, the bridge was completed in 1912.

² *Yell County Court Records*, Book I (1912), 397-398.

³ See also: HAER No. AR-103, Marble Bridge and HAER No. AR-104, Gulpha Gorge Bridges (Nos. 1-4).

⁴ V.T. Rogers, "Dardanelle Springs, Yell County, Arkansas," *Arkansas Gazette*, 28 April 1841, 3.

⁵ "Dardanelle Springs," *Arkansas Gazette*, 20 July 1848, 2.

⁶ *Yell County Court Records*, Book I (5 June 1911), 282.

⁷ *Yell County Court Records*, Book I (25 October 1911), 364-365.

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.⁸ 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.⁹

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.¹⁰ 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 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.

⁸ The 39' Caronne Canals Bridge at Grisoles, France, is believed to be 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 (HAER No. NY-336).

⁹ Monier's Pont de Chazelet (1875), a 52' reinforced concrete pedestrian bridge, still survives in France.

¹⁰ See HAER No. CA-33, Alvord Lake Bridge.

Sources

Arkansas Highway and Transportation Department. Bridge Records: Bridge No. 17729.

Aron, Cindy S. *Working at Play: A History of Vacations in the United States*. New York: Oxford University Press, 1999.

Banks, Wayne. *History of Yell County, Arkansas*. Van Buren: *The Press-Argus*, 1959.

Blackburn, W.T. [Map of] "Yell County, 1912."

Chambers, Thomas A. *Drinking the Waters: Creating an American Leisure Class at Nineteenth-Century Mineral Springs*. Washington, DC: Smithsonian Institution Press, 2002.

Cooper, James L. *Artistry and Ingenuity in Artificial Stone: Indiana's Concrete Bridges, 1900-1942*. Greencastle, Indiana: DePauw University, 1997.

"Dardanelle Springs," *Arkansas Gazette*, 20 July 1848, 2.

Hool, George A. *Reinforced Concrete Bridge Construction: Bridges and Culverts*. New York: McGraw-Hill Book Company, 1916.

Hume, John. "The Automobile Age in Arkansas." *Arkansas Highways* No. 23-25 (Spring 1977-Winter 1979).

"Map of Dardanelle and Vicinity as it was in 1827."

Reid, Homer. *Concrete and Reinforced Concrete Construction*. New York: Myron C. Clark Publishing Company, 1907.

Rogers, V.T. "Dardanelle Springs, Yell County, Arkansas," *Arkansas Gazette*, 28 April 1841, 3.

Thacher, Edwin. "Concrete and Concrete-Steel in the United States." *Transactions of the American Society of Civil Engineers, International Engineering Congress, 1904*, 425-458.

Von Emperger, Fritz. "The Development and Recent Improvement of Concrete-Iron Highway Bridges." *Transactions of the American Society of Civil Engineers* 31, 438-88.

Yell County Court Records, 1910-1920. Office of the County Clerk, Yell County Courthouse, Danville, Arkansas.

U.S. Post Office Department. "Reports of Site Locations, 1837-1950." Washington, DC: National Archives.