

BUTTRAM FORD BRIDGE

(Third Bridge)

Arkansas Bridges 2005

Spanning Petit Jean River at Old AR 109 (Magazine-Sugar Grove Road)

Sugar Grove vicinity

Logan County

Arkansas

HAER AR-73

AR-73

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

## BUTTRAM FORD BRIDGE (Third Bridge)

HAER No. AR-73

Location: Spanning Petit Jean River at Old AR 109 (Magazine-Sugar Grove Road), Sugar Grove vicinity, Logan County, Arkansas

UTM: 15.426975.3884086, Sugar Grove, Arkansas, Quad.

AHTD #: M3349

Structural Type: Pratt through truss

Construction Date: 1906

Builder: Joliet Bridge & Iron Company, Joliet, Illinois

Original Use: Vehicular bridge

Present Use: Closed to traffic

Significance: Buttram Ford Bridge is an intact example of an early twentieth century pin-connected steel Pratt through truss, a bridge type that is growing increasingly rare. It was built by the Joliet Bridge & Iron Company of Illinois, a nationally significant bridge manufacturer and is representative of the pre-highway era of bridge building in Arkansas.

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  
Petit Jean River shown on S.H. Long's "Map of Arkansa [sic] and Other Territories"
- 1820s Construction of military roads stimulates white settlement west of the Mississippi River
- 1836 Arkansas becomes 25th state to join the Union
- 1840 America's first all-iron bridge built on Erie Canal at Frankfurt, New York
- 1844 Pratt truss patented
- 1845 Eli Hopper settles near present-day Magazine
- 1848 John Scott settles near present-day Sugar Grove
- 1852 First iron Pratt truss built for the Pennsylvania Railroad
- 1870 Road and crossing appear on Taintor & Merrill's map of Arkansas
- 1871 Logan County formed (named Sarber County until 1875)
- 1873 Arkansas Legislature authorizes counties to build and maintain bridges
- 1883 Magazine population 200
- 1901 Bridge erected at Estep Ford (First Bridge)
- 1906 Bridge erected at Fuller Ford (Middle Bridge)  
Bridge erected at Buttram Ford (Third Bridge)
- 1910 Magazine population 2,000
- 1925 Logan County has at least nine metal bridges on Petit Jean River
- 1938 Floods damage or destroy numerous Logan County bridges
- 1939 WPA repairs Buttram Ford Bridge
- 1998 Buttram Ford Bridge closed to traffic

## Description

Buttram Ford Bridge is a 273' bridge, comprised of a 150' steel Pratt through truss and a 60' steel Pratt pony truss on concrete-filled steel cylinder piers, with two 15' stringer approach spans at each end. The outer ends of the approaches are supported on dry-laid stone abutments.

The upper chords of the main span are riveted, built-up members, comprised of back- to-back channels connected by a solid plate on top and lacing bars underneath. The lower chords are paired forged eyebars. The upper and lower chords are parallel and are connected by built-up posts and paired loop-ended tension bars angling up towards the ends. The center panel has paired adjustable tension rods with turnbuckles angling in both directions. The trusses are braced overhead with transverse struts and cross bracing between the panel points.

The trusses are connected at both the top and bottom chord with pins secured with a hex nut at each end. Steel floor beams are suspended below the lower chord by U-bolt hangers that loop over the pins at each panel point. Steel stringers are laid longitudinally on top of the floor beams. A wood plank deck is laid transversely on the stringers, with longitudinal running boards on top.

## History

The Petit Jean River enters the southwest corner of Logan County, Arkansas, and flows in an easterly course to its confluence with the Arkansas River at the easterly boundary of Perry County. For many years, this river provided rich bottom land for farming but also created an impediment to overland travel, particularly in times of high water.

In 1900-01, Logan County laid out a road between the towns of Magazine and Sugar Grove.<sup>1</sup> Originally, the road crossed Petit Jean River at three fords, but within a short time, citizens of the county were petitioning for bridges at those locations. The first bridge was erected at Estep Ford, just south of Magazine, in 1902. The other two crossings were spanned in 1906. The history of those crossings is summarized in the chart below.

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<sup>1</sup> *Logan County Court Records*, Book M (11 February 1901), 439. There is a reference to the "New Cut Road" in *Logan County Court Records*, Book M, 63.

AHTD#	BRIDGE	EARLY 1900s	1910s	1920s	1939	1990s
M3635	ESTEPP FORD (FIRST)	1902—HENDERSON FORD BRIDGE MOVED TO THIS SITE <sup>2</sup>	1908—BRIDGE BUILT BY ILLINOIS STEEL BRIDGE CO.	REPLACED	REPAIRED	LOST
M3356	FULLER FORD (MIDDLE)	1906—BRIDGE BUILT BY ILLINOIS STEEL BRIDGE CO.		REPLACED 1922	REBUILT	REPAIRED
M3349	BUTTRAM FORD (THIRD)	1906—BRIDGE BUILT BY JOLIET BRIDGE & IRON CO.			REPAIRED	CLOSED

On March 25, 1905, residents of Logan County submitted a petition to the Logan County Court for construction of a bridge across Petit Jean Creek on the Magazine-Sugar Grove Road:

*The ford across the Petit Jean on this road heading to Magazine, our principle market and shipping point, is deep and dangerous and many times during the year is rendered impassable by the high water even for three or four weeks in succession and many narrow escapes by attempting to cross it have been reported.*<sup>3</sup>

In October 1905, the Logan County Quorum Court appropriated \$4,000 "for the purpose of building a bridge across Petit Jean Creek at the mouth of Sugar Creek on Sugar Grove and Magazine Road."<sup>4</sup> On February 1, 1906, Logan County Judge Jerry Cravens and Bridge Commissioners A. Barker and J.P. Childs awarded the contract for a steel bridge across Petit Jean River "at the Buttram Ford at the mouth of Sugar Creek" to the Joliet Bridge and Iron Co. of Joliet, Illinois.<sup>5</sup> Buttram Ford Bridge was erected in 1906 at a cost of \$5,385.00.

In April 1939, floods damaged or destroyed numerous bridges in Logan County, including Estopp Ford Bridge and Fuller Ford Bridge. According to newspaper accounts, Fuller Ford Bridge was "believed to be at the bottom of the river somewhere."<sup>6</sup> In the fall of 1939, WPA crews salvaged, straightened and re-erected Fuller Ford Bridge and repaired the other two

<sup>2</sup> Henderson Ford Bridge (1897) was located 3 miles west of Magazine on Booneville-Magazine Road. Joliet Bridge & Iron Co. erected a new bridge at Henderson Ford in 1902.

<sup>3</sup> Citizens of Sugar Grove, "Petition for a Bridge Across Petit Jean River," *Logan County Court Records*, 25 March 1905.

<sup>4</sup> *Logan County Court Records*, Book N (2 October 1905), 221.

<sup>5</sup> *Logan County Court Records*, Book N (1 February 1906), 295.

<sup>6</sup> "Much Damage to Roads and Bridges Seen," *Booneville Democrat*, 20 April 1939, 1.

bridges on the Magazine-Sugar Grove Road. One year later, the Magazine-Sugar Grove Road became part of State Highway 109.<sup>7</sup> Buttram Ford Bridge was closed to traffic in 1998.

### Builder

In 1896, bridge builder Robert C. Morrison organized the Joliet Bridge & Iron Company near the railroad at Joliet, Illinois.<sup>8</sup> While most of the company's work was concentrated in the South and Midwest, they obtained contracts throughout the United States and several foreign countries and gained an international reputation for "*prompt action and good workmanship.*"<sup>9</sup> By 1914, the company had expanded its payroll to 400 employees and its operations to include the manufacture of structural steel for buildings. In 1920, Raymond K. Morrison sold the company's manufacturing plant and reorganized as the Joliet Bridge & Construction Company, which continued to be listed in Joliet City directories until 1984. Joliet Bridge & Iron Company erected many of Logan County's early twentieth century metal truss bridges.

### Design

Civil engineer Thomas Willis Pratt (1812-1875) was born in Boston, where his father, Caleb Pratt, was a noted architect. After obtaining his secondary education in the public schools of Boston, he enrolled at the Rensselaer Academy (now Rensselaer Polytechnic Institute) in Troy, New York, where he studied architecture. After graduation, Pratt worked for the Army Corps of Engineers, building dry docks for the Navy Yards at Charleston, South Carolina, and Norfolk, Virginia. In 1833, Pratt was employed by the Boston & Maine Railroad, where he began designing bridges. The remainder of his career was devoted to engineering and supervising work for railroad lines in the Eastern United States.

During his career, Thomas Pratt patented several inventions, including a steam boiler and a method of ship hull construction. The patent he achieved notoriety for is a roof and bridge truss, patented in 1844. The Pratt truss reversed the configuration of the 1840 Howe truss, putting the shorter web members in compression and the longer web members in tension, which greatly reduced the chances of structural failure through buckling. Developed at a time when the structural action of trusses was just beginning to be understood, the Pratt truss was one of several truss types that heralded the transformation from empirical to scientific bridge design. Over time, the Pratt truss came to be favored for its strength and straightforward design; by the 1870s it was the standard American truss type for moderate railroad and highway spans and continued to be so well into the twentieth century.

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<sup>7</sup> "Highway 109 May be Improved," *Paris Express*, 14 July 1938; "Joint Project for Improving 109 Planned," *Paris Express*, 21 July 1938.

<sup>8</sup> According to *Joliet Illustrated, Historical, Descriptive and Biographical* (1897), Morrison had been building bridges at Joliet, Illinois, since 1883. Further research needs to be done to determine if Robert C. Morrison was related to David H. Morrison (1817-1882) of the Columbia Bridge Company (est. 1868, Dayton, Ohio). *Joliet Illustrated, Historical, Descriptive and Biographical* (Joliet, Illinois: *The Daily Republican*, 1897), 99.

<sup>9</sup> "Joliet Bridge and Iron Company has a Large Plant," *Joliet Evening Herald*, 29 October 1914, 27.

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