

HISTORIC AMERICAN ENGINEERING RECORD

ISLAND SLOUGH BRIDGE
(Big Bottom Slough Bridge)

HAER No. AR-82

LOCATION: Spanning Island Slough (also known as Big Bottom Slough and Akron Slough) at County Road 58 (Padgett Island Road, formerly Big Island Road), Magness vicinity, Independence County, Arkansas
UTM: 15.637825.3948454, Newark, Arkansas Quad

ATHD #: 14014

STRUCTURAL TYPE: Pratt through truss

DATE OF CONSTRUCTION: 1909

DESIGNER: Hill & Lund, Little Rock, Arkansas

BUILDER: Joliet Bridge & Iron Company, Joliet, Illinois

USE: Vehicular bridge

SIGNIFICANCE: Island Slough Bridge is representative of the pre-highway era of metal truss bridge building and an excellent example of the work of the Joliet Bridge & Iron Company, a nationally significant bridge fabricating firm. It is the third oldest of twelve Pratt through truss bridges in the Arkansas Historic Bridges database.

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 and industrial works 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 cosponsored and funded the project.

Chronology

- 1819 Arkansas Territory created from part of the Louisiana Purchase
- 1820 Independence County established
- 1836 Arkansas achieves statehood
- 1844 Thomas and Caleb Pratt patent the Pratt truss
- 1850 First metal Pratt truss constructed
- 1854 Big Bottom post office established
- 1875 Arkansas State Legislature authorizes counties to construct and maintain bridges
- 1876 “Big Bottom” appears on Frank A. Gray’s map of Arkansas
- 1878 William Magness establishes a ferry crossing on Island Slough
- 1880 Big Bottom changes its name to Akron; population totals 100
- 1885 “Akron” appears on George F. Cram’s map of Arkansas
- 1896 Robert C. Morrison organizes the Joliet Bridge & Iron Company at Joliet, Illinois
- 1907 Independence County Court appropriates \$1,000 for Island Slough Bridge
- 1908 Independence County awards contract to Joliet Bridge & Iron Company
- 1909 Island Slough Bridge erected
- 2000 Big Bottom Slough Bridge listed on the National Register of Historic Places
- 2005 Island Slough Bridge recorded by the Historic American Engineering Record

Introduction

Bridges were rare in Arkansas until the late nineteenth century. Crossings over most rivers were by ford or ferry, both often unreliable and dangerous. Although wood and stone spans were built in some instances, there were few bridges in Arkansas until after the Civil War, by which time iron and steel truss bridges dominated American bridge building.

The rise of specialized bridge building firms in the 1860s and 1870s occurred in response to the rapid growth of American railroads and the concomitant demand for strong, economical, and efficient railroad bridges. Iron manufactories specialized in the fabrication of standard truss bridge designs that could be shipped to the site by rail and erected quickly by local workmen. These companies found an eager market in town and county governments seeking strong and affordable prefabricated iron bridges.

Island Slough Bridge was financed by county taxes and manufactured by a bridge fabricating firm in another state and shipped to the site by rail. It is highly representative of both the era of metal truss bridge technology and the period of Arkansas history that saw the development of county road systems, prior to the establishment of the Arkansas State Highway Department in 1913.

Description

Island Slough Bridge is a single-span, seven-panel, steel Pratt through truss bridge on steel cylinder piers. It carries Padgett Island Road over Island Slough at a height of about 20' above the water. The structure is 191'-8" long overall, with a clear span of 109'-5". The main span is 12' wide and 20' high overall, with clearance of 16'-7" and a roadway width of 10'-6". There are two 20' stringer approaches on steel bents at each end of the bridge.

The truss has a combination of bolted connections (upper chord) and pinned connections (lower chord). The upper chords and inclined end posts are riveted, built-up 7-3/8"x12" members, comprised of back-to-back channels connected by a solid plate on top and lacing underneath. The lower chords are paired eyebars, which vary in size from 1"x1" in the first and second panels, to 3/4"x2-1/2" in the third panels, to 3/4"x3" in the center panel.

The vertical posts are 6"x10" built-up members consisting of back-to-back 2"x6" channels connected by 1-1/2" lacing bars at 12" centers. The upper portion of the verticals at panel points 1 and 6 are 3/4"x3/4" eyebars. Single braces, angling up toward the ends, are 1/2"x2" eyebars in panels 1 and 6 and 1"x1" loop-ended bars in the remaining panels. Single counterbraces, angling down towards the ends in panels 3 and 5, are 3/8"x1-1/2" loop-ended bars. The center panel has crossed 1"x1" loop-ended braces with turnbuckles.

The deck system consists of transverse steel deck beams, longitudinal steel stringers and a transverse wood deck. The 5"x12" steel floor beams are comprised of plates and angles riveted together and suspended below the lower chord. There are five lines of 4"x8" steel stringers on

top of the floor beams. The wearing surface of the deck consists of wood planks laid transversely on the stringers. A railing made of steel angles has been bolted to brackets welded on the vertical posts on both sides of the roadway.

Upper and lower lateral sway bracing consists of 1"-diameter loop-ended rods, which cross between panel points. Portal bracing consists of 2-1/2"x3" angles and 18"x18" gusset plates.

A builder's plate, attached to the northwest end post, reads:

19 BUILT BY 09
THE JOLIET BRIDGE
& IRON CO.
JOLIET ILL.
COUNTY JUDGE
CUL. L. PEARCE
COMMR'S.
J.G. HAZELRIGG
E.L. JERNIGAN

LUND & HILL
ENGINEERS

History

Padgett Island, named for William Padgett who farmed here in the mid-nineteenth century, is an isolated bottomland between White River and a backwater known as "Big Bottom Slough" or "Island Slough." William Magness established ferry service across Island Slough in 1878, but by the turn of the century, local farmers wanted a permanent crossing.¹

In 1907, residents near Padgett Island petitioned for a bridge across Island Slough. The Independence County Court appropriated \$1,000 for a steel bridge, with the provision that said landowners would pay any additional amount for its construction. A year later, the landowners agreed to this arrangement, provided the additional funds did not exceed 15 cents per acre.²

On November 28, the county court published a "*Notice to Bridge Contractors*" for construction of a bridge across Island Slough, specifying:

One through Pratt truss, steel highway bridge 12 feet wide, 110 feet long. Steel trestle approaches at each end, two twenty feet panels each, 12 feet wide. Total

¹ Robert D. Craig, *A History of Newark, Arkansas* (Newport, Arkansas: Craig Printing Co., 1999), 149.

² *Independence County Court Records*, 7 October 1908, Book T, 446.

*length of bridge and approaches 190. Two steel cylinder piers, 35 feet high; two concrete abutments, 8 feet high; two trestle bents, 14 feet high.*³

On December 19, the county awarded contracts for two steel viaducts to Dube Lockwood & Hannaford of Batesville and contracts for steel bridges at Ten Mile Creek and Big Island Slough to Joliet Bridge & Iron Company.⁴ Big Island Slough Bridge was built in the summer of 1909 at a cost of \$3,148.62.⁵

Builder

In 1896, Robert C. Morrison (a bridge-builder since 1883) organized the Joliet Bridge & Iron Company at Joliet, Illinois, with a capital of \$50,000.⁶ Located on a 15-acre site at the Illinois & Michigan Canal and the Elgin, Joliet & Eastern Railroad, the plant initially employed about seventy-five workers in designing and fabricating “*steel bridges of every description.*”⁷ While their bridges were concentrated in the South and Midwest, the company gained an international reputation “*for prompt action and good workmanship,*” obtaining contracts throughout the United States and several foreign countries.⁸ 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 manufacturing plant and reorganized as the Joliet Bridge & Construction Company, a contracting firm. The company continued to be listed in Joliet City directories until 1984. Joliet Bridge & Iron Company is known to have built at least three bridges in Arkansas: two in Independence County (1908) and one in Sharp County (1911).⁹

Design

In 1844, railroad engineer Thomas Pratt and his father, Boston architect Caleb Pratt, received a patent for a wood and iron truss with vertical members in compression and diagonal members in tension. A reversal of the 1840 Howe truss, the Pratt truss shortened the compression members and reduced the danger of buckling. Developed at a time when railroads were placing new demands on bridges and 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. While the type was not immediately popular for wood spans, the Pratt truss came to be favored for its straightforward design, strength and adaptability, and by 1870, in

³ “Notice to Bridge Contractors,” *Batesville Guard*, 4 December 1908, 3.

⁴ “Bridge Contracts,” *Batesville Guard*, 25 December 1908, 2.

⁵ *Newark Journal*, 30 July 1909; *Independence County Court Records*, 4 October 1909, Book U, 372.

⁶ According to *Joliet Illustrated, Historical, Descriptive and Biographical* (1897), Morrison had been building bridges since 1883. For further research: Was Robert C. Morrison related to David H. Morrison (1817-1882) of the Columbia Bridge Company (established 1868) at Dayton, Ohio?

⁷ *Joliet Illustrated, Historical, Descriptive and Biographical* (Joliet, Illinois: The Daily Republican, 1897), 99.

⁸ “Joliet Bridge and Iron Company has a Large Plant,” *Joliet Evening Herald*, 29 October 1914, 27.

⁹ Desmond Walls Allen, *Abstracts from the Sharp County Record Newspaper, Published in Evening Shade, Arkansas, 1911* (Conway, Arkansas: Arkansas Research, Inc.).

a simplified all-metal version, it had become the standard American truss for moderate road and railroad spans, and remained so well into the twentieth century.

Island Slough Bridge is the third oldest of twelve Pratt through truss bridges listed in the Arkansas State Highway and Transportation Department Historic Bridges Database.

HAER AR-64	17862	Fryer's Ford Bridge	Conway County	1891	pinned	Wrought Iron Bridge Co.
HAER AR-46	SA0019	Old River Bridge	Saline County	1891	pinned	Youngstown Bridge Co.
	14014	Island Slough Bridge	Independence County	1909	pinned	Joliet Bridge Co.
HAER AR-30	10622	Osage Creek Bridge	Benton County	1911	pinned	Youngstown Bridge Co.
HAER AR-77	M2747	Pryor's Ford Bridge	Grant County	1916	pinned	Boardman Co.
	11047	Terre Noir Creek Bridge	Clark County	c1916	pinned	
	10631	Pedro Bridge	Benton County	1922	pinned	
	M1791	Point Remove Creek Bridge	Conway County	1926	riveted	Virginia Bridge & Iron Co.
HAER AR-71	18091	Mulberry River Bridge	Crawford County	1929	pinned	Lakeside Bridge & Steel Co.
	17726	Petit Jean River Bridge	Yell County	1930	riveted	Vincennes Bridge Co.
HAER AR-73	M3349	Petit Jean River Bridge	Logan County	1938	riveted	WPA
	03140	Cove Creek Bridge	Logan County	1958	riveted	Forsgren Brothers

Appendix A: Field Photographs



Perspective view of bridge deck. Field photograph by Lola Bennett.

Sources

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