

HISTORIC AMERICAN ENGINEERING RECORD

TULL BRIDGE (Brown's Ferry Bridge) (Pryor's Ford Bridge)

HAER No. AR-77

Location: Spanning Saline River at CR 5 (Old AR 291), Tull, Grant County, Arkansas

UTM: 15.536749.3811178, Tull, Arkansas Quad.

AHTD #: M2747

Structural Type: Pratt through truss

Construction Date: 1916

Builder: Boardman Company, Oklahoma City, Oklahoma

Original Owner: Grant County and Saline County, Arkansas

Present Owner: City of Tull, Arkansas

Original Use: Vehicular bridge

Present Use: Pedestrian bridge and historic landmark

Significance: Tull Bridge is representative of early twentieth century metal truss bridge-building technology. The bridge was bypassed in 2005 but has been preserved in place as a pedestrian bridge and historic landmark.

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
- 1819 Saline River delineated on S.H. Long's "*Map of Arkansa [sic] and other Territories*"
- 1835 Saline County formed
- 1836 Arkansas becomes 25th state to join the Union
- 1840 America's first all-iron bridge built on the Erie Canal at Frankfurt, New York
- 1840s Abraham and Archibald Tull settle near this site on Saline River
- 1844 Pratt truss patented
- 1850 First all-metal Pratt truss built for the Pennsylvania Railroad
- 1869 Grant County formed
- 1870 Road and crossing appear on Taintor & Merrill's map of Arkansas
- 1873 Arkansas Legislature authorizes counties to build and maintain bridges
- 1887 Tull population 200
- 1890 Saline County begins erecting iron bridges
 - Tull appears on Rand McNally & Co.'s map of Arkansas in *Indexed Atlas of the World*
- 1910 John R. Boardman establishes the Boardman Company at Oklahoma City, Oklahoma
- 1916 Boardman Company erects Tull Bridge
- 1981 61 percent of Arkansas' bridges deemed inadequate for modern traffic¹
- 1995 Tull Bridge closed for repairs
- 2005 Tull Bridge bypassed and preserved in place

¹ "61% of State Bridges are Deficient," *Arkansas Highways*, Spring 1981.

Description

Tull Bridge is a 130' long, single-span, pin-connected steel Pratt through truss on concrete-filled steel cylinder piers. The trusses are 22' high and spaced 15' apart. The roadway is 14' wide. There is a stringer approach span at each end.

The upper chords and inclined endposts are riveted, built-up 7-1/2" x 12" 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, which vary in size from 3/4" x 2" in panels 1, 2, 6 and 7, to 7/8" x 3" in panels 3 and 5, to 1" x 3" in panel 4. The upper and lower chords are parallel and are connected by 5" x 10-1/2" built-up posts and paired loop-ended 3/4" x 2" tension bars angling up towards the ends. The center panel has paired adjustable 1"-diameter tension rods with turnbuckles angling in both directions. The trusses are braced overhead with transverse struts, comprised of angles and lacing, at each panel point. The truss members are connected with 2-1/2"-diameter pins secured with a hex nut at each end. Upper and lower lateral sway bracing consists of rods with threaded ends that cross between panel points.

The floor system consists of transverse steel floor beams, longitudinal steel stringers and a transverse wood deck. The floor beams are comprised of plates and angles riveted together and suspended below the lower chord by U-bolt hangers that loop over the pins at each lower chord panel point. There are five lines of steel stringers on top of the floor beams. The deck consists of wooden planks laid transversely on the stringers.

History

In 1912, Grant County, Arkansas, embarked on an aggressive program of steel truss bridge building. The county subsequently contracted with Hope Bridge Company of Hope, Arkansas, and Vincennes Bridge Company of Vincennes, Indiana, for the erection of steel truss bridges across the Saline River at Pratt's Ferry, Jenkin's Ferry and Lee's Ferry. In early 1916, Grant County Judge Isaac McClellan advocated erecting another bridge across the Saline near the community of Tull, whose residents needed access to the railroad at neighboring Traskwood:

This closes my second year as county judge, and during the two years there has been much improvement done on bridges, and much interest in the betterment of our public highways. Nearly all the bridges have been built anew and there will be very few bridges to build for several years. The court should take steps towards cooperating with Saline County for the building of a bridge at Tull across Saline River.²

Accordingly, the Grant County Court appropriated \$1,000 for "the building of a steel bridge across Saline river in the Tull neighborhood."³ An agreement was reached with Saline County

² Grant County Court Records, Book F, 289.

³ Grant County Court Records, Book F, 290.

and a contract arranged with R.M. Tate, agent for the Boardman Company of Oklahoma City, Oklahoma.

In June, the *Benton Courier* reported that work had begun on the bridge at Tull, stating, "*A bridge across the Saline near this point is a long felt need in both Tull and Traskwood communities.*"⁴ The cost of the new bridge was split by Grant and Saline counties, with Grant County paying \$2,433 and Saline County paying \$6,200.⁵

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.

Builder

In 1910, Illinois native John R. Boardman founded the Boardman Company at Oklahoma City, Oklahoma. Four years later, he purchased the Imperial Iron & Steel Company plant and began fabricating structural steel for buildings and bridges. The company was one of two bridge manufacturers that received many contracts from the Oklahoma State Highway Department.⁶ The Boardman Company continues heavy industrial steel fabrication today.⁷

⁴ *Benton Courier*, 18 June 1916.

⁵ *Saline County Court Records*, Book F, 434 and Book H, 537-39.

⁶ The Oklahoma Department of Transportation website lists five extant Boardman Company bridges with dates ranging from 1914 to 1926. See <www.okladot.state.ok.us>.

⁷ See <http://www.boardmaninc.com>.

Sources

Arkansas Highway and Transportation Department. Bridge Records: Bridge No. M2747.

Benton Courier, 18 June 1916.

Biographical and Historical Memoirs of Pulaski, Jefferson, Lonoke, Faulkner, Grant, Saline, Perry, Garland and Hot Spring Counties, Arkansas. Chicago: Goodspeed Publishing, 1889.

Boller, Alfred P. *Practical Treatise on the Construction of Iron Highway Bridges for the Use of Town Committees*. New York: John Wiley & Sons, 1876.

"Building Bridges in Oklahoma." *Harlow's Weekly* 24 (29 August 1925): 8.

Goolsby, Elwin L. *Our Timberland Home: A History of Grant County*. Little Rock, Arkansas: Rose Publishing Company, 1984.

Goolsby, Elwin Leonard and Kay Mosley Goolsby. *Golden Memories: A Photographic Album of Grant County, Arkansas*. Little Rock: Rose Publishing, 1986.

Grant County Court Records, Books F and G (1912-17), Office of the County Clerk, Grant County Courthouse, Sheridan, Arkansas.

Hume, John. "The Automobile Age in Arkansas." *Arkansas Highways* 23-25 (Spring 1977-Winter 1979).

Looking Back: Saline County, Past Tense. Benton, Arkansas: *The Benton Courier*, n.d.

Pratt, Caleb and Thomas W. Pratt. U.S. Letters Patent No. 3,523, 4 April 1844.

"Pratt, Thomas," biographical sketch. *Dictionary of American Biography*, Vol. VIII. New York: Charles Scribner's Sons, 1933.

"Thomas Pratt," memorial notice. *Proceedings of the American Society of Civil Engineers* I (1876): 332-335.

Saline County Court Records, Books H and I (1911-1922), Office of the County Clerk, Benton County Courthouse, Benton, Arkansas.

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

TULL BRIDGE

HAER AR-77

(Brown's Ferry Bridge)

(Pryor's Ford Bridge)

Spanning Saline River at CR 5

Tull

Grant County

Arkansas

INDEX TO BLACK AND WHITE PHOTOGRAPHS

Jet Lowe, photographer, April 2008

AR-77-1	OBLIQUE PERSPECTIVE LOOKING SOUTH
AR-77-2	ACUTE OBLIQUE PERSPECTIVE FROM WEST
AR-77-3	ELEVATION NW PORTAL AND PIERS
AR-77-4	OBLIQUE PERSPECTIVE OF BELOW DECK STRUCTURE
AR-77-5	INCLINED END POST ASSEMBLY AT WESTERN END OF STRUCTURE
AR-77-6	PERSPECTIVE VIEW FROM EAST BANK LOOKING W
AR-77-7	SE PORTAL ELEVATION