

HISTORIC AMERICAN ENGINEERING RECORD

SPAVINAW CREEK BRIDGE

(GRAVETTE-DECATUR BRIDGE)

HAER No. AR-29

LOCATION: Spanning the Spavinaw Creek, on Benton County Road 29, between Gravette and Decatur, Benton County, Arkansas.

UTM: 15/4027320/367100

Quad: Gravette, Arkansas

DATE OF CONSTRUCTION: 1909

CONTRACTOR: Illinois Steel Bridge Company, Jacksonville, Illinois.

PRESENT OWNER: Benton County

PRESENT USE: Vehicular bridge

SIGNIFICANCE: Though bedstead trusses were widespread near the turn of the century, the Spavinaw Creek Bridge is now unique as the only surviving example of a bedstead truss in Arkansas. Built in 1909, this seventy-foot span was a focal point in a local dispute over the location of the proposed bridge.

HISTORIAN: Kathryn Steen

DESCRIPTION BY: Corinne Smith

Arkansas Historic Bridge Recording Project, 1988.

TOWN HISTORY

In 1909, in Gravette, Arkansas, the decision was made to build a new bridge over the Spavinaw Creek about one and one-half miles south of town. Gravette dates at least to 1893 when Ellis T. Gravett, a local property owner gave up land to allow the Kansas City, Pittsburgh and Gulf Railway to come through.(1) The surrounding area has long been agriculturally oriented, and became known locally as the "fruit belt." Gravette had a canning factory while, seven miles away, Decatur was well-known for its peaches.(2) With the Spavinaw River running between them, it was logical to build a bridge to link the two towns.(3)

DELAYS IN BRIDGE

For a time, due to funding difficulties, it appeared that a bridge was not forthcoming. In 1907, Benton County had held a levy to establish a fund to build new bridges and, although none were built that year, funds had been used in bridge repairs. The next year went by with more tax collecting, but no new bridges, prompting the Gravette News-Herald to report that some citizens were beginning to wonder about the possibility of corruption. However, on a positive note, the paper wrote in January, 1909:

The News-Herald is confident that the Gravette-Decatur bridge will [be] built when the proper time arrives. We can trust that much to our Republican County Judge, say naught about our honorable Democratic officials; for as yet we never have and hope never will have call to lose confidence in grand old Benton County. . .[but] there has been funds misused in the past, and probably will be under conditions that warrant throughout the ages to come.(4)

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Tracking down the bridge fund was not the only delay, there was also some disagreement as to just where the bridge ought to be located. In April 1909 the bridge commission, consisting of County Judge Leander Norris, Culver Crowder and W.T. Patterson, made a trip out to the area to find a bridge site. They decided on a point "just below the ford."⁽⁵⁾ A week later, the editor of the newspaper urged his readers to voice their complaints now about the chosen site if there were any. Some people had suggested a point further upstream might be better since it would not cut off "access to a cemetery, two churches and Mr. Holt's."⁽⁶⁾ At this point, the paper's coverage of the story diminished for two months, but by June the location issue still had not been settled. On the 18th of that month, a disgruntled, anonymous contributor's letter to the paper suggests the last few weeks had been divisive ones. The letter reads:

. . .The principle bone of contention seems to be over the location. As I understand, the commission has never considered but two points, at the ford of the creek and a point about 200 yards or less higher up stream. Now it seems to me that it could make no vital difference as to which of these points is selected, provided the approach to the bridge from either side is suitable. . . . Now as Sister Long Tongue's opinion that a bridge could not be constructed at the lower point that would stay, I think the sister has spoken hastily, just as people afflicted with too much tongue are apt to do.⁽⁷⁾

CONTRACT

The differences were obviously resolved since the bridge was eventually built, but there is no mention in the record about which site was actually chosen. On July 1, 1909, a notice was published announcing that bids would be taken July 31 to build a 70-foot bridge across the Spavinaw Creek according to the existing plans and specification.⁽⁸⁾ By the end of July 31 a contract has been

drawn up between Benton County, Arkansas and Thomas Boles, company agent of the Illinois Steel Bridge Company of Jacksonville, Illinois.(9)

The contract called for the company to erect a 70-foot bridge by December 31, 1909. In return the company would receive \$2000 in Benton County "warrants" upon completion.(10) A four-panel bedstead truss was the type called for in the specifications. There was to be a county-provided railing, concrete encased piers, an oak flooring and two coats of paint.(11)

The Spavinaw Creek Bridge is a bedstead truss as the original specifications demanded. Bedsteads fit into a group of bridges that could be labeled "interesting," but not interesting enough to have survived the standardization state highway departments imposed when they became the regulating agencies for bridges. James L. Cooper, in his book on Indiana bridges wrote,

". . .[T]he bedstead represents. . . a very different order of creative design, one where short spans could be built cheaply in part by incorporating the substructure directly into the metal fabricator's equation. . . .Neither eye-catching nor otherwise attention getting, bedstead pony trusses provided cheap and quite functional spans. . . ."(12)

CONSTRUCTION

Once the contract was actually signed, progress on the bridge continued more smoothly. The Benton County Court Record shows various entries related to the Spavinaw bridge over the course of construction. Patterson and Crowder both received payments for their work as commissioners in July 1909. In August 1909, the total 1908 collection for the bridge fund was registered at \$4089.54. The bond guarantee for the Illinois Steel Bridge Company was recorded in September.(13) The substructure construction took the majority of the overall construction time since

the superstructure's steel did not arrive in Gravette until early December. At that point construction was on schedule and the News-Herald was expecting "a splendid bridge, an ornament to any country road as well as a very useful structure."(14)

Despite the early delays in getting the bridge built, the Spavinaw Creek bridge became a reality in 1909. It has survived for nearly eighty years, and although appears a little worse for the wear, is still intact. At this point, due to a preservation versus modernization conflict, it appears that the bridge will be removed in 1988 under as much controversy as when it was erected.

ENGINEERING DESCRIPTION

The Spavinaw Creek Bridge is a bedstead pony truss, with a distribution of forces similar to that of a Warren truss with verticals. This classification implies that the diagonal web members carry the compressive and tensile forces. The distribution of forces depends on the loading of the bridge, indicating that the stresses change within a member as a vehicle travels over the bridge. The vertical web members only serve as bracing for the top chord and do not carry any force. The verticals are four angles, legs inward, connected by small batten plates at two-foot intervals. The diagonals are only two angles with plates at three-foot intervals.

The distinguishing feature of the Spavinaw Bridge is the vertical end post. The post gives the bridge the identification as a bedstead truss. According to J.A.L. Waddell, in the text of Bridge Engineering, vertical end posts were rarely used for three reasons. First, in the Spavinaw Creek design, the end post and end panel of the top chord cannot carry direct axial forces because they cannot transmit perpendicular forces to each other. Since these members carry no stresses, they are

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subject to vibration. Second, more metal is used than if inclined were employed, and last, inclined posts were considered to be more appealing visually. The vertical end post is the same built-up section as the top chord, namely two channels with a continuous top plate and bottom batten plates. These posts are embedded in the concrete piers. The posts, like the vertical web members, pass between the two angles which form the bottom chord.

The eight paneled bridge is 71 feet long, with a stringer approach span on the north end. The total bridge width is 14½ feet, and the roadway is 10½ feet wide. The wood plank deck is supported by six I-beam stringers. The I-beam floor girders (at panel points L0, L2, L4, L6, and L8 in Drawing #1) are suspended from the verticals with bolts and laterally braced with rods. The end floor girders sit directly on concrete. Expansion or contraction of the bridge was not provided for since the vertical end posts and end girders are essentially immobile. This means that changes in the dimension of the steel due to temperature fluctuations create stresses in the bridge because the steel is not able to shift.

The concrete abutment walls have wing walls to retain the steep bank of the creek. The south wall has tilted slightly downstream due to foundation problems of the abutment.

ENDNOTES

1. Robert D. Evans, "Gravette History," Benton County Pioneer, Vol. 24, No. 1 (Winter 1979), pp. 5-6.
2. "A New Era of Prosperity has Dawned upon Gravette," Gravette News-Herald, Vol. XVI, No. 32, p. 1.
3. The Spavinaw begins in springs only five miles from Gravette. Not far from the proposed bridge site, the creek "disappears into a dry gravel bed" for a short while, and returns to the surface to run into Oklahoma, the next state west. Lucile McWilliams Belknap, "Spavinaw Mill," Benton County Pioneer, Vol. 18, No. 4 (Fall, 1973), p. 29.
4. "Our Bridge Fund," Gravette News-Herald, Vol. XV, No. 21 (January 29, 1909), p. 2.
5. "Located the Bridge," Gravette News-Herald, Vol. XV, No. 30 (April 2, 1909), p. 1.
6. "A Word About the Bridge," Gravette News-Herald, Vol. XV, No. 31 (April 9, 1909), p. 2.
7. "The Bridge Question," Gravette News-Herald, Vol. XV, No. 41 (June 18, 1909), p. 1.
8. "Notice of Bridge Letting," Benton County Democrat, Vol. XXIV, No. 26 (July 1, 1909), p. 2.
9. "Contract," Benton County Court Record, Vol. Q (August 2, 1909), p. 73.
10. "Contract," p. 73.
11. "Specifications," Benton County Court Record, Vol. Q (September 6, 1909), pp. 85-6.
12. James L. Cooper, Iron Monuments to Distant Posterity: Indiana's Metal Bridges, 1870-1930 (Greencastle, IN: DePauw University, 1987), pp. 80,82.
13. Benton County Court Record, (July 6, 1909), p. 24; (July 8, 1909), p. 25; (August 3, 1909), p. 78; (September 6, 1909), p. 83.
14. "The Spavinaw Bridge Here," Gravette News-Herald, Vol. XVI, No. 14 (December 10, 1909), p. 1.

BIBLIOGRAPHY

- Belknap, Lucile McWilliams. "Spavinaw Mill." Benton County Pioneer. Vol. 18, No. 4 (Fall, 1973), p. 29.
- Benton County Court Record. July 6, 1909, p. 24; July 8, 1909, p. 25; August 3, 1909, p. 78; September 6, 1909, p. 24.
- "The Bridge Question." Gravette News-Herald. Vol. XV, No. 41 (June 18, 1909), p. 2.
- "Contract." Benton County Court Record. Vol. Q. August 2, 1909, p. 73.
- Cooper, James L. Iron Monuments to Distant Posterity: Indiana's Metal Bridges, 1870-1930. Greencastle, IN: DePauw University, 1987.
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- "A New Era of Prosperity has Dawned upon Gravette." Gravette News-Herald. Vol. XVI, No. 32, p. 1.
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- "The Spavinaw Bridge Here." Gravette News-Herald. Vol. XVI, No. 14 (December 10, 1909), p.1.
- "Specifications." Benton County Court Record. Vol. Q. September 6, 1909, pp. 85-6.
- "A Word About the Bridge." Gravette News-Herald. Vol. XV, No. 31 (April 9, 1909), p. 1.

CONTRACT

This agreement made the 31st day of July A.D. 1909, by and between the Illinois Steel Bridge Company of Jacksonville, Illinois, party of the first part, and Benton County, Arkansas, party of the second part.

Witnesseth, that the said party of the first part, for the consideration herein after mentioned, agrees to furnish all materials and build and construct for the said party of the second part.

One 70' x 12' span with 2 - 20' approaches with steel joints.

Over Spavinaw Creek 1½ South of Gravette and have the same completed on or before the 31st day of Dec. A.D. 1909.

Said bridge to be completed in accordance with the plans and specifications hereunto attached, which are hereby made a part of this contract.

In consideration of the foregoing materials to be furnished and work executed by said party of the first part, said party of the second part hereby agrees to pay to said party of the first part the sum of Two Thousand Dollars (\$2000.00) in the following manner, towit: Benton County Warrants upon completion of Bridge.

And for the performance of all and every article and agreement above mentioned, the parties hereto do hereby bind themselves each to the other firmly by these presents. It is further agreed by and between the parties hereto, that should the weather or condition of said stream be such as to preclude the completion of the said Bridge within the time above specified, or should the same be delayed by the failure of the railroads to transport any portion of the same within such time, or from strikes or any other cause or causes beyond the control of the said party of the first part, then the time for the fulfillment of this contract shall be extended for a period not less than that caused by such delay.

In Witness Whereof, the said parties of the first part and second part have hereunto affixed their hands and seals. Signed this 31st day of July A.D. 1909.

Illinois Steel Bridge Co.
By Thomas Boles Agt

Leander Norris, County Judge
W.T. Patterson
C. Crowder, Commissioners

Filed August 2, 1909
W.E. Hill, County Clerk

Benton County Court Record, Vol. Q,

July 5, 1909 p. 13

In the Matter of Letting
the Contract for County
Bridge across Spavinaw Creek

Now on this day the Court fixed the time for receiving bids on Bridge across Spavinaw Creek on July 31st 1909, at 1 o'clock PM. It is therefore considered, ordered and adjudged by the Court that notice be given in accordance with the law, and that the contract for building said bridge be let at public outcry at the South door of the Court House in the town of Bentonville, Benton County, Arkansas, on Saturday, July 31st 1909, at 1 o'clock PM to the lowest and best bidder, said bid to be accompanied with Certified Check for \$500.00.

July 6, 1909 p. 24

On this day the Court allowed W.T. Patterson the sum of \$63.00 for services in viewing Bridge Site, plans and specifications of Bridge, service as Bridge Commissioner and mileage and the same ordered paid out of Bridge funds.

July 8, 1909 p. 25

On this day the Court allowed Culver Crowder the sum of \$15.00 for services as Bridge Commissioner and mileage and the same ordered paid out of Bridge funds.

August 3, 1909 p. 78

In the Matter of
the Bridge Funds
of Benton County

Now on this day the Court ordered the Bridge funds collected for 1908 at $3/4$ mills levy amounting to \$4089.54 be set aside by the Treasurer of Benton County as a Bridge fund.

September 6, 1909 p. 83

On this day is presented to the Court the Bond of Illinois Steel Bridge Company, as follows towit:

Bond for Bridge Contract

Know all men by these presents that the Illinois Steel Bridge Company of Jacksonville, Illinois, as principals, and T.A. Chapin and Nelson McMurphy, as sureties, are held and firmly bound to Benton County, Arkansas, in the penal sum of Two Thousand (\$2000.00) Dollars, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, and assigns jointly and severally by these presents. Dated at Jacksonville in the County of Morgan and State of Illinois, this 12th day of August, 1909.

The condition of this obligation is such that if the said Illinois Steel Bridge Co. construct a steel bridge in Benton County, Ark. according to the plans, specifications, and contract of the 31st day of July, 1909, then this obligation to be void and of no effect or otherwise to remain in full force and virtue in law.

Illinois Steel Bridge Company, Principals
By T.W. Beadle, Asst Secy
T.A. Chapin
Nelson McMurphy, Sureties

Specifications for 110' Bridge Across
Spavinaugh River $1\frac{1}{2}$ Miles South of
Gravette Benton County Arkansas

Conditions:

The Contractor shall do all work and furnish all material in a prompt and mechanical manner. he shall furnish all tools protections and appurtinances of every kind necessary to Complete this work. he shall furnish a bond satisfactory to the County Commissioners and shall do this work in a first class manner to the full satisfaction of the Commissioners and the supervising engineer.

Excavation:

The Contractor shall do all the necessary excavation for the piers and abutments and shall properly protect such excavations until foundations are in place. all Materials removed from such excavations shall be placed convenient for filling in behind the abutments.

Main Span:

The main span of the Bridge to Consist of one 4 panel riveted Bed-Stead truss— 70 feet long 12 foot roadway and depth of truss to be 8 feet. said Span to be Capable of carrying 1200 pounds per lineal foot of Bridge. The shop work shall be first class and subject to the inspection of the supervising engineer. Span to be composed of members of the dimensions as shown on the attached blue print.

Approaches:

There shall be a 20 foot approach at each end of above span one end of approach to rest on the piers and the other to rest on the abutments.

Railing:

The railing will be heavy Page Fencing furnished by the County. The approaches shall have steel posts properly punched so that this fencing can be fastened thereto each panel post on the span will also be properly punched so as to carry this fencing.

Piers:

The piers shall be 13 feet high made of steel columns built of 2 - 6" channels with 12" plate properly sway braced entire pier to be enclosed with concrete so that no portion of the steel will be exposed. The Concrete Wall will be at least 12" thick.

Abutments:

The abutments will be built of steel and enclosed in a concrete wall 12" thick. should wing walls be necessary the Contractor is to build same to the satisfaction of the Engineer in Charge

Steel Joists:

Joist system to be 6 lines of 7" steel with 3 Nail strips 3" x 7" throughout

Flooring:

To be of Oak of a grade suitable to the engineer and to be securely nailed to the Nail Strips.

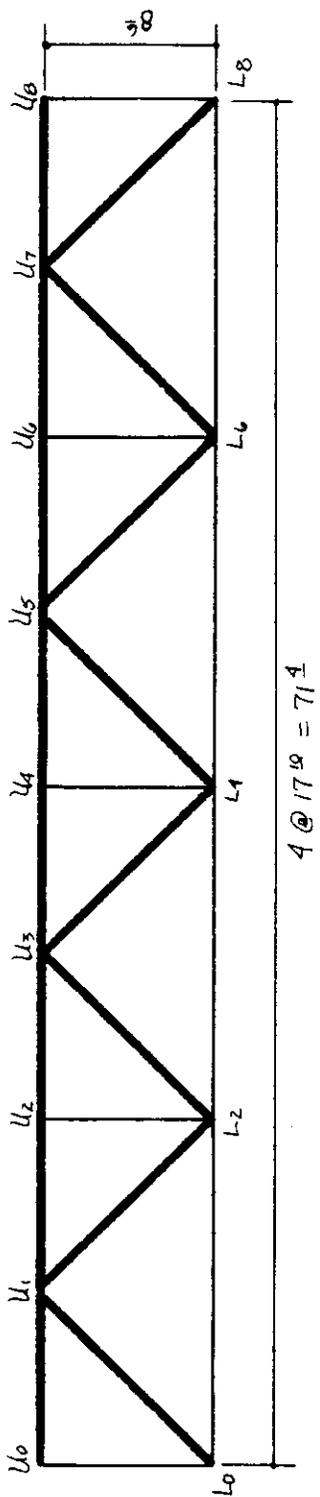
Painting:

The Bridge shall receive one coat of oil before assembling at the shop one coat of Bridge paint after assembling and one field coat after erection

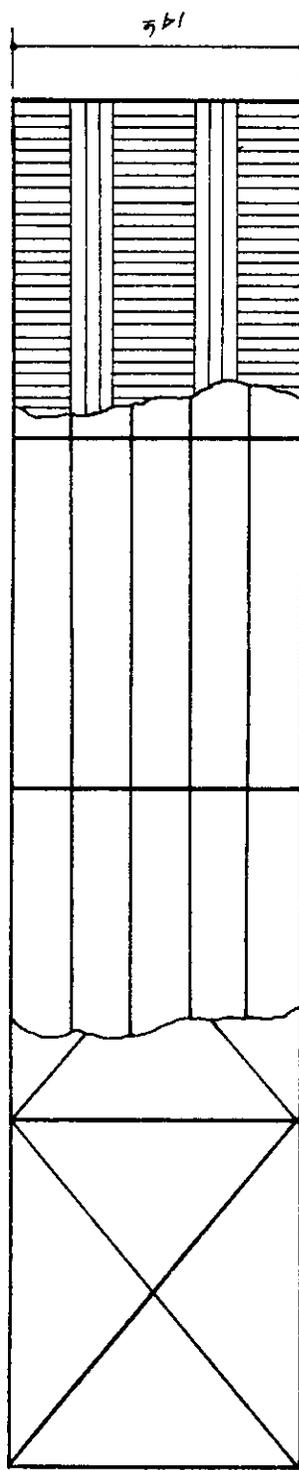
General:

The Bridge must be first class and entirely satisfactory to the County Judge and Bridge Commissioners.

ELEVATION



PLAN



FLOOR BRACING

STRINGER SYSTEM

FLOOR DECK

DRAWING #1

DRAWN BY CORINNE L. SMITH

DRAWINGS NOT TO SCALE