

Lewis Mill Bridge
Spanning the Grand River on Cart Road 570
Jameson vicinity
Daviness County
Missouri

HAER No. MO-45

HAER
MO,
31-JAN.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U. S. Department of the Interior
P. O. Box 25287
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD

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Lewis Mill Bridge

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Location: Spanning the Grand River on Cart Road 570 between the townships of Grand River and Marion in Daviess County, Missouri. In Section 22, Township 60 North, Range 28 West, 2-1/4 mile west and 1/2 mile south of Jameson, Missouri. Near the site of a grinding mill once owned and operated by the Lewis family.

UTM: Lewis Mill Bridge is at latitude North 39 degrees, 59 minutes, 52 seconds west; its longitude is 94 degrees, 01 minute, 51 seconds east.

Quad: Altamont

Date of Construction: October 3, 1892

Builder: St. Joseph Bridge and Iron Company, St. Joseph, MO.

Present Owner: Daviess County
Daviess County Court House
Gallatin, Missouri 64640

Present Use: Vehicular bridge to be replaced by a new vehicular bridge. Projected date of removal: November-December 1988.

Significance: The Lewis Mill Bridge is an example of common Pratt truss used extensively throughout the country from 1844 to the early part of this century.

Compiled by: Bill Arthaud, North District County Commissioner, and
Beth Wheeler
September 1988

I. HISTORY

A. Securing a Contractor

Records available at the Daviess County Courthouse in Gallatin indicate that a bond was secured on November 2, 1891, to finance a new bridge "across Grand River where the line running east and west through the center of section 22, township 60, range 28 crosses said river."¹

Also on November 2, 1891, the county court advertised and let, to the lowest and best bidder, the St. Joseph Bridge and Iron Company for an iron bridge across the Grand River at said location. The court minutes show the cost of the contract to be \$447.² However, a local newspaper reported on November 6, 1891, that the contract was let for \$4747.³

The July 18, 1892, county court records indicate the county revenue fund would pay for half the total bridge construction costs of \$4747 and half of the approach costs of \$270. The remaining half would be paid from a fund financed by subscribers (land owners).⁴ Two of the subscribers listed for the Lewis Mill Bridge project were George D. Grant and John D. Feurt.⁴

B. Construction Chronology

Separate contracts for each stage of the bridge construction project were let. The substructure and superstructure bids were let first (\$4747) and were completed before the approaches. The bid for approaches was accepted on July 18, 1892, for \$270.⁴

On May 4, 1892, when construction materials were on site, county court records indicate a sum of \$2,373.50, one-half the contract price, was paid for the erection of said bridge.⁵ One half of this amount came from county revenue fund and the other half from the subscribers. This was verified in a local newspaper.⁶

The county court and St. Joseph Bridge and Iron Company entered into a contract to erect an iron bridge of 200-foot span on tubular piers of 42-inch diameter with 80 feet of wooden pile bents, 20 feet each, with extra pile bents and that said pile bents are completed according to contract. There would be 120 feet of approaches at \$4.50 per foot, for a total of \$540, and the company would construct 60 feet of approaches to the iron bridge.⁷ Lewis Mill Bridge was conceived and designed for horse drawn wagons.

The October 3, 1892, minutes of the county court show that a total of \$4757 was paid for the completed Lewis Mill Bridge.⁸ This is a \$10 discrepancy from the \$4747 that the records indicated consistently.

The July 3, 1893, county court minutes indicate that the Lewis Mill Bridge had been badly damaged by wind and badly-needed repairing. Several bridge men were present at the meeting and the court considered the case an emergency. They proceeded to take the bids for the repair of Lewis Mill Bridge. The lowest bid received was \$695, which was considered by the court to be high and was rejected.⁹

When the court met in August 7, 1893, they were notified that a bid for \$500 to return Lewis Mill Bridge to the original specifications was awarded to Frameworth & Brodget.¹⁰ Work was completed prior to this meeting.

To make matters worse, in January 1894, the Lewis Mill Bridge fell and was wrecked. The Davieas county court entered into another agreement with St. Joseph Bridge & Iron Company to replace the bridge to its original state. The agreement was for \$3,000. County records state, "The said bridge was originally built by said Bridge and Iron Company and the main span has fell and is now a wreck. It is distinctly understood that the said main span of said bridge is to be built by said company according to said plan on piers heretofore erected by said company. It is further order of this court that said main span and the approaches thereto shall be built and completed by said company so that said bridge and approaches will be safe for public use. The said bridge company is to have all the material from the old bridge." The bridge commissioners would now have to approve it and a bond would be kept on the bridge company for four years, including piers and approaches, assuring replacement if another mishap occurred.

The next mention of the Lewis Mill Bridge is in the November 1894 county court minutes. A stipulation in the contract was that the bridge would be completed by the first of September 1894. If it was not completed, then \$5 per day for each day of delay would be charged against St. Joseph Bridge & Iron Company. Since the bridge was completed 20 days late, the county paid the bridge company the original bid price of \$3,000 minus the \$100 penalty, which equalled \$2,900.¹²

**Lewis Mill Bridge
HAER No. MO-45 (page 4)**

Note: Page #4 of this survey is missing.

C. Location

Lewis Mill Bridge is located west of Jameson, Missouri. It is near the center of Section 22, Township 60 North, Range 28 West. It is on County Road No. 570, one mile southwest of the west end of State Route 00. This is two miles west, 1/2 mile south, and 3/10 mile west of Jameson, Missouri.

II. THE BRIDGE

A. Description

The Lewis Mill Bridge is an eleven-panel pin connected Pratt high through truss. It has one 28 foot 6 inch steel beam approach span plus four 30-inch steel beam approach spans on the northwest. The southeast approach spans consist of a 14-inch steel beam span plus a 40-foot bedstead truss. The main span measures 197 feet 1 inch. Total length of the bridge is 399 feet 6 inches. Vertical clearance over the deck is 27 feet. The clear roadway is 16 feet 3 inches, with an out-to-out dimension of 17 feet 8 inches.

Main Span

The main span has diagonal members in tension, with the eight inside vertical members acting in compression. The two vertical members nearest the ends of the main span are hangers and act in tension. The tension members consist of eye bars. Round iron rods were used for diagonal bracing, both top and bottom. Diagonal members are double eyebars tied to pins, top and bottom. The end posts and top chord are comprised of two channels with a solid cover plate and laced underside bracing. The vertical compression members are made up of two channels tied together with lacing riveted in place. The upper sway bracing is fabricated of angles with riveted gusset plate connections. The sway bracing connects to the vertical compression members and the end posts. The lower chords are eyebars pin connected to the vertical members. The floor beams are attached to the vertical members with riveted plates.

The bridge has no metal ornamentation. A bracket at each portal indicates that plaques may have existed. The plaques are now gone and their whereabouts are unknown.

The bridge deck is made of rough sawn lumber of various dimensions. The bottom layer of decking is laid transverse to the centerline of the bridge. Two sets of four planks each have been laid longitudinally to serve as runners for vehicle wheels. The deck lays on steel stringers comprised of channels and I beams. The stringers are supported by I beams, commonly known as transverse floor beams.

Approach Spans

The southeast approach spans are comprised of a 14-foot steel beam span and a 40-foot bedstead truss. The stringers and floor system are the same as for the main span. The top chord of the bedstead truss has been strengthened by addition of an I beam welded to the top.

The northwest approach spans are unusual, in that they are built on a curve. Span lengths are 1 at 28 feet 6 inches and 4 at 30 feet. The spans are comprised of steel beams with a floor system similar to that of the main span.

Piers

The piers under the southeast end of the main span are 42 inches in diameter and extend 25 feet from the floor of the bridge to the ground. They are made of concrete encased in steel. On the southeast end of the main span, the upriver pier is badly damaged from river drift and ice.

The northwest piers of the main span are 42 inches in diameter and extend 20 feet from the floor of the bridge to the ground. They are made of concrete encased in steel.

Piling

On the southeast approach, the pier is made of two legs of the bedstead truss plus two 6-inch by 5-inch piling. These are 9 feet from the bridge floor to the ground. These are diagonally braced with 3-inch angle iron.

On the northwest approach, the steel piling piers are of three heights. The westernmost pier is 9 feet high. The next pier is 12 feet high. The remaining piers are each 15 feet high. These are also diagonally braced with 3-inch angle iron.

On the middle third of the piers, 'X' bracing is used. It is a 1-1/4-inch rod. Beneath this bracing, there are two tie braces, each 2 inches by 6 inch channel iron, spaced 4 inches apart. This is identical on both sets of piers.

Abutments

The northwest abutment is made up of timber planks and piling. The southeast abutment was built of concrete.

B. Modifications

The northwest approach stringers have been increased in number from 7 to 11. This was done in the fall of 1983 after Stitt's garbage truck fell through it. The outside stringers are 10-inch channel iron and the others are 10-inch I-beam. At the same time, two additional pilings were installed in each pier in the northwest approach.

In the spring of 1984, the westernmost pilings on the northwest approach were replaced because the concrete abutment had collapsed.

In September 1897, a local newspaper reported that "the west approach of the Lewis Mill Bridge is in bad shape."¹³ The upriver pier on the northwest end of the main span settled and was raised by placing the 30-inch diameter by 8-inch thick original burr stone from Lewis Mill on top of the pier.

The bedstead truss was reinforced by placing a 6-inch I beam on top of the truss. During 1974-1976, the work was done on both sides of the truss. This was not in the court records, but was gathered from the county bridge foreman, Artie Hightree. Mr. Hightree also reported that in the mid-1950s the upriver pier on the south side end of the main span was repainted when the truss had settled into the pier, causing the bridge to settle. The truss was raised, concrete poured into the top of the pier, and the truss returned to its proper position on top of the pier. The bridge flooring has been replaced periodically as needed.

C. Ownership and Future

The Lewis Mill Bridge has been owned and maintained by Daviess County since its construction. The county bridge inventory number is 570000.0. A structural appraisal of the Lewis Mill Bridge revealed that the steel superstructure remains in relatively good condition, but has a very limited load capacity. Rating calculations, based on an inspection in 1983, recommended a load limit of 3 tons, or 5 tons with a 15-mile per hour speed limit. This allows only for passage of automobiles and light pickup trucks.

The original steel cylinder pier foundations show significant deterioration and have been damaged by high water. Several units have been repaired with steel piling and concrete blocks.

The entire floor system of the trusses and approach spans have load ratings of 5 tons or less. All transverse floor beams would require reinforcement and the number of floor stringers would have to be

doubled to reach even an 8-ton capacity which would allow passage of school buses. Considering the age of the structure, its narrow width and the significant costs of strengthening and repairs to the substructure, rehabilitation does not appear feasible. Because of its condition, a decision was made to replace the bridge.¹⁴

The new bridge is to be built immediately downstream, abutting the existing bridge on the southeast approach. It was proposed to leave Lewis Mill Bridge in place and closed to traffic. However, the bridge, if washed out by a flood, would have threatened the new span downstream and federal funding guidelines would not permit this risk.

In August 1988, The Gallatin North Missourian, The Preservation News of Washington, D. C., and the Missouri Transportation Bulletin of Jefferson City, Missouri, advertised that the Lewis Mill Bridge was available for purchase.¹⁵ No response was received from these notices.

III. BIOGRAPHICAL MATERIAL

A. The St. Joseph Bridge & Iron Company

The St. Joseph Bridge & Iron Company was located in St. Joseph, Missouri. It was originally incorporated on October 23, 1890, as St. Joseph Bridge & Boiler Works. On November 3, 1891, the name was changed to St. Joseph Bridge & Iron Company.

The company was incorporated in Missouri for 50 years. During that time, they bought, sold, and manufactured iron bridges and combination bridges, boiler iron, and structured iron. They also bought, sold, and manufactured cast iron.¹⁶

The grinding mill owned and operated by the Lewis family was on the east bank, just downstream from the bridge. The millstone or burr stone was used to raise the western pier of the main span on the upriver side. It is likely that the 30-inch diameter, 8-inch thick millstone was brought to the mill from Europe, possibly from France.

The 1874 Daviess County atlas states, "Prior to the bridge being built, the road starting at a point 1/8 mile east of the East end of the present bridge, angles to the southwest where it crossed the river at a low water crossing in the bend, 1/2 mile south of the present bridge and then joined a road leading to the west."¹⁷

During the planning process for replacing the Lewis Mill Bridge, the Missouri Department of Conservation temporarily delayed the

the project (spring 1987) to review the possible presence of the ostrich fern (*Matteuccia struthiopteris* var. *pennsylvanica*), which is listed as rare in Missouri. However, the plant has been plotted 1/2 mile downstream; thus, it did not interfere with the replacement project.¹⁸

High water marks for the Lewis Mill Bridge are marked on the truss above the downriver pier on the northwest end of the main span. These will be transferred to the new bridge, in an effort to link the past and present for the future. This will assure continuity through generations of the river's history.

Another unique feature of the Lewis Mill Bridge is its curving west approach. This unique feature was a determining factor in the bridge being placed on the National Register of Historic Places.

IV. FOOTNOTES

- 1 Daviess County Court Record Book - Book J, page 6, November 2, 1891
- 2 Daviess County Court Record Book - Book J, page 7, November 3, 1891
- 3 Jamesport Gazette-Herald, November 6, 1891, page 5
- 4 Daviess County Court Record Book - Book J, page 95, July 18, 1892
- 5 Daviess County Court Record Book - Book J, page 78, May 4, 1892
- 6 Jamesport Gazette-Herald, May 8, 1892, page 5
- 7 Daviess County Court Record Book - Book J, page 111, September 5, 1892
- 8 Daviess County Court Record Book - Book J, page 146, October 3, 1893
- 9 Daviess County Court Record Book - Book J, page 264, July 3, 1893
- 10 Daviess County Court Record Book - Book J, page 275, August 7, 1893
- 11 Daviess County Court Record Book - Book J, page 338, January 9, 1894
- 12 Daviess County Court Record Book - Book J, page 450, November 13, 1894
- 13 Jameson Laconic, news item, September 1897
- 14 Harrington & Cortelyou, Inc. - Consulting Engineers
127 W. 10th Street, Kansas City, Missouri 64105, December 13, 1985

- 15 Cook, Flatt and Strobel, Engineers, P.A.
616 Main, Joplin, Missouri 64801, July 21, 1988
- 16 Missouri Secretary of State's Office - Corporations Division
Truman Office Building, Jefferson City, Missouri 65101
- 17 Daviess County Atlas - 1874
- 18 Missouri Department of Conservation letter from Dan F. Dickneite,
Environmental Administrator, to Richard L. Heisler of Cook, Flatt &
Strobel, July 10, 1987