

HISTORIC AMERICAN ENGINEERING RECORD

ST. FRANCIS RIVER BRIDGE

(LAKE CITY BRIDGE)

HAER No. AR-18

LOCATION: State Highway 18, spanning the St. Francis River. Lake City, Craighead County, Arkansas.

UTM: 15/3966880/731920

15/3967570/732700

QUAD: Lake City, Arkansas

DATE OF CONSTRUCTION: 1934

CONTRACTOR: Vincennes Bridge Company of Vincennes, Indiana.

PRESENT OWNER: Arkansas Highway and Transportation Department.

PRESENT USE: Vehicular Bridge

SIGNIFICANCE: The St. Francis River Bridge is the only I-beam vertical lift span in Arkansas. Its location is important because it allows passage from the eastern third of Craighead County across the swampy Sunken Lands to the rest of the county.

HISTORIAN: Corinne Smith, Engineer

Arkansas Bridge Recording Project, 1988.

LOCAL HISTORY

Craighead County was created on February 19, 1859, from three parent counties: Greene, Mississippi, and Poinsett. William A. Jones, a representative for three counties in the northeast corner of Arkansas, actively pursued the organization of the new county, but another representative from that area, Thomas B. Craighead, opposed Jones' proposal. In early 1859, with Craighead absent, Jones pushed the bill for the new county through the state senate. Emphasizing his opponent's defeat, Jones put Craighead's name on the bill as the name of the new county. (1)

The eastern third of the new county contained rich timber land mixed with swamps. The St. Francis River, flowing from North to South, separates this area from the rest of the county. The tract of land along the rivers called the Sunken Lands because the river channel sunk during the earthquakes of 1811-12. The county seat, Jonesboro, lies seventeen miles west of the river. The land east of the St. Francis became known as the East Bottoms. (2)

Lake City, a port on the west side of the river, was the largest community near the bottoms. After the Civil War, people were attracted to the timber industry opportunities in the bottoms. The growing eastern community warranted the establishment of a second county seat at Lake City in 1883. Prior to this time, a direct route had not existed between Lake City and Jonesboro. The construction of a road between the two cities was as important as the new courthouse that was built. The highway across the county made Lake City a major stop for travelers going west. The new county seat underwent several name changes before 1883: up to and prior to 1848, Lake City was called Old Town, but this name was changed in the 1870s when the community could not open a post office because another Old Town, Arkansas, already existed; in 1877 a post office was established

for Sunk Lands, Arkansas, at the site of what had been Old Town; the name of Lake City, formally used after 1881, was derived from the city's location on a particularly wide portion of the St. Francis River.

In 1898 the Jonesboro, Lake City, and Eastern Railroad developed, bringing new business and growth to Lake City. Sawmills, stores, a cotton gin, and a new school were built. Prosperity led to the incorporation of Lake City on February 7, 1898.

EARLY RIVER CROSSINGS

Incorporation of Lake City made the need for a proper river crossing more feasible. For over thirty years, the only way to cross the mile-wide St. Francis at Lake City was a ferry. William Tweedell started a lucrative ferry business in 1866. He and his wife Edith, a Canadian and a New Yorker, helped the economy of Lake City by providing a means of crossing the river. Steamboat travelers on the St. Francis also stopped to eat and lodge at the Tweedells'.(3)

Along with the steady, if not increasing, income of the ferry business, came certain risks. William Tweedell drowned on Christmas Day, 1878, when he fell from the ferry during a crossing. The business was continued alone by Mrs. Tweedell until she married Harry M. Stroud on September 16, 1881. Stroud operated the ferry until his death on March 1, 1885. Within a year Mrs. Tweedell-Stroud had found a new ferry operator and husband in John J. McBroom. McBroom, a retired riverboat captain and veteran of the Mexican and Civil War, charged one dollar per wagon in 1894. (4) The growing population of the east bottoms had no choice but to pay this extravagant

fee because McBroom offered the only passage across the river. On November 24, 1894, a correspondent for the Craighead County Sun reported that:

The only man in this country making any money is the ferryman. If a person would go to Lake City and see the wagons backed up, waiting to go across the river, they would think that Captain John McBroom is the only lucky man in the County.

Eventually, the ferry could no longer keep up with the increasing traffic from the bottoms, and McBroom's death in May, 1895, made passage across the St. Francis more uncertain. Residents of the bottoms campaigned until 1898 for a bridge at Lake City. In that year a one-lane wooden bridge spanned the mile needed to connect the east and west shores of the St. Francis at Lake City.

The first bridge was a wooden deck supported by wooden pilings. An act of Congress on March 3, 1896, authorized construction of a bridge at Lake City. The plans approved on September 24, 1897, were for a lift span providing 32 feet vertical clearance over the then highest known water and 30 feet horizontal clearance.(5) The bridge, an improvement over the ferry, still presented problems to its user. Turnouts every quarter mile were provided for passing, but a meeting of two vehicles halfway between turnouts meant one person would have to back up. This inconvenience caused a great number of fights on the bridge. (6)

The wooden structure was not designed to withstand the constant use it received and in 1912 the residents of the bottoms and Lake City began a campaign for a new bridge. County Judge W.A. Maywood promised a replacement bridge by mid-February of 1913, allowing only sixty days for its construction.(7)

The second bridge was essentially a duplicate of the first in steel with concrete pilings, so while the new structure was sturdier, the problems of a single lane passage were still very evident.

Unlike the first bridge, this steel pony truss had a swing span to accommodate river traffic, although according to the reports of the Corps of Engineers in Memphis, the second bridge was supposed to have a vertical lift span: in 1929 when a third bridge design was being discussed, Lt. Col. F.B. Wilby told the state highway commission that the Corps did "not have any record of authorization for the swing span now in that (the 1913) bridge." (8) Design of the bridge did not take into account the automobile traffic that would soon ensue after its construction, and by late 1928, the state highway commission was considering building a third bridge at Lake City.

BRIDGE CONSTRUCTION

A field survey in October 1928 concluded that the streambed of the St. Francis River at Lake City was unchanging and a channel could not be cleared for more waterway. A new steel and timber bridge was recommended with a 20-foot-wide roadway of laminated-treated asphaltic carpet flooring, to handle two-way traffic on Route 18. By mid-December of the same year, E.H. Flannery, the Office Engineer for Craighead County, had told the Bureau of Public Roads that a new Lake City Bridge would be included in the 1930 construction program of the Arkansas Highway Commission.

By late April 1929, S.H. Lee, the District Engineer in Jonesboro, had prepared preliminary layouts of the new bridge. He forwarded tracings of the layouts to bridge engineer N.B. Garver at the highway commission. The proposal for the new bridge became official in paperwork on April 26, 1929, when an index card of pertinent data for the bridge was set up at the commission.

An article in the Arkansas Gazette notified the public and the Corps of Engineers about the highway commission's plans. Lt. Col. Wilby wrote a letter to the commission outlining the

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military's concerns for the new bridge. Wilby wanted at least 24 feet of navigable channel, as provided at Ash Camp, 28 miles downstream from Lake City. The channel should be opened by a "true draw span of some type and not . . . a removable span" (9) The highway commission assured the Corps that the required clearance would be a criteria for the bridge design, which had not been started yet.

In October Flannery contacted Garver and his supervisor, S.C. Christian, to discuss the federal aid for the bridge and the "terms of the project agreement." (10) Unfortunately any aid and contract agreements that had been decided upon were nullified with the crash of the stock market on October 24, 1929. Subsequently, the pace of designing and constructing the St. Francis River Bridge slowed to a crawl. Four bills of approval and almost five years later the bridge was completed.

The first congressional act, Public No. 478, was passed on June 20, 1930. The act specified that no tolls could be charged on the bridge at Lake City. The other recorded event of the year was Garver's reply to interested contractors that no plans and no bid date had been established yet. Private consultants, probably eager for work in the bleak economic climate, were told by Garver that the bridge would be designed by the state.

Bridge activity in 1931 was almost non-existent. Garver requested information on the river depth at the site. A new levee being constructed in the northeast part of the state would raise flood levels of the St. Francis River, so the new bridge would have to accommodate almost five feet more for the highwater mark than its predecessor.

Interest in the bridge revived in 1932. The Bureau of Public Roads and the Jonesboro District Engineer approved the general structural type and river location planned for the bridge.

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Congress reinstated its authorization act in the early spring and extended the starting date of construction one year from April 15, 1932, and the time of completion to April 15, 1934. In October a public hearing was held at the U.S. Engineers Office near Memphis for citizens to voice any suggestions or objections to the proposed bridge. No comments from Lake City or east bottom residents are filed with the state highway records. Apparently the hearing was uneventful, and no serious objections were raised--possibly because the meeting was held fifty miles away from Lake City.

Despite the renewed activity of the state, Corps of Engineers, and federal agencies on the St. Francis River Bridge in 1932, the preliminary drawings had not been started by the close of the year. So 1933 opened with another request for a Congressional extension. Congressman W.J. Driver was responsible for presenting the bill for the St. Francis River Bridge each time. He kept the highway commission informed of the status of the bills with telegrams.

The National Industrial Recovery Act was passed on June 16, 1933. NIRA established \$3.3 million in the Public Works Administration for civic projects. The Federal Government planned to pump money into the economy to spur on recovery from the depression. This fund inspired hope in Lake City that the money needed for the bridge would soon be available. District Engineer C.E. Swain inquired of W.W. Zass, Acting Chief of the highway commission, about the status of the project, urging that the St. Francis River Bridge "should be among the first submitted under the National [Industrial] Recovery Act." (11)

By the end of July 1933, Garver had nearly completed plans for a bridge with steel I-beam stringers, a concrete floor, and concrete pilings. Swain tentatively approved the design, with the

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stipulation that the total cost was not greater than the amount allotted by NIRA. (12) The design included a vertical lift span that would provide the passageway required by law for navigable rivers, with the dimensions requested by the Corps. Realizing that the St. Francis was seldom navigated, Garver requested permission from the Corps to modify the plan to a fixed span that could be converted to a vertical lift later. Major Edwin C. Kelton, the Acting District Engineer for the Corps, thought the current design was satisfactory and that the proposed modification was radical. He maintained that another public hearing would have to be held locally to discuss the change. Apparently Kelton's reply discouraged Garver, and he abandoned the idea of temporarily fixing the span. No other mention is recorded, and the completed bridge has a vertical lift. Garver's request was prophetic, however, because the span was only ever lifted once. (13) The final design was approved by the Corps of Engineers and the War Department in late October. Another continuance of the Congressional authorization was needed to make the bridge legal. Congressman Driver reintroduced the bill to Congress in March, 1934, and received sanction for the construction which was already underway. The contract had been let to the Vincennes Bridge Company on October 17, 1933.

Construction began ten days after the Vincennes Bridge Company received the bridge contract. For months the Corps of Engineers and Garver had been discussing the method of clearing the river to allow construction to proceed through the winter.(14) Even so, the Bureau of Public Roads was dissatisfied with construction progress. One problem encountered was the fracture of one of the driven concrete piles in March. Instead of holding up construction more by pulling the pile out and replacing it, the supervising engineer replaced the damaged concrete and wrapped a collar

around the new section of the pile. (15) Piling continued, and by July the completion date was set for the end of August 1934.

BRIDGE CELEBRATION

The residents of the east bottoms were anxious for an end to the bleak era. In early 1934, the Lake City Chamber of Commerce formed to find ways to alleviate the economic depression in Lake City. The emerging new bridge spawned the idea of staging a celebration for the opening of the bridge. On July 25, the president of the Chamber of Commerce, Joe Clay Young, invited N.B. Garver to the two day festivities planned for August 31 and September 1. Later the celebration was postponed one week to accommodate a lag in completion of the bridge. Even this date was tentative until Thursday, September 6, when the resident engineer, Ted Pelton, announced that the bridge would be completed by 7 a.m. Friday morning. The Jonesboro Daily Tribune reported that Thursday to be rainy, but the excitement in Lake City did not dampen; several thousand people were expected to arrive for the festivities.

At ten o'clock Friday morning a local band held a concert. Joe Clay Young delivered the welcome address and introduced state senator Charles B. Gregg of Jonesboro. Gregg recounted how he had been the first man to cross the first bridge at Lake City in 1898. The key speaker for the celebration was to have been Governor J. Marion Purcell, but he was unable to appear. Instead, Craighead County Judge Gordon Keller, Ted Pelton, contractor W.L. Sharp, Vincennes Bridge Company contractor Seymour Riddle, state highway commissioner James R. Rhyne, and a few Jonesboro businessmen spoke about the new bridge. A luncheon for visiting newspapermen, mayors,

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and "other prominent guests" attracted speakers from Craighead County and neighboring Mississippi County. Talking about the bridge and the eastern part of the county continued to be the main event of the day as Congressman Driver gave a dedication address in the early afternoon.

For those who did not enjoy all the speeches, the celebration picked up in the afternoon. An air circus highlighted Friday afternoon, drawing a large crowd for the grand parade through Lake City. The culmination of the day's events was to be the crowning of a bridge queen. The princesses and their maids rode through the parade to a beauty revue at its end. A newsreel of the parade and bridge was made to be viewed later in Jonesboro and neighboring towns. The parachute jump at 5:30 ended the afternoon activities. The Jonesboro Daily Tribune projected that ". . . prospects for at least 5000 people loomed by nightfall." (16)

At ten p.m. the Richard Diggons orchestra from Memphis sounded the first notes of the Queen's Ball. The crown was awarded to Miss Ida Francis Metz of Jonesboro. Miss Metz accepted the title by saying "It is indeed an honor and a surprising pleasure to have been selected your bridge queen, and I'm glad that I have a part in presenting this magnificent and beautiful structure." (17)

After another band concert the next morning, Queen Metz christened the new bridge. "Then she dismounted from an automobile and walked to a corner of the steel tower, and climbed upon the railing of the bridge to christen it" with a bottle of beer.(18) The newspapers of the day had a discrepancy on how Queen Metz christened the bridge. One reported that she called it the "Lake City-St. Francis River Bridge", and the other that she called it the "St. Francis River Bridge." In highway commission correspondence it was referred to as the Lake City job, the bridge over the St. Francis, or the bridge at Lake City. The plans labeled it the bridge over the St. Francis at Lake City

or the St. Francis River Bridge. The plaque on the bridge does not use the word 'bridge,' but it does say "St. Francis River."

The carnival and air circus continued Saturday afternoon after the christening. The Jonesboro Evening Sun reflected on the two-day celebration and estimated it was ". . . the largest crowd ever to pour into any of the smaller eastern district towns." (19) The bridge celebration was definitely very successful as a temporary boost to the Lake City economy. The spirits of the Lake City and east bottoms residents were undoubtedly lifted after five years of depression; the completion of the long-awaited bridge promised better things to come.

VINCENNES BRIDGE COMPANY

The Vincennes Bridge Company in Vincennes, Indiana, was initiated by John and Frank Oliphant and Jacob Riddle in 1898. For the first two decades they built county and township bridges in Indiana and Illinois. When state highway departments were organized in the 1920s, the company was able to expand its operation to North Carolina, West Virginia, Alabama, Kentucky and Arkansas. The company continued to specialize in simplified structures that "emphasized function and economy more than elegance and novelty." The Vincennes Bridge Company became the largest metal fabricator in Indiana when the capital stock was increased from \$50,000 to \$75,000 in 1927. The company continued to build the bridges it fabricated while other fabricators became subcontractors.

In 1932, the officers of the bridge company incorporated the Vincennes Steel Corporation, using the holdings of the parent company. Industrial Enterprises, Inc. of New York City purchased

the corporation of \$1 million dollars in 1956. Sales were expected to top \$2.5 million that year, with net earnings at \$250,000. The New York Company, later known as Novo Industrial Corporation, was a diversified manufacturing, transportation, and service enterprise.

BRIDGE DESCRIPTION

The St. Francis River Bridge spans 3412 feet across that river at Lake City, Arkansas. This length is composed of 109 31-foot long steel I-beam trestles and one 31-foot long vertical lift span. The lift span is the seventh span from the west (Lake City) side of the bridge. A clear roadway width of 24-feet provides two lanes of traffic.

The I-beam trestles are simple structures formed by five I-beam stringers with their ends resting on reinforced concrete piers. The rectangular piers are hollow and filled with gravel. Pre-cast octagonal concrete piers reinforce the ground underneath the piers. A reinforced concrete slab forms the bridge deck. A concrete rail at a height of 3 feet frames into the 1-foot-square concrete posts, spaced 5 feet apart.

The vertical lift span has six I-beam stringers, supporting a reinforced concrete deck, that frame into I-beam girders at either end of the span. The 37 foot height of the lift towers makes this span visually prominent next to the trestle spans. The four towers are double angles forming trusses that are cantilevered upward from the deck. Pairs of towers at each end of the span are braced with two portal trusses. Sheave wheels, 4 feet in diameter, at the top of each tower guide the cables that lift the span. The plough steel cables are twisted from six strands of nineteen wires each. One end of each cable is pulled through a plate attached to the top of a girder and embedded in the deck. The

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other ends of the cables hold the pre-cast concrete counterweights which balance the weight of the vertical lift span.

The span is lifted by turning a hickory handle which is keyed into the capstan in the center of the span. The torque on the handle operates two perpendicularly set gears. A shaft transfers the turning force to drums in each tower. The cable is wrapped six times around the drum. As the drum is turned, it travels along the cable, raising or lowering the span. The span can be lifted about 20 feet above the normal deck level. A bracket protrudes from each tower to impede further upward movement. A brake drum around the principle shaft is operated by a foot pedal near the capstan. A lock at either end of the span prevents unintended motion.

ENDNOTES

1. Goodspeed, Goodspeed's History of Craighead County, Arkansas, (1964).
2. Charles A. Stuck, The Story of Craighead County, Arkansas, (1960).
3. Hershel (Plug) Eaton, "Lake City Elects a Bridge Queen: The Dedication of the St. Francis River Bridge," Craighead County Quarterly, Vol. XXII, Winter, No. 1. p.1.
4. Ibid., p.2.
5. Lt. Col. F.B. Wilby, Corps of Engineers, letter to Arkansas Highway Commission, May 20, 1929, Arkansas Highway and Transportation Department.
6. Eaton, p.3.
7. Ibid., p.3.
8. Wilby.
9. Ibid.
10. E.H. Flannery, Craighead County Office Engineer, letter to S.C. Christian, highway engineer, October 14, 1929, AHTD.
11. C.E. Swain, District Engineer, letter to W.W. Zass, Acting Chief of Arkansas Highway Commission, July 20, 1933, AHTD.
12. C.E. Swain, District Engineer, letter to W.W. Zass, Acting Chief of Arkansas Highway Commission, July 27, 1933, AHTD.
13. Elvis "Cotton" Taft, interview with author, July 7, 1988. Mr. Taft, a lifelong resident of Lake City, recounted that the span was only lifted once. About a week after the bridge opened, Taft brought a houseboat up the river and under the bridge. Taft has lived most of his time in Lake City on the river bank within two hundred feet of the bridge, and has never seen the bridge lifted again.
14. C.E. Swain, District Engineer, letter to W.W. Zass, Acting Chief of Arkansas Highway Commission, September 26, 1933, AHTD.
15. W.W. Zass, Chief Engineer, letter to J.M. Page, Highway Engineer of Bureau of Public Roads, August 20, 1934, AHTD.

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16. "River Bridge Fete Draws Big Crowd," Jonesboro Daily Tribune, (September 7, 1934), p.1.

17. "Bridge Queen Honor Goes to Jonesboro Girl," Jonesboro Evening Sun, (September 8, 1934) p.2.

18. Ibid., p.2.

19. Ibid., p.1.

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Jonesboro Daily Tribune. September 5, 1934 - September 8, 1934.

Jonesboro Evening Sun. September 7, 1934 - September 8, 1934.

"Lake City Bridge Dedication Today." Osceola Times. (September 7, 1934).

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