

HISTORIC AMERICAN ENGINEERING RECORD

OUACHITA RIVER BRIDGE

HAER No. AR-19

LOCATION: US Highway 167, spanning the Ouachita River. Calion, Union County, Arkansas.

UTM: 15/3689490/543535

Quad: Calion

DATE OF
CONSTRUCTION: 1930

CONTRACTOR: Keliher Construction Company of Little Rock, Arkansas.

PRESENT OWNER: Arkansas Highway and Transportation Department, Little Rock, Arkansas.

PRESENT USE: Vehicular Bridge

SIGNIFICANCE: The Ouachita River Bridge at Calion is a good example of the cantilever design used in Arkansas in the late 1920s and early 1930s. The bridge is also significant because it united the southeastern and southwestern quarters of Arkansas, which the Ouachita River separated. It also opened a direct route from Little Rock to El Dorado.

HISTORIAN: Corinne Smith, Engineer.

Arkansas Historic Bridge Recording Project, 1988.

LOCAL HISTORY

The community of Calion was named for its location in northeast Union County on the border of Calhoun County. Union County was organized in 1836 from parts of Hempstead and Clark Counties, and presumably named for the federal union of states, "but some say the name grew out of the unison of feeling that existed at the time the county was created."(1)

Over the next thirty years, portions of Union County were used to create new counties; in 1850 a northeastern section was added to Calhoun County but, twelve years later, some of that land, including the settlement of Calion on the Ouachita River, was returned to Union County.

Calion started out as the El Dorado Landing, a port on a high bluff only twelve miles from El Dorado, the county seat of Union County. The landing was almost forgotten when the Cotton Belt railroad came through El Dorado in the late nineteenth century. The Rock Island railroad came to the old landing in 1902, and Calion grew where the port had been.

Accessibility by rail and the nearby pine woods made the community a prime location for a lumber mill to be built by the Thomas family in 1916. The mill thrived during the 1920s, but suffered during the Depression. The town was given a boost in 1932 when a shipping terminal and docks were built by a new barge line. Calion became a shipping point for cotton on its way to New Orleans.

By the 1950s, the mill had regained its footing and used its profits to improve the living conditions of Calion residents by constructing pre-fabricated homes for mill employees and organizing a federally subsidized waterworks.

The 1980 census recorded 638 people in Calion, 47 percent of whom were black. Calion

residents make up half of the mill's 125 employees, while a few businesses and churches in town also provide limited employment.(2) State Highway No. 167 on the west side of Calion connects the community easily to El Dorado for commuters.

DESIGN PROCESS : PUBLIC HEARING

The highway to El Dorado had not always been convenient to commuters because a bridge did not carry the highway across the Ouachita River at Calion. When the bridge was considered in 1929, objections were made on the grounds of inconvenience to river traffic: the citizens fought the highway department on the vertical clearance of the bridge, and the Corps of Engineers fought them on the location and horizontal clearance. Eventually, the highway department gave in to the clearance demands.

Congressional approval for a bridge over the Ouachita River on State Highway No. 167 to the north of Calion was first given on March 12, 1928. The section in the act about operation as a toll bridge was amended May 25, 1928, to specify that the bridge would be operated as a free bridge once all bonds for construction had been repaid.

This act called for a bridge which followed the general guidelines of the act of March 23, 1906, concerning the construction of bridges over navigable waters. River navigation could not be inhibited by any structure built over the river (see HAER Report No. AR-8). The people on the Ouachita River were concerned with the vertical height of the proposed bridge: the federal government had spent over seven million dollars to make the river navigable; three million alone had been spent on locks between Calion and Monroe (14), and many businesses relied on the river for transporting items through Calion.

In May 1929 Captain Edward Dignowity, an executive assistant with the Corps of Engineers, sent the state highway department bridge engineer, N.B. Garver, the required vertical clearances for various types of bridges. A swing bridge would need to be 5 feet above highwater; lift bridges and fixed spans would have to provide 55 feet of vertical clearance.(3) A reduction of 5 feet would delay some boats an average of fourteen-and-a-half days in a twenty year period, and a reduction of 15 feet would delay some boats as much as 922 days in a twenty year period.(4)

After congressional approval was renewed in early June of 1929, the highway commission submitted its application on June 20. Local residents started organizing a formal complaint against the highway commission's proposed fixed-span bridge, which only allowed 40.14 feet vertical clearance above highwater. A similar discontentment over the proposed bridge at Felsenthal, Arkansas, was being voiced.(5) At the public hearing on July 12, 1929, Luther Ellison, secretary of the Camden Chamber of Commerce, implored the state, "We have begun to build the thing [river navigation] up to a profitable basis now and for goodness sake let's don't put a fence around it."(6)

Highway Commissioner Justin Matthews argued against raising the bridge higher by claiming that "excessive heights on projects of that kind tended to frighten persons in the crossing and caused considerable expense to the autoist (sic) in propelling his car on steep upgrades."(7) In fact Matthews was probably less worried about the timidity of motorists than he was about the six thousand dollars required per additional foot of vertical clearance, totalling sixty thousand dollars for the residents' request. Camden shippers preferred a lift or turn span, but the annual cost of a twenty-four hour attendant was prohibitively high. A lawyer from El Dorado suggested that steamers put hinges on their smokestacks so they could lower the stacks to pass under the bridge.(8)

The complaints at the public hearing contributed to the Corps of Engineers' decision to disapprove the bridge application. Major Lee, the district engineer, would consider a bridge that provided 50 feet vertical clearance. The horizontal clearance was satisfactory if the highway department moved the bridge 1000 feet further downstream. The department originally planned to put the bridge a mile-and-a-half northeast of Calion. The location Lee suggested posed problems with property belonging to the mills and lumber yards. If the first location was used, however, Lee demanded that the horizontal clearance be increased to 250 feet from 200 feet.(9) The added cost of increasing the horizontal clearance as well as the vertical must have convinced Garver to move the bridge. A new vicinity map was drafted on August 12, 1929, for re-siting the bridge.

Garver increased the vertical clearance to 49.25 feet, according to a bridge at Johnsville on the Saline River. Apparently he had misunderstood Lee during a conversation on the bridge height. At the end of August, Lee told Garver that the Ouachita Bridge had to be higher than the bridge at Johnsville. The increase to fifty feet is not shown in the highway drawings, but a grade change is noted on November 17, 1929, so the incline of the approaches must have been changed. Another application was submitted to the War Department on September 5 and approved.

KELIHER CONSTRUCTION COMPANY

The contract for the bridge had been let while the first application was undergoing the Corps' review. Keliher Construction Company won the contract on July 15, 1929, with the low bid of \$376,992.83. The state's estimated cost had been \$426,569.83.

Not much is known about the Keliher Construction Company. In 1920 Lester J.N. Keliher was listed as a contractor in the Little Rock city directory. He and his wife Hilda had not been

residents the previous year. By 1930, the Kelihier Construction Company had its own listing in the directory, but by 1934 the Kelihers and the company had left Little Rock. The Ouachita River Bridge may well have been a larger project than any the company had previously undertaken.

BRIDGE DESCRIPTION

The Ouachita River Bridge has two lanes and a total length of 2500 feet, comprised of one 240 foot long Parker through truss flanked on each side by three Pratt deck trusses averaging 141 feet in length, and a 900 foot concrete approach on the west and a 514 foot concrete approach on the east.(15) All the deck trusses have seven panels and are 24 feet deep. Only the end two are true Pratts with double diagonal bracing in the center panel. The deck trusses immediately on either side of the through span have diagonals all oriented in the same direction. The end panels of the twelve-panel Parker overlap the end panels of the deck trusses, so the Parker's second panel point is over a concrete pier. The third panel point at the bottom chord is connected with a double channel section to the same bearing shoe as the end of the deck truss. The center two panels of the Parker, at a height of 32 feet, have double diagonal bracing.

The diagonals for all the trusses, like the chords and verticals, are built from double channels or angles joined together by plates or lacing. The angles are joined with batten plates for the diagonals in the two spans on either end. Channels with lacing and batten plates are used for the rest of the diagonals and the verticals throughout the bridge. The bottom chord of double channels also uses lacing and batten plates except for the four end spans, which use the plates alone. The top chord on the deck trusses is two channels with batten plates and lacing on both sides; on the through truss, the top chord has a continuous top plate.

The I-beam floor girders rest on the top chord of the deck trusses and are riveted to the bottom chord and verticals of the through truss. The girders are over twice as deep as the bottom chord of the through truss, so the 24 foot wide road deck is almost 3 feet above the bottom of the chord. The eight I-beam stringers are riveted to the webs of the girders.

The bracing for the floor in all the trusses consists of angle bars diagonally spanning one panel. The lower lateral bracing of the deck trusses is the same. The upper lateral bracing of the through truss is comprised of two angles laced together. The lateral bracing is completed with sway bracing in the deck trusses which are identical to the upper laterals in those trusses. The portal and sway braces of the through trusses is made from laced double angles.

ERECTION PROCEDURE

The erection order of the bridge as described in Highway Drawing No. 1705 and an engineering calculation sheet was used to change the center three spans of the bridge during erection from one continuous truss to three individually acting spans after erection.(11) First all the deck trusses and the first two panels of the through truss were constructed. All joints, except those where the first verticals met the Parker top chord, were riveted. An uplifting force was applied at the two center piers to imitate the reaction there if the spans acted individually.

The center span was built as two cantilevers out from the piers and deck trusses. The middle two panels of the Parker could be adjusted during construction to make the pre-fabricated members fit correctly. Upon completion of the Parker truss, the last connection was riveted, and the rivets at A, B, C, and D in Drawing No. 1705 were removed. The remainder of the dead load, the concrete deck, was applied. Then the open rivet holes at A and B were filled, leaving slot

connections at these joints. The slots allow some expansion in the bridge. The connections at C and D were re-riveted, and the handrail was riveted into place.

BRIDGE CELEBRATION

Fifteen months after the bridge design was approved, the impending completion of the bridge was announced. At the beginning of January 1931, Fred J. Herring, a highway engineer, announced that the steel work had been completed and the final concrete slab would be poured within a few days.

The toll charges were announced as follows:

log wagon	\$1.00
wagon or buggy	25 cents
live stock	5 cents/head
trailer over 1 ton	50 cents
1 ton trailer	25 cents
trailer over 4 ton	\$1.00
truck 1.5 - 3 ton	75 cents
automobile	50 cents
(book of 10 crossings for \$2.50)(12)	

The completion of the bridge would link south Arkansas with a direct east-west route. The Ouachita River Bridge was also the final link in a \$1,025,129.19 project, including the El Dorado-Hampton Highway.(13) The residents of El Dorado began preparations for a celebration to start the new relationship between southeast and southwest Arkansas.

The first event on Tuesday, March 3, 1931, was a good will tour before the bridge was to open. About one hundred people left from El Dorado in the early morning to tour the counties and towns east of the Ouachita. The thirty-one car motorcade visited Hampton, Fordyce, Warren, Banks, Harrell, Hermitage, and Monticello.

On Friday, the dedicatory address was given by Highway Commission Chairman Dwight H. Blackwood from the center span of the bridge, which had been decorated with evergreens. Then another motorcade proceeded back to El Dorado for the rest of the festivities. The Friday program included motor boat races, concerts, a horse shoe tournament, an old fiddlers contest, dancing, and negro spiritual singing. The highlight of the day was a wedding pageant symbolizing the union of Southern Arkansas. ". . . Romance [was] rampant, excitement [was] running high and arrangements for the union of royalty were never made with more completeness of detail."(14) This characterized the feeling of southern Arkansans when the Ouachita River was spanned at Calion.

ENDNOTES

1. Juanita Whitaker Green, History of Union County, Arkansas, 1954.
2. Charles E. Thomas, Jelly Roll, (Little Rock, Arkansas : Rose Publishing Company, 1986) p.13.
3. Captain Edward H. Dignowity, Corps of Engineers, letter to N.B. Garver, state bridge engineer, Bridge No.1230, Job No, 7108 files, Arkansas Highway and Transportation Department, May 6, 1929.
4. Dignowity to Garver, July 9, 1929.
5. Felsenthal is a small town approximately twenty-five miles downstream on the Ouachita River from Calion. The design for a bridge at Felsenthal was being drafted and bid in the same time period as the bridge at Calion.
6. "Agreement Reached on Calion Bridge Height," Camden Evening News, (July 12, 1929), p.1.
7. Ibid., p.1.
8. "Bridge Plan Arguments Are Heard," Evening Times, (July 2, 1929) p.1.
9. Major John Lee, Corps of Engineers, letter to N.B. Garver, state bridge engineer, Bridge No. 1230, Job No. 7108 files, Arkansas Highway and Transportation Department, August 30, 1929.
10. Lee to Garver, August 31, 1929.
11. "Calculations for Erection of Calion Bridge," Bridge No. 1230, Job No. 7108 files, Arkansas Highway and Transportation Department, November 19, 1930.
12. "Toll Charges on Bridge Announced," Evening News, (February 27, 1931) p.5.
13. "5000 Attend Bridge Dedication Program," Evening News, (March 6, 1931) p.1.
14. " 'East' Joins 'West' in Local Wedding," Evening News, (March 5, 1931), p.1.
15. The bridge geometry is that of Highway Drawing No. 1696 and not that of Highway Drawing No. 1694.

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Camden Evening News. (Camden, Arkansas) June 21, 1929 through July 12, 1929.

Evening Times. (El Dorado, Arkansas) June 27, 1929 through July 12, 1929 and February 27, 1931 through March 7, 1931.

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