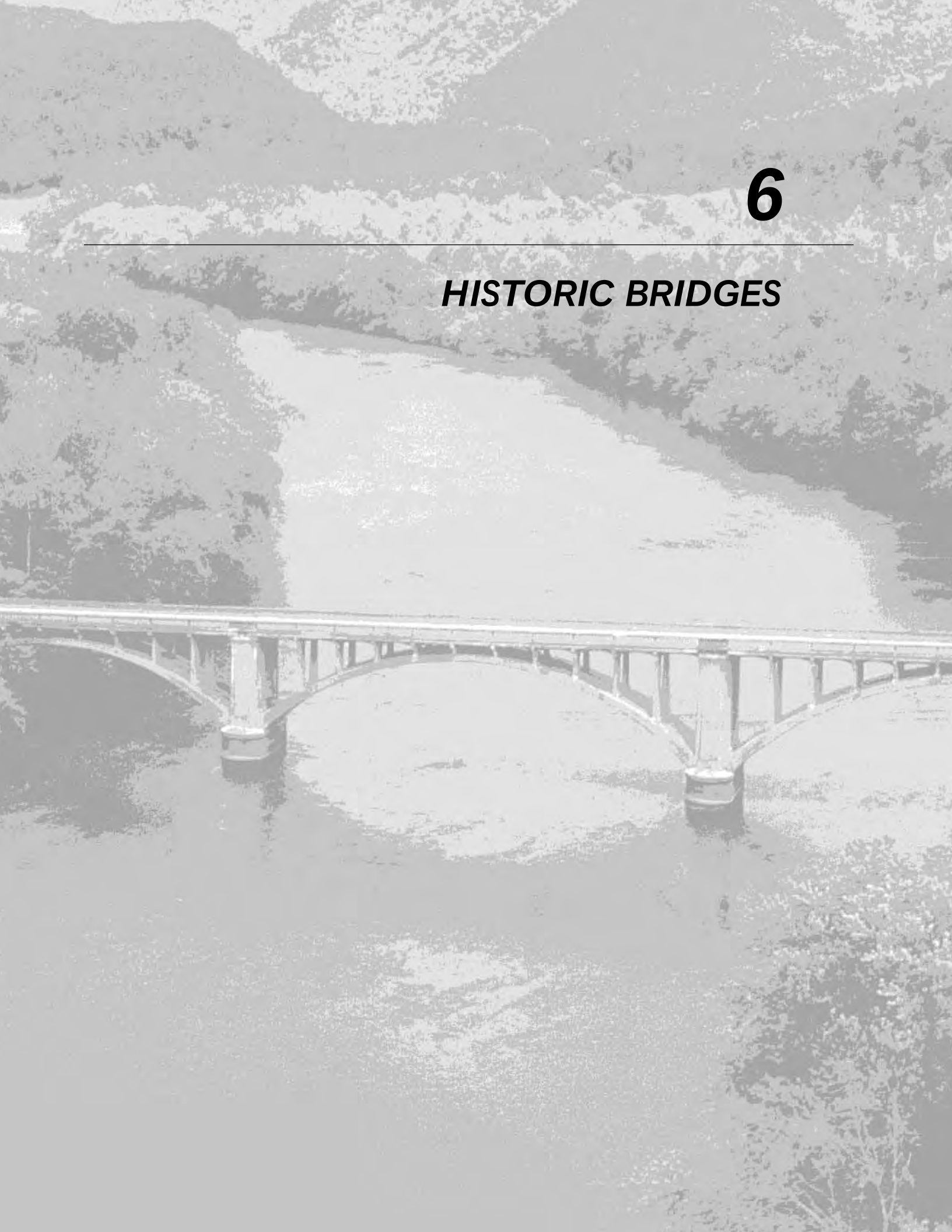


6

HISTORIC BRIDGES

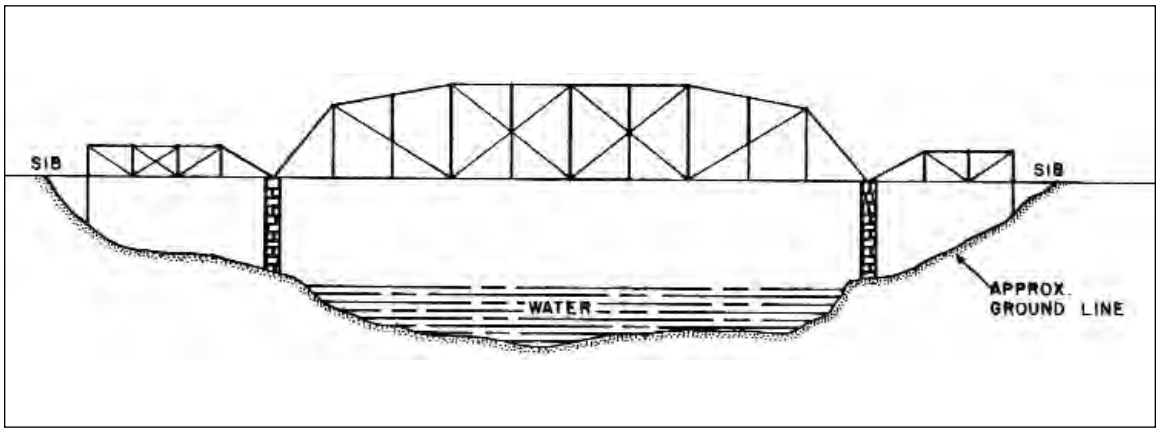
1901-1920 PERIOD

By the turn of the century, bridge design, as a profession, had sufficiently advanced that builders ceased erecting several of the less efficient truss designs such as the Bowstring, Double Intersection Pratt, or Baltimore Petit trusses. Also, the formation of the American Bridge Company in 1901 eliminated many small bridge companies that had been scrambling for recognition through unique truss designs or patented features. Thus, after the turn of the century, builders most frequently erected the Warren truss and Pratt derivatives (Pratt, Parker, Camelback). In addition, builders began to erect concrete arch bridges in Tennessee. During this period, counties chose to build the traditional closed spandrel design that visually evoked the form of the masonry arch.

Floods in 1902 and 1903 that destroyed many bridges in the state resulted in counties going into debt to undertake several bridge replacement projects. One of the most concentrated bridge building periods at a county level occurred shortly before World War I as a result of legislation the state passed in 1915 that allowed counties to pass bond issues for road and bridge construction. Consequently, several counties initiated large road construction projects, for example, Anderson County (#87, 01-A0088-03.53) and Unicoi County (#89, 86-A0068-00.89). This would be the last period that the county governments were the most dominant force in road and bridge construction.

This change in leadership occurred due to the creation of the Tennessee State Highway Department in 1915 and the passage of the Federal Aid Highway Act of 1916. However, due to funding limitations and the time needed to develop and implement a program, it was not until about 1920 that changes began to occur in the design and extent of road and bridge construction. In addition, the advent of World War I and its related shortage of materials sharply curtailed bridge construction in the late 1910s.

(#35) 52-NonHighway-3: Mulberry Bridge spanning the Elk River east of Fayetteville in Lincoln County (Mulberry Quad, 80 NW).

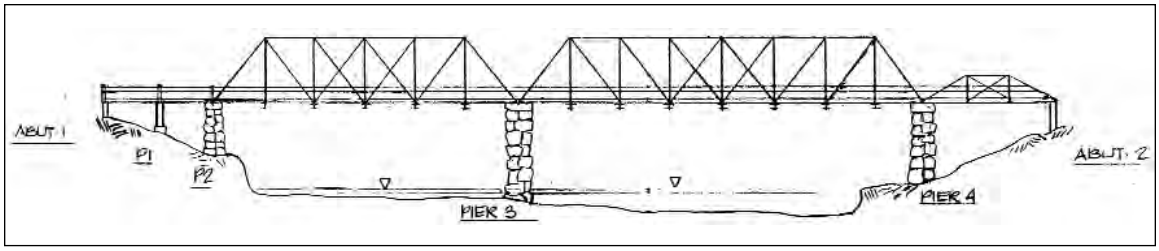


Significant under Criterion C due to unusual trusses and as example of work by the American Bridge Company.

The nationally prominent American Bridge Company built this bridge in 1901 for about $5,000. A. J. Dyer, who founded the Nashville Bridge Company shortly thereafter, was the agent. However, a legal dispute continued into 1904 over $70.76 owed to Jos. Lightman who had subcontracted to build the substructure. After several appearances before the county court, the county paid Lightman his money. This bridge served local traffic until the county abandoned it in the 1970s (Lincoln County Court Minutes Book 1897-1902:148, 231, 274, 291-292; Book 1903-1907:75, 87, 115).

The main span is a pin connected modified Camelback through truss. Two unusual riveted Pratt pony trusses flank the main truss. While the end panels next to the main truss are typical, the outside panels have vertical end posts extending below the floor beam as a truss leg or bedstead truss would. The fact that a pre 1910s Pratt truss contains riveted connections is also unusual in Tennessee. Composition of the through truss is typical. Top chords and end posts are channels with lacing. Bottom chords and diagonals are paired rectilinear eyebars. Verticals and sub struts are paired angles with lacing. Hip verticals and sub ties are paired cylindrical tie rods. Composition of the pony trusses is less typical. Top chords and end posts are channels with lacing top and bottom, and bottom chords are paired rectilinear eyebars. Verticals and diagonals are paired angles with battens. The bridge rests on a masonry substructure.

(#36) 90-A0900-00.97: Glaze's Ford/Smith Bridge spanning the Nolichucky River southwest of Jonesboro in southwest Washington County (Chucky Quad, 190 NW).

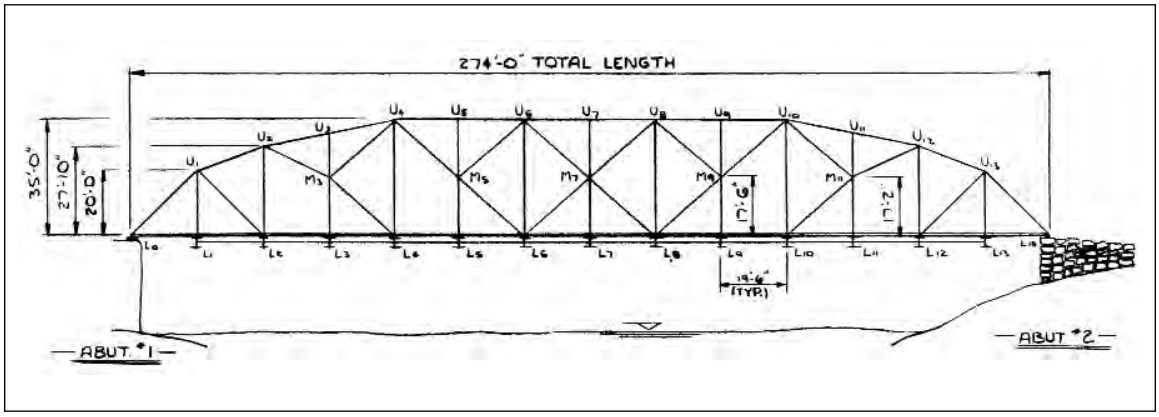


Significant under Criterion C as representative Pratt trusses by the Southern Bridge Company.

As early as 1897 Washington County began to evaluate building a bridge at this site, then locally known as Glaze's Ford. By the 1920s, the crossing was known as the Smith Bridge. However, it was not until early 1901 that the court voted to build this bridge and appointed a committee of Cy Lyle, R. P. Cloyd, and J. S. Ford. In April the court received five bids from bridge companies: Champion Bridge, $7,995; Brackett Bridge, $7,859; Virginia Bridge, $7,943; George King, $8,200; and Southern Bridge, $7,850. The county awarded the contract to the low bidder, the Southern Bridge Company. The flood of 1901 caused some delays and one pier had to be rebuilt. In October 1902 the committee reported that the contractor had completed the bridge and described it as "a first class modern steel superstructure upon massive piers of solid masonry." In 1912 the county paid for repairs to the bridge, and in 1913 the county paid Southern $2,090 to make additional repairs. E. N. Matthews who, while working for Southern on this bridge in 1902, married and settled in this area made further repairs in 1955. In 1983 the county barricaded and closed the bridge to traffic but it remains intact (Washington County Court Minutes Volume N:211, 245, 262, 286-287, 500, 562, 565; Volume Q:405, 535, 580).

The bridge contains one 140.8 foot pin-connected Pratt through truss, one 107.2 foot pin connected Pratt through truss, one 46.1-foot riveted Pratt pony truss, and two steel I-beams (originally one 39.3-foot span, it now has a steel helper bent). The bridge has a curb-to-curb width of 11.7 feet and an out-to-out width of 14.0 feet. The piers are masonry. The original steel column abutments were encased in concrete in 1955. Composition of the two through Pratts is typical. Top chords and end posts are channels with battens, and bottom chords are rectilinear eyebars. Verticals are laced angles except the hip verticals which are paired rectilinear eyebars. Diagonals are paired rectilinear eyerods, and counters are single cylindrical tie rods. The pony truss is somewhat atypical in its composition. Top chords and end posts are channels with lacing top and bottom, and bottom chords are paired angles with battens. Verticals are angles with battens, and diagonals and counters are angles. It is also atypically built on a 75° skew. It is possible that this span dates from 1902, but its riveted connections and atypical composition indicate a later date, possibly from either the 1912 or 1913 renovation.

(#37) 28-A0153-01.95: Hanna Ward Bridge spanning the Elk River near Poplar Hill in southeast Giles County (Elkton Quad, 66 SW).



Significant under Criterion C as a representative Pennsylvania Petit truss bridge and a late example by the King Iron Bridge Company.

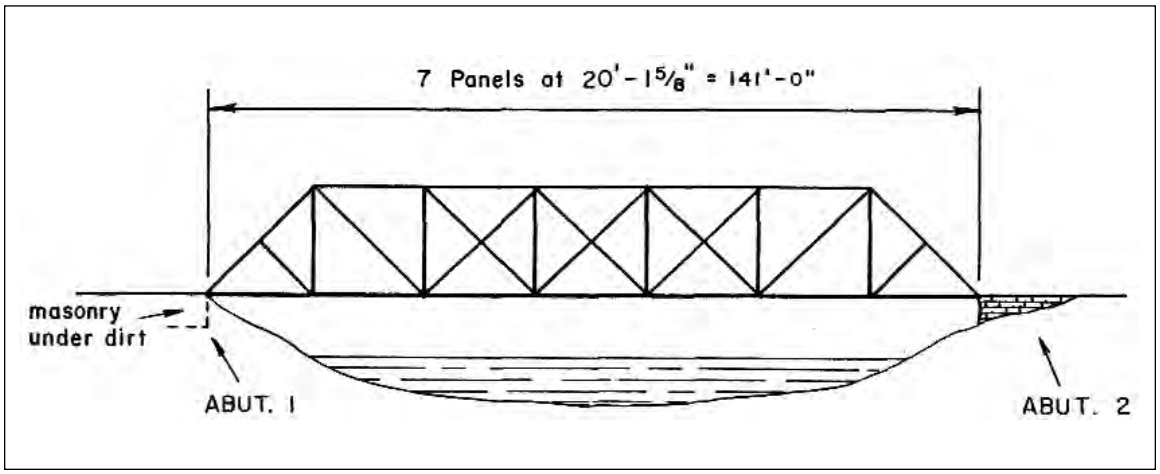
On 28 March 1902 a flood caused great destruction in Giles County killing at least ten people and washing away numerous bridges including one at this site. The county quickly moved to replace these bridges, allocating $30,000 for new bridges. At its 7 April 1902 regular county court meeting, the court appointed a special bridge committee of J. D. Pullen, O. S. Smith, R. L. Culps, and A. J. Powell. On 17 April 1902 the committee let a contract for a new bridge at this site to King Bridge Company. The contract called for King Bridge to furnish the superstructure, which was to consist of one 272-foot span 16 feet wide, for $6,700, and to be completed by 17 October 1902. The county contracted separately with Jones Smith for $900 in August for the masonry substructure with a concrete base below water (Edwards 1978:103-104; Giles County Court Minutes Volume A:565-566; *Giles County Record* 5 April 1902; *Pulaski Citizen* 3 April 1902).

This is one of the few bridges in the state reputed to be haunted. The legend contends that Hannah Ward with her baby in her arms is pursued either by Indians or Federal troops (the versions vary) across the bridge until she leaps to her death in the river below. Local lore says that several residents have heard the sound of the hooves of the pursuers' horses as well as Ward's screams as she jumps.

The bridge is composed of one span, a 274-foot pin connected Pennsylvania Petit through truss with a curb-to-curb width of 16 feet and an out-to-out width of 18 feet. The western abutment is masonry while a timber pad on a natural rock bluff forms the other abutment. The bridge has an elaborate portal with latticed portal bracing and knee bracing containing a star flanked by two pear-shaped openings. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are channels with lacing except hip verticals which are paired rectilinear eyerods. Diagonals and counters are paired rectilinear eyerods.

In 1988, the county removed the bridge deck and barricaded the road and bridge, bypassing it as a historic ruin.

(#38) 81-NonHighway-2: Handicapped Fishing Bridge spanning South Cross Creek in the Cross Creeks National Wildlife Refuge in west Stewart County (Cumberland City Quad, 38 NW).

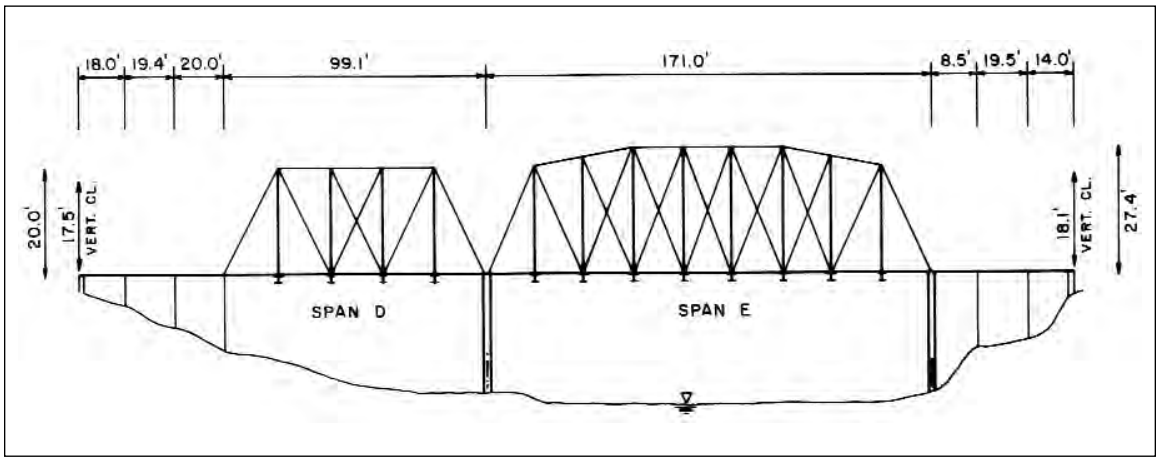


Significant under Criterion C as an atypical Pratt truss bridge by the American Bridge Company.

About 1901 Stewart County hired J. M. Johnson, an engineer recommended by the Louisville and Nashville Railroad, to prepare plans and specifications to use to advertise for bids for a bridge at this site. In December 1901 the county opened bids from four companies: Nashville Bridge, Converse Bridge, American Bridge (all of whom had agents present) and from Champion Bridge (who had mailed in a bid). The county then contracted with American Bridge whose agent was W.T. Young. Members of the bridge committee were J. G. Robertson, J. H. Lory, J. W. Rice, R. E. Thomas, Edward Schober, and R. L. Lowry. The bridge, which opened to traffic 6 August 1902, cost the county $2,689.49. These costs included $2,200 to American Bridge for the superstructure; $52.75 for lumber at $5 per mil; $275.83 to C. C. Sykes for masonry at $4.50 per yard; $9 to A. Fisher for approaches; $100 to the engineer Johnson; $15.25 for livery fees; and $36.66 in interest on deferred payments (Stewart County Quarterly Court Minutes Volume 1:174-180). The road containing this bridge roughly served the same traffic corridor as State Route 49 that the state built in the 1920s. Several years later, the county abandoned this route. In recent years, the Cross Creek National Wildlife Refuge has used it as a handicapped fishing pier as well as a crossing on a pedestrian trail.

Perhaps because a national firm fabricated the truss instead of a local company, several features are unusual. The bridge contains one span, a Pratt through truss. At 141 feet, it is unusually long for this period. The end panels contain a diagonal compression member, a feature rarely seen in Tennessee. The bridge has a curb-to-curb width of 13 feet and an out-to-out width of 15.1 feet. The composition of members is atypical. Top chords and end posts are offset channels without lacing or battens. Bottom chords are paired rectilinear eyebars, which are below the floor beams. Verticals and diagonals in the end panels are channels with battens. Other diagonals and counters are paired rectilinear eyerods. Decorative features include a latticed portal with arched knee bracing. The only sway bracing used is a set of arched knee bracing.

(#39) 82-A0872-00.05: Old Central Holston Bridge spanning the South Fork of Holston River in west Sullivan County (Bristol Quad, 206 SW).



Significant under Criterion C as representative Camelback and Pratt trusses by the Cope Bridge Company.

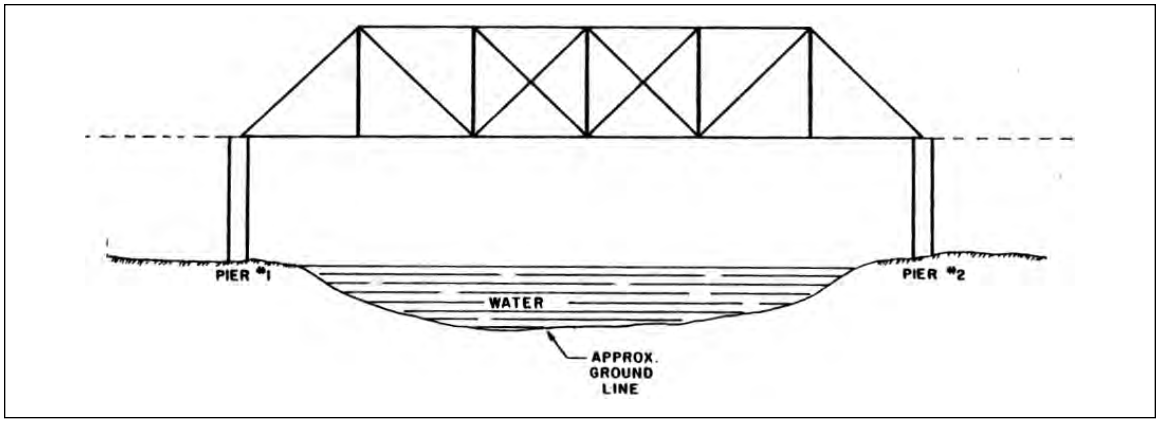
In July 1902 the Sullivan County Court appointed a committee of J. H. Carrier, N. D. Morton, A. S. Bullock, A. McClellan, N. O. Crumley, W. B. Simesly and J. A. Booher to locate a site for a bridge in this general area and to get cost estimates. In October the committee reported that the Patton Furnace Stack Site was the best location and that it had received bids from several companies with the Cope Bridge Company's bid of $6,799 being the lowest. By a vote of 36 to 3, the court approved letting a contract 1 October 1902 with Morris and O. J. Cope to build a 340-foot bridge containing two spans 170 and 100 feet long by 1 April 1903. The court also appointed a committee of Carrier, McClellan, Crumley, Morton, and J. B. Sinclair to superintend the erection of the bridge. Some indications exist that the road may have been realigned and

the bridge relocated a short distance, possibly in the early 1930s (Boling 1930; Sullivan County Court Minutes Volume Q:85, 205-210, 218; U.S. Postal 1930).

The bridge contains two pin connected through trusses, a 171-foot Camelback and a 99-foot Pratt, and six steel I-beams (18, 19.5, 20, 18.5, 19.5, and 14 feet long). The bridge has a curb-to-curb width of 11.5 feet and an out-to-out width of 14.0 feet. The substructure consists of concrete abutments, piers of steel encased concrete cylinders connected with crossed bracing, and bents of small channels with lacing. Composition of the members is typical. Top chords and end posts are channels with battens. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are small channels with lacing except the hip verticals which are paired rectilinear eyebars. Counters are single cylindrical tie rods, except in the center panels where they are paired rectilinear tie rods.

The county barricaded and closed this bridge to traffic in 1983, bypassing it as a historic ruin.

(#40) 36-NonHighway-1: Hagly's Bridge spanning Snake Creek near Shiloh in western Hardin County (Pittsburg Landing Quad, 13 NE).

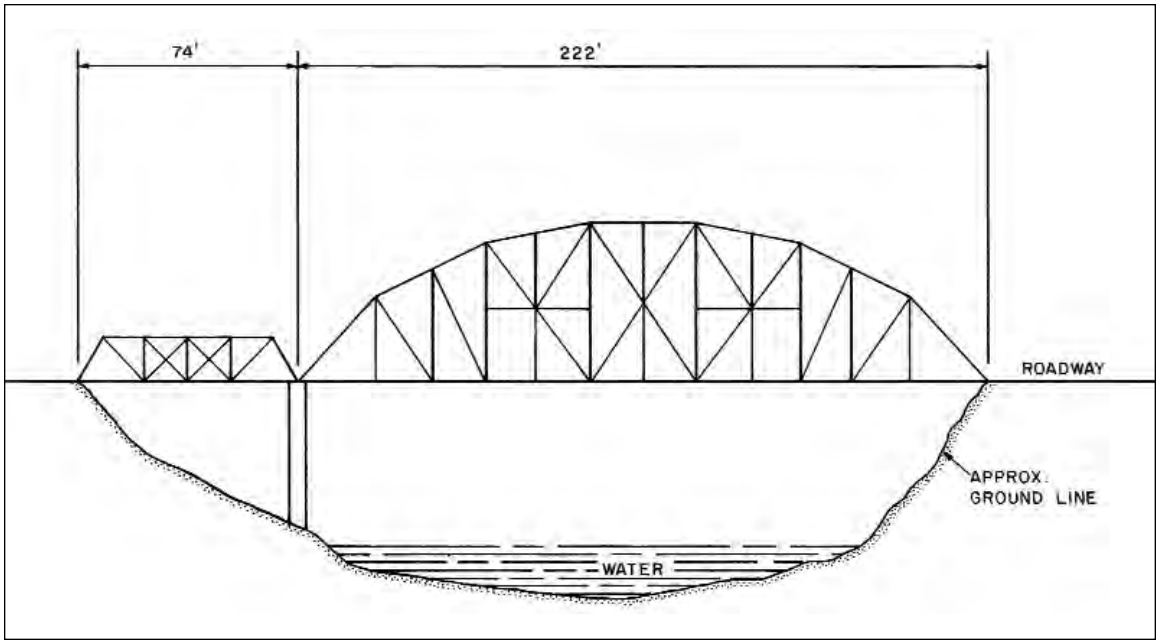


Significant under Criterion C as a representative Pratt truss bridge by the Chattanooga Bridge Company.

This bridge is located near the confluence of Snake Creek and the Tennessee River just north of Pittsburg Landing, the site of the Shiloh National Military Park. Hardin County abandoned the bridge and the roadway several years ago. The truss is intact, but the approach spans and deck have been removed.

The Chattanooga Bridge Company built this bridge for $1,290 in 1903 (Hardin County Court Minutes Book 1:216 217). It contains one span, a cotter pin connected Pratt through truss that rests on steel encased concrete tubular piers. The approach spans (which rested on a concrete substructure) have been removed. The composition of truss members is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are paired angles with lacing. Diagonals are paired rectilinear eyerods, and counters are single cylindrical tie rods.

(#41) 60-NonHighway-1: Kettle Mill Bridge spanning the Duck River west of Columbia in Maury County (Greenfield Bend Quad, 50 NE).



Significant under Criterion C as a representative Petit truss bridge and as early work of the Nashville Bridge Company.

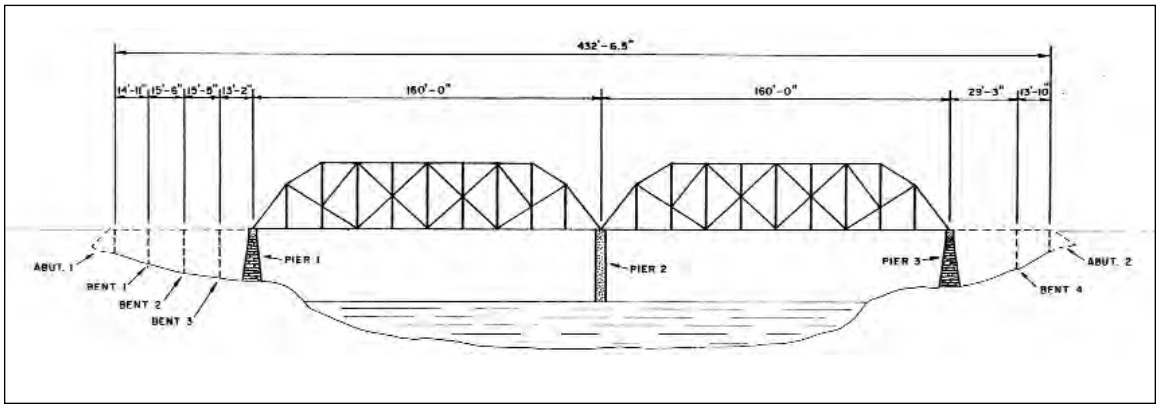
In January 1903 the Maury County Court appointed a committee of Thomas Webster, Jim Davis, and B. S. Thomas to let a contract for a new bridge spanning the Duck River at Kettle Mills. In October the court appointed T. H. Nixon to the committee to replace Thomas who had died. In January 1904, W. Delk replaced Davis. The bridge committee contracted with the Nashville Bridge Company for $9,995. Local citizens donated the right-of-way and built the

approaches. The committee reported in January 1904 that the contractor had completed the bridge, except for the approaches, (*Columbia Herald* 9 January 1903, 8 January 1904; Maury County Court Minutes Volume P:476; Volume Q:75, 145, 146; Nashville Bridge Company #63).

The bridge contains a 222-foot pin-connected through modified Pennsylvania Petit and a 74 - foot pin-connected pony Pratt half-hip. Composition of the members is fairly typical. The Petit's top chords and end posts are channels with lacing, and the bottom chords are two or four rectilinear eyebars. Verticals are small channels with lacing on each side except hip verticals which are paired rectilinear eyerods. Diagonals are paired rectilinear eyebars, and counters are paired rectilinear eyerods. The pony truss's top chords are channels with lacing underneath, and the end posts are channels with lacing top and bottom. Bottom chords are paired rectilinear eyebars. Verticals are paired angles with lacing. Counters are paired rectilinear eyerods. Diagonals are paired rectilinear eyerods except in the hip panels where the diagonals are eyebars. The only decorative feature is the Petit's portal knee bracing that contains a spoke-like element, a motif used for some of Nashville Bridge's early designs. The abutments are not visible, and two steel encased concrete tubular columns form the pier.

The bridge served local traffic until about 1960 when the county built a new bridge nearby and removed the deck and approaches from this bridge. The trusses, which are in relatively good condition, remain as a historic ruin.

(#42) 43-NonHighway-1: Tanksley Bridge spanning the Duck River in south central Humphreys County (Hurricane Mills Quad, 31 NE).



Significant under Criterion C as early truss bridge by the Nashville Bridge Company and as representative Camelback trusses.

In October 1902 the Humphreys County Court appointed a committee of five men, E.T. Lewis, W. C. Jones, A. B. Hooper, E. Conver, and John E. Pullen, to recommend a site for a new bridge over the Duck River. The committee investigated three sites on 22 December 1902. On 5 January 1903, the committee reported to the court that it advised against the site near the mouth of the Buffalo River and against the site at Oguinns Ferry at the mouth of Hurricane Creek due to longer widths, flooding issues, lengthy approach work, and the potential for a natural rechanneling at one site. The committee recommended the third site, at Dr. Foresee's Farm or at Foresee's Ford, in a secret and unanimous ballot. The committee based its recommendation on the stream width, minimal approach work, and easy access from a variety of roads, thus serving more citizens of the county. The court accepted the recommendation of the committee and appointed a new bridge building committee of Pullen, John T. Anderson (see #68, 43-A0340-00.01), and H. W. Hooper. In April 1903 Pullen, on behalf of the committee, reported to the court that it had obtained two sets of bridge plans and specifications from a civil engineer and submitted them to the court for their review. Pullen reported that the committee had advertised widely and had received eleven sealed bids. The Nashville Bridge and Construction Company was the "lowest and best bid," and the committee, subject to final approval by the court, awarded the contract to the company for the sum of $11,925 for a steel and concrete substructure or at $13,500 for a stone substructure of three twenty-six foot piers. The court selected a stone substructure and voted to approve the contract with the Nashville Bridge Company.

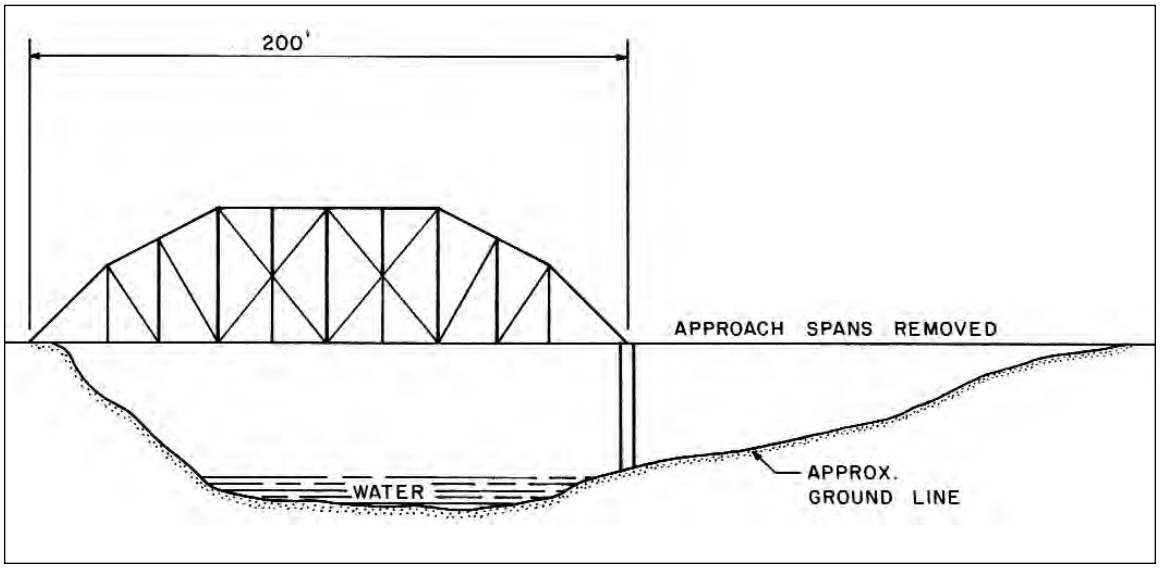
The Tanksley Bridge is one of the earliest bridges in the state that Nashville Bridge erected. The bridge plaque, which lists the company as the Nashville Bridge and Construction Company, a name it used for only a short time, is a tangible indicator of its early date.

During the construction phase, the committee added four-foot concrete caps to the piers after discovering that the original plans contained an error in the height of the piers. However, as the Nashville Bridge Company neared completion of the bridge in April 1904, the court appointed a committee to determine if the bridge should be raised twenty feet at a probable cost of $8,000, but apparently the court decided not to do so. On 4 July 1904, Pullen reported to the court that the committee had received the completed bridge on 3 May 1904 calling it "an elegant structure built wholly of steel, except the floor, which is of white and post oak." The county paid each committee member $150 for expenses and as compensation (Humphreys County Court Minutes Volume 14:544-545; Volume 15:50-52, 56, 321-323, 339-340, 349; Nashville Bridge Company #1066).

The state designated this road as State Route 13 in the 1920s, but by the 1940s, the state had built a new alignment to the east and this road became a local route. In 1976 the county built a new bridge nearby, but this bridge remained open until about 1980 when the county removed the deck and six approach spans.

The bridge contains two 160-foot pin-connected modified Camelback through trusses. The bridge has a curb-to-curb width of 16.0 feet and an out-to-out width of 18.0 feet. The portal bracing is composed of a portal strut with three punched-out star designs; the arched knee bracing contains one star. Piers one and three are masonry with concrete caps, but at an unknown date, the original middle stone pier was replaced with concrete. Composition of members is typical. Top chords and end posts are channels with battens. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are paired angles with lacing, and counters are single cylindrical tie rods.

(#43) 60-NonHighway-2: Carpenter Ford Bridge spanning the Duck River east of Columbia in Maury County (Verona Quad, 64 SE).



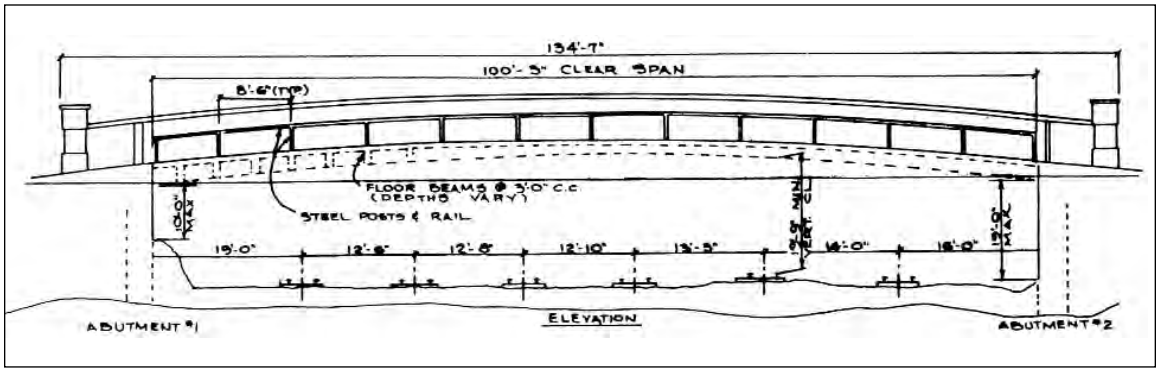
Significant under Criterion C as a representative Camelback truss bridge and as work by the W.T. Young Bridge Company.

In July 1903, the Maury County Court appointed a committee of W. L. Green, Charles Baker, and J. A. Matthews to investigate the advisability of building a bridge across the Duck River at Carpenter's Ford. In November the court approved the construction of a new bridge and appointed a committee of Baker, Green, T. C. Hardison, and R. J. Derryberry to let the contract. This committee then let a contract for $9,213.50 to W.T. Young. The committee reported in October 1904 that the contractor had completed the bridge (Maury County Court Minutes Volume Q:9, 81, 304; Nashville Bridge Company #07).

The Carpenter Ford Bridge contains one span, a 200.0 foot pin-connected modified Camelback through truss that is 18.0 feet wide. The south end of the bridge rests on dirt while the north approach spans have been removed. The north end of the truss sits on steel encased concrete tubular cylinders. Composition of the members is typical. Top chords and end posts are channels with lacing. Verticals are channels with lacing except the hip verticals which are paired rectilinear eyerods. Diagonals are paired rectilinear eyebars or eyerods, and counters are paired rectilinear eyerods. The bottom chords are atypical, being composed of small channels with lacing in each of the two end panels while the other panels contain paired rectilinear eyebars. The portal knee bracing contains a three-circle cutout motif, and there is a finial on top of each hip vertical connection.

The bridge served local traffic until the 1960s when the county built a new bridge nearby and removed the deck and approaches from this bridge. The truss, which is in relatively good condition, remains as a historic ruin.

(#44) 79-E0578-00.21: Dudley Street spanning the Frisco Railroad at Elmwood Cemetery, Memphis, Shelby County (Southwest Memphis Quad, 404 SE).



Significant under Criterion C as an early concrete arch bridge that is the oldest documented vehicular concrete arch in the state.

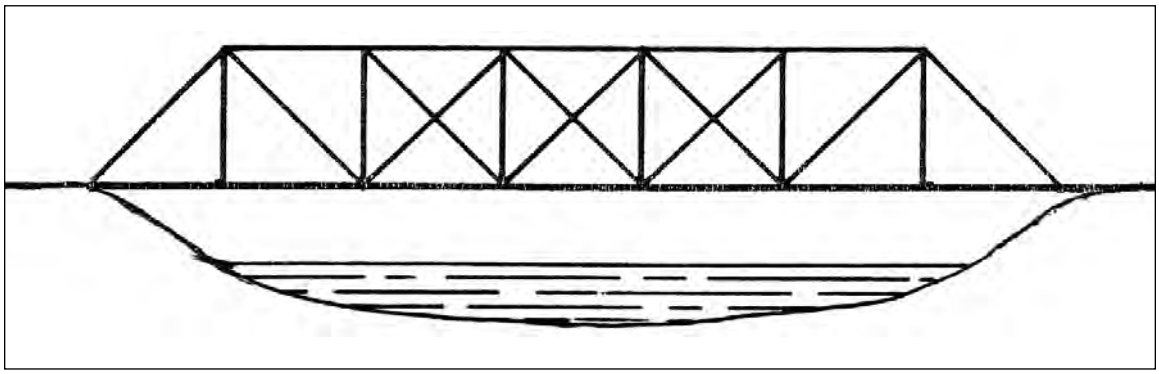
The bridge is located at the north entrance to Elmwood Cemetery. Founded in 1852, the cemetery is the burial site for many of Memphis's most prominent citizens, including over one thousand Civil War soldiers and most of the victims of Memphis's yellow fever epidemics of the 1870s. Located at the southeast corner of the bridge is the cemetery's office, an architecturally distinctive circa 1880 Gothic Revival cottage. The Elmwood Cemetery office and bridge were listed in the National Register in 1978 (Bennett 1977), and the boundaries were expanded in 2002.

By 1902, the owners of the cemetery had begun working with the railroads to build a bridge across their tracks at the main entrance to the cemetery. In January 1903, the cemetery board appointed a committee of W. H. Moore, John Boegli, and John Overton to work with the railroads on building the bridge. At that time, seven rail lines used the tracks underneath the

bridge so they and the City of Memphis each had a one eighth interest in the cost and maintenance of the bridge. This group arranged for the construction of the bridge, sometime between January 1903 and 1905.

The Elmwood Cemetery Bridge contains one 100.2-foot span, a closed spandrel arch (there has been speculation that this bridge is actually an arched beam cast in concrete). The bridge has a 134.6-foot out-to-out width. Sidewalks are located on the outside of the parapet rails which have recessed panels. On the north end of the bridge, wrought iron posts on top of concrete columns support an iron "Elmwood Cemetery" sign that spans the roadway. Similar light fixtures are on top of the columns at the south end. Also on the south end are two elaborate iron gates to close the roadway and a smaller gate on each sidewalk.

(#45) 02-A0048-00.38: Moore Road Bridge spanning North Fork Creek south of Unionville in Bedford County (Unionville Quad, 71 SE).



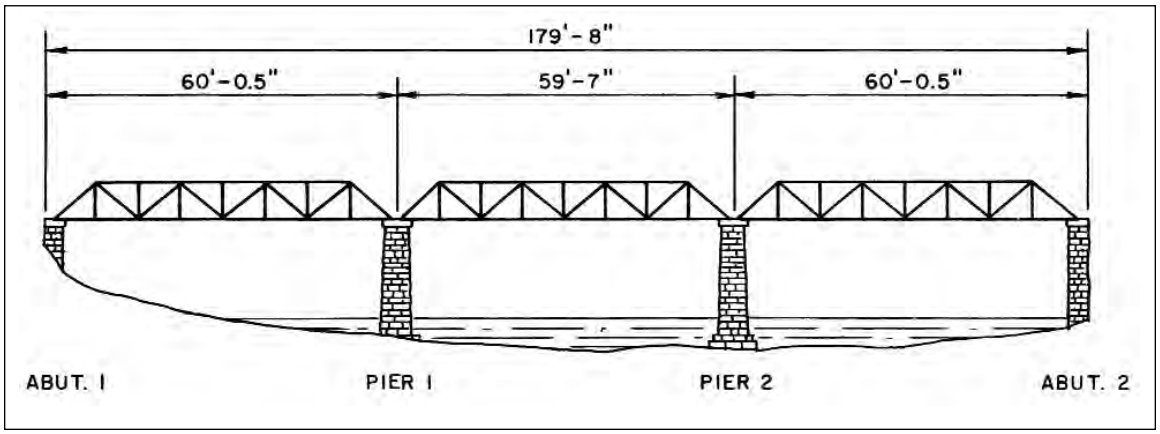
Significant under Criterion C as a representative Pratt truss bridge and as work of the Nashville Bridge Company.

The Nashville Bridge Company erected this bridge in 1904 for $1,200 west of Wartrace spanning Wartrace Creek on the Bell Buckle to Wartrace Road. About 1914 the county shifted the road alignment and moved the bridge about two hundred yards. The county again moved the bridge in 1952 for $2,500 when the state replaced the original bridge (Bedford County Court Minutes Book 1901-1903a:165; Book 1907-1911b:357; Carver 1983a; Nashville Bridge Company #3006).

The Moore Road Bridge contains one span, a pin-connected through 120-foot Pratt truss resting on concrete abutments. It is 17.2 feet high with an out-to-out width of 17.8 feet. The portal treatment is somewhat unusual. The main portal bracing is a cross-laced design with a boss decorative detail of rosettes at the intersection points of the lacing. The triangular portal knee bracing contains a cutout flower and circle motif. The composition of members is typical. Top chords and end posts are channels with lacing. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are cross-laced angles except hip verticals which are paired rectilinear eyebars. Counters are single cylindrical tie rods.

The Tennessee Department of Transportation, in conjunction with Bedford County and the Federal Highway Administration, demolished this bridge and erected a new bridge at this site in 1984.

(#46) 19-D0981-02.00: Newsom's Mill Bridge spanning the Harpeth River in southwest Davidson County (Bellevue Quad, 308 SW).



Significant under Criterion C as an early Warren truss bridge by the Nashville Bridge Company.

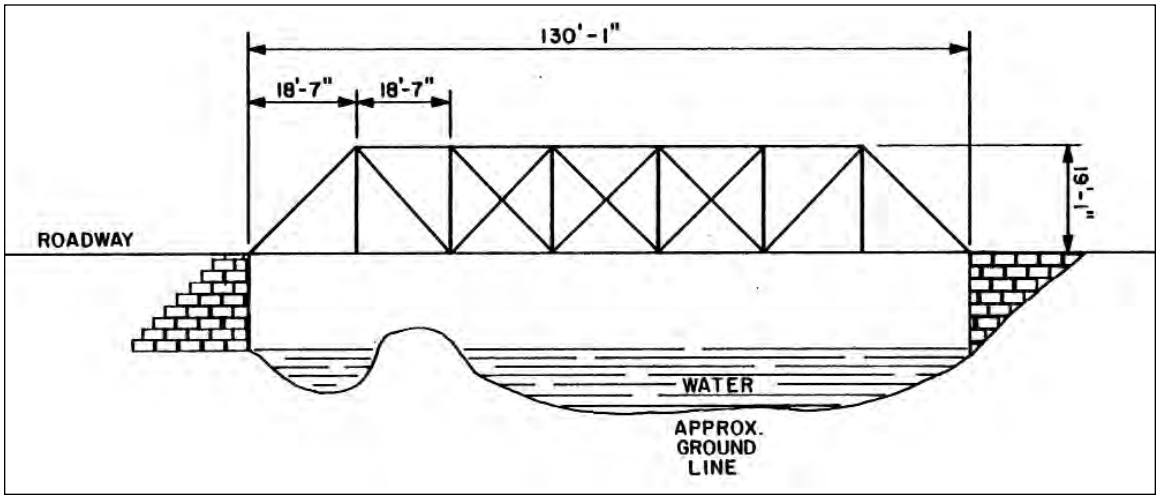
The Newsom's Mill Bridge is located within the National Register eligible Newsom's Station Historic District. The district contains a circa 1840-1860 house, an 1862 masonry mill (individually listed in the National Register), a stone and concrete dam rebuilt in 1907, and historic archaeological ruins associated with the mill and railroad. The district is significant under Criterion A due to its associations with the pioneer Newsom family and under Criterion C due to its architectural and engineering merits (Cornwell 1976; Slater 1984).

The William Newsom family settled this area about 1790, soon becoming millwrights. At this site, around their home and an earlier mill, the community of Newsom grew. A bridge at this site existed before 1832 for in that year the county court discussed repairing or replacing it. In 1852 the Nashville and Northwestern Railroad extended its line through Newsom causing the area to be renamed Newsom's Station. In 1884 the county built a new wooden bridge on a masonry substructure near the mill. By the turn of the century a new bridge was necessary, and in January 1904, the Davidson County Court appointed a committee to investigate replacing the existing bridge. In April the committee reported that the wooden bridge should be replaced with a "steel low truss type" but that the existing stone "abutments and two pillars are in splendid condition made of the finest stone, and the workmanship could not be better." The committee estimated the new bridge would cost $2,700, and following the court's approval, the committee let the contract for $2,563 to Nashville Bridge (Carver 1985a; Davidson County Quarterly Court Minutes Volume A:194, 206, 225; Volume E:299; Volume F:205, 235; 503; Nashville Bridge Company #1104).

Sitting on the substantial 1886 masonry abutments and piers, the new bridge contained three spans. Each span is a 60-foot long 6.3-foot tall semi-deck riveted Warren pony truss with hip verticals. The curb-to-curb width is 11.0 feet and the out-to-out width is 12.0 feet. The top chords and end posts are channels. The bottom chords and diagonals are angles with battens, and the posts are angles with lacing. The handrail is latticed.

The Tennessee Department of Transportation, in conjunction with Davidson County and the Federal Highway Administration, demolished this bridge and erected a new bridge at this site in 1987.

(#47) 22-01864-02.86: County House Bridge spanning Jones Creek in central Dickson County (Charlotte Quad, 48 NE).



Significant under Criterion C as a representative Pratt truss bridge.

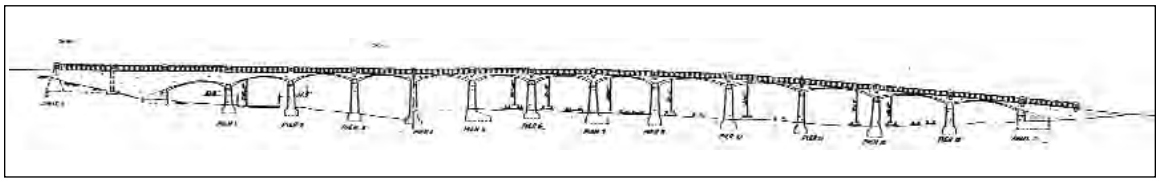
In January 1904 the Dickson County Quarterly Court appointed a committee of W.A. Bell, J. S. Hicks and J. B. Harris to receive bids and superintend erection of a bridge on the Old Charlotte Pike across Jones Creek on the Poor House land. In June the county appointed E. H. Stone to replace W.A. Bell who had resigned. In October the committee reported to the

court that it had entered into a contract and the court directed the committee to proceed as the members thought best (Dickson Court Minutes Volume 1902-1905:389, 475, 546). This road later became State Route 47. When the state rerouted State Route 47, this road became a little-used county road.

Somewhat long at 130 feet, the single pin-connected Pratt through truss sits on massive stepped masonry abutments. The top chords, end posts, and verticals are channels with lacing. The bottom chords and diagonals are paired rectilinear eyebars, and the counters are single cylindrical tie rods. The hip verticals are somewhat unusual in that they are paired small channels tightly laced together. The bridge contains chevron shaped latticed portal bracing and a simple lattice rail.

The Tennessee Department of Transportation, in conjunction with Dickson County and the Federal Highway Administration, built a new bridge nearby in 1983 and closed this bridge to traffic and left it in place as a historic ruin. In 1985, the county sold the truss for scrap and the buyer removed it.

(#48) 47-A0135-00.42: Clinch Avenue Viaduct spanning railroads in downtown Knoxville, Knox County (Knoxville Quad, 147 NW).



Significant under Criterion C as an early concrete arch bridge with patented features and for its associations with Edwin Thacher.

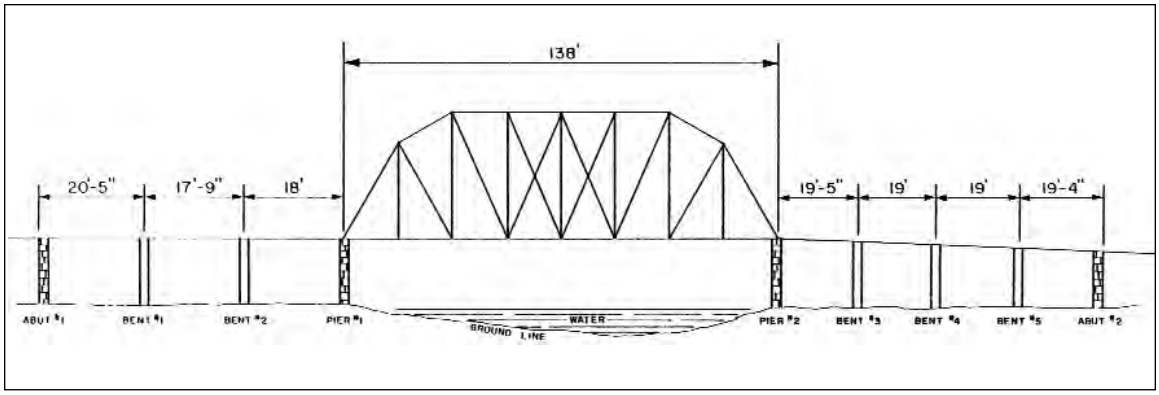
In 1905, the City of Knoxville demanded that the railroads build a bridge across their tracks at this location. The Louisville and Nashville Railroad bore the primary cost but the Southern Railway and the Knoxville Traction Company also paid a portion. The City of Knoxville provided the right-of-way, paid property damages, and removed a nearby sewer. An engineer from Southern Railway encouraged the use of a concrete bridge over steel due to reduced maintenance and because a concrete bridge would be more "indestructible" than steel "and handsomer in appearance." His sentiments seemed to have been shared by others, for the three major competing bids were for concrete bridges based on the "Kahn," "Johnson," and "Melan" systems. The city awarded the contract to the Concrete Steel Engineering Company, based on plans that Edwin Thacher had prepared using the Melan system.

Nationally recognized Thacher (1839-1920) had worked briefly as an engineer with the Cedar Rapids and Missouri River Railroad in 1863, for the U.S. Military in 1864-1865, and for the Louisville, Cincinnati, and Lexington Railroad in 1866-1868. From 1868-1879 he worked for the Louisville Bridge and Iron Company. From 1879 to 1887, he worked for the Keystone Bridge Company which appointed him as chief engineer in 1883. Thacher was chief engineer and vice-president of the Decatur Bridge Company from 1887-1889 until it went into receivership. Afterward, Thacher opened an office in Louisville as a consulting engineer. During the 1880s and 1890s, he became more interested in concrete bridges and became a national leader in concrete arches during the infancy of that bridge type. Thacher built the world's largest concrete arch of its kind in Topeka between 1894 and 1899. From 1901, until his retirement in 1912, Thacher and William Mueser were partners in the firm Concrete Steel Engineering Company of New York City. In the 1880s, Thacher patented the Thacher Truss and in the 1890s patented improvements for concrete arch bridges such as the "Thacher Bar." He was also well known as a mathematician patenting the Thacher Cylindrical Slide Rule in 1881 and a flat slide rule in 1900. In addition to this bridge, the survey identified one other bridge that Thacher built in Tennessee, the Walnut Street Bridge in Chattanooga (#20, 33-03544-00.12).

A local company, the Oliver Company, (who had bid on the Johnson System), was the contractor. The bridge plaque records that the design used "Melan and Thacher Patents Nos. 505-054-617, 731-731-595." The firm built the bridge between June and December 1905 (*Knoxville Sentinel* 1905). The city partially rebuilt the bridge in 1929 and altered it in 1982 when the city used it as a pedestrian shopping mall during the 1982 World's Fair. After the fair, the city closed the bridge to vehicular traffic but left it open for pedestrian use. In 2002, the city reopened it for vehicular traffic.

The 757-foot Clinch Avenue Viaduct originally contained thirteen concrete closed arches and carried two traffic lanes and two trolley lines. However, in 1929 the city added two spans on the east end and raised the deck in the first three spans that then functioned as concrete deck girders. Thus, the bridge now contains ten concrete arch spans and five concrete deck girders. The bridge is built on a skew; individual spans vary from 68° to 85°. The bridge has a curb-to-curb width of 30.0 feet and an out-to-out width of 43.9 feet. The original parapet railing utilized an elaborate raised quatrefoil design on each side with molded posts above each pier. The city removed this railing during the 1982 renovation. The replacement railing is a plain parapet railing with two quatrefoil panels placed above each pier. The extrados of the arch ring forms a decorative line along the arch.

(#49) 74-00979-01.58: Hill's Mill Bridge spanning Sulphur Fork Creek in Walnut Grove in west Robertson County (Adams Quad, 303 SE).



Significant under Criterion C as a representative Camelback truss bridge by the Champion Bridge Company.

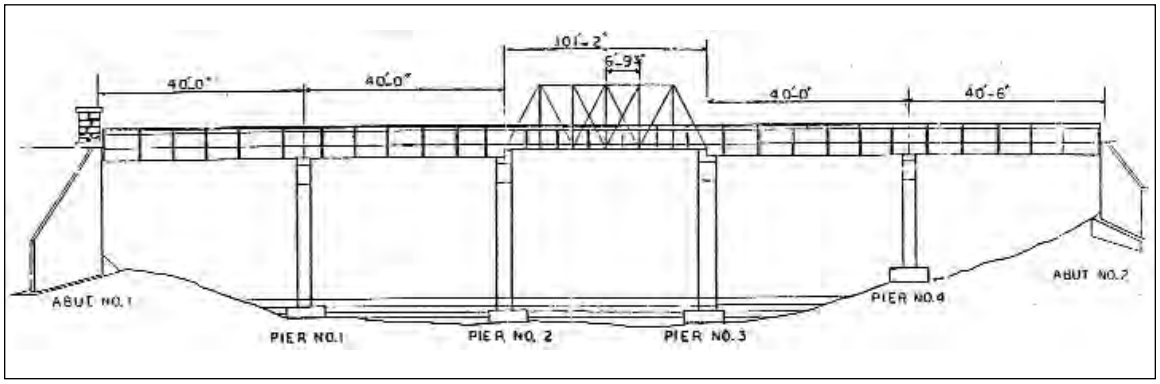
In April 1904 the County Court appointed a committee to build a bridge at this site for $3,000 (Robertson County Court Minutes Volume 25:213). A plaque indicates that the Champion Bridge Company completed it in 1905.

This 271-foot structure contains seven steel I-beams and one pin-connected through truss. This truss is a 138-foot Camelback span. The length is unusually short for this truss type, which explains the atypical one-panel incline rather than the typical two. The bridge has a curb-to-curb width of 12.0 feet and an out-to-out width of 14.0 feet. The piers and abutments are masonry; one abutment has a concrete cap indicating it may predate the truss. The steel I-beams sit on steel bents. Composition of the members is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are

channels with cross lacing except the hip verticals which are double rectilinear eyerods. Diagonals are paired rectilinear eyebars, and counters are single rectilinear tie rods.

This bridge is located on a short road segment easily serviced by the State Route 76 corridor. Due to the bridge's deterioration and the low level of traffic on the road, the county permanently closed the bridge and road in 1985. The county left the bridge standing as a historic ruin.

(#50) 16-P0001-00.02: Old Stone Fort Bridge spanning the Duck River in Old Stone Fort Park in Manchester, Coffee County (Manchester Quad, 86 NE).

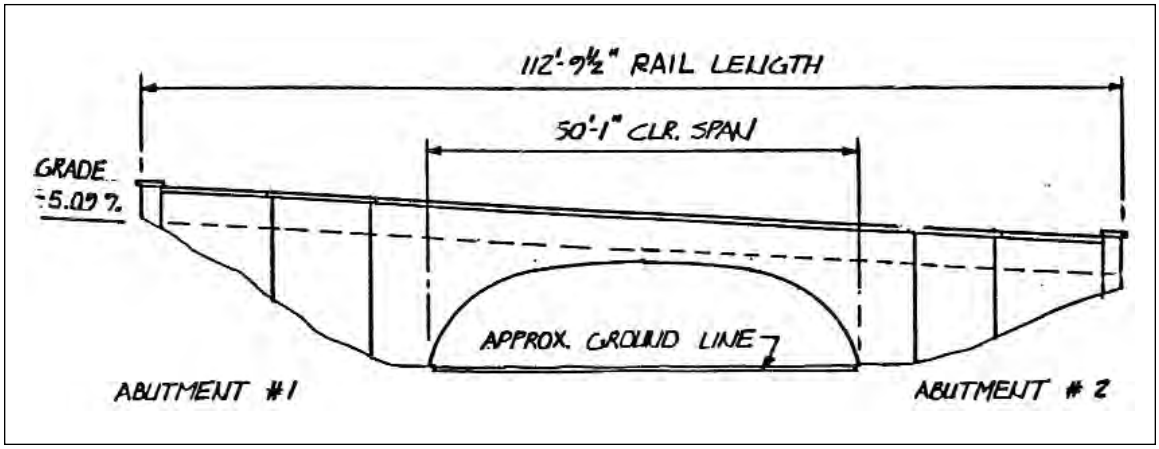


Significant under Criterion C as a representative Pratt truss and as work of the Joliet Bridge Company.

The Joliet Bridge Company originally erected this bridge in 1906 at the Dabbs Ford over the Elk River on the Franklin-Coffee County line on the Prairie Plains to Winchester Road. Coffee County paid two-fifths and Franklin County paid three-fifths of the $6,057 cost (Coffee County Quarterly Court Minutes Volume 2:76, 87, 114, 160, 182; Franklin County Court Minutes Volume P:225, 298). After several years of discussion, in 1970 the state, in cooperation with Coffee and Franklin Counties, replaced the Dabbs Ford Bridge for $250,000. The Tennessee Department of Conservation purchased the truss span from the state's contractor on the bridge project, and the contractor relocated the truss span to the Old Stone Fort State Park. The bridge is now located on a dead end road that provides access to a campground.

Containing five spans, the bridge is 262 feet in length. The main span is a pin-connected through 101-foot Pratt truss which is flanked by four steel I-beam approach spans. The truss is 16.8 feet high and 13.9 feet wide. Composition of members is typical. Top chords and end posts are channels with stay plates, and bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing except the hip verticals which are angles with battens. Diagonals are paired rectilinear eyerods, and counters are single cylindrical tie rods. The elaborate portal treatment contains a solid beam with three cutout designs and a similar design in the knee bracing.

(#51) 19-B0983-01.61: Belle Meade Bridge on Jackson Boulevard spanning Richland Creek in Belle Meade, Davidson County (Oak Hill Quad, 308 SE).



Significant under Criterion A for its associations with development of Belle Meade and under Criterion C as "textbook" example of circa 1900 trends in concrete arch design.

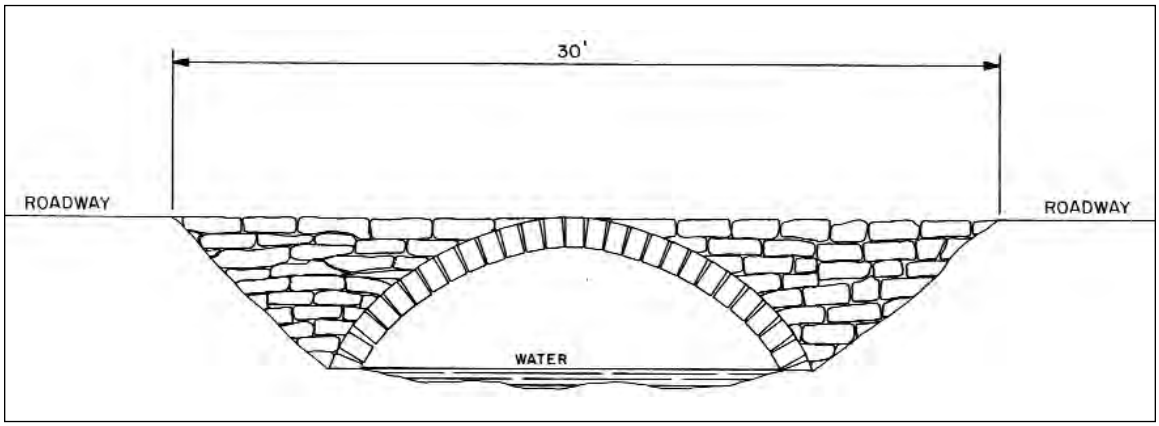
Belle Meade, one of Tennessee's outstanding plantation complexes and one of the country's best thoroughbred nurseries, was in severe financial trouble by 1900. Between 1902 and 1904, the owners disposed of much of the property. A group of businessmen headed by Judge J. M. Dickinson purchased 2,200 acres of the Belle Meade estate that included the old deer park and formed the Belle Meade Land Company. This company began a residential development on 250 acres in 1906, and by September an exclusive subdivision named Belle Meade Park had opened. In 1912 the Land Company conveyed its roads to Davidson County for public use (see #33, 19'NonHighway'9; Coop 1969; Davidson Quarterly Court Minutes Volume I:136-138; Ellis 1983; Tidwell 1983).

Landscape gardeners O. G. Simonds and Company of Chicago prepared the design for the spatial arrangement of Belle Meade Park. This design retained the natural beauty of the old deer park while situating residential tracts along four miles of macadamized road that formed two big loops, much like a figure-eight. The contract for grading and building the road was let in April 1906 to the Nashville firm Sharpe and Company. An August newspaper article described the bridge as "one of the handsomest and probably the most artistic arched stone bridge in the state." The same article described the entrance as:

> artistic and most picturesque. A fine stone fence has been built at the entrance and curves in toward the park, seeming to give invitation for all to enter. The boulevard begins in this entrance and leads directly over a graceful stone arched bridge of cut stone, which crosses the creek, and one is then in the park proper (*Nashville Banner*, 30 August 1906).

Despite the newspaper's description of a masonry arch, the bridge is actually a closed spandrel concrete arch faced with stone. It is 112.8 feet in length with a 50-foot arch. The bridge has a curb-to-curb width of 30.0 feet and an out-to-out width of 33.2 feet. Railings, built of coursed stone with crenellating end posts and topped with a row of flat stones, run the length of the bridge. These railings each contain two offset observation balconies. Between the bridge and the main road is a handsome landscaped stone wall denoting the entry to Belle Meade Park, which remains today as an exclusive residential area in suburban Nashville.

(#52) 31-NonHighway-2: Old Northcutts Road spanning Firescald Creek north of Altamont in Grundy County (Altamont Quad, 99 NW).



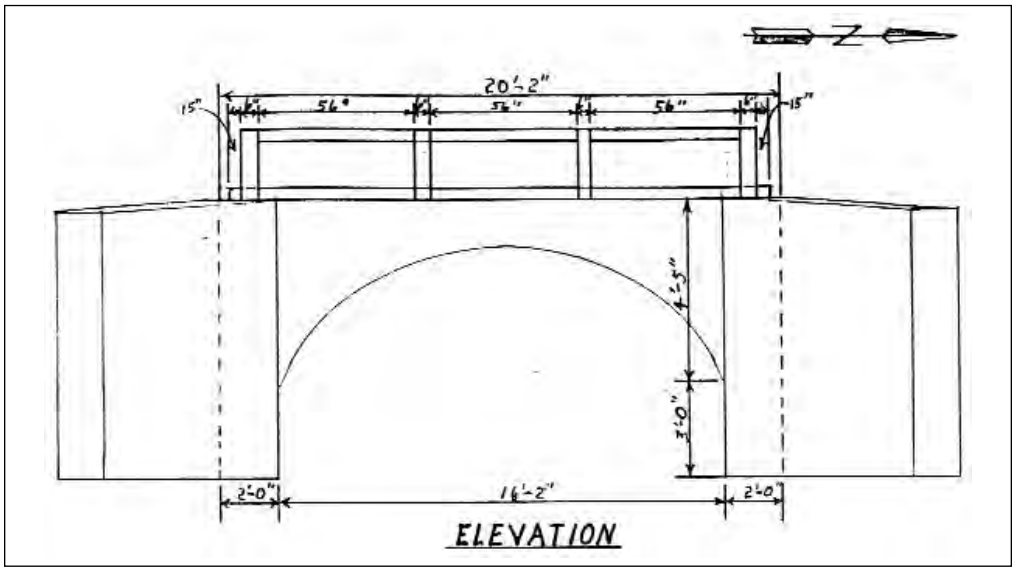
Significant under Criterion C as rare masonry arch bridge.

Grundy County paid R. M. Crick $547.45 to build this one span masonry arch bridge in 1906 (Grundy County Court Minutes Volume L:267, 324-325, 354-355). The bridge, formed of irregularly cut stones, contains one span approximately thirty feet in length and twelve feet wide. A row of cut stones follows the line of the arch. There is little fill between the roadway and the arch, and there is no railing.

No information was available about Crick. The survey identified two other Grundy County bridges that he built: a two span masonry arch over Hickory Creek built in 1910 that has since been altered (31-A0023-02.58) and a two span masonry arch over Hickory Creek built in 1912 (#71, 31-A0022-02.49).

The state built a new bridge nearby in 1970 and left this bridge in place as a historic ruin. It remains in relatively good condition.

(#53) 58-A0443-00.50: Cumberland Avenue Bridge spanning Poplar Spring Branch in Richard City in southwest Marion County (Bridgeport Quad, 101 NW).



Significant under Criterion A in community planning and under Criterion C as early concrete arch bridge.

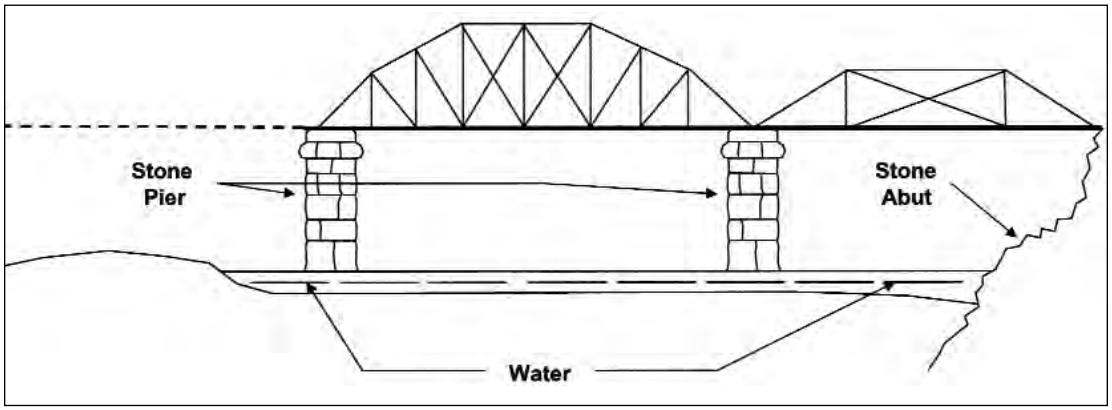
In 1905 the United States Geological Services published a study on areas suitable for cement processing in Tennessee. As a result, in 1907 the Dixie Portland Cement Company of Nazareth, Pennsylvania, opened Tennessee's first Portland cement plant in Deptford (renamed Richard City). About 1905 the Dixie Portland Cement Company hired Lee Hunt Engineering to develop a plan for their cement plant and worker housing in Deptford. Lee Hunt updated an 1890 Deptford plan, prepared by Thompson and Hall Engineers, and soon began construction on streets and houses in an area nicknamed Townsite, a name that is still used for this area. The

Dixie Portland Cement Company used this project to showcase concrete as a building material, constructing cement houses as well as cement outbuildings, streets, sidewalks, post and rail fences, utility poles, and bridges. A cement company operated in Richard City until 1982. The bridge was individually listed in the National Register in 1991 as part of a multiple property nomination for Richard City (Daniels 1991a; 1991b).

The Dixie Portland Cement Company built this bridge in 1906 on the main street of the planned community for the workers of the Dixie Portland Cement Company. It contains one span, a 20.1-foot closed spandrel concrete arch. The curb-to-curb width is 15.0 feet, and the out-to-out width is 19.0 feet. The bridge has a parapet rail with posts on the outside of the rail.

The city replaced this bridge in 1992.

(#54) 68-NonHighway-2: Sugar Hill Bridge spanning the Buffalo River in southern Perry County (Linden Quad, 32 SE).



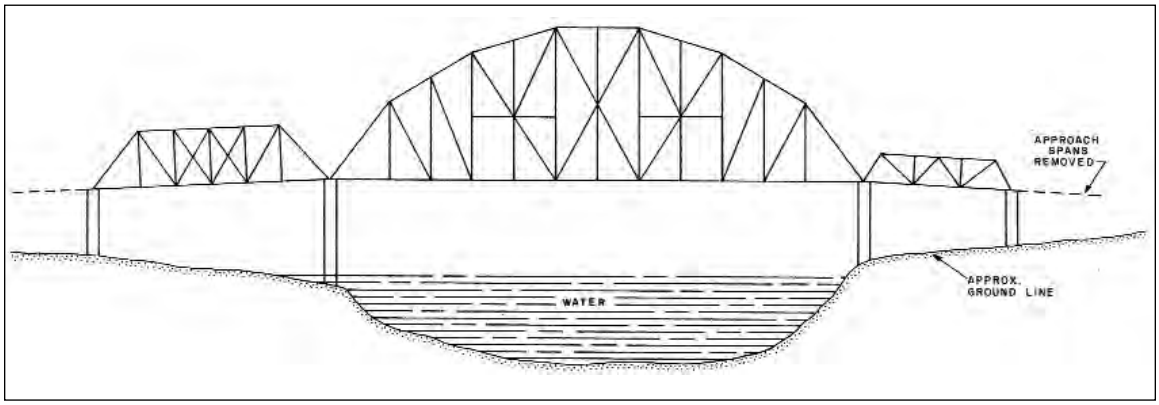
Significant under Criterion C as representative trusses by the Virginia Bridge and Iron Company.

The Virginia Bridge and Iron Company erected this bridge, possibly in 1906. Perry County's Quarterly Court Minutes are incomplete, but they do record that in October 1906 the court appointed J. T. Turner to investigate the "bridge and road affair" at Sugar Hill and in January 1907 paid him $10 for supervising the "bridge road" at Sugar Hill. At the same session the court ordered that the $200 that it had appropriated at an earlier term "be used immediately for the completion of the Sugar Hill Bridge." The court appointed a committee of Turner, S. F. Polk, and W. A. Kirk to use the money for that purpose. Work on the road to the bridge continued to be an issue. In October 1908, the court appropriated $250 to build a road on each side of the bridge and appointed a committee of Kirk, J. F. Warren, and John M. Dodson to receive bids and let a contract. In October 1911 the court further appropriated $500 to build a road to the Sugar Hill Bridge. At that time this road was the main road between Linden and Flatwood, but when the county built the Mount Olive Bridge (68-A0177-01.15) in 1912-1913, that created a more direct corridor. The State Highway Department designated the road corridor containing the Mount Olive Bridge as State Route 47 (now State Route 13) about 1920 (Perry County Quarterly Minutes Volume 3:20, 38, 41, 63, 108, 200; Volume 4:7). This route change left the Sugar Hill Bridge on a county road until 1964 when the county built a new bridge about 1,500 feet to the east. At that time, the county removed the deck and left the bridge as a historic ruin. In 1972 the county declared the bridge a historic landmark and although there has been interest in developing the site as a local park, it has not been done. The bridge remains as a relatively intact ruin.

The bridge contains one pinned Camelback through truss and one pinned pony Pratt truss on masonry abutments and piers. Measurements are not available, but the Camelback appears to be about 120-150 feet long which is somewhat short for a Camelback with a two-panel incline. The pony Pratt is about 35-45 feet long. The bridge has a curb-to-curb width of 12.0 feet and an out-to-out width of 14.6 feet. Composition of the members is typical. On the Camelback, the top chords and end posts are channels with battens, and the bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing on both sides except the hip verticals which are paired rectilinear eyerods. Diagonals are paired tie rods, and the counters are single tie rods. On the Pratt, the top chords and end posts are channels with battens, and the bottom chords are paired rectilinear eyebars. Verticals are angles with battens, and the diagonals and counters are single cylindrical tie rods. The verticals are splayed, a feature that this company commonly used. The pony truss sits on a masonry abutment on the north end.

In 1964, the county barricaded the bridge and removed the southern approach spans, which sat on steel bents, leaving the truss spans as a historic ruin.

(#55) 41-NonHighway-1: Only Bridge spanning the Duck River near Only in northwest Hickman County (Coble Quad, 40 SW).



Significant under Criterion C as representative Petit, Pratt, and Warren trusses by the Nashville Bridge Company.

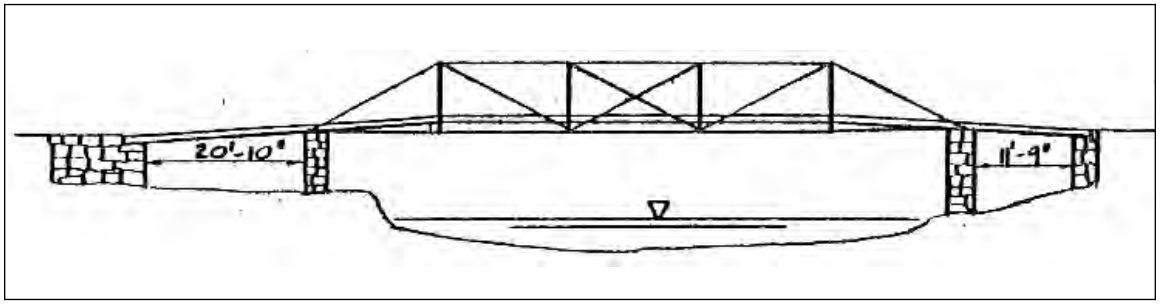
In October 1906 the Hickman County Court appointed a five member committee composed of J. A. Pope, J. C. Burchard, A. H. Brown, B. E. Wilkins, and G. H. Johnston "to locate and ascertain the cost" of a bridge across the Duck River at Only. The bridge site was in Hickman County but close to the Humphreys County line, and the court directed the committee to contact Humphreys County and request it to pay half the cost. The committee made its report to the county court in January 1907, and the court voted thirteen to three to build the bridge, apparently without any assistance from Humphreys County. The court appointed a new committee composed of Burchard (Chairman), Johnston, and Wilkins to oversee the construction of the bridge. During 1907 the Nashville Bridge Company built the bridge for $16,200. In April 1908, after the bridge had been built, the court appointed a committee of Johnston, Wilkins, and R. C. Wilkins "to look after the bridge" (Hickman County Court Minutes Volume 11:552; Volume 12:10, 11, 242; Nashville Bridge Company #3113).

The bridge contains one 225-foot pin-connected modified Pennsylvania Petit through truss, one 110-foot pin-connected Pratt through truss, and one 60-foot riveted Warren pony truss. The composition of both through trusses is similar. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing except for those on the Petit which are four angles paired back-to-back. Diagonals are paired rectilinear eyebars, and counters are paired cylindrical tie rods. The Warren truss'

top chords, end posts, and bottom chords are channels. Diagonals are paired angles with battens, and verticals are atypical I-bars. Each span rests on steel encased concrete tubular piers.

The state built a new bridge nearby in 1962 and removed the deck and approach spans, leaving this bridge as a historic ruin.

(#56) 80-A0206-00.47: Buena Vista Ford Bridge spanning Lick Creek near Grant in western Smith County (New Middleton Quad, 318 NE).



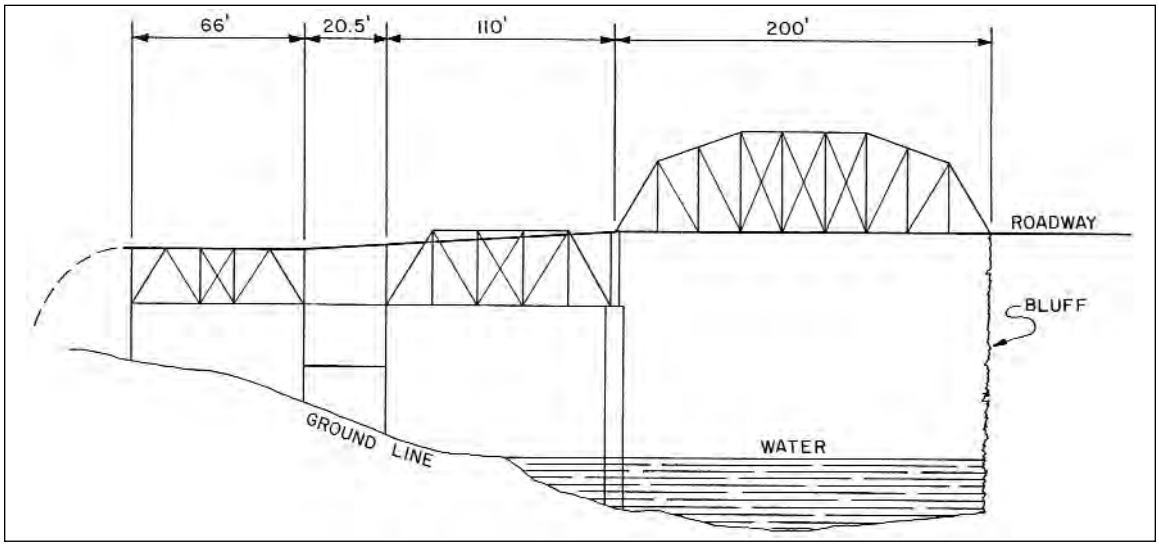
Significant under Criterion C as atypical Pratt truss with fishbellied bottom chord by the W.T. Young Bridge Company.

In April 1907, the Smith County Court appointed a committee of J. R. Curtis, R. M. Baird, and F. E. Bell to let a contract for a bridge at this site. The committee reported in January 1908 that it had accepted the completed bridge. W.T.Young built the superstructure for $1,395, and T. G. Ford built the masonry substructure of "three pillars" for $295; apparently one pier or abutment predates the truss (Carver 1985d; Smith County Court Minutes Volume 11:10, 70-71, 232, 519; Volume 12:119).

The bridge contains an 85-foot pin-connected Pratt pony truss 8.7 feet high, flanked by steel I-beams. The bridge has a curb-to-curb width of 10.1 feet and an out-to-out width of 12.1 feet. At 85 feet, the truss is virtually the maximum length that a lightweight pin-connected pony Pratt could be built. The "fish-bellied" bottom chord, which provided more stability, allowed this longer length (Ketchum 1908:208-209). Top chords and end posts are channels with lacing on top and battens underneath. Bottom chords are paired rectilinear eyebars, and verticals are paired angles with lacing. Diagonals are paired rectilinear eyerods, and counters are single rectilinear tie rods.

The Tennessee Department of Transportation, in conjunction with Smith County and the Federal Highway Administration, built a new bridge at this location in 1986 and relocated the truss span to a city park in Loudon for use on a bicycle trail.

(#57) 80-NonHighway-3: Old Stonewall Bridge spanning the Caney Fork River near Gordonsville in southeast Smith County (Gordonsville Quad, 322 NW).

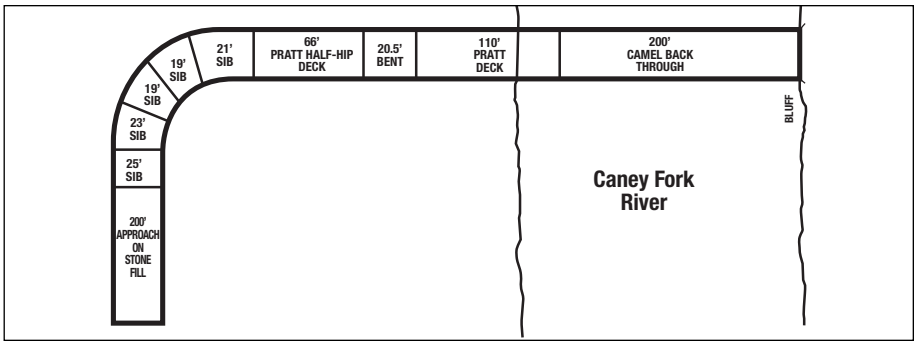


Significant under Criterion A as rare privately built toll bridge and Criterion C as representative Camelback and Pratt trusses and as the only bridge identified in the state built by the Chicago Bridge Company.

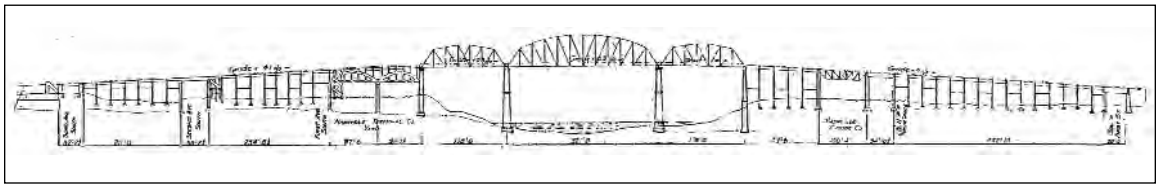
In 1901, E. M. McDonald and Robert Scruggs filed a petition with the Smith County Court for permission to build a toll bridge over the Caney Fork River above Trousdale's Ferry. These men owned land on each side of the river at this site and had sold subscriptions for a stock company known as the "Caney Fork Bridge Company" to finance the bridge. The court gave them permission to build the bridge and to collect tolls equivalent to ferry rates while reserving the right to buy the bridge within the next thirty years at market price. In 1904, the court exempted the company from county, school, road, and special taxes for the first five years after construction of the bridge. Records of the Nashville Bridge Company indicate that the company awarded it a contract in 1904 to build a bridge, but for unknown reasons, the Nashville Bridge Company did not build the bridge. In 1907-1908 the Chicago Bridge Company erected this bridge. In 1927 the county, possibly with assistance from the state highway department, bought the bridge from the Caney Fork Bridge Company for $12,000 (*Carthage Courier* 1972b, 1973; McDonald 1987; Nashville Bridge Company #3001; Smith County Court Minutes Volume 9:390, 418-419; Volume 10:461; Volume 11:427, 468, 520; Volume 12:4; Volume 22:586; Volume 23:212, 368, 382, 476, 588).

The bridge is 703.5 feet long and 12 feet wide. It contains one 200-foot Camelback through truss, one 110-foot Pratt deck truss, one 20.5-foot bent, one 66-foot Pratt half-hip deck truss, five steel I-beams (from 19-25 feet long), and one 200-foot approach on masonry fill. All trusses are pin-connected. Composition of the Camelback truss is typical. Top chords and end posts are channels. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are small channels with lacing except hip verticals which are paired rectilinear tie rods. Counters are paired cylindrical tie rods. Composition of the Pratt trusses is less typical but not unique. Top chords and end posts are paired angles with lacing top and bottom, and bottom chords are paired rectilinear eyebars. Verticals are paired angles with lacing. Diagonals in the end panels are paired rectilinear eyebars. Diagonals in the center panels and all counters are single cylindrical tie rods. The Camelback truss rests on a small masonry abutment on top of a stone bluff and a pier of steel encased concrete tubular cylinders; the remainder of the substructure is steel bents. The steel bent eastern approach contains a sharp curve.

Due to the bridge's deteriorated condition, the county barricaded it to traffic in January 1973, and the state later built a new bridge downstream near the site of the Trousdale Ferry. The bridge retains its deck and is relatively intact as a historic ruin.



(#58) 19-03245-01.47: Shelby Street Bridge spanning the Cumberland River in downtown Nashville, Davidson County (Nashville West Quad, 308 NE).



Significant under Criterion A for its associations with Nashville's transportation history and under Criterion C for its engineering design.

At the turn of the century, Nashville, which is Tennessee's State Capital, was one of the fastest growing cities in the South. However, with only the 1886 Woodland Street Bridge to East Nashville, the city experienced difficulty in expanding to the east and north. In 1905, Davidson County began exploring the possibility of building a new river bridge that would connect to East Nashville. Dissension quickly developed over the site of a new bridge. Downtown merchants wanted the new bridge at the foot of Broadway while East Nashville residents wanted a site north of the Woodland Street Bridge. In the end, the county built both bridges: the Shelby Street Bridge (then called the Sparkman Street Bridge) near Broadway and the Jefferson Street Bridge (19-03258-00.40) to the north of Woodland Street.

Nashville engineer, Howard M. Jones, whose experience was largely limited to designing bridges for the Nashville, Chattanooga, and St. Louis Railroad, designed both bridges. In 1907, the county began the bid letting process for various elements of the bridge project and simultaneously tried, but failed, to sell a $1 million bond issue to fund the bridges. A local construction company, Foster-Creighton, working with local banks, offered to buy the bonds if the county guaranteed that the company would receive the contract for the entire substructure. The county agreed and later also awarded the superstructure contract to the firm with American Bridge Company bidding as fabricator. Due to Foster-Creighton's inexperience with large-scale bridge work, it sold one-third of the contract to the Gould Contracting Company of Louisville.

Begun August 1907 and opened 4 July 1909, the Shelby Street Bridge is 1,768 feet long and contains forty-eight spans, including four steel trusses and two reinforced concrete trusses. The river spans are a 321-foot pin-connected through Parker truss flanked by two 178-foot pin-connected through Camelback trusses. Span 30 is a 100-foot inverted deck Pratt that is now enclosed within a building on the north bank of the river.

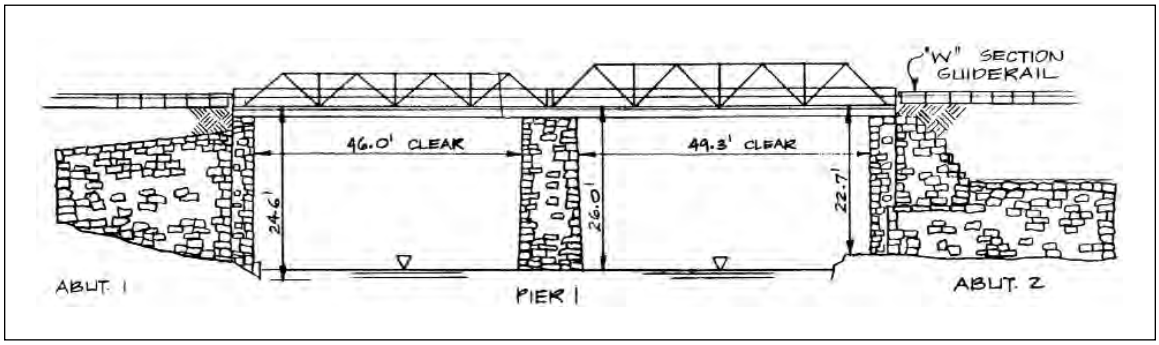
A unique feature of the bridge is the two reinforced concrete truss spans (spans 20 and 21) over the Old Tennessee Central Railroad Tracks (now Louisville and Nashville Railroad) on the west end. These are the only concrete trusses identified in Tennessee. The overall lengths of these spans are 97 and 92 feet; each contains three identical trusses lying parallel to each other. These "six" trusses are on a skew and thus vary in length. An article in a 1909 issue of *Engineering Record* described the two spans as the "most interesting feature" of the bridge. The article stated that from a structural standpoint, the "bottom chords act as ties with the concrete acting as a stiffener and as a protective covering for the steel." Thus, these two spans are technically trusses and partially function as trusses, but they also distribute the forces within the span as an arch does (Creighton 1909; Jones 1909; Nolen 1983; Morrison 1985; Sturtevant 1986b; Waller 1972).

Spans 1 (beginning on the west end) through 19, spans 25 through 29, and spans 31 through 48 are concrete deck girders. All of the girder approach spans rest on concrete bents except for span 10 (over Third Avenue South), span 31, and span 47 (over South First Street) which rest on concrete piers. All of the remaining spans rest on concrete piers.

The original design for the bridge contained a forty-foot roadway for three lanes within the trusses. In addition, the design included a ten-foot sidewalk on the outside of each truss. The middle lane was intended for streetcars, although it was never used for that purpose. This spatial arrangement remained intact during its use as a vehicular bridge with the middle lane reversible during peak traffic hours. Between spans 21 and 22 (the western-most steel trusses) there is a 76°/14° skew as the bridge realigns to tie into the existing street pattern. There are concrete steps from the bridge down to the ground level west of Third Avenue South, east of Second Avenue South, and east of First Avenue South.

In the 1990s, the Tennessee Department of Transportation, in cooperation with Metro-Davidson County and the Federal Highway Administration, scheduled the Shelby Street Bridge for replacement. The city closed the existing bridge to vehicular traffic in 1998 and renovated it for pedestrian use. The bridge reopened in August 2003.

(#59) 21-A0028-01.21: Liberty Bridge spanning Smith Fork Creek in DeKalb County (Liberty Quad, 322 SW).



Significant under Criterion A due to its associations with development of Liberty and Criterion C as representative Warren trusses and as work of the Nashville Bridge Company.

The Liberty Bridge is a contributing element in the Liberty National Register Historic District. This town, which was settled about 1800, is believed to be the oldest town in the county. In December 1837, a group of investors incorporated themselves as a company to build a turnpike from Lebanon to Sparta that passed through Liberty. By 1840, this toll road crossed Smith Fork Creek at this site on a covered bridge. This toll road included another covered bridge at Dowelltown and four tollgates. It is unclear when the original covered bridge was replaced, but in 1908 the county built a two-span truss bridge here. The town flourished as a trade center on the turnpike until the 1920s, when Liberty's position as a trading center waned. In 1925, the state freed the toll road, which the state first designated as State Route 43 about 1918, as State Route 54 in 1923, and as State Route 26 and U.S. 70 in the mid-1920s.

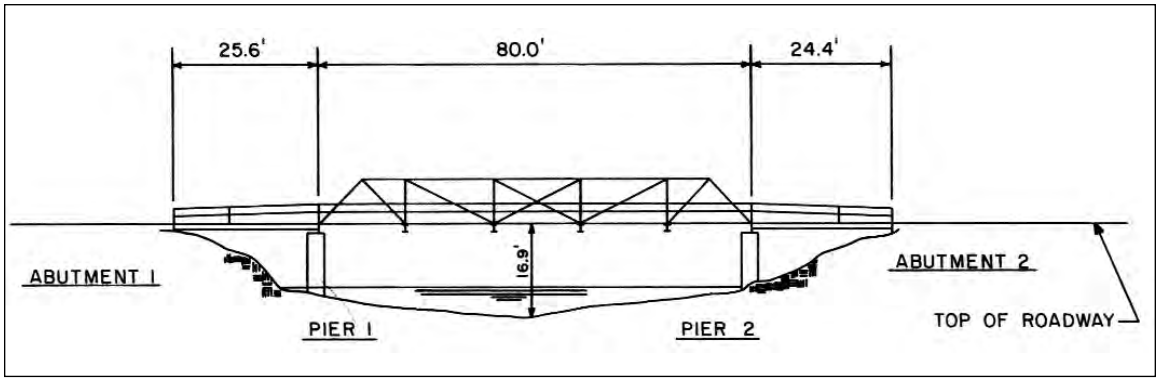
In the 1950s the state rebuilt State Route 26 on a different alignment and bypassed Liberty. This bridge and road, once a part of a main roadway corridor, became a city street for local traffic.

As part of an overall effort to upgrade county roads, in 1908 the county awarded a contract for $1,100 to the Nashville Bridge Company to build this bridge. The contract stated that the contractor would retain and repair the old substructure and erect two Warren pony truss spans 51 feet and 55 feet long. However, the 55-foot span collapsed in 1969. At that time the county moved a 62-foot span from near Salem Church on the west side of Liberty to this site. The Nashville Bridge Company had erected this two span Warren pony truss bridge at Salem Church in 1917 for $400 (Carver 1987a; DeKalb County Court Minutes Volume T:156, 175, 183, 193; Volume U:107, 108, 115, 146, 193; Hale 1915; Nashville Bridge Company #3221, #3823; Slater and Baskin 1987; Webb 1986).

The 1908 span (span one) is 52.1 feet long and is a four panel riveted Warren pony truss 5.3 feet high. The 1917 span is 60.2 feet long and is also a four panel riveted Warren pony truss 7.6 feet high. The curb-to-curb width is 12.9 feet. The composition of the members is typical. Top chords, end posts and verticals are channels. The diagonals and bottom chords are angles connected with battens. The connections on span two at the union of the top chords and end posts were altered when this span was moved. The substructure, composed of two massive stone abutments and one pier that is staggered on the downstream (west) side, is believed to date from the circa 1838 covered bridge at this site.

The Tennessee Department of Transportation, in conjunction with the City of Liberty and the Federal Highway Administration, built a new bridge adjacent to this bridge in 1988. The project resulted in the removal of the trusses but left most of the masonry substructure intact.

(#60) 30-A0934-00.16: Bible Chapel Road Bridge spanning Lick Creek in west Greene County (Mohawk Quad, 172 NE).

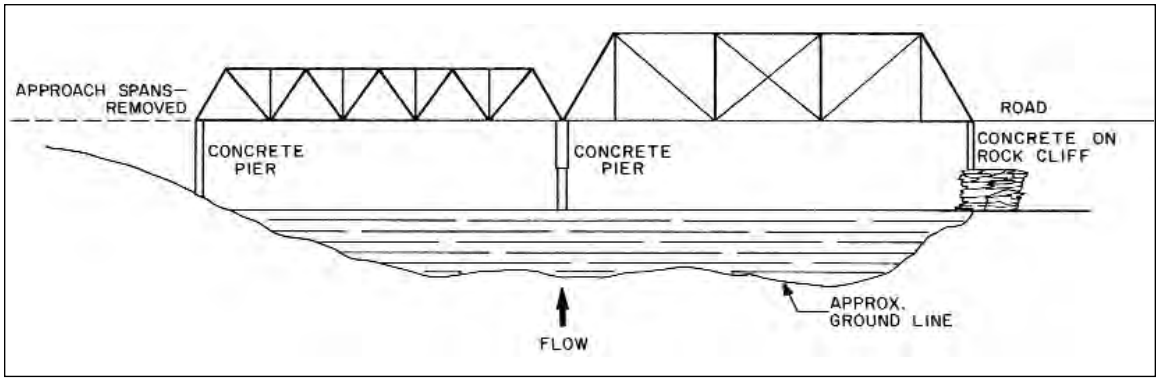


Significant under Criterion C as a representative Pratt half hip truss bridge by the Converse Bridge Company.

The Converse Bridge Company erected this bridge in 1908. It contains one 80 foot Pratt half-hip pony truss flanked by two steel I-beams. The truss is 7.9 feet tall and utilizes cotter pin connections. It has a curb-to-curb width of 11.6 feet and an out-to-out width of 12.0 feet. The abutments are concrete and the piers are steel encased concrete tubular cylinders. Composition of truss members is typical. Top chords and end posts are channels with battens. The bottom chords and diagonals are paired rectilinear eyebars. Verticals are paired angles with lacing, and counters are paired cylindrical tie rods.

The Tennessee Department of Transportation, in conjunction with Greene County and the Federal Highway Administration, replaced this bridge in 1998.

(#61) 88-NonHighway-1: Double Bridge Road spanning Cane Creek at River Hill in north central Van Buren County (Bald Knob Quad, 332 SW).



Significant under Criterion C as representative Pratt and Warren trusses by the Nashville Bridge Company.

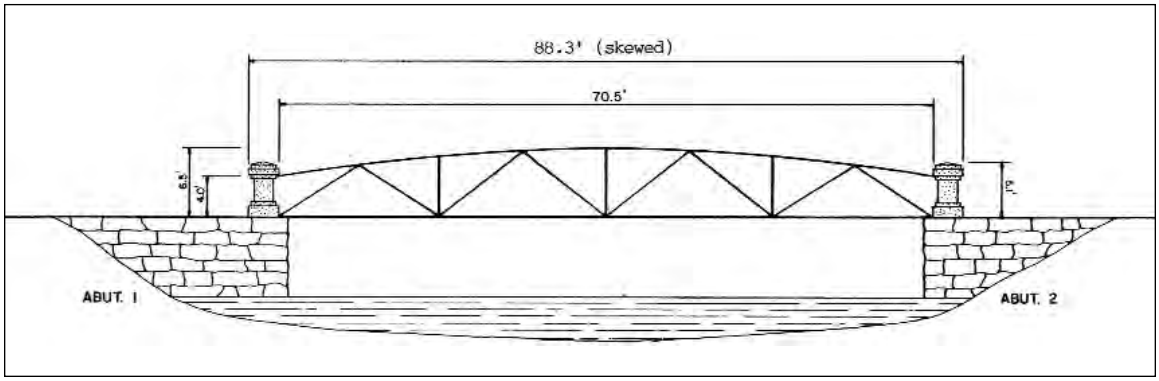
The Nashville Bridge Company built the Double Bridges, the Caney Fork River Bridge and the Cane Creek Bridge, in 1908 for $9,871.45 as a joint Van Buren and White County project. The Caney Fork River Bridge contained a 175-foot Petit through truss and spanned the Caney Fork River that served as the county line. The smaller bridge, the Cane Creek Bridge, spanned the mouth of Cane Creek at its confluence with the Caney Fork River. The Cane Creek Bridge was located in Van Buren County immediately to the west of the south abutment of the Caney Fork Bridge. Together, the two bridges formed an "L" shaped crossing over the two streams.

The Cane Creek Bridge contained a 90-foot Pratt. In 1924, after buying the Great Falls Power Company, the Tennessee Electric Power Corporation (TEPCo) raised the Great Falls Dam, causing increased water levels that resulted in numerous bridges being raised or rebuilt. Consequently, at a cost of $6,680, Nashville Bridge raised the Caney Fork Bridge and added a 56-foot Warren and, at a cost of $9,871.45, raised the Cane Creek Bridge and added a 75-foot Warren. By the 1930s the Caney Fork Bridge was no longer standing and the road system including this bridge had largely been abandoned. This was probably due to a combination of

the 1920s construction of State Route 111 that bypassed these bridges and the March 1929 flood that greatly damaged most bridges in this area (Nashville Bridge Company #3167, #4222-5; White County Court Minutes Volume 30:411; Volume 33:157-161, 532 539; Volume 34:376-384).

The Cane Creek Bridge contains a 90-foot pin-connected Pratt through truss built in 1908 and a 75-foot riveted Warren pony truss built in 1924. At an unknown date, the county removed the approach spans on the west end. The Pratt's substructure originally consisted of a small concrete abutment on a rock ledge on the east end and steel encased concrete tubular piers (with no lateral bracing). The 1924 project raised the bridge by adding concrete on top of the original abutment and adding concrete cylinders connected with a solid concrete wall on top of the pier. The 1924 pier consists of two diamond-shaped concrete columns connected with a bar. Composition of the members is typical. On the Pratt, the top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are paired angles with lacing except hip verticals which are paired eyerods. Diagonals are paired rectilinear eyebars, and counters are single cylindrical tie rods. On the Warren, the top chords and end posts are channels. Bottom chords, verticals, and diagonals are angles with battens.

(#62) 19-NonHighway-1: Cliff Lawn Bridge spanning Richland Creek in Belle Meade, Davidson County (Oak Hill Quad, 308 SE).



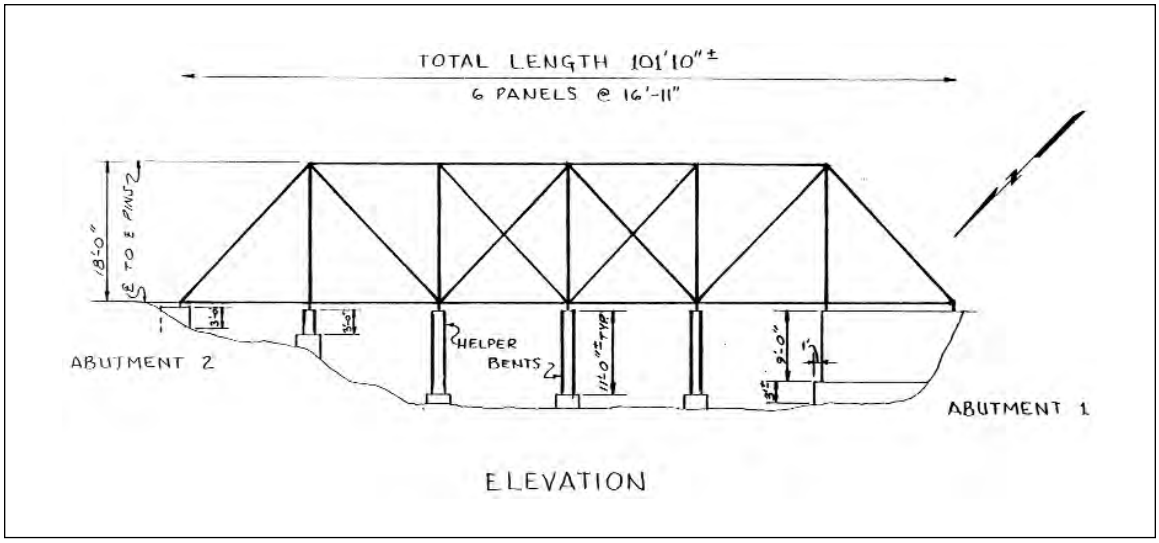
Significant under Criterion C as unusual Warren truss bridge built for driveway use.

This bridge is located at what was once the elaborate private entrance off Harding Pike to the locally prominent Frances McGavock's estate, although road improvements have removed the stone entrance gate and walls. The original 1850s house passed to McGavock's daughter Mrs. Archie Cheatham. After her death, it was sold in 1908 to W. J. Cude who made extensive renovations. In 1910 the house burned, and H. G. Hill rebuilt the house, which remains a private residence.

Historic drawings and photographs from 1880 and 1894 show the existing abutments with a different superstructure (Clayton 1880; Parish 1894). A 1911 publication contains a photograph of the current bridge and the remodeled 1850s house (Caldwell 1911). It is probable that the bridge was built between 1908 and 1910, estimated 1910, when Cude remodeled the house. In the 1930s, a public bridge was built nearby, and in the 1940s, the estate was sold for a residential subdivision, both of which caused traffic patterns to change. This bridge has largely been unused for vehicular traffic since the 1930s, although it is well maintained.

The bridge consists of pre-1880 masonry abutments with one riveted Warren pony truss. Built on a 30° skew, the truss is 88 feet long and 6.5 feet tall with a curb-to-curb width of 11.9 feet and an out-to-out width of 13.3 feet. Light in scale compared to highway bridges, all members are made of paired angles. At each corner are 4.0-foot tall concrete posts.

(#63) 26-A0406-00.33: Boulevard Bridge spanning Wagner Creek, on Decherd and Winchester City limits line in Franklin County (Winchester Quad, 87 NE).



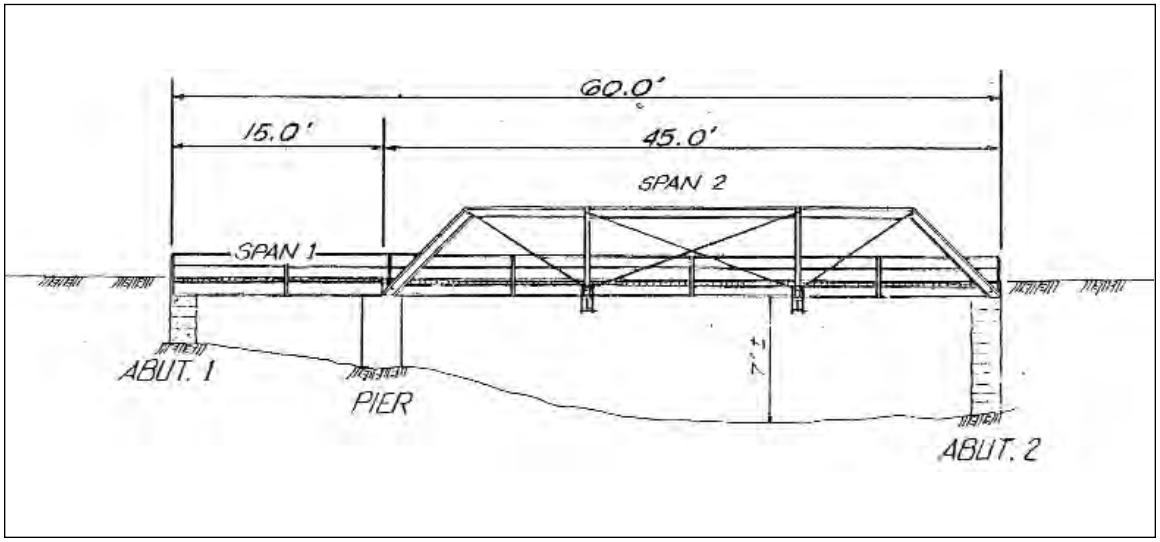
Significant under Criterion C as only skewed through truss in state and as work of the Nashville Bridge Company.

The Nashville Bridge Company erected the Boulevard Bridge in 1909 for $3,253 (Carver 1984; Nashville Bridge Company #3293). The bridge contains one span, a Pratt through truss. Pin-connected, the truss span is 101 feet in length and sits on concrete abutments. It is 18.0 feet tall and 18.0 feet wide. Composition of the members is typical. The top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are paired angles with battens. Diagonals are paired rectilinear eyebars or eyerods, and counters are tie rods.

The portal treatment and the bridge's skewed alignment are unusual features. The portal bracing is a solid strut with three cutout decorative elements composed of a large knobbed circle with five smaller circles abutting it. Between these medium sized circles are small circles. The most unusual feature of the bridge is its skewed alignment. Although most truss bridges are erected on a 90°/90° skew, the Boulevard Bridge sits on a 133°/47° skew. Due to the difficulties in properly designing the lateral stress distributions, few builders erected skewed through truss bridges. This is the only skewed through (vehicular) truss bridge surveyed in Tennessee.

The Tennessee Department of Transportation, in cooperation with the cities of Decherd and Winchester and the Federal Highway Administration, demolished this bridge and erected a new bridge at this site in 1984.

(#64) 29-A0051-00.06: Powder Springs Bridge spanning Flat Creek in west Grainger County (Powder Springs Quad, 154 SW).



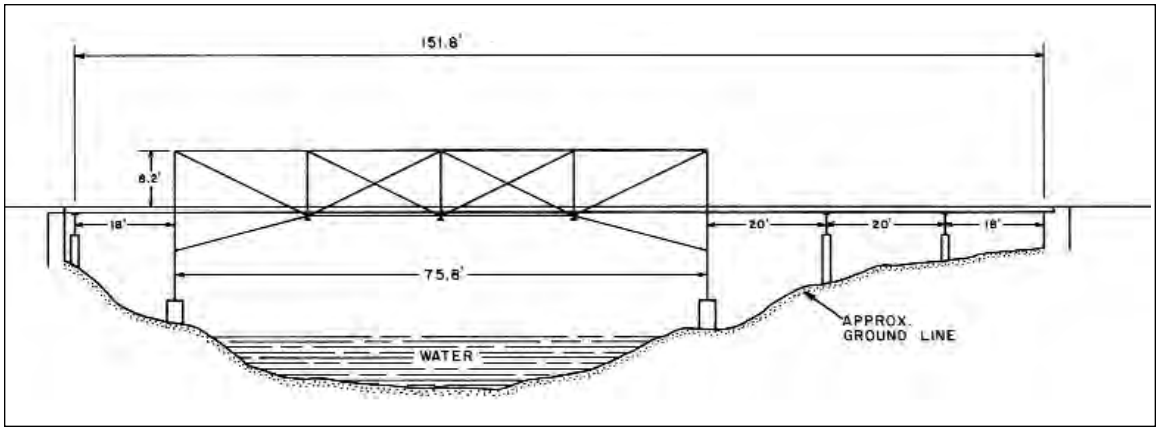
Significant under Criterion C as representative Pratt half-hip truss bridge by the Converse Bridge Company.

In July 1909 the Grainger County Court, in response to a petition from local citizens, voted to erect a steel bridge across Flat Creek at Powder Springs. The court appointed William Needham, Dr. C.A. Atkins, and R. B. Bailer as a bridge committee to let a contract with "some responsible bridge co. at the best price and to [the] best interest of Grainger County and when said bridge is completed, they will report the cost after the work has been inspected" (Grainger County Court Minutes 6:106, 109). A bridge plaque indicates that the Converse Bridge Company built the Powder Springs Bridge in 1909 (Carver 1986b).

The Powder Springs Bridge contains a 15-foot steel I-beam span and a 45-foot Pratt half-hip truss span. The truss is 5.0 feet tall and utilizes cotter-pin connections. The bridge has a curb-to-curb width of 13.8 feet and an out-to-out width of 16.1 feet. Composition of members is typical. Top chords and end posts are channels with battens, and bottom chords and diagonals are paired rectilinear eyebars. Verticals are paired angles with lacing, and counters are paired cylindrical tie rods. Both abutments are of masonry construction; however, a portion of the western abutment (abutment one) has been replaced with concrete. Two steel encased concrete tubular cylinders connected with crossed tie rods form the pier.

The Tennessee Department of Transportation, in cooperation with Grainger County and the Federal Highway Administration, demolished this bridge and erected a new bridge at this site in 1987.

(#65) 61-NonHighway-1: Ten Mile Road Bridge spanning Big Sewee Creek northeast of Decatur in northeast Meigs County (Tranquillity Quad, 124 SW).

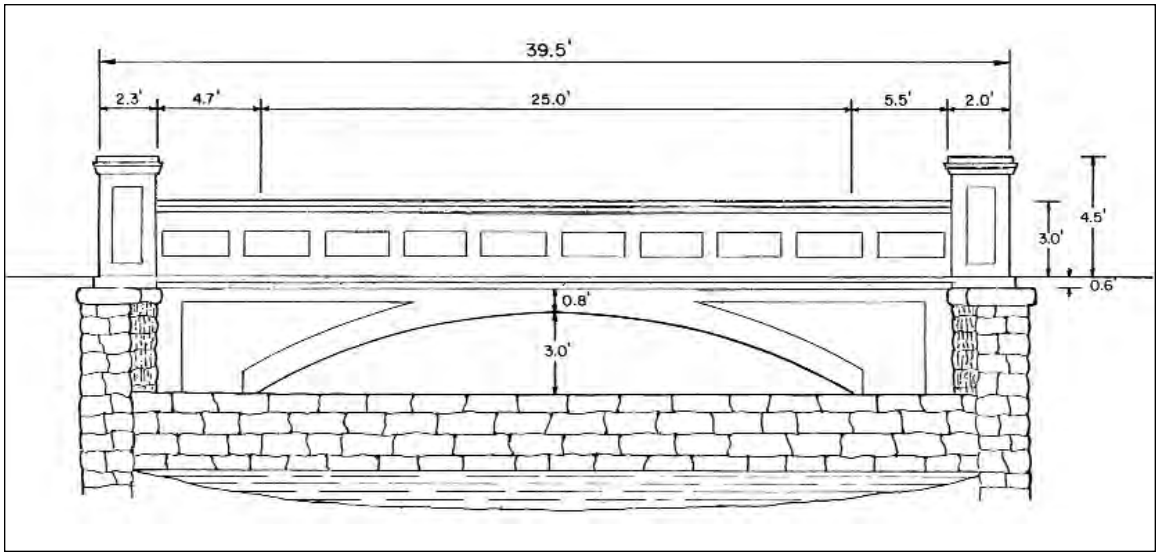


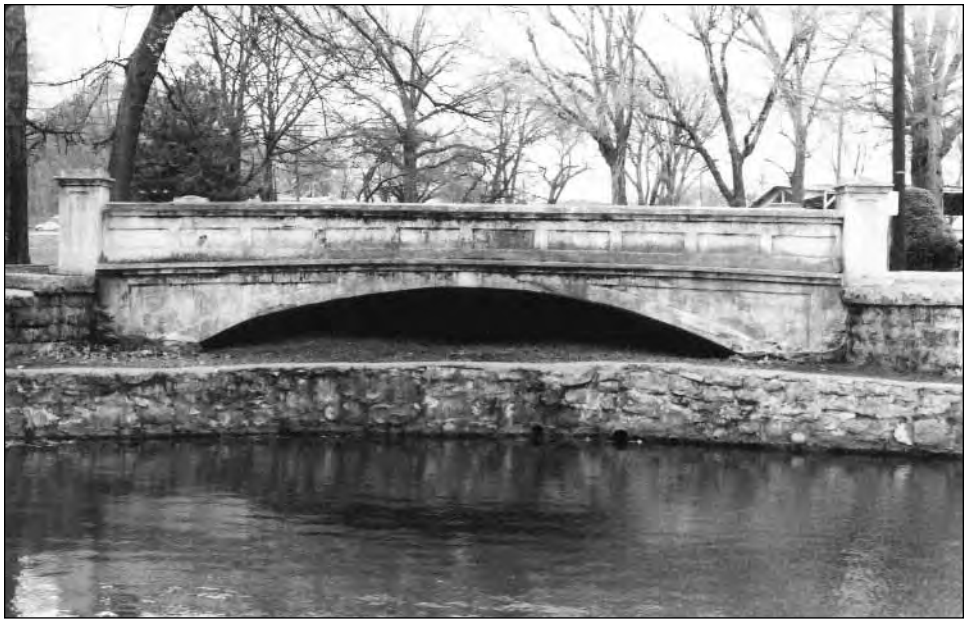
Significant under Criterion A as example of county's commitment to improved transportation and under Criterion C as representative bedstead truss bridge by the Champion Bridge Company.

In October 1909 Meigs County approved plans to build this bridge and subsequently let the contract to the Champion Bridge Company (Meigs County Court Minutes Book 13:334; Toplovich and Rogers 1981). The bridge contains one 76-foot Pratt Bedstead pony truss, which is 8.2 feet high, and four steel I-beam spans. The bridge has an unusually narrow curb-to-curb width of 9.7 feet and an out-to-out width of 11.7 feet. The substructure is composed of steel bents and masonry abutments; the truss legs sit on concrete pads. Composition of most members is typical. Top chords and end posts are channels with battens, and verticals are laced angles. Diagonals in the center panels are single rectilinear eyebars and in flanking panels are paired rectilinear eyebars. Counters are single rectilinear tie rods. However, the bottom chord is atypical. It is composed of H-bars and angles diagonally downward in the end panels. The builder used the combination of a heavy composition and an angled bottom chord to compensate for the design weaknesses of this truss type.

The county abandoned the road with this bridge in the late 1970s. It remains as a relatively intact ruin.

(#66) 19-NonHighway-4: Duck Pond Bridge in Centennial Park in Nashville, Davidson County (Nashville West Quad, 308 NE).





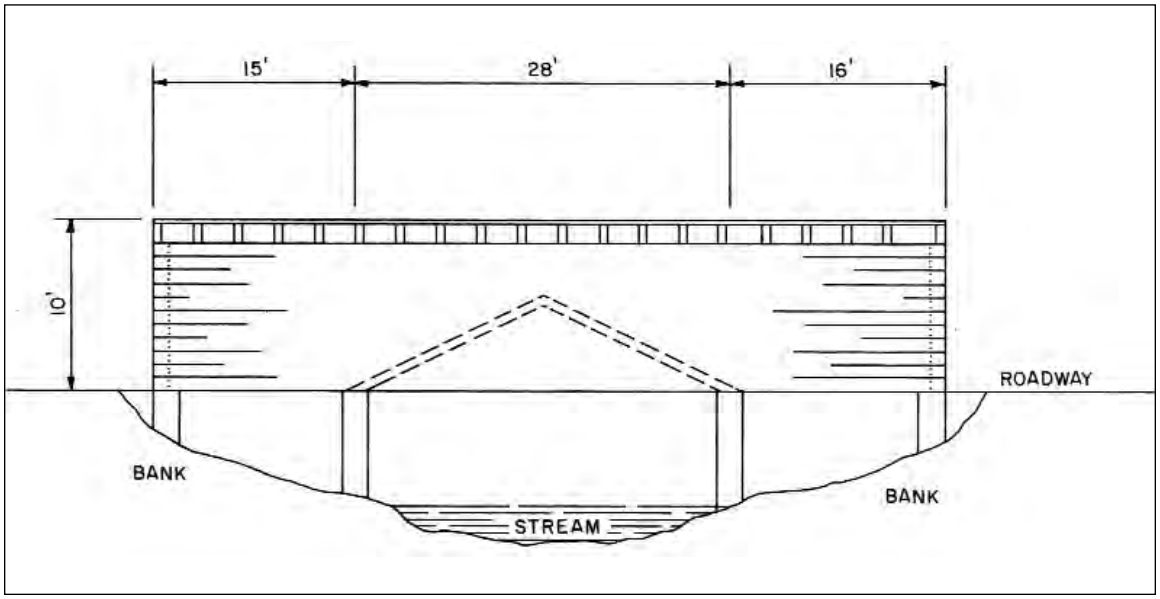
Significant under Criterion C as early concrete arch bridge.

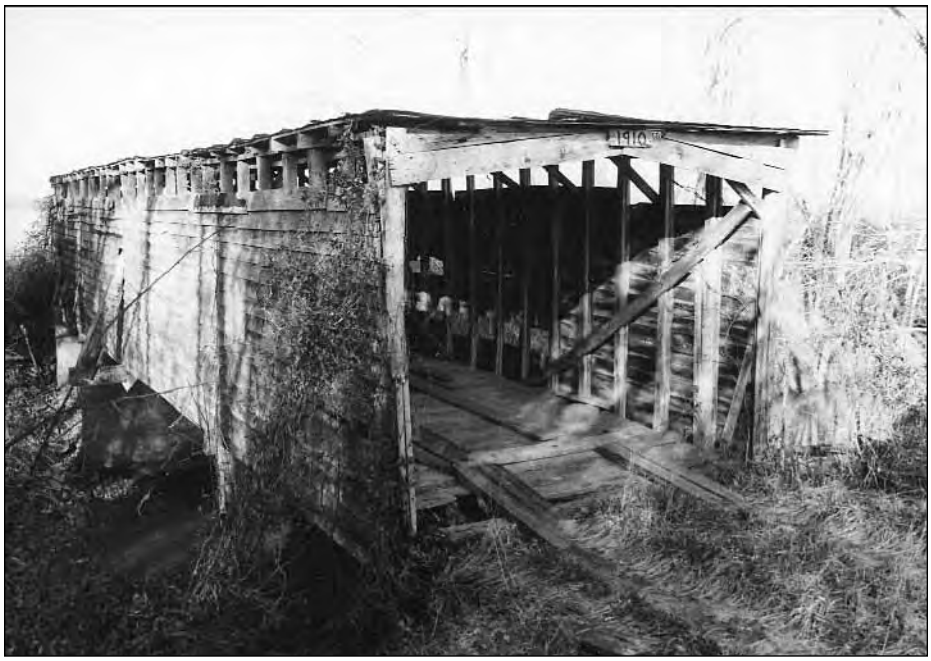
In 1896-1897 the State of Tennessee planned a Centennial exposition to celebrate her century as a state. The state developed a large site in downtown Nashville for this purpose with many temporary structures. After the exposition, the grounds became the city-owned Centennial Park. Over the years, the city built some permanent replacement structures. In 1909 E. C. Lewis, Chairman of the Board of Park Commissioners, decided to replace a wooden bridge at this site and awarded the contract to the Foster and Creighton Company.

Wilbur Creighton Sr. had graduated with an engineering degree from Vanderbilt in 1904 and then joined his father's firm. His thesis had been on the design of arched bridges, and he was responsible for the design of this bridge, one of the company's first reinforced concrete bridges (Creighton 1969; Creighton 1974).

Built in 1910, the bridge is 39.5 feet long with a curb-to-curb width of 21.8 feet and an out-to-out width of 25.0 feet. The bridge contains one closed spandrel arch with an incised design in the spandrel area. The railing is a parapet rail with incised rectangular panels and crenellating end posts. The bridge is at one end of a man-made lake with a stone retaining wall and is on a road carrying vehicular traffic through Centennial Park.

(#67) 66-NonHighway-1: Parks Covered Bridge spanning the Obion River Drainage Canal northeast of Trimble in south-central Obion County (Trimble Quad, 428 NW); moved in 1997 to city of Trimble.



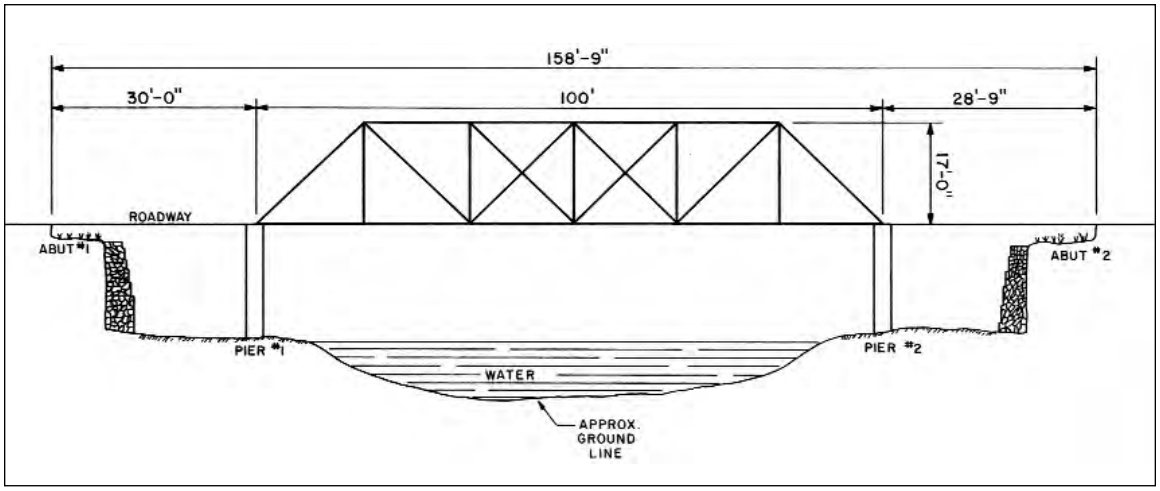


Significant under Criterion C as rare covered wooden truss bridge.

Local farmer W. E. Parks built this bridge, the Parks or Trimble Covered Bridge, about 1910-1912 to span a drainage ditch dividing two of his fields on his farm. Although the bridge's primary purpose was agricultural, local traffic also used it until 1928, when the state built a state route with a modern bridge nearby (Dalton 1978). The bridge remained in use on the Trimble farm until 1997. At that time, due to erosion at the original site that had endangered the historic bridge, the community salvaged as much material as possible and rebuilt the bridge in a city park in nearby Trimble, which resulted in the bridge being delisted from the National Register of Historic Places.

The bridge contains a 28-foot Kingpost truss and two approach spans 15 and 16 feet long. Tin covers the diagonal lateral bracing that extends outward from the center of the truss. The curb-to-curb width is 11.4 feet and the out-to-out width is 12.4 feet (plus bracing). Weatherboarding covers the ten-foot high bridge, which has an open area at the eaves for light and ventilation. A gable roof originally covered the bridge, but a tornado destroyed the original roof in 1914. After the tornado, Parks replaced the gable roof with a flat shed roof.

(#68) 43-A0340-00.01: Hurricane Mills Bridge spanning Hurricane Creek in south central Humphreys County (Hurricane Mills Quad, 31 NE).



Significant under Criterion C as representative Pratt truss which is a contributing structure in the National Register listed Hurricane Mills Rural Historic District.

This bridge is located at Hurricane Mills within the National Register listed Hurricane Mills Rural Historic District (Jones 1999). It is eligible under Criterion A due to its history as a commercial center and Criterion C for the architectural significance of the buildings and engineering merits of the bridge.

Hurricane Mills was settled about 1850 when Stephen Allen constructed a log house on the site of the existing residence. In the following years a small community evolved. At an

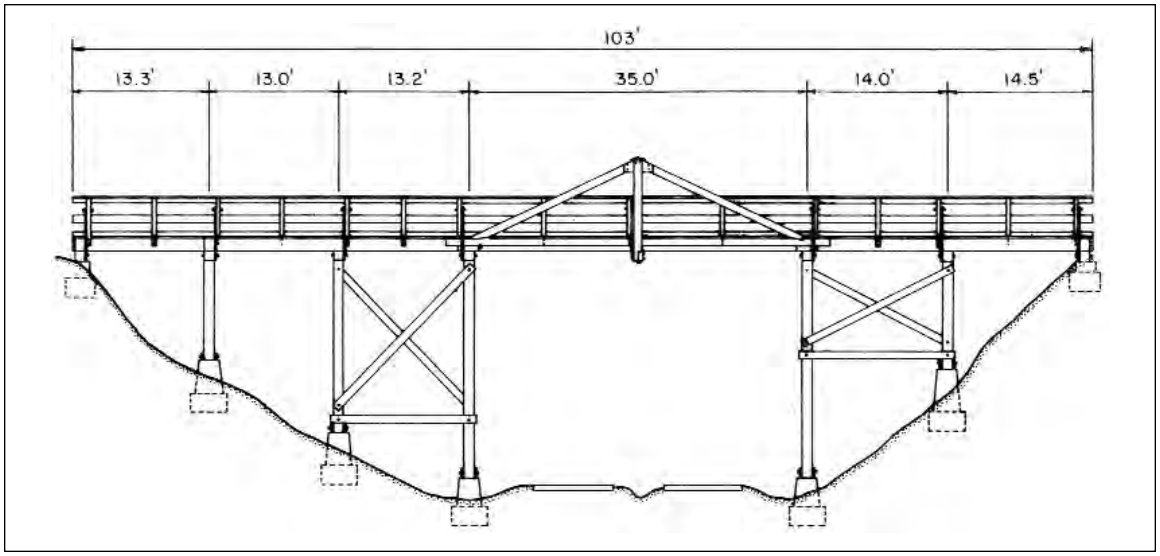
unknown date George Hillman, who purchased the land in 1853, built a two-story frame residence. In 1895 James T. Anderson purchased extensive land holdings from Hillman. Anderson quickly expanded operations by constructing a new mill and dam the same year. Around 1910, Anderson extensively remodeled the old Hillman house and greatly altered its appearance. In 1911 the county built the existing bridge. A plaque identifies the committee as E. W. Anderson, J. B. Bell, and J. B. Tanksley. In 1912 and 1916 the dam and levee were repaired (DuVall and Carver 1984; Humphreys County Historical Society 1979; Nashville Bridge Company #3397, #3861).

During Hurricane Mills' busiest days, Anderson operated a flour mill, stave mill, woolen mill, blacksmith shop, grocery store, and post office. Extant properties that relate to this enterprise are the house, flour mill, dam, and bridge. The mill contains some of the original machinery and post office equipment. This complex is a focal point of the Loretta Lynn Dude Ranch.

The Nashville Bridge Company built the Hurricane Mills Bridge in 1911. The Nashville Bridge Company also did $700 in repairs to it in 1918. These repairs involved reinforcing the truss and possibly replacing the approach spans. The bridge contains a 100-foot pin-connected Pratt through truss flanked by two steel I-beam spans. The bridge has a curb-to-curb width of 11.9 feet and an out-to-out width of 15.3 feet. The piers are steel encased concrete tubular cylinders connected with cross bracing. The original concrete abutments were altered when stone filled gabions were placed along the stream's edge. Composition of the bridge is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing except the hip verticals which are angles with battens. Diagonals are paired rectilinear eyebars, and counters are single cylindrical tie rods.

The Tennessee Department of Transportation, in cooperation with Humphreys County and the Federal Highway Administration, built a new bridge nearby in 1985 and closed the old bridge to vehicular traffic. The older bridge is open for pedestrian use.

(#69) 54-A0214-00.10: Old Coghill Road spanning the Louisville and Nashville (CSX) Railroad south of Etowah in southeast McMinn County (Etowah Quad, 125 SE).

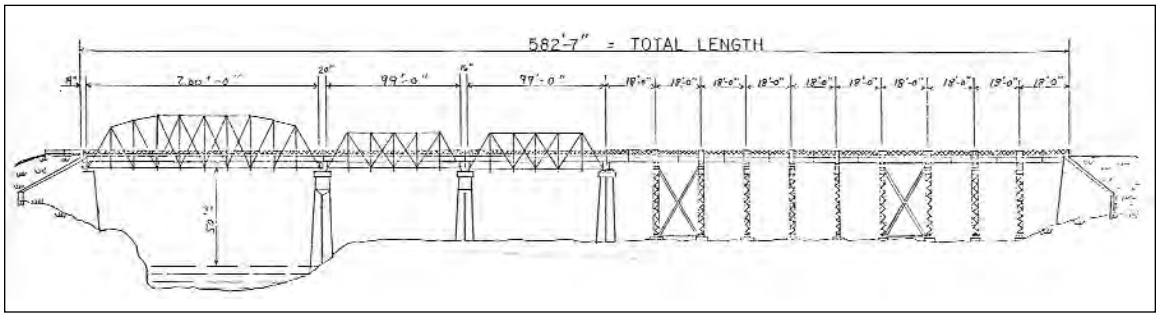


Significant under Criterion C as rare timber Kingpost truss bridge.

The Louisville and Nashville Railroad erected this bridge in 1911 to provide a grade separation with a local county road. The 103-foot bridge contains a 35-foot timber Kingpost pony truss and five timber stringer spans. The truss is 9.1 feet tall and contains the typical metal tension rod suspended from the apex. Also connected at the apex is a wooden 10" x 10" lateral bracing member which extends outward where it connects with the floor beam. The bridge has a curb-to-curb width of 11.4 feet and an out-to-out width of 19.0 feet. The bridge sits on small concrete abutments. The piers are timber posts on concrete footings. Two stringer spans have wooden diagonal bracing.

In the early 1990s, the county removed the Kingpost truss and extensively rebuilt the bridge, rendering it not eligible. In 1995, the state replaced the entire structure.

(#70) 70-01223-02.53: Dentville Road Bridge spanning the Hiwassee River north of Benton in northwest Polk County (Benton Quad, 126 NW).



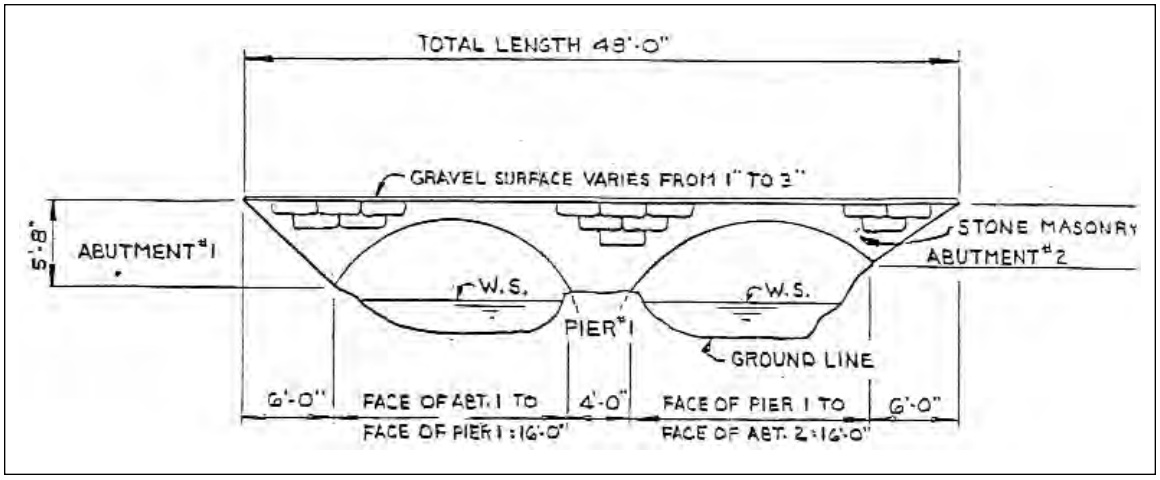
Significant under Criterion A as representative of county's bridge building program and under Criterion C as representative Parker and Pratt trusses by the Joliet Bridge Company.

Unlike most other counties, Polk County had no bridges spanning its three major rivers by the turn of the century. Feeling that ferry service hindered the county's growth, Polk County initiated an ambitious bridge building program. In 1899 the state legislature authorized the county to issue bonds for $25,000 to build bridges. However, it was not until about 1905 that the county contracted for major bridges. At that time it contracted with the Converse Bridge Company for $40,000 to build six bridges. It is not clear why this contract was not honored, but local mining interests (a major component of the local economy) opposed construction of the bridges and they may have succeeded in stopping the work. However, over the following years, the county built not only those six bridges but others such as this bridge, one at a time, primarily between 1908 and 1915 (Carver 1983c; Clemmer Book 3:384, 385, 382; Polk Quarterly Court Minutes Volumes 13-19).

Erected in 1911 by the Joliet Bridge Company, the Dentville Road Bridge contains three pin-connected through trusses and ten steel I-beam spans. The main channel span is a 200-foot Parker truss, and the other two trusses are 99-foot Pratts. The south approach across the floodplain contains ten 18-foot steel I-beams on steel bents. The remainder of the substructure is concrete. There is a laced handrail and laced portal bracing with arched knee bracing. The bridge has a curb-to-curb width of 17.8 feet and an out-to-out width of 18.6 feet; a width wider than the typical 12-foot of this era. This seems to be a result of Polk County's planned building approach and viewing the bridges as keys to growth as opposed to the more random replacement most counties did. The composition of members is typical. Top chords and end posts are channels with lacing. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are paired angles with lacing, and counters are tie rods.

The county barricaded the bridge in 1988. In 1993 the Tennessee Department of Transportation, in cooperation with Polk County and the Federal Highway Administration, demolished the bridge and erected a new bridge at this site.

(#71) 31-A0022-02.49: Sherwood Road spanning Hickory Creek in northwest Grundy County (Cane Hollow Quad, 93 NE).



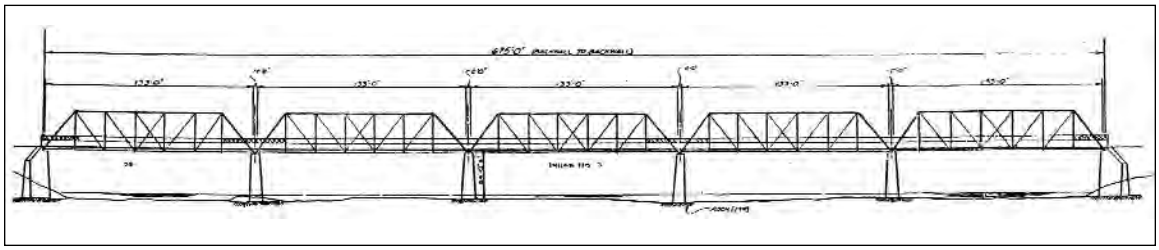
Significant under Criterion C as rare masonry arch bridge.

Apparently, R. M. Crick erected this bridge for $639 in 1912 (Grundy County Court Minutes Volume M:540; Volume N:53). It contains two earth-filled masonry arches formed of irregularly cut stones. Each arch is 16.0 feet long. The curb-to-curb width is 10.0 feet and the out-to-out width is 12.0 feet. A row of cut stones follows the line of the arch. There is little fill between the roadway and the arch, and there is no railing.

No information was available about Crick. The survey identified two other Grundy County bridges that he built: a one span masonry arch over Firescald Creek built in 1906 (#52, 31-NonHighway-2) and a two span masonry arch over Hickory Creek built in 1910 that has since been altered (31-A0023-02.58).

The county built a new bridge at this site in 1984 but left this bridge in place as a historic ruin. It remains in good condition.

(#72) 70-SR315-00.02: Reliance Bridge spanning the Hiwassee River in Reliance in north central Polk County (Oswald Dome Quad, 126 NE).



Significant under Criterion A for local history and Criterion C as representative Pratt trusses by the Roanoke Bridge Company.

Unlike most other counties, Polk County had no bridges spanning its three major rivers by the turn of the century. Feeling that ferry service hindered the county's growth, Polk County initiated an ambitious bridge building program. In 1899 the state legislature authorized the county to issue bonds for $25,000 to build bridges. However, it was not until about 1905 that the county contracted for major bridges. At that time it contracted with the Converse Bridge Company for $40,000 to build six bridges, including a bridge at this site. It is not clear why this contract was not honored, but local mining interests (a major component of the local economy) opposed construction of the bridges and they may have succeeded in stopping the work. However, over the following years, the county built these six bridges and others, one at a time, primarily between 1908 and 1915 (Carver 1983c; Clemmer Book 3:384, 385, 382; Polk Quarterly Court Minutes Volumes 13-19).

The Roanoke Bridge Company erected this bridge in 1912. Members of the bridge committee were J. N. McBrayer, R. L. Ramsey, Charles Johnson, W. A. Vaughan, and R. B. Hammons. The engineer was R. H. Anderson.

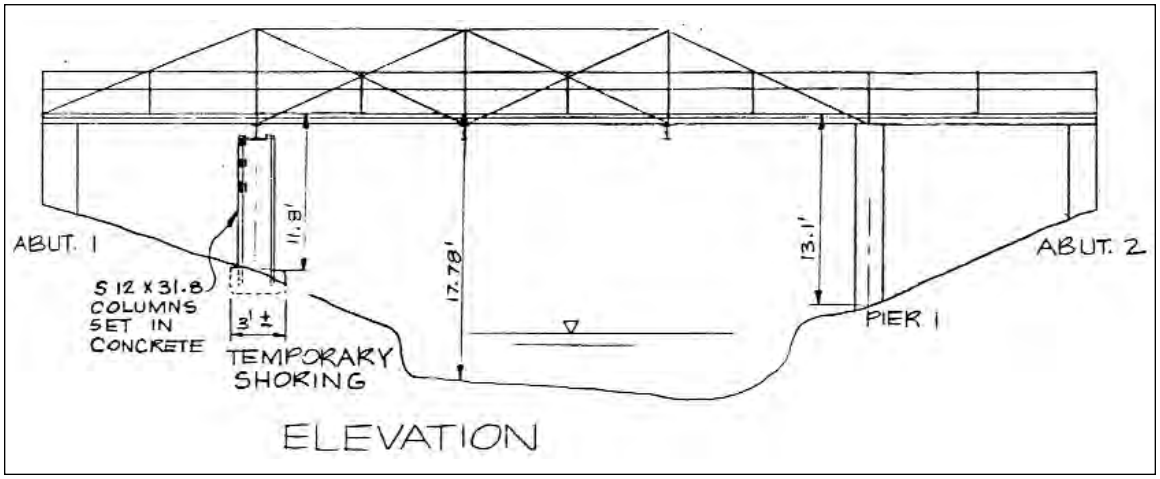
The bridge is a contributing element in the National Register listed Reliance Historic District. This district contains five principal buildings built between 1888 and 1899 as well as the 1912 bridge and several outbuildings, all located along the rich bottomland of the Hiwassee River (Carver 1987b; Evans and Karhu 1985). The striking scenic area lies within the Cherokee National Forest.

The Reliance Bridge contains five spans, each a 133-foot pin-connected Pratt through truss. The substructure is concrete. It has a curb-to-curb width of 17.5 feet and an out-to-out width of 20.5 feet; a width wider than the typical 12-foot of this era. This seems to be a result of Polk County's planned building approach and viewing the bridges as keys to growth as opposed to the more random replacement most counties did. The composition of members

is somewhat atypical. Top chords and end posts are small channels with lacing top and bottom. Bottom chords are paired rectilinear eyebars in the three center panels while those in the flanking panels are laced channels. Verticals are small channels with lacing on each side. Diagonals are paired rectilinear eyebars, and counters are paired rectilinear tie rods.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, demolished this bridge and erected a new bridge in 1992.

(#73) 93-A0285-00.95: Lost Creek Bridge spanning Lost Creek in Lost Creek in southeast White County (Lonewood Quad, 332 SE).



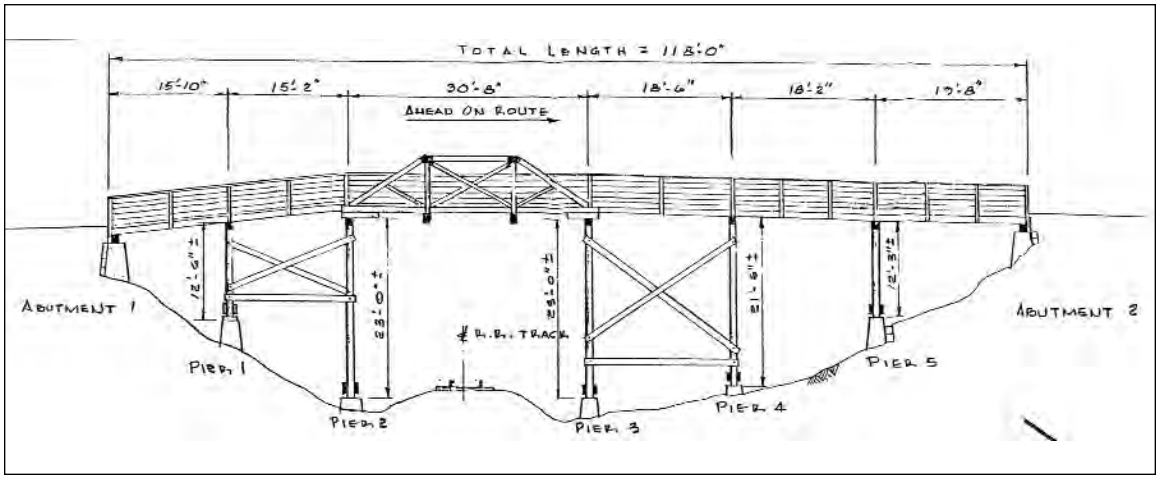
Significant under Criterion C as a representative Pratt truss bridge by the Nashville Bridge Company.

In January 1912 the White County Court appointed a committee to examine the Lost Creek Bridge and either replace or repair it. In April the court ordered that a new bridge be built. The county let the contract to the Nashville Bridge Company for $1,400 (Nashville Bridge Company #3467; White County Court Minutes Volume 31:85, 99).

The bridge is 82.7 feet long and contains a 64.7-foot cotter pinned Pratt pony truss, which is 8.0 feet tall, and an 18.0 steel I-beam span. The bridge has a curb-to-curb width of 10.7 feet and an out-to-out width of 14.0 feet. The substructure contains two concrete abutments and one pier of steel encased concrete tubular cylinders connected with crossed cylindrical rods. In 1969, the county placed shoring composed of steel I-beams underneath the southernmost hip vertical of the truss span. Composition of the truss is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are angles with battens. Diagonals are paired rectilinear eyerods, and the counters are single rectilinear tie rods.

The county built a new bridge and bypassed the old bridge in the 1990s. The old bridge remains intact as a historic ruin.

(#74) 70-A0317-02.09: County Road spanning Louisville and Nashville (CSX) Railroad northeast of Benton in northwest Polk County (Oswald Dome Quad, 126 NE).

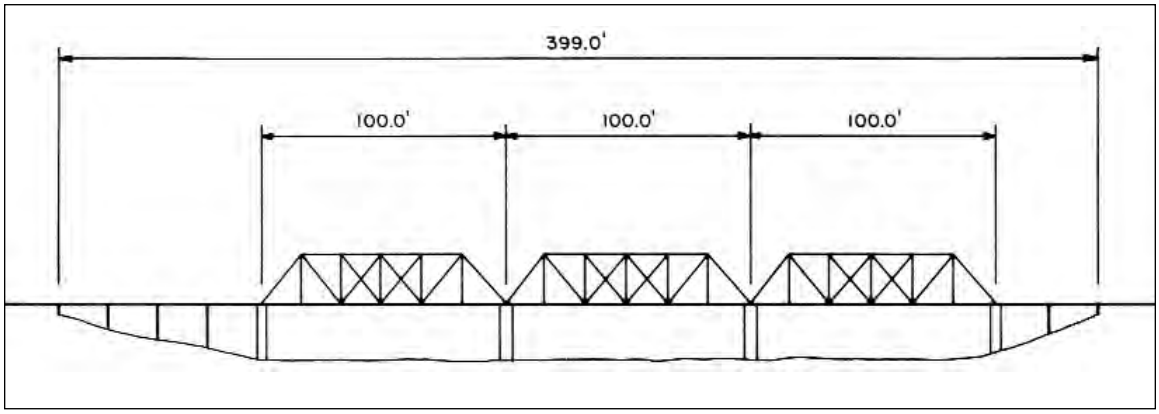


Significant under Criterion C as rare timber Queenpost truss bridge.

The Louisville and Nashville Railroad built this bridge in 1913 to provide a grade separation with a county road. The 118-foot bridge contains a 30.7-foot timber Queenpost truss and five timber stringer approach spans. The truss is 7.4 feet tall and has diagonal bracing. The abutments are concrete; the stringers rest on timber piers on concrete caps. The bridge has a curb-to-curb width of 15.9 feet and an out-to-out width of 16.9 feet. The bridge layout features a 56° skew.

This bridge was replaced in the 1980s.

(#75) 82-C0539-00.01: Riverside Bridge on Weaver Pike spanning the South Fork of the Holston River in central Sullivan County (Keenburg Quad, 207 NW).

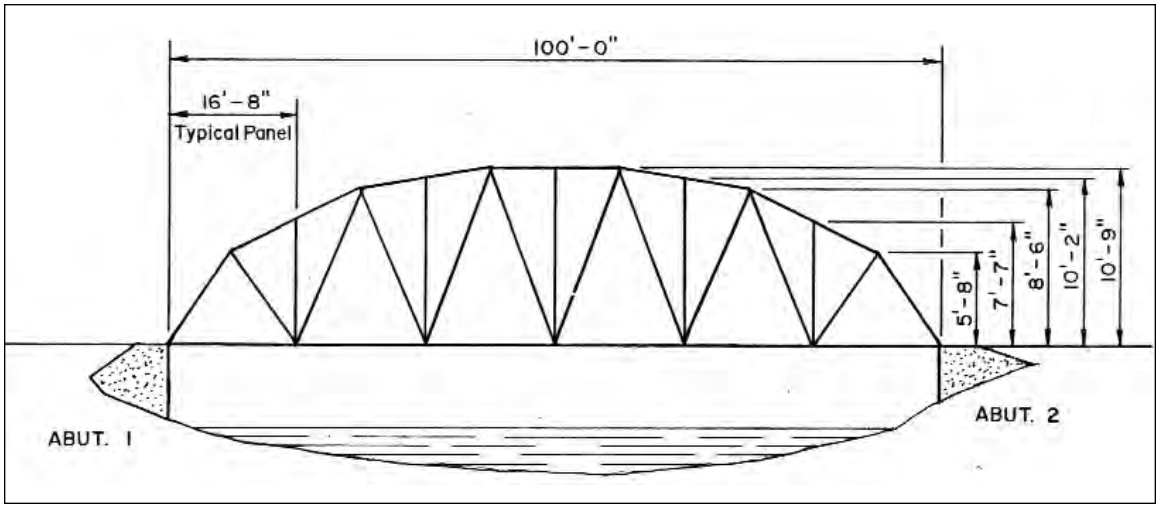


Significant under Criterion C as representative Pratt trusses by the Converse Bridge Company.

The Converse Bridge Company erected the Riverside Bridge in 1913 (Carver 1983e). It is 399 feet long and contains three cotter-pinned 100-foot Pratt through trusses and six 16.5-foot steel I beam spans. The bridge has a curb-to-curb width of 11.3 feet and an out-to-out width of 14.3 feet. The composition of the truss is typical. Top chords and end posts are channels with battens. Bottom chords, diagonals, and hip verticals are paired rectilinear eyebars. The remaining verticals are paired angles with lacing. Counters are cylindrical tie rods. The substructure contains two concrete abutments, three steel encased concrete tubular piers connected with steel sheets or crossed tie rods, and six steel bents of paired angles with lacing.

The Tennessee Department of Transportation, in cooperation with Sullivan County and the Federal Highway Administration, demolished this bridge and erected a new bridge at this site in 1984.

(#76) 83-NonHighway-1: Old State Route 52 Bridge spanning Caney Fork Creek near Corinth in north central Sumner County (Fountain Head Quad, 312 SW).

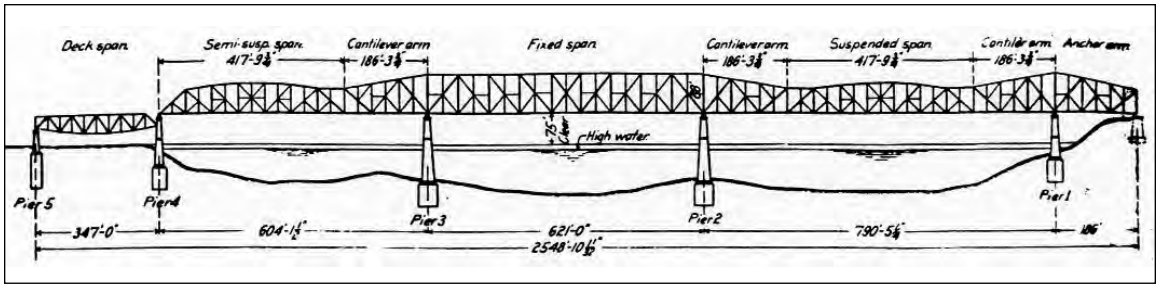


Significant under Criterion C as representative Warren truss with polygonal top chord by the Nashville Bridge Company.

The Nashville Bridge Company erected this bridge in 1913 for $1,945 (Nashville Bridge Company #3567). Members of the county's bridge committee were G.W. Jackson (Chairman), W. G. Stewart, A. Hester, and B. B. Gillespie. The bridge was located on the old main road from Portland to Westmoreland that the state designated State Route 52 in the 1920s. The state realigned State Route 52 about 1970, and this bridge, with a one-mile segment, became a county road. The bridge and a short road segment were redundant, and the county soon barricaded the road and closed it to traffic.

The bridge contains one span, a 100-foot riveted Warren pony truss with polygonal top chords on concrete abutments. The bridge has a curb-to-curb width of 12 feet and an out-to-out width of 14 feet. Composition of the members is typical. Top chords and verticals are angles with battens. Diagonals are paired angles with lacing, except in the hip panels where they are paired angles.

(#77) 79-NonHighway-4: Harahan Bridge spanning the Mississippi River in downtown Memphis on the Tennessee-Arkansas state line, Shelby County (Northwest Memphis Quad, 404 NE).



Significant under Criterion A for its role in overland transportation and for expanding development into West Memphis and under Criterion C for its engineering merits.

As rail traffic in Memphis increased after the construction of the Frisco Bridge (#14, 79-NonHighway-3), local citizens represented by Representative Kenneth McKellar and officials from the Rock Island Railroad initiated efforts to build a second bridge across the Mississippi River at Memphis. The Memphis and Arkansas Bridge and Terminal Company, Cotton Belt Southern Railway, and the Missouri Pacific rail line also participated in the project. Throughout 1912 local interests and railroad officials argued over the issue of trolley cars, who would build and maintain the approaches for vehicular traffic, and vehicular tolls. The various interests finally agreed that the railroads would build the vehicular lanes on the bridge but that local

interests would build and maintain the approach spans which were to be free. The arrangement eliminated trolley cars. The railroads also agreed to pay the City of Memphis $50,000 for street closures. Since the viaduct and trolley lines more directly affected Arkansas, many citizens in Arkansas viewed the arrangement as unsatisfactory, and the vehicular viaduct remained a source of controversy throughout its existence.

The nationally significant bridge designer Ralph Modjeski, designed and supervised the erection of the Harahan Bridge. Modjeski was born in 1861, in Crakow, Poland, as Rudolphe Modrzejewski. In 1876 his family moved to America intending to live in a Polish Artists colony or a commune in California. However, they soon left California and Modjeski's mother, a famed actress, resumed her career with son Modjeski as her manager. It was at this time that he changed his name. After considering becoming a professional pianist, Modjeski chose to pursue engineering. He trained in Paris at the E'cole des Ponts et Chaussees from 1881 to 1885 and graduated at the head of his class with a degree in Civil Engineering. During this time he became a naturalized United States citizen.

Modjeski's first job upon his return from Paris was with George Morison, one of the country's most prominent engineers (see the Frisco Bridge, #14, 77-NonHighway-3). While working for Morrison on the Frisco Bridge, he served as chief draftsman, chief inspector, and assistant engineer over construction. Modjeski trained under Morison until 1892 when he left to open his own firm in Chicago. Like Morison, Modjeski was best known for his work in railroad bridges, but unlike Morison who specialized in metal trusses, Modjeski worked with a variety of bridge types.

In 1894, Modjeski began work on his first major project on his own, a seven span railway and highway bridge spanning the Mississippi River at Rock Island, Illinois. He developed a set of standard bridge designs for the Northern Pacific Railroad that the line used for many years. In 1902 Modjeski formed a partnership with Alfred Noble (who had also worked on the Frisco Bridge). With Noble, Modjeski first achieved national recognition with the 1905 design for a railway bridge spanning the Mississippi River at Thebes, Illinois. Between 1904 and 1915 he designed a series of bridges in Oregon. In 1907 the collapse of the Quebec Bridge, spanning the St. Lawrence River, attracted worldwide attention. In 1908, Canadian authorities appointed a three-man advisory commission for the design and construction of the new bridge. It was a mark of Modjeski's prominence that he was chosen to represent American engineers and served on the commission until completion of the bridge in 1918. Historian Carl Condit credits Modjeski with reintroducing K-trussing to North America through its use on the Quebec project (Condit 1960, 1968). As an independent engineer, Modjeski designed the 1910 McKinley Bridge spanning the Mississippi River at St. Louis, a double track rail and vehicular bridge. Modjeski also designed the 1912 Cherry Street Bridge spanning the Maumee River in Toledo, Ohio, the first of several concrete bridges that he designed.

Modjeski returned to Memphis in 1914 to design the Harahan Bridge, a joint rail and vehicular bridge spanning the Mississippi River immediately adjacent to the Frisco Bridge. Until 1930 this was the only vehicular bridge spanning the lower Mississippi. Historian David Plowden states that due to:

> its proximity to Morison's landmark, Modjeski's achievement has always been eclipsed, increasingly so after a new highway bridge was built on the other side of it. As part of a trilogy of cantilevers, representing one of the most impressive

> masses of steelwork to be found anywhere, the Harahan is lost. Had it stood alone, no doubt it would have been recognized as one of America's major railroad bridges (Plowden 1974:172).

During the 1910s, Modjeski designed a railway and highway bridge spanning the Mississippi River at Keokuk, Iowa; a railway bridge spanning the Ohio River at Metropolis, Illinois; and a railway bridge spanning the Thames River at New London, Connecticut. Between 1920 and 1924, he rebuilt two bridges under traffic at Cincinnati and at Omaha. Until the 1920s, Modjeski had primarily worked with metal trusses. However, in 1920 he was hired as chief engineer for a suspension bridge spanning the Delaware River at Philadelphia. The Philadelphia-Camden Bridge, now known as the Benjamin Franklin Bridge, at its completion in 1926, was the longest suspension bridge in the world. Some engineers consider it to be his largest and single most important design (Durand 1944).

In 1923, Modjeski formed a partnership with Frank Masters and later Clement Chase and, after Chase's death in 1933, with Montgomery Chase. Based in Pennsylvania, this firm built a wide variety of bridges across the country. One of the best known bridges by this firm is the 1933 Huey P. Long Bridge spanning the Mississippi River at New Orleans, a joint highway and railway bridge. This was the fourth bridge spanning the lower Mississippi, and Modjeski had worked on three of the four. Modjeski's last major project was the San Francisco-Oakland Bay Bridge. In 1931 he was appointed Chairman of a Board of Consulting Engineers for the bridge which, though overshadowed by the concurrent development of the Golden Gate Bridge, was at that time the longest major highway and electric railway bridge in the world. Due to failing health, Modjeski moved to California in 1936 in order to work on this project (Durand 1944; Modjeski and Masters 1990).

Upon Modjeski's death in 1940, an obituary in the *New York Times* praised him as "the World's leading bridge builder" (Duszak 1986). Plowden credits him with being the chief engineer in charge of the construction or the rebuilding of thirty of America's major bridges, "four of which hold records and have attained the status of classics" (Plowden 1974:171).

In addition to Modjeski, the crew for the Harahan Bridge in Memphis included; W. E. Angieras, assistant chief engineer and M. B. Case as resident engineer. Modjeski and many other crew members had previously worked on the Frisco Bridge project which was 200 feet downstream from the Harahan Bridge. This close proximity necessitated a parallel substructure placement for river traffic and thus spans of similar lengths. Construction lasted from late summer 1913 through February 1917, and the project cost nearly $6 million. High waters repeatedly plagued the project and delayed construction. The deaths of twenty three laborers also marred construction activities.

Modjeski let a contract 1 June 1913 for the substructure to the Union Bridge and Construction Company of Kansas City. (This company's president L. S. Stewart had been Superintendent of Construction for the Frisco Bridge.) In November 1913 caisson work began for the piers. The piers are of concrete, faced with granite, and rest on pneumatic caisson foundations which in turn rest on the clay riverbed. Workers built the foundation for the anchor pier in open excavation while they built the foundations for piers one through five by sinking caissons by pneumatic process. During construction on the caisson for pier five on 9 April 1914, during shift change as the old crew left safely, poisonous gases in the locking in process killed the in-coming crew of nine men.

The contract for the superstructure was let to Pennsylvania Steel Company of Philadelphia. The bridge carries two rail lines within the trusses and 14-foot vehicular roadways cantilevered out from each side of the truss. From east to west, the main section of the bridge contains one 186-foot anchor arm span, one 790-foot channel span, one 621-foot fixed or center span, and one 604-foot shore span all comprising the pin-connected continuous truss section. This truss fits no easy classification but reflects Petit influences with its subdivided panels. To the west is a 347-foot deck Warren. A combination of carbon steel and a nickel-chrome alloy, known as "Mayari Steel" that was manufactured from Cuban ores, forms the superstructure.

The contract for the second major section of the bridge, the approach viaduct on the Arkansas side, was let to Virginia Bridge and Iron that operated a plant in Memphis. The viaduct is 2,364 feet long and contains plate girder spans on steel towers on concrete piers. Twenty 80-foot girder spans alternate with nineteen 40-foot tower spans.

In the summer of 1916 crews finished the bridge, which included two 14-foot "wagonways" for vehicular traffic and an approach viaduct for rail traffic on the Arkansas side. The only major feature not built by then was the vehicular approaches. On 14 July 1916, the first train crossed the bridge for a dry run and the following day the bridge officially opened. Over the previous two years, the Chamber of Commerce had planned elaborate dedication ceremonies that included raising $100,000 and appointing over thirty committees. However, due to the involvement of the United States in World War I, the chamber decided it was inappropriate to hold such ceremonies and announced that it would postpone the ceremonies until the contractor had completed the vehicular viaduct later in the year. The ceremonies were never held. The railroads named the bridge in honor of J. T. Harahan, president of the Illinois Central Railroad and proponent of the bridge, who died in a train wreck in 1912.

The vehicular viaduct, to be built and maintained by local groups, was a source of controversy throughout its existence. On the Tennessee side, approach work was simple as the anchor arm rested on a bluff and the only work needed was to connect the truss span with local roads. The Arkansas side was far more complex as that end of the truss span stopped in Crittendon County about 75 feet above the ground in a flood prone bottom two miles away from the 1895 St. Francis Levee. Arkansas blamed Memphis leaders and Senator McKellar for agreeing to an arrangement that benefited Memphis but left Arkansas with a substantial obligation to build and maintain the viaduct that the trolley car prohibition exacerbated. As fund-raising for the $50,000 viaduct proved difficult, dissension between Arkansas and Memphis residents increased. Finally, the vehicular viaduct opened 5 September 1917. While its wood construction on a steep three percent grade may appear crude in hindsight, at the time it was considered quite superior to the previous ferry system.

Up to the 1910s, much of this area of Arkansas had been swampland, but improved canals and drainage methods allowed farmers to convert acreage for use as cotton fields. As a result, better access between agrarian Arkansas and the urban trade center of Memphis became necessary. Initially, local leaders planned to extend the viaduct toward an existing town in Arkansas, but for various reasons, it went further south toward a logging camp known as Bragg's Spur. Along this corridor at Bragg's Spur a new town named West Memphis developed. West Memphis was incorporated in 1927 (the year construction on a new viaduct began), and between 1930 and 1940, the population nearly quadrupled. Today it is a major town in this area.

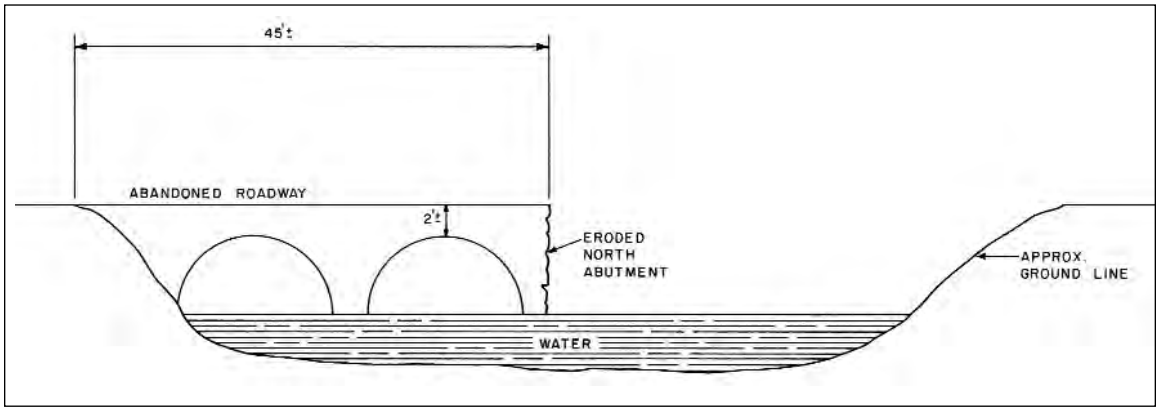
When the viaduct on the Harahan Bridge opened in 1917, it was the only bridge spanning the Mississippi south of the Ohio River confluence to carry vehicular traffic and remained so until 1930 when a combined railroad-highway bridge was built at Vicksburg, Mississippi. As such, the Harahan Bridge was a vital link in regional and transcontinental transportation networks such as the Lee Highway, the Bankhead Highway, and the U.S. and state route systems. A booster publication from 1929 noted that "seven highway arteries of national importance converge at Memphis to cross the Mississippi on the Harahan Bridge...the physical link that makes Memphis the gateway for all this tourist travel" (Volunteer 1929:63). Between 1935 and 1940 four other bridges spanning the Mississippi River south of the Ohio River confluence were built. The next bridge built south of the confluence was the Memphis-Arkansas Bridge which opened in 1949 (#156, 79-I055-12.00). Since then eight other bridges have been built over the "true" Mississippi.

By the early 1920s, local citizens proposed a new viaduct, and a toll placed on the viaduct in 1924 exacerbated this pressure. In 1923, Memphis leaders proposed to build a new viaduct and to improve the vehicular lanes. After direct lobbying by Memphis leaders, the U.S. Commissioner of Agriculture, whose agency administered the Bureau of Public Roads, visited Memphis in 1924 and agreed that each state could use federal highway money for such a project. For two years, negotiations continued between Tennessee and Arkansas over how to split the cost. Tennessee Commissioner of Highways, J. C. Creveling, agreed to pay half the costs of the truss portion since it spanned the state line. However, he refused to pay for any of the costs of the viaduct since it was entirely within Arkansas. Under intense pressure from West Tennessee leaders, the U.S. Bureau of Public Roads and Tennessee Governor Austin Peay ordered Creveling to authorize funds for the viaduct. Rather than participate in what he believed to be an illegal appropriation, Creveling resigned 21 October 1925.

The next highway commissioner approved Tennessee funding for the viaduct. On 6 February 1926, participants signed a financial agreement in which Memphis, the Harahan Viaduct Improvement Association (composed of eight Arkansas Counties), Arkansas, and Tennessee agreed to fund the $1.7 million viaduct. The contract for the new viaduct was let 25 July 1927. A fire in September 1928, which resulted in motorists being ferried across the river for two months, heightened interest in the new viaduct. The new concrete viaduct opened 10 July 1930.

When the Memphis and Arkansas Bridge (79-I055-12.00, a continuous truss designed by the firm of Modjeski and Masters) opened in 1949, Crittendon County and Arkansas closed the Harahan Bridge Viaduct and tried to sell both it and the roadway for scrap. Memphis opposed the move, saying that the old roadway should be left in case it was needed for emergencies. Lengthy court proceedings followed. Ultimately, President Harry Truman intervened and directed that although the decking could be removed, the vehicular roadways should remain intact for emergency use. Today the Harahan Bridge is a vital link in the rail system, but the roadway and viaduct remain closed to traffic (Case 1915; Fraser 1986; Johnson 1978b; Lee 1979; Macpherson 1969; *Memphis Commercial Appeal* 1916-1917; Memphis Library Clipping File; *Memphis News Scimitar* 1925-1953; Modjeski 1917; Tennessee 1959).

(#78) 26-NonHighway-1: Bridge at Falls Mills spanning Factory Creek, southwest of Winchester, Franklin County (Huntland Quad, 80 SE).

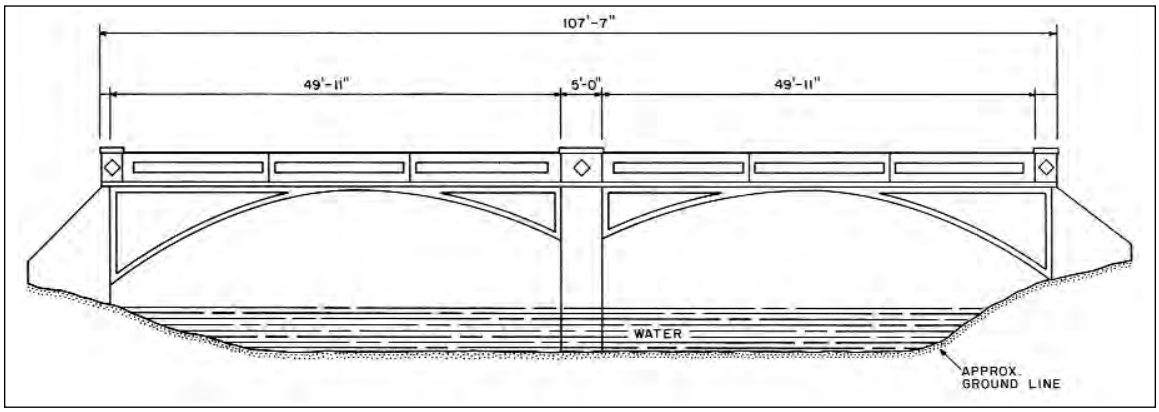


Contributing element in historic district which is eligible under Criteria A and C.

This circa 1914 masonry arch bridge is a contributing structure within the National Register listed Falls Mills Historic District. The historic district lies in a narrow line along each side of Factory Creek which snakes through this hilly region. The creek links the district's contributing properties that include: an 1873 brick mill, 1915 frame residence, 1871 masonry dam and millrace, 1914 masonry arch bridge, 1897 brick and frame grist mill, millrace and ruins of masonry dam, and an 1850 residence. The district depicts the remnants of a once thriving rural milling community in the Salem area that dates to the 1830s. The bridge was erected in 1914 after Franklin County passed a turnpike bond that resulted in a new road being built across the valley (bisecting the current district). Prior to that, two pedestrian bridges were the only crossings at the mills (Nolen and Stager 1987).

The 1914 bridge contains two masonry arch spans, formed of rubble stone patched with concrete, and is about 45 feet long and 16 feet wide. Over the years the creek flow has eroded the north bank destroying the north abutment and substantially widening the channel, but the southern portion of the bridge remains relatively intact. The bridge has remained closed to vehicular traffic since it was replaced with a modern two-lane bridge, probably in the 1940s. The state replaced this newer bridge in 1985.

(#79) 28-01891-04.77: Spanning Big Creek northwest of Pulaski in Giles County (Milky Way Quad, 58 SE).



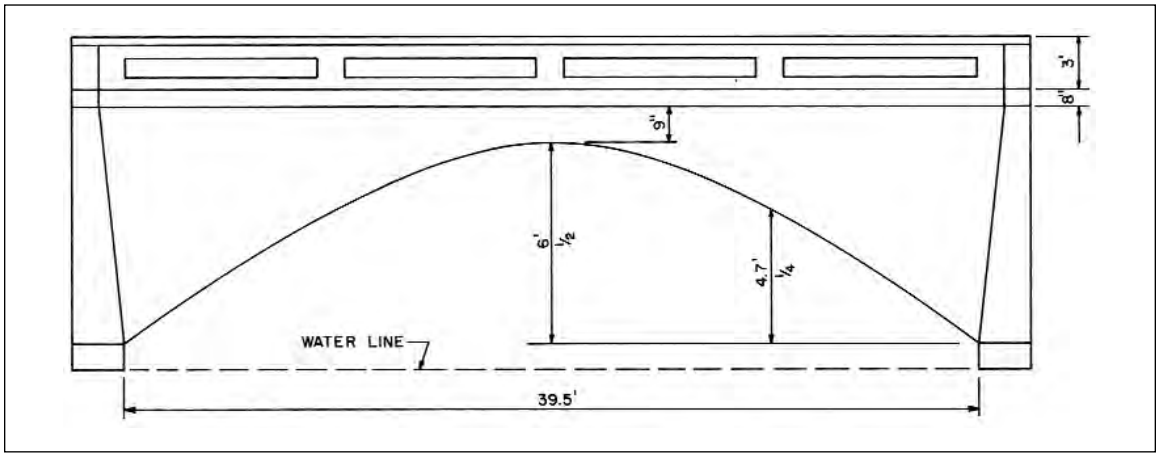
Significant under Criterion C as early and representative closed spandrel arch bridge by the Luten Bridge Company.

In 1914 when Giles County decided to build a bridge to replace a ford at this site, it evaluated a proposal for a 75-foot steel span on steel cylinders for $1,800 by F. M. Dobson of Jasper Construction Company and a proposal for a 100-foot concrete arch bridge for $2,780 by C. S. Daugherty of Luten Bridge Company. Even though the concrete arch cost more, the county selected that design (Giles County Court Minutes Book 4:409-410).

The bridge contains two spans, each a closed spandrel arch 49.9 feet long. The overall length is 107.6 feet and the out-to-out width is 14.4 feet. Each spandrel area contains an incised design roughly rectangular in shape with one side following the line of the arch. The parapet railing contains incised rectangular and diamond designs. Bridge plaques are located on the inside of the railing, within incised octagonal designs. One plaque identifies the County Judge as George McCallem and the Bridge Committee as C. H. Witt and T. M. Stevenson. The other plaque states that the Luten Bridge Company built the bridge in 1914.

After changing road patterns rendered this bridge and a short road segment redundant, the county transferred ownership to adjacent property owners in the mid-1980s. The road is barricaded to traffic, but the bridge remains in good condition.

(#80) 53-02507-08.23: Gaylon Gap Road spanning Pond Creek in southwest Loudon County (Philadelphia Quad, 131 NW).

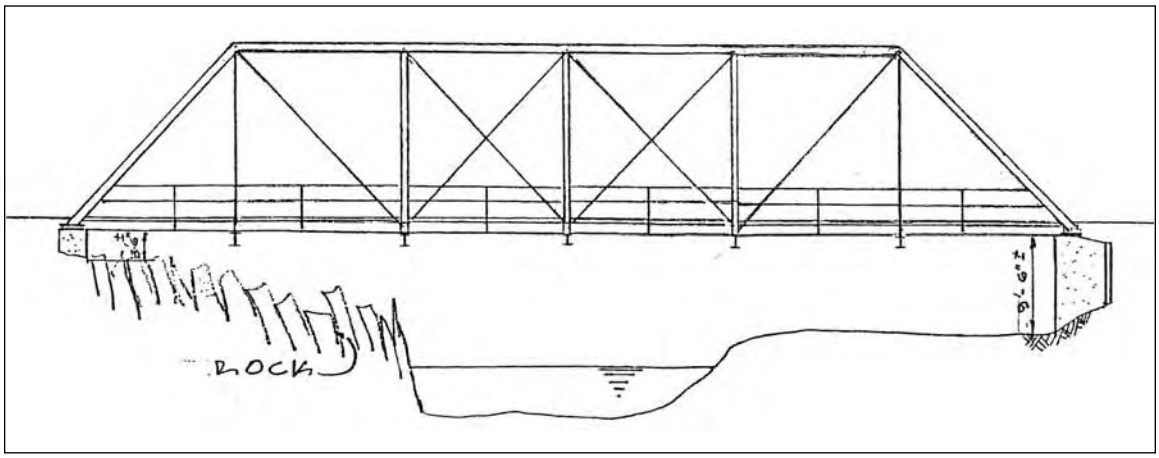


Significant under Criterion C as early closed spandrel arch bridge by the Luten Bridge Company.

Bridge plaques indicate that the Luten Bridge Company of Nashville erected this bridge in 1914. The bridge committee included: J.A. Beals, C. H. Hill, and W. P. Spraker with J.W. Campbell as Chairman. The bridge contains one span, a 40-foot closed spandrel arch. The parapet railing contains incised rectangular designs. The bridge has a curb-to-curb width of 15.9 feet and an out-to-out width of 18.6 feet.

The county replaced this bridge in 1991.

(#81) 61-A0028-00.23: Hickory Flat Road spanning Big Sewee Creek in northeast Meigs County (Tranquillity Quad, 124 SW).

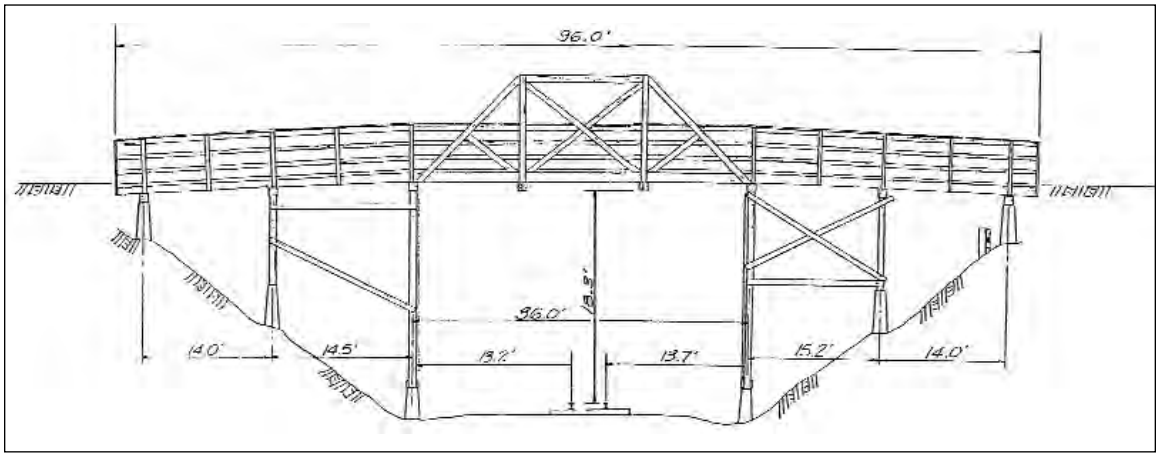


Significant under Criterion A as example of county's commitment to improved transportation and Criterion C as a representative Pratt truss bridge by the Champion Bridge Company.

The Champion Bridge Company erected this bridge in 1914 (Toplovich and Rogers 1981). It contains one span, a 94.5-foot pin-connected Pratt through truss on concrete abutments. Seventeen feet tall, the bridge has a curb-to-curb width of 11.0 feet and an out-to-out width of 13.0 feet. The portal bracing is laced, and the knee bracing is a single angled member. Composition of members is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing except hip verticals which are single rectilinear eyebars. Diagonals are single rectilinear eyebars in the center panels and paired rectilinear eyebars in flanking panels. Counters are single rectilinear tie rods.

The county barricaded and closed this bridge to traffic in 1985. It remains intact as a historic ruin. The Tennessee Department of Transportation, in cooperation with Meigs County and the Federal Highway Administration, built a new bridge nearby in 1988.

(#82) 62-A0520-02.45: Ridge Road spanning the Louisville and Nashville (CSX) Railroad south of Madisonville in northwest Monroe County (Englewood Quad, 132 NW).

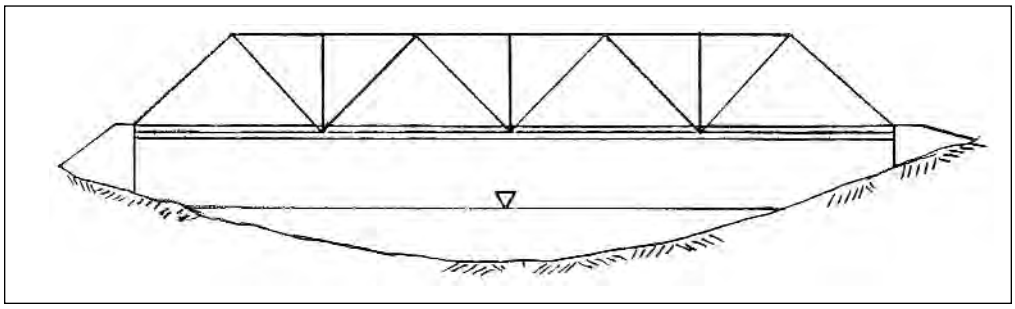


Significant under Criterion C as rare wooden truss bridge.

The Louisville and Nashville Railroad erected this bridge in 1914 to provide a grade separation with railroad tracks. Ninety-six feet in length, the bridge contains one 36-foot timber Queenpost pony span and four timber stringers. The bridge has a curb-to-curb width of 15.9 feet and an out-to-out width of 16.9 feet. The substructure is timber on concrete pads. Eight feet tall, the truss has typical timber compression members. Vertical metal tension rods (1-3/4" in diameter) hang from the connection of the end post and top chord, and wooden lateral bracing extends diagonally outward from the same connection. Additional diagonal bracing members are in the end panels.

The railroad replaced this bridge in 1999.

(#83) 66-NonHighway-2: Old Samburg Bridge spanning South Fork Indian Creek northeast of Samburg in northwest Obion County (Samburg Quad, 419 NE).



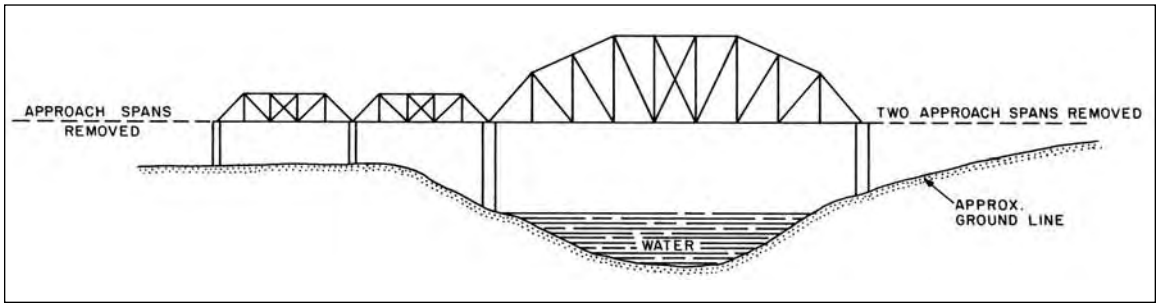
Significant under Criterion C as a representative Warren truss bridge by the Vincennes Bridge Company.

The Obion County Court appointed a committee of N. L. Williams, H. E. Williams, and S. R. Bratton in July 1914 to supervise the erection of this bridge. The county awarded the contract to the Vincennes Bridge Company. In October 1914 the county court ordered that the Vincennes Bridge Company be paid $1,500 for the steel bridge near Samburg and that Kirby and Riddle be paid $50 for levees at the bridge (Obion County Court Minutes Volume G:328; *Union City Commercial* 10 July 1914).

The bridge contains one span, a 65-foot Warren pony truss resting on concrete abutments. The curb-to-curb width is 12.0 feet and the out-to-out width is 14.5 feet (plus buttresses, 18.5 feet). The truss is 7.5 feet tall. The composition of members is fairly typical. Top chords and end posts are channels with battens, and bottom chords are small channels with battens. Diagonals are angles with battens. The verticals, which are paired angles connected with lacing that are given additional support by a buttress member, are somewhat atypical. In recent years, scouring has occurred at the abutments.

The state designated this road as State Route 78 about 1923 and later renumbered it as State Route 22. About 1950 the state realigned State Route 22 to the west. The county then used this bridge and a short road segment for local traffic until completely bypassing and abandoning the segment, leaving the truss as a historic ruin.

(#84) 68-NonHighway-1: Mill Bridge/Lobelville Bridge on Jones Hollow Road spanning Buffalo River West of Lobelville in Perry County (Lobelville Quad, 31 SE).



Significant under Criterion C as representative Camelback and Parker trusses and as work of the Vincennes Bridge Company.

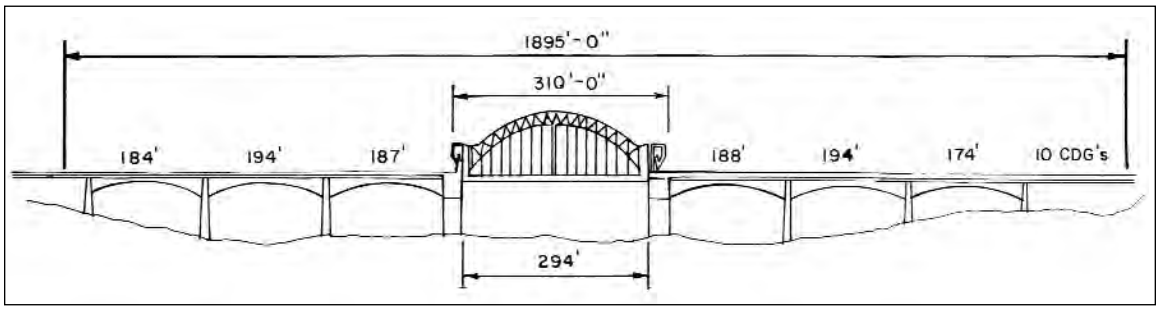
During the early 1910s, Perry County initiated a concerted road and bridge building program. Citizens in this area of the county presented a petition to the quarterly court in April 1913 that requested the county to build a bridge spanning the Buffalo River at Blackwell and Chissons Mill near Lobelville on the road from Waverly through Lobelville and Linden to Perryville. The court appropriated up to $4,500 to build the bridge and appointed a committee of S.T. Park, A. Kelly, S. J. Leiper, and John M. Godwin to investigate building this and two other Buffalo River bridges approved at the same time. In January 1914 the court approved an additional $500 for this bridge and appointed new committees for each of the three bridges. Members of the Lobelville Bridge Committee were J. C. Curry, I. J. Toomy, and F. G. Loveless. In July 1914, the court approved the committee's contract with Vincennes Bridge for a "free bridge across Buffalo River at or near Lobelville." In January 1915 the committee reported that the Vincennes Bridge Company had completed the Chisson's Mill Bridge for $5,000 (Perry Quarterly Court Minutes Volume 4:237, 239, 371, 373, 475; Volume 5:2). By 1935 the mill was known as the Lobelville Mill and Power House, and U.S.G.S. topographic maps marked the crossing as the "Mill Bridge."

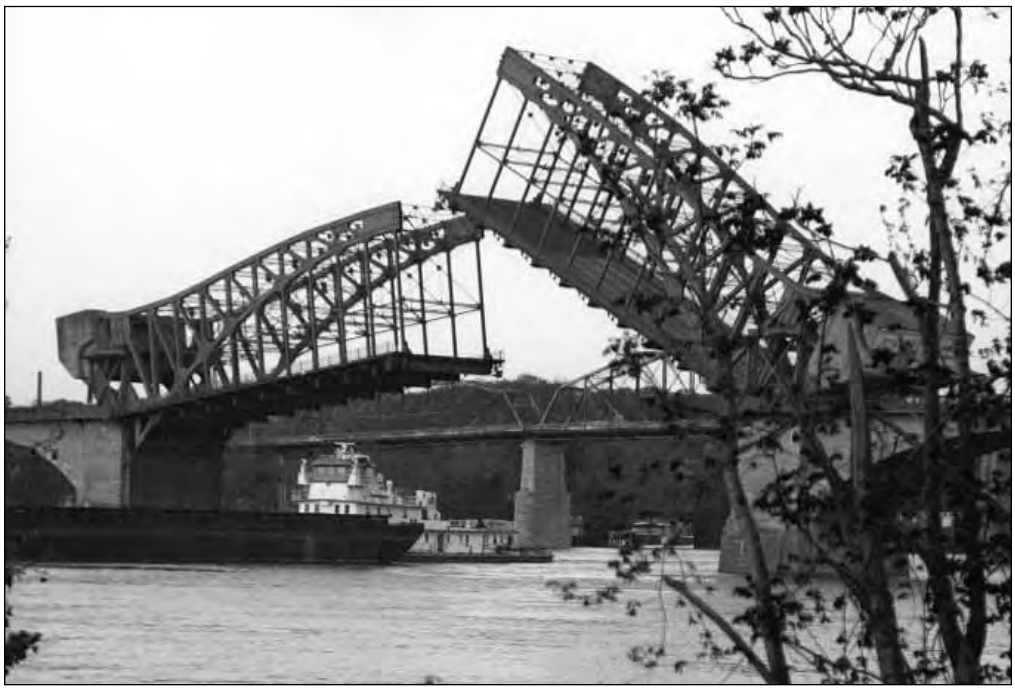
The bridge contains a pin-connected through Camelback truss and two pin-connected pony Pratt trusses. Composition of the members is typical. Top chords and end posts are channels

with lacing, and bottom chords are paired rectilinear eyebars. Verticals are two channels with cross lacing on each side except for the hip verticals which have small channels with lacing on one side. All panels contain paired rectilinear eyerods for diagonals except the center panels which have crossed single circular tie rods. The dimensions of the bridge were unavailable. Masonry abutments, concrete piers, and steel bents form the substructure.

The county built a new bridge nearby in 1962, and removed the approach spans and decking and bypassed this bridge. The truss remains intact.

(#85) 33-SR008-09.53: Market Street Bridge spanning the Tennessee River in downtown Chattanooga in Hamilton County (Chattanooga Quad, 105 SE).





Significant under Criterion A for associations with Dixie Highway and for its role in local politics as well as under Criterion C as rare bascule lift bridge and for concrete arch spans.

The 1891 construction of the Walnut Street Bridge (#20, 33-03544-00.12) resulted in a building boom north of Chattanooga. By 1910 Hamilton County officials had decided to build a new downtown bridge. By 1911 a bridge committee had persuaded the state legislature to pass enabling legislation for the county to build such a bridge at Market Street. In 1913 the legislature authorized the county to pass a $500,000 bond issue for the bridge. The county court, under Judge Will Cummings, approved the funding at the January 1914 session. The court appointed a committee to let a contract and supervise the construction of the new bridge. Members of this bridge committee were; Theodore King, J. B. Ragon, H. F. Lawrence, J. Walter Cummings, and L. B. Bryan.

Although the project had its share of disagreements, the county firmly wanted a concrete bridge. The county apparently based its decision on maintenance problems with the Walnut Street Bridge that had experienced various small fires, as well as a serious fire in 1897 that nearly destroyed the bridge. However, from the earliest planning stages, the county knew that the War Department's clearance requirements (300-foot span, 100-feet above water) precluded a concrete river span. However, the county continued to debate the issue with the War Department. Ultimately, the county used a compromise bridge design of a central movable lift span flanked by concrete arches.

In early 1914, the bridge committee advertised nationally for engineers to submit plans for a bridge. An editorial in *Engineering News* criticized this approach, asserting that the county was treating this as it would a small bridge even though it was a major undertaking. From over a dozen engineers who presented plans, the county selected a design submitted by New Yorker Benjamin H. Davis, in part due to his reputation with concrete structures. Davis had worked for four years with the engineering department of the Delaware, Lackawanna and Western Railroad. There he designed the Delaware River Viaduct in Pennsylvania and the Paulius Kill Viaduct in New York, both concrete bridges about 2,500 feet long. As a private engineer he had designed several large concrete bridges in the northeast United States. The county later hired Davis as the consulting engineer but, after a controversy over cost overruns, replaced him with J. E. Griner of Baltimore. The county hired Ellis Soper of Chattanooga and W. C. Spiker of Atlanta as construction engineers. In the following months, Vang Construction Company of Maryland erected the concrete spans, the Scherzer Rolling Lift Bridge Company of Chicago designed the lift span, and the Toledo Bridge and Crane Company erected the steel span.

Construction crews encountered several difficulties. High waters repeatedly delayed work, and in December 1915, despite extensive work by Vang, one span with falsework and forms washed away. However, a far more critical problem was the discovery of serious foundation problems that were a prime factor in increasing the project cost to $1.1 million. The county blamed this cost overrun on Davis and fired him. Davis sued in federal court. At his trial, Davis testified that he had built more large concrete bridges and viaducts than any other living American engineer except for one. In 1920, the jury exonerated Davis and awarded him damages (Chattanooga Library, Clipping File, Market Street Bridge; *Engineering News* 1914). These cost overruns were also a major factor in the 1918 election defeat (by less than 100 votes) of the regionally significant Democrat, Judge Will Cummings. Cummings had led the fight for the new bridge and was considered, for better or worse, the "individual, living or dead [most] responsible for the completion of the bridge and its construction" (Hixson 1962:59).

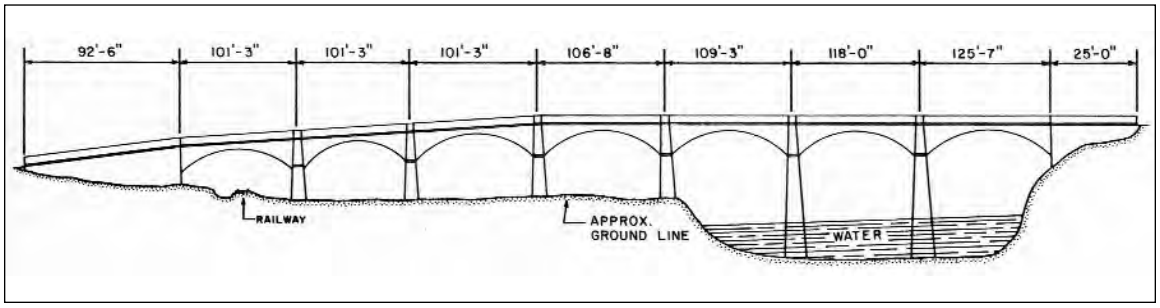
Dedicated 17 November 1917, the Market Street Bridge was a major engineering achievement (Wilson 1980:332). The main channel span was a 310-foot double leaf bascule lift bridge that

was then the longest span of its type in the country. Today it is considered the third largest span of its type in the world (Encyclopedia 1979). The span opens in the middle and a 25-horsepower motor raises each leaf. In theory, it is balanced so well that the motors simply start the process and the counter weights (the large concrete blocks on each end) pull it the rest of the way (similar to the way a see saw functions). Six substantial concrete arch spans flank the lift span. When completed, local papers called it the largest concrete bridge in the South. Until the state rebuilt the Wauhatchie Pike route (State Route 2/U.S. 41) from Jasper to Chattanooga between 1933 and 1935, the Market Street Bridge was on the main north-south route in this region, both the Eastern and Western Divisions of the Dixie Highway, as well as U.S. 41.

Overall, excluding the southern concrete approach, the bridge is 1,895 feet long. Beginning on the south end, there are three arch spans at 184, 194, and 187 feet long, then the 310-foot lift span, three more arches 188, 194, and 174 feet long, and then ten concrete deck girders. The bridge carries three traffic lanes (a reversible lane replacing the old streetcar line) within a curb-to-curb width of 36 feet. Bronze light posts, which cost $3,934 in 1917, remain. There are also four pylons. Each pier has nosings under a tapering pilaster leading to the deck. Each arch ring contains a radiating voussoir pattern, a rare decorative feature in the state. The railing has a concrete spindle design.

Nicknamed the Million Dollar Bridge when built, the structure's official name was the Market Street Bridge. However, in 1950, the county court voted to change the name to the Chief John Ross Bridge, in honor of a Cherokee Chief who had settled Ross's Landing, which contained a ferry, warehouse, and landing that originally served as a trading center for both Cherokees and Euro-Americans. Ross's Landing would also serve as a disembarkation point for the Cherokee during the Trail of Tears in 1838, the same year that the community took the name of Chattanooga. The bridge is located adjacent to the National Register listed site of Ross's Landing. However, it is still commonly referred to as the Market Street Bridge. The bridge was renovated in 2007.

(#86) 73-01226-00.50: Old Emory River Bridge spanning the Emory River in Harriman in north-central Roane County (Harriman Quad, 123 NE).



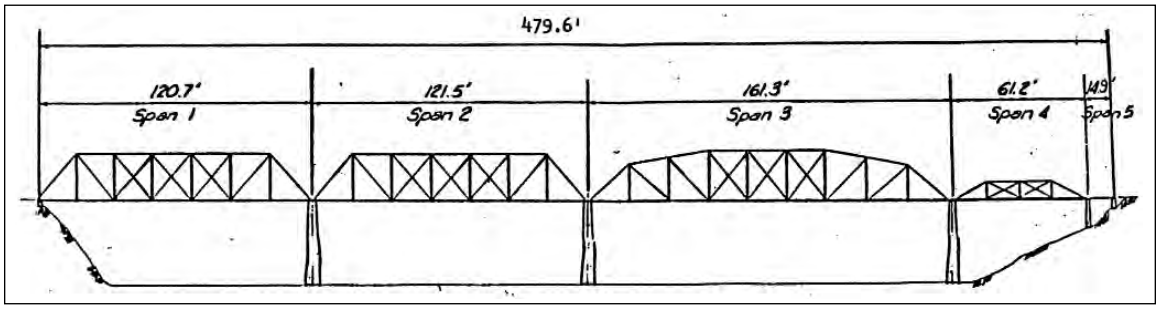
Significant under Criterion C as representative closed spandrel arch bridge by the Luten Bridge Company; rare surviving example of a large scale 1910s concrete arch bridge in a relatively urban setting.

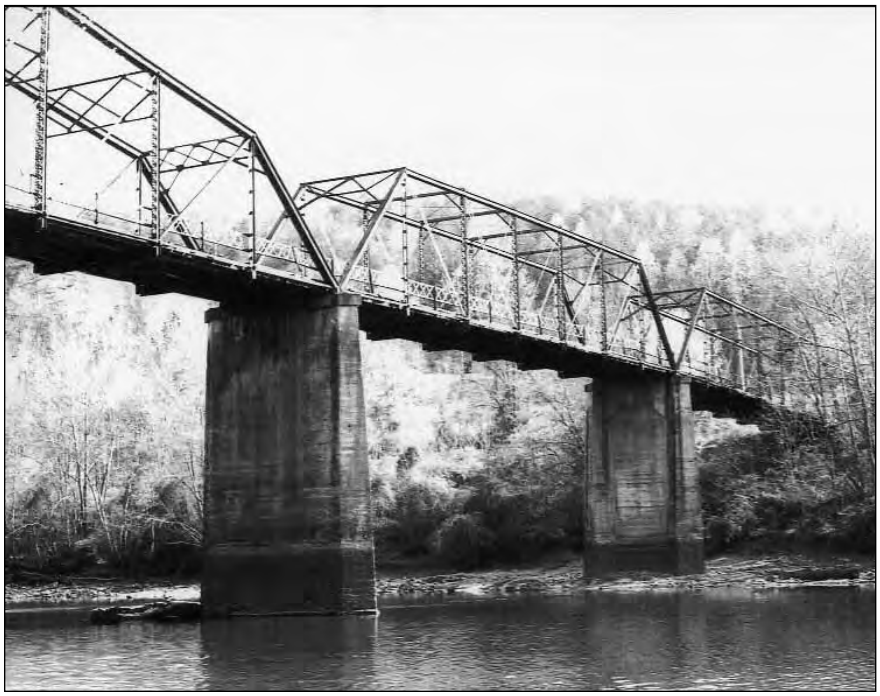
The East Tennessee Land Company developed Harriman in 1890 as a planned community for industrial development and turned it over to corporate authorities in 1891. An 1892 truss bridge constructed by the city near this site washed away in the 1902 flood and the city soon erected another truss bridge. By the 1910s the city began to actively promote the construction of a new bridge. In July 1915 Roane County contracted with the Luten Bridge Company to build a concrete arch, originally for $55,400 but later increased the payment to about $59,000 due to approach work. The county primarily bore this cost, although the city paid $400 and the Harriman North Eastern Railway Company paid $5,000. By the fall of 1918, Luten had completed the bridge. In the 1910s, the city lobbied extensively to be included on the Dixie Highway which was then routed through the town on State Route 29/U.S. 27 across this bridge. During the March 1929 flood, boxcars and buildings crashed into the bridge and damaged it. Soon after, local officials initiated efforts to get a new bridge built. This did not happen until 1957 at which time the state relocated State Route 27 a substantial distance downstream. This bridge and the old main road into town then became a local facility (Carver 1989d).

The bridge contains seven filled spandrel arches 101 to 126 feet long and two concrete approaches. The bridge has curb-to-curb width of 21.0 feet and an out-to-out width of 25.5 feet. There are two ten-foot traffic lanes and one three-foot sidewalk; a water line has been placed along the sidewalk. The parapet railing has an incised rectangular design. Above each pier is a tapered pilaster. The extrados of the arch is delineated, forming a decorative line above the arch. Four of the six original light fixtures by George S. Cutler of South Bend, Indiana, remain.

The Tennessee Department of Transportation, in cooperation with the City of Harriman and the Federal Highway Administration, demolished this bridge and built a new structure at this site in 1992.

(#87) 01-A0088-03.53: Massengill Bridge spanning the Clinch River north of Clinton in Anderson County (Norris Quad, 137 NE).





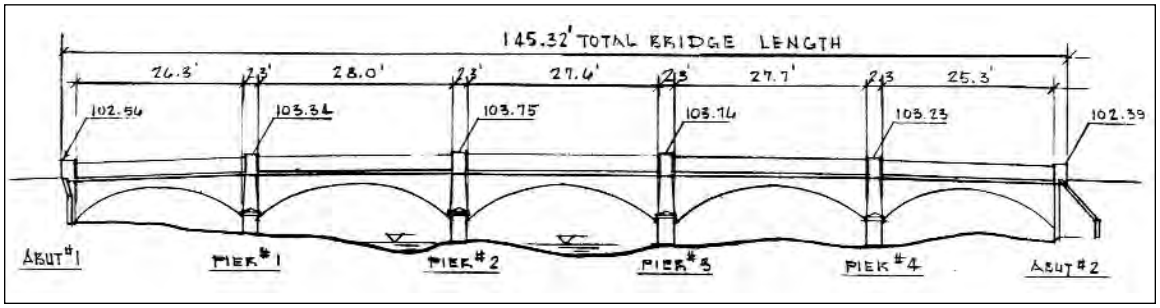
Significant under Criterion A due to associations with 1915 state law and county bond issue and Criterion C as representative Camelback and Pratt trusses by the Virginia Bridge and Iron Company.

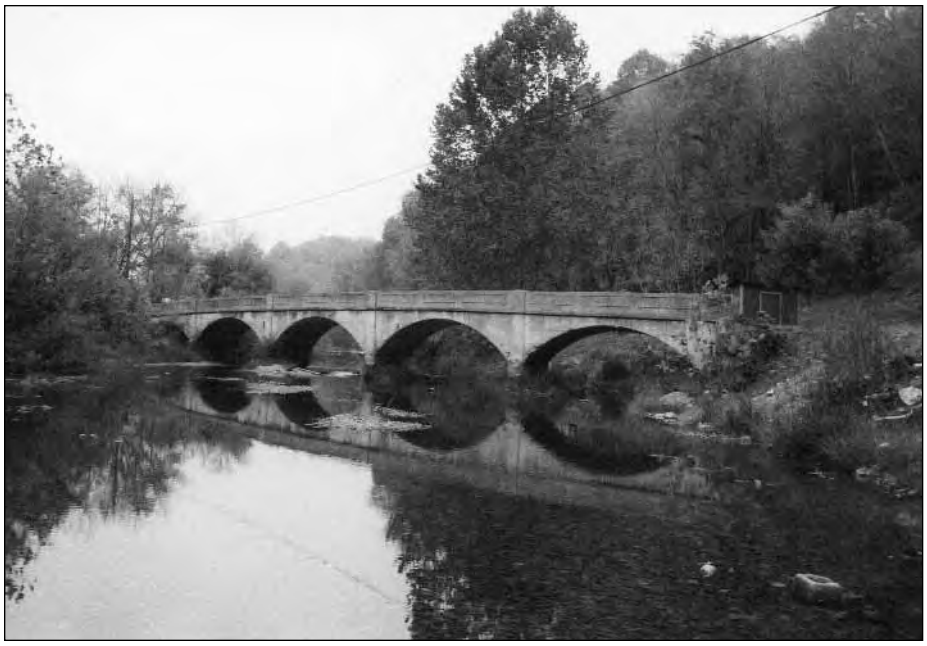
As a result of a 1915 state law that allowed counties to pass bond issues to fund road projects, Anderson County issued bonds for $75,000 to build four bridges at Clinton, Moore's Ferry, Edgemoor Ferry, and at the Massengill Ferry. By 1970, the county or the state had replaced all of these bridges except for the Massengill Bridge (Carver 1982; Hoskins 1975).

The Virginia Bridge and Iron Company erected the Massengill Bridge in 1916. It contains one 161-foot pin-connected through Camelback 22.5 feet high, two 121-foot pin-connected through Pratts 19 feet high, one 61-foot pin-connected pony Pratt 7.6 feet high with splayed verticals, and one steel I-beam span. The curb-to-curb width is 15 feet, and the out-to-out width is 18.1 feet. The substructure is concrete. The railing is formed of angles in a diamond pattern. All members are typical. Top chords and end posts are channels with lacing. Bottom chords and diagonals are paired rectilinear eyebars. Verticals are channels with lacing except the hip verticals which are channels with battens. Counters are single cylindrical tie rods.

The Tennessee Department of Transportation, in cooperation with Anderson County and the Federal Highway Administration, demolished this bridge and built a new structure at this site in 1982. The agencies stored the pony truss for later use in a local city park where it remains.

(#88) 60-A0358-00.42: Sandy Hook Bridge spanning Big Bigby Branch in southwest Maury County (Sandy Hook Quad, 58 NW).





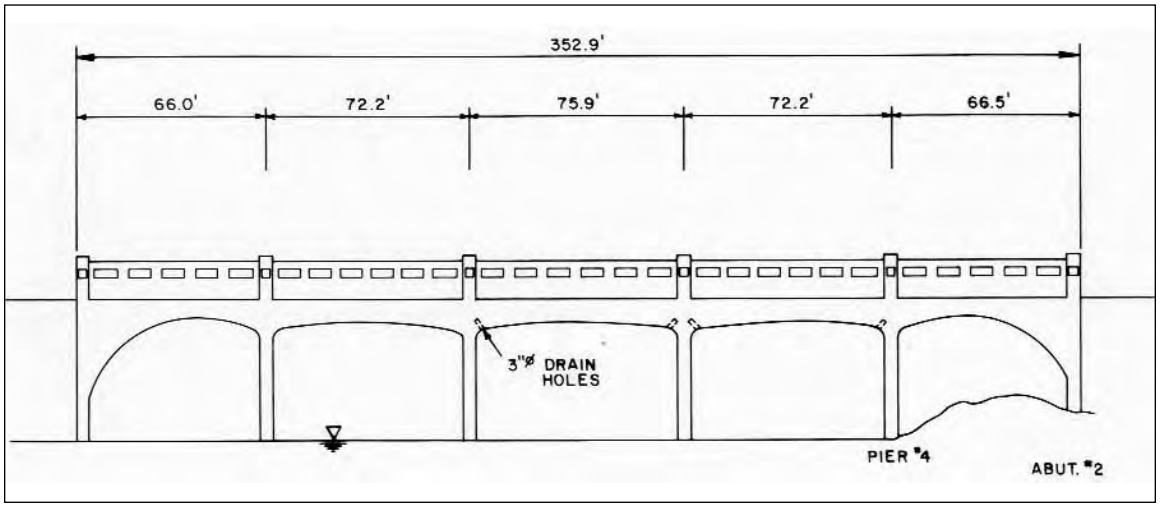
Significant under Criterion C as a representative closed spandrel concrete arch bridge by locally prolific builder.

In April 1916 the Maury County Court let a contract to Maury County native W. B. King for this bridge at a cost of about $1,869.

Born in Maury County, Tennessee, W. B. King worked for the Luten Bridge Company in East Tennessee in 1913 and 1914 before returning to Maury County about 1915. Like many concrete arch bridges of that period, King's bridges are similar to those designed by Luten. From 1915 to 1917, Maury County awarded most of its bridge contracts to King, but the Sandy Hook Bridge is the only extant concrete arch bridge that the survey could clearly attribute to him. King and his wife lived in a tent at each bridge site. King's bridge building career ended when the government drafted him for service in World War I. However, in 1918, Mr. Raynor White requested that King's military service be deferred so that he could read blueprints during the construction of the Armour Mines plant. King never returned to building bridges and worked at Armour until he retired as plant manager in 1956. King died 24 October 1969 (Maury Quarterly Court Minutes Volume 1:45; Warren 1988a; Warren 1988b).

The survey identified only one bridge that King built in Tennessee, the Sandy Hook Bridge. This bridge contains five spans, each a closed spandrel arch. These arches are 26.3, 28.0, 27.6, 27.7, and 25.3 feet long. These short lengths spread over five spans are probably indicative of the fact that a local contractor built this bridge rather than a more experienced bridge builder who would have used longer (and fewer) spans. Built on a 55-degree skew, the bridge has a curb-to-curb width of 12.2 feet and an out-to-out width of 13.5 feet. The parapet railing has an incised rectangular design and crenellating posts and end posts. There are pier nosings on each side of the bridge under tapered pilasters. Substantial spalling and heavy scouring exist at the piers.

(#89) 86-A0068-00.89: Chestoa Bridge spanning Nolichucky River south of Erwin in Unicoi County (Chestoa Quad, 199 SW).



Significant under Criterion A due to local bond issue and development of transportation corridors and Criterion C as representative filled spandrel arch bridge by the Luten Bridge Company.

In the early 1910s Unicoi County began to expand some of its local services. This community growth resulted, in large part, from the economic prosperity brought to the area by the construction of the Clinchfield Railroad through the county and the selection of Erwin, the county seat, as the location for the line's repair shops. One element of this expansion was an improved transportation system of four major macadamized roads with several bridges, including this bridge on the Erwin to Flag Pond Road. Bond issues of $100,000 in 1916 and 1917 funded this program (Carver 1986d; Pratt 1960:44-47). By 1923 the state had designated

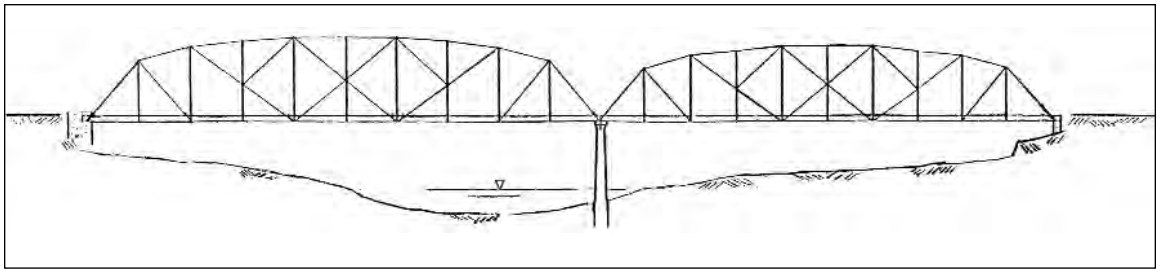
this route as State Route 36, the main north-south route in this area. By the 1930s, the state had also designated the corridor as State Route 81, U.S. 23, and U.S. 19W. It retained these designations until about 1977 when the state built a new road to the west. Most of the old road network then became a county road.

One bridge plaque identifies the builder as the Luten Bridge Company and the date of construction as 1916. Another plaque identifies the Board of Road Commissioners as T. C. Hensley (Superintendent), J. W. Taylor (Secretary), J. R. Anderson, C. P. Tongray (Engineer), and R. M. Barry (Chairman County Court).

The Chestoa Bridge contains five spans, each a closed spandrel concrete arch. The length of the bridge is 352.8 feet. From abutment one (west) to abutment five (east) the span lengths are 66 feet, 72.3 feet, 75.8 feet, 75.8 feet, 72.3 feet, and 66.5 feet. The bridge has a curb-to-curb width of 13.9 feet and an out-to-out width of 16.0 feet. The crenellated parapet railing features incised rectangular motifs. The piers have nosings on each side, and above each pier is a tapered pilaster.

The Tennessee Department of Transportation, in cooperation with Unicoi County and the Federal Highway Administration, demolished this bridge and built a new structure at this site in 1989.

(#90) 90-B0586-00.00: Gibson Bridge spanning the Watauga River near Watauga Flats in northeast Washington County (Bluff City Quad, 198 NE).



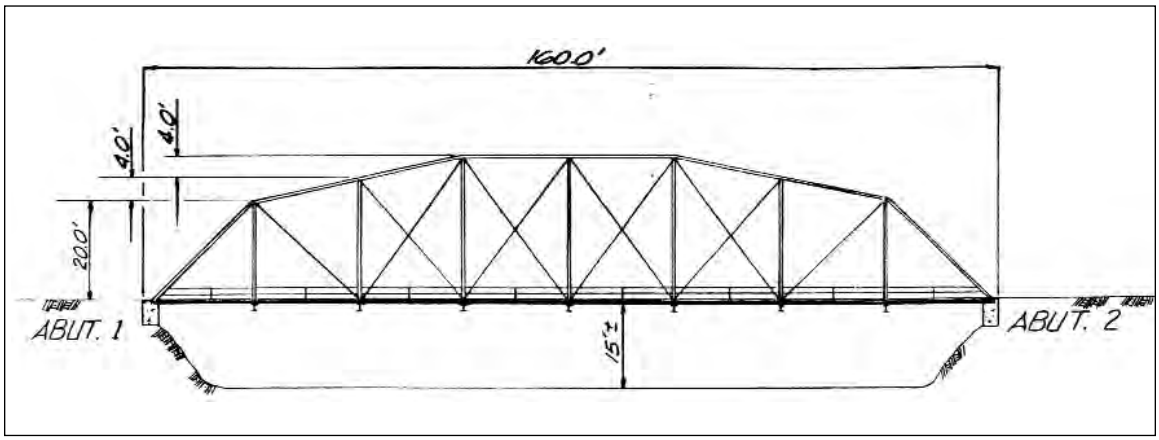
Significant under Criterion C as rare Petit trusses by the Nashville Bridge Company.

The Nashville Bridge Company originally erected these two truss spans in 1916 in Cocke County over the French Broad River apparently at the Grooms/Fugate Bridge site. By 1940 the Forest Service had acquired much of the area surrounding the bridge and it became unnecessary for local traffic. Concurrently, in nearby Washington County, a flood in August 1940 destroyed a 1929 concrete arch bridge at this site. Washington County acquired the old Grooms Bridge from Cocke County and paid E. N. Matthew to re-erect it at this site in early 1941 (Carver 1985e; Nashville Bridge Company #3748; Washington County Court Minutes Volume W:66; Volume CC:136, 154, 186).

The bridge contains two pin-connected Petit through trusses 180 and 200 feet long. The bridge has a curb-to-curb width of 14.4 feet and an out-to-out width of 18 feet. The substructure is concrete. Composition of members is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals and sub-ties are small channels with lacing except the hip verticals which are angles with battens. Diagonals are paired rectilinear eyebars, and counters and sub-struts are paired rectilinear eyerods.

The Tennessee Department of Transportation, in cooperation with Washington County and the Federal Highway Administration, demolished this bridge and built a new structure on the site in 1986.

(#91) 29-A0025-02.62 : Lay's Bridge spanning Hogskin Creek in northeast Grainger County (Powder Springs Quad, 154 SW).

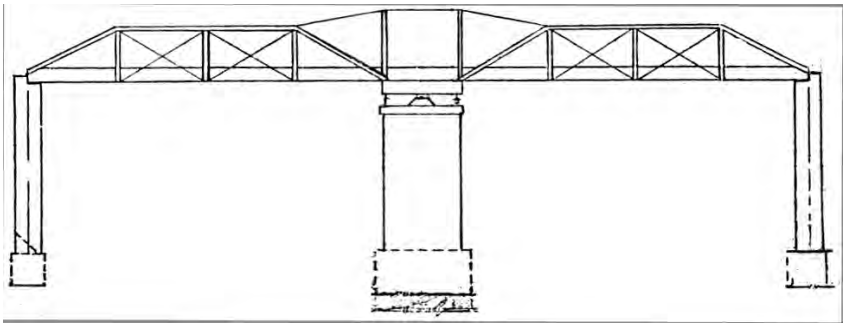


Significant under Criterion C as representative Camelback truss bridge by the Nashville Bridge Company.

The Nashville Bridge Company originally erected this span in 1916-1917 in Union County over the Clinch River on a local road that the state later designated as State Route 33. Residents referred to it as the Ousley Bridge or the Miller's Ferry Bridge. In addition to this span, it contained two 120-foot Pratt through trusses. However, as part of the Norris Dam project, TVA flooded that part of Union County and relocated this span in about 1935 to its current location (Nashville Bridge Company #3728-A; TVA 1940).

This bridge contains one span, a 160-foot pin-connected Camelback through truss on concrete abutments. The curb-to-curb width is 15.6 feet and the out-to-out width is 17.3 feet. Composition of the members is typical. Top chords and end posts are channels with battens, and bottom chords are paired rectilinear eyebars. Verticals are small channels with lacing except the hip verticals which are angles with battens. Diagonals are paired rectilinear eyerods, and counters are single cylindrical tie rods.

(#92) 23-NonHighway-1: Lenox Bridge spanning Canal in Lakewood Subdivision northwest of Dyersburg in Dyer County (Dyersburg Quad, 420 SW).



Significant under Criterion C as rare movable truss bridge for vehicular traffic and as example of work by the Vincennes Bridge Company.

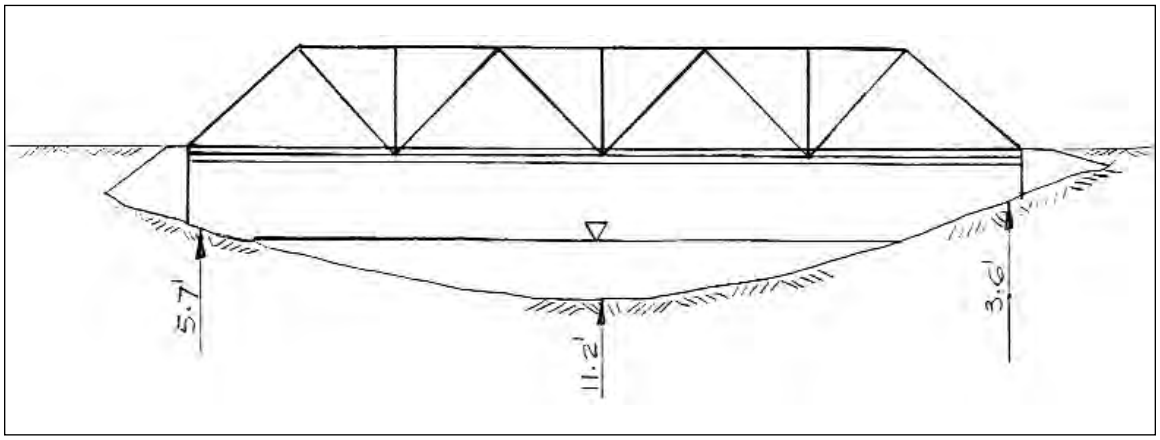
In April 1916 the Dyer County Court appointed a committee to investigate building a bridge southwest of Dyersburg across the Obion River at the site of the McClure Ferry. This committee included W. N. Pollard, A. A. Kirk, J. W. Little, J. E. Redd, and C. W. King. The committee subsequently awarded a contract for a new bridge costing $28,350 to the Vincennes Bridge Company in January 1917. The company finished by December of that year (Dyer County Court Minutes Volume O:78; Volume R:20, 191, 249-250, 610; *Dyersburg State Gazette*, 4 July, 29 August 1916; U.S. Army Corps of Engineers 1986).

For many years the bridge was a vital component of the local transportation system, but it had become substantially deteriorated by the 1970s. At the state's recommendation, the county

barricaded the bridge in 1973, but residents moved the barriers and continued to use the bridge. The bridge continued to deteriorate and partially collapsed in 1977 when a tractor-trailer loaded with farm tractors became lost, missed the I-55 bridge, and attempted to cross this bridge. After that, the county and state barricaded the bridge and rerouted traffic to I-55. In the early 1970s, the U.S. Corps of Engineers proposed to remove the bridge as part of a dredging project. However, the Corps did not implement the project until 1985, at which time the Corps placed the main span of the bridge on the bank until it could be relocated. In 1987 the Corps relocated this span to its current site northwest of Dyersburg for pedestrian use in a subdivision. Dedication ceremonies were held 27 June 1988.

Originally fourteen feet wide and 957 feet long, the Lenox Bridge contained four pin-connected 66-foot Pratt pony trusses, one pin-connected 165-foot Pratt pony swing span, and 27 steel I-beam spans. The hand-operated swing span is the only span that the Corps relocated to the new site. Composition of the members is relatively typical. Top chords and end posts are channels with lacing top and bottom, and bottom chords are channels with lacing. Verticals are small channels with lacing. Diagonals are paired rectilinear eyebars, and counters are paired cylindrical tie rods. Paired rectilinear eyebars form the polygonal top chord on the center section.

(#93) 37-A0131-01.67: Carpenter Road Bridge spanning Poor Valley Creek in western Hawkins County (Lee Valley Quad, 171 NW).

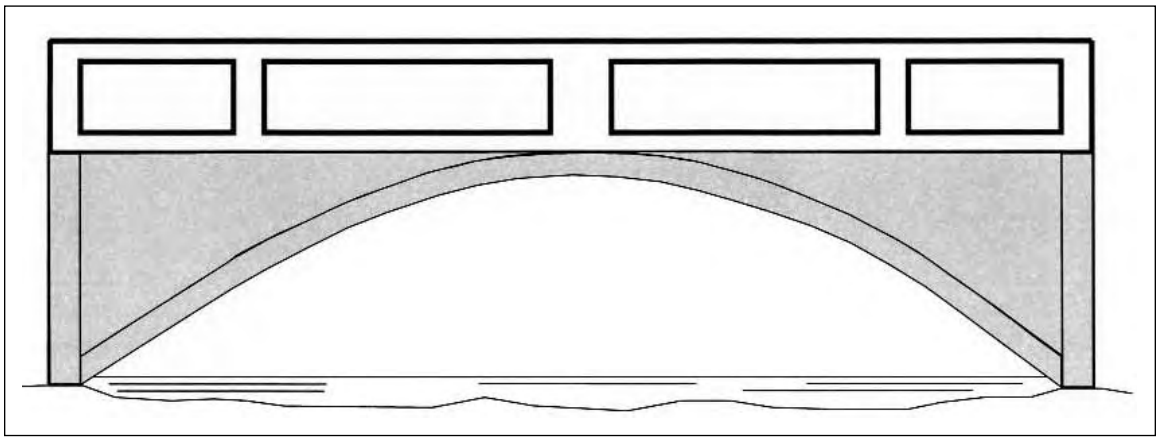


Significant under Criterion C as a representative Warren truss bridge by the Nashville Bridge Company.

The Nashville Bridge Company erected this simple truss bridge for $760 in 1917 (Nashville Bridge Company #3773). It contains one span, a 61-foot riveted Warren pony truss on concrete abutments. The truss is 6.4 feet tall and has a curb-to-curb width of 16.0 feet. Composition of members is typical. Top chords and end posts are channels, bottom chords and diagonals are angles with battens, and verticals are I-beams.

This bridge suffered substantial traffic damage in 1987. In 1988 the county closed and demolished it.

(#94) 60-NonHighway-4: Bridge on Old Hampshire Pike spanning Beard Branch southeast of Columbia in Cross Bridges in Maury County (Mount Pleasant Quad, 57 SW).



Significant under Criteria A and C as a contributing element of Big Bigby Rural Historic District.

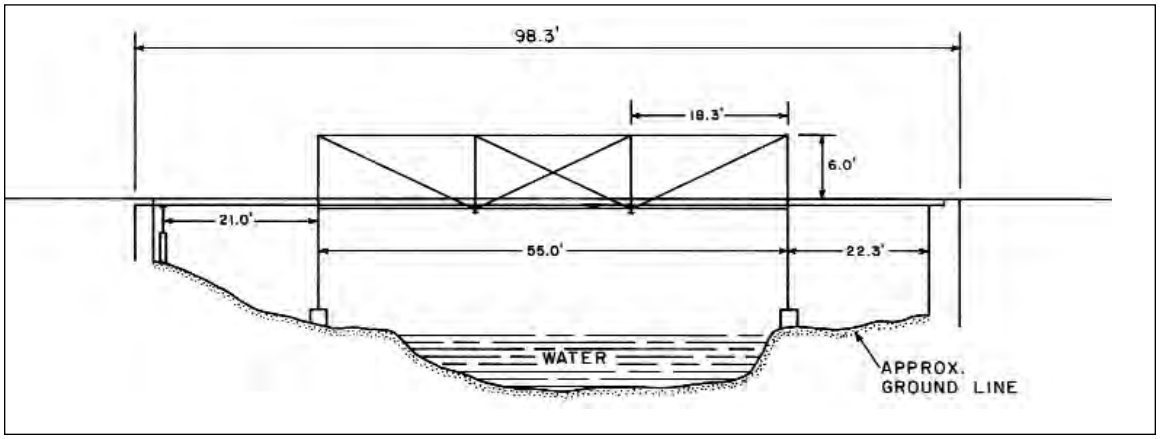
The State Historic Preservation Office determined the Big Bigby Rural Historic District eligible for the National Register in 1990. The area contains several resources from the plantation era when Maury County's wealth and prestige made it a leader in state and national politics. The area then contained an unbroken belt of large slave-operated cotton and hemp plantations along the Duck River from Williamsport to Cross Bridges. The area's prosperity continued into the twentieth century, and several properties remain from that period as well.

Resources include mansions, servants quarters, barns, support buildings, churches, stores, and landscape features such as mill races, stone walls, water gaps, and cemeteries. Transportation features include abandoned roads, fords, bridges, ferry sites, and a rail bed. This bridge, while not individually eligible, is a good example of a twentieth century bridge that is contributing to a rural historic district. It is located in the community of Cross Bridges, so named due to the large number of bridges located in the community where east-west and north-south roads crossed Big Bigby Creek, Beard Branch, and two unnamed branches (Quin 1990).

Since there were several bridges at Cross Bridges, it is difficult to pinpoint the construction date of this bridge because the county court minutes are somewhat vague. However, it is probable that the county built the bridge in 1917. In October 1916 the Maury County Court recommended $250 for a new bridge at the tollgate at Cross Bridges. The court appropriated the money at the January 1917 session and added another $250 at the October session (Maury County Quarterly Court Minutes Volume 1:117, 128, 188). This bridge is located adjacent to State Route 99. In 1948 the state highway department improved this route and replaced several older bridges, including one roughly adjacent to this bridge. It is assumed that the state bypassed and abandoned this bridge during that improvement project.

The bridge contains one span, a closed spandrel concrete arch 20 feet long. The curb-to-curb width is 12 feet, and the out-to-out width is 14 feet. The crenellated parapet railing features an incised rectangular motif.

(#95) 61-NonHighway-2: Surprise Bridge spanning Big Sewee Creek northeast of Decatur in northeast Meigs County (Ten Mile Quad, 124 NW).



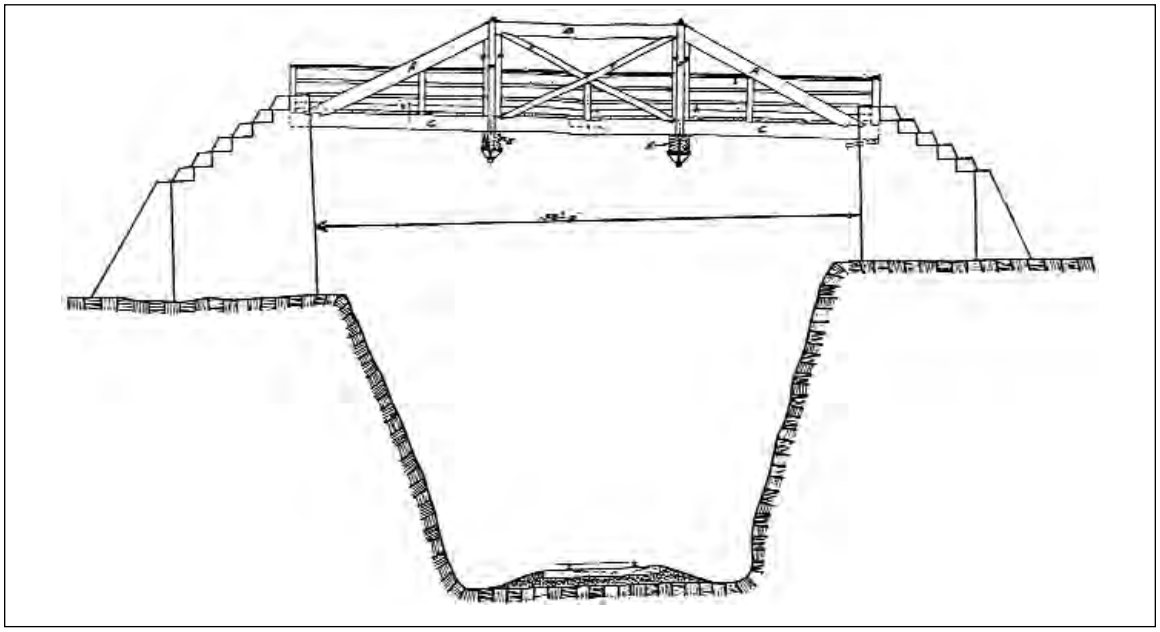
Significant under Criterion A as an example of the county's commitment to improved transportation and under Criterion C as a representative Pratt Bedstead truss bridge by the Champion Bridge Company.

In October 1916 Meigs County approved the construction of a bridge spanning Sewee Creek at Woody's (Woodey's) Mill. In January 1917, the county let a contract to the Champion Bridge Company (Meigs County Court Minutes Book 114:306; Toplovich and Rogers 1981).

This bridge contains one 55.0-foot Pratt Bedstead pony truss, which is 6.0 feet high, and two steel I-beam spans. The curb-to-curb width is 12.2 feet, and the out-to-out width is 13.9 feet. The truss legs sit on concrete pads and the abutments are concrete. One steel helper bent has been added to support the truss. Composition of most members is typical. Top chords and end posts are channels with battens as are the verticals. Diagonals in the center panel are single rectilinear eyebars and in flanking panels are paired rectilinear eyebars. Counters are single rectilinear tie rods. The bottom chord in the center panel is composed of paired rectilinear eyebars while the flanking panels are I-beams. The builder used this unusually heavy member in an effort to compensate for design weaknesses of the truss type.

The state bypassed this bridge and a short road segment with a new bridge about 1982. It is now closed to vehicular traffic.

(#96) 93-A0415-00.19: Power House Road spanning North Carolina and St. Louis Railway/Louisville & Nashville/CSX Railroad near Rock Island in White County (Doyle Quad, 327 SE).

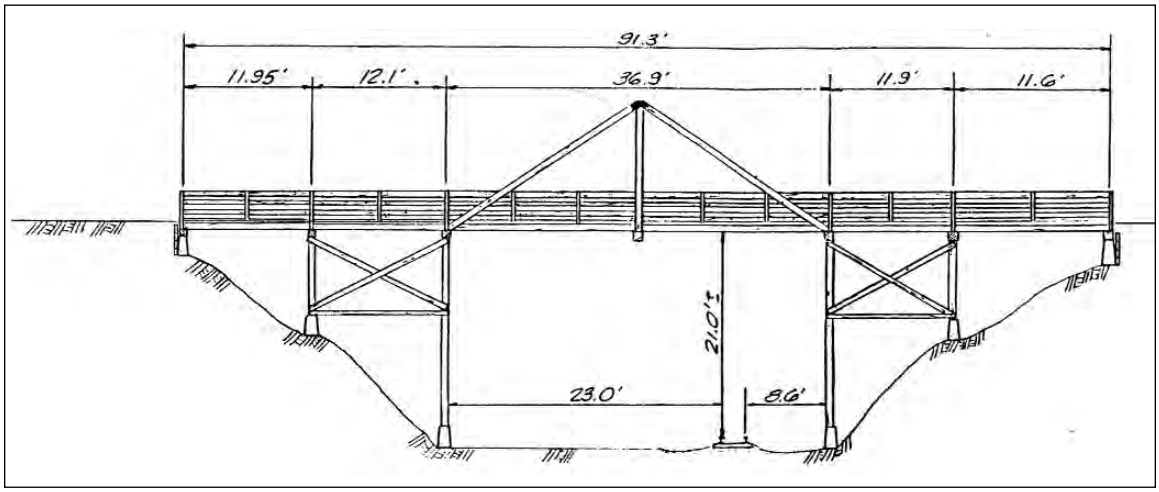


Significant under Criterion C as rare wooden truss bridge.

The office of the Chief Engineer of the Nashville Chattanooga and St. Louis Railway (later a part of Louisville and Nashville/CSX Railroad) prepared the plans for this bridge in October 1917. The abutment contains etched numerals "2 1918," apparently indicating a construction date of February 1918. The bridge contains one span, a 43-foot timber Queenpost truss which sits on concrete abutments. There are lateral bracing members that extend diagonally outward from each vertical. The bridge has a curb-to-curb width of 18 feet and an out-to-out width of 22 feet.

This bridge collapsed under a truck in 1985.

(#97) 01-02444-06.74: Marlow Road Bridge spanning Louisville & Nashville (CSX) Railroad southwest of Clinton in Anderson County (Clinton Quad, 137 SW).

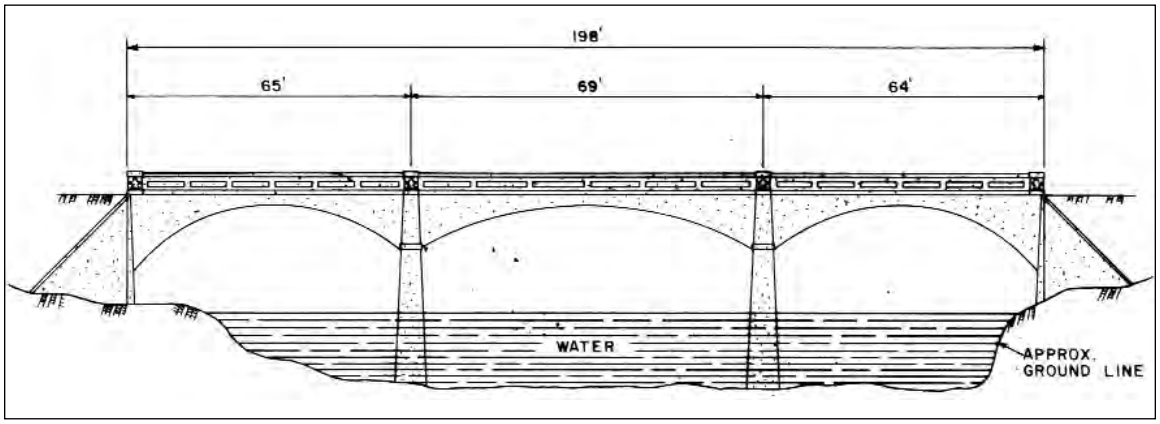


Significant under Criterion C as rare timber Kingpost truss bridge.

The Louisville and Nashville Railroad erected this bridge in 1918 to provide a grade separated crossing with a county road (Carver 1989a). The bridge contains one 37-foot timber Kingpost truss span and four twelve-foot timber stringer approaches for a total length of 91.0 feet. The bridge has a curb-to-curb width of 16.3 feet and an out-to-out width of 17.4 feet. It sits on a timber and concrete substructure. Suspended from the 12.5-foot tall apex is a metal tension rod as well as a wooden diagonal member that extends outward, providing additional lateral bracing.

The Tennessee Department of Transportation, in conjunction with Anderson County and the Federal Highway Administration, initiated a replacement project for this bridge in 1988, but before the new bridge could be completed, this bridge collapsed in 1989.

(#98) 05-NonHighway-1: Walland Bridge spanning Little River east of Maryville in Blount County (Kinzel Springs Quad, 148 NE).



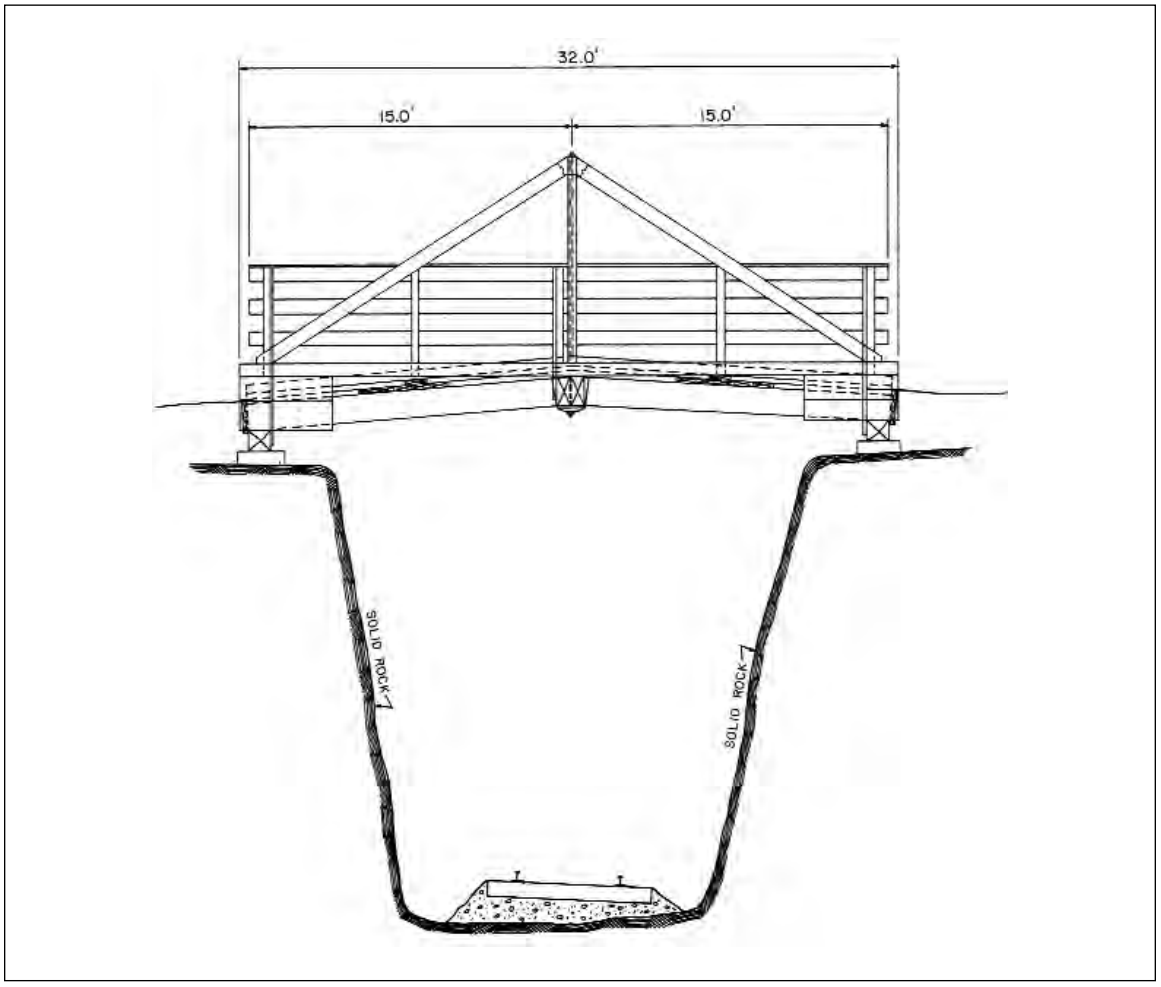
Significant under Criterion C as a representative concrete arch bridge by Luten Bridge Company.

In January 1918 the Blount County Court approved an appropriation of $9,500 for this bridge (Blount County Court Minutes Volume 26:13). A plaque indicates that the Luten Bridge Company built it.

The bridge contains three closed arch spans 65, 69, and 64 feet in length. The curb-to-curb width is 15.4 feet, and the out-to-out width is 18.0 feet. The crenellated parapet railing contains incised rectangular and star designs. Each pier has a nosing that terminates at the spring line above which is a pilaster.

The county barricaded this bridge and closed it to traffic after it built a new bridge nearby in 1963. The bridge remains intact.

(#99) 28-A0340-00.83: Spanning Louisville and Nashville (CSX) Railroad south of Pulaski in Giles County (Fayetteville Quad, 73 NE).



Significant under Criterion C as a rare wooden truss bridge.

The Louisville and Nashville Railroad built this bridge in 1918 to provide a grade separation with a county road. It contains one 32-foot timber Kingpost truss resting on a concrete and timber substructure. Ten feet in height, the out-to-out width is 28 feet. As is typical of many of these bridges, a metal tension rod connected to the floor beam is suspended from the apex. Wood lateral bracing also extends outward from the apex.

This bridge collapsed in June 1989.

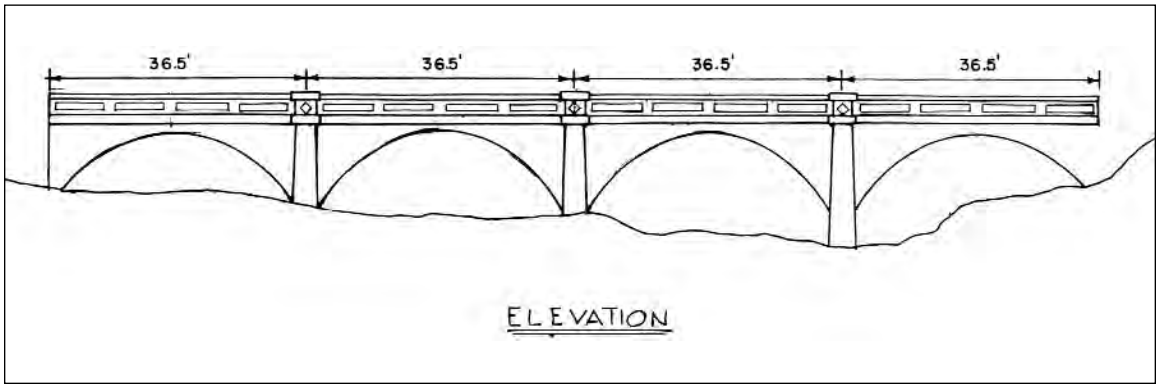
Post 1920 Period

After World War I, although counties continued to build bridges and be involved in the process, the state highway department gradually assumed a leadership role in road and bridge construction across the state. While the counties continued to build bridges on secondary roads, the state became responsible for bridge construction on major roads. State projects increasingly featured massive bridges that had been financially and technologically unrealistic only a few years previously. The list below is somewhat misleading in that it contains more county built bridges than state built bridges. However, that is due to the attrition rates that are naturally higher on major roads that carry heavier traffic loads and are widened more frequently, resulting in the demolition of many older bridges.

The passage of federal legislation and the creation of state highway departments resulted in a more standardized process and standardized plans. Although the state built some concrete arches such as the Wolf Creek Bridge (#118, 15-SR009-21.60), the state primarily built Parker or Camelback trusses and, to a lesser extent, Warren trusses for longer spans. The state experimented with the somewhat inefficient K truss in two designs, the Cunningham Bridge (#108, 63-00973-03.88) and the Austin Peay Bridge (#119, 44-SR056-10.96). Perhaps based in part on these designs, the state developed a hybrid design that incorporated the K feature into the central panel of a Parker truss; for example, the Calvin Ward Bridge (#130, 73-SR058-11.92). The state also implemented a creative funding system to build a series of toll bridges over major streams in the state, for example, the Paris Landing Bridge (#125, 40-SR076-30.34).

In an effort to provide employment during the Great Depression, the federal government sponsored programs that resulted in extensive road and bridge construction through agencies such as the Tennessee Valley Authority. Examples include the TVA built Clinch River Bridge (#140, 87-SR033-15.83), the National Park Service built bridges on New Found Gap Road (#s141-146, 148 New Found Gap Road Bridges on State Route 71 in Sevier County), the Works Progress Administration built Deep Draw Road Bridge (#137, 18-01168-03.76), and the Civilian Conservation Corps built Cumberland Dam (#147, 18-01166-03.59). The programs ended with the advent of World War II, and the resulting shortage of materials essentially brought bridge construction to a halt. The government built a few large bridges, such as the Dandridge Bridge (#152, 45-SR092-09.21), during World War II due to their contributions to the war effort through power production. More common was the fate of the Hassler Bridge in Pickett County (#154, 69-SR042-03.27) whose construction the Corps halted in 1943 due to the shortage of steel and which the Corps did not complete until after the end of World War II. After World War II, truss and arch designs were no longer economically competitive, and few bridges utilizing these designs were built.

(#100) 80-01068-03.16: County Road spanning Hickman Creek in Sykes in southern Smith County (Liberty Quad, 322 SW).



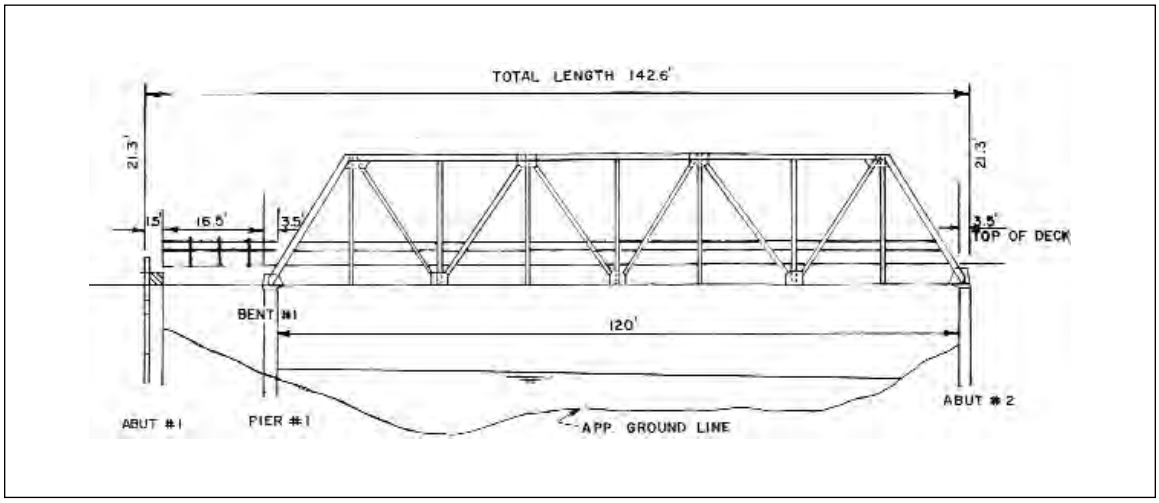
Significant under Criterion C as a representative closed spandrel concrete arch bridge by the Luten Bridge Company.

The Luten Bridge Company built this bridge in 1920. The committee included R. M. Baird, L. H. Gwaltney, and H.T. Key (DuVall 1995).

The bridge contains four spans, each a 35-foot concrete closed arch. The bridge has a curb-to-curb width of 11.5 feet and an out-to-out width of 15.0 feet. The parapet railing on the outside has incised rectangular designs with diamond designs above each pier. Hexagonal and rectangular designs are located on the inside of the railing. The piers have nosings on each side that narrow as they rise to the railing where they terminate below crenellated posts in the railing. A horizontal band separates the substructure and superstructure.

Smith County demolished this bridge in 1995.

(#101) 57-01644-00.05: Campbell's Levee Bridge on Old State Route 1/U.S. 70 spanning the South Fork of Forked Deer River west of Jackson in central Madison County (Jackson South Quad, 438 SE).



Significant under Criterion A as the first Federal-aid Bridge project in the state and for its associations with State Route 1/Memphis to Bristol Highway.

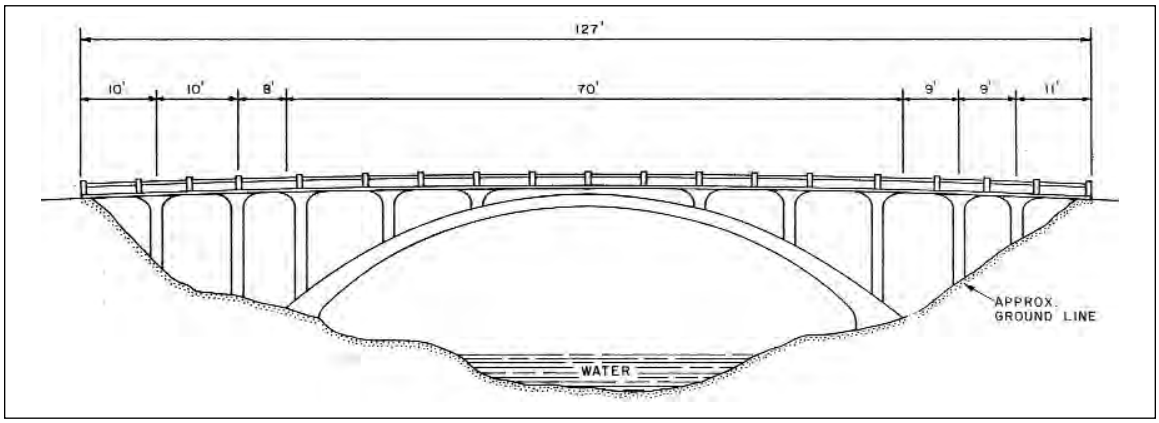
After the state legislature created the Tennessee State Highway Department in 1915, the development of the Memphis to Bristol Highway (State Route 1), was the state's top highway priority and many of the state's early federal-aid contracts pertained to the Memphis to Bristol Highway. Much of this route was later incorporated into the route of U.S. 70 in 1925 and the

route of the fifteen state Broadway of America in the late 1920s. The contract for this bridge was the fifteenth federal-aid project in the state and the first exclusively devoted to a bridge. The State Highway Department designed the bridge and awarded the contract for its construction in January 1920 to the Vincennes Bridge Company. It was completed at a cost of $37,389.88 in September 1921 (Carver 1991; Tennessee Report 1943:81).

The bridge originally contained only one span, a 120-foot riveted Warren through truss. However, about 1975, a 22-foot precast concrete slab was added on the west end on a timber bent abutment and the old concrete abutment was rebuilt as a pier. The original concrete abutment on the east end is intact. Twenty-one feet in height, the bridge has a curb-to-curb width of 18.4 feet and an out-to-out width of 21.6 feet. The truss is deteriorated and suffers from traffic damage. Composition of the members is atypical, reflecting the state's early transitional design work. Top chords and end posts are channels with lacing, and bottom chords are angles with battens. Verticals are angles paired back-to-back with lacing, and diagonals are small channels with lacing on two sides.

The Tennessee Department of Transportation, in cooperation with the City of Jackson and the Federal Highway Administration, demolished this bridge and built a new bridge at this site in 1993.

(#102) 30-NonHighway-1: Rainbow Bridge spanning Camp Creek southeast of Greeneville in Greene County (Davy Crockett Lake Quad, 181 SE).

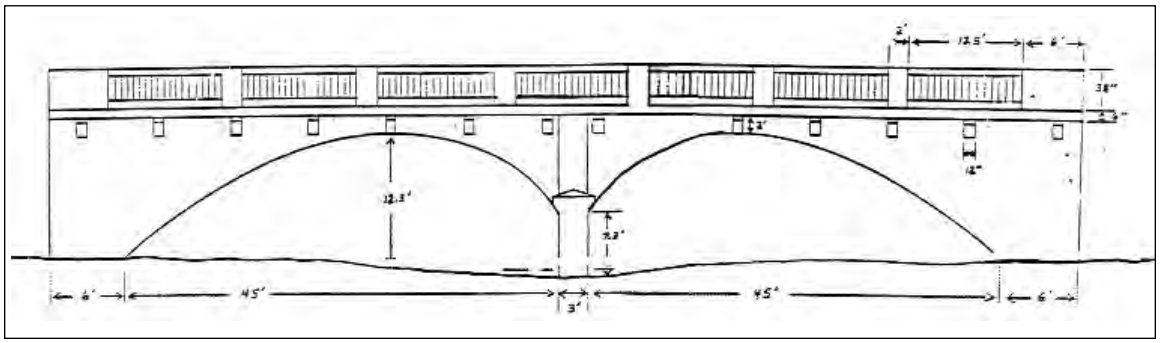


Significant under Criterion C as a good example of an open spandrel arch bridge and as early work of the Steel and Roehl Bridge Company.

In 1921 the Steel and Roehl Bridge Company erected this bridge, which is known locally as the Rainbow Bridge due to its outline. It contains one 70-foot concrete open spandrel arch flanked on each side by three short approach spans. Dual ribs, connected by lateral bracing, form the arch. The flared tops of the spandrel columns create a colonnade effect. The railing is post and rail. The curb-to-curb width is 11.0 feet and the out-to-out width is 12.1 feet. Interestingly, the concrete railing has not weathered well and is in very poor condition while the arch portion, obviously made from a different concrete mixture, is in excellent condition.

In 1958 the state built a new bridge adjacent to the Rainbow Bridge and bypassed it. The adjoining property owner has erected gates at each end of the bridge, but it is occasionally used on a farm road.

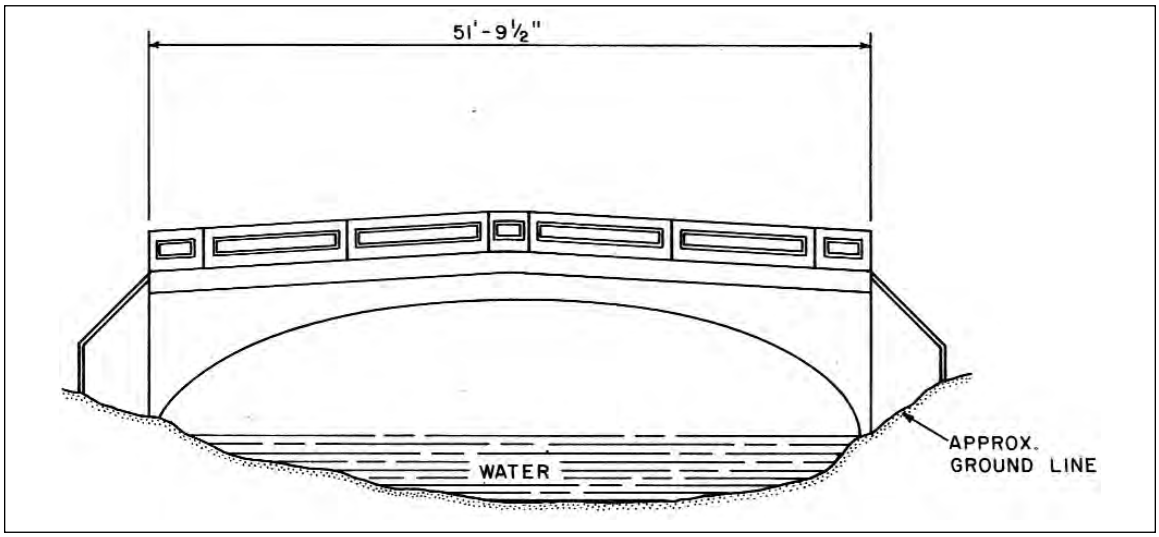
(#103) 95-02036-01.51: East Main Street spanning Round Lick Creek in Watertown in southeast Wilson County (Watertown Quad, 318 SW).



Significant under Criterion C as a representative closed spandrel arch bridge design by the Luten Bridge Company.

The Luten Bridge Company erected this bridge in 1921 for the City of Watertown. Built for an urban setting, the bridge is different in design than most of Luten's remaining bridges from this period which are generally located in rural areas. The bridge is 102 feet long and contains two asymmetrical 45-foot concrete closed spandrel arches. Tapered brackets support cantilevered sidewalks. The pier has nosings on each side and above each nosing is a tapered pilaster. Although in poor condition, the railing of urn shaped balusters is elaborate in design. A 14-foot section has been replaced with straight spindles. The bridge originally had four Ionic columns with light fixtures on top of the capitals. None of the lights remain intact and one entire column is missing. Reflecting its urban setting, the bridge has a relatively wide width for this era, a curb-to-curb width of 24.0 feet and an out-to-out width of 36.0 feet.

(#104) 28-A0334-00.33: Spanning Jenkins Branch south of Pulaski in Giles County (Aspen Hill Quad, 59 SE).



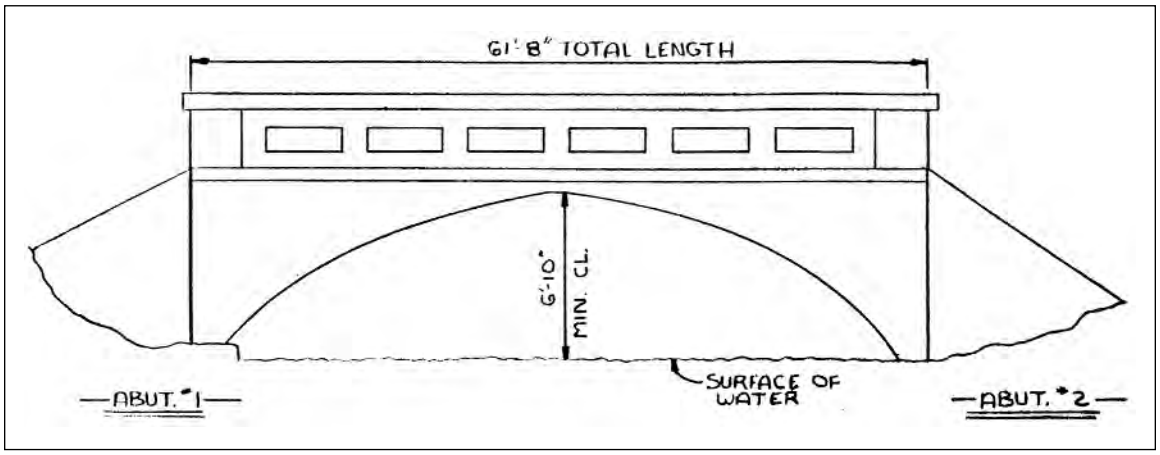
Significant under Criterion C as a rare concrete arch bridge by the Nashville Bridge Company.

The Nashville Bridge Company specialized in metal truss bridges and built very few concrete arch bridges in Tennessee. The survey identified only four extant concrete arch bridges that the Nashville Bridge Company built. Giles County paid the Nashville Bridge Company about $3,000 to build this bridge in 1921-1922 (Giles County Court Minutes Book 7:162, 259; Nashville Bridge Company #4085).

The bridge contains one span, a closed spandrel arch 51.8 feet long. The out-to-out width is 14.0 feet. The height of the parapet bridge railing varies but is about 2.8 feet above the curb. The railing contains an incised rectangular design.

The state improved this road corridor in 1955, bypassing about a two-mile long segment containing this bridge. Although local traffic continued to use most of the bypassed segment, a short segment containing this bridge was rarely used and therefore redundant. In the mid-1980s, the county closed the road to traffic but the bridge remains in good condition.

(#105) 28-A0002-00.23: Spanning Factory Creek northwest of Pulaski near Campbellsville in Giles County (Campbellsville Quad, 58 SW).

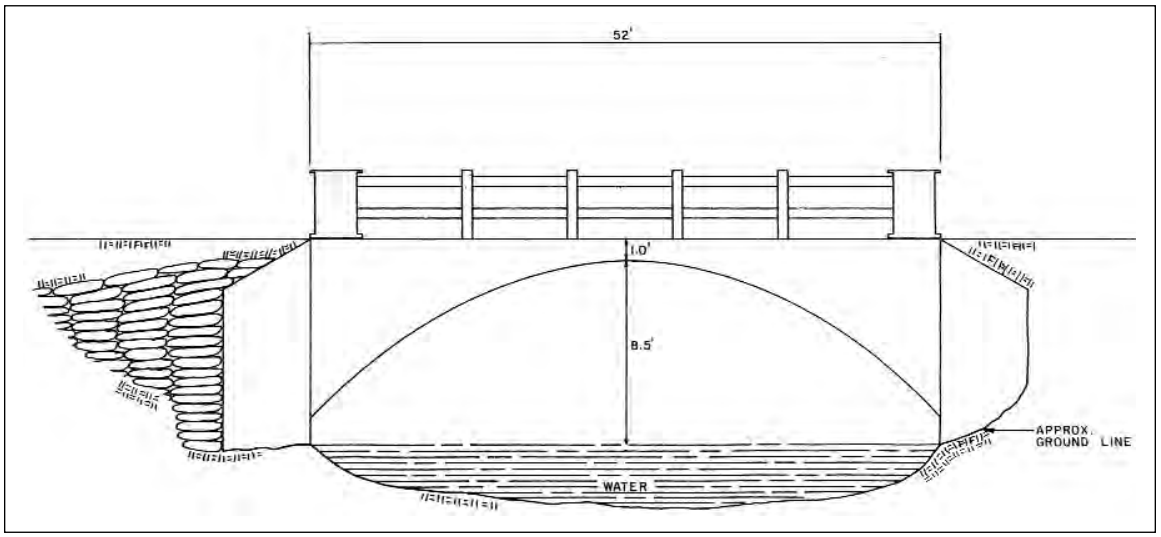


Significant under Criterion C as a representative closed spandrel ribbed concrete arch bridge by the Luten Bridge Company.

Giles County paid the Luten Bridge Company about $2,700 to erect this bridge in 1922 (Giles County Court Minutes Book 7:162, 259). It contains one span, a closed spandrel dual ribbed arch 61.7 feet long. Built on an 85° skew, the out-to-out width is 17.6 feet. From the floor, the parapet railing is 4.1 feet tall and contains an incised rectangular design.

In 1959 the state improved this corridor and, to straighten a curve, bypassed this bridge and a short road segment. The county kept it open as a local road until the mid-1980s. Today, the bridge is abandoned but in good condition.

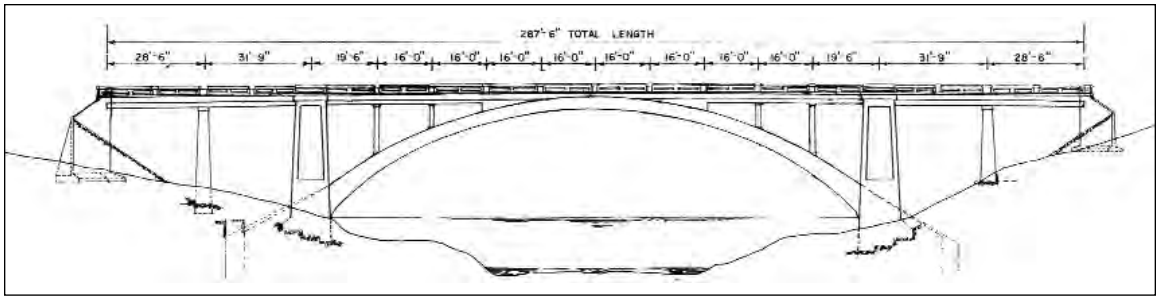
(#106) 78-01284-00.56: Bridge spanning Birds Creek northeast of Pigeon Forge in central Sevier County (Richardson Cove Quad, 164 SW).



Significant under Criterion C as a representative closed spandrel arch bridge by the Steel and Roehl Bridge Company.

The Steel and Roehl Company erected this bridge in 1922. The bridge contains one span, a 52-foot closed spandrel arch built on a 45° skew. The bridge has a curb-to-curb width of 16 feet and an out-to-out width of 18 feet. The 3.0-foot tall railing is the post and rail design with crenellating posts and end posts.

(#107) 89-A0278-00.31: Goodbars Bridge spanning the Rocky River northwest of McMinnville on Warren-Van Buren County line (Welchland Quad, 328 NE).



Significant under Criterion A as an early state highway department bridge and under Criterion C as an open spandrel arch bridge.

As early as 1915, Warren and Van Buren Counties tried to get a new bridge built at this location but did not reach an agreement until July 1919 when each agreed to pay half. However, the following January the state offered to design the bridge and pay two-thirds of its cost. The remaining one-third of the cost was a subject of debate for some time but the counties finally agreed to split it. The state awarded the contract, federal-aid number 79 for $44,340.98, to Warren County Construction Company 8 August 1922. The firm completed the contract 10 October 1923. The state briefly designated this road as State Route 57 but soon renumbered it as State Route 30. In 1968 the state realigned State Route 30 to the south, and a short road segment containing this bridge became a county road (Tennessee 1943:88; *Tennessee Highways* October 1922; August 1924:1, 4-5; Warren County Quarterly Court Minutes Volume 4:230, 265, 331 332, 420, 429, 459, 522; Volume 5:46). In recent years, the county has barricaded the bridge, leaving it as a historic ruin.

The bridge is 287.6 feet long and contains five spans: one 167-foot open spandrel dual ribbed concrete arch and four concrete deck girder approaches. The bridge has a curb-to-curb width of 16.8 feet and an out-to-out width of 22.5 feet. Of all the extant open spandrel arches in

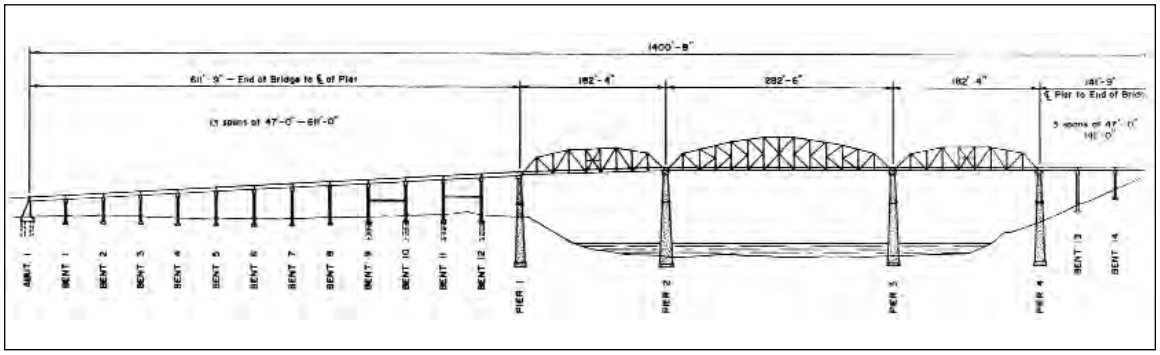
the state, this is the only bridge with a parapet rail. The railing contains incised rectangular designs and crenellating posts and end posts. Like other bridges of this type built by the state in the 1920s, this bridge has straight spandrel columns with caps that create a bracketed appearance. The main piers contain tapering recessed panels.

In a 1924 article, Resident Engineer Witt Wilson described the construction of the bridge in this manner:

> This job...consisted of an open spandrel type re-inforced concrete arch of a clear span of 155 feet and a rise of 33 feet 3 inches from springing line to intrados.
>
> There are two 26-foot deck girder approach spans on each side of river, making a total length of 287 feet, 6 inches. This arch was placed by the alternate block or voussoir method. That is, each of the two ribs were divided into eight main sections with two foot spaces between the blocks. Concreting was then carried on in such a manner that an equal distribution of pressure was obtained on the falsework.
>
> The two crown sections were poured first to prevent the arch from rising as the haunch and springing sections were poured.
>
> At the completion of pouring of all the main voussoirs and after concrete had set for a week, the bulkheads were removed and the two-foot joints between the blocks were concreted. This method of placing of course reduced the shrinkage stresses to a minimum…
>
> A little difficulty was encountered in excavating the arch abutments. That is the abutments for the two ribs, on the Van Buren side of the river.
>
> It was found necessary, in securing a reliable foundation to go about ten feet below the rock line as shown on plans. In so doing a cave was encountered back of each rib. These caves were mucked out and filled with class "B" concrete so that the foundation would be capable of resisting the horizontal thrust of the arch ribs.
>
> Very little trouble was experienced from high water with the exception of one occasion. In December, 1922 high water and drift washed three bents from the center of the arch span on the upstream side, allowing the forms to settle some two feet. This was before concreting had started. The bents were replaced and forms packed back into place with very little loss.
>
> Concrete was placed on the job by an inclined tramway running from the mixing plant to about ten feet above the highest point of bridge. It was there dumped into a hopper and distributed to all parts of the job by wood chutes. This plan worked very efficiently (*Tennessee Highways*, August 1924:4-5).

The county has closed this bridge and barricaded the road, leaving the bridge intact.

(#108) 63-00973-03.88: Cunningham Bridge on State Route 13 spanning the Cumberland River southwest of Clarksville in central Montgomery County (New Providence Quad, 301 SW).



Significant under Criterion A as the first major federal-aid bridge project in Tennessee and under Criterion C as early transitional work by the state highway department and as rare K truss bridge.

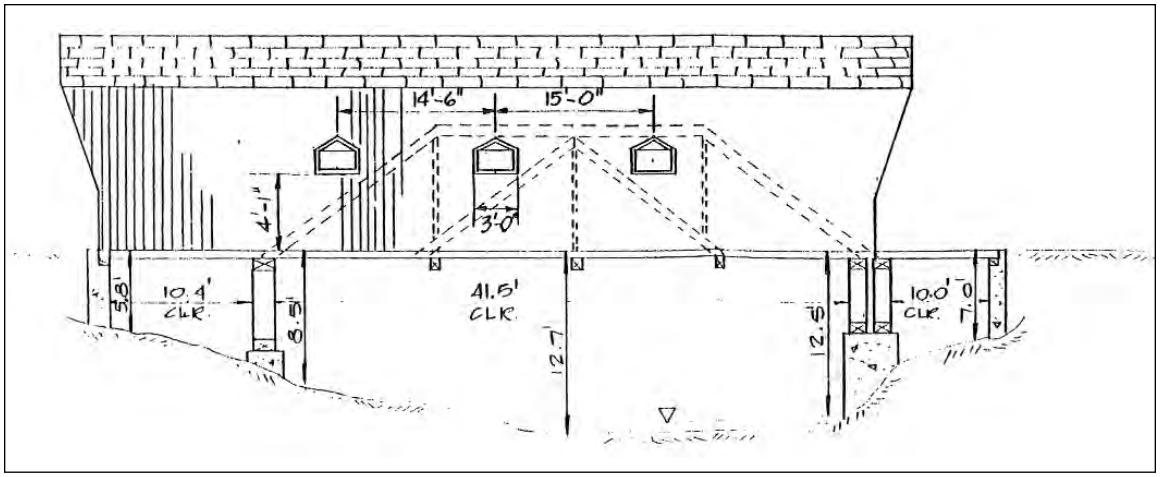
Montgomery County had seriously considered building a bridge across the river at Clarksville since the 1890s. However, nothing materialized until 1916 when the county appointed a local committee that began working with the newly created Tennessee State Highway Department. By 1919 the state had agreed to design and build the bridge at the site of the Old Gaiser's Ferry with the county paying one-third of the total cost through a $100,000 bond issue. The project was the first major Federal-aid bridge project in Tennessee and the state's sixteenth federal aid road project.

In 1921 the county committee reported that all plans, specifications, and preliminary work had been completed. After approval of these plans by the War Department and the Federal Bureau of Public Roads, the county let the contracts in 1922. The county let the contract for the substructure and concrete approaches in July 1922 to Gould Contracting Company of Nashville (for $196,891.76). In September 1922, the county let the $88,118.79 contract for the three truss spans to Nashville Bridge. The contractors finished the bridge in 1925, and the county named it the John T. Cunningham Memorial Bridge in honor of a prominent local politician. In the early 1920s, the state designated this route as State Route 13. In 1965 the state realigned the State Route 13 corridor, and this bridge and about two miles of old State Route 13 became F.A.S. 973 (Carver 1985c; Montgomery County Quarterly Court Minutes Volume 2:209, 441-449, 569; Volume 3:36, 92, 110, 123, 203, 223, 284, 296; Tennessee 1943:81).

The Cunningham Bridge is reflective of the transitional and experimental stage of the relatively new State Highway Department. The bridge contains nineteen spans and is 1,400.7 feet in length. The three river spans are riveted through steel truss spans. The main channel span is a 282.5-foot K-truss. Each flanking truss span is a 182-foot modified Warren with polygonal top chords. On the western end of the bridge are three concrete deck girder spans, each 47.0 feet long. On the eastern end of the bridge are thirteen concrete deck girder spans, each 47.0 feet long. The substructure is concrete. The bridge has a curb-to-curb width of 18.0 feet and an out-to-out width of 21.3 feet. The composition of some members varies, but the descriptions below are generally true. Top chords and end posts are channels with lacing, and bottom chords are channels with lacing top and bottom. Posts are channels, diagonals are small channels with lacing, and the counters are angles with battens. The minimum vertical clearance is 14.0 feet. The K-truss is 42.0 feet at its tallest point and on each flanking truss is 30 feet in height at its tallest point. On each truss, the height at the hip vertical is 22.0 feet. Each truss span contains a lattice railing, and the girder spans contain a spindle concrete railing. The only known alterations to the bridge occurred in 1961 when the state raised the portal bracing.

The Tennessee Department of Transportation, in cooperation with Montgomery County and the Federal Highway Administration, demolished this bridge and built a new bridge on this site in 1986.

(#109) 30-A0906-00.01: Bible Bridge spanning Little Chucky Creek in southwest Greene County (Parrotsville Quad, 172 SE).



Significant under Criterion A as a rare privately built truss bridge and Criterion C as rare wooden truss.

The E. A. Bible family erected the Bible Bridge in 1923 as a private bridge to serve their farm. Mr. A. A. McLean, a self-taught engineer who practiced in Greene County, built the bridge. In 1940 the county court requested the court's Financial Committee to determine a just compensation for Mr. Bible in order to make public his farm road and bridge. The court subsequently agreed to pay Mr. Bible $750 for the bridge (Greene County Court Minutes Volume 57:508, 583; Volume 58:109).

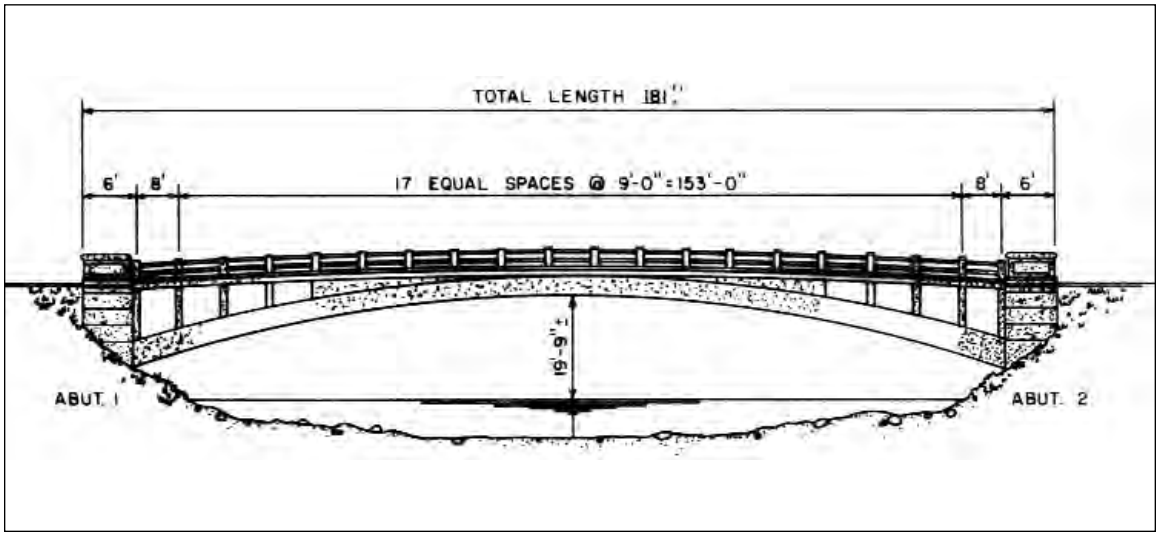
The Bible Bridge contains a covered wooden Queenpost truss span 44.7 feet in length, a covered timber stringer 12.5 feet in length, and a timber stringer 11.6 feet in length. The

roadway width is 11.8 feet, and the minimum vertical clearance is 8.4 feet. The bridge sits on a concrete substructure of two piers and two abutments.

Around 1972-1973, the Greene County Heritage Trust initiated a project to rehabilitate this bridge that included an entirely new exterior covering. The previous covering had contained no windows, had vertical gable ends, a ventilation area along the roofline of horizontal slats, and a tin roof. The new covering contains three pedimented windows on each side, projecting end gables (much like the Elizabethton Covered Bridge, #8, 10-A0398-00.01), and a ventilation area of diagonal slats. This 1970s covering also contains a new roof bracing system and a shingle roof. However, the bridge retains the original wooden and steel truss members, the original concrete substructure, and an older (and possibly original) floor. Although the 1970s remodeling substantially altered the historic appearance of the bridge, the truss system is intact.

In 1987-1988 the Tennessee Department of Transportation, in cooperation with Greene County and the Federal Highway Administration, erected a new bridge adjacent to this site. The project added riprap to stabilize the covered bridge and built a pull off/parking area to provide access to the bridge. The state added offset railings at the portal to prohibit vehicular traffic while allowing pedestrian access. In recent years, Greene County has rehabilitated and stabilized the bridge. The bridge remains as a historic site within a small park-like setting.

(#110) 70-02268-01.51: Easley Ford Bridge spanning the Conasauga River west of Tennga in southwest Polk County (Felker Quad, 120 SE).



Significant under Criterion C as a good example of an open spandrel arch bridge by the Roehl and Steel Bridge Company.

Unlike most other counties, Polk County had no bridges spanning its three major rivers by the turn of the century. Feeling that ferry service hindered the county's growth, Polk County initiated an ambitious bridge building program. In 1899 the state legislature authorized the county to issue bonds for $25,000 to build bridges. However, it was not until about 1905 that the county contracted for major bridges. At that time it contracted with the Converse Bridge Company for $40,000 to build six bridges, including a bridge at this site. It is not clear why this contract was not honored, but local mining interests (a major component of the local economy) opposed construction of the bridges and they may have succeeded in stopping the work. However, over the following years, the county built these six bridges and others, one at a time, primarily between 1908 and 1915 (Carver 1983c; Clemmer Book 3:384, 385, 382; Polk Quarterly Court Minutes Volumes 13-19).

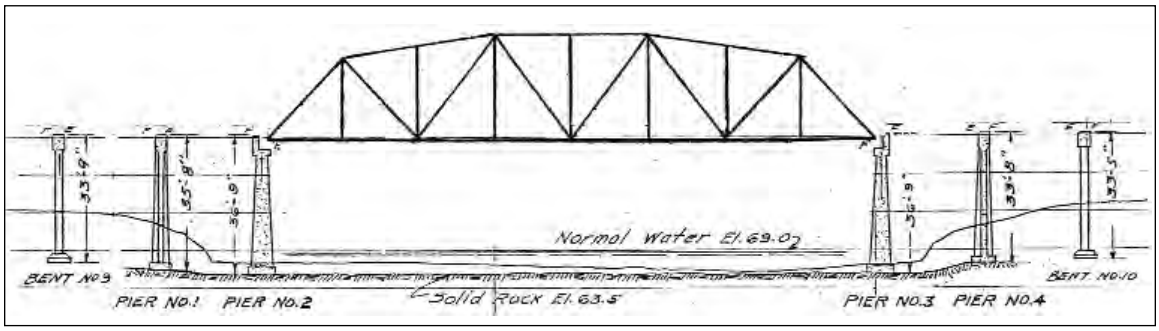
Although Polk County's original 1905 contract with Converse included this bridge (see #70, 70-01223-02.53), the county did not build the bridge until 1923. In July 1919, the county court appointed a committee of W. G. Willis, W. Davis, and James Headrick to investigate building a bridge at this site. In October the committee reported that a bridge 160 feet long was needed and that engineer C. P. Williams had submitted plans for a 16-foot wide bridge of steel (110 and 50 feet spans) and a two span concrete bridge (80 feet each). The report stated that each bridge was designed to carry either a "road roller" or "two heavily loaded freight trucks passing each other in the center of the span." While a steel bridge was slightly cheaper, the committee felt a concrete bridge would be more cost efficient in the end saying "a concrete bridge should stand from one to two hundred years without a dollars cost for upkeep." This committee also stated that this was the last major bridge this county would need for several years and could concentrate on roadwork.

However, it was not until April 1923 that the court appropriated $14,000 to build the bridge. In May the committee received a bid for $8,978 from Roehl and Steel for a one span arch and a bid for $12,900 from the Luten Bridge Company for a two-span arch. The county awarded the contract May 9 to Roehl and Steel and amended it in June to $12,854. However, the contract was a "plus cost" arrangement providing Roehl and Steel a fifteen percent profit

above cost. The firm finished the bridge by the end of the year, but due to foundation problems and raising the bridge higher than planned, the final cost to the county was $21,376.53 (*Polk County News* 5 April, 9 May 1923, 27 March, 10 April 1924; Polk County Court Minutes Volume 20:462, 557-558; Volume 22:46, 125, 164, 206).

The 182-foot bridge contains one span, a 170-foot open spandrel dual ribbed concrete arch. Lateral bracing bars connect the paired ribs. The bridge has a curb-to-curb width of 15.7 feet and an out-to-out width of 17.7 feet. The railing is post and rail.

(#111) 28-NonHighway-1: Old Elkton Bridge spanning the Elk River, Elkton in Giles County (Elkton Quad, 66 SW).



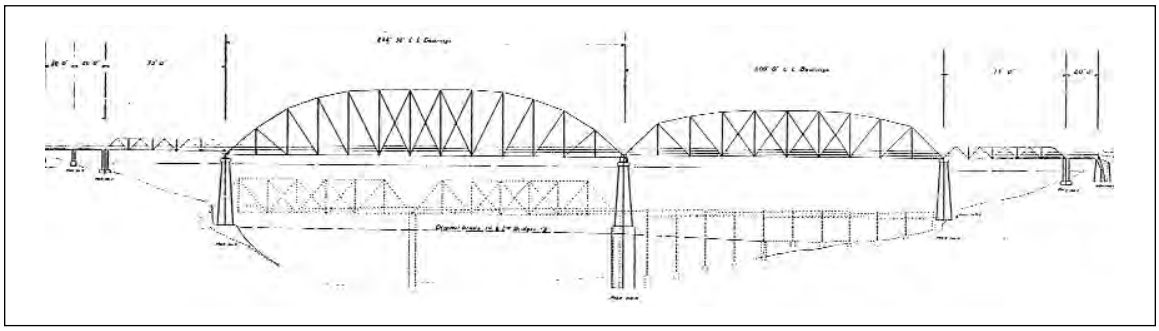
Significant under Criterion A for its association with Bee Line Highway and as an early bridge by the State Highway Department and under Criterion C as a representative through Warren truss bridge.

In 1920 Giles County approved a $175,000 bond issue to fund the Bee Line Highway through the county along present day State Route 7/U.S. 31. Giles County paid one-third and the State Highway Department paid two-thirds of the cost. As part of this project, the state designed and built this bridge. The state awarded a construction contract, federal-aid project 25-C, to the Montgomery and Parker Company in December 1922. The firm completed the project at a cost of $66,295.36 in December 1924.

As an early example of the state's work, the bridge is transitional in design. It contains one riveted 160.9-foot Warren through truss with polygonal top chords and twenty 26.5-foot concrete deck girder approach spans for a total length of 692.2 feet. The curb-to-curb width is 18.0 feet, and the out-to-out width is 22.0 feet. The composition of the members is not as heavy as later state bridges but transitional. Top chords and end posts are channels with lacing, and the bottom chords are channels with battens. Verticals are four riveted angles. Diagonals are either paired angles with battens or small channels with lacing or battens. Unlike later state bridges, the truss does not have a lattice rail but a metal bar. There are water drainage holes along the curb. The substructure is concrete.

The state built a new bridge adjacent to this structure in 1959 and barricaded the old bridge to traffic. Except for traffic damage to portal bracing on the southern end, the bridge remains intact. TDOT awarded the county a Transportation Enhancement grant to rehabilitate the bridge for use within a trail system.

(#112) 89-04261-11.60: Collins River Bridge spanning the Collins River at Rock Island in northwest Warren County (Doyle Quad, 327 SE).



Significant under Criterion A for its associations with the Great Falls Dam and TEPCo and under Criterion C as unusual 1889 Parker and representative trusses by the Nashville Bridge Company.

The largest truss on this bridge was originally erected in 1887-1889 as part of the Hyde's Ferry Bridge located in Davidson County. Eugene Falconnet designed the bridge, and the Mount Vernon Bridge Company erected it. In 1917 Davidson County awarded a contract to the Nashville Bridge Company to relocate two spans from the Hyde's Ferry Bridge in Davidson County (#16, 19-NonHighway-2) and gave this span to the Nashville Bridge Company. The Nashville Bridge Company stored it until 1924 when the company erected it at this site. Arthur Dyer, president of the Nashville Bridge Company, often used this bridge as an example of the superiority of truss bridges over concrete due to their mobility.

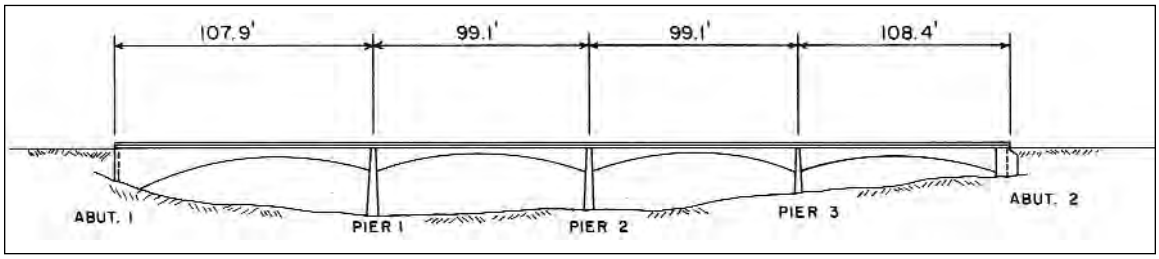
This site is located near the 1916 Great Falls Dam, a major power source in the area. The Tennessee Power Company, of which Dyer was a stockholder, owned the dam. In 1922 this company merged with two other firms to become the Tennessee Electric Power Company (TEPCo), one of the most significant power producers in the region. Afterwards, TEPCo began to expand its facilities at the Great Falls Dam. This expansion program included raising the

dam thirty-five feet which resulted in several bridges being modified (see #61, 88-NonHighway-1) or as in the case of this bridge, being replaced (see #16, 19-NonHighway-2; Crouch 1973; Crouch and Claybrook 1976; Hamblen 1976; Nashville Bridge Company #4222-11; Woodruff 1978).

Consequently, the Nashville Bridge Company removed the existing truss bridge from this site in 1924 and erected a new bridge. The stored 1889 247-foot pin-connected elliptical iron Parker through truss became the main span. Its composition is identical to #16, 19-NonHighway-2 except that the original rail is missing. Top chords and end posts are channels with lacing, and diagonals and the bottom chords are paired rectilinear eyebars. Verticals are channels with lacing except hip verticals which are paired rectilinear eyerods. Counters are single rectilinear tie rods. The bottom chords are below the floor beams, a somewhat unusual arrangement. The other spans are a 200-foot pin-connected Parker through truss, two 75-foot riveted Warren pony trusses, and three 20-foot steel I-beam approaches. The bridge has a curb-to-curb width of 15 feet and an out-to-out width of 17 feet. The substructure is concrete. Composition of the members of the 1924 trusses is typical. The Parker's top chords and end posts are channels with lacing. Bottom chords, diagonals and counters are angles with battens. Verticals are paired angles with lacing. The Warrens' top chords are channels, and the end posts are channels with battens. Bottom chords, verticals, and diagonals are angles with battens.

In the 1930s, when TVA acquired TEPCo, it also assumed maintenance responsibility for this and several other bridges. TVA maintained this bridge until 1982 when the road became a state route. After the state built a new structure adjacent to this bridge in 1986, the Tennessee Department of Transportation made necessary repairs to the bridge for pedestrian use and transferred ownership of the bridge to the Department of Conservation, which incorporated it into a trail system in the Rock Island State Park.

(#113) 30-A0909-00.21: Conway or Nolichucky River Bridge spanning the Nolichucky River on Greene-Cocke County line (Rankin Quad, 172 SW).



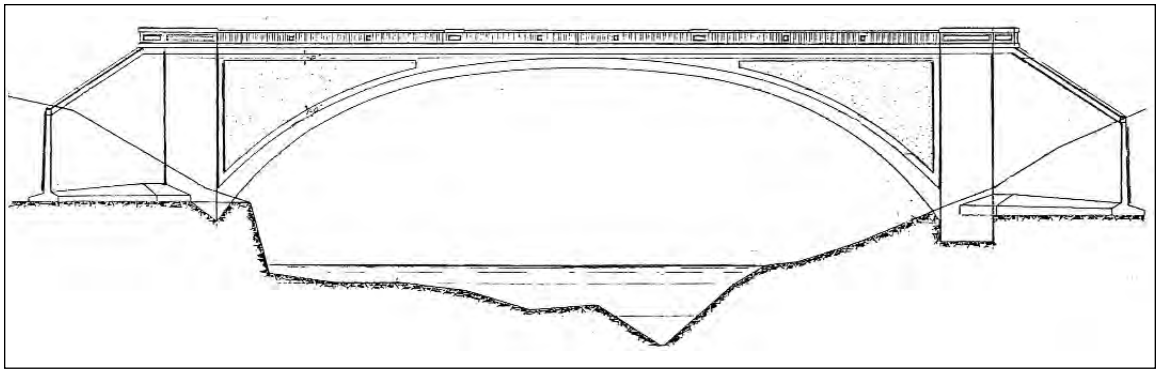
Significant under Criterion C as a representative closed spandrel ribbed arch bridge by the Steel and Lebby Bridge Company.

In the early 1920s, the Tennessee Eastern Electric Corporation (TEPCo) raised a nearby dam that changed the water levels of the Nolichucky River. As a result, beginning in July 1923, Greene and Cocke Counties debated, often heatedly, the issue of raising the existing Bird's Hill (or Conway) Bridge on their joint county line. In July 1924 Greene County approved an expenditure of up to $9,000 to build a new bridge at the Bird's Hill or Conway Ferry site if Cocke County would agree to spend an equal sum. Cocke County originally rejected this offer but in October agreed. In January 1925, the Greene County Court voted to raise the Bird's Hill Bridge because the electric company would pay only $5,270, the original construction cost of the existing truss not the replacement cost. However, in April 1925, the Greene County Court rescinded this motion. Greene County then agreed to build a new bridge and move the existing truss spans to Easterly's Ferry (30-A0894-01.09). The Easterly Bridge was repainted, erected, "put in good order" for $1,400, and opened in December 1925. The counties let the $12,750 contract for the new Bird's Hill Bridge to Steel and Lebby who completed the bridge by October 1925 (Greene County Court Minutes Book 49: 245, 309, 361, 440, 520; *Greeneville Democrat* Sun 9 January 1924, 8 July 1924, 7 April 1925, 5 October 1925; *Newport Plain Talk* 7 October 1924, 7 July 1925).

Although now commonly known as the Conway Bridge, the plaque identifies the bridge as the Nolichucky River Bridge and gives 1924-1925 as the construction date. The joint Greene County and Cocke County committee included; J. U. Brown, J. H. Moore, J. D. Holdway, and H. L. Davis.

The Conway Bridge contains four spans, each a closed spandrel dual ribbed arch 99 to 108 feet long. The bridge is 414.5 feet in length with a curb-to-curb width of 16 feet and an out-to-out width of 17.1 feet. The piers have nosings on each side. The railing is a post and rail design.

(#114) 36-A0446-00.43: Old State Route 15 spanning Indian Creek in eastern Hardin County (Olivehill Quad, 23 SE).

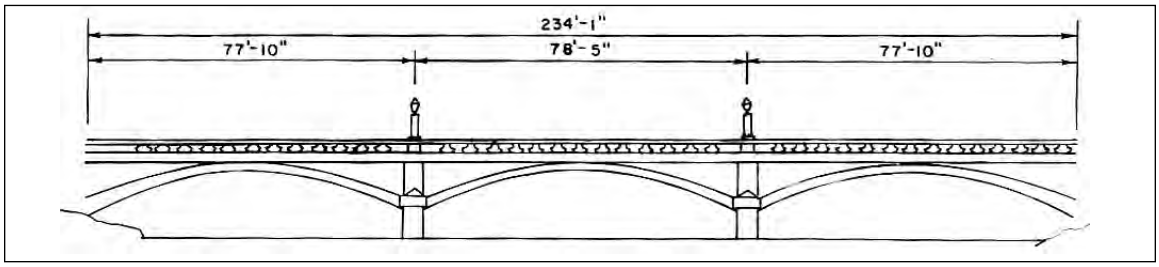


Significant under Criterion C as an early closed spandrel concrete arch bridge by the state highway department.

The State Highway Department designed this bridge in 1925. At that time, this road was State Route 15/U.S. 64, an early stage route that had evolved into the main route across southern Tennessee linking Memphis and Chattanooga. The state awarded a state aid contract for it and other bridges on State Route 15 to V. W. Clanton in January 1925. The firm completed these bridges by March 1926 (Tennessee 1943:125). An unusual feature is that old quad maps label this crossing "Arch Bridge." The state realigned State Route 15 about 1964, and this bridge with a short segment of highway became a county road. The bridge is one of the early designs by the state and contains decorative features usually omitted on later bridges.

The bridge contains one span, a closed spandrel arch 126 feet long. It has a curb-to-curb width of 20.1 feet and an out-to-out width of 23.6 feet. The bridge has a spindle railing with bush-hammered depressed panels on each end post. The delineated extrados of the arch forms a decorative line along the arch. Above the extrados in each spandrel area is a bush-hammered depressed panel roughly triangular in shape, although one side follows the curving line of the extrados. The floor system contains four drains.

(#115) 10-03939-00.10: Elk Avenue Bridge spanning the Doe River in Elizabethton in Carter County (Elizabethton Quad 207 SW).



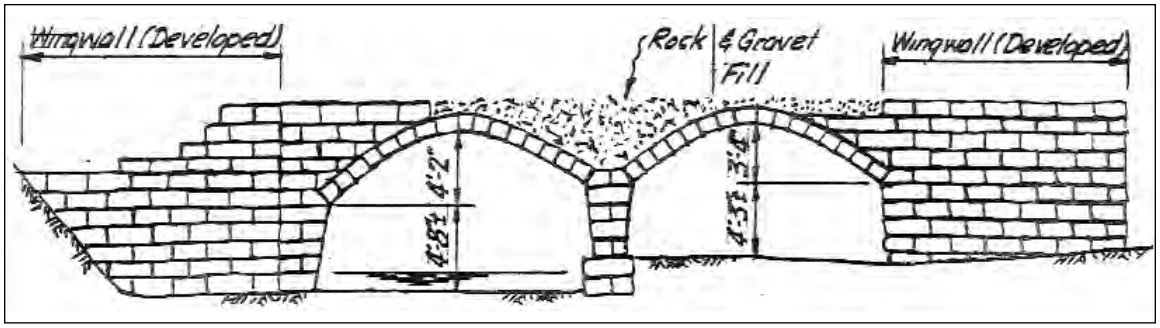
Significant under Criterion C as an unusual closed spandrel ribbed arch bridge by the Luten Bridge Company.

The Luten Bridge Company erected this bridge in 1926. It is located in downtown Elizabethton, the county seat of Carter County. Much of the downtown is listed in the National Register as a historic district under Criteria A and C. The Elizabethton Historic District contains a variety of properties ranging in age from the late 1700s through the 1930s and includes the well known Elizabethton Covered Bridge (#8, 10-A0398-00.01).

The Elk Avenue Bridge contains three spans, each a 78-foot closed spandrel arch with ribs. While it is typical for most ribbed arches to have only two ribs, due to the substantial width, the bridge contains seven ribs. The curb-to-curb width is 54 feet with on-street parking and sidewalks, and the out-to-out width is 80 feet. The bridge has an elaborate railing with urn shaped spindles and lamp posts in the shape of Ionic columns. The piers have nosings that terminate with a projecting molding at the springline. Pilasters are located above the springline. The delineated extrados of the arch ring forms a decorative line above the arch.

With funds through the Highway Bridge Replacement and Rehabilitation Program, TDOT rehabilitated the Elk Avenue Bridge between June 2003 and June 2004.

(#116) 52-A0147-03.89: Lane Branch Road spanning Lane Branch north of Mimosa in Lincoln County (Fayetteville Quad, 73 NE).



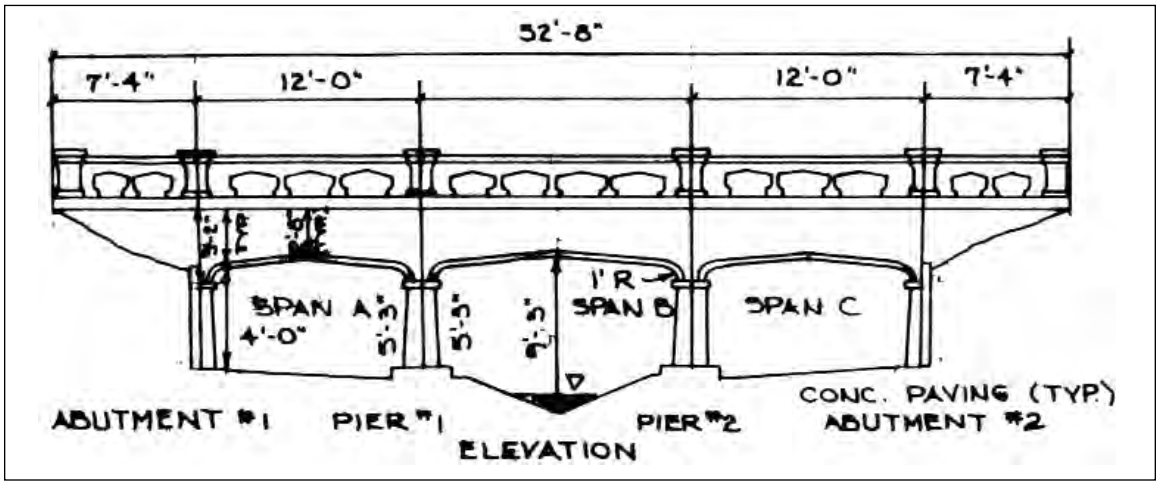
Significant under Criterion C as a rare masonry arch bridge.

In 1926 Lincoln County contracted with D. F. Keith to build this two-span masonry bridge for $650 (Lincoln Quarterly Court Minutes Volume T:124). Built of limestone and filled with rock and gravel, the bridge lies on a 70° skew, a design feature that increased the difficulty in erection. The bridge is 36.6 feet long and contains two spans, each 14.5 feet long. The out-to-out width is 12.3 feet. A row of stones follows the line of the arches. A low parapet rail of coursed, rough hewn-stone twenty-seven inches high and twelve inches wide runs the entire length of the bridge.

Keith worked in the Lincoln County area in the 1920s. The survey inventoried one other bridge that he erected, a two-span masonry arch bridge built in 1924 that has since been altered (52-A0399-02.37).

In 1981, the county built a new bridge nearby and left this bridge, in somewhat deteriorated condition, as a historic ruin.

(#117) 79-B0741-00.01: Iroquois Road spanning Cypress Creek, Chickasaw Gardens in southeast Memphis, Shelby County, (northeast Memphis Quad, 409 NW).

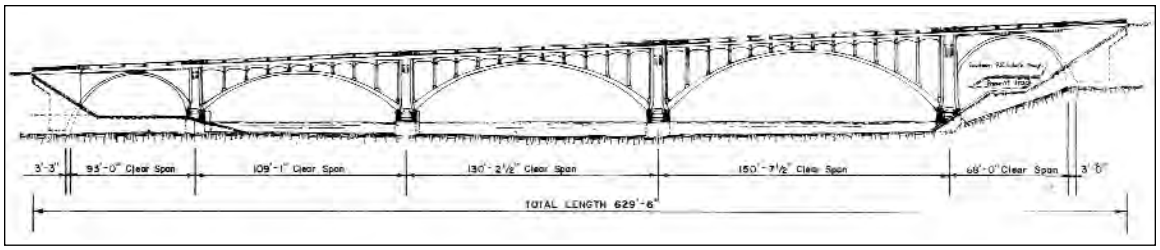


Significant under Criterion C as a concrete arch bridge with unusual aesthetic details.

In 1922 millionaire grocer, Clarence Saunders, began construction on a 160-acre estate of a grand mansion known locally as the Pink Palace. However, he soon went bankrupt and the estate was sold to Garden Communities Corporation of Louisville, Kentucky. In 1926, this firm donated the Pink Palace with twelve acres to the City of Memphis that now uses it as a museum. The firm also began development of the remainder of the estate, which contained a lake and golf course, into an exclusive residential subdivision known as Chickasaw Gardens. Harland Bartholomew and Associates of St. Louis was the designer of the subdivision with Thomas H. Allen of Memphis as engineer. The subdivision contained curvilinear streets with the main two streets lying parallel to the lake. This man-made lake and a canal, which runs the length of the subdivision, form the core of an area given to the city as a park. This bridge, erected in 1926 to span the canal, was designed to have an aesthetically attractive appearance that would blend with the subdivision's park-like setting. Due to the Stock Market Crash of 1929 and the Great Depression, only a few individuals built houses in the subdivision until after World War II (Carver and Ward 1988; Linberg and Benton 1980).

The bridge, composed of brown exposed aggregate concrete, contains three short ogee shaped closed spandrel arches. The bridge is 52.7 feet long and has a 22.0-foot curb-to-curb width and a 26.7-foot out-to-out width. The ogee motif is repeated in the rail.

(#118) 15-SR009-21.60: Wolf Creek Bridge spanning the French Broad River and the Southern Railway east of Newport in Cocke County (Paint Rock Quad, 182 NW).



Significant under Criterion A for its associations with the development of the Dixie Highway and the state highway department and under Criterion C as outstanding concrete arch bridge designed by the state highway department.

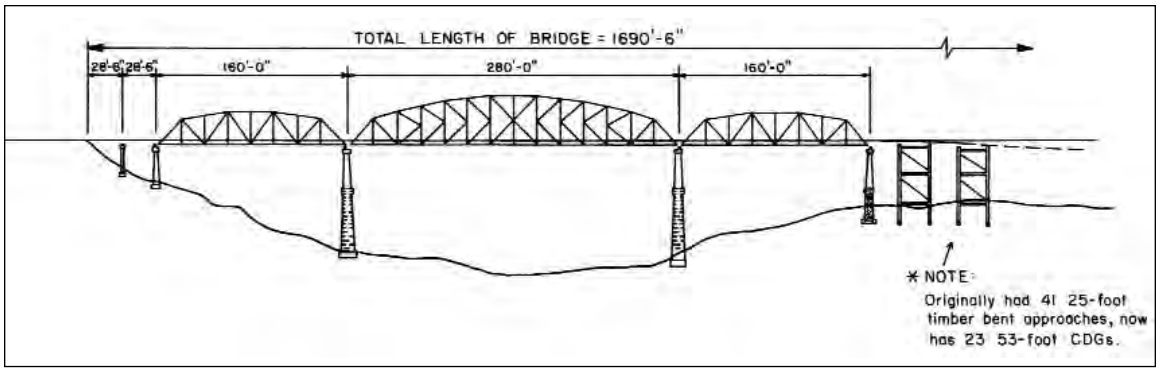
The Tennessee State Highway Department designated this road corridor through mountainous East Tennessee as State Route 3 in 1917, and the Dixie Highway Association designated it as the route of the Eastern Division in 1918. The state found that "the unimproved route was a steep, narrow trail, a nightmare to travel" (Johnson 1978b:33), and in 1920, the state made a location survey for an improved facility. However, Cocke County voted down its match for construction costs twice and did not agree to provide its share of the funding until 1922. Construction was further delayed because Southern Railway and the state could not reach an agreement over right-of-way where the highway paralleled the railway for over a mile along the banks of the French Broad River. After a flood in 1920, the state's engineers relocated a five-mile stretch in an effort to minimize future flood damage, and at the same time, the state also decided to relocate the road so that it crossed the railway once perpendicularly rather than paralleling it. This resulted in the need for a major new bridge structure to span both the French Broad River and Southern Railway. For a short period in

the early to mid-1920s, in order to generate support for its projects, the struggling state highway department proposed a model road program of three segments, one in each Grand Division, with this road being East Tennessee's model section.

Between December 1922 and 1924, the state built a sixteen foot macadam road ten miles in length from near Del Rio to the North Carolina state line as Federal Aid Project 23. Rather than detour a hundred miles to avoid construction activities, motorists made their own roads through the area, which were often impassable due to mud. Many of the motorists were tourists, "most of whom were accustomed to smoother country, and better roads, and these were far from bashful in their caustic criticism." That year farmers along the way "harvested the automobile crop; one even charged motorists a dollar for crossing his land" (Johnson 1978b:34). The road project did not include the construction of the French Broad River Bridge because Cocke County did not agree to provide its match for the bridge until 1926. The state designed the bridge in 1925 and let a contract for $119,102.41 for its construction in October 1926 to the R. C. Stevens Company that completed the bridge in February 1928 (Tennessee 1943:82).

Grander in design and larger in scale than other state-built concrete bridges of this period, the 566-foot Wolf Creek Bridge contains five arches (three open spandrel and two filled) and two approach spans. The curb-to-curb width is 21.4 feet, and the out-to-out width is 24.3 feet. The main spans are dual-ribbed open spandrel arches. The individual spandrel arches of these spans have arched beams creating an arcaded effect. The spandrel supports are classical columns with a base, shaft, and capital. The delineated extrados of the arch ring forms a decorative line above the arch on the outside edge of the intrados. Block modillions are below the deck. The river piers are scored horizontally below the springline. Near the deck, the piers contain either five or seven incised vertical lines. At the deck each pier makes a graceful semi-circular outward curve ending flush with the outside edge of the deck. Each arch ring is scored to form the appearance of radiating voussoirs, a decorative feature rarely used on concrete arches in Tennessee.

(#119) 44-SR056-10.96: Austin Peay Bridge spanning the Cumberland River in Gainesboro in Jackson County (Gainesboro Quad, 325 SW and Whitleyville Quad, 325 NW).



Significant under Criterion C as a rare K truss bridge and as work by the state highway department.

This bridge is a relatively early design by the state, and is one of two state designed K trusses. The state signed a state aid contract for the erection of this bridge 11 June 1926 with Montgomery and Parker of Rockport, Indiana. The Nashville Bridge Company fabricated and erected the K truss. At the request of the local Civitan Club, the state named the bridge the Austin Peay Bridge in honor of this Tennessee governor who died suddenly in October 1927. Although the bridge opened to traffic 10 April 1928, the state did not hold official dedication ceremonies until 16 June 1928. Speakers at this elaborate ceremony included Governor Henry Horton and national hero, Alvin C. York. The bridge cost $266,011.53 (Durbin 1991; Tennessee 1943:128, 335-A).

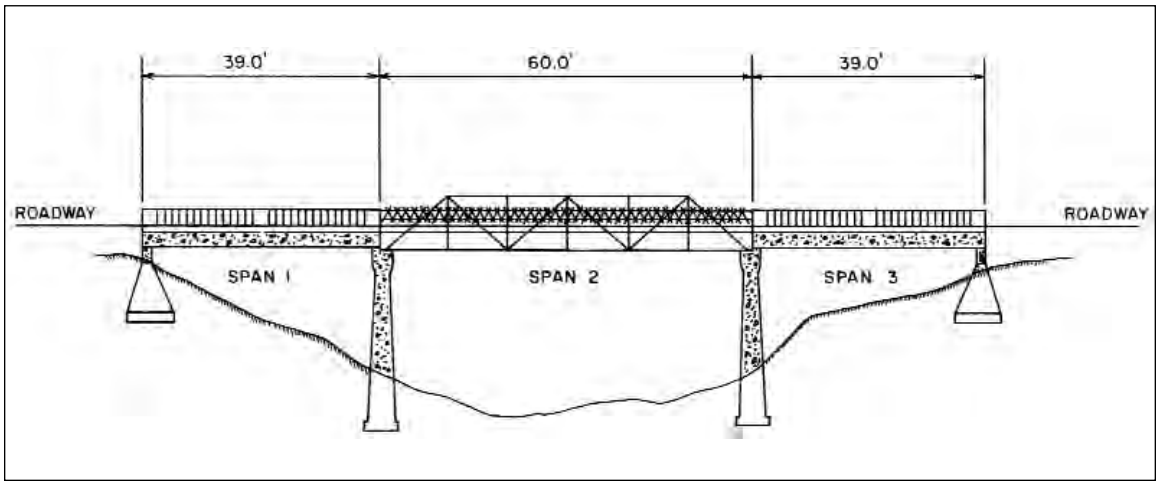
At least two tragic events are associated with the bridge. During its construction, workman E. G. Morrell of Nashville fell from the bridge to his death on Thanksgiving Day 1927. On 21

January 1941 the thirty nine timber approach spans on the north end of the bridge burned. The state closed the bridge, the only one over the river for several miles in either direction, for several months while it built concrete replacement spans. The state awarded the contract for this work in April 1941 to A. B. Long. Long completed the new viaduct, which cost $130,687.37, in April 1942.

The bridge contains one 280-foot riveted K through truss that is flanked on each side by a 160-foot riveted Warren through truss with a polygonal top chord. The south approach consists of two 28.5-foot concrete deck girder spans, and the north approach contains twenty-three 53-foot concrete deck girder spans. The bridge sits on a scored concrete substructure. It has a curb-to-curb width of 18.0 feet and an out-to-out width of 21.3 feet. Composition of the members is typical. Top chords and end posts are channels with lacing, and bottom chords are channels with battens. Verticals, diagonals and counters are I-beams or channels with lacing.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, demolished this bridge and built a new structure at this site in 1994.

(#120) 65-A0450-03.25: Old State Route 29 Bridge spanning the Emory River north of Wartburg in central Morgan County (Gobey Quad, 122 NE).

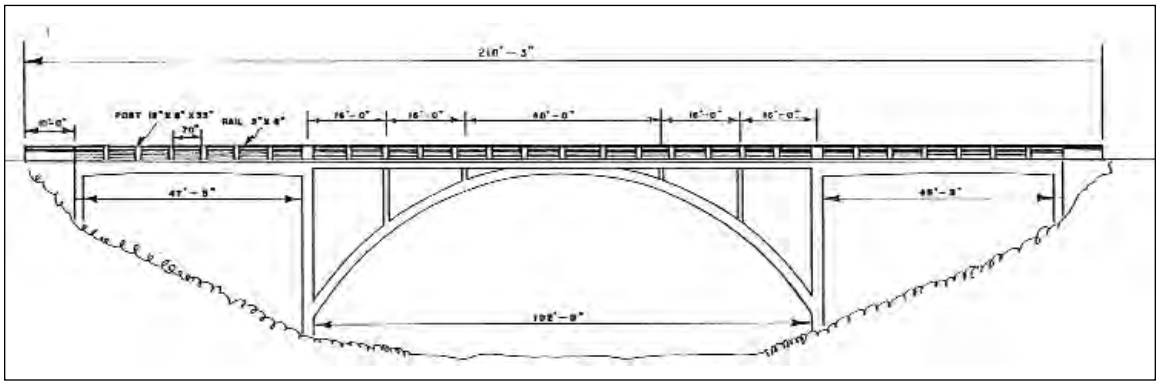


Significant under Criterion C as a semi-deck Pony Warren truss bridge by the state highway department.

In 1922 the Tennessee State Highway Department announced the proposed construction of a main highway through Morgan County that would be a link in the Cincinnati-Chattanooga Airline Highway, also known as the Dixie Airline Highway. The state built this route, which included this bridge, between 1922 and 1926. In March 1926, the state let a contract for it and other bridges on State Route 29 between Pilot Mountain and Wartburg to the North Fork Construction Company. This firm completed the state aid project for $135,777.07 by April 1928 (Dickinson 1987:86; Tennessee 1943:126, 300-C). About 1980 the state realigned State Route 29 and bypassed this segment, which the county incorporated into a local road.

The bridge contains a 60.0-foot riveted Warren pony (semi-deck) truss 9.0 feet tall flanked by two 39.0 concrete deck girder spans. The bridge sits on a scored concrete substructure. The truss has its original lattice railing. The girder spans have a concrete spindle railing. The bridge has a curb-to-curb width of 20.5 feet and an out-to-out width of 22.4 feet. Composition of the members is typical. Top chords and end posts are channels with lacing, bottom chords are channels with battens, and verticals and diagonals are I-beams.

(#121) 47-01262-01.16: Mascot Road spanning Roseberry Creek in northeast Knox County (John Sevier Quad, 146 SE).



Significant under Criterion C as a representative open spandrel arch bridge by the Steel and Lebby Bridge Company.

In 1926 Knox County decided to replace a deficient bridge in the Mascot community, stating that the existing bridge was in a:

> ...bad and dangerous condition; and unsafe for travel and dangerous to the public health; so a new bridge will have to be built on the public road or the same will have to be closed. If said public bridge and road are closed, it will practically cause the closing down of the work of the American Zinx [sic] Company at Mascot, where hundreds of people are employed, and upon which thousands are dependent for a living and support (Knox County Quarterly Court Minutes Volume 2:585-587).

Two days later, the *Knoxville News* reported on the court's action:

> BRIDGE WORK TO PROCEED
> Order Building of Roseberry Creek Span
>
> Lebby & Steel, who were some weeks ago awarded the contract to build the new bridge over Roseberry Creek near Mascot have been authorized by the Highway Commission to proceed with the work.
>
> This notice follows the action of the County Court in appropriating $22,000 out of the general fund for this bridge and the one over Beaver Creek to replace the old Cox Bridge. Lebby & Steel's original contract for the Roseberry Creek Bridge calls for the expenditure of $13,600 but the county court allowed $15,000 for the work (*Knoxville News Sentinel* 6 October 1926:12).

The Quarterly Court of 3 January 1927 reported progress on the bridge:

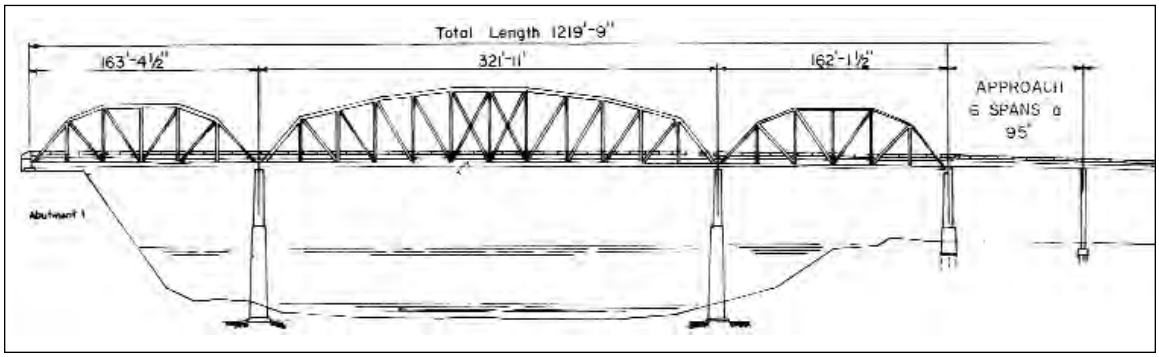
> ...Roseberry Creek Bridge is well underway and if we have fair weather so we can work and pour cement, it will not be long before [it] will be completed (Knox County Quarterly Court Minutes Volume 2:602).

The contractor completed the bridge as scheduled, and a metal plaque identified the members of the Knox County Highway Commission as Peter E. Blow, Chairman; Howell Q. Davis; Sam Clapp; Cowan Rogers; S. B. Cliffin; E. D. Jeffrie, Superintendent; and F. L. Thomas, Engineer. The plaque no longer remains (McLeod 1995).

The bridge contains one 103-foot open spandrel dual ribbed arch flanked on each side by concrete deck girder approach spans. Lateral bracing bars connect the dual arch ribs. The abutments are scored. The railing is post and rail design. The bridge has a curb-to-curb width of 19.8 feet and an out-to-out width of 25.0 feet.

The Tennessee Department of Transportation, in cooperation with Knox County and the Federal Highway Administration, replaced this structure with a new bridge in 1997.

(#122) 19-SR045-02.03: Old Hickory Bridge spanning the Cumberland River in northeast Davidson County (Goodlettsville Quad, 310 SW).



Significant under Criterion A in community planning and under Criterion C as representative Parker and Camelback trusses and unusual entry towers.

The outbreak of World War I created an increased need for munitions and explosives that resulted in the DuPont Company and the U.S. Government entering into an agreement to develop one of the world's largest munitions plants with its own planned community. The site chosen, largely based on the 1904 recommendations of E. C. Lewis (see #22, 11-NonHighway-1) to the DuPont Company who had at that time planned to build a mill in Nashville but did not, was Hadley's Bend in northeast Davidson County. DuPont named the community Jacksonville in honor of the nation's seventh President, Andrew Jackson, whose home, the Hermitage, is a few miles to the south. For security reasons, the government and DuPont purchased the entire bend and although some workers came by train from Nashville, the community functioned as a self-contained entity with its own commercial, health, and educational facilities.

Built in 1918, the plant and town thrived for about one year until shortly after the Allies signed the Armistice. Located in what was then a rural area, the town soon became virtually a ghost town as workers fled trying to find jobs. In 1920 the government sold the bend to a group of

businessmen who in turn sold 500 acres to the DuPont Company. In 1923 DuPont razed the munitions plant and built a facility to manufacture its new "artificial silk" called Rayon. To avoid confusion with towns of similar names, the firm renamed the community Old Hickory, Jackson's nickname. Over the next few years, DuPont rehabilitated much of the housing from the 1918 development and constructed new houses. The area around this community grew steadily with residential areas surrounding it. DuPont also gradually expanded over the years and is today an important industry in Davidson County. [Two historic districts and three individual properties associated with this development are listed in the National Register.]

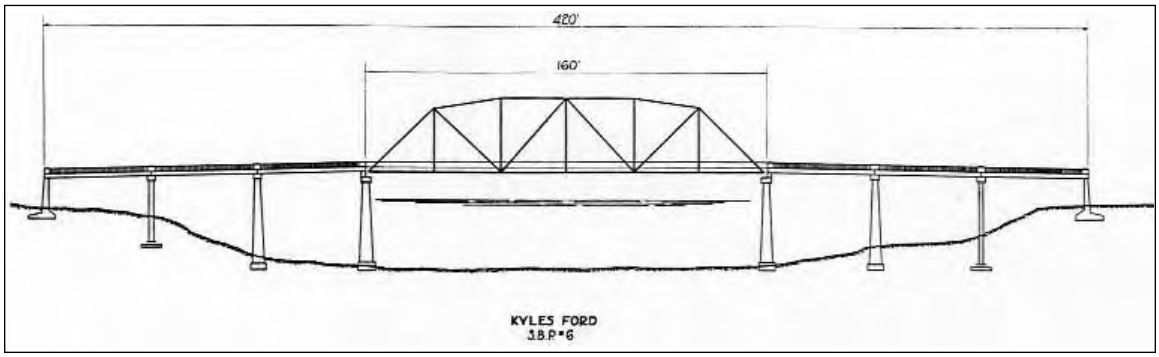
As a rural farming area, Hadley's Bend had no real need for a bridge connecting it to Nashville, but that changed with the erection of the munitions plant in 1918. At first, trains from north Nashville carried passengers to Edenwold where they crossed the river on a ferry and later a pontoon bridge, a relatively inefficient system. The government erected a 540-foot pedestrian suspension bridge that opened in late November 1918. Tradition contends that this bridge was scheduled for shipment to South America but that the government diverted it to this location. Designed by the American Bridge Company, the government intended for the nine-foot wide suspension bridge to be temporary. DuPont gave the bridge to the county in 1923. The county converted the bridge to light vehicular use, anticipating that it would have a life expectancy of three to five years

With the area beginning to develop in the mid-1920s, the county then began to plan a new vehicular bridge at this site. In 1926 the county passed a $1 million bond issue to fund it. In October of that year the county hired Freeland-Roberts to design the bridge and supervise its erection. In July 1927 the county awarded the construction contract to Gould Construction Company. The American Bridge Company fabricated the trusses. The county held elaborate dedication ceremonies for the new bridge 27 March 1929. The bridge cost $830,000 (Davidson Quarterly Court Minutes Volume O: 64-71, 482; Volume P: 47 77, 209-212, 239-243, 271-273, 500-504; Volume Q: 304-305, 353; Volume S: 8-9; Thomason and Draeger 1984; Tootle 1953).

The Old Hickory Bridge is 1,222 feet long and contains three riveted through truss spans and six concrete approaches on the east end. The main span is a 320-foot Parker flanked by two 160-foot Camelbacks. The truss piers are concrete faced with masonry. The approaches sit on concrete bents. Composition of members varies from state designed bridges of this era but is not unique. Top chords, end posts, and bottom chords are channels with lacing. Verticals are channels. Diagonals are either channels or channels with lacing, and counters are channels with lacing.

An unusual feature is the set of monumental concrete towers that are located on the outside end of each Camelback truss. The west tower is located over an abutment, but the east tower is located in the middle of the approach viaduct. These towers rest on massive masonry bases below the road surface. Featuring neoclassical detailing, the symmetrical towers serve as visual portals to the bridge. Stepped pyramidal roofs with urn finials top each tower. Each tower contains a room with pedimented doorways that open both onto the roadway and to the outside of the truss. Although the east tower is in the middle of the approach viaduct, the doorway exits into open air to maintain the design symmetry.

(#123) 34-SR070-01.65: Kyle's Ford Bridge spanning the Clinch River in northeast Hancock County (Kyle's Ford Quad, 170 SE).



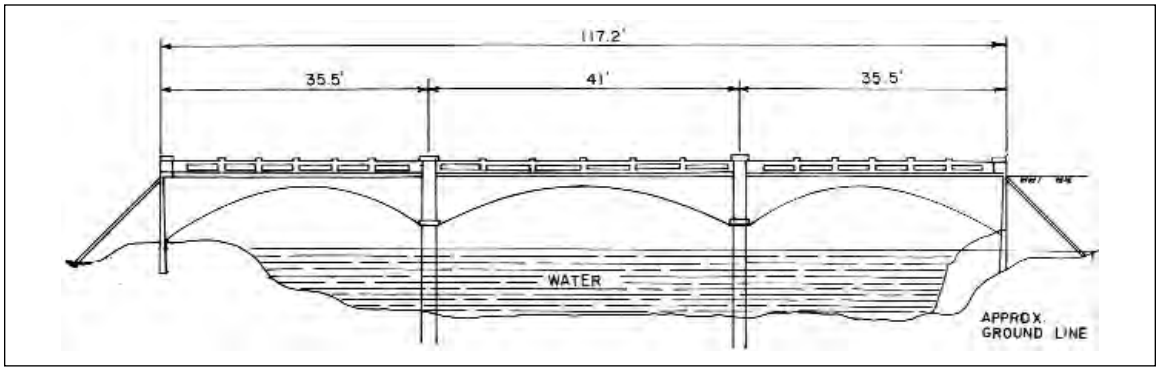
Significant under Criterion A as a toll bridge and under Criterion C as a representative Warren through truss bridge by the state highway department.

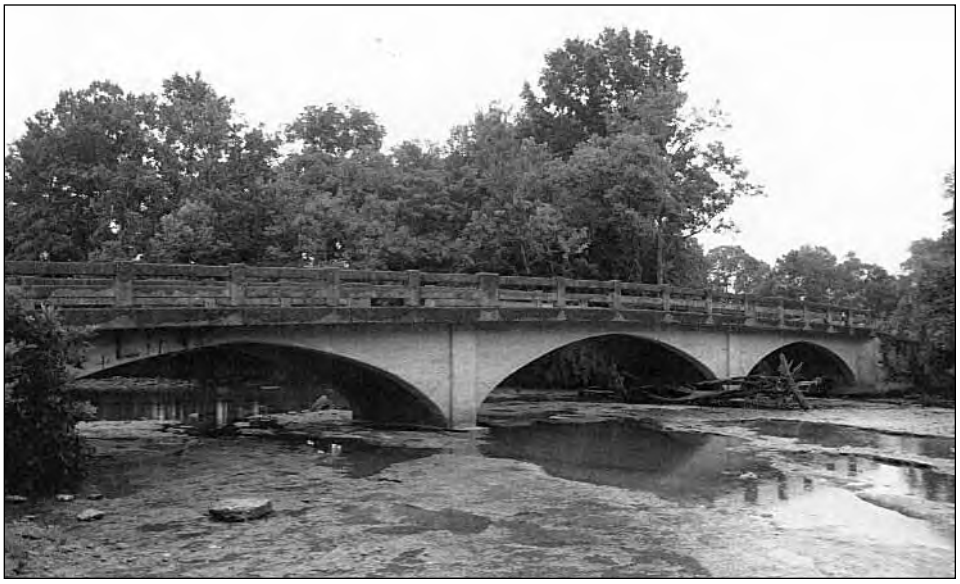
The State Legislature funded this project in 1927 as a Special Bridge Project in its toll bridge program. In 1927 the state awarded a contract for core drilling to Standard Drilling for $1,124; a contract for grading and draining for $38,034 to Mack Construction Company; and the bridge contract for $71,151 to W. H. Shons. The contractors completed the primary work on the bridge between December 1927 and May 1928 but did not complete the approach work until October. The state operated it as a toll bridge until 1939 (Keeble 1947:1-8; Tennessee 1931:88-95; 1933:106-115; Tennessee 1943:119).

The bridge contains six concrete deck girder approaches and one 162-foot riveted Warren through truss with polygonal top chords. The bridge has a total length of 420.6 feet, a curb-to-curb width of 20.2 feet, and an out-to-out width of 23.8 feet. The bridge sits on a concrete substructure scored in a block pattern. Composition of members is relatively typical. Top chords and end posts are channels with lacing, and bottom chords are channels with lacing top and bottom. Verticals are I-beams. Diagonals are channels with lacing except those in the end panels that are I-beams.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for replacement.

(#124) 95-A0392-02.12: Salem Road spanning Fall Creek southeast of Cedars of Lebanon State Park in south-central Wilson County (Vine Quad, 314 SE).



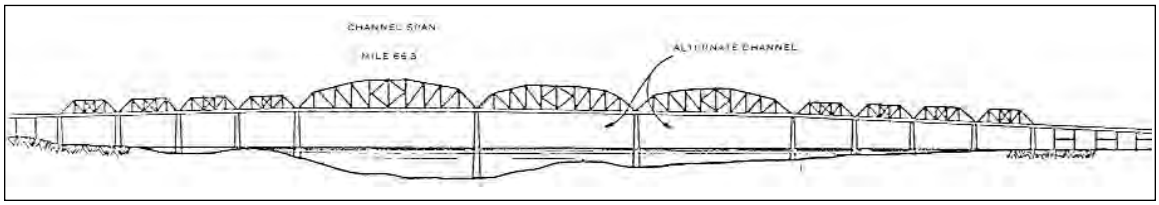


Significant under Criterion C as a representative closed spandrel ribbed arch bridge by the Bell and Bell Bridge Company.

In the 1920s Wilson County contracted primarily with either the local firm Bell and Bell of Watertown or, less often, the Luten Company of Knoxville to build dozens of concrete arch bridges in the county. The county awarded the contract for this bridge in 1928 to Bell and Bell. A local newspaper article in July 1928 stated, "The concrete bridge on the road at Simmons Bluff is progressing rapidly, and it is expected that it will soon be open for traffic" (*Lebanon Democrat* 26 July 1928). A bridge plaque indicates that the Wilson County Highway Commission included; E. C. Walker (County Judge), E. M. Baird, W. T. Terry, J. W. Cragwall, C. C. Young, and C. R. Coleman.

The bridge contains three closed spandrel dual ribbed arch spans and has a railing of post and rail design. At each pier is a straight pilaster extending from the deck to the foundation. The curb-to-curb width is 15.8 feet, and the out-to-out width is 18.0 feet.

(#125) 40-SR076-30.34: Paris Landing/Scott Fitzhugh Bridge spanning the Tennessee River on Henry-Stewart County line (Paris Landing Quad, 19 NE).



Significant under Criterion A as a toll bridge and Criterion C as representative Parker and Pratt trusses by the state highway department.

Prior to the 1920s, no vehicular bridges spanned the Tennessee River in West Tennessee. However, after a special statewide appropriation from the State Legislature in 1927, the state designed and built four toll bridges in West Tennessee. The state chose bridge locations that spanned the Tennessee River somewhat equidistantly from north to south at Paris Landing, New Johnsonville, Perryville, and Savannah. The state collected tolls on the Paris Landing Bridge until 1939.

The state officially designated this bridge the Scott Fitzhugh Bridge, but it came to be known as the Paris Landing Bridge since it is adjacent to the Paris Landing State Park. The state let contracts that included; core drilling for $12,425 to Mott Core Drilling Company; grading for $42,102 to R. E. Martin; guard rail for $2,757 to State Forces; bridge work for $26,819 to Forcum-James Company; and bridge work for $945,288 to Whiting-Turner Construction Company. Construction occurred between October 1929 and October 1930. About 1950 the Tennessee Valley Authority raised the Paris Landing Bridge on the Stewart-Henry County line due to increased water levels resulting from the impoundment of Kentucky Dam. (Carver 1989c; Keeble 1947-1-8; Tennessee 1931:88-95; 1933:106-115; 1943:119; TVA 1951).

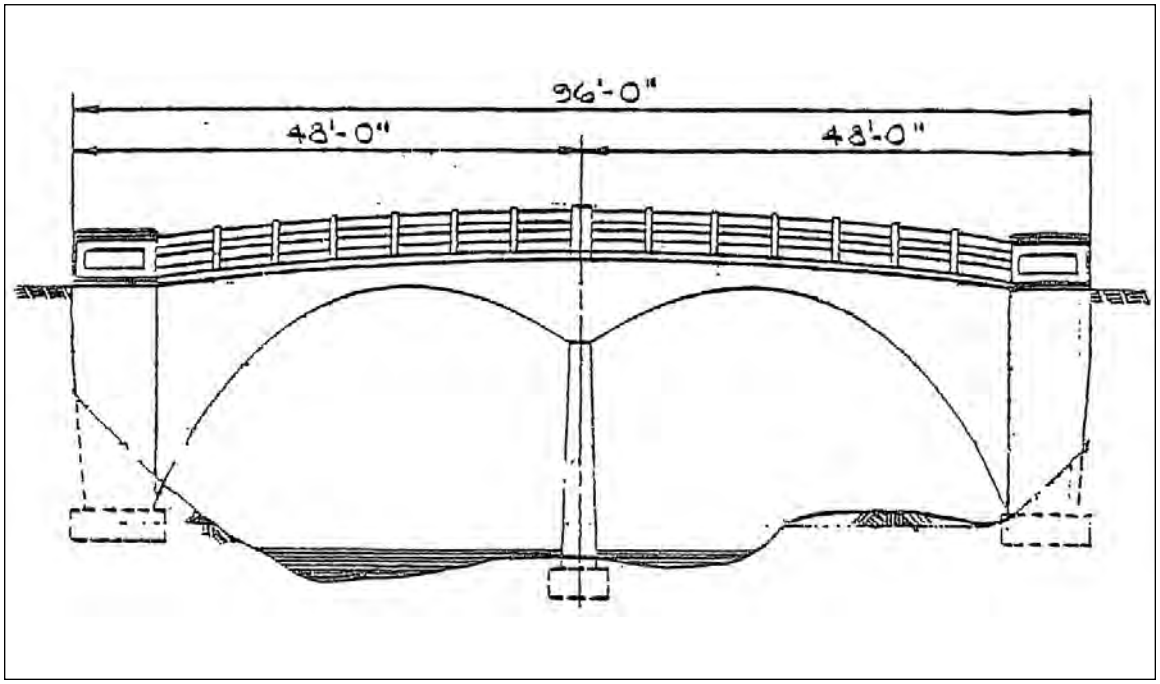
The bridge is 4,734 feet in length and has a 20-foot roadway. Resting on a concrete substructure, the bridge contains eighty spans: eleven riveted through steel trusses and sixty-nine concrete deck girder spans. There are eight Pratt trusses at 120 feet each, two Parker

through trusses at 320 feet each, and one Parker through truss that is 365 feet in length. Unusually large in scale, the bridge contains more truss spans than any other bridge in the state.

Typical of state bridges during this period, the bridge contains a concrete spindle railing on the approach spans and a metal lattice rail on the trusses. Composition of the members is also typical of state bridges during this time. Top chords and end posts are channels with lacing, and bottom chords are small channels with battens. On the Pratts, diagonals are small channels except in the center panel where the diagonals and counters are angles with battens. On the Parkers, verticals are paired angles with lacing or small channels.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, demolished the bridge and built a new structure at this site in 1991. After the state had let the demolition contract, local citizens arranged for the contractor to relocate one of the Pratt trusses to a picnic area within the Paris Landing State Park where it remains.

(#126) 07-A0080-00.49: Old Stinking Creek Road spanning Stinking Creek north of LaFollette in Campbell County (Jellico West Quad, 338 SW).

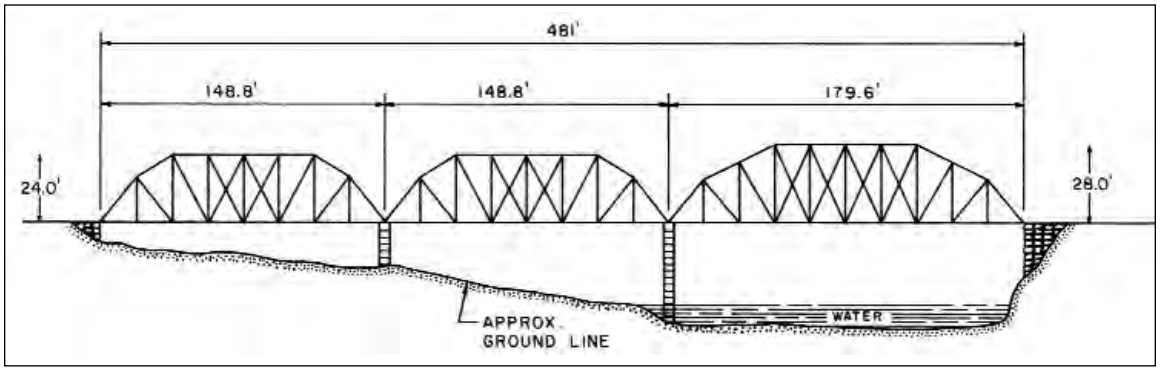


Significant under Criterion C as a representative closed spandrel arch bridge by the Steel and Lebby Bridge Company.

In May 1928 the Campbell Quarterly Court authorized $30,000 in bridge warrants to pay for several bridges that included this bridge spanning Stinking Creek. The court appointed a committee of W. A. W. Carden (Chairman), Z. D. Baird, and S. H. Wilburn to let a contract and supervise construction. The court requested that the committee give preference to a concrete bridge. In June the committee awarded a contract to Steel and Lebby. The following April, due to a flood in March, the county amended the contract to raise the bridge. In October 1929, the committee reported that the contractor had completed the bridge (Campbell Quarterly Court Minutes Volume 12:92-95, 499-500, 512-515, 576-577; Volume 13:124).

The bridge contains two 48.0-foot closed spandrel arches. The railing, a post and rail design 2.8 feet in height, has a prominent position at one corner for the plaque. The concrete pier contains two ten-foot arched openings rather than being solid concrete as is typical on most smaller concrete bridges such as this. The asymmetrical arches (uneven springlines) are also unusual. It is possible that Steel and Lebby used an asymmetrical opening to provide a larger stream flow area during flooding conditions.

(#127) 65-00444-09.58: Nemo Bridge spanning the Emory River southwest of Wartburg in south-central Morgan County (Lancing Quad, 122 SW).



Significant under Criterion C as Camelback trusses and as late pin-connections on large scale bridge.

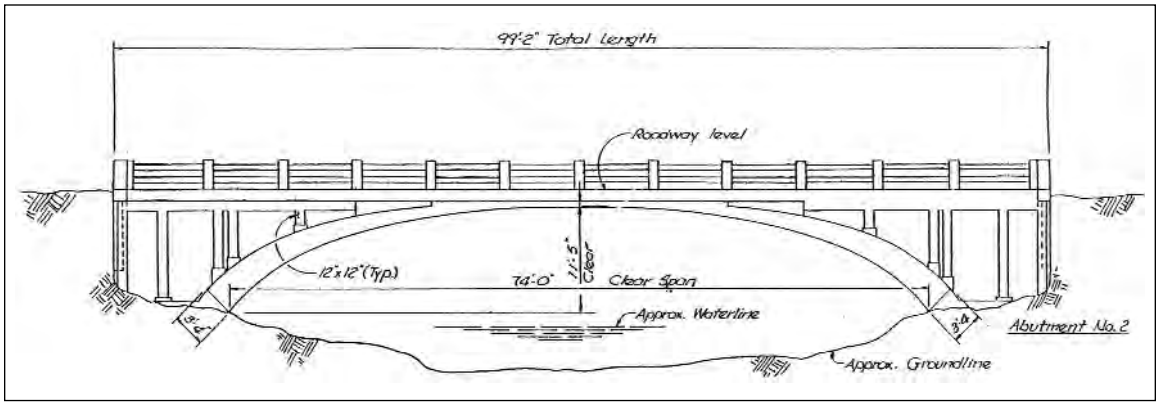
In 1906 the Nashville Bridge Company erected a bridge composed of one 180-foot Parker and one 40-foot Warren at this site. On 22 March 1929 severe floods destroyed that bridge as well as numerous other bridges in Morgan County, necessitating a major rebuilding program. On 22 April 1929, the county court approved a $100,000 bond issue "to constitute a special fund known as 'Bridge Rebuilding Fund' of Morgan County" to replace the destroyed bridges across the Emory River at Oakdale, Deermont, and Nemo. The county had spent $80,000 only a few years previously to build the Oakdale Bridge, a magnificent concrete arch bridge designed by Steel and Lebby, that provided access from the town of Oakdale to the interstate Chattanooga Lookout Mountain and Cincinnati Air-Line Highway. The bonds for this bridge were still outstanding, and the county strongly urged the state highway department, which

agreed, to design and to take the lead in rebuilding the Oakdale Bridge (65-SR299-09.89). The county also requested, but as a lower priority, that the state highway department agree to take the lead in rebuilding the bridges at Deermont (65-02378-07.84) and Nemo. However, the state did not, and the county quickly contracted with the Atlantic Bridge Company to design and build these bridges (Morgan County Court Minutes Volume U:330-340).

The Nemo Bridge is 481 feet long and contains three spans, each a pin-connected Camelback through truss. An unusual feature is the use of pin-connections on a bridge this large as late as 1929. On the two 149-foot Camelback spans, the second incline contains only one panel, unlike the 180-foot river span that has the more typical two-panel incline. The bridge has a curb-to-curb width of 15.6 feet and an out-to-out width of 18.7 feet, a relatively narrow width for this large a bridge built as late as 1929. The west abutment is masonry and the east abutment is masonry with a concrete cap, an indication that they may date from the 1906 bridge. The piers are concrete. Composition of the members is typical. Top chords, end posts, and verticals are channels with lacing. Bottom chords and diagonals are paired rectilinear eyebars. Counters are single cylindrical tie rods.

The Tennessee Department of Transportation, in cooperation with Morgan County and the Federal Highway Administration, scheduled this bridge for replacement in the 1990s. Although, originally scheduled for demolition, the Tennessee Department of Environment and Conservation incorporated the bridge into the newly developed Cumberland Trail system.

(#128) 81-A0330-01.41: Standing Rock Road spanning Standing Rock Creek west of Mulberry Hill in southwest Stewart County (Standing Rock Quad, 29 NW).

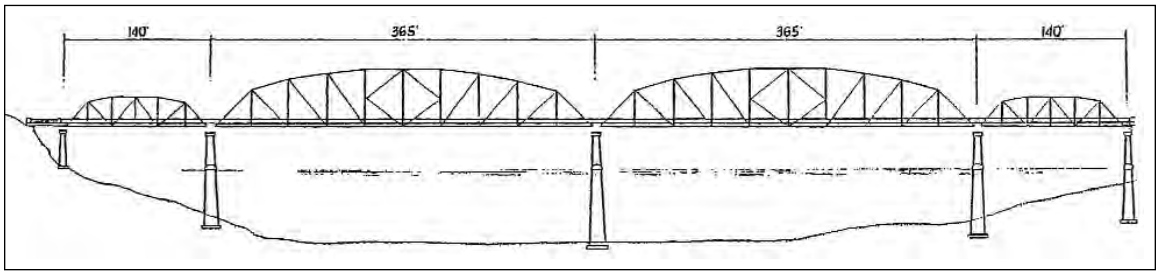


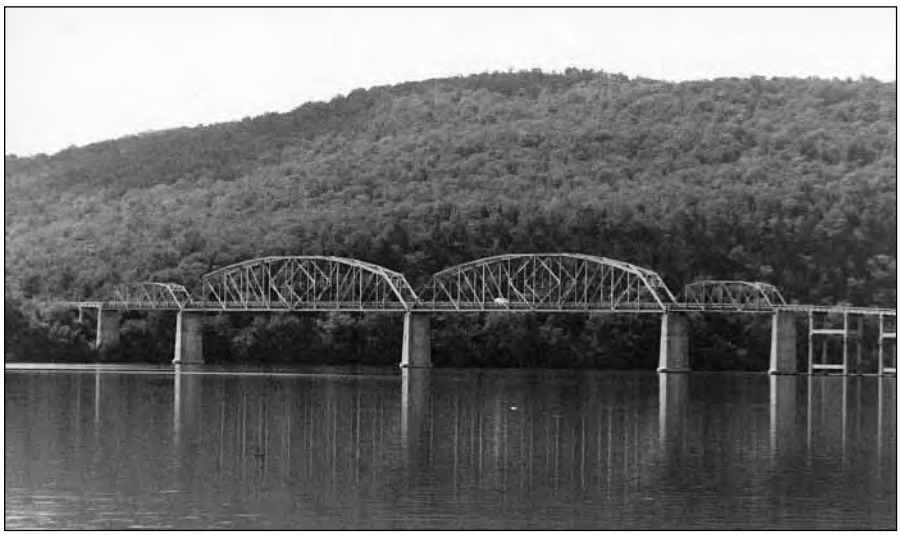
Significant under Criterion C as a representative open spandrel arch bridge by the Luten Bridge Company.

The Luten Bridge Company erected this bridge in 1929. A plaque indicates that members of the bridge committee were M. C. Hicks and H. P. Andrews.

The bridge contains one span, a 99-foot open spandrel dual ribbed arch. Horizontal bars connect the ribs of the arch ring. The bridge has a curb-to-curb width of 12.6 feet and an out-to-out width of 15 feet. The rail is a post and rail design. The bridge is built on an 85° skew. There are no decorative features.

(#129) 58-SR002-21.19: Marion County Memorial Bridge spanning the Tennessee River southeast of Jasper in south-central Marion County (Sequatchie Quad, 100 SE).





Significant under Criterion A as a toll bridge and Criterion C as representative Parker and Warren trusses by the state highway department.

The state legislature designated this site, which a ferry then serviced, for one of its toll bridges in 1927. This crossing was a key link in the Wauhatchie Route of the Dixie Highway between Chattanooga and Jasper. The state highway department designed the bridge and built it for $442,287.93 primarily between April 1929 and November 1930. State crews built a toll house for $652.17 between July and November 1931. The total project cost of $488,848.68 included core drilling, grading, and surfacing (Johnson 1978a:163-168; Keeble 1947-1-8; Raulston and Livingood 1974:200-207; Tennessee 1931:88-95; 1933:106-115; 1943:119; TVA 1972).

Soon after the state completed the bridge, between 1930 and 1932, it removed the U.S. 41 designation from the Suck Creek Route of the Dixie Highway, State Route 27, and applied it to this route, State Route 2, from Jasper to Chattanooga. The state then upgraded State Route 2 from Jasper to Chattanooga and renamed the road the Will Cummings Highway. As part of U.S. 41, this bridge was on the main north-south corridor in the area, and revenue was sufficient to keep the bridge open as a toll bridge until 1947.

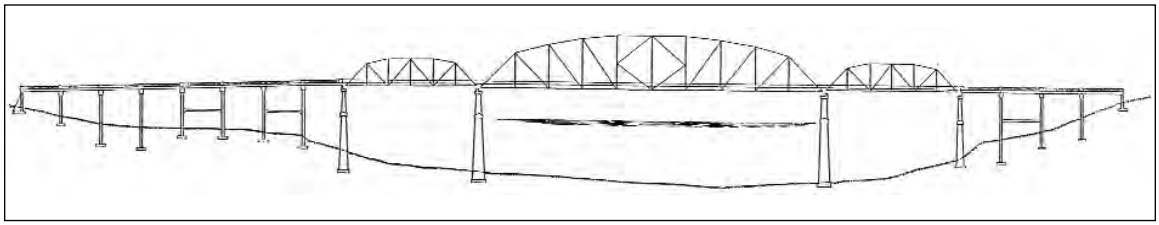
The bridge was located near the 1905-1914 Hale's Dam, which consistently had leakage and other problems primarily due to foundation problems. Repairs were repeatedly made to the dam, including some by TVA that acquired it in the 1930s. By the 1960s TVA deemed it more

economical to erect a new dam than try to continue repairing the old one. As a result, TVA built the Nickajack Dam in the 1960s downstream from this bridge crossing. Due to changes in water levels, TVA rebuilt this bridge. In order to provide a 57-foot vertical navigation clearance, TVA placed caps on top of the original piers and raised the main truss spans 21 feet. Twenty pre-cast, pre-stressed concrete slabs replaced the original 28 concrete approach spans, eliminating nine approach spans on the east end and adding one on the west end. Although TVA built one new bent, it reused most of the original bents by adding caps. Other repairs included new abutments and a new handrail to replace the original lattice railing. Although some initial work was done in 1966, the bridge was closed from December 1967 to December 1968 while the majority of the work was done.

The bridge contains four riveted through truss spans. The main two spans are 365-foot Parkers. The other two trusses are 140-foot Warren trusses with polygonal top chords. The bridge has a curb-to-curb width of 20.0 feet, and an out-to-out width of 24.0 feet. Composition of the members is typical for this era. Top chords and end posts are channels with stay plates or lacing, bottom chords are channels with lacing on top and bottom, posts are I-beams, and diagonals are I-beams or laced channels.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for replacement.

(#130) 73-SR058-11.92: Calvin J. Ward Bridge spanning the Tennessee River south of Kingston in central Roane County (Bacon Gap Quad, 123 SE).



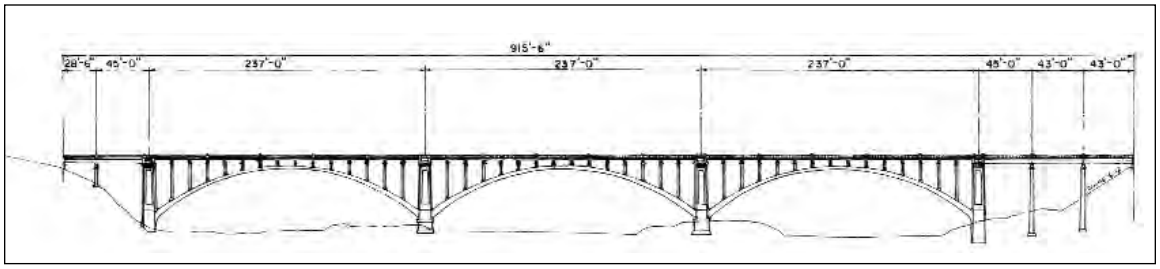
Significant under Criterion A as a toll bridge and under Criterion C as representative Parker and Warren trusses by the state highway department.

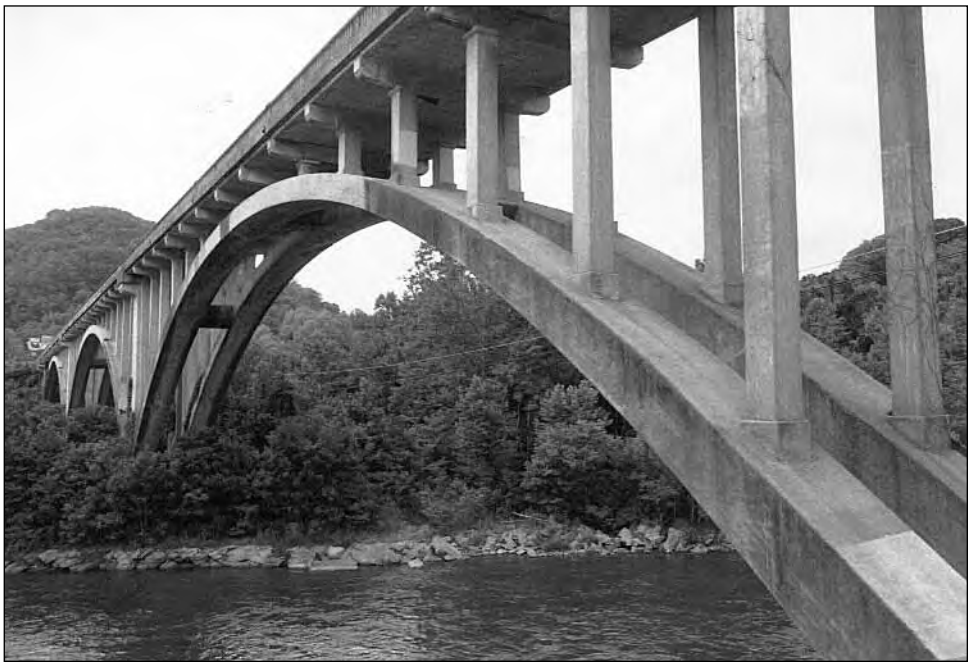
Designed by the state highway department and funded as a Special Bridge Project by the State Legislature, the state built this toll bridge primarily between January 1929 and January 1931. The state awarded a contract for core drilling for $7,754 to Pennsylvania Drilling Company, a contract for $1,417 to Kirkman Brothers, a contract for crushed stone for $2,866 to State Forces, and a contract for the bridge for $295,923 to Whiting-Turner Construction Company. The state operated it as a toll bridge until 1939 (Keeble 1947:1-8; Tennessee 1931:88-95; 1933:106-115; 1943:119; TVA 1949b).

The bridge was originally 1,170 feet long, but in the 1940s TVA lengthened and raised the bridge as part of the Watts Bar Dam project, and it is now 1,246.7 feet long. The bridge contains three riveted through trusses and twelve concrete deck girders, all on a concrete substructure. The main truss is a 365-foot Parker truss. Two 140-foot Warren trusses with polygonal top chords flank the main truss. The bridge has a curb-to-curb width of 20.0 feet and an out-to-out width of 23.7 feet. Composition of the members is typical. Top chords and end posts are channels with lacing, and bottom chords are channels. Verticals and diagonals are angles with lacing, and counters are angles with battens.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, replaced this bridge in 2005.

(#131) 82-SR036-05.01: Hammond Memorial Bridge spanning the Holston River south of Kingsport in western Sullivan County (Boone Dam Quad, 189 NE).





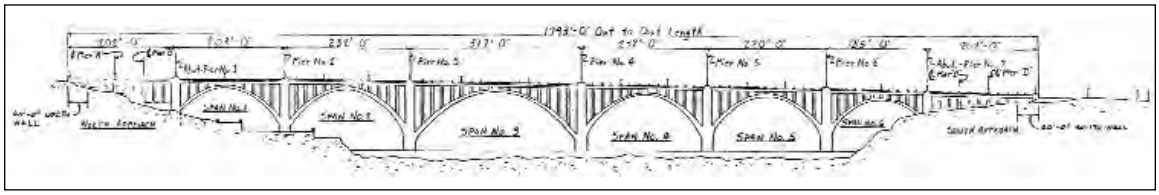
Significant under Criterion C as an open spandrel arch bridge by the state highway department.

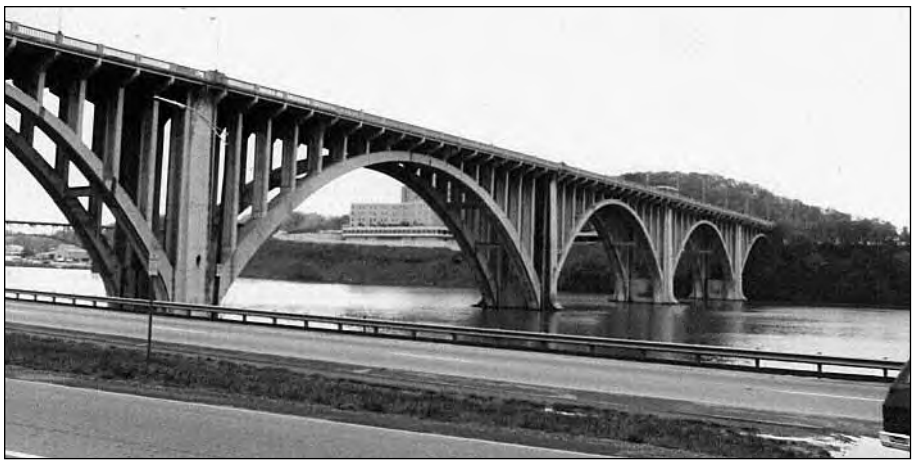
The state highway department designed and built this bridge between June 1929 and August 1930 for $165,067.06 as a state aid project. It replaced an earlier steel truss bridge near the old Pactolus Ferry site (Tennessee 1943:133).

The 916-foot bridge contains three 237-foot open spandrel dual ribbed concrete arches and five concrete deck girders, all on a concrete substructure. The bridge has a curb-to-curb width of 20.0 feet and an out-to-out width of 23.2 feet. Above each spandrel rib is a horizontal bar molded to create a modillion effect along the underside of the deck. Each pier contains three modillions below the deck as well as tapering recessed panels. The concrete handrail is the state's standard spindle design.

In 1969 the state built another bridge adjacent to this bridge and it is now part of a paired one-way bridge system.

(#132) 47-SR033-06.72: Henley Street Bridge spanning the Tennessee River in downtown Knoxville in Knox County (Knoxville Quad, 147 NW).





Significant under Criterion A due to its associations with city planning efforts and under Criterion C as an outstanding open spandrel arch bridge design.

In 1923, the City of Knoxville selected a city manager and council form of government, and in a general reform movement typical of the City Beautiful movement, appointed several advisory boards. As a result, the city contracted with the planning consultant Harland Bartholomew and Associates of St. Louis to develop a comprehensive city plan that was completed in 1930. A major street plan for Knoxville, which the City Council adopted in 1927, was one element of this master plan. One of the major recommendations of this plan was a 54-foot wide bridge at Henley Street across the Tennessee River along with the widening and extension of Henley Street. The construction of this bridge was concurrent with much of the development of the Great Smoky Mountains National Park, and this bridge was on the main road many tourists would have used. A local newspaper article deemed it as the "gateway for millions who will turn their faces toward the Great Smokey [*sic*] Mountains National Park" (*Knoxville News Sentinel* 3 January 1932).

Controversy dogged the construction of the new bridge from the beginning. One of the earliest issues concerned whether the bridge should be of steel or concrete construction. Otto Roehl (formerly with the Steel and Roehl Bridge Company) was City Manager and he strongly favored concrete. The city first selected J. E. Griner and Company of Baltimore to build the new bridge, but Griner argued that a 36 foot bridge width was adequate. Debate raged for months over the width, and under a subsequent administration, the city hired a Chicago engineer to review plans for a 54-foot bridge. Based on his recommendation, the city chose in April 1930 a design by Marsh Engineering over that of the firm Harrington and Cortelyou, a decision primarily based on Marsh's center span design of structural steel covered with concrete.

James Barney Marsh (1856-1936) headed the Marsh Engineering Company of Des Moines, Iowa. After graduating in 1882 from Iowa State College of Agriculture and Mechanical Arts with a Bachelor of Mechanical Engineering degree, Marsh worked in the Des Moines office of the King Iron Bridge Company until about 1895. At King Iron, Marsh undertook a variety of jobs including design work, marketing metal truss bridges, and actual erection work. From 1887 to 1889, as he continued to work with King Iron, Marsh also worked as head of the Des Moines Office of the Kansas City Bridge and Iron Company. In the spring of 1896, Marsh formed his own company, the Marsh Bridge Company. In April of 1904, he incorporated it as the Marsh Bridge Company with himself as president and chief engineer. In 1909, Marsh reorganized the firm as the Marsh Engineering Company. In the early 1900s Marsh began to experiment with concrete arch bridges. From this work he began to specialize in reinforced concrete arch work and developed at least two patents for reinforced concrete arches, patent #1,035,026 in 1912 and patent #1,388,584 in 1921. Although Marsh did not work in the Tennessee area in the 1910s and early 1920s, his Rainbow Arch was widely constructed in the Mid-West and influenced other designers to build rainbow arches (Baldwin 1929; Iowa DOT 1981; Jochims 1980). It was this extensive experience and reputation with concrete designs that influenced the City of Knoxville to hire Marsh for the Henley Street Bridge project.

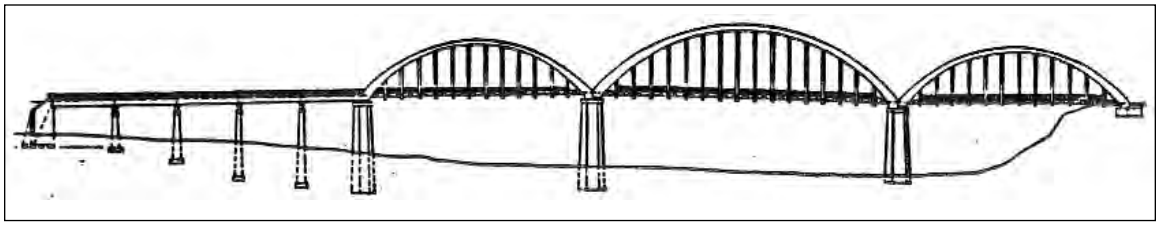
However, local opposition to Marsh, in part led by the *Knoxville News Sentinel*, continued. In July after a lengthy and bitter fight, the city hired local engineer L. M. Don as the supervising engineer, a position usually held by the designing firm (Marsh Engineering). The resident engineer was S. B. Goodsey. In another break from Marsh, in September, the city decided to erect a reinforced concrete center span, like the other spans, rather than use Marsh's steel and concrete design. Also in September, a councilman claimed that he had been offered a bribe, and by the time the bridge opened to traffic, a fellow councilman had been indicted on bribery charges.

Construction of the bridge began 30 September 1930, and the city held dedication ceremonies 2 January 1932. The city and county split the bridge cost of $965,222. A bond issue from August 1928 funded the city's portion. Associated road improvements raised the total cost to $1,149,000. The contractor for the bridge was Booth and Flinn of Pittsburgh (Bartholomew 1927; Bartholomew 1929; *Construction Methods* April 1932:16-19; Deaderick 1976:117; *Knoxville Journal* 28 January 1976, 28 March 1977; *Knoxville News-Sentinel* 16 April 20, 22, 24 September 1930, 2, 3 January 1932; McClung Photograph Collection).

The Henley Street Bridge is 1,793 feet long and contains six concrete open spandrel dual ribbed arches and six concrete deck girder spans, all on a concrete substructure. The arch spans are 203, 232, 317, 232, 220, and 185 feet in length. Lateral bracing connects the arch ribs. The spandrel ribs are plain vertical columns that form a "T-shape" at their intersection with the floor beams, creating a bracketed effect. The decorative treatment on the spindle railing, which has posts with a protruding circular motif above each spandrel column, enhances the visual verticality. While the piers are devoid of decorative designs, they do emphasize the vertical lines of the bridge through tapering molded lines. There are four traffic lanes with a curb-to-curb width of 54.4 feet; sidewalks and the railings increase the out-to-out width to 70.6 feet. The original light fixtures have been replaced.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for rehabilitation.

(#133) 47-01262-04.68: McBee (or Mascot) Bridge spanning the Holston River in northeast Knox County (Mascot Quad, 155 SW).

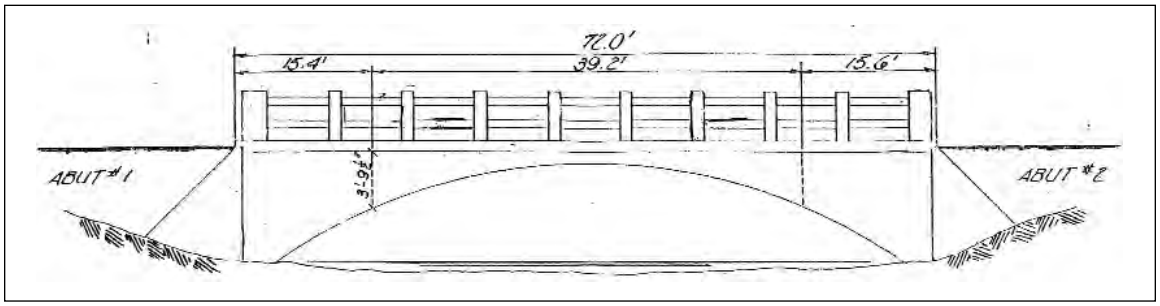


Significant under Criterion C as a rare open spandrel through arch bridge.

In 1929 the Knox County Court approved the construction of two major county bridges, each to replace a ferry: the Solway Bridge across the Clinch River (demolished 1970s) and the McBee Ferry Bridge across the Holston River. At this site, the combination of government guidelines that required a fifty-foot clearance above the water and a railroad along the bank would have resulted in a deck arch prohibitively elevated above existing road levels. Thus, Freeland-Roberts, the designer, used an open spandrel through arch design. The firm completed the plans in January 1930, and the county soon let the construction contract for $250,000 to the Southern Company of Birmingham. The county held dedication ceremonies with speeches and a free barbecue lunch at noon on 12 October 1931.

The 785-foot McBee Bridge contains three concrete arches and five concrete deck girder approaches. Each arch is an open spandrel through arch (or tied rainbow arch). This type is also sometimes called a bowstring arch. The main span is 222 feet and each flanking arch is 165 feet long. The bridge originally contained two traffic lanes and a sidewalk, but in 1979 the sidewalk was removed, making the curb-to-curb width 24 feet. At the same time, a concrete parapet railing was built on the inside of the original concrete railing, a post and rail design.

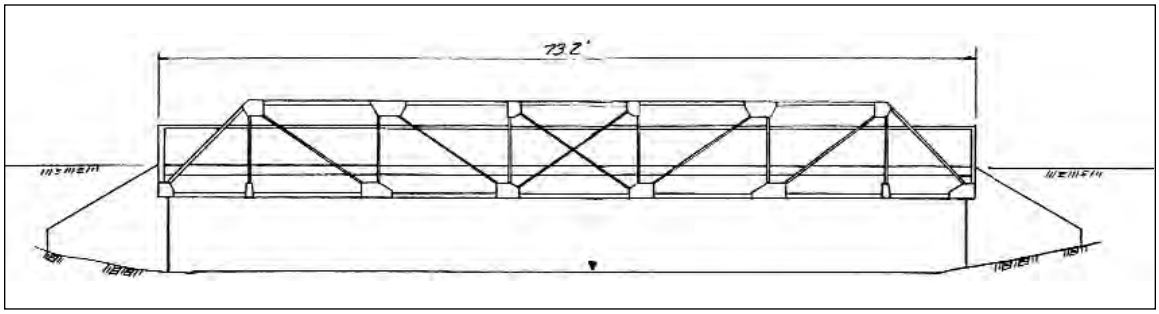
(#134) 01-A0136-01.96: Taylor Chapel Road spanning Hinds Creek northeast of Clinton in Anderson County (Norris Quad, 137 NE).



Significant under Criterion C as a representative closed spandrel ribbed arch bridge by the Luten Bridge Company.

The Luten Bridge Company erected this one span bridge in 1931. It contains one closed spandrel dual ribbed arch 72 feet in length. The curb-to-curb width is 15.5 feet, and the out-to-out width is 17.8 feet. The railing is a post and rail design containing a two bar rail with posts set about eight feet apart. The bridge plaque is located on the inside of one of the end posts.

(#135) 62-02340-13.67: Forest Service Bridge spanning the Tellico River southeast of Tellico Plains in southeast Monroe County (Big Junction Quad, 140 SE).



Significant under Criterion A for its associations with the Forest Service and Cherokee National Forest and under Criterion C as atypical Pratt truss bridge.

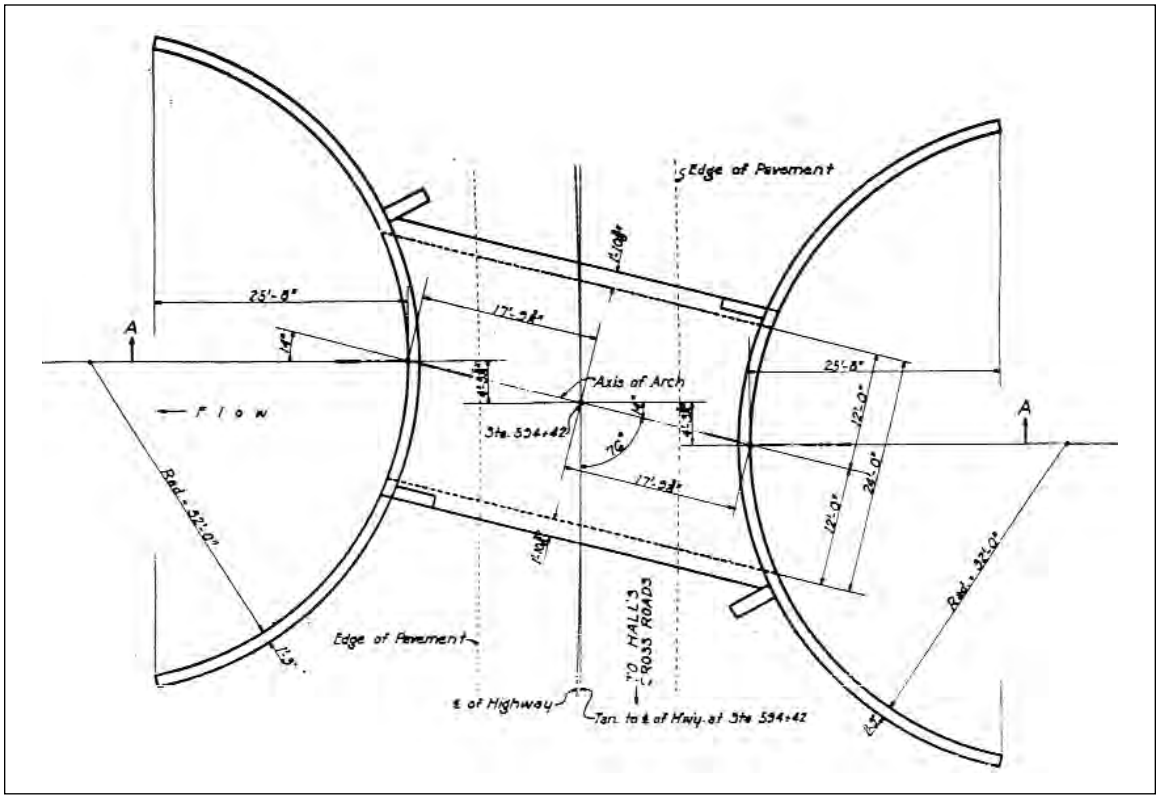
The federal government created the Forest Service in 1876 as an office within the Department of Agriculture, upgraded in 1886 to the Division of Forestry. In 1891 the government began to set aside timber resources as "forest reserves" for timber and watershed purposes. These reserves became the National Forest System. The Division expanded substantially under Gifford Pinchot who urged a professional approach to conservation and who served as its Chief from 1898 to 1910. Pinchot persuaded President Roosevelt to move forest management from another section in Agriculture, which had regulated trees as a crop, to his division. He also assumed responsibility for managing certain public lands that the Department of Interior had previously administered. With these efforts, Pinchot created the modern day U.S. Forest Service. From the tiny department with which Pinchot began, the Forest Service became the largest agency within the Department of Agriculture.

Up to the 1910s, the Forest Service had concentrated on acquiring timber and forest reserves in the western United States. However, by the 1910s there was pressure to establish similar areas in the Northeast and Appalachia where serious erosion problems existed due to large-scale timber cutting by the lumber industry, improper farming practices, and blight. The Forest Service acquired most of its land in the East under the Weeks Law of 1911, which authorized the acquisition of land for the purpose of watershed protection. Under this law, the government established almost all of the National Forests east of the Great Plains, including the Cherokee National Forest. The Cherokee National Forest extends from Georgia to Virginia along the mountainous eastern border of Tennessee. There are two divisions, the Unaka Division north of the Great Smoky Mountains National Park and the Cherokee Division south of the park.

In the early twentieth century, the agency acquired extensive holdings in nine counties in eastern Tennessee and additional land in neighboring states. Some of the land purchased for the Cherokee National Forest included the holdings of the Babcock Lumber Company, an influential industry in the region that had depleted much of the commercial timber in this area of East Tennessee by the 1920s. In the following years, in addition to planting trees, the Forest Service repaired existing roads, converted abandoned logging rail lines into roads, and built new roads, all requiring numerous bridges to be built. One project involved converting the old alignment of the Tellico River (Babcock) Lumber Company Railroad line, whose tracks had been pulled up in 1925, into a road. This project included the construction of this bridge in 1931. The Virginia Bridge and Iron Company fabricated the bridge (Frome 1971; Sands 1982; Sulzer 1975:278; U.S. Forest Service 1933).

The bridge contains one span, a 73-foot riveted Pratt pony (semi-deck) truss on concrete abutments. The bridge has a curb-to-curb width of 18.7 feet and an out-to-out width of 20.0 feet. The truss is 8.0 feet tall. Composition of the members is unusually heavy. Channels make up all members except the verticals that are I-beams.

(#136) 01-SR071-01.96: Norris Bridge spanning Buffalo Creek in Norris in southeast Anderson County (Norris Quad, 137 NE).



Significant under Criterion A for its associations with TVA and Norris and under Criterion C for its Art Moderne design.

When Congress created the Tennessee Valley Authority (TVA) in 1933, the government envisioned it as a 900-mile long laboratory for experimentation in social and economic measures. TVA's first project was the Norris Dam in Anderson County. TVA, with unbounded enthusiasm and nearly unlimited funds, not only developed the dam but also the town of Norris as a planned community with a collective farm and a 21-mile freeway. The Norris

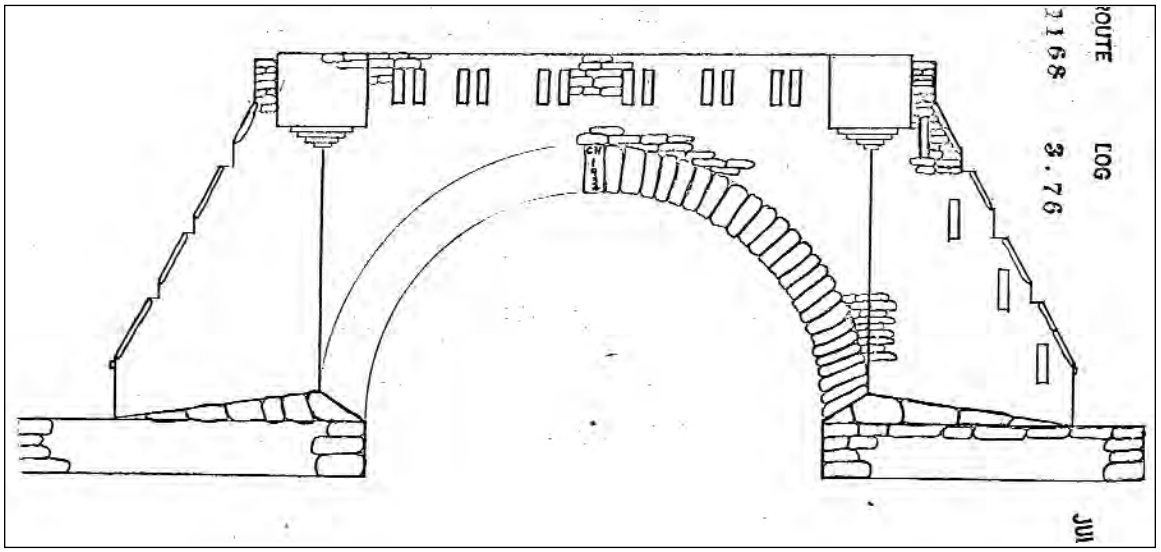
Freeway, the first in Tennessee, ran between Coal Creek (later renamed Lake City) and Halls Crossroads passing over the dam and through Norris. It provided a necessary construction road between the railroad in Coal Creek and the dam as well as between TVA's administrative offices in Knoxville and Norris. TVA intended for Norris to serve as a prototype community for a network of such towns along the river, but TVA never built any of the other towns (Creese 1990; Cutler 1985; Harper 1975).

TVA built this bridge in 1934 on the Norris Freeway to span Buffalo Creek, which is a boundary for the town of Norris, a National Register district. The architectural design for the town and the freeway are quite different. The buildings in the town primarily reflect a rustic design using indigenous materials. In Norris there are three concrete arch bridges faced with local stone (less than 20 feet long and thus not included in the survey). However, this bridge and the other structures on the freeway, which are slab or girder designs, reflect Art Moderne influences with streamlined rails and sweeping lines. The State Historic Preservation Office has determined that 18.9 miles of the original 21 mile Norris Freeway are eligible for the National Register. Thus, the bridge is both within the National Register listed Norris District and on the eligible Norris Freeway.

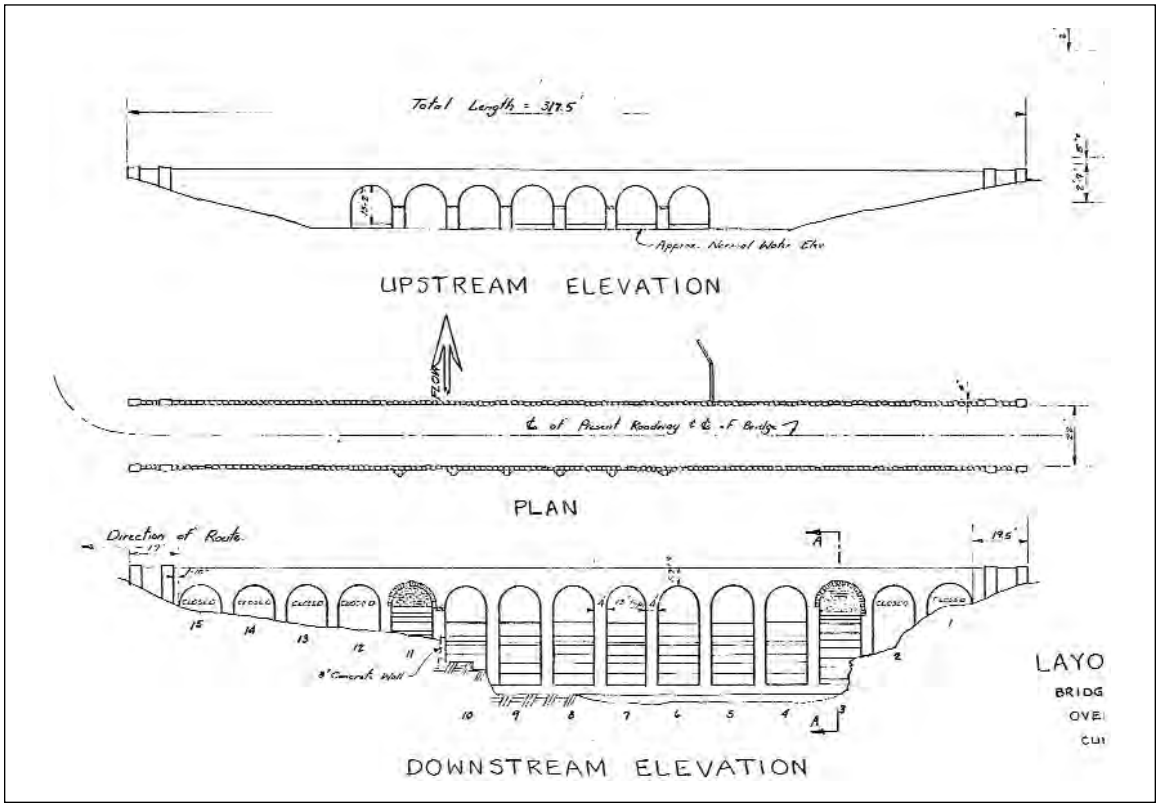
This bridge contains one span, a closed concrete arch 28 feet long with curb rails. Built on a 73° skew, it is 34 feet wide. The spandrel walls form a continuous line across the bridge creating sweeping semi-circular wingwalls.

(#137, 147, 149)

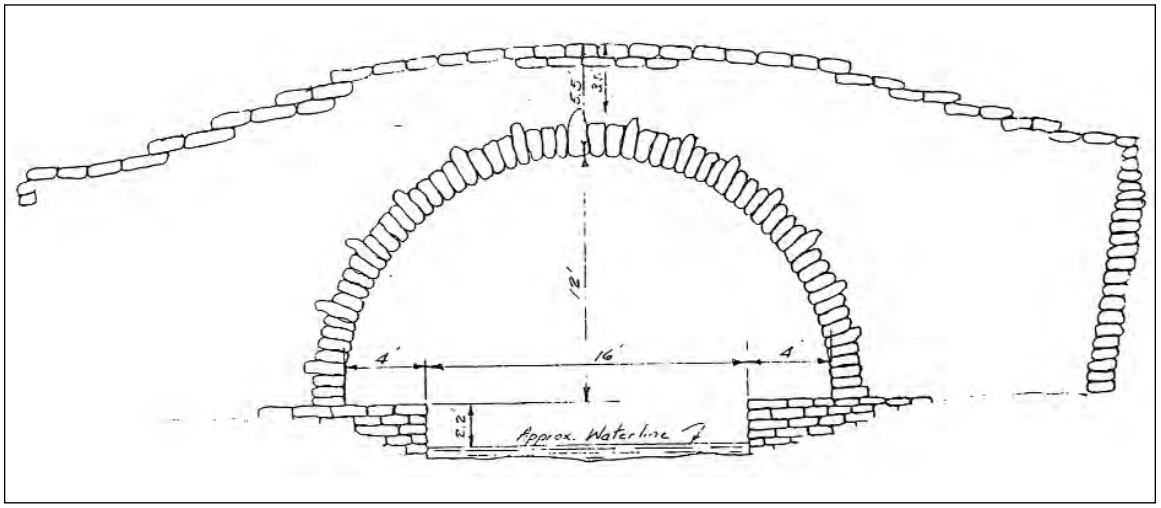
(#137) 18-01168-03.76: Deep Draw Road Bridge spanning Byrd's Creek northwest of Crab Orchard in Cumberland County (Dorton Quad, 117 NW).



(#147) 18-01166-03.59: Cumberland Mountain State Park Dam at Byrd's Lake south of Crossville in Cumberland County (Dorton Quad, 117 NW).



(#149) 18-A0939-01.00: Old Mail Road Bridge spanning Byrd's Creek in Cumberland Mountain State Park south of Crossville in Cumberland County (Crossville Quad, 109 NE).



Significant under Criterion A in community planning and social history as well as for New Deal associations and under Criterion C for engineering merits.

These three bridges are located within the National Register listed Cumberland Homesteads Historic District (Casteel 1980; Jones and Stager 1986; Straw 1988).

The federal government initiated the Cumberland Homesteads project in 1933 as a New Deal program under the Division of Subsistence Homesteads, a section of the Department of the Interior. The government selected a site that was primarily undeveloped land, largely acquired from timber companies. The government intended for the program to give low income or out-of-work farmers and industrial workers jobs, the opportunity to own homes, to grow their own food, and to farm on a relatively small scale in a "back-to-the-land" movement. Although over 2,000 families applied to the Cumberland Homesteads, the government selected only 250 families. Communal programs for the participants included a non profit medical association, a cannery, a general merchandise store, an interdenominational church, and women's clubs.

As a result of the novelty of the program and some initial success, visitors such as First Lady Eleanor Roosevelt and the U.S. Secretary of Agriculture Henry A. Wallace visited the project. Articles concerning the project appeared in such newspapers as the *Wall Street Journal*, the *Christian Science Monitor*, and the *Chicago Tribune*. Also for some time, the *Crossville Chronicle* contained a full-page story about the project in each issue.

The government developed a park as an integral component of the Homesteads project. The park was located adjacent to the Homesteads on approximately 1,500 acres of land perceived to be poor farm land and was first called the Cumberland Homesteads Park. When the State of Tennessee acquired the park in 1938, it changed the name to the Cumberland Mountain State Park. The Works Progress Administration (WPA) and the Civilian Conservation Corps (CCC) as well as the Homesteaders themselves cleared the land and performed the actual labor. Architect William Macy Stanton, who is known to have designed the Deep Draw Road Bridge (#137, 18-01168-03.76) and possibly designed the other two bridges, designed the buildings and the layout of the colony. This design laid out a cohesively planned community containing farmsteads of a Stanton designed house and outbuildings distributed throughout the countryside around a central core that contained schools, offices, and other cooperative buildings. All of the houses and most major structures, such as the bridges, were built of indigenous Crab Orchard sandstone. The bridge on Deep Draw Road, with its distinctive keystone denoting that it was built in 1934 for the Cumberland Homesteads project, was the first of these three bridges to be built, probably by the WPA. Within the Homesteads boundaries and in conjunction with it, the CCC simultaneously developed Cumberland Mountain State Park. The dam (#147, 18-01166-03.59) and the Old Mail Road Bridge (#149, 18-A0939-01.00) are located within the park. Although it is only documented that the CCC built the dam, it is probable that the CCC built the Old Mail Road Bridge as well.

The Cumberland Homesteads provided work for its occupants as long as it was under construction. However, an inherent flaw was the absence of long term employment that resulted in the ultimate failure of the project. However, a lasting testament to this social experiment is the remaining collection of houses, farm support buildings, cooperative buildings, and other structures such as the bridges.

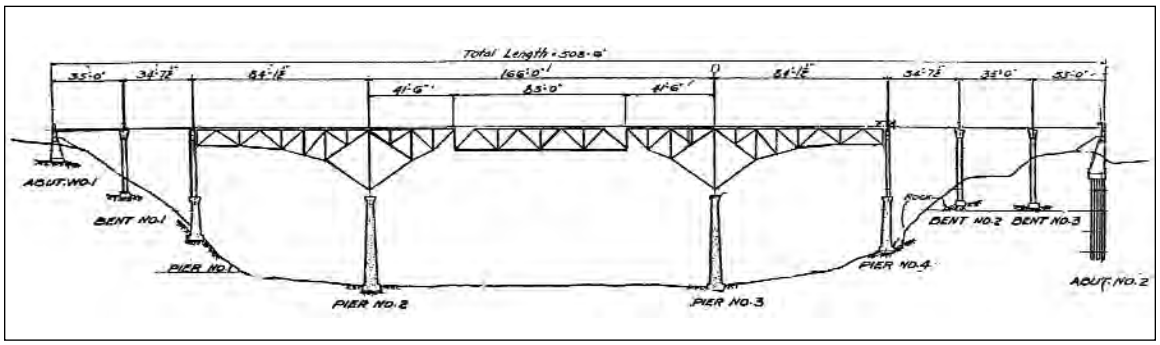
The Deep Draw Road Bridge (#137, 18-01168-03.76) is a one span arch of finished Crab Orchard sandstone laid in an irregular pattern. A row of cut stones follows the line of the arch. "CH 1934" appears on the keystone. The sides of the bridge continue above the

roadway to form parapet railings that contain six sets of paired niches. The bridge is located in a sharp "U" shaped curve. The bridge is 41 feet long and 25 feet wide. The plans, which William Macy Stanton signed, are dated 31 December 1934.

The Cumberland Mountain State Park Dam (#147, 18-01166-03.59) is of concrete construction and faced with finished Crab Orchard sandstone laid in an irregular pattern. The CCC built this bridge, the largest structure it built in Tennessee, between 1936 and 1938. It contains seven 15-foot arches on the upstream (impoundment) side with rounded nosings. On the downstream side, it contains fifteen spillway arches, eight open and seven closed. A row of cut stones with a keystone follows the line of the arches, which are deep and narrow. The sides of the bridge continue above the roadway 3.6 feet to form parapet railings capped with large flat stones. The railings contain a set of paired arches in the spandrel area between each arch. The bridge is 317.5 feet long. Originally, the bridge contained a 17-foot roadway, concrete curbs, and a flagstone sidewalk, but the state later paved over the sidewalk in order to accommodate two-lane traffic. The bridge now has a curb-to-curb width of 21.7 feet and an out-to-out width of 25.0 feet.

The Old Mail Road Bridge (#149, 19-A0930-01.00) is quite different in appearance than the previous two bridges. It is a one-span arch of unfinished Crab Orchard sandstone laid in an irregular picturesque masonry pattern with many stones laid at odd angles and projecting outward in a skintled effect. A row of stones follows the line of the arch. The sides of the bridge continue above the roadway to form stepped parapet railings. The bottom of the arch turns inward in an impost effect and forms ledges underneath the bridge at the waterline. The arch span is 24 feet long and the railings extend the total length 58 feet. The roadway is 16 feet wide, the curb-to-curb width is 22 feet, and the out-to-out width is 25 feet.

(#138) 30-SR070-08.48: Oscar B. Lovette Bridge spanning the Nolichucky River in south-central Greene County (Davy Crockett Lake Quad, 181 SE).



Significant under Criterion C as a representative continuous truss bridge by the state highway department.

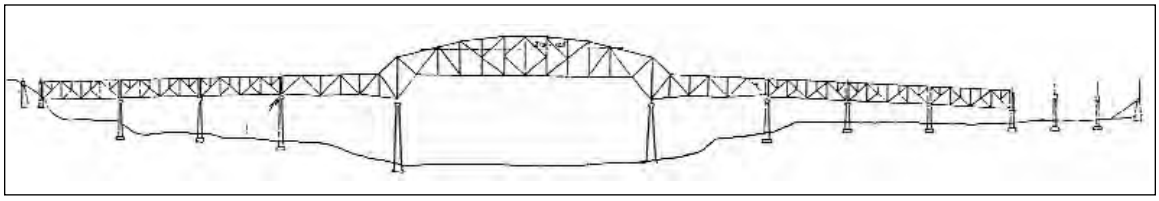
The state highway department designed this bridge in 1934 and awarded a construction contract in October of that year to T. M. Strider and Company. The firm completed the bridge by early January 1936 at a cost of $81,623.21 with funding provided through the National Industrial Recovery Act (Tennessee 1943:105). The bridge is located on State Route 70, also designated as the Trail of the Lonesome Pine. The Trail of the Lonesome Pine cut through upper east Tennessee on its route from Blue Field, West Virginia, through Rogersville and Greeneville to Asheville, North Carolina, along present day State Route 70.

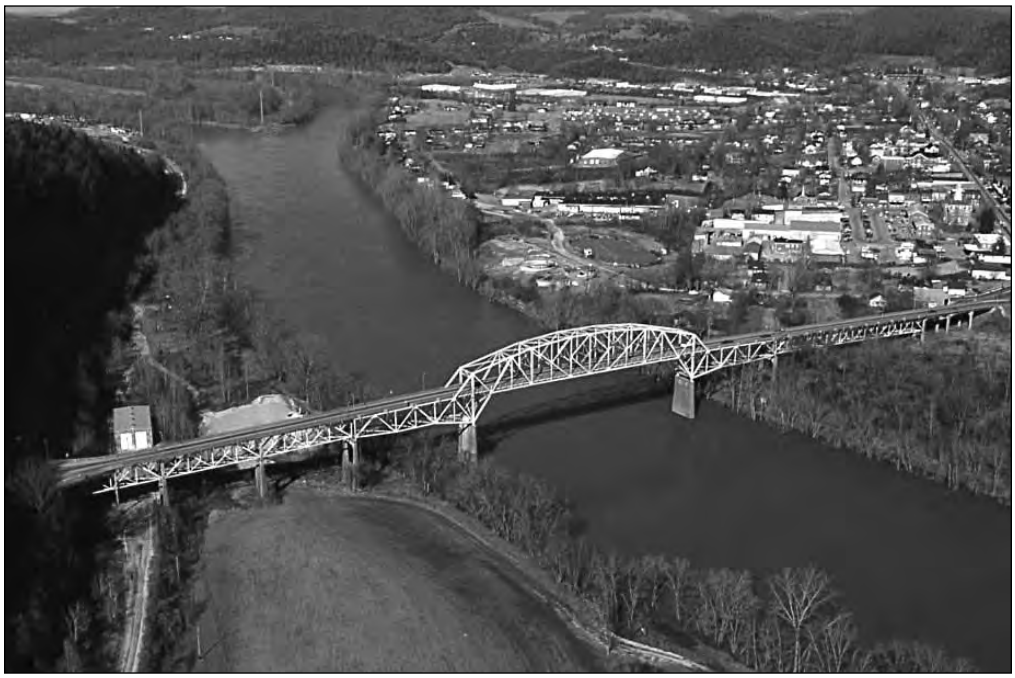
The bridge is 508.5 feet long and has a curb-to-curb width of 24.0 feet and an out-to-out width of 27.0 feet. The bridge contains one continuous three span deck truss 334.2 feet long with five concrete deck girder spans. The truss has two 125.6 foot end sections that use a modified Warren design supporting an 83.0-foot center section. Composition of the truss is typical. Bottom chords are channels with lacing. Verticals are I-beams except at piers where

they are two small channels with lacing on both sides. Diagonals and counters as well as sub-members are I-beams. The substructure is concrete, and the four piers supporting the truss feature a scored block pattern. The concrete guardrail utilizes the spindle rail. In 1988 the state added metal ribbon guardrail on a concrete base to the inside of the original rail.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, replaced this bridge in 2007.

(#139) 80-SR025-11.32: Cordell Hull Bridge spanning the Cumberland River in Carthage in Smith County (Gordonsville Quad, 322 NW).





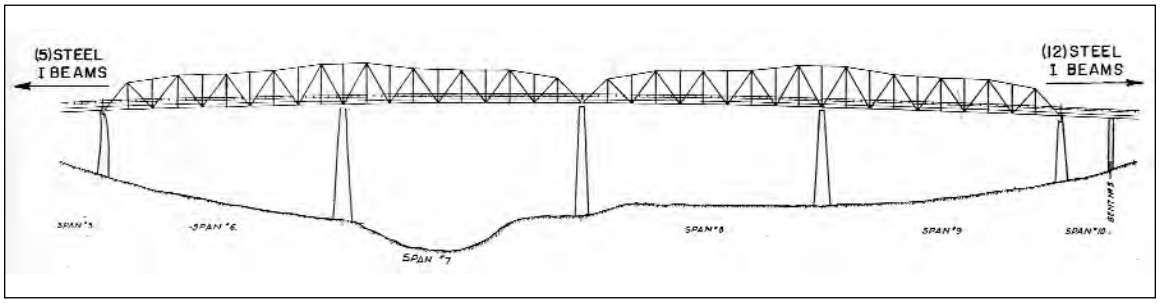
Significant under Criterion A for its associations with New Deal era programs and under Criterion C as a continuous truss bridge by the state highway department.

Local citizens erected a privately built toll bridge at this crossing in 1908 that the county and state bought in 1927 and freed. By the 1930s, Smith County was actively trying to build a new bridge. Funding was difficult to secure, but Carthage native and U.S. Secretary of State Cordell Hull assisted the county and state in getting approval in 1934 for funds through the National Industrial Recovery Act. A local newspaper article in December 1934 stated that the area was lucky to have gotten the money since that specific federal program was now being withdrawn. [However, in early 1935, the National Industrial Recovery Act implemented a new program, the Works Progress Administration, which would fund many road and bridge projects.]

In 1934 the state designed the bridge and let the contract in October to the Vincennes Bridge Company. Construction began in December 1934. In May 1935 Vincennes began working on the trusses, and the local newspaper stated that the new Carthage Bridge "is going to be tall and handsome, and one of the greatest improvements that has come to Smith County in a very, very long time." In November a timber beam fell on a local man and fatally injured him. By December, Vincennes had begun to erect the falsework for the main span. The bridge, which cost $199,083.39 of the $200,000.00 appropriated, opened in May 1936. The State Legislature in August of 1935 formally passed a resolution naming the bridge the Cordell Hull Bridge, in honor of the Carthage native who was a former U.S. Congressman and Senator, then U.S. Secretary of State (1933-1944) who had helped acquire federal funding for the bridge, and who in 1945 would be awarded the Nobel Peace Prize for his role in organizing the United Nations (*Carthage Courier* 1934-1936; Tennessee 1943:105).

The design chosen featured an eclectic continuous through and deck truss with six simple deck trusses, all of riveted construction. The main span is a three span continuous truss whose central span is a 318-foot Parker-K through truss flanked on each end with a 144.5-foot Warren deck truss. There are also six unusual 101-foot simple deck trusses that appear to be Warrens with vertical end posts whose panels are subdivided with a Petit configuration. There are five concrete deck girder approach spans. The overall length is 1,412 feet. The bridge has a curb-to-curb width of 24 feet and an out-to-out width of 27.3 feet. Composition of the members is typical for state bridges of this era. Top chords, end posts, and bottom chords are channels with battens. Diagonals and posts are channels with lacing or battens. Counters are I-beams with lacing or battens. The substructure is concrete. The stream piers feature a scored block pattern.

(#140) 87-SR033-15.83: Clinch River Bridge spanning the Clinch River northeast of Maynardville in northeast Union County (Powder Springs Quad, 154 SW).



Significant under Criterion A for TVA's role in government and planning and under Criterion C as a representative continuous truss bridge by TVA.

Soon after the federal government created the Tennessee Valley Authority (TVA) in 1933, TVA began work on its first hydroelectric project, the Norris Dam in Anderson County. As a result, increased water levels flooded huge areas in adjoining Campbell and Union Counties, and TVA initiated efforts to restore route continuity for the roads and bridges destroyed by the changes in water levels. This structure replaced the Old State Route 33 Bridge at Walker's Ford and was TVA's main bridge on the Norris project. TVA moved the three truss spans from the old State Route 33 Bridge to other locations; the only remaining span is the Lays Bridge (#91, 29-A0025-02.62). TVA's General Engineering and Geology Division designed this bridge in 1934-1935 and completed its construction by 1936 (TVA 1940).

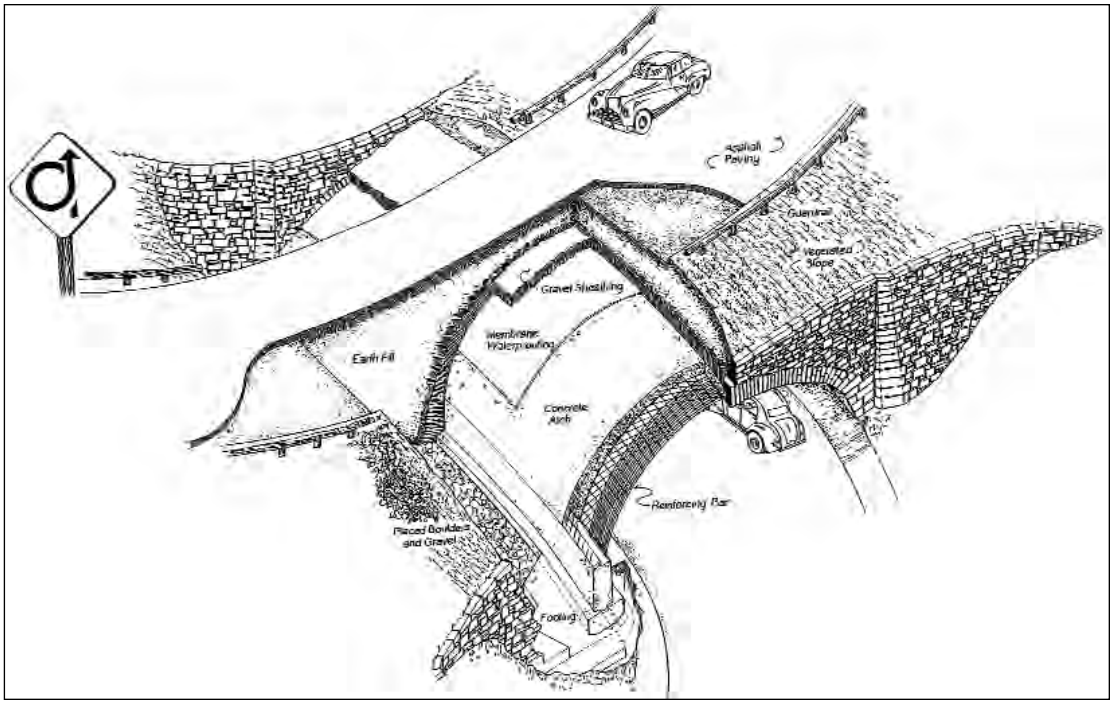
The bridge is 1,916 feet long and contains two, two-span continuous trusses, each a 505.5-foot through Warren, and 17 steel I-beam approaches on a concrete substructure. The bridge has a curb-to-curb width of 24.0 feet and an out-to-out width of 29.2 feet. Composition of the members is typical. Top chords and end posts are channels with lacing, and bottom chords are channels with lacing top and bottom. Verticals are small paired channels with lacing, and diagonals are small channels with cross lacing on each side.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for replacement.

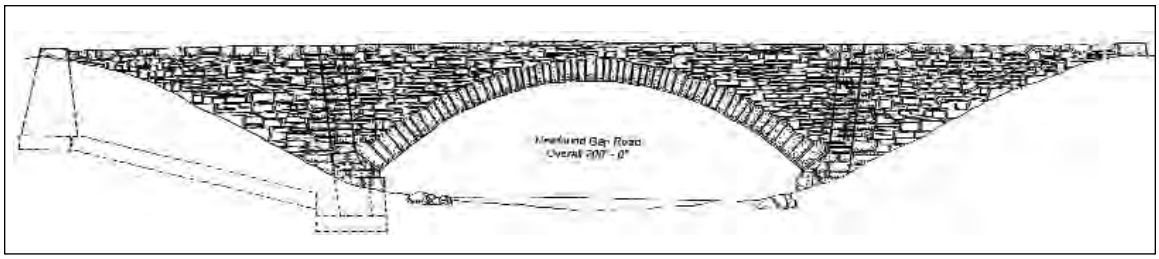
(#s 141, 142, 143, 144, 145, 146, 148)

Bridges on New Found Gap Road/State Route 71 in Great Smoky Mountains National Park: #148, 78-SR071-13.31; #142, 78-SR071-08.54; #141, 78-SR 71-05.85; #143, 78-SR071-05.65; #144, 78-SR071-05.23; #145, 78-SR071-02.83; and #146, 78-SR071-01.98 (Gatlinburg 157 NE, Mount Le Conte 165 NW, Clingman's Dome 165 SW Quads).

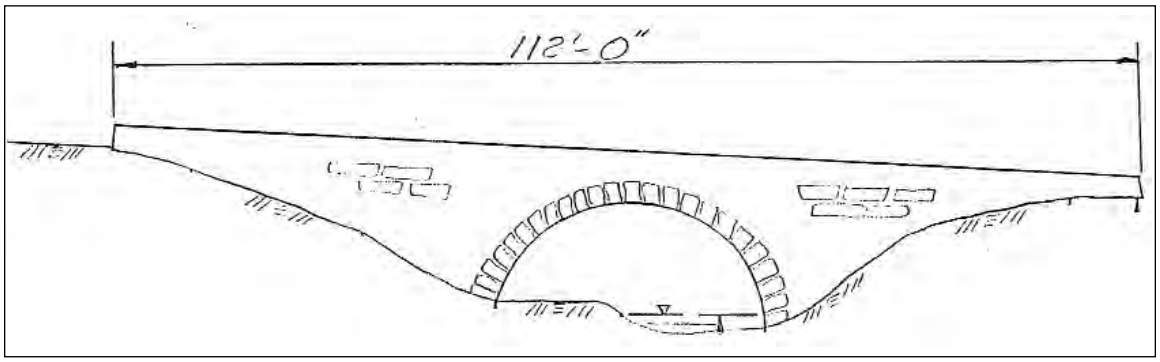
(#141) 78-SR071-05.85



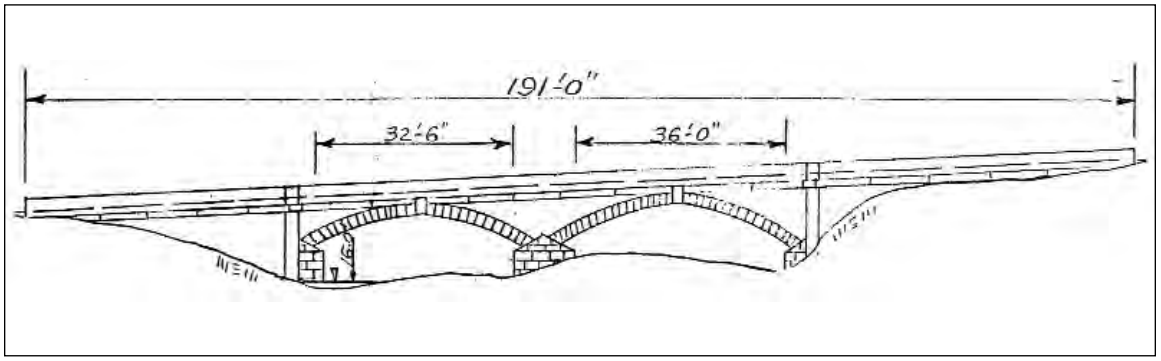
(# 142) 78-SR071-08.54



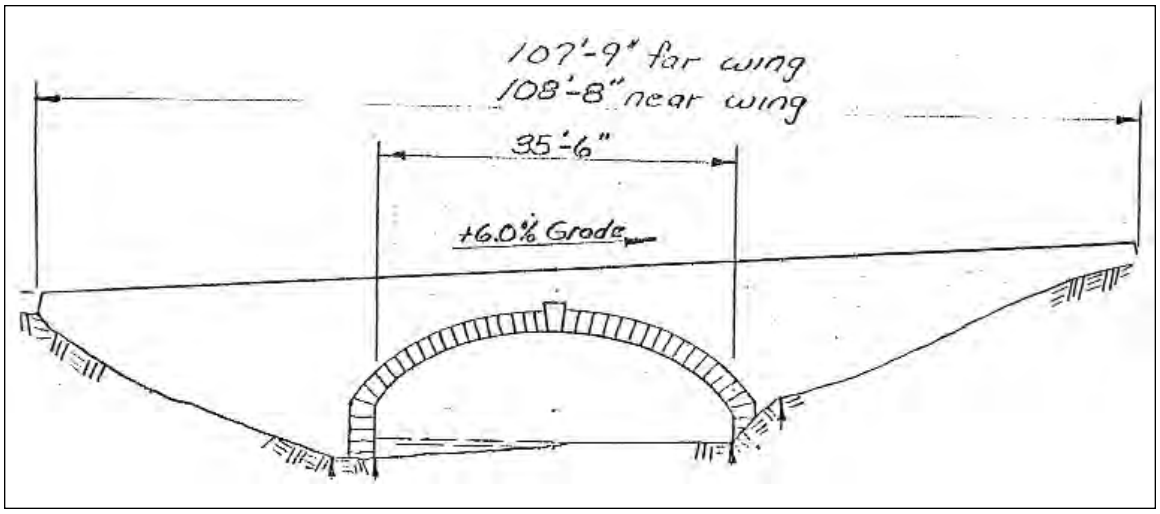
(# 143) 78-SR071-05.65



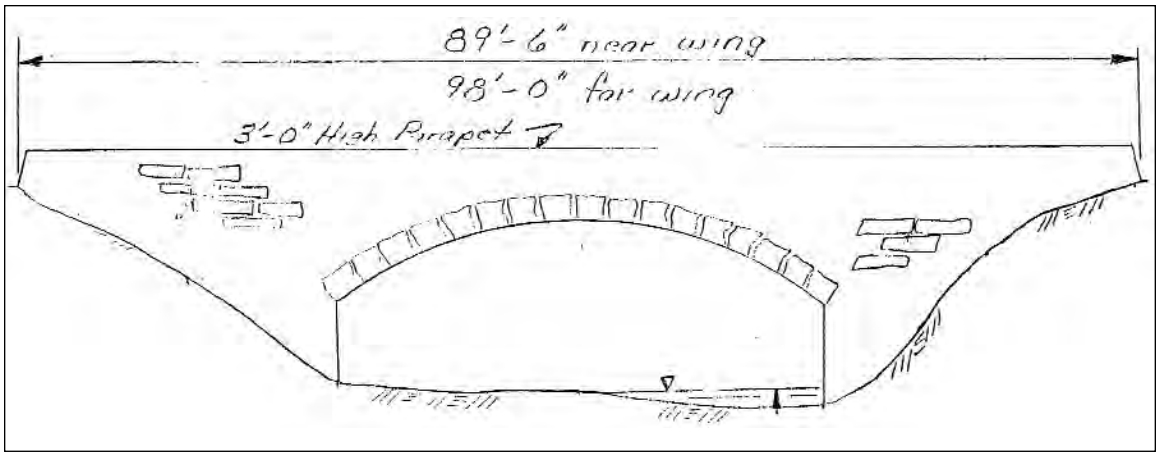
(# 144) 78-SR071-05.23



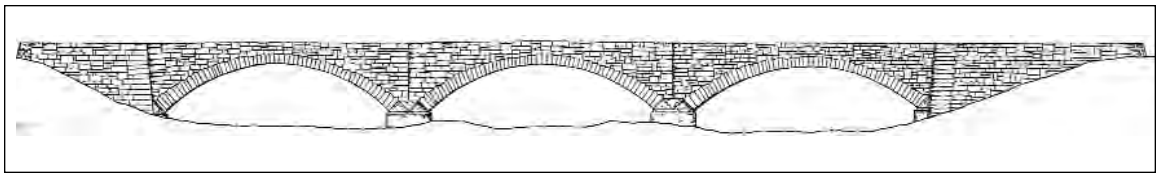
(# 145) 78-SR071-02.83



(# 146) 78-SR071-01.98



(# 148) 78-SR071-13.31



Significant under Criterion A as an example of the National Park Service's park roads as integrated park components from the 1930s implemented through New Deal programs and under Criterion C as a good example of a road system that embodies a cohesive design philosophy articulated through its aesthetically designed structural components.

The eastern edge of Tennessee lies within the southern portion of the Appalachian Mountain range. This area is extremely mountainous and, apart from scattered settlers, was sparsely populated through the nineteenth century. In the 1890s, lumber companies bought large areas and began harvesting timber. Concurrently, citizens in the region began to discuss its potential as a park or wilderness area, and the Forest Service considered purchasing the Great Smoky Mountains area in the 1910s but did not do so.

When Congress designated Yellowstone Park as the country's first national park in 1872, the federal government assigned management of the park to the U.S. Department of the Interior that controlled all the national parks until 1916. In 1916, Congress created the National Park Service to specifically manage the national parks, which at that time consisted of seventeen national parks and twenty-two national monuments. Since virtually all of these parks were in the West, the National Park Service focused on creating new parks east of the Mississippi River. The National Park Service considered the Appalachian Mountain range for one of the parks, and in 1924 the government appointed the Southern Appalachian National Park Commission to study the region and to recommend a specific site. Citizens from the various areas under consideration vied intensely to be chosen, viewing such a designation as an economic windfall. Leaders in the Good Roads and interstate highway associations played an active role in the development of this and other national parks. As one historian stated, "in the strange ways of democracy, the cause of wilderness preservation was led...not by botanists and bird lovers but by energetic civic boosters and businessmen" (Frome 1966:182).

After studying the region, the Park Commission met in December 1924 in Washington, D. C. and recommended two parks, the Blue Ridge in Virginia and the Great Smoky Mountains in North Carolina and Tennessee, the highest mountain range in the eastern United States. In the 1930s, the National Park Service built the Blue Ridge Parkway to connect these two parks. In 1925 and 1926, Congress passed bills establishing the Great Smoky Mountains Park and authorizing the government to accept land for it. However, Congress did not appropriate any money for land acquisition, and local groups began an arduous fund raising process. Intense in-fighting among Virginia, North Carolina, and Tennessee, combined with strong opposition from the timber industry, which continued to clear-cut the forests, made fund raising slow. Finally, the first land was bought in November 1926. Critical to the land acquisition phase was the decision in 1928 of John D. Rockefeller to donate $5 million through the Laura T. Spelman Rockefeller Foundation as a matching grant to purchase land. In February 1930, the governors of North Carolina and Tennessee presented to the United States deeds for 158,000 acres of land, an amount that exceeded the 150,000 acre minimum for the area to be given "limited park status" and for the United States to assume responsibility for the park. In 1931, the National Park Service appointed the park's first superintendent. After 1933 the federal government assisted in funding land acquisition. By 1935, holdings for the park exceeded 400,000 acres, the minimum set by Congress for full National Park status. President Franklin D. Roosevelt dedicated the Great Smoky Mountains National Park on Labor Day 1940.

The Great Smoky Mountains are the most massive and rugged mountain range in the Eastern United States and run the entire length of the park, a distance of about seventy miles. The state line between North Carolina and Tennessee runs north-south along the summit of the main range of the Smoky Mountains, and the park is about equally divided between North Carolina and Tennessee. It contains large areas of land in Blount and Sevier Counties in Tennessee.

Due to the mountainous terrain, the few roads in the park in the 1920s were rugged trails. Only one main road ran east-west across the park between Gatlinburg, Tennessee, and Cherokee, North Carolina, the Indian Gap road, originally a Cherokee trail that in Tennessee largely followed the West Prong of the Little Pigeon River into the mountains. In 1923, the state designated this route as State Route 71 as part of the state highway system and later designated it as U.S. 441. This road served as a pivotal link in tourist travel for the area, and North Carolina and Tennessee jointly began improving the route in the 1920s. Tennessee's side followed the old route of the Indian Gap Highway except that the state chose to place the alignment through New Found Gap rather than Indian Gap. New Found Gap lay less than a mile to the northeast of Indian Gap and provided a better grade.

Concurrently with the state's improvement of the Indian Gap Road, the federal government prepared plans for the development of the area as a park. Local residents, who strongly wanted a road system, perhaps more than a park, pushed for immediate road improvements in the area and the state obliged. Park interests, on the other hand, opposed the state improving the road. The Park Service believed that it could design a more aesthetically pleasing alignment and construct it with less impact to the natural environment. The Park Service specifically opposed the state's choice of the New Found Gap crossing (rather than Indian Gap), stating that it would blight the vista from Mount LeConte. However, the Tennessee state highway department proceeded with its plans and built the route as a twenty-foot wide dirt road, on a six percent grade. The state awarded a contract for 14.5 miles of road and bridge work in July 1927 to the Discus Brothers Company for $425,000. The company completed the contract in July 1930. In April 1932 *The Appalachian Journal*, a booster publication based in Knoxville, carried a front page story promoting "The New Indian Gap Highway" for tours through a "wonderful wilderness" stating, "For the first time in history automobiles are now going daily over the new Indian Gap Highway up, over, and down the Great Smoky Mountains, which in their 65-mile length rarely fall under one mile high...'Eventually' you will travel the Indian Gap Highway, why not soon?" (*The Appalachian Journal* April 1932:1). For all practical purposes, Tennessee transferred responsibility for its portion of the Indian Gap Highway to the Park Service in the 1933-1937 period, but a formal transfer did not occur until 1951.

Once the federal government controlled the road and as federal relief programs provided funds and labor for park improvements, the National Park Service completely rebuilt the road system based on its design philosophy. As early as 1917, the National Park Service had begun to develop a design approach for landscape preservation within its parks. Through the 1920s, the National Park Service honed a philosophy that reflected the necessity of harmonizing the development and accessibility of the parks with the natural components of the park. Meanwhile, a nationwide movement to create state parks and park systems emerged, resulting

in large numbers of tourists visiting the parks, often overwhelming inadequate local roads. Beginning in 1924, Congress annually appropriated limited funds for the development of roads and trails within the national parks.

In 1926, the National Park Service entered a cooperative agreement with the Bureau of Public Roads that:

> resulted in a long-term relationship whereby park designers set aesthetic standards of workmanship, location, and design of roads while bureau engineers provided the latest technology. The close interaction between the park service's civil engineers and landscape architects led to clear distinctions in standpoint and in role. Concerned with landscape preservation and harmonization, the landscape designers called for practices of clearing, blasting, cutting and filling, rounding and flattening slopes, bank blendings, and plants that harmonized with the natural environment; they called for methods of construction that located roads and overlooks to present scenery at its best and to blend them naturalistically with the surrounding landscape. They designed bridges and culverts to fit their site and setting. Specifications for the masonry rockwork of bridges, guardrails, and culverts emerged that blended manmade construction inconspicuously into the natural setting (McClelland 1993:3-4).

The government and the public alike perceived park roads as necessary and as such the National Park Service consciously chose to develop them as an integral component of the park experience. Mountain roads typically contained switchbacks, sharp curves, cuts and steep inclines. The National Park Service replaced these with roads that followed the natural contours of the land featuring tunnels, sweeping radial curves, panoramic vistas, pull-offs or turnouts, and rustic guardrails and retaining walls of native materials. By the late 1920s, although the National Park Service used a number of standard bridge types with common features, engineers designed each vehicular bridge as a unique project focusing on the specific site features. Although designers most often used stone-faced concrete bridges, they did use other materials (McClelland 1993:102-103;129-131).

Paradoxically, limited funding for road improvements in national parks changed during the Great Depression as the federal government funded expansive and labor intensive construction projects in the national parks. The government often funded these efforts through the Public Works Administration and the Emergency Conservation Works program carried out by the Civilian Conservation Corps. The Public Works Administration provided funds for work approved by the National Park Service through skilled labor provided by private contractors. The Emergency Conservation Works was quite different in its organization. It was an interagency program that provided work to camps of Civilian Conservation Corps crews. In 1937 the Emergency Conservation Works became an independent agency and officially renamed the Civilian Conservation Corps. The Works Progress Administration, established in 1935, also provided funds for work in the parks.

Upon assuming management of the road system in the 1930s from the state, almost immediately, the Park Service re-named Indian Gap Highway the New Found Gap Road and,

utilizing its evolved landscape approach, redesigned the park's road system as a cohesive network and integral component of the park itself. The Park Service, with labor in part provided by Civilian Conservation Corps workers, redesigned the road with smoother curves and lower grades, primarily between 1933 and 1938 when the park opened the road to traffic. Additional finishing work continued through 1941-1942 when such work ended due to the country's involvement in World War II. The road system is a serpentine route that begins near Gatlinburg on the valley floor at an elevation of 1,400 feet near the park's headquarters and the Sugarlands Visitor Information Center and climbs to a large rest area at New Found Gap on the state line at an elevation of 5,045 feet, a distance of about fourteen miles. The route features sweeping curves, overlooks and turnouts defined by native stone parapet retaining walls and curbs that showcase spectacular vistas of the mountain scenery. In addition to these features, masonry faced bridges, culverts, and tunnels link the road network. The road follows a meandering path along the corridor formed by the West Prong of the Little Pigeon River and Walker Camp Prong. In addition, several small streams that originate on the steep hillsides empty into West Prong or Walker Camp Prong, requiring bridges on New Found Gap Road to span the smaller tributaries.

As part of its overall road project, the National Park Service built seven masonry-faced concrete arch bridges on Tennessee's stretch of New Found Gap Road. [The tunnels, bridges less than twenty feet long, and culverts are contributing elements of the National Register eligible road system but are not structure types included in this survey.] Although it is usually more difficult and expensive to build curving bridges, the elimination of straight lines was a design priority. Bridges are a natural focal point on a road, and in order to break the linear nature of the road and to emphasize a curvilinear flow, the designers placed the bridges at a right angle to the roadway (90 degree skew or on a tangent for ease in construction) but located them within curves or placed curves at one or both ends. The dramatic Loop Bridge (#141, 78-SR071-05.85), erected in 1935, appears to have been the first built. In 1936, the Park Service built one-span structure spanning the West Prong of the Little Pigeon River near the entrance to Chimneys Campground (#142, 78-SR071-08.54). The Park Service built a large bridge (#148, 78-SR071-13.31) near its park headquarters in 1937 (Kelleher 1996). It is estimated that the other bridges were built about 1936-1937.

In the 1990s, the National Park Service and the Historic American Engineering Record conducted studies of the roads and bridges of the park, with one goal being the nomination of portions of the park to the National Register of Historic Places (Blythe 1999, Kelleher 1996; Maher 1996). These materials are on file at the park and with the Historic American Engineering Record.

Beginning at the headquarters at Sugarlands on the valley floor and climbing the mountains, the first bridge on the route (#148, 78-SR071-13.31) spans the West Prong of the Little Pigeon River near the headquarters. Built between May and December of 1937, it contains three symmetrical semi circular concrete closed spandrel arch spans, each 48.0 feet long and faced with stone laid in an uncoursed quarry faced ashlar pattern. A row of relatively uniform cut stones follows the line of each arch. The stone parapet rails extend the total length to 270.0 feet. The curb-to-curb width is 30.0 feet, and the out-to-out width is 41.5 feet. The bridge contains two four-foot grassy shoulders. Each pier contains a blunt buttress at the waterline

beneath a tapered pilaster. Stone nosings project on the upstream side. The barrel of the arch on this, and all of the New Found Gap Road bridges, is not faced with stone. The bridge is located in one of the relatively few straight sections of New Found Gap Road.

The second bridge (#142, 78-SR071-08.54), opened to traffic October 1936, spans the West Prong of the Little Pigeon River near the entrance to Chimneys Campground. It contains one concrete semi-circular closed spandrel arch span faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of cut stones of similar size laid in an undulating peak pattern follows the line of the arch. The arch is 82 feet long and the 2.0-foot parapet railing extends the total length to 192 feet. The curb-to-curb width is 28 feet, and the out-to-out width is 40.8 feet. The bridge contains one 4.5 foot sidewalk. The bridge is located in a widely sweeping curve that forms a gentle switchback.

The Loop (#141, 78-SR071-05.85), which replaced two switchbacks from the state's road system, is one of the most well-known man-made structures in the park. The C.Y.Thomason Company of Greenwood, South Carolina, built this bridge between March and November 1935. The roadway runs through the arched bridge, makes a 360 degree turn, switching back over itself on top of the bridge in a long fluid motion creating a structure variously called a "loop," "pigtail," or "corkscrew" bridge. The bridge contains one concrete semi-circular closed spandrel arch span faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of randomly sized cut stones follows the line of the arch and flares to a wider width as it approaches the ground line. The span is 59 feet long and the total length is 178 feet. The curb-to-curb width is 33 feet, and the out-to-out width is 73 feet.

The bridge over Coles Creek (#143, 78-SR071-05.65) is a single span concrete semi-circular closed spandrel arch faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of uniformly cut and dressed stones follows the line of the arch. The arch is 30.0 feet long and the 2.0-foot tall parapet rail and retaining wall extend the total length to 112.0 feet. The curb to curb width is 22.0 feet, and the out-to-out width is 40.0 feet. The roadway spans a small branch perpendicular to the road at the stream's confluence with Walker Camp Prong in a narrow area between the base of a mountain and Walker Prong. New Found Gap Road curves along the bend of Walker Prong. The railing on the mountain side is straight, but the railing parallel to Walker Prong follows the curve of the road and creek.

The Walker Camp Prong Bridge (#144, 78-SR071-05.23) contains two semi-circular concrete closed spandrel arch spans 36 and 32.5 feet long that are faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of uniformly cut and dressed stones follows the line of the arch. The keystone extends upward and is part of a belt course of dressed stone. The pier has a nosing. The 3.0--foot tall parapet railing extends the total length to 191 feet. The curb-to-curb width is 23.0 feet, and the out-to-out width is 34.0 feet. Although there is no sidewalk, the bridge is located adjacent to a pull-off, and there are 5.0-foot shoulders on the bridge, and on each side of the arch, the parapet railing flares to create an even wider shoulder. The bridge is built on a 30° skew in a relatively straight stretch of roadway, but the road curves immediately past the pull-off.

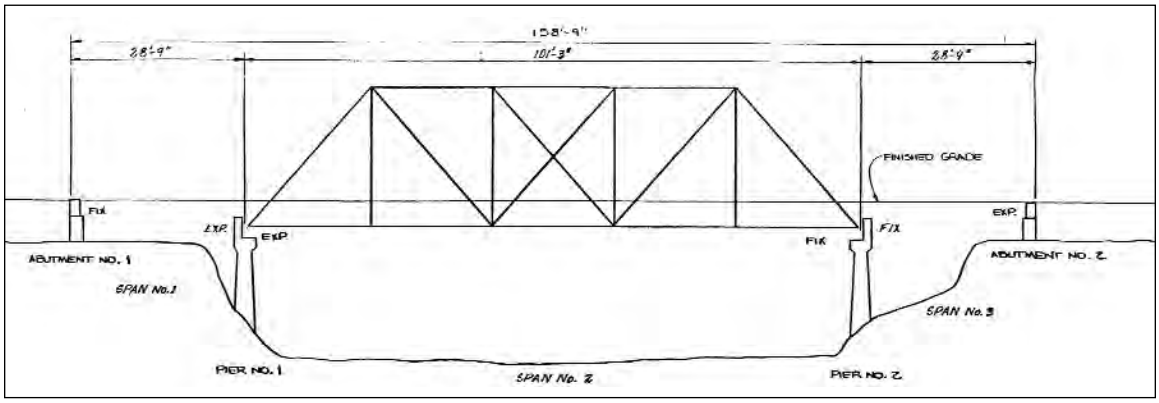
The next bridge on New Found Gap Road spans the Walker Camp West Prong (#145, 78-SR071-02.83). The bridge contains one span, a 35.5 foot concrete elliptical closed spandrel

arch faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of uniformly cut and dressed stones that increase in size as they near the ground line follow the line of the curve. The keystone extends upward and is part of a belt course of dressed stone. The parapet railing extends the total length to 108.7 feet. The curb-to-curb width is 34.0 feet, and the out-to-out width is 40.0 feet. There are two shoulders, 5.0 and 6.0 feet wide, and on each side of the arch, the parapet railing flares to create an even wider shoulder. The bridge is built on a six-percent grade on a tangent, but the road curves out of the bridge.

The last bridge (#146, 78-SR071-01.98) spans Walker Camp Prong near its head high in the mountains a short distance from the state line. It is a one-span concrete shallow semi-circular closed spandrel arch structure faced with stone laid in an uncoursed quarry-faced ashlar pattern. A row of uniformly cut and dressed stones with a projecting keystone follows the line of the curve, which ends well above the water line, and the row then turns at a right angle to cap the buttresses. A row of cut and dressed stones forms a beltcourse the length of the bridge. The arch is 29.7 feet long and the 3.0-foot tall stone parapet railing extends the total length to 98.0 feet. The curb-to-curb width is 24.0 feet, and the out-to-out width is 40.0 feet. The bridge is near a pull-off and contains a 4.0-foot and an 8.0-foot shoulder. The bridge is built in a tangent alignment, but the road curves through the bridge and the approach railing follows this curve.

Drawings for the Loop (#141, 78-SR071-05.85), #142, the Chimneys Campground Bridge (#142, 78-SR071-08.54), and the Walker Camp Prong Bridge (#148, 78-SR071-13.31) were taken from the Historic American Engineering Record (DeLony 2004:74-86).

(#150) 25-SR028-29.24: York Homeplace Bridge spanning the Wolf River near Pall Mall in Fentress County (Pall Mall quad, 335 SW).



Significant under Criterion A for its associations with Alvin C. York's efforts to improve roads in rural Fentress County and under Criterion B due to its associations with York.

This bridge is a contributing structure within the National Register Sergeant York Historic Area, and it is adjacent to the National Historic Landmark Alvin Cullom York Farm.

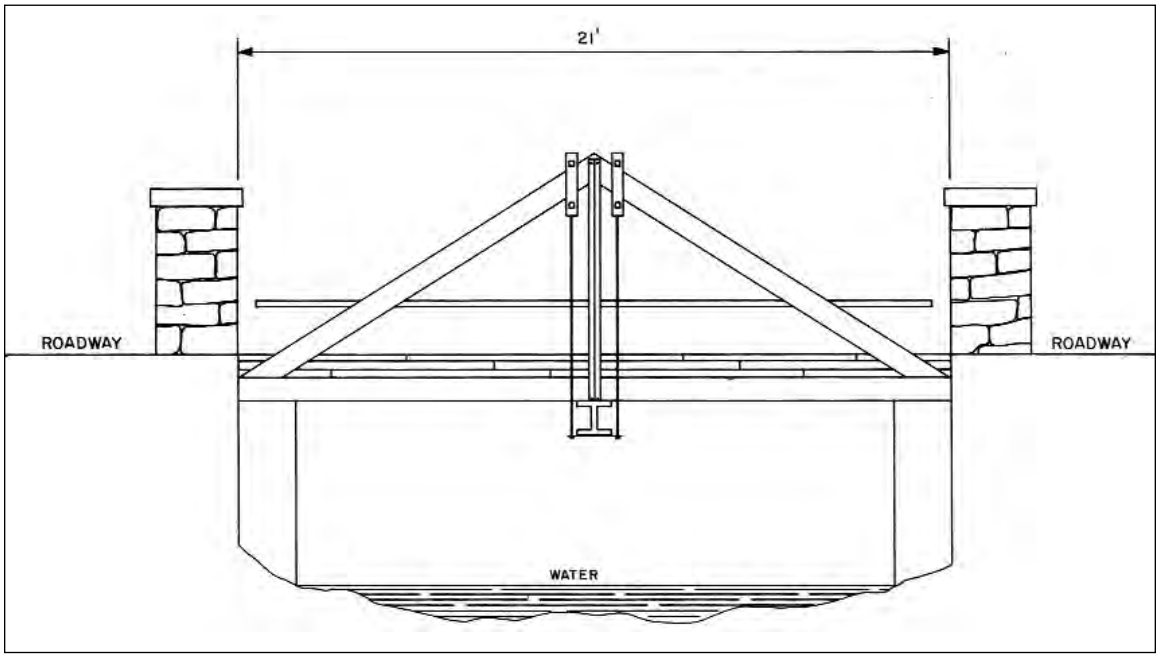
Alvin C. York gained international fame in 1918 during the Battle of the Argonne Forest when he nearly single-handedly killed 25 Germans and captured 132 men and 35 machine guns. For his efforts, York received world-wide acclaim and returned to the United States in May 1919 a hero who would eventually receive nearly fifty medals and decorations. He also received many financial offers to capitalize on his fame, but he returned home to Fentress County to devote his efforts to improving the area's educational facilities and general living conditions. York remained widely popular and in 1940, to raise money to fund a Bible school, signed a contract for a movie based on his life. The movie, *Sergeant York*, was immensely successful and won an Academy Award for Best Actor for its star, Gary Cooper.

While York was growing up, rugged, if not impassable, mountain paths were the only roads in the area. Due to the road conditions, the county court often met at the home of one of his neighbors rather than travel to the county seat. After York returned home, he was instrumental in getting a new highway built through Pall Mall. The state built this highway, State Route 28 from Jamestown to the Pickett County line, between 1920 and 1925 as Federal Aid Project Number 20. This highway was a link in the Taft Memorial Highway from Canada to Fort Myers, Florida, but in Tennessee the State Legislature named the route the Alvin C. York Highway.

In December 1938, the state sent Fentress County a proposal stating that it would build a new bridge spanning the Wolf River at Pall Mall if Fentress County would provide the right-of-way and relocate the utilities. On 2 January 1939 the county court agreed. In April 1939 the court appointed a committee of M. L. Greer, W. H. Voiles, Will R. Stone, and Judge W. M. Johnson to secure the right-of-way. The committee returned to the court 12 April 1939 with signed contracts from the three adjacent property owners that included York. The court defeated a motion to reject the bridge project by seven to four. The court passed a county motion accepting the bridge with the same coalitions voting seven to four. The county paid York $1,000 in damages and relocated his foal shed, store, and tenant house out of the right-of-way. The state awarded the $34,340.88 contract as Federal Aid No. 20 A in August 1939 to J. M. Hickman. The firm completed the bridge project in May 1940. On Thursday 4 July 1940, the state held dedication ceremonies from 9:00 a.m. to 5:00 p.m. with York as the featured speaker. Other speakers included state highway officials from states on the Taft Highway. Special features included a barbecue dinner, boat rides, and the presence of an airplane. A Nashville radio station broadcast the ceremony live (Adams and Christian 1975; Fentress County Court Minutes Volume 7: 92 94, 344, 361, 364; Tennessee 1943:83; Harper 1973).

This bridge is 159 feet long and contains one truss span and two concrete deck girder approaches on a scored concrete substructure. The truss is a riveted 101-foot through Pratt. Composition of the members is typical for this period. Top chords and end posts are channels with lacing. Bottom chords are channels with battens. Verticals, diagonals, and counters are channels. Typical for state bridges, this truss has a lattice railing, and the girders have a spindle concrete railing.

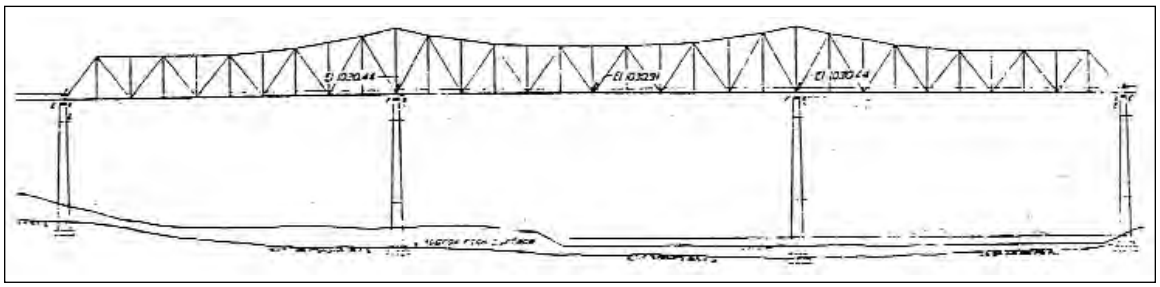
(#151) 19-NonHighway-3: Drake Dairy Farm Bridge spanning Drakes Branch northwest of Nashville in Davidson County (Nashville West Quad, 308 NE).



Significant under Criterion C as a rare metal Kingpost truss bridge.

The Nashville Bridge Company built this bridge in 1941 on a driveway to the Drake Dairy Farm. On a masonry substructure, the bridge contains one metal Kingpost truss 21 feet long. Channels form the apex and the bottom chord. From the apex, metal tension rods extend to the floor beam as does lateral diagonal bracing of angles. One stone column is located on each end of the bridge, diagonally across from each other.

(#152) 45-SR092-09.21: Dr. James D. Haskins and H. B. Jarnagin Bridge spanning the French Broad River/Douglas Lake in Dandridge in central Jefferson County (Jefferson City Quad, 163 SW).



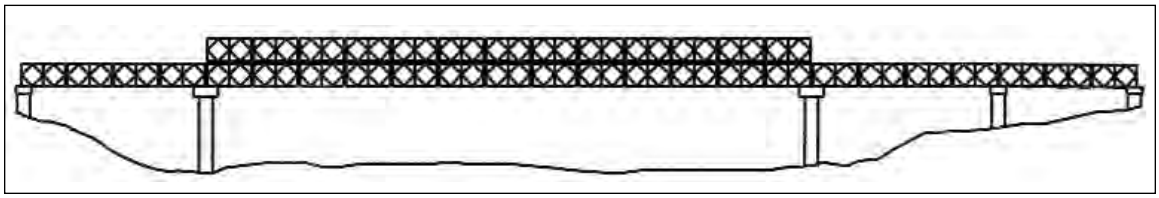
Significant under Criterion A due to its associations with TVA's involvement in community planning and development of region.

The Tennessee Valley Authority (TVA) designed this bridge, and the Nashville Bridge Company erected it between 1942 and 1944. TVA built the bridge as a result of the Douglas Project that was recommended in 1936 and approved in 1942 as a World War II emergency program to provide power. The Douglas Project resulted in the inundation of large areas of the state, which originally included the county seat of Dandridge, but intense lobbying by local residents persuaded TVA to build a dike around the town. Due to the change in water levels, TVA relocated an old truss bridge at the site, and built this bridge to restore route continuity (TVA 1949a).

The bridge rests on a concrete substructure and contains one three-span continuous Warren through truss with polygonal top chords and five steel I-beams. The truss is 888 feet long, and the total length is 1,468 feet. The curb-to-curb width is 18 feet, and the out-to-out width is 21 feet. Composition of members is atypical, reflective of TVA's involvement. All members are either channels or beams with oval perforations. The concrete and steel railing reflect Art Moderne influences.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for replacement.

(#153) 73-00653-04.34: Blair Bridge spanning Poplar Creek in northeast Roane County (Elverton Quad, 130 NW).



Significant under Criterion A for its associations with the development of Oak Ridge and post World War II reuse by Corps of Engineers and under Criterion C as early Bailey truss bridge.

In 1941 President Franklin Delano Roosevelt ordered the Army Corps of Engineers to organize a project to build an atomic bomb, named the Manhattan Project. The Corps bought 59,000 acres near Clinton, Tennessee, to contain three facilities for the production of enriched plutonium (the X-10, Y-12, and K-25 plants) and a townsite to house workers (Oak Ridge). The Corps quickly built roads, houses, research facilities, and support facilities for 75,000 employees. The project was successful, and the plants at Oak Ridge provided the uranium used on the atomic bomb dropped on Hiroshima. After World War II, the federal government chose to continue nuclear production and research at Oak Ridge. The Corps managed the site until January 1947 when the Atomic Energy Commission assumed responsibility. Once the government made the decision to continue production at Oak Ridge, the Corps began to erect permanent buildings and to improve the infrastructure. During the transitional 1945-1947 period, the Corps erected this bridge in 1946 adjacent to the K-25 plant.

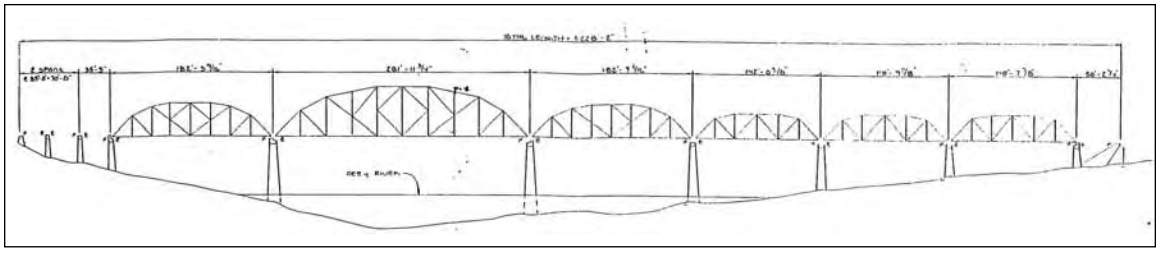
In the early 1940s, an Englishman named D. C. Bailey invented the Bailey truss, a temporary movable bridge, for military use during World War II (U.S. Patent #2,376,023). Department of

Energy records indicate that the spans erected at this site in 1946 were "second-hand," but the original location(s) and use(s) are unknown.

The bridge is 233 feet long and contains three Bailey truss spans on a concrete substructure. The bridge has a curb-to-curb width of 12.0 feet and an out-to-out width of 16.4 feet. Two of the spans are Double-Singles (two panels wide, one panel high) and are 40 and 80 feet long. The 80-foot truss has had a bent added which gives it the appearance of two spans. The main span, which is 111 feet long, reflects the versatility of the truss type and contains another "storey" or "bank" of panels and is a Double-Double.

The Tennessee Department of Transportation, in cooperation with Roane County and the Federal Highway Administration, built a new bridge at this site in 1985. The state dismantled the truss spans and placed them in storage "on call" for temporary use in the event of bridge failures.

(#154) 69-SR042-03.27: L. B. Hassler Bridge spanning the Obey River in south central Pickett County (Byrdstown Quad, 333 SW).



Significant under Criterion A for its associations with the social and economic changes in the area due to the construction of the Dale Hollow Dam and under Criterion C as a late example of a large-scale truss bridge.

In 1917 Pickett County built a bridge at this site to replace a ferry. In 1938 the state contracted with the Marion Construction Company for $87,000 to build a new truss bridge. In 1942 the Corps of Engineers announced plans to build the Dale Hollow Dam that would require the removal of the state's 1938 bridge due to the increase in water levels on the Obey River. In 1943 the Corps began work on this bridge, which was about one mile downstream from the 1938 bridge. The government proceeded with the construction of the dam during World War II because it was a war industries power source. However, after the Corps had completed the piers, the war-related shortage of steel delayed completion of the bridge until after the war ended. Concurrent with the dam's construction, the government directed that the 1938 bridge and all other non-essential metal bridges spanning the Obey River be scheduled for salvage and demolition.

The salvage of the old bridge left no bridge to serve as a river crossing for the State Route 42 corridor. To solve the river crossing problem, the Corps instituted a ferry service to transport vehicles across the flooded hollow until the new bridge, which sat unfinished, could be completed following the war. An exact construction date for this bridge is unknown. Since the Corps did not complete the bridge during the war, the earliest that construction could have resumed was August 1945 with early 1946 being more probable. Historic photographs show the Corps producing a water safety demonstration in the reservoir in August 1947 with the completed Hassler Bridge in the background.

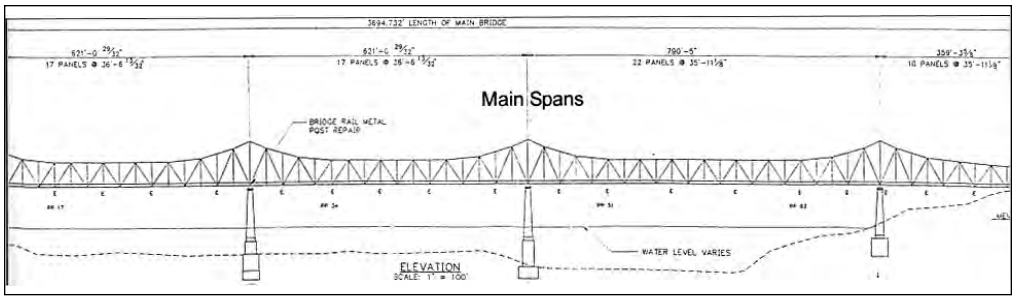
The Corps named the bridge the L. B. Hassler Bridge in honor of Landon Bedford Hassler, a Pickett County Judge who was an activist for improved highway construction in the region (McLeod 1994).

The Hassler Bridge rests on a concrete substructure and contains six riveted through trusses and four concrete deck girder approaches in an asymmetrical layout. On the north end are three concrete deck girder approach spans, each 35 feet long. Next to these spans are three trusses, each a modified Parker with Petit influences. These spans are 182.2, 281.9, and 182.8 feet long. Next to these spans are three Warren with vertical trusses with polygonal top chords that are 142.0, 141.8, and 141.6 feet long. A single concrete deck girder span 50.1 feet long completes the southern end of the bridge. The curb-to-curb width of the Hassler Bridge is 24.0 feet, and the out-to-out width is 26.0 feet. Minimum vertical clearance is 14.0 feet. The 140-foot spans are 28.0 feet tall, the 180-foot spans are 36.8 feet tall, and the 280-foot span is 56 feet tall. The original guardrail is metal lattice that now has a ribbon metal guardrail placed between it and the traffic. The only feature that is different from typical state-designed bridges of this period is the approach rail on the north end. This rail is a sweeping Art Moderne-influenced concrete rail with arched openings that follow the curve of the road around the hillside. This railing has suffered extensive traffic damage, and like the metal lattice railing on the bridge, has a modern ribbon metal guardrail between it and the traffic.

Composition of members is typical for bridges of this era. On the Warren trusses, top chords and end posts are channels with lacing, and bottom chords are channels with lacing on the top and bottom. Diagonals in the center panels are channels with battens, and other diagonals and verticals are channels. On the Parker trusses, top chords and end posts are channels with lacing, and bottom chords are channels with lacing. Diagonals are channels.

The Tennessee Department of Transportation, in cooperation with Pickett County and the U.S. Army Corps of Engineers, built a new bridge at this site in 1995 and demolished the historic bridge.

(#155) 79-I055-12.00: The Memphis and Arkansas Bridge spanning the Mississippi River in downtown Memphis on the Tennessee-Arkansas state line, Shelby County (Northwest Memphis Quad, 404 NE).



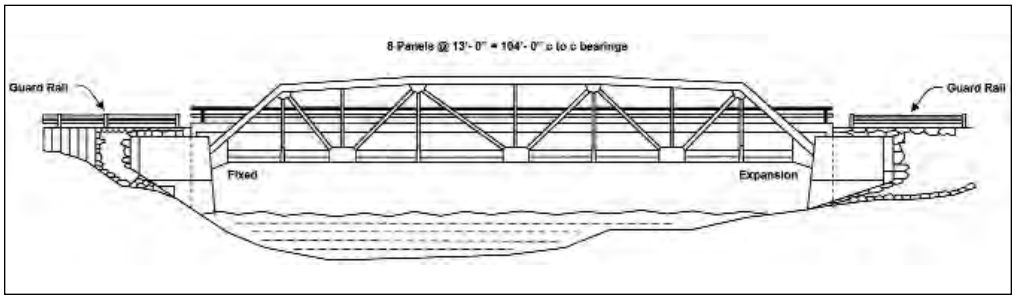
Significant under Criterion C for its engineering merits.

By the 1930s, the Harahan Bridge (#77, 79-NonHighway-4), the only bridge carrying vehicular traffic across the Mississippi River for abut 170 miles, contained at least five major U.S. routes and served as a significant corridor for vehicular traffic in the southeast. By the 1930s, the bridge carried 11,000 vehicles per day on the two vehicular lanes. Since each lane was cantilevered out from the trusses, the arrangement did not allow passing, such as when vehicles stalled, and the bridge was unable to adequately carry traffic during peak hours. In 1939 prominent Arkansans and Tennesseans formed the Memphis and Arkansas Commission to investigate building a vehicular bridge across the Mississippi River. In 1944, the Arkansas State Highway Commission and the Tennessee Department of Highways and Public Works hired the firm of Modjeski and Masters to supervise construction. Delayed because of World War II and the shortage of building materials, contracts were let between 1945 and 1948 to the Merritt-Chapman and Scott Corporation of New York City, the Harris Structural Steel

Company of New York, and the Virginia Bridge Company of Roanoke. Construction began in August 1945 and the bridge opened to traffic on 17 December 1949 (Mills 2000; Modjeski and Masters 1950). For navigation reasons, the pier placement for this bridge aligns with the Harahan Bridge and the Frisco Bridge (#14, 79-NonHighway-3), which are located immediately to the north (to the right in the photo).

The bridge rests on a substructure of concrete and rock-faced piers with dressed stone blocks. The main channel span is on the Memphis side of the river, on a bluff, and going from Memphis (east) to Arkansas (west), the main bridge span is a five-span continuous Warren through truss with polygonal top chords that is 2,824.7 feet long (spans are 359.2, 790.4, 621, 621, and 433.1 feet long). The next spans are two through Warren with vertical trusses each 435.1 feet long and two deck Warren with vertical trusses 175.8 and 173.6 feet long. The viaduct on the Arkansas end contains nineteen girder spans ranging in length from 35 feet to 87 feet and totaling 1,177.4 feet. The total bridge length is 5,222 feet, and all trusses feature riveted or bolted connections. The curb-to-curb width is 52 feet (four 12-foot traffic lanes plus the concrete barrier median), and the deck out-to-out width is 65 feet. Most members are either channels or beams with oval perforations although some floor lateral bracing is composed of I-beams with lacing. The steel railing reflects a modern design of vertical posts ("picket" design) topped with a 4.5-inch horizontal bar. The bridge contains sidewalks cantilevered outside the trusses. Originally, the bridge contained a low concrete median barrier between opposing lanes of traffic, much like a sidewalk, but this has been replaced with a raised modern concrete barrier. Also, concrete barriers have been placed inside the trusses, adjacent to the traffic lanes.

(#156) 33-01151-00.78: Daugherty Ferry Road spanning Sale Creek in North Hamilton County (Graysville Quad, 111 NE).



Significant under Criterion C as atypical Warren truss bridge.

In the 1930s, in part due to the intense lobbying of Hamilton County Judge Will Cummings with his friend President Franklin Roosevelt, the Tennessee Valley Authority (TVA) decided to locate the Chickamauga Dam on the Tennessee River near Chattanooga. As a result of the dam, backwaters on several creeks along the river substantially increased in size. Consequently, TVA replaced an existing bridge at this site with this truss span, built between April 1939 and June 1940. In 1954 Hamilton County replaced that bridge with this truss. The bridge committee included Ernest D. Cushman, H. P. Dunlap, Joseph Killebrew, and Mrs. Fred Robinson. Of all the bridges in the survey, this appears to be the only bridge committee on which a woman served. The plans indicate that L.A. Schmidt was the engineer. In 1963, Schmidt started the consulting firm Hensley-Schmidt, which continues to operate in Chattanooga under the name Arcadis.

The bridge contains one span, a 106-foot riveted Warren pony truss with polygonal top chords. The truss is 13.5 feet in height. The bridge has a curb-to-curb width of 20.0 feet and an out-to-out width of 24.5 feet. Top chords and end posts are channels with perforated cover plates (oval cut-outs), and all other members are I-beams. The bridge sits on concrete abutments.

The Tennessee Department of Transportation, in cooperation with the Federal Highway Administration, has scheduled this bridge for replacement.