NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

**United States Department of the Interior**
**National Park Service**

NR 9/24/08

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

## 1. Name of Property

historic name Highway B-29 Bridge

other names/site number County Road 623 Bridge, Bridge #17390 / Site # WA0966

## 2. Location

street & number North Black Nursery Road/County Road 623 over the Illinois River ☐ not for publication

city or town Prairie Grove ☐ vicinity

state Arkansas code AR county Washington code 143 zip code 72753

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set for in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☐ nationally ☐ statewide ☒ locally. (See continuation sheet for additional comments.)

Cathie Matthews 7/28/08

Signature of certifying official/Title Date

Arkansas Historic Preservation Program

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See Continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

## 4. National Park Service Certification

I hereby certify that the property is:

- ☐ entered in the National Register.
  - ☐ See continuation sheet
- ☐ determined eligible for the National Register.
  - ☐ See continuation sheet
- ☐ determined not eligible for the National Register.
- ☐ removed from the National Register.
- ☐ other, (explain:) _____

Signature of the Keeper Date of Action

## 5. Classification

**Ownership of Property**
(Check as many boxes as apply)

- ☐ private
- ☒ public-local
- ☐ public-State
- ☐ public-Federal

**Category of Property**
(Check only one box)

- ☐ building(s)
- ☐ district
- ☐ site
- ☒ structure
- ☐ object

**Number of Resources within Property**
(Do not include previously listed resources in count.)

| Contributing | Noncontributing | |
|---|---|---|
| | | buildings |
| | | sites |
| 1 | | structures |
| | | objects |
| 1 | | Total |

**Name of related multiple property listing**
(Enter "N/A" if property is not part of a multiple property listing.)

Historic Bridges of Arkansas

**Number of Contributing resources previously listed in the National Register**

N/A

## 6. Function or Use

**Historic Functions**
(Enter categories from instructions)

TRANSPORTATION/Road-Related/Bridge

**Current Functions**
(Enter categories from instructions)

TRANSPORTATION/Road-Related/Bridge

## 7. Description

**Architectural Classification**
(Enter categories from instructions)

OTHER/closed-spandrel concrete arch deck

**Materials**
(Enter categories from instructions)

foundation Concrete, reinforced
walls N/A
roof N/A
other Concrete, reinforced/Earth

**Narrative Description**
(Describe the historic and current condition of the property on one or more continuation sheets.)

## 8. Statement of Significance

**Applicable National Register Criteria**
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- ☒ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ☐ **B** Property is associated with the lives of persons significant in our past.
- ☒ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ☐ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

**Criteria Considerations**
(Mark "x" in all the boxes that apply.)
Property is:

- ☐ **A** owned by a religious institution or used for religious purposes.
- ☐ **B.** removed from its original location.
- ☐ **C.** birthplace or grave of a historical figure of outstanding importance.
- ☐ **D** a cemetery.
- ☐ **E** a reconstructed building, object, or structure.
- ☐ **F** a commemorative property
- ☐ **G** less than 50 years of age or achieved significance within the past 50 years.

**Levels of Significance** (local, state, national)
LOCAL

**Areas of Significance** (Enter categories from instructions)
ENGINEERING
TRANSPORTATION

**Period of Significance**
1923-1958

**Significant Dates**
1923, 1928

**Significant Person** (Complete if Criterion B is marked)
N/A

**Cultural Affiliation** (Complete if Criterion D is marked)
N/A

**Architect/Builder**
Luten Bridge Company of Knoxville, TN

**Narrative Statement of Significance**
(Explain the significance of the property on one or more continuation sheets.)

## 9. Major Bibliographical References

**Bibliography**
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

**Previous documentation on file (NPS):**

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ Previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

**Primary location of additional data:**

- ☒ State Historic Preservation Office
- ☐ Other State Agency
- ☐ Federal Agency
- ☒ Local Government
- ☐ University
- ☐ Other

Name of repository:
Washington County Archives, Fayetteville, AR

## 10. Geographical Data

**Acreage of Property** Less than one

**UTM References**
(Place additional UTM references on a continuation sheet.)

| | Zone | Easting | Northing |
|---|---|---|---|
| 1 | 15 | 382997 | 3984167 |
| 2 | | | |
| 3 | | | |
| 4 | | | |

☐ See continuation sheet

**Verbal Boundary Description**
(Describe the boundaries of the property on a continuation sheet.)

**Boundary Justification**
(Explain why the boundaries were selected on a continuation sheet.)

## 11. Form Prepared By

name/title Van Zbinden, National Register Historian
organization Arkansas Historic Preservation Program date 19 June 2008
street & number 323 Center Street, 1500 Tower Building telephone 501.324.9880
city or town Little Rock state AR zip code 72201

## Additional Documentation

Submit the following items with the completed form:

**Continuation Sheets**

**Maps**

A **USGS map** (7.5 or 15 minute series) indicating the property's location

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

**Photographs**

Representative **black and white photographs** of the property.

**Additional items**
(Check with the SHPO or FPO for any additional items.)

## Property Owner

(Complete this item at the request of SHPO or FPO.)

name Washington County, Judge Jerry Hunton
street & number 280 North College Street, Suite 500 telephone 479.444.1700
city or town Fayetteville state AR zip code 72701

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National Park Service

# National Register of Historic Places Continuation Sheet

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## Summary

The Highway B-29 Bridge crosses the Illinois River in central Washington County, Arkansas, northeast of the town of Prairie Grove. The bridge is a reinforced concrete, filled-spandrel arch built in 1923. It consists of one span with a length of approximately ninety-seven (97) feet and a total length of approximately one hundred (100) feet. The bridge has a height above water of approximately twenty (20) feet.

## Elaboration

Luten Bridge Company of Knoxville, Tennessee, built the reinforced concrete, filled—or closed—spandrel arch bridge over the Illinois River in central Washington County in 1923. Though it was built on a secondary state highway, the bridge was paid for by the county government of Washington County. It was one of the first bridges to be built by Luten in the county. The bridge is of Luten's standard design with gently sloping, shallow arches, spandrel walls topped with coping, and solid balusters with square inset detail. There are no piers. Only one span, the bridge is one hundred feet long with a span of ninety-seven feet. The bridge is approximately twenty feet above the water and the deck is seventeen feet wide. The spandrel walls of the bridge appear to have been brush hammered; a type of finishing common to Luten bridges. As was common for Luten bridges, the rings were polished for decorative effect.

Daniel B. Luten began his career in commercial bridge design in 1902 when he founded the National Bridge Company in Indianapolis, Indiana. Luten was an engineer who preached economics as well as solid engineering design. His designs consistently focused on strengthening the bridge while also reducing the amount of material needed to construct the bridge. Primarily this was accomplished by connecting the reinforcement of the piers with that of the rings while simultaneously connecting the rings to the spandrel walls. In this way, Luten increased the strength of the bridge while reducing the amount of material needed to build the bridge. It was the economical design and strength of the Luten bridges that proved their success. The Luten Bridge Company of Knoxville successfully bid on several of the filled spandrel arch bridges in Washington County and won each contract.

Bridge #17390, as numbered by the Arkansas Highway and Transportation Department, currently connects U. S. Highway 62 with North Black Nursery Road or County Road 623. Though the road could serve as a bypass for U. S. Highway 62, it is now primarily a secondary road serving a local farming community. This road was originally part of the Fort Smith to Jackson Road, the Cane Hill Road, and the Fayetteville-Prairie Grove Road. Originally the road crossed the river at a ford very near the location of the current bridge. The ford was replaced by a truss bridge; abandoned bridge abutments are the only evidence of this previous bridge. The truss bridge was replaced by the current bridge in 1923.

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**Integrity**

Highway B-29 Bridge—County Road 623 Bridge, Bridge #17390—retains good integrity. The county transportation department has done a good job in maintaining the bridge. There have been no modifications or changes to the bridge, nor have there been unnecessary or extensive repairs. The roadway has never been modified, nor paved, though they have allowed it deteriorate to the point that vehicular traffic now drives directly on the crown of the bridge, well below the designed roadway. The bridge has never been modified, is in similar condition, and in a similar setting to that of 1923.

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## Summary

Highway B-29 Bridge, Bridge #17390, is being nominated to the National Register of Historic Places with **local significance** under **Criterion C** as a good example of reinforced concrete, filled-spandrel bridge construction. The bridge is also a good example of Daniel B. Luten bridge design in Washington County, Arkansas. The bridge is also being listed under **Criterion A** for its association with transportation in Washington County. Bridge #17390 is being submitted to the National Register of Historic Places under the multiple property listing "Historic Bridges of Arkansas."

## Elaboration

The Highway B-29 Bridge—also known as the Cane Hill Road Bridge, Prairie Grove Road Bridge, Fayetteville-Prairie Grove Road Bridge, the Illinois River Bridge at Prairie Grove, and Bridge #17390—crosses the Illinois River at a point one-half mile down river from the modern U. S. Highway 62 bridge. The bridge is oriented east and west and is immediately north of the abutments of a previous bridge. The Illinois River is approximately 40 feet wide at normal pool in this location and is not terribly deep.

The headwaters of the Illinois River begin in the Boston Mountains south of Hogeye, Arkansas, and northeast of Strickler, Arkansas. The stream flows gently out of these mountains northward toward the once open prairies of central Washington County. John Butterfields's Overland Mail followed the Boston Mountain Road very near these waters. East and north of Prairie Grove, the river reaches flatter, wider land and like the land through which it flows, it too widens. Here the river, especially during low water, is generally wide and shallow.

It was here on these prairies at the foot of the Boston Mountains that Tom Wagnon, a hunter and trapper, settled in 1829. According to local historians, Wagnon traded his claim to Reverend Andrew Buchanan that same year for two good sermons. Buchanan established a church in the area and later added a school.[1] Early settlement in the area was sparse. The 1832 map of the Surveyor of Public Lands shows widely scattered fields among large, irregular prairies.[2] Sweet Home was the first post office in the area, being established in 1840. The post office was located just south of modern Prairie Grove and was closed by 1846.

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[1] Shiloh Museum, *History of Washington County Arkansas* (Springdale, AR: Shiloh Museum, 1989), 102, 103, 264.

[2] Surveyor of Public Lands, Little Rock Office, Nicholas Rightor, *Township 15 North of the baseline, Range 31 West of the 5th Prime Meridian* [map], Scale: 40 chains to the inch. Little Rock, Arkansas Territory: privately printed, 1832. Available online at the Bureau of Land Management, General Land Office Records, http://www.glorecords.blm.gov, document management identifier 6196. Accessed 16 May 2008.

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Ada, established by Archibald Borden, was the second post office in the area. Established eleven years later than Sweet Home, Ada was northwest of the modern site of Prairie Grove and very close to the location of Buchanan's homestead.[3]

Buchanan's homestead is prominently marked on the Surveyor of Public Lands 1832 map. Along with Buchanan's improvements there are several other homes and a mill noted on the map. The surveyor, Nicholas Rightor, did not record the location of roads for this map except at the margins. This makes exact placement of the homes and the mill site more difficult. However, when one overlays the 1832 map on later maps, it may be readily seen that the 1832 mill was very near the location of the current bridge.

D. H. Burr's 1835 map of Arkansas shows the Ft. Smith to Jackson road passing along the same route as that suggested by the Surveyor's map of 1832. Burr's map shows the road reaching Fayetteville from the west and turning to the southwest toward Vineyard Post in a very similar route to that of later maps.[4] Surveying for the Ft. Smith to Jackson Road commenced in 1835. By December of 1835, Lieutenant Richard D. C. Collins reported, "I have opened the road from Fort Smith to Jackson 70 miles." Opening the road from Fort Smith to Jackson in approximately six months with a budget of $5,000—$20,000 less than requested—suggests that Collins depended heavily on preexisting transportation networks to complete his road. Further suggesting that he used previously existing roads, Collins reported on January 8, 1836, "I have opened and entirely completed the road from Jackson in the direction of Fort Smith 78 miles. The road is for a new one extremely good – It now intersects the old road leading to Fayetteville and Fort Smith at the crossing of the North fork of White river – and will be of great advantage to the country even should no new appropriation be made to complete it, as it opens a direct route from the eastern parts of Arks. to Washington County the most populous in the Territory."[5]

Indeed, such was the influx of settlers that by 1840 Washington County was the state's most productive agricultural county. Settlement and agricultural production remained heavily focused in only a few areas of the county until after 1840, those being primarily the prairies and river bottoms.[6] Given the rapidly growing population, new roads were regularly being cut through the forests of the county. D. C. Collins notes that he was able to connect his Fort Smith to Jackson Road to the "road leading to Fayetteville and Fort Smith." It is highly likely that this was the Cane Hill Road.

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[3] Russell Pierce Baker, *From Memdag to Norsk: A Historical Directory of Arkansas Post Offices 1832-1971* (Hot Springs: Arkansas Genealogical Society, 1988), 1, 215.

D. H. Burr, *Arkansas* [map]. Edition unknown. Scale 1:3,480,000. N. P.: privately printed, 1835.

[5] D. C. Collins, quoted in Mark Christ, *Fort Smith to Jackson Road—Talberts' Ferry Segments*, National Register Nomination on file at the Arkansas Historical Preservation Program. Accessed online at http://www.arkansaspreservation.com/ on June 10, 2008.

[6] Brooks Blevins, *Hill Folks: A History of Arkansas Ozarkers and Their Image* (Chapel Hill: University of North Carolina Press, 2001), 18-24.

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The Cane Hill Road is clearly shown on a United States government survey map made in 1834.[7] This road ran from Fayetteville to Cane Hill and on to Van Buren by way of Hermannsberg and Vineyard Post. Though there were several fords to cross, the lower route avoided several steep mountain climbs and was heavily traveled throughout the early nineteenth century. As early as 1836, the Washington County court appointed overseers for maintenance of the Cane Hill Road.[8] J. H. Colton's 1855 map of Arkansas shows the road leaving southwest from Fayetteville, crossing the Illinois in approximately the same place as the current bridge and turning south toward Sweet Home.[9]

Sweet Home post office closed in 1846 but was still listed on Colton's 1855 map. Little is known about the history of Sweet Home. Buchanan's church and school remained—Buchanan died in 1857—and a local stage route passed through the village but little else was located there. The local stage between Fort Smith and Fayetteville attracted the attention of John Butterfield who was looking for routes for his new stage operation—Butterfield's Overland Mail. Butterfield and his engineers examined the possibility of using the Cane Hill Road. Locating a good road was apparently a difficult task, as one newspaper editor noted, "We have no roads of any kind except a few that are merely cut out and not fit to travel over. It does not appear that the people of this state manifest more apathy on the improvement of the roads of the State than any other State of the Union."[10]

Ultimately, Butterfield's Overland Mail bypassed the Cane Hill route in favor of the Boston Mountain Road which, though in just as rough condition, had only two fords. The Cane Hill route through the valleys required fording five unbridged river crossings: it crossed the Illinois River at Cane Hill, the Barren Fork of the Illinois near Dutch Mills, Evansville Creek, Mountain Fork Creek, Natural Dam Creek, and Lee Creek between Evansville and Cedarville. Additionally, rain soaked the clay soils and quickly made sticky, slow roads that were highly likely to mire animals and wagons alike.[11] The Cane Hill Road between Fort Smith and Fayetteville through Sweet Home was so well traveled that by 1859 Washington County built a bridge over the Illinois River at Cane Hill. The *Fayetteville Arkansian* noted, "We are gratified to learn that the long talked of bridge across the Illinois [River] at Cane Hill crossing is in a fair way of being built."[12]

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[7] Surveyor of Public Lands, Little Rock Office, Nicholas Rightor, *Township 14 North of the baseline, Range 33 West of the 5th Prime Meridian* [map]. First Edition. Scale: 40 chains to the inch, Little Rock, Arkansas Territory: privately printed, 1832. Available online at the Bureau of Land Management, General Land Office Records, http://www.glorecords.blm.gov, document management identifier 5756. Accessed 12 June 2008.

[8] Washington County Court, Court Record Book A, 26.

[9] J. H. Colton, *Arkansas* [map]. Edition unknown. Scale: 1:1,013,760. New York: J. H. Colton & Co., 1855.

[10] *Fort Smith Herald* quoted in Robert B. Walz, "Migration into Arkansas, 1820-1880: Incentives and Means of Travel," *Arkansas Historical Quarterly* Volume XVII, No. 4 (Winter 1987): 321.

[11] Mary Frances Ezell, "The Problem of Selecting the Northern Arkansas Route for the Butterfield Overland Mail," *Arkansas Historical Quarterly* Volume XVII, No. 3 (Autumn 1958): 237.

[12] *Fayetteville Arkansian*, quoted in Ezell, 235.

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Archibald Borden's establishment of the Ada post office near the former site of Sweet Home, and Buchanan's farmstead, in 1857 is indicative of a significant population in the area. The location remained no more than a village surrounded by widely dispersed farms yet the population of the county nearly doubled in the decade between 1850 and 1860. As population grew in the central and western parts of Washington County the Cane Hill Road grew in importance. The population would soon find itself in the middle of the Civil War.

At the outbreak of the Civil War the road became a strategic route between Fort Smith and northwest Arkansas. The Cane Hill Road was very heavily traveled by confederate forces, union forces, renegade bands, and refugees. In November of 1862 a confederate force under General John S. Marmaduke marched north along the Cane Hill Road from Fort Smith. They confiscated supplies from homes and mills in the fertile prairie area known as Cane Hill and returned to Fort Smith. On their second foraging trip to this location they were met by the 5,000 men of the Union's Army of the Frontier. The battle began in the afternoon on the 28th near Boonesboro. Nine hours of fighting led to a minor Union victory. This engagement at Cane Hill led to the battle of Prairie Grove on December 7, 1862.[13]

The presence of General James Blunt and his Union force in Washington County provoked the Confederate forces into sending 12,000 soldiers north to attack the federal army. General Francis J. Herron and his force arrived after a three day march from Springfield, Missouri. Marching southwest along the Cane Hill Road Herron's force arrived at the Illinois River and came under fire from Confederate artillery. To relieve his position Herron ordered a new road cut to a ford just north of the current location of the Highway B-29 bridge.[14]

Herron reported to his commanders, after the battle at Prairie Grove, "I then ordered Colonel Huston, commanding the Second Division, to cut a road through the timber, and move Battery F (Captain Murphy), First Missouri Artillery, to a point on the south side of the creek [Illinois River], and half a mile from the regular ford, my intention being to draw the fire of the enemy, to enable my infantry to cross the creek at the ford. The movement was entirely successful."[15] Herron's artillery was able to clear the ridge of confederate artillery. Archibald Borden's yard was the scene of a back-and-forth battle with heavy fighting.

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[13] Don Montgomery, "Engagement at Cane Hill," *Arkansas Encyclopedia of Arkansas History* available online at http://encyclopediaofarkansas.net/Default.aspx. Accessed 13 June 2008.

[14] Don Montgomery, "Prairie Grove Campaign," *Arkansas Encyclopedia of Arkansas History* available online at http://encyclopediaofarkansas.net/Default.aspx. Accessed 13 June 2008.

[15] United States War Department, *War of the Rebellion: Official Records of the Union and Confederate Armies*; Series 1, Vol. 22, Part 1 (Washington: GPO, 1899), 106. Thanks to Alan Thompson, Museum Registrar at Prairie Grove Battlefield State Park for his assistance.

By the evening of the 7th both sides suffered similar losses, however the battle was considered a Union victory. Though raiding parties and guerilla action continued throughout the war, confederate forces would not return to northwest Arkansas or southern Missouri.

Colonel James P. Neal, who earned the honor of Colonel in the Mexican War, returned to the Ada/Sweet Home area in 1870. Neal, a lawyer, was the step-son of Andrew Buchanan and upon returning from Texas repurchased the scattered parts of the family farmstead. In 1871, Neal established the Prairie Grove post office and determined to establish the town. Only a year later Rogers & Baggett opened a blacksmith shop and wagon-shop. By 1875, the town had a large dry-goods store house and by 1877 the McPhetridge, Baggett, & Rogers interests constructed a large steam grist mill. The small town was surveyed and laid out in 1877 though it was not incorporated until 1888.[16]

As the nineteenth century neared its end Prairie Grove was quickly becoming the center of a very productive farming community. The arrival of the St. Louis and San Francisco Railroad in Washington County brought about an agricultural boom of sorts, especially in the production of fruits. Washington and Benton counties, as early as 1869, accounted for half of the state's fruit production, producing a combined $68,000 dollar harvest. However shipping the fruits to market proved uneconomical in that relatively small amounts of fruit could be shipped by wagon and the distance shipped was limited by rot; which in-turn limited market availability.[17]

The lack of markets and the inability to capitalize on large shipments resulted in a decline in the fruit harvest, reaching a low point in 1879, when only $20,000 dollars of fruit was harvested.[18] The arrival of the railroad in Washington County made it possible to reach significantly larger markets and to get the produce to those markets while it was still fresh. In speaking of Washington County fruits, particularly apples, Goodspeed's entry on Washington County notes, "These, heretofore raised for home consumption, have, since the advent of the Frisco Railway, been raised almost exclusively for commercial purposes, and become famous throughout the country."[19]

[16] Goodspeed Publishing Company, *The Goodspeed Biographical and Historical Memoirs of Northwestern Arkansas* (Chicago: Goodspeed Publishing Co., 1889; reprint Easley, SC: The Southern Historical Press, 1971), 265. Susan Parks-Spencer, "Prairie Grove (Washington County)," *Arkansas Encyclopedia of Arkansas History* available online at http://encyclopediaofarkansas.net/Default.aspx. Accessed 13 June 2008.
[17] Blevins, 42.
[18] Ibid.
[19] Goodspeed, 140.

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In 1881, the St. Louis and San Francisco Railroad (the Frisco) completed its line from Springfield, Missouri, to Fort Smith, Arkansas, through Benton and Washington Counties. Within five years of completion, canneries, cold storage warehouses, and packing houses opened in Springdale, Fayetteville, Rogers and other cities along the railroad. Though it was approximately nine miles to the railroad at Fayetteville, Prairie Grove was home to two canning factories by 1889. The Prairie Grove Canning and Evaporating Factory had a capacity of 10,000 cans per day and used over 250 bushels of fruits and vegetables at full production.[20]

By 1889, Washington County's apple harvest was 200,000 bushels. Of course apples were not the only produce grown by Washington County farmers; grapes, tomatoes, and strawberries made significant harvests as well.[21] This change in agricultural focus and shift in economic centers had unique ramifications on the villages and roadways of central Washington County. The movement of agricultural products toward railroad loading points increased traffic from the southwestern corner of Washington County.

The products of the Prairie Grove Canning and Evaporating Factory and the Prairie Grove Mills were transported up the Cane Hill Road to warehouses and shippers in Fayetteville. Livestock, hay, poultry, milk, and other agricultural commodities not processed in canneries were also transported to Fayetteville for shipment to markets in larger cities. In this way, the condition and quality of the roadways in central and southwestern Washington County became more important and the demand for better roads grew.

The increasing availability and use of automobiles and trucks brought consistent increases in traffic counts along the Prairie Grove-Fayetteville/Cane Hill Roads. Traffic census completed by the Arkansas Highway Commission for the Twelfth and Thirteenth Biennial Reports show steady traffic counts between 500 and 1000 automobiles a day.[22] These numbers were for traffic studies completed after the construction of the Highway B-29 Bridge. Nevertheless they show that while the majority of the state's highways saw between 100 and 200 cars per day, the Cane Hill Road was a busy route, even prior to the traffic study.

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[20] Ibid., 266.

[21] Blevins, 42-44; For more on the fruit harvest see also, Thomas Rothrock, "A King that Was" *Arkansas Historical Quarterly*, Volume XXXIII, No. 4 (Winter 1974): 326-33; and Carl H. Moneyhon, *Arkansas and the New South, 1874-1929* (Fayetteville: University of Arkansas Press, 1997), 63.

[22] Arkansas Highway Commission, *Twelfth Biennial Report of the Arkansas State Highway Commission for the Period From July 1, 1934 to June 30, 1936* (Little Rock: privately printed, 1936), 35. Hereafter referred to as AHC, *Twelfth*. Arkansas Highway Commission, *Thirteenth Biennial Report of the Arkansas State Highway Commission for the Period From July 1, 1936 to June 30, 1938* (Little Rock: privately printed, 1938), 27. Hereafter referred to as AHC, *Thirteenth*.

The high, and increasing, traffic counts in the county and across the state were cause for concern among the county governments and the state's highway department. Not only were many of the roads unpaved and narrow but many lacked adequate bridges. As engineers for the Arkansas Highway Commission noted, "Many of the improved roads are being damaged from the excessive loads on trucks and other vehicles and from tractors and engines having lugs or cleats upon the wheels, and from the excessive speed of some of these vehicles, as well as heavy pleasure cars."[23] They continued, "The great majority of bridges in the State were designed for loads far below those passing over them."[24]

Washington County Judge George Appleby noted in 1918 that Washington County's streams were well bridged. He noted additionally, "There is a general demand for good roads in Washington County and nearly all the principal roads have been graded and culverts placed."[25] Indeed, Washington County had one of the more active road programs in the state. From its beginning the Washington County Court was involved with some aspect of roadways. They were appointing overseers, viewers, and commissioners to maintain, change, or layout roads in every session of the Court from the first onward. The first county records show the appointment of overseers to layout two separate roads. One from Franklin to Damon's Lick on Lee Creek and the other from Fayetteville to the southern boundary of the county, "at or near Cove Creek."[26] In July of 1837, the Court appointed commissioners to oversee construction of one of the first public bridges in the county over the dam at Dugan's Mill on the White River.[27] In October of that year they ordered construction of a bridge across the mill dam at Fisher's Mill, also on the White River.[28]

On a state level, the organization of comprehensive road network was much slower to come to fruition. Act 302 of 1913 created the State Highway Department as a part of the Department of State Lands. This newly created department served more in an advisory capacity than as a true regulatory body. It was not until after the Federal Aid Road Acts of 1916 that the state gained some control over the road network in Arkansas. Act 338 of 1915, more commonly known as the Alexander Law, enabled counties to form local road districts for improvement and construction of roads. Under this act Washington County formed several road districts to assess property taxes for road improvements.[29]

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[23] Arkansas Highway Commission, *Fourth Biennial Report of the Department of State Lands, Highways, and Improvements for the Period Ending September Thirtieth Nineteen Twenty* (Little Rock: privately printed, 1921), 171. Hereafter referred to as ACH, *Fourth*.

[24] Ibid.

[25] Arkansas Highway Commission, *Third Biennial Report of the Department of State Lands, Highways, and Improvements for the Period Ending November Thirtieth, Nineteen Eighteen* (Little Rock: privately printed, 1918), 86.

[26] Goodspeed, 163, 164.

[27] Washington County Court, Court Record Book A, 140.

[28] Ibid., 203.

[29] A brief discussion of the legislative history of road law in Arkansas can be found in Arkansas Highway Commission, *Eighth Biennial Report of the Department of State Lands, Highways, and Improvements for the Period Ending June 30, 1928, Supplemented to the Period Ending September 30, 1928* (Little Rock: H. G. Pugh & Co., 1929). There were at least ten separate

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These road districts continued to actively improve roads throughout the county. Through the early twentieth century the demand for good roads in Washington County continued to grow. This was the result of several factors; however it was primarily due to economic growth in both the farming and logging industries. The increase in automobile and truck ownership further created demand for good roads. The Arkansas Highway Commission's 1920 report shows a growth in automobile licensure of 13 percent between 1919 and 1920. In 1920, there was one car for every 13 people in the county, bringing over $27,000 dollars of revenue to the county for road improvements.[30]

Local road districts retained control of maintenance and construction of new roads in their districts through the early 1900s. In 1923, the Arkansas legislature passed Act 5 during a special session. This act, commonly called the Harrelson Road Law, was enacted to comply with the Federal Aid Acts of 1921. The Act required the creation of a state highway system compromising no more than seven percent of the state's transportation network; approximately 6,700 miles.[31] With the establishment of the State Highway System, the Cane Hill Road/Prairie Grove Road was designated Highway B-29.

Under the new highway system, federally funded highways were designated as "A" roads. Highways with a "B" designation were Secondary Federal Aid Roads while highways marked with "C" designations were connecting state roads. Highway B-29 was a graded road that ran from Fayetteville through Prairie Grove to Summers where it connected with Highway C-1.[32] The B-29 designation didn't last long. Following the recommendations of the American Association of State Highway Officials and the United States Bureau of Public Roads, the Arkansas Highway Commission reorganized the state highway system in 1925. Highway B-29 became Arkansas Highway 45.[33]

As a secondary federal aid road, work projects on the Cane Hill Road—Highway B-29—often consisted of nothing more than grading and drainage improvements. Federal construction funds were regularly diverted to primary federal aid roads. The Highway Department noted frequently in its annual reports that state funding was not adequate to meet the incredible demand for road construction and improvement.

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road districts formed in Washington County between 1907 and 1920. For more see Washington County, Court Record Books U, V, and W.

[30] AHC, *Fourth*, 171.

[31] AHC, *Twelfth*, 11.

[32] Arkansas State Highway Department, *Map of State of Arkansas Showing System of Primary and Secondary Federal Aid Roads and Connecting State Roads and Progress of Improvements* [map]. Scale: 10 miles to the inch. Little Rock, AR: privately printed, 1924.

[33] Arkansas State Highway Department, *State of Arkansas Showing System of State Highways* [map]. Scale: Not Given. Little Rock, AR: privately printed, 1926. Arkansas Highway 45 from Fayetteville to Prairie Grove was designated U. S. Highway 62 in 1930.

The result was that in many instances funding for improvement fell to the county. Washington County was one of the more active counties in the state at supporting road construction and improvement of roads. Unable to secure federal or state funding to replace the bridge on the Cane Hill Road/Prairie Grove Road, Highway B-29, the county decided to pay for construction of a bridge over the Illinois River at Prairie Grove.

Luten Bridge Company of Little Rock won the contract to construct the bridge. The bridge constructed is a one span, filled-spandrel reinforced concrete bridge. To complete the bridge at a lower cost the original deck was not concrete but dirt covered in gravel. It is said, though undocumented, that the county had the concrete work done by the Luten Bridge Company but that local citizens and contractors were responsible for filling the spandrels and finishing the roadway.

Filled—or closed—spandrel arch bridges were the specialty of the Luten Bridge Company. In fact they were of particular interest to Daniel B. Luten, the civil engineer who designed the bridges. Luten specialized in reinforced concrete bridges. His designs and innovations led to a number of patents and for many years in the early twentieth century, an almost complete monopoly on concrete arch bridge construction.

By the 1920s, concrete was very commonly used in bridge construction. Concrete is a mixture of an aggregate—usually sand, gravel, or both—cement, and some amount of water. The cement holds everything together. Portland Cement is the cement most often used in concrete construction. It was first patented in 1848 in Portland, England. The first use of it in the United States is generally attributed to David O. Saylor who, in 1871, patented the American equal to Portland cement and began a manufacturing plant. Frederick Law Olmstead is credited with the first design of a concrete-arch bridge for his Central Park in New York.[34]

Portland cement was widely used in the United States for concrete construction by the early 1890s.[35] The Columbian Exhibition of 1893 though, brought concrete to the fore. This exhibition depended heavily on the use of concrete in its classical designs and bridges. The bridges were based heavily on Roman designs and featured filled spandrels, ornate balustrades, and facades designed to simulate real stone. From the exhibition grew a demand for design of buildings and structures that were elegant, fit naturally into their surroundings, and yet had a feel of grandeur. The imprint of the exhibition on the American landscape would be felt for many years to come.

[34] James L. Cooper, *Artistry and Ingenuity in Artificial Stone: Indiana's Concrete Bridges 1900-1942* (Greencastle, IN: privately printed, 1997), 9.
[35] Ibid.

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In bridge and road design, the post Columbian Exhibition movement toward classical designs was called the City-Beautiful movement.[36] One of the critics of the City-Beautiful movement was Daniel B. Luten. In opposition to his peers who supported the City-Beautiful movement Luten once noted, "A concrete arch, in harmony with its surroundings, but without ornamentation is an exceedingly beautiful structure."[37]

Luten was a civil engineer who received his engineering training at the University of Michigan. He graduated in 1894 and then was asked to teach in the engineering staff of the university. In 1895, he took a position in the engineering school at Purdue University where he taught Architectural and Sanitary engineering.[38] Several years of teaching left Luten dissatisfied with what he perceived as the academic professionals' lack of empirical knowledge about engineering. As he once noted, "College professors, 'are not leaders in engineering,'" and that in fact, they are, "'almost always years behind the practical men of the profession.'"[39] This dissatisfaction led Luten to resign his post at Purdue to become a practical man.

As reinforced concrete construction gained notoriety and acceptance Luten made it his material of choice. He noted in *The Railroad Gazette* in 1902 that, "A concrete arch is a structure that grows continually stronger with age, both because of the continual increase in strength of concrete and because of the impacting of earth filling on the arch and back of the abutments."[40] Basing his future on the superiority of concrete, Luten made his name by changing the way bridges—especially reinforced concrete bridges—were designed in the United States.

In an article published in 1902 Luten questioned the practicality of John C. Trautwine's theorems on arch, culvert, and bridge design. Trautwine's works *Curves*, *Excavations and Embankments*, and *The Civil Engineer's Pocket Book* were widely accepted in American engineering practice as the standard to follow.[41] On the offensive, Luten noted that the majority of the reinforced concrete structures being built in the United States were being built using Trautwine's antiquated formulas—in the standards and designs of stone bridges.

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[36] Two, of many, good books on the City-Beautiful movement are William H. Wilson, *The City Beautiful Movement* (Baltimore: Johns Hopkins Press, 1989) and Jon A. Peterson, *The Birth of City Planning in the United States*, 1840-1917 (Baltimore: Johns Hopkins Press, 2003).

[37] Daniel B. Luten, "Bridges" in *Proceedings of the Eight Annual Convention of the National Association of Cement Users, Vol. III* by the American Concrete Institute (Detroit, MI: American Concrete Institute, 1912), 631.

[38] Cooper, 38.

[39] Daniel B. Luten quoted in Cooper, 38.

[40] Daniel B. Luten, "Design of a Concrete-Steel Arch Culvert," *Railroad Gazette*, 1 August 1902, 608.

[41] John C. Trautwine, *The Field Practice of Laying Out Circular Curves for Railroads* (Philadelphia: R. W. Barnard, 1851); *A New Method of Calculating the Cubic Contents of Excavations and Embankments, By the Aid of Diagrams* (Philadelphia: R. W. Barnard & Sons, 1851); *The Civil Engineer's Pocket Book of Mensuaration, Trigonometry, Surveying, Hydraulics* (Philadelphia: Claxton, Remsen & Haffelfinger, 1871).

This, Luten noted, "[Results] in a clumsy, awkward section that is far from efficient when concrete is the material used."[42] Instead of accepting Trautwine's empirical formulas Luten used the nineteenth century designs of Viennese Professor, Joseph Melan, and the American, Edwin Thacher as the basis for his innovations. Both Melan and Thacher used reinforcing metal to provide support for their concrete arches. Melan's designs however could more correctly be called metal bridges encased in concrete; with rolled I-beam girders supporting the weight of the bridge and the concrete serving as decorative and protective coatings.[43]

Thacher took Melan's designs and decreased the amount of metal used in the reinforcing by substituting flat bars or rods. Thacher also redesigned the location of the bars in the top and bottom of the ring. In this way the reinforcing courses acted independently of one another and provided additional strength. Thacher also designed his system to have smaller piers and anchors by carrying the reinforcing metal into the abutment. This small design change redirected the thrust of the ring more toward vertical giving the bridge greater carrying capacity while using less material.[44]

Luten took all of these designs and pushed them further. Like all engineers, Luten focused on empirical design; however, he felt that determining calculations for each specific job was a waste of time and money. Luten developed a series of calculations that he applied to each bridge. With these calculations Luten developed a set of two corollaries both of which stressed that the bridge should be assessed as a whole and not as pieces. Luten's corollaries led him to integrate the bridge components more completely than had his predecessors.

Assessing the bridge as a whole unit led Luten to better utilize the entire bridge structure. The spandrel walls, which once were designed to only hold dirt fill, were connected in Luten design to the arch rings and extended beyond the abutments.[45] In this way, Luten placed more weight on the ends of the bridge and increased leverage to support more weight in the middle. Increasing the spandrel wall height and weaving the reinforcing rods through the bridge helped add strength across the bridge and allowed for less concrete in the spandrel walls. By reducing the material and adding strength Luten was able to reduce the size of his piers and abutments. Between 1902 and 1911 Luten received seven patents including the steel-tied arch, the ring-stiffening spandrel, and the arch-ring reinforcing method. By 1915, Luten held 39 U.S. Patents and designed over 6,000 bridges in the U.S., Mexico, Canada, and Japan.[46]

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[42] Daniel B. Luten, "Warped Ends for Concrete Arch Culverts," *Railroad Gazette*, 3 October 1902, 761.
[43] Cooper, 15, 16.
[44] Ibid., 39-41.
[45] Ibid., 44-50.
[46] Jayne H. Feigle, *Andrew J. Sullivan Memorial Bridge, Spanning Cumberland River, Williamsburg vicinity, Whitley County, KY*, Historic American Engineering Record No. KY-31 (July 2000), http://memory.loc.gov/ammem/collections/habs_haer/ [Accessed 06/21/2007]. One of Luten's business related innovations that had a more dramatic effect on the history of engineering in the

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The Highway B-29 Bridge served as the primary means of crossing the Illinois River northeast of Prairie Grove until 1928. Governor John Martineau worked diligently toward the improvement of the highway system of Arkansas during 1927 and 1928. His efforts to enhance the system were focused primarily on changing the financing structure from the centuries old-land based system to a user-based tax system. With these changes the highway department began improvements and new construction along Arkansas's highways. This included rerouting Arkansas Highway 45 toward a more direct route into Prairie Grove. At the completion of construction 1928 the Highway B-29 Bridge became a county bridge on a county roadway; serving then much as it does today.

**Statement of Significance**

The Highway B-29 Bridge—also known as Bridge #17390, Black Nursery Road Bridge, County Road 623 Bridge, Prairie Grove Road Bridge, Fayetteville-Prairie Grove Road Bridge, Cane Hill Road Bridge—is exemplar of the deck arch bridge design in Arkansas. It was built by Washington County in 1923 and retains good integrity of setting and remains unaltered. As one of Daniel B. Luten designs, the bridge is exemplary not only of Luten's engineering design but of the influence of the Arkansas Highway and Transportation Department on road and bridge construction in the state.

The Highway B-29 Bridge is being nominated to the National Register of Historic Places with **local significance** under **Criterion C** as a good example of reinforced concrete, filled-spandrel bridge construction. It is a good example of Daniel B. Luten bridge design in Washington County, Arkansas. The bridge is also being listed under **Criterion A** for its association with transportation in Washington County. The Highway B-29 Bridge is being submitted to the National Register of Historic Places under the multiple property listing "Historic Bridges of Arkansas."

United States was his licensing program. Luten used his corollaries and established computations to apply bridge design to multiple locations. In this way he was able to license, for a fee, his design to independent companies who built Luten bridges. Ultimately Luten was taken to court for this practice and in several high profile cases ultimately had his patents stripped from him.

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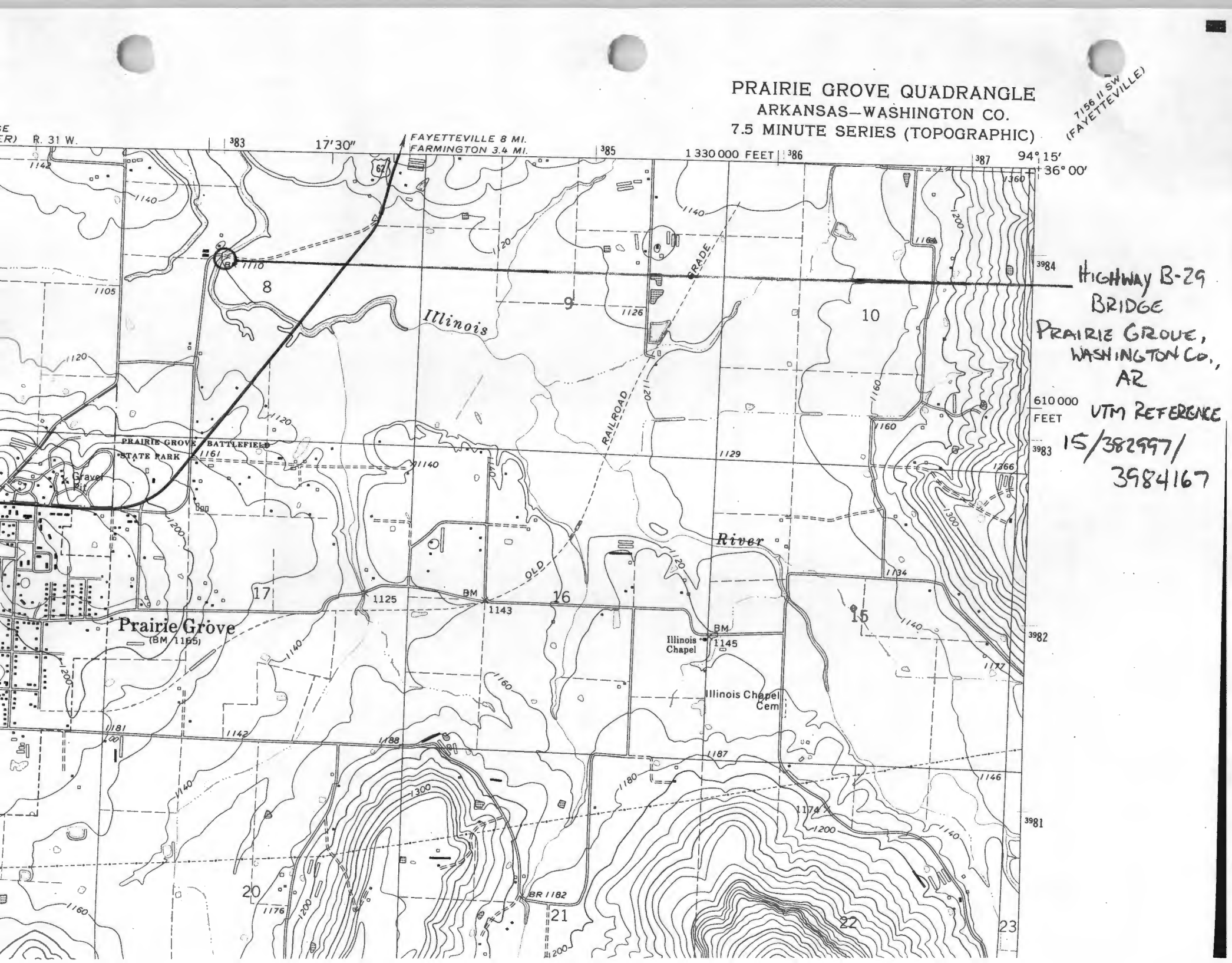
**Verbal Boundary of Description**

Beginning thirty (30) feet on the east side of Highway B-29 Bridge, Bridge #17390, and running west and north for one hundred eighty (180) feet. Extending fifteen (15) feet from the centerline to the north and south of the Highway B-29 Bridge for a total width of thirty (30) feet.

**Boundary Justification**

The boundary encompasses all of the land historically associated with the Highway B-29 Bridge.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