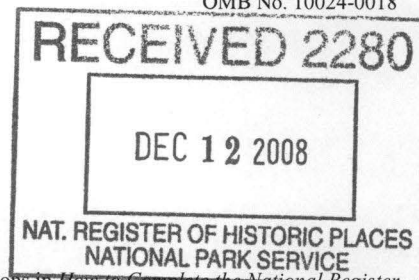


United States Department of the Interior  
National Park Service

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 Illinois River Bridge at Phillips Ford

other names/site number Washington County Road 848 Bridge, Bridge #17405 / Site # WA0961

2. Location

street & number Robinson Road/County Road 848 over the Illinois River

☐ not for publication

city or town Savoy

☒ vicinity

state Arkansas code AR county Washington code 143 zip code 72704

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.)

Catherine Hatch  
Signature of certifying official/Title

12/3/08  
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:) \_\_\_\_\_

Edson H. Beall  
Signature of the Keeper

1-22-09  
Date of Action

Illinois River Bridge at Phillips Ford

Name of Property

Washington County, Arkansas

County and State

## 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

## 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.)

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## National Register of Historic Places Continuation Sheet

Section number 7 Page 1

### Summary

Illinois River Bridge at Phillips Ford, Bridge #17405, carries Robinson Road across the Illinois River in the Wedington Wildlife Management Area of the Ozark-St. Francis National Forest. Prior to the formation of the National Forest this bridge provided safe transportation for rural northwest Washington County. The bridge is a reinforced concrete, filled-spandrel arch built in 1926. It consists of two spans of a total length of approximately 168 feet with a height above water of approximately thirty (30) feet.

### Elaboration

Luten Bridge Company of Knoxville, Tennessee built the reinforced concrete, filled—or closed—spandrel arch bridge over the Illinois River in northwestern Washington County in 1926. This was one of 12 bridges to be built by Luten of Knoxville in the county. The bridge is of Luten's standard design with gently sloping, shallow arches, spandrel walls topped with coping at the deck, and solid balusters with square inset detail, and rounded piers. The double span bridge is approximately 168 feet long with equal spans of eighty-one (81) feet. The bridge is approximately thirty feet above the water and the deck is fifteen (15) feet wide. As was common on Luten bridges, the walls were brush hammered and 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, IN. 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 #17405, as numbered by the Arkansas Highway and Transportation Department, connects rural, northwestern Washington County, near Savoy, with rural, southern Benton County on what is now known as Robinson Road, or County Road 848. The bridge is in Section 23, Township 17 North, Range 32 West. It is at this point that the Illinois River rounds the north end of Wedington Mountain and runs in a westerly direction to the east side of Twin Mountains. County Road 848 takes a route directly north through the river valley to Robinson in Benton County. This road, and bridge, over the Illinois River provided important access to rural farms and timber interests in northern Washington County and southern Benton County. With safe passage over the Illinois at this point farmers could easily truck their agricultural goods to the economic and shipping points at Fayetteville, Rogers, and Springdale. As part of the National Forest this area is more rural than it was when the bridge was completed.

Illinois River Bridge at Phillips Ford  
Name of Property

Washington County, Arkansas  
County and State

United States Department of the Interior  
National Park Service

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### Integrity

Illinois River Bridge at Phillips Ford, Bridge #17405, retains good integrity. The county transportation department has done an excellent job in maintaining the bridge. The earthen fill bridge never had a concrete deck, nor was it macadamized, or paved. There is some erosion of the roadway and exposure of the interior walls on the southern end of the bridge. There is however no major damage, nor major repairs, to the bridge.



**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**

1926-1959

**Significant Dates**

1926

**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

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## National Register of Historic Places Continuation Sheet

Section number 8 Page 1

### Summary

The Illinois River Bridge at Phillips Ford, Bridge #17405, 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 #17405 is being submitted to the National Register of Historic Places under the multiple property listing "Historic Bridges of Arkansas."

### Elaboration

Washington County was formed from Lovely County on 17 October 1828. In the 1830 census the population was 2,182. By 1840, that population had grown an astonishing 327 percent to 7,148 people.<sup>1</sup> This early settlement was primarily in the prairies of the Springdale Plateau and in the valleys along the county's rivers and creeks. The fertile woods and prairies along the Illinois River were prime locations for establishing homesteads. At one such location, Township 17 North, Range 32 West, the Illinois River is shown on the Surveyor General's 1839 map as winding its way through scattered prairies and woodlands. It was here, in section 23, that John Kinchloe, William P. Clary, and Samuel Wilson chose to settle.<sup>2</sup> Samuel Wilson claimed the large, open prairie in east half of the southeast quarter in 1843.<sup>3</sup>

As settlement of the county increased, and the desire to establish markets for agricultural surpluses arose, the demand for roads grew louder. On 12 October 1838 the Court appointed overseers and established a road fifteen feet wide from Fayetteville to John Still's saw mill on the West Fork of the White River. Prior to the establishment of Still's Mill Road, the county ordered the establishment of a Fayetteville & Richland Creek Road and Fayetteville & Middle Fork of White River Road.<sup>4</sup> From its beginning the Washington County Court was involved with some aspect of roadways. The first county record shows the appointment of overseers to layout two separate roads.

<sup>1</sup> Mathew Bryan Kirkpatrick, "Washington County," *The Encyclopedia of Arkansas History and Culture* online at <http://encyclopediaofarkansas.net/> accessed 17 September 2007.

<sup>2</sup> Land Patent Records of the Bureau of Land Management. Accessed online at <http://www.glorerecords.blm.gov>. Accessed 29 September 2008.

<sup>3</sup> Surveyor of Public Lands, Little Rock Office, David Fulton, *Township 17 North of the baseline, Range 38 West of the 5<sup>th</sup> Prime Meridian* [map], Scale: 40 chains to the inch. Little Rock, AR: privately printed, 1839. Available online at the Bureau of Land Management, General Land Office Records, <http://www.glorerecords.blm.gov>, document management identifier 6986. Accessed 29 September 2008.

<sup>4</sup> *Ibid.* Fayetteville & Richland Creek was established in 1836 and the Fayetteville & Middle Fork of the White River Road was established in January 1838. See Washington County Court, Court Record Book A, 32, 177.

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## National Register of Historic Places Continuation Sheet

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One road was laid out 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."<sup>5</sup> They were appointing overseers, viewers, and commissioners to maintain, change, or layout roads in every session of the Court from the first onward. 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.<sup>6</sup> In October of that year they ordered construction of a bridge across the mill dam at Fisher's Mill, also on the White River.<sup>7</sup>

Little is known of the early roadways along the Illinois River in the northern sections of Washington County. Maps of the Surveyor of Public Lands for Township 17 North, Range 32 West show no roadways or homesteads. County records make no note of appointment of overseers, or establishment of county roads. It is likely that antebellum roads in this section of the county were simply constructed by private individuals or local land owners, as was custom.<sup>8</sup> At least one antebellum map of Arkansas shows a road passing near the homesteads of Kinchloe, Clary, and Wilson. That road ran west from Fayetteville to Hillochee and then northwest toward Double Springs in Benton County.<sup>9</sup> There is very little known of the village of Hillochee. A post office by that name was established in 1850 in Section 23, Township 17 North, Range 32 West, along the Illinois River near the homesteads of Kinchloe, Wilson, and Clary. However the post office closed in 1868 and the village name disappears from maps by the early twentieth century.<sup>10</sup>

The first map to show Robinson Road and Phillips Ford is Garland V. Skelton's 1894 *Real Estate Atlas for Washington County*.<sup>11</sup> Population in the section had been slowly increasing through the nineteenth century. By 1850, there were 660 people living in the Marr's Hill Township. In 1860, that number grew to 952 and by 1870 that number increased to 1,280 inhabitants. The growth of Marr's Hill Township was so great—reaching 1,746 in 1880—that in 1885 a new township, Wheeler, was formed. Wheeler Township, north of Marr's Hill Township, claimed 473 inhabitants in 1890.<sup>12</sup>

<sup>5</sup> 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), 163, 164.

<sup>6</sup> Washington County Court, Court Record Book A, 140.

<sup>7</sup> *Ibid.*, 203.

<sup>8</sup> Robert W. Scoggin, "Roads and Highways." *Arkansas Encyclopedia of History and Culture Online*. Available at <http://encyclopediaofarkansas.net/>. Accessed 29 September 2008.

<sup>9</sup> J. H. Colton, "Arkansas" [map], Scale 1:1,013,760 (New York: J. H. Colton & Co., 1855).

<sup>10</sup> Russell Pierce Baker, *From Memdag to Norsk: A Historical Directory of Arkansas Post Offices 1832-1971* (Hot Springs: Arkansas Genealogical Society, 1988), 100.

<sup>11</sup> Garland V. Skelton, *Real Estate Atlas for Washington County, Arkansas* (Fayetteville, AR: privately printed, 1894).

<sup>12</sup> United States Department of the Interior, Bureau of the Census, *Seventh Census of the United States—1850* (Washington, DC: GPO, 1851), 546. Hereinafter referred to as Census, *Seventh*. United States Department of the Interior, Bureau of the Census, *Statistics of the Population of the United States, Ninth Census-Volume I* (Washington, DC: GPO, 1872), 89. Hereafter referred to as Census, *Ninth*. United States Department of the Interior, Bureau of the Census, *Report on the Population of the United States at the Eleventh Census: 1890, Part I* (Washington, DC: GPO, 1895), 68. Hereafter referred to as Census, *Eleventh*.

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Skelton's 1894 map shows that the 160 acres originally owned by William P. Clary belong to James H. Phillips. The Robinson Road—connecting Robinson in Benton County with Wheeler and Viney Grove, both in Washington County—runs north and south bisecting Phillips' property. A structure, believed to be Phillips' home, sat on the east side of the road south of the Illinois River. It was here that the Robinson Road crossed the Illinois River however there was no bridge and travelers were required to ford the river, thus the name Phillips Ford. Phillips had two large orchards and the entire 160 acres under cultivation.<sup>13</sup> This would have made Phillips' farm larger than the average farm in Washington County at the end of the nineteenth century; the average being only 119 acres.<sup>14</sup>

As early as 1840, Washington County was the state's most productive agricultural county. By 1869, Washington and Benton Counties 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.<sup>15</sup> 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.<sup>16</sup> The arrival of railroads 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."<sup>17</sup>

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. The Ozark and Cherokee Central Railroad, completed 1902, provided rail service through the Illinois River valley westward from Fayetteville through Prairie Grove to Tahlequah, Oklahoma.

<sup>13</sup> Skelton, Township 17—Range 32.

<sup>14</sup> There were 1,094 farms of 50 to 100 acres and 1,962 farms of 100 to 500 acres. United States Department of the Interior, Bureau of the Census, *Report on the Statistics of Agriculture in the United States at the Eleventh Census: 1890* (Washington, DC: GPO, 1895), 124.

<sup>15</sup> Brooks Blevins, *Hill Folks: A History of Arkansas Ozarkers and Their Image* (Chapel Hill: University of North Carolina Press, 2001), 17-24, 42.

<sup>16</sup> *Ibid.*, 42.

<sup>17</sup> Goodspeed, 140.



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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.<sup>18</sup> Farmers like James H. Phillips growing apples or other produce on their farms utilized the Robinson Road to take agricultural products to the Ozark and Cherokee Central or to the canneries at Prairie Grove.

Increasingly, this northern portion of Washington County became more and more isolated. The growth of railroad traffic and road construction through the late nineteenth and early twentieth centuries consolidated the population centers and directed traffic away from this part of the county. After reaching a peak population of 549 people in 1900, Wheeler Township lost population in subsequent census, declining to 383 by 1920.<sup>19</sup>

As the young nineteenth century progressed, large areas of unclaimed lands in this section remained in the hands of the federal government. Scattered small farms could be found on the mountain tops overlooking larger farms in the Illinois River valley. As in the rest of the county, the fruit and vegetable harvests were very important to the economic well being of the local farmers. Just as important was the farmers' ability to get those products to market. County Judge George Appleby commented in 1918, "There is a general demand for good roads in Washington County and nearly all the principal roads have been graded and culverts placed."<sup>20</sup>

Washington County was very active in building and maintaining roads for settlement, public safety, and economic development. 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.<sup>21</sup>

<sup>18</sup> Goodspeed, 266.

<sup>19</sup> United States Department of the Interior, Bureau of the Census, *Fourteenth Census of the United States taken in the year 1920. Population 1920*. (Washington, DC: GPO, 1921), 352.

<sup>20</sup> 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.

<sup>21</sup> 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 road districts formed in Washington County between 1907 and 1920. For more see Washington County, Court Record Books U, V, and W.



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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.<sup>22</sup>

One of the most important areas needing road improvements was apparently the bridges. Appleby noted in 1918 that Washington County's streams were well bridged. The state engineers however, felt differently, "the great majority of bridges in the State were designed for loads far below those passing over them."<sup>23</sup> The report further recommended replacement of inadequate bridges to withstand heavier vehicles and loads. Indeed, though the County Judge claimed in 1918 that the county's streams were well bridged, the citizens of the county petitioned for construction of thirteen new bridges on October 27, 1921.<sup>24</sup>

Washington County was one of the more active counties in the state at supporting road construction and improvement of roads. With no bridge over the Illinois at this point, crossing the river at Phillips' Ford would have been extremely difficult if not impossible at moderate to high water. To promote public safety and promote economic growth in this area of the county, the county government decided to build a bridge at the Ford.

Luten Bridge Company of Knoxville 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.

<sup>22</sup> 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*.

<sup>23</sup> ACH, *Fourth*, 171.

<sup>24</sup> Washington County Court, Court Record Book V, 69.

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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.<sup>25</sup>

Portland cement was widely used in the United States for concrete construction by the early 1890s.<sup>26</sup> 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.

In bridge and road design, the post Columbian Exhibition movement toward classical designs was called the City-Beautiful movement.<sup>27</sup> 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.”<sup>28</sup>

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.<sup>29</sup> 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.’”<sup>30</sup> This dissatisfaction led Luten to resign his post at Purdue to become a practical man.

<sup>25</sup> James L. Cooper, *Artistry and Ingenuity in Artificial Stone: Indiana’s Concrete Bridges 1900-1942* (Greencastle, IN: privately printed, 1997), 9.

<sup>26</sup> Ibid.

<sup>27</sup> 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).

<sup>28</sup> 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.

<sup>29</sup> Cooper, 38.

<sup>30</sup> Daniel B. Luten quoted in Cooper, 38.

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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."<sup>31</sup> 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.<sup>32</sup> 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.

This, Luten noted, "[Results] in a clumsy, awkward section that is far from efficient when concrete is the material used."<sup>33</sup> 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.<sup>34</sup>

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.<sup>35</sup>

<sup>31</sup> Daniel B. Luten, "Design of a Concrete-Steel Arch Culvert," *Railroad Gazette*, 1 August 1902, 608.

<sup>32</sup> 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 Mensuration, Trigonometry, Surveying, Hydraulics* (Philadelphia: Claxton, Remsen & Haffelfinger, 1871).

<sup>33</sup> Daniel B. Luten, "Warped Ends for Concrete Arch Culverts," *Railroad Gazette*, 3 October 1902, 761.

<sup>34</sup> Cooper, 15, 16.

<sup>35</sup> *Ibid.*, 39-41.

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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.<sup>36</sup> 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.<sup>37</sup>

The Luten Bridge Company of Knoxville completed the bridge in 1926. It did not meet however, the goal of increasing settlement in the section or improving the economic stability of those in this part of the county. Ultimately, this section of the county continued to decline. Farm soils in the Illinois River valley and along the nearby mountains decreased in productivity. By the early 1930s the Great Depression placed severe hardships on the people of the Illinois River valley. Recovery programs like the Works Progress Administration or the Civilian Conservation Corps were important in providing Arkansans with some economic stability.

The Wedington Wildlife Management Area of the Ozark-St. Francis National Forest, in which the bridge is currently located, was formed as a part of a Soil Conservation Service (SCS) project in the mid-1930s. Civilian Conservation Corps workers provided the labor while the SCS funded their erosion control efforts. Erosion control and flood control work was carried out on both public and private lands.

<sup>36</sup> Ibid., 44-50.

<sup>37</sup> 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/](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 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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Upon completion of the erosion control programs the Soil Conservation Service lands became part of the U. S. Forest Service lands.<sup>38</sup> Now in a National Forest, the bridge has remained well preserved and sees little traffic.

### Statement of Significance

The Illinois River Bridge at Phillips Ford, Bridge #17405, 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 #17405 is being submitted to the National Register of Historic Places under the multiple property listing "Historic Bridges of Arkansas."

<sup>38</sup> The Soil Conservation Service was part of the U.S. Department of Agriculture. The SCS had funding for programs but used the CCC for labor. Douglas Helms, "The Civilian Conservation Corps: Demonstrating the Value of Soil Conservation," *Journal of Soil and Water Conservation* 40, no. 2 (April 1985): 184-88. Reprinted online at <http://www.nrcs.usda.gov/ABOUT/history/articles/ccc.html>. Accessed 2 October 2008.



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National Park Service

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Illinois River Bridge at Phillips Ford  
Name of Property

Washington County, Arkansas  
County and State

## 10. Geographical Data

Acreage of Property Less than one

### UTM References

(Place additional UTM references on a continuation sheet.)

1 15 377803 3999774  
Zone Easting Northing  
2 \_\_\_\_\_

3 \_\_\_\_\_  
Zone Easting Northing  
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 2 October 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

**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listing. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*)

**Estimated Burden Statement:** Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P. O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20303.

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National Park Service

## National Register of Historic Places Continuation Sheet

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### Verbal Boundary of Description

Beginning thirty (30) feet on the south side of Bridge #17405 and running north and west for two hundred and thirty (230) feet. Extending fifteen (15) feet from the centerline to the east and west of Bridge #17405 for a total width of thirty (30) feet.

### Boundary Justification

The boundary encompasses all of the land historically associated with the Illinois River Bridge at Phillips Ford, Bridge #17405.



UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES  
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Illinois River Bridge at Phillips Ford

MULTIPLE NAME: Historic Bridges of Arkansas MPS

STATE & COUNTY: ARKANSAS, Washington

DATE RECEIVED: 12/12/08 DATE OF PENDING LIST: 12/31/08  
DATE OF 16TH DAY: 1/15/09 DATE OF 45TH DAY: 1/25/09  
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 08001344

REASONS FOR REVIEW:

APPEAL: N DATA PROBLEM: N LANDSCAPE: N LESS THAN 50 YEARS: N  
OTHER: N PDIL: N PERIOD: N PROGRAM UNAPPROVED: N  
REQUEST: N SAMPLE: N SLR DRAFT: N NATIONAL: N

COMMENT WAIVER: N

☒ ACCEPT ☐ RETURN ☐ REJECT 1.22.09 DATE

ABSTRACT/SUMMARY COMMENTS:

**JAN 22 2009**

**Entered in  
The National Register  
of  
Historic Places**

RECOM./CRITERIA \_\_\_\_\_

REVIEWER \_\_\_\_\_ DISCIPLINE \_\_\_\_\_

TELEPHONE \_\_\_\_\_ DATE \_\_\_\_\_

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.



1. Illinois River Bridge at Phillips Ford
2. Washington County, AR
3. Sarah Sampole MARKS
4. February 2007
5. Arkansas Historic Preservation Program
6. West elevation looking Northeast
7. #1,





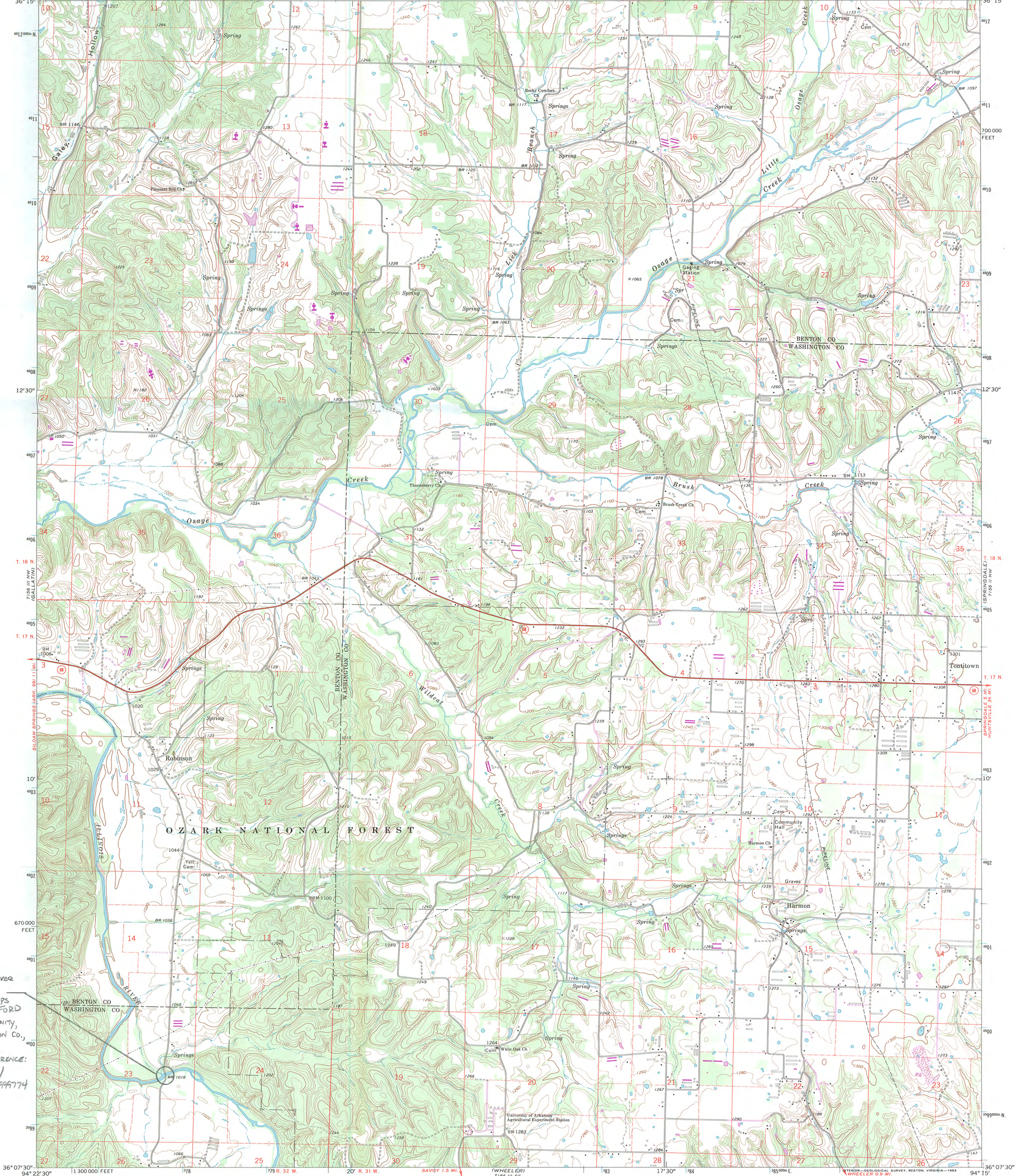
1. Illinois River Bridge at Phillips Ford
2. Washington County, AR
3. Sarah Jampole Marks
4. February 2007
5. Arkansas Historic Preservation Program
6. South bridge approach looking North
7. # 2.



DESIGNED AND BUILT  
BY  
LUTEN BRIDGE CO.  
KNOXVILLE TENN.  
1926.

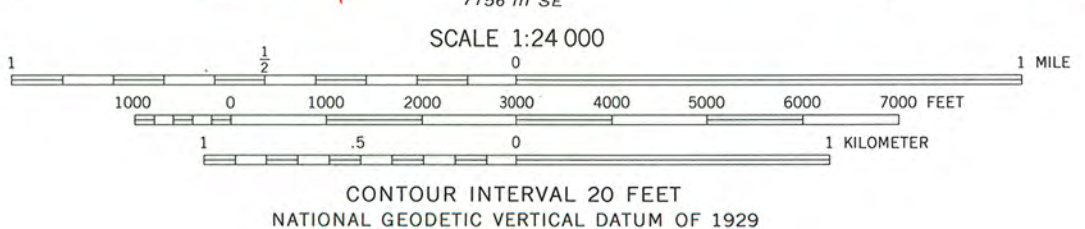
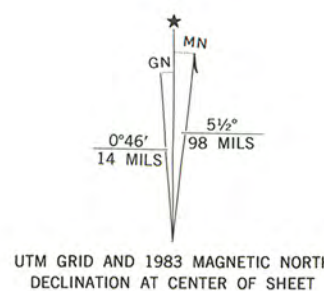
1. Illinois River Bridge At Phillips Ford
2. Washington County, AR
3. Sarah Jampole Marks
4. February 2007
5. Arkansas Historic Preservation Program
6. Builder's plaque, west guardrail, center, looking west
7. #3





Illinois River  
BRIDGE  
AT PHILLIPS  
FORD  
SAVOY VICINITY,  
WASHINGTON CO.,  
AR  
UTM REFERENCE:  
15/37803/  
3995774

Mapped, edited, and published by the Geological Survey  
Control by USGS and USC&GS  
Topography by photogrammetric methods from aerial  
photographs taken 1968. Field checked 1970  
Polyconic projection. 1927 North American datum  
10,000-foot grid based on Arkansas coordinate system, north zone  
1000-meter Universal Transverse Mercator grid ticks,  
zone 15, shown in blue  
To place on the predicted North American Datum 1983  
move the projection lines 5 meters south and  
18 meters east as shown by dashed corner ticks  
There may be private inholdings within the boundaries of  
the National or State reservations shown on this map  
Revisions shown in purple and woodland compiled in cooperation with  
U. S. Forest Service from aerial photographs taken 1980 and other sources  
Partially field checked by U. S. Forest Service. Map edited 1983



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION  
Primary highway, all weather, Light-duty road, all weather,  
hard surface improved surface  
Unimproved road, fair or dry  
weather  
State Route

ROBINSON, ARK.  
N3607.5-W9415.7.5  
1970  
PHOTOREVISED 1983  
DMA 7156 III NE-SERIES V884







The Department of  
**Arkansas  
Heritage**

Mike Beebe  
Governor

Cathie Matthews  
Director

Arkansas Arts Council

Arkansas Natural Heritage  
Commission

Delta Cultural Center

Historic Arkansas Museum

Mosaic Templars  
Cultural Center

Old State House Museum



Arkansas Historic  
Preservation Program

1500 Tower Building  
323 Center Street  
Little Rock, AR 72201  
(501) 324-9880  
fax: (501) 324-9184  
tdd: (501) 324-9811

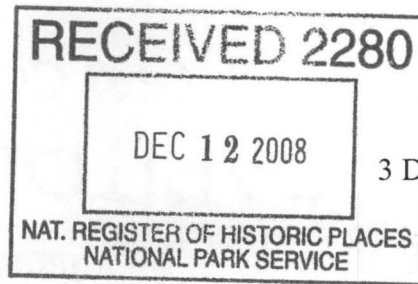
e-mail:

[info@arkansaspreservation.org](mailto:info@arkansaspreservation.org)

website:

[www.arkansaspreservation.com](http://www.arkansaspreservation.com)

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3 December, 2008

Dr. Janet Matthews  
Chief of Registration  
United States Department of the Interior  
National Register of Historic Places  
National Park Service  
8<sup>th</sup> Floor  
1201 Eye Street, NW  
Washington, D.C. 20005

RE: Illinois River Bridge at Phillips Ford, Savoy vicinity, Washington  
County

Dear Dr. Matthews,

We are enclosing for your review the above-referenced nomination. The  
Arkansas Historic Preservation Program has complied with all applicable  
nominating procedures and notification requirements in the nomination process.

If you need further information, please call Van Zbinden of my staff at (501)  
324-9789. Thank you for your cooperation in this matter.

Sincerely,

Cathie Matthews  
State Historic Preservation Officer

CM:vz

Enclosure