NPS Form 10-900
(Rev. 8-86)

NK listed 4/4/90 OMB No. 1024-0018

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 of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Lincoln Avenue Viaduct
other names/site number Cantrell Road Bridge
HAER No. AR-6

2. Location

street & number State Highway 10, spanning the Missouri-Pacific Railroad ☐ not for publication N/A
city, town Little Rock ☐ vicinity N/A
state Arkansas code 05 county Pulaski code 119 zip code 72201

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
☐ private	☐ building(s)	____	____ buildings
☒ public-local	☐ district	____	____ sites
☐ public-State	☐ site	1	____ structures
☐ public-Federal	☒ structure	____	____ objects
	☐ object	1	____ Total

Name of related multiple property listing:
Historic Bridges of Arkansas

Number of contributing resources previously listed in the National Register N/A

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, 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 forth in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official — 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.

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this 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

6. Function or Use

Historic Functions (enter categories from instructions)

Transportation/Road-Related

Current Functions (enter categories from instructions)

Transportation/Road-Related

7. Description

Architectural Classification
(enter categories from instructions)

Other: Rainbow Arch

Materials (enter categories from instructions)

foundation reinforced-concrete
walls steel
concrete
roof
other

Describe present and historic physical appearance.

☒ See continuation sheet

SUMMARY

The Lincoln Avenue Viaduct is a single span reinforced-concrete Rainbow Arch. It supplies vehicular access across the Missouri-Pacific Railroad lines on State Highway 10 in downtown Little Rock, Arkansas. It is in good condition with minor alterations and is currently being maintained by the City of Little Rock. A new steel girder bridge has been constructed adjacent to its south elevation.

ELABORATION

The Cantrell Road Bridge is a rainbow arch bridge with a total length of 144 feet, comprised of ninety foot long arches and 24 foot long concrete deck approaches on either end. The two arches support a thirty foot wide roadway, with a five foot sidewalk on the north side. Each arch is a steel frame covered with concrete to create continuity between the different structural parts. The concrete was poured to form panels in the faces of each visible member.

The arches, entirely above the road deck, spring from the top of concrete piers to a maximum height of twenty-one feet. The piers are made from two rectangular columns connected by beams at the top and bottom. Ten hangers suspend the floor slab from the arch. Two top lateral struts connect the arches at the fourth and seventh hangers. Beams connect all the pairs of hangers. The floor, beams, hangers, and the portions of the arches to which the hangers are attached were simultaneously covered with concrete to form one continuous reinforced concrete support structure.

The floor and curb, which are probably reinforced with a grid of longitudinal wires and transverse rods, are continuous across the approaches and the arch span. The balustrade handrail crosses the bridge from one abutment to the other. The reinforced concrete rail is on a sidewalk suspended from extensions of the ties on the north side of the bridge.

The sidewalk balustrade on the south side of the bridge has been removed and the south sidewalk has been incorporated into a new steel girder bridge built immediately adjacent to the south elevation of the as a one-way couplet. This new bridge that does not distract or significantly alter the integrity of the Lincoln Avenue Viaduct.

SUMMARY

The Lincoln Avenue Viaduct is an outstanding and unaltered Arkansas example of a reinforced-concrete Rainbow Arch bridge type and reflects the historic context of the Arkansas Highway and Transportation Era: 1923-1939. Designed by the Missouri Pacific Railroad Company and presented to the City of Little Rock as a corporate gesture of goodwill, the Lincoln Avenue Viaduct was the first and only through rainbow arch in the city. As an example of a single span reinforced concrete bridge of through rainbow arch design it remains unique in Arkansas. It was built by The Ozark Engineering Company of Joplin, Missouri in 1928, and though it has lost a balustrade on the west side and has had a second bridge built adjacent to it, the Lincoln Avenue Viaduct is remarkably well preserved. This bridge is nominated under Criteria A and C for statewide significance.

ELABORATION

The Lincoln Avenue Viaduct, a reinforced concrete rainbow arch bridge, was opened at 2:05 p.m. on Friday, December 28, 1928 and, despite later alterations it remains particularly well preserved.[1] It was built as part of a general improvement undertaken by the Missouri Pacific Railroad Company, the most important railroad company in the state.[2] The improvements were part of the reconstruction of Little Rock after the damage wrought by the infamous spring floods of 1927.[3] On the morning of April 21, the Missouri Pacific railroad bridge crossing the Arkansas River, the Old Baring Cross Bridge, was taken away by the floods. The bridge linked the company's workshops on the north side of the river, in North Little Rock, with the railroad station, Union Station, on the south side. The efficient reconstruction of this link across the Arkansas was vitally important to the company's continued success. The replacement of the old bridge was an important undertaking which included the construction of a new viaduct across the tracks at Lincoln Avenue.

THE OLD BARING CROSS BRIDGE

Alexander Baring, an English banker who came to America in the late nineteenth century, married into the multimillionaire Bingham family of Philadelphia. He was a regular visitor to the then fashionable resort of Hot Springs, but was dissatisfied with the uncomfortable ferry crossing of the Arkansas River at Little Rock. Realizing that a bridge across the river would be a lucrative investment "...he told the people he could build them a mighty nice bridge with $300,000 of his wife's money. That she wouldn't mind.[4] The construction of the bridge was undertaken in association with the Cairo and Fulton Railroad Company which, since 1853, had held rights to cross the river. This company, founded in 852 to construct a railroad from Cairo, Illinois to Fulton near Texarkana, Arkansas, was to operate the bridge after its completion.

Baring organized and financed the Baring Cross Bridge Company on April 8, 1872, with James M. Loughborough as Commissioner.[5] The bridge, built of wood, was opened on December 21, 1873, and was the first railroad route across the river. The limited longevity of its wooden structure required regular renovation. By 1890 the wooden beams of the bridge had decayed and were replaced by steel. However, the basic structure survived until the floods of April, 1927.

MISSOURI PACIFIC RAILROAD COMPANY

The Missouri Pacific Railroad company was the most important railroad system in Arkansas. With 1,796 miles of Class One railroads in Arkansas by 1936, its nearest competitor having less than half that mileage, and its workshops situated in North Little Rock, the railroad company was a major factor in the economy of the whole state.[6] The significance of the company was reinforced in 1927 when Alderman George R. Gay, at a

sitting of the Little Rock City Council, proposed that a holiday be specifically devoted to the Missouri Pacific Company, when "state, county and city officials will be invited to participate in a parade."[7] It was in this fashion that the city acknowledged its debt to the company.

The Missouri Pacific lines were incorporated in 1907 with John G. Drew as president. This incorporation absorbed the St. Louis, Iron Mountain and Southern Railroad, a descendant of the Cairo and Fulton. It was thus that the Missouri Pacific Company came into possession of the Old Baring Cross Bridge. With the loss of the bridge in the floods, the Missouri Pacific Railroad Company began immediate preparations for its replacement. Included in its considerations regarding the new bridge was the general improvement of the railroad's lines through Little Rock. The company intended to replace the old viaduct across the lines at Lincoln Avenue with a new structure in "the latest type of bridge construction."[8]

ORDINANCE 4335

The construction of The Lincoln Avenue Viaduct was undertaken by the Missouri Pacific Railroad Company as a cost-free service to the City of Little Rock. However, the railroad construction needed appropriate authorization from the City through its officials, the City Council. In the passing of Ordinance 4335, on May 28, 1928, such authority was granted.[9] The ordinance was entitled:

> "An ordinance providing for the construction and maintenance by the Missouri Pacific Railroad Company of a viaduct over its right of way and tracks connecting Cross Street with North Street and for the closing of North Street across the railroad companys right of way and tracks and the removal of the old viaducts"[10]

The ordinance was first read before the City Council on May 14, 1928. It was presented by Alderman Lange and, by his own motion, referred to the Street Committee. The Street Committee, overseeing the city's streets and their facilities, returned the ordinance on May 28 "with recommendation that the ordinance be passed."[11] That day, the obligatory second and third readings of the ordinance were made at the sitting of the City Council, and the ordinance was voted on and unanimously passed. Its passing was documented in the Council Records as follows:

> "The ordinance, having been read the first time on May 14, 1928, was then read the second time and, by unanimous vote of the members of the Council present, being eighteen in number and all of the members of the council elect, the rules were suspended and the ordinance read the third and last time and the aye and no vote taken upon the question, Shall the Ordinance pass, the result being as follows; Ayes - ...total 18; Noes - none; absent and not voting - none. Whereupon, the said ordinance was declared passed."[12]

The ordinance registered the following undertakings by The Missouri Pacific Railroad Company: 1. That the company would construct and maintain over its railroad tracks at Lincoln Avenue "a re-inforced concrete viaduct with a 30 foot clear roadway and five foot sidewalks on either side...".[13] 2. That company would furnish, open and dedicate to the public the viaduct and its accesses.[14] 3. That the company would remove "the old present existing viaducts" at Lincoln Avenue and North Street.[15]
4. That all the above "be furnished, constructed and done by the Missouri Pacific Railroad Company... at its sole cost and without expense to the City of Little Rock."[16]

These provisions were undertaken by the company in return for which the city of Little Rock abandoned the old viaducts and its right of way across the tracks at North Street.[17] Little Rock also resolved to return the

rights and titles of the viaduct and its accesses to the company "in the event that at any time the street or way...shall be abandoned by the public or the city."[18]

CONSTRUCTION AND OPENING

> "The new viaduct on Lincoln Avenue across the tracks of the Missouri Pacific Lines, one of the most beautiful structures of its kind in the country, was opened at 2:05 p.m. yesterday."[19]

The new viaduct was built as a replacement for two older viaducts; one its direct predecessor at Lincoln Avenue and the other at North Street, abandoned by the City under Ordinance 4335. The old Lincoln Avenue Viaduct "was built of wood and steel, [materials] now obsolete in bridge construction."[20] The new viaduct, "in contrast", featured "the rainbow arch design... said by engineers to be the latest type of bridge construction".[21] It was begun in September, 1928 and "required more than three months to build, and the labor alone cost more than $20,000. The total cost of $50,000 was carried by the railroad company."[22]

The bridge was designed by the railroad company and built--under the supervision of the railroad company's chief engineer in St. Louis, E. A. Hadley--by the Ozark Engineering Company of Joplin, Missouri under the direction of its own foreman, Ray Bishop. The completed viaduct was opened with "brief opening ceremonies, at which two automobiles bearing members of the Street Committee of the City Council were the first to cross the new structure."[23] This opening took place before the approaches were completed. These could not "...be laid for several weeks on account of having to let the fills at either end settle."[24]

The completed viaduct and its accesses were discussed with great appreciation in the Little Rock Year Book of 1929. The Year Book contained reports by the Mayor and other city officials of work done during their year in office. The report on the Lincoln Avenue Viaduct registered the city's appreciation of, and indebtedness to, the Missouri Pacific Railroad Company:

> "Alignment between the streets is very much improved and the general appearance is pleasing. Most of the material used was purchased locally. The City of Little Rock is under many obligations to the Missouri Pacific Railroad for its many improvements to the City"[25]

VIADUCT DESIGN

The Arkansas Gazette described the completed bridge as being:

> "...143 feet 10 inches in length, overall. The span across the tracks is 96 feet four inches, while there are 24-foot approaches at either end. It is provided with five-foot sidewalks on either side giving it a width of 50 feet six inches. The roadway is 30 foot wide while the arch rings extend 21 feet over and above the roadway."[26]

The arch rings referred to the most distinctive aspect of the bridge, its through arch construction. The Arkansas Gazette was impressed with "the rainbow arch design", where the deck of the bridge passes through the structure at the arch, a popular though never common method of bridge construction of the time.[27] With walkways "protected by ornamental concrete handrails," the design was complete.[28]

MARSH'S ARCH

> "In a bridge, the combination with the abutments, parapets along the side walls thereof, a pair of arches springing from points in the abutments below the upper edges of their walls, and beams integrally connecting said arches at two points between the abutments."[29]

Such was the description James Marsh provided of what was new in his Marsh arch. As defined by Patent 1,035,026, Marsh's arch had its arches springing from inside the inner faces of the abutments, and rising to "carry their crowns above the line of the floor for quite some distance at the center of the bridge."[30] The floor rested "slidably" on beams, below it, connecting the arches. The floor also rested "slidably" on the abutments. The points of friction were set with "wear plates" which absorbed the friction. Parapet protection was provided for by rails.

The basic elements of the patented arch were that the arch rose through the deck line, supporting the floor above its springing line, and that the deck and beams were "slidably connected" at appropriate points. A second summary of his patent was given by Marsh, with the reinforced arch specified. This, however, merely elaborated more fully on the basic principals of the Marsh arch patent.

MARSH'S ARCH AND THE LINCOLN AVENUE VIADUCT

The structure of the Lincoln Avenue Viaduct does not involve a basic specification of Marsh's classic 1912 patent and its design does not have the arches "springing from points in the abutments (or piers) below the upper edges of their walls.[31] As such neither this viaduct or similar designs such as the Second Street Bridge, do not qualify as "Marsh Arches" proper, despite classifications to the contrary.[32] While these designs might well have included the expansion and construction elements specified in the Marsh patent, Marsh clearly required the support of the deck by beams connecting the arches above the springing line. Consequently the use of the term "Marsh Arch" in the context of the Lincoln Avenue Viaduct is inappropriate.

Endnotes

1. "Missouri Pacific Viaduct is Opened." Arkansas Gazette, December 29, 1928, p. 12. The viaduct lost a balustrade in AHTD road development, but, apart from its context, is otherwise unchanged. c.f. AHTD files cited in bibliography.

2. Murray, J.C., "States Fine Transportation Facilities." Arkansas Centennial, Little Rock, 1936, pp. 65-66.

3. c.f. Arkansas Gazette, various articles, April,1927.

4. Anderson, W.A., "Goulds Southern Railroads." unpublished, p. 49.

5. Murray, J.C., loc. cit., p. 65.

6. c.f. Murray, J.C., loc. cit. and Anderson, W.A. op. cit.

7. Council Record, Book VI, 1926-1928, City of Little Rock, p. 309.

8. "Missouri Pacific Viaduct is Opened." Arkansas Gazette, December 29, 1928, p. 12.

9. Council Record Book V, City of Little Rock, 1926-1928. May 14, 1928, p. 549 and May 28, 1928, p. 554. Also Ordinance 4335, May 28, 1928 of the City of Little Rock. The title remained unchanged.

10. ibid.

11. Council Record Book V, City of Little Rock, 1926-1928. May 28, p. 554.

12. ibid.

13. Ordinance 4335, City of Little Rock, Section 1.

14. ibid.

15. ibid., Section 2.

16. ibid.

17. ibid., Section 1.

18. ibid., Section3.

19. "Missouri Pacific Viaduct is Opened." Arkansas Gazette, December 29, 1928, p. 12.

20. ibid.

21. ibid.

22. ibid.

23. ibid.

24. ibid.

25. Little Rock Year Book. Reports to City Council for 1928, Little Rock, 1929, p. 96.

26. "Missouri Pacific Viaduct is Opened." Arkansas Gazette, December 29, 1928, p. 12.

27. ibid.

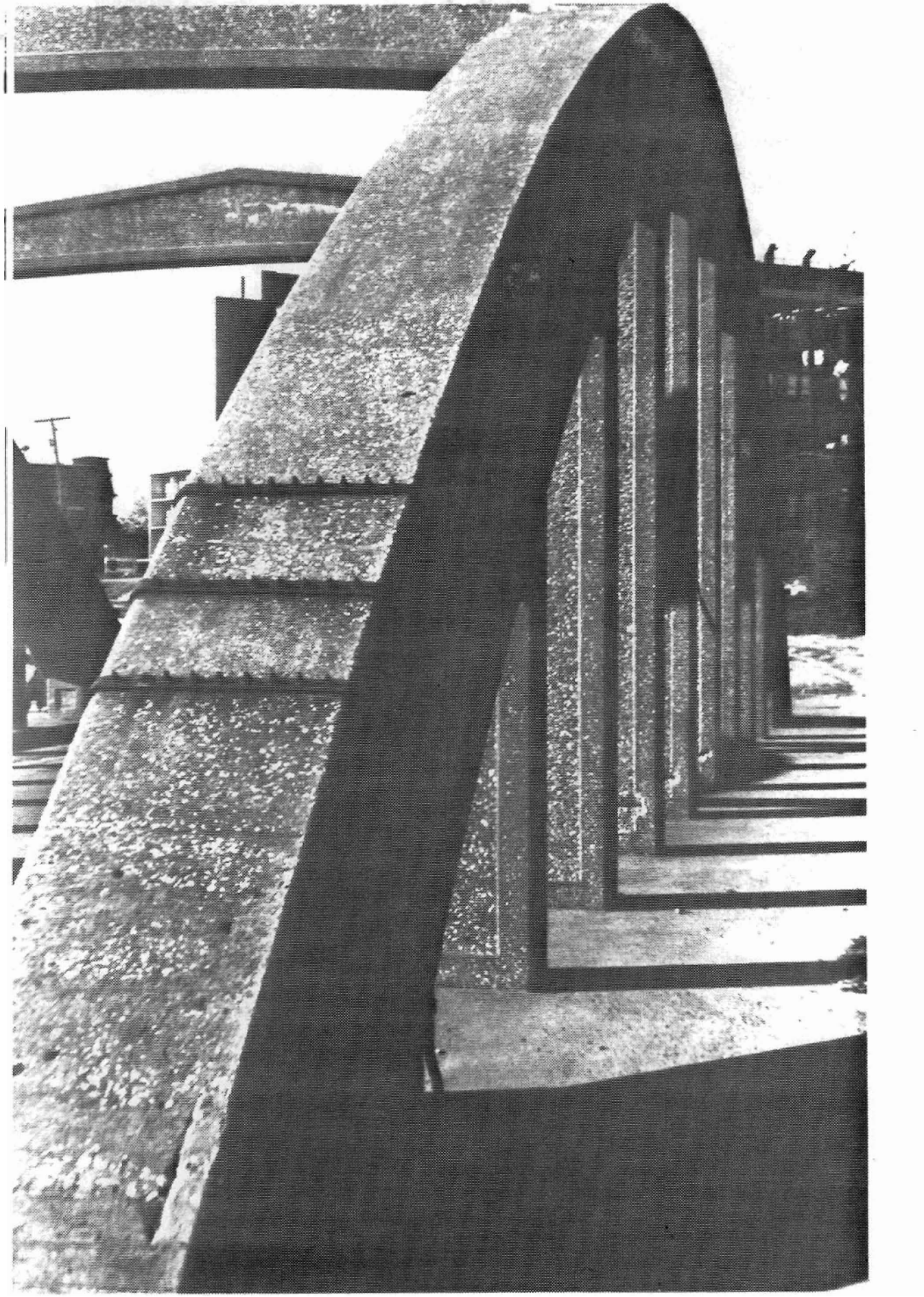
28. ibid.

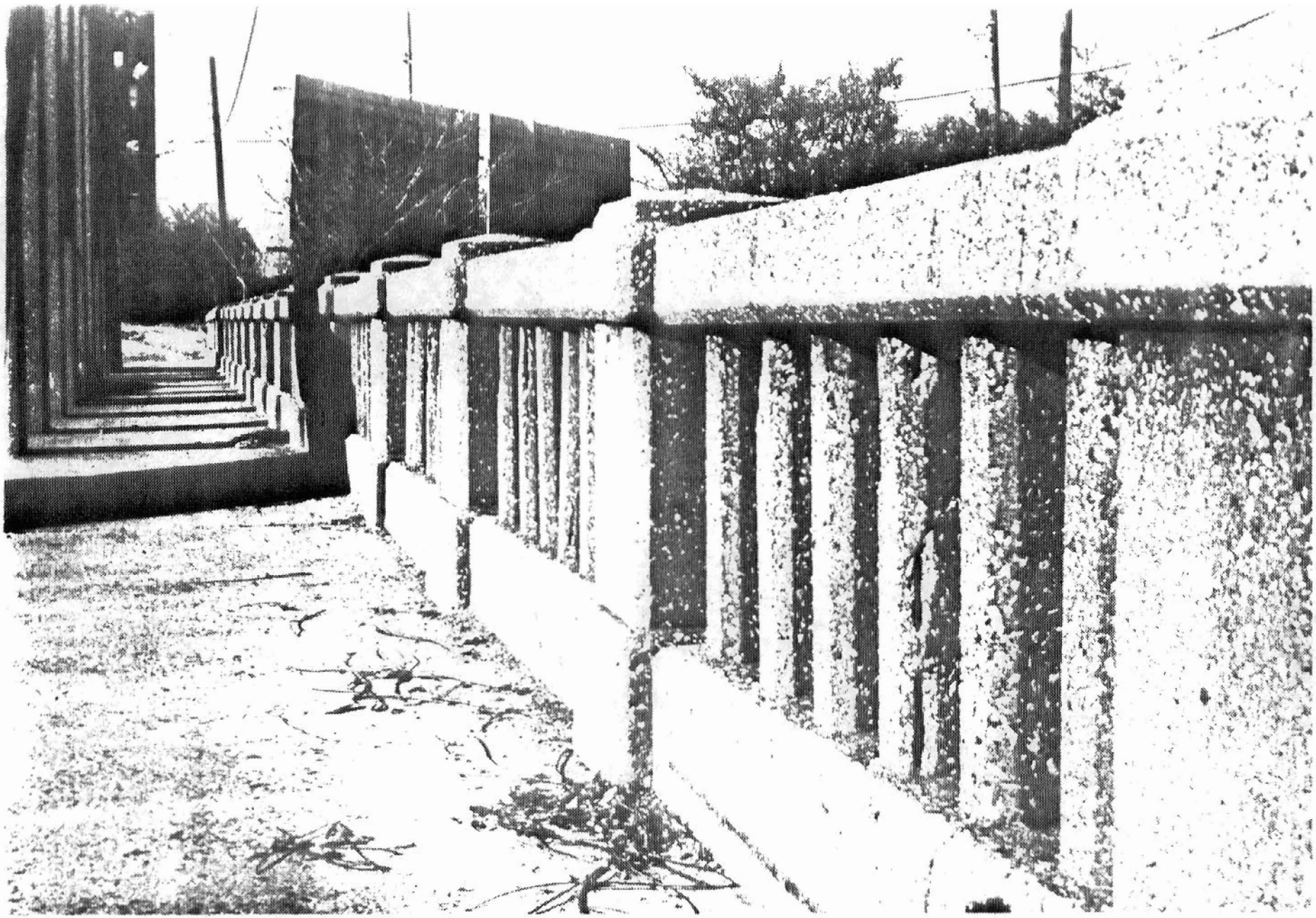
29. Patent 1035026, Page 3, Lines 55-61.

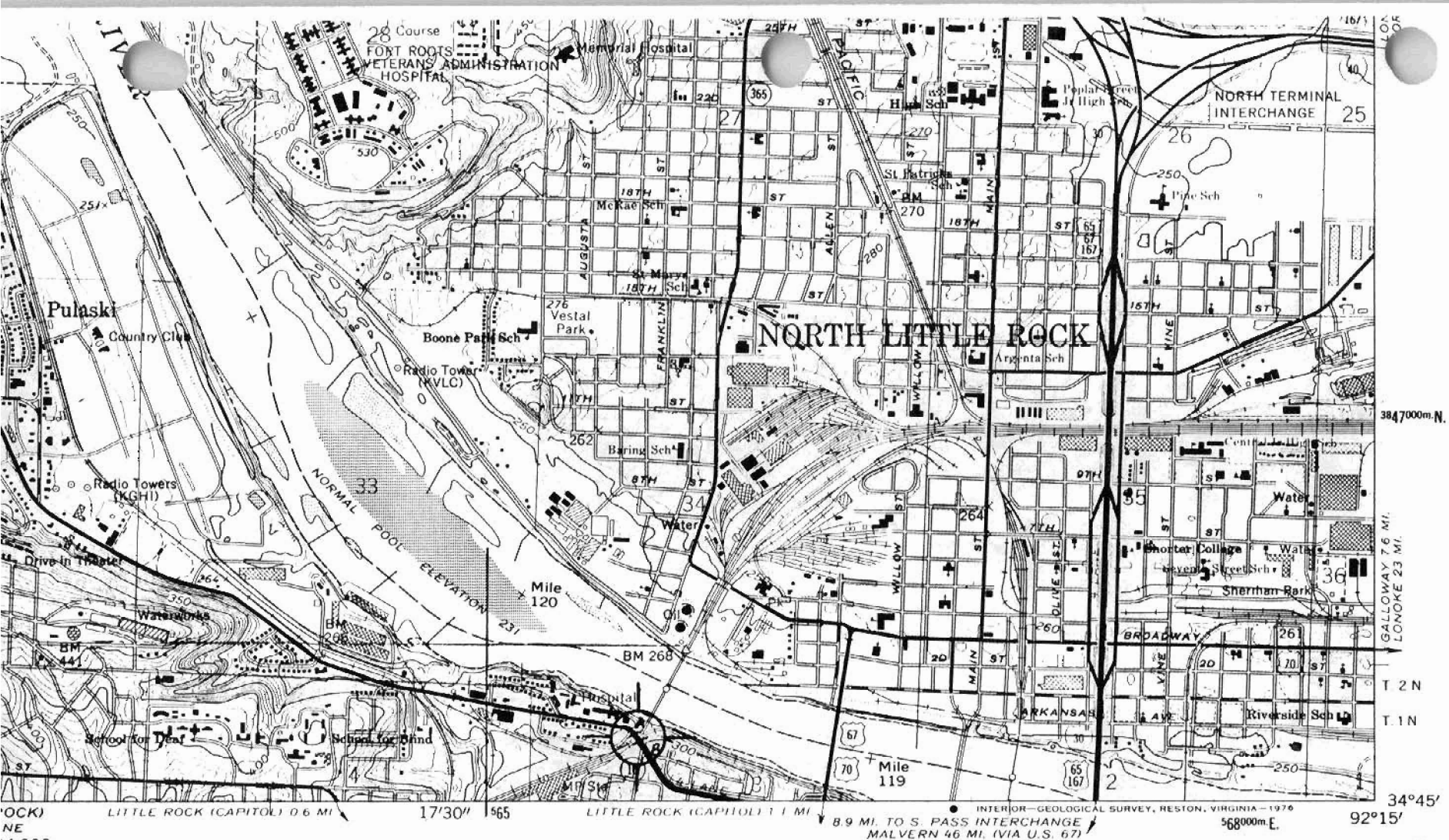
30. ibid., Page 1, Lines 93-95.

31. ibid.

32. O'Reilly, Sean. "Second Street Bridge, HAER No. AR-41." Washington, 1988.: c.f. also "Kansas" in Great American Bridges, Washington, 1988, pp. 206-208. The Cedar Creek Bridge at Elgin, though built by the Marsh Engineering Company, does not accord with the details of the patent discussed in the text of this report. i.e. The arches do not rise from the sides of the piers.







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T 5-FOOT CONTOURS
ICAL DATUM OF 1929

AL MAP ACCURACY STANDARD
COLORADO 80225, OR RESTON
ON, LITTLE ROCK, ARKANSAS .
ND SYMBOLS IS AVAILABLE ON REQUEST

Lincoln Avenue Viaduct
Little Rock, Arkansas
Pulaski County
A) 15/565610/4845640
B) 15/565625/4845610
North Little Rock Quadrangle
1:24,000

ROAD CLASSIFICATION

Heavy-duty — Light-duty

Medium-duty — Unimproved dirt

Interstate Route U. S. Route State Route

NORTH LITTLE ROCK, ARK.
N3445—W9215/7.5

1961

PHOTOREVISED 1970 AND 1975

AMS 7553 IV SE—SERIES V884

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☒ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)
Transportation
Engineering

Period of Significance
1928–1939

Significant Dates
1928

Cultural Affiliation
N/A

Significant Person
N/A

Architect/Builder
Architect: Missouri-Pacific Railroad Co.
Builder: Ozark Engineering Co.

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

☒ See continuation sheet

9. Major Bibliographical References

See Historic Bridges of Arkansas, Multiple Property Nomination, Section H.

☐ See continuation sheet

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 # HAER No. AR-6

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☒ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: U.S. Library of Congress

10. Geographical Data

Acreage of property Less than one acre

UTM References

	Zone	Easting	Northing
A	15	565610	484640
B	15	565625	484610
C			
D			

☐ See continuation sheet

Verbal Boundary Description

The boundary of the Lincoln Avenue Viaduct begins at the end of the west approach span, which is approximately 1,030 feet east of the intersection of State Highway 10 and Riverside Drive,then it continues for approximately 144 feet east across the Missouri-Pacific railroad lines, and then terminates at the east end of the west approach span.

☐ See continuation sheet

Boundary Justification

The boundary includes the main span, approach spans, piers, and abutments that are historically associated with this property.

☐ See continuation sheet

11. Form Prepared By

name/title Text by Sean O'Reilly & Corinne Smith; edited by Michael Swanda, Survey Coordinator
organization Arkansas Historic Preservation Program date August 15, 1989
street & number 225 East Markham Street telephone (501) 371-2763
city or town Little Rock state Arkansas zip code 72201