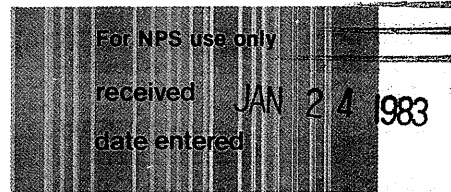


United States Department of the Interior  
National Park Service

National Register of Historic Places  
Inventory—Nomination Form



See instructions in *How to Complete National Register Forms*  
Type all entries—complete applicable sections

1. Name

historic Brush Creek Bridge (Rainbow)

and/or common Brush Creek Bridge

2. Location

street & number 3.4 Miles North<sup>5N</sup> of Baxter Springs N/A not for publication

city, town Baxter Springs vicinity  vicinity of ~~Congressional District~~

state Kansas code 20 county Cherokee code 21

3. Classification

<b>Category</b>	<b>Ownership</b>	<b>Status</b>	<b>Present Use</b>
<input type="checkbox"/> district	<input checked="" type="checkbox"/> public	<input checked="" type="checkbox"/> occupied	<input type="checkbox"/> agriculture
<input type="checkbox"/> building(s)	<input type="checkbox"/> private	<input type="checkbox"/> unoccupied	<input type="checkbox"/> commercial
<input checked="" type="checkbox"/> structure	<input type="checkbox"/> both	<input type="checkbox"/> work in progress	<input type="checkbox"/> educational
<input type="checkbox"/> site	<b>Public Acquisition</b>	<b>Accessible</b>	<input type="checkbox"/> entertainment
<input type="checkbox"/> object	<input type="checkbox"/> in process	<input type="checkbox"/> yes: restricted	<input type="checkbox"/> government
	<input type="checkbox"/> being considered	<input checked="" type="checkbox"/> yes: unrestricted	<input type="checkbox"/> industrial
	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> no	<input checked="" type="checkbox"/> transportation
			<input type="checkbox"/> other:

4. Owner of Property

name Cherokee County

street & number Courthouse

city, town Columbus N/A vicinity of state Kansas

5. Location of Legal Description

courthouse, registry of deeds, etc. Register of Deeds

street & number Cherokee County Courthouse

city, town Columbus state Kansas

6. Representation in Existing Surveys

title Inventory of Marsh Arch Bridges-  
Kansas Department of Transportation has this property been determined eligible?  yes  no

date 1980  federal  state  county  local

depository for survey records Kansas State Historical Society

city, town Topeka state Kansas

# 7. Description

<b>Condition</b>		<b>Check one</b>	<b>Check one</b>
<input type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input checked="" type="checkbox"/> unaltered	<input checked="" type="checkbox"/> original site
<input checked="" type="checkbox"/> good	<input type="checkbox"/> ruins	<input type="checkbox"/> altered	<input type="checkbox"/> moved date _____
<input type="checkbox"/> fair	<input type="checkbox"/> unexposed		

**Describe the present and original (if known) physical appearance**

The Brush Creek bridge in Cherokee County is located on a county road 3.4 miles north of Baxter Springs. The 130 foot re-enforced concrete "rainbow arch" (or "Marsh arch") bridge was part of a project in the early 1920's that linked Galena, Riverton, and Baxter Springs with a concrete road. The roadway has been resurfaced periodically but this has not significantly compromised the bridges integrity. Marsh's plans allowed for whatever filling material, between the bridge deck curbs, that locality might desire. Apparently during the bicentennial celebrations of 1976 the bridge was painted red, white, and blue with various patriotic slogans and symbols.

The best description of a rainbow arch span is contained in James Marsh's 1911 patent application. The bridge consists of ". . . two abutments (which could be piers), a pair of arches disposed between and springing from the abutments, the floor carried by and between the arches and reaching from one abutment to the other where it alines with the parapets or rails along opposite sides of the floor line." The original patents called for slideable wear plates to be moulded into the concrete where the bridge floor came into contact with the beams and abutments. This is of importance as one of the main benefits of this design was to allow for the expansion and contraction of the reinforced concrete bridge under varying conditions of temperature and moisture.

The Brush Creek bridge is 20 feet wide and its arches rise 26 feet. The bridge deck is approximately 22 feet above the low water elevation and approximately 34 feet above the bedrock on which the abutments rest. Completed on December 20, 1923 the structure had a live load capacity of 125 pounds per square foot.

There were two basic rainbow arch designs, fixed and tied. The original patent application describes the fixed type, such as the Brush Creek bridge, in which case the arch flowed below the bridge deck and was "fixed" directly into the abutment. This massive abutment (or pier) resisted both the horizontal and the vertical thrust of the arch. In a tied design the arch did not flow below the deck line and was not fixed directly into the abutment. It was secured atop the abutment or pier by the use of steel rocker or expansion rocker bearings. Vertical thrust was resisted by the pair and bearing, while horizontal thrust was resisted by the addition of a lower chord.

# 8. Significance

Period	Areas of Significance—Check and justify below			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/ humanitarian
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> art	<input checked="" type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> theater
<input type="checkbox"/> 1800-1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> transportation
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input checked="" type="checkbox"/> other (specify)
		<input type="checkbox"/> invention		

**Specific dates** 1924 **Builder/Architect** James Barney Marsh, Engineer

### Statement of Significance (in one paragraph)

The Brush Creek "rainbow arch" (or "Marsh arch") bridge north of Baxter Springs retains its integrity of location, design, setting, materials, feeling, and association. It is associated with the life of James B. Marsh, pioneer in steel and concrete bridge construction. It embodies the distinctive characteristics of a type and method of construction that is no longer being used and, as such, may yield information important to the history of engineering. Although 72 rainbow arches are known to exist in Kansas they are endangered due to the needs of modern transportation. However, the Brush Creek bridge, due to its out-of-the-way location, has a good chance for survival.

James Barney Marsh was born in 1856 at North Lake, Wisconsin. He went to Iowa at the age of 18 to enter preparatory school at Fredericksburg. Marsh graduated in 1882 from Iowa State College of Agriculture and Mechanical Arts in Ames, with a B.M.E. degree. In March of 1883 he began his professional career in the Des Moines office of the King Bridge Company of Cleveland, Ohio. With King, Marsh was involved in the design, sales and actual erection of metal bridges. While he continued to work with the King company, he also became head of the Northern Agency for the Kansas City Bridge and Iron Company. In this capacity, he both designed and superintended the actual construction work done by the company. By March of 1889, Marsh had become general western agent and contracting engineer for the King Bridge Company and was placed in charge of the general western office in Des Moines. In the spring of 1896, he formed his own company, the Marsh Bridge Company, and was its sole proprietor. In private practice as a contracting engineer, Marsh was able to more fully develop his own designs. He also constructed the designs he developed, usually using steel as a medium. At the turn of the century, Marsh initiated the use of both concrete and steel in his bridge design. In April of 1904, the Marsh Bridge Company was incorporated with Marsh as president and chief engineer. In 1909, the company was reorganized as the Marsh Engineering Company.

It was not until the introduction of the "rainbow arch" by Marsh, the Kansas made widespread use of reinforced concrete spans for major stream crossings. Marsh canvassed the midwest, selling his arches in direct competition with the steel trusses at that time.

On February 15, 1923 the Columbus Weekly Advocate printed a notice to bridge contractors for the construction of several bridges on the Spring Valley road extension including a 130 foot rainbow arch across Brush Creek. Bids were received until 11:00 A.M. March 8, 1923 and contracts were awarded on March 15, 1923. The Maxwell Construction company received the contract for the bridges with a total bid of \$46,457.17 of which \$15,937.40 was for the Brush Creek bridge. The contracts were approved by the Highway Commission on April 5, 1923 and excavation began a week later, on the 12th. The Columbus Weekly Advocate reported the pouring of concrete for the abutments on July 19, 1923 and the completion of the bridge except for handrails and approaches on November 22, 1923. Work was stopped for the winter on the 27th of December with the bridge still lacking its south approach. On May 22, 1924, the weather permitting, the final slab was laid. The Columbus Weekly Advocate on May 22nd, reported that it would still be several days before the road would be open to traffic as the concrete "must be given time to solidify properly."

## 9. Major Bibliographical References

See Continuation Sheet, Item Number 9.

## 10. Geographical Data

Acree of nominated property .5

Quadrangle name Baxter Springs

Quadrangle scale 1:24,000

### UMT References

A 

1	5	3	4	5	2	7	0	4	1	0	4	2	3	0
Zone			Easting				Northing							

B 

Zone			Easting				Northing							

C 

Zone			Easting				Northing							

D 

Zone			Easting				Northing							

E 

Zone			Easting				Northing							

F 

Zone			Easting				Northing							

G 

Zone			Easting				Northing							

H 

Zone			Easting				Northing							

### Verbal boundary description and justification

The structure being nominated is 130 feet long and 20 feet wide. That property on and over which the bridge is built, 3.4 miles north of Baxter Springs, Kansas. S14, T34S, R24E. Includes bridge superstructure plus supporting abutments.

### List all states and counties for properties overlapping state or county boundaries

state	code	county	code
N/A			

state	code	county	code
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## 11. Form Prepared By

name/title Larry Jochims, Research Historian and Michael Snell

organization Kansas State Historical Society date June 10, 1982

street & number 10th & Jackson Streets telephone (913) 296-2973

city or town Topeka state Kansas

## 12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

national  state  local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature Joseph M. Snell

title Executive Director, Ks. State Historical Society date January 4, 1983

For NPS use only

I hereby certify that this property is included in the National Register

date

Keeper of the National Register

Attest:

date

Chief of Registration

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

FOR NPS USE ONLY

RECEIVED

DATE ENTERED

**NATIONAL REGISTER OF HISTORIC PLACES  
INVENTORY -- NOMINATION FORM**

CONTINUATION SHEET

ITEM NUMBER 9 PAGE 1

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"Open Road Soon" Columbus Weekly Advocate, November 33, 1923 p 6 c 6  
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Marsh, James B., Specification of Letters Patent, Number 1,035,026, patented August 6, 1912, United States Patent Office, Washington, D.C.

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