NPS Form 10-900
(7-81)

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EXP. 12/31/84

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received JAN 24 1983
date entered

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

1. Name

historic Neosho River Bridge (Rainbow

and/or common Neosho River Bridge

2. Location

street & number ~~.2 miles east~~ 1/2 SE of Hartford N/A not for publication

city, town Hartford vic. x vicinity of ~~congressional district~~

state Kansas code 20 county Coffey code 31

3. Classification

Category	Ownership	Status	Present Use	
___ district	x public	x occupied	___ agriculture	___ museum
___ building(s)	___ private	___ unoccupied	___ commercial	___ park
x structure	___ both	___ work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
___ object	___ in process	___ yes: restricted	___ government	___ scientific
	___ being considered	x yes: unrestricted	___ industrial	x transportation
	N/A	___ no	___ military	___ other:

4. Owner of Property

name Coffey County

street & number Courthouse

city, town Burlington N/A vicinity of state Kansas

5. Location of Legal Description

courthouse, registry of deeds, etc. Register of Deeds

street & number Coffey County Courthouse

city, town Burlington state Kansas

6. Representation in Existing Surveys

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

date 1980 ___ federal x state ___ county ___ local

depository for survey records Kansas State Historical Society

city, town Topeka state Kansas

7. Description

Condition		Check one	Check one
___ excellent	___ deteriorated	___ unaltered	_x_ original site
_x_ good	___ ruins	_x_ altered	___ moved date _____
___ fair	___ unexposed		

Describe the present and original (if known) physical appearance

The Neosho River bridge is situated .2 miles east of Hartford, Kansas on a county road. It is composed of two reinforced concrete "rainbow arch" (or "Marsh arch") spans each 140 feet in length. The 20 foot wide roadway has been resurfaced periodically since the bridge's construction in 1926 but this has not significantly compromised its integrity. Marsh's plans allowed for whatever filling material, between the bridge deck curbs, that locality might desire. Vandals have painted names and words on the bridge surface. The footing elevation of the abutments and piers lies approximately 31 feet below grade and the stream bed is 29 feet below grade.

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.

There were two basic rainbow arch designs, fixed and tied. The original patent application describes the fixed type 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 such as that of the Neosho River bridge, 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 pier and bearing, while horizontal thrust was resisted by the addition of a lower chord.

8. Significance

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

Specific dates 1926 **Builder/Architect** James B. Marsh, Engineer

Statement of Significance (in one paragraph)

The Neosho River "rainbow arch" (or "Marsh arch") bridge near Hartford, Kansas 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 used, and, as such, may yield information important to the history of engineering. Although 72 rainbow arches are known to exist in Kansas the ever-changing needs of modern transportation have made them an endangered species. The Neosho River bridge, however, has a good chance for survival due to its out-of-the-way location.

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, that 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.

The Lyon and Coffey county commissioners held a meeting on November 12, 1924 and decided to erect a new bridge across the Neosho River east of Hartford at a point about 100 yards downstream from the existing structure. According to the Hartford Times on November 21, 1924 the bridge to be replaced was one of the oldest in the county and was a wood and steel structure 324 feet long.

See Continuation Sheet, #8.

9. Major Bibliographical References

See Continuation Sheet, Item #9.

10. Geographical Data

Acreage of nominated property .5

Quadrangle name Hartford **Quadrangle scale** 1:24,000

UMT References

	Zone	Easting	Northing		Zone	Easting	Northing
A	15	241216 10	4124139 18 10	B			
C				D			
E				F			
G				H			

Verbal boundary description and justification

That property on and over which the bridge is built, east of Hartford, Kansas, S14, T20S, R13E. Includes bridge superstructure plus supporting piers and abutments.

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

state	N/A	**code**	**county**	**code**
state		**code**	**county**	**code**

11. Form Prepared By

name/title Larry Jochims, Research Historian and Michael Snell

organization Kansas State Historical Society **date** 7/22/82

street & number 10th and 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 _x_ 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 Jerome A. 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