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 ~~Elgin~~ Cedar Creek Bridge (Rainbow Arch

and/or common Elgin Cedar Creek Bridge

2. Location

street & number ~~1.5 miles east of Elgin on~~ FAS 96 N/A not for publication

city, town Elgin Vicinity x ~~x~~ vicinity of ~~congressional district~~

state Kansas code 20 county Chautauqua code 19

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 Chautauqua County

street & number Courthouse

city, town Sedan N/A vicinity of state Kansas

5. Location of Legal Description

courthouse, registry of deeds, etc. Register of Deeds

street & number Chautauqua County Courthouse

city, town Sedan 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 Cedar Creek Bridge on FAS 96 1.5 miles east of Elgin is a single span reinforced concrete "rainbow arch" (also called a "Marsh arch"). It is 82 feet long with a 30 foot approach deck on each end. The 20 foot wide roadway has been resurfaced periodically but this has not significantly compromised the bridge's integrity. Marsh's plans allowed for whatever filling material, between the bridge deck curbs, that locality might desire.

The bridge's piers and abutments rest on a bed of solid rock approximately 31 feet below grade. The low water elevation is approximately 25 feet below grade and the arches rise 17 feet from grade.

The best description of a rainbow arch is contained in James Marsh's 1911 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 Cedar Creek 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	___ transportation	
x 1900–	___ communications	___ industry	___ politics/government	___ other (specify)	
		___ invention			

Specific dates 1927 **Builder/Architect** James B. Marsh, Engineer

Statement of Significance (in one paragraph)

The Cedar Creek "rainbow arch" (or "Marsh arch") bridge east of Elgin 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. The bridge 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 Cedar Creek bridge, due to its 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, 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.

According to the Elgin Journal on June 2, 1927 the county commissioners opened and awarded the contract for the Cedar Creek bridge on May 27, 1927. The contract was let to the Marsh Engineering Company of Topeka at a bid of $14,476.38. The new rainbow arch was to replace a bridge that had washed out on the first of October, 1926. Since that time people had been forced to use an exceedingly dangerous ford crossing. On April 28, 1927 the Journal reported the story of Mr. R. H. Fuller whose car stalled mid-stream and was washed away by the rapidly rising waters.

See Continuation Sheet.

9. Major Bibliographical References

See Continuation Sheet, Item Number 9.

10. Geographical Data

Acreage of nominated property .5

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

UMT References

	Zone	Easting	Northing
A	14	744200	4099240
B			
C			
D			
E			
F			
G			
H			

Verbal boundary description and justification

That property on and over which the bridge is built 1.5 miles east of Elgin, Kansas S13, T35S, 10E. 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 Joseph W. 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

Significance

"The big cement mixer, the grade tools, and the first load of form timber" arrived on site on May 9, 1927, according to the Journal. In September, hard times befell the workers. The September 1, 1927 Elgin Journal reported:

> "In addition to being hindered often by rain, the big flood of a few weeks ago washed away all the false wood work scaffolding, etc., but fortunately for the boys of the construction gang, most of the timbers were found and brought back and rebuilt and the men were getting in good work again when the flood last Saturday morning came and made another clean sweep of the woodwork. . ."

On October 20, 1927, work was progressing nicely and the bridge was nearing completion. By November 11, 1927 the floor had been laid and much of the concrete column work was done. The Journal wrote that it would still be two to three weeks before work could be completed, but, "Oh boy, she will be a beauty when that day comes."

The Cedar Creek bridge was reported open to traffic on December 15, 1927.

9. Bibliography

"A Narrow Escape," Elgin Journal, April 28, 1927, p. 4, c. 2.

"It Will be a Fine Bridge," Elgin Journal, June 2, 1927, p. 1, c. 3.

"The big cement mixer . . . ," Elgin Journal, June 9, 1927, p. 1, c. 4.

"County Seat News," Elgin Journal, June 9, 1927, p. 4, c. 1.

"It Will be a Beauty," Elgin Journal, August 25, 1927, p. 1, c. 3.

"Bad Luck Again," Elgin Journal, September 1, 1927, p. 1, c. 4.

"Nearing Completion," Elgin Journal, October 20, 1927, p. 1, c. 2.

"Putting on the Finish," Elgin Journal, November 3, 1927, p. 1, c. 4.

"County Seat News," Elgin Journal, November 7, 1927, p. 4, c. 2.

"Local & Personal," Elgin Journal, December 1, 1927, p. 1, c. 2.

"We Have a Bridge," Elgin Journal, December 8, 1927, p. 1, c. 3.

"Using the New Bridge," Elgin Journal, December 15, 1927, p. 1, c. 3.

Nichols, C. S., Comp. Directory of Graduates of Division of Engineering, Iowa State College of Agriculture and Mechanical Arts, Ames, Iowa.

The Alumnus of Iowa State. Alumni Association of Iowa State College, Ames, Volume XXXII, #1, July 1936.

Marsh, James B., Specification of Letters Patent, Number 1,035,026, patented August 6, 1912, United States Patent Office, Washington, D.C.