

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 Blacksmith Creek Bridge (rainbow)  
and/or common Blacksmith Creek Bridge

2. Location

street & number 5 miles west of Topeka N/A not for publication  
city, town Topeka vicinity of  
state Kansas code 20 county Shawnee code 177

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
	N/A	<input type="checkbox"/> no	<input checked="" type="checkbox"/> transportation
			<input type="checkbox"/> museum
			<input type="checkbox"/> park
			<input type="checkbox"/> private residence
			<input type="checkbox"/> religious
			<input type="checkbox"/> scientific
			<input type="checkbox"/> other:

4. Owner of Property

name Shawnee County  
street & number Courthouse  
city, town Topeka N/A vicinity of state Kansas

5. Location of Legal Description

courthouse, registry of deeds, etc. Register of Deeds  
street & number Shawnee County Courthouse  
city, town Topeka state Kansas

6. Representation in Existing Surveys

Inventory of Marsh Arch Bridges--  
title 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 type="checkbox"/> unaltered	<input checked="" type="checkbox"/> original site
<input checked="" type="checkbox"/> good	<input type="checkbox"/> ruins	<input checked="" 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 Blacksmith Creek "rainbow arch" (or "Marsh arch") bridge situated five miles west of Topeka on a county road measures 100 feet out to out with a clear span of 60 feet. The bridge has been resurfaced periodically but this has not significantly compromised its integrity as Marsh's plans called for whatever filling material, between the bridge deck curbs, that locality might desire. The bridge has been painted white at some time in its history.

The bridge's abutments rest on bedrock approximately 25 feet below grade. The low water level is 18 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 aligns 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 typed such as the Blacksmith 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 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			
<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 1930

Builder/Architect James B. Marsh, Engineer

### Statement of Significance (in one paragraph)

The Blacksmith Creek "rainbow arch" (or "Marsh arch") bridge west of Topeka, 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 being used, and, as such may yield information important to the history of engineering. Although 72 rainbow arch bridges are currently known to exist in Kansas. The ever-changing needs of modern transportation have made them an endangered species. This particular bridge, however, has a good chance for survival due to the fact that most of its original traffic now travels interstate 70.

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 history of the Blacksmith Creek bridge is quite sketchy. All that can be found to date is the advertising for bids on December 26, 1928, and again on January 2, 1929 in the Topeka Daily Capital and the letting of the contract to the Maxwell Construction Company of Columbus, Kansas on January 17, 1929. The bid was \$40,042.92 (this included another rainbow arch and a concrete slab bridge also part of the project). The master construction record shows a completion date of March, 1930.

## 9. Major Bibliographical References

See Continuation Sheet, Item #9.

## 10. Geographical Data

Acreeage of nominated property .5

Quadrangle name Silver Lake

Quadrangle scale 1:24,000

### UMT References

A	<u>1</u> <u>5</u>	<u>2</u> <u>5</u> <u>13</u> <u>9</u> <u>14</u> <u>10</u>	<u>4</u> <u>13</u> <u>2</u> <u>16</u> <u>0</u> <u>14</u> <u>10</u>	B	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>
	Zone	Easting	Northing		Zone	Easting	Northing
C	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	D	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>
E	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	F	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>
G	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	H	<u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>	<u> </u> <u> </u> <u> </u> <u> </u>

### Verbal boundary description and justification

That property on and over which the bridge is built west of Topeka, Kansas S34, T11S, R14E. Includes bridge superstructure and supporting abutments.

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

state	code	county	code
<u>N/A</u>			

## 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  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

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

9. Bibliography

"Notice to Road Contractors," Topeka Daily Capital, January 2, 1929, p. 14, c. 5.

"County Lets Contract for West Tenth Road," Topeka Daily Capital, January 17, 1929,  
p. 1, c. 6.

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.

Plans and files. Design Department, Kansas Department of Transportation, Topeka,  
Kansas Microfilm Roll #127, frame #57+.

United States Department of the Interior  
National Park Service

National Register of Historic Places  
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For NPS use only  
received  
date entered

Continuation sheet

Item number

Page 141

Multiple Resource Area  
Thematic Group

dnr-11

Name Rainbow Arch (Marsh Arch) Bridges of Kansas Thematic Resources  
State Kansas

Nomination/Type of Review

Date/Signature

- |     |                           |                                     |            |         |                         |
|-----|---------------------------|-------------------------------------|------------|---------|-------------------------|
| 1.  | Cedar Creek Bridge        | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 2.  | Brush Creek Bridge        | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 3.  | Neosho River Bridge       | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 4.  | Conroe Bridge             | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 5.  | Mine Creek Bridge         | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 6.  | Soden's Grove Bridge      | Substantive Review                  | for Keeper | 3/10/83 | <u>Linda McClelland</u> |
|     |                           |                                     | Attest     |         | _____                   |
| 7.  | Creamery Bridge           | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 8.  | Pottawatomie Creek Bridge | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 9.  | Dewlen-Spohnhauer Bridge  | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |
| 10. | Blacksmith Creek Bridge   | Entered in the<br>National Register | for Keeper | 3/10/83 | <u>Delores Byers</u>    |
|     |                           |                                     | Attest     |         | _____                   |

United States Department of the Interior  
National Park Service

Blacksmith Creek Bridge (Rainbow Arch (Marsh  
Arch) Bridges of Kansas TR)  
Shawnee County  
KANSAS

Working No. JAN 24 1983  
Fed. Reg. Date: 2.7.84  
Date Due: 2/24/83 - 3/10/83  
Action:  ACCEPT 3/10/83  
 RETURN  
 REJECT  
Entered in the National Register  
Federal Agency: \_\_\_\_\_

- resubmission
- nomination by person or local government
- owner objection
- appeal

Substantive Review:  sample  request  appeal  NR decision

Reviewer's comments:

Recom./Criteria \_\_\_\_\_  
Reviewer \_\_\_\_\_  
Discipline \_\_\_\_\_  
Date \_\_\_\_\_  
see continuation sheet

Nomination returned for:  technical corrections cited below  
 substantive reasons discussed below

1. Name

2. Location

3. Classification

Category	Ownership	Status	Present Use
	Public Acquisition	Accessible	

4. Owner of Property

5. Location of Legal Description

6. Representation in Existing Surveys

has this property been determined eligible?  yes  no

7. Description

Condition		Check one	Check one
<input type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input type="checkbox"/> unaltered	<input type="checkbox"/> original site
<input 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

- summary paragraph
- completeness
- clarity
- alterations/integrity
- dates

## 8. Significance

Period \_\_\_\_\_ Area of Significance—Check and justify below

Specific dates \_\_\_\_\_ Builder/Architect \_\_\_\_\_

Statement of Significance (in one paragraph)

- \_\_\_\_\_ summary paragraph
- \_\_\_\_\_ completeness
- \_\_\_\_\_ clarity
- \_\_\_\_\_ applicable criteria
- \_\_\_\_\_ justification of areas checked
- \_\_\_\_\_ relating significance to the resource
- \_\_\_\_\_ context
- \_\_\_\_\_ relationship of integrity to significance
- \_\_\_\_\_ justification of exception
- \_\_\_\_\_ other

## 9. Major Bibliographical References

## 10. Geographical Data

Acreage of nominated property \_\_\_\_\_

Geographic name \_\_\_\_\_

USRT References \_\_\_\_\_

Verbal boundary description and justification \_\_\_\_\_

## 11. Form Prepared By

## 12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is

\_\_\_\_\_ national \_\_\_\_\_ state \_\_\_\_\_ local

State Historic Preservation Officer signature \_\_\_\_\_

Title \_\_\_\_\_ Date \_\_\_\_\_

## 13. Other

- \_\_\_\_\_ Maps
- \_\_\_\_\_ Photographs
- \_\_\_\_\_ Other

Questions concerning this nomination may be directed to \_\_\_\_\_

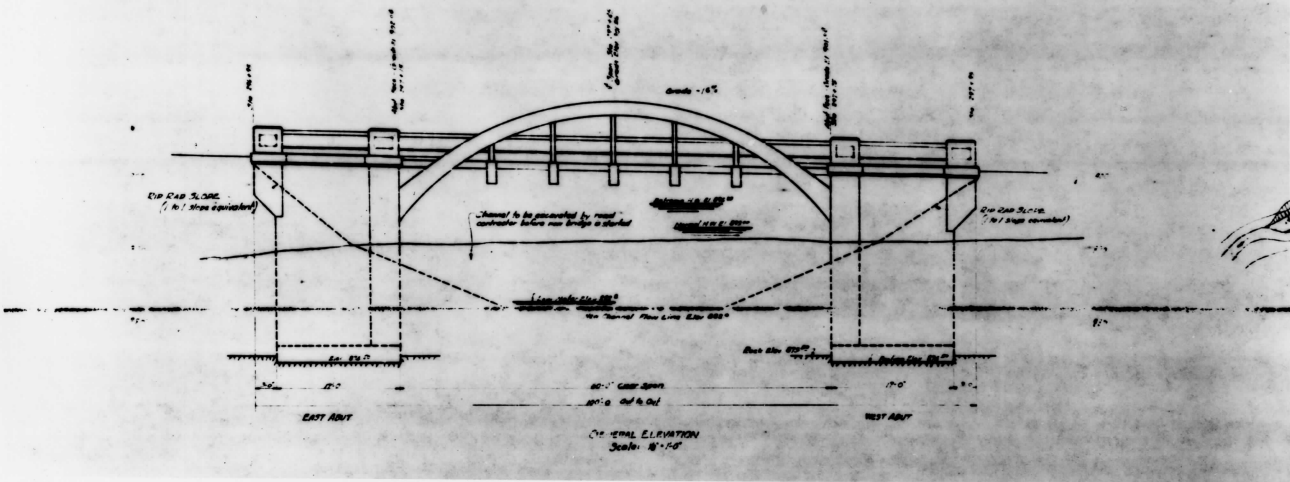
Signed \_\_\_\_\_ Date \_\_\_\_\_ Phone: 202 272-3500

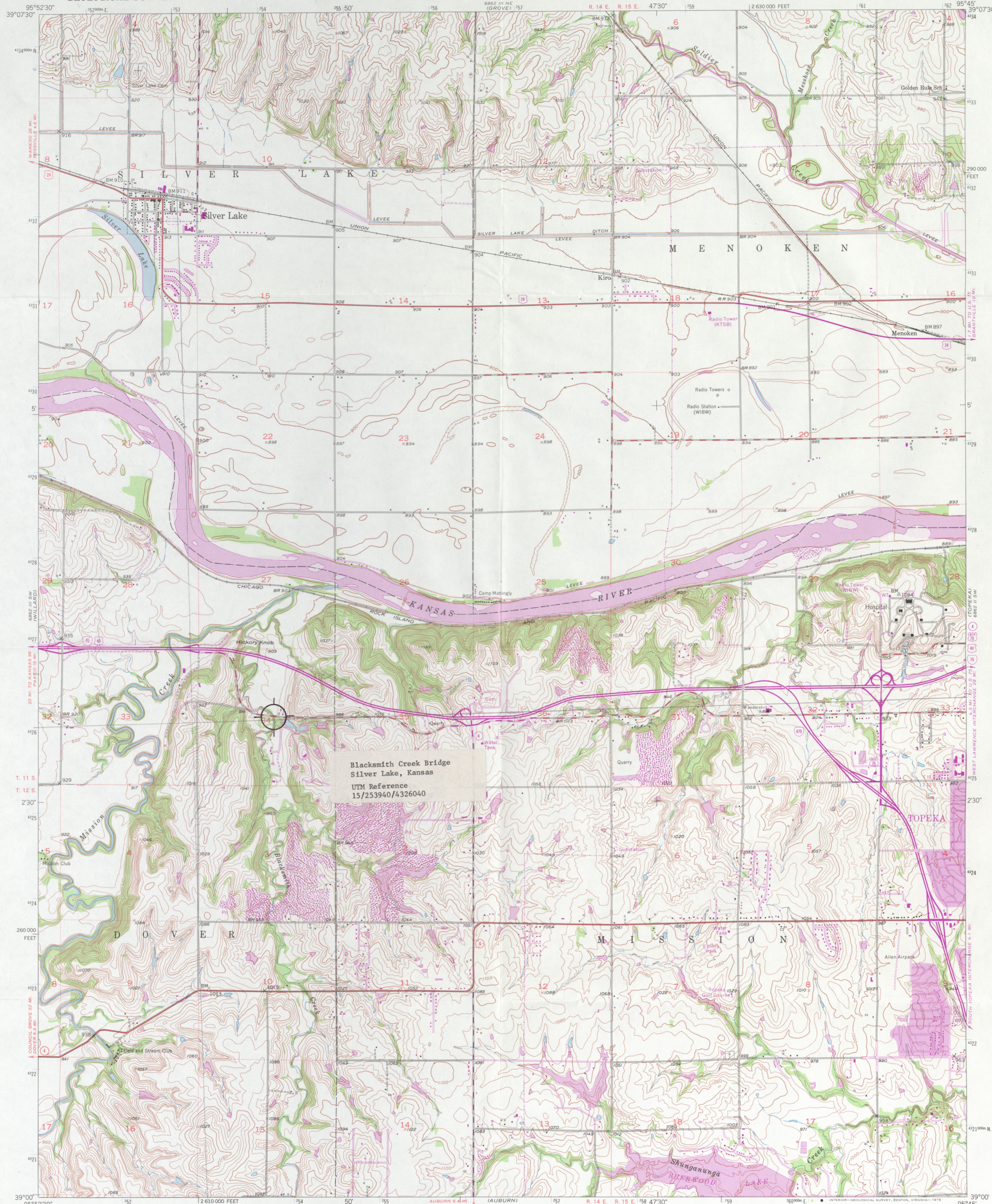
Comments for any item may be continued on an attached sheet





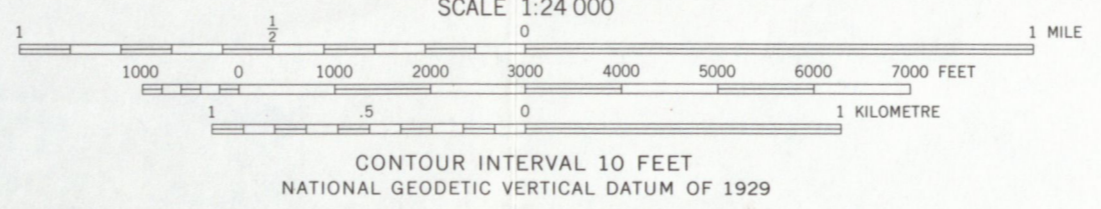
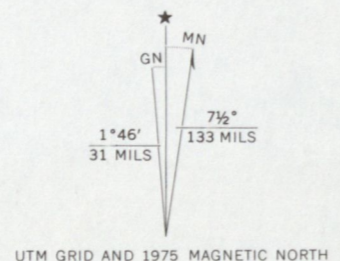






Blacksmith Creek Bridge  
Silver Lake, Kansas  
UTM Reference  
15/253940/4326040

Mapped, edited, and published by the Geological Survey  
Control by USGS and USC&GS  
Topography from aerial photographs by Kelsch plotter  
and by plane-table surveys 1952. Aerial photographs taken 1948  
Polyconic projection. 1927 North American datum  
10,000-foot grid based on Kansas coordinate system, north zone  
1000-metre Universal Transverse Mercator grid ticks,  
zone 15, shown in blue  
Dotted land lines by Bureau of Indian Affairs  
indicate approximate location  
Revisions shown in purple compiled from aerial photographs  
taken 1970 and 1975. This information not field checked  
Purple tint indicates extension of urban areas



CONTOUR INTERVAL 10 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092  
AND STATE GEOLOGICAL SURVEY, LAWRENCE, KANSAS 66044  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION

Heavy-duty	LANE & LANE	Light-duty	LANE & LANE
Medium-duty	LANE & LANE	Unimproved dirt	LANE & LANE

U. S. Route      State Route  
Interstate Route

SILVER LAKE, KANS.  
N3900-W9545/7.5

1952  
PHOTOREVISED 1970 AND 1975  
AMS 6862 III SE—SERIES V878