BENTON COUNTY

INCLUDED: [Significant feature(s) of bridge given in boldface]
[Field inventoried bridge indicated by asterisk]

Inv. No.	MHTD	Bridge Name	Description
BENT01	012000.3	Persimmon Fork Bridge	1- 24' steel stringer **1911** county work force
BENT02	021001.0	Flat Creek Bridge	1- 36' riveted Warren pony truss **1913** Kansas City Bridge Company
*BENT03	045000.2	County Line Bridge	1- 60' pinned Pratt bedstead **1907** Kansas City Bridge Company
*BENT04	079001.2	Culvert	2- 10' **concrete arch culvert** c1930
*BENT05	088001.6	Spangberg Ford Bridge	1- 48' pinned Pratt bedstead **1907** Kansas City Bridge Company
BENT06	093000.5	Barkers Creek Bridge	1- 48' pinned Pratt bedstead **1905** Kansas City Bridge Company (replaced)
*BENT07	175000.1	Cole Camp Creek Bridge	
BENT08	252000.4	Turkey Creek Bridge	1- 95' pinned Pratt pony truss **1904** Dildine Bridge Company
BENT09	356000.3	Bentonville Bridge	1- 80' riveted Warren pony truss c**1915** Kansas City Bridge Company
*BENT10	445500.2	Upper Bridge	1-**600'** **steel cable suspension bridge** 1928 Midland Erection Company; J.A. Dice

EXCLUDED:

Pratt pony truss
252000.4

Steel stringer / girder
004000.5 013000.1 015001.0 025001.2 028001.6 086001.0 195000.3
096000.1 097000.8 106002.4 115000.1 146000.5 148000.7 155000.6
191001.7 250001.5 254001.0 344002.2

Concrete girder
X 744

Concrete slab
Y 401 132000.8 138000.5 138000.6 140000.2 143002.0 144000.5
154001.0 161000.5 162000.1 172001.4 180002.5 203002.8 224000.3
224002.5 228001.0 235000.2 248001.2 253002.4 323000.1 325002.0
336001.4

BENTON COUNTY

EXCLUDED (cont.):

Concrete box culvert

H 773R	H 774	H 776	P 86	S 111	S 438	S 439
X 254	X 255	X 257	X 258	X 604	X 742	X 890
035000.8	357000.3					

Timber stringer
159000.8

SUMMARY:

	Primary	Secondary	Urban	Other	Total
Included	0	9	0	0	9
Excluded	16	43	0	0	59
	16	52	0	0	68 structures

Persimmon Fork Bridge

BENT01

GENERAL DATA

structure no.: 012000.3
county: Benton

city/town: 6.2 miles southwest of Ionia
feature inters.: branch of Flat Creek
cadastral grid: S14/23, T43N, R23W
highway route: County Road 12
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel stringer
substructure: concrete abutments and wingwalls

span number: 1
span length: 24.0'
total length: 25.0'
roadway width: 14.2'

condition: fair
alterations: unknown
floor/decking : concrete deck
other features: guardrail: none

HISTORICAL DATA

erection date: 1911
erection cost: unknown
designer: unknown
fabricator : unknown
contractor: county work force

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 012000.3; Benton County Court Record, Book P, page 86 (27 September 1911), located at Benton County Courthouse, Warsaw MO.

sign. rating: 30
evaluation: NRHP non-eligible (undistinguished, small-scale example of common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Flat Creek Bridge

BENT02

GENERAL DATA

structure no.: 021001.0
county: Benton
city/town: 1.6 miles southwest of Ionia
feature inters.: Flat Creek
cadastral grid: S16/21, T43N, R22W
highway route: County Road 21
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 3-panel, rigid-connected Warren pony truss, skewed
substructure: concrete abutments and wingwalls

span number: 1
span length: 36.0'
total length: 38.0'
roadway width: 13.9'
condition: fair
alterations: none
floor/decking : concrete deck over steel stringers
other features: guardrail: steel

HISTORICAL DATA

erection date: 1913
erection cost: $512.00 (superstructure)
designer: Kansas City Bridge Company, Kansas City MO
fabricator : Kansas City Bridge Company, Kansas City MO
contractor: county work force

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 021001.0; Benton County Court Record, Book P, page 394 (7 May 1913), page 456 (9 August 1913), located at Benton County Courthouse, Warsaw MO.

sign. rating: 61
evaluation: NRHP possibly eligible (well-preserved, atypically configured example of a standard truss type)

inventoried by: Clayton B. Fraser 26 February 1991

County Line Bridge

BENT03

GENERAL DATA

structure no.: 045000.2
county: Benton

city/town: 6.1 miles southwest of Cole Camp
feature inters.: Lake Creek
cadastral grid: S4, T43N, R20W
highway route: County Road 45
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 4-panel, pin-connected Pratt truss-leg bedstead
substructure: steel bedstead legs with concrete abutments and wingwalls

span number: 1
span length: 60.0'
total length: 92.0'
roadway width: 14.0'

condition: fair
alterations: none
floor/decking : timber deck
other features: end post: 3 channels forming built-up H-column; top chord: 2 channels with cover and batten plates; lower chord: 2 looped square eyebars, 2 angles with batten plates; vertical: 4 angles with double lacing; diagonal: 1 or 2 looped square eyebars; lateral bracing: round rod with threaded ends; floor beam: I-beam, field-bolted to vertical; steel guardrails

HISTORICAL DATA

erection date: 1907
erection cost: $998.00
designer: Kansas City Bridge Company, Kansas City MO
fabricator : Kansas City Bridge Company, Kansas City MO
contractor: Kansas City Bridge Company, Kansas City MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 045000.2; Benton County Court Record, Book N, page 463 (10 May 1907), page 530 (9 August 1907), located at Benton County Courthouse, Warsaw MO.

sign. rating: 46
evaluation: NRHP non-eligible (well preserved, but typically configured example of a common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Culvert

BENT04

GENERAL DATA

structure no.: 079001.2
county: Benton

city/town: 2.8 miles southwest of Ionia
feature inters.: South Flat Creek
cadastral grid: S27/34, T43N, R22W
highway route: County Road 79
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: concrete arch culvert
substructure: concrete abutments, wingwalls and pier

span number: 2
span length: 10.0'
total length: 24.0'
roadway width: 12.3'

condition: fair
alterations: guardrails removed; concrete extensively patched
floor/decking : concrete deck over earth fill
other features: guardrail: steel pipe

HISTORICAL DATA

erection date: c1930
erection cost: unknown
designer: unknown
fabricator : none
contractor: county work force (probable)

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 079001.2; field inspection by Clayton Fraser, 10 May 1990.

sign. rating: 13
evaluation: NRHP non-eligible (poorly preserved example of exceedingly common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Spangberg Ford Bridge

BENT05

GENERAL DATA

structure no.: 088001.6
county: Benton

city/town: 7.5 miles northwest of Lincoln
feature inters.: Brush Creek
cadastral grid: S35, T43N, R23W
highway route: County Road 88
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 3-panel, pin-connected Pratt truss leg bedstead
substructure: steel bedstead legs with concrete abutments and wingwalls

span number: 1
span length: 48.0'
total length: 62.0'
roadway width: 14.0'

condition: fair
alterations: none
floor/decking : timber deck over railroad rail stringers
other features: end post: 3 channels forming built-up H-columns; top chord: 2 channels with cover and batten plates; lower chord: 2 looped square eyebars (in center panel), 2 angles with batten plates (in outer panels); vertical: 4 angles with double lacing; diagonal: 1 or 2 looped square eyebars; lateral bracing: round rod with threaded ends; floor beam: I-beam, field-bolted to vertical; guardrail: none

HISTORICAL DATA

erection date: 1907
erection cost: $798.00
designer: Kansas City Bridge Company, Kansas City MO
fabricator : Kansas City Bridge Company, Kansas City MO
contractor: Kansas City Bridge Company, Kansas City MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 088001.6; Benton County Court Record, Book N, page 463 (10 May 1907), page 530 (6 & 9 August 1907), located at Benton County Courthouse, Warsaw MO; field inspection by Clayton Fraser, 10 May 1990. (See HAER Inventory Form for additional information.)

sign. rating: 43
evaluation: NRHP non-eligible (typical example of common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Barkers Creek Bridge

BENT06

GENERAL DATA

structure no.: 093000.5
county: Benton

city/town: 11.2 miles northwest of Lincoln
feature inters.: Barkers Creek
cadastral grid: S19/30, T43N, R23W
highway route: County Road 93
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 3-panel, pin-connected Pratt truss-leg bedstead
substructure: steel bedstead legs with concrete abutments and wingwalls

span number: 1
span length: 48.0'
total length: 79.0'
roadway width: 14.0'

condition: fair
alterations: none
floor/decking : concrete deck over steel stringers
other features: guardrail: steel

HISTORICAL DATA

erection date: 1905
erection cost: $670.00
designer: Kansas City Bridge Company, Kansas City MO
fabricator : Kansas City Bridge Company, Kansas City MO
contractor: Kansas City Bridge Company, Kansas City MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 093000.5; Benton County Court Record, Book M, page 600 (2 February 1905), Book N, page 1 (6 March 1905), pages 21-22 (8 April 1905), located at Benton County Courthouse, Warsaw MO.

sign. rating: 43
evaluation: NRHP non-eligible (typical example of common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Turkey Creek Bridge

BENT08

GENERAL DATA

structure no.: 252000.4
county: Benton

city/town: 6.8 miles southeast of Warsaw
feature inters.: Turkey Creek
cadastral grid: S28, T40N, R21W
highway route: County Road 252
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 5-panel, pin-connected Pratt pony truss
substructure: concrete abutments, wingwalls and pier

span number: 1
span length: 95.0'
total length: 112.0'
roadway width: 12.0'

condition: fair
alterations: concrete piers added under two panel points
floor/decking : concrete deck over steel stringers
other features: steel guardrails

HISTORICAL DATA

erection date: 1903-04
erection cost: $795.00
designer: Dildine Bridge Company, Cameron MO
fabricator : unknown
contractor: Dildine Bridge Company, Cameron MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 252000.4; Benton County Court Record, Book L, page 606 (9 May 1902), Book M, page 128 (5 March 1903), page 162 (8 May 1903), page 379 (8 April 1904), located at Benton County Courthouse, Warsaw MO.

sign. rating: 35
evaluation: NRHP non-eligible (typical example of common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Bentonville Bridge

BENT09

GENERAL DATA

structure no.: 356000.3
county: Benton
city/town: 8.3 miles northeast of Fristoe
feature inters.: branch of Little Pomme de Terre River
cadastral grid: S35, T39N, R23W
highway route: County Road 356
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: steel, 5-panel, rigid-connected Warren pony truss
substructure: concrete abutments and wingwalls

span number: 1
span length: 80.0'
total length: 80.0'
roadway width: 12.2'
condition: fair
alterations: unknown
floor/decking : timber deck
other features: guardrail: none

HISTORICAL DATA

erection date: c1915
erection cost: unknown
designer: Kansas City Bridge Company, Kansas City MO
fabricator : Kansas City Bridge Company, Kansas City MO
contractor: Kansas City Bridge Company, Kansas City MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 356000.3.

sign. rating: 40
evaluation: NRHP non-eligible (typical example of common structural type)

inventoried by: Clayton B. Fraser 26 February 1991

Upper Bridge

BENT10

GENERAL DATA

structure no.: 445500.2
county: Benton
city/town: Warsaw
feature inters.: Osage River
cadastral grid: S17, T40N, R22W
highway route: vacated county road
highway distr.: 5
current owner: Benton County

STRUCTURAL DATA

superstructure: wire cable suspension bridge
substructure: concrete abutments, tower pedestals and cable deadmen

span number: 1
span length: 600.0'
total length: 600.0'
roadway width: 12.0'
condition: good
alterations: maintenance-related repair and replacement of parts; bridge closed to traffic, 1979
floor/decking : timber deck over steel stringers
other features: steel tower column: 2 channels with cover plate and lacing (tower anchor-bolted to concrete pedestal); tower strut: 2 channels with batten plates; cable / suspender: parallel strand steel wires; cable cradle: cast steel or iron; floor beam: I beam; lateral bracing: 1 angle; guardrail: 2 channels with chain-link fencing

HISTORICAL DATA

erection date: 1928
erection cost: unknown
designer: Kansas City Bridge Company; J.A. Dice
fabricator : Illinois Steel Company, Chicago IL
contractor: Midland Erection Company, Kansas City MO; J.A. Dice, Warsaw MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 445500.2; Benton County Court Record, Book N, 8 February 1907, Book T, 28 March 1928, Book T, 2 August 1927, 7 September 1927, 3 & 4 October 1927, 8 October 1927, 28 March 1928, located at Benton County Courthouse, Warsaw MO; Robert Hayden, "Historical Resources Mitigation: Bridges over the Osage," report for U.S. Army Corps of Engineers, September 1980, pages 19-20; field inspection by Clayton Fraser, 10 May 1990.

sign. rating: 73
evaluation: NRHP eligible (outstanding example of engineered/vernacular bridge design)

inventoried by: Clayton B. Fraser 26 February 1991

HAER INVENTORY
Missouri Historic Bridge Inventory

NAME(S) OF STRUCTURE
Flat Creek Bridge
MHTD: 021001.0

BENT02

DATE(S) OF CONSTRUCTION
1913

LOCATION
County Road 21 over Flat Creek; S16/21, T43N, R22W
1.6 miles southwest of Ionia; Benton County, Missouri

USE (ORIGINAL / CURRENT)
roadway bridge / roadway bridge

RATING NRHP possibly eligible (score: 61)

CONDITION
fair

OWNER
Benton County

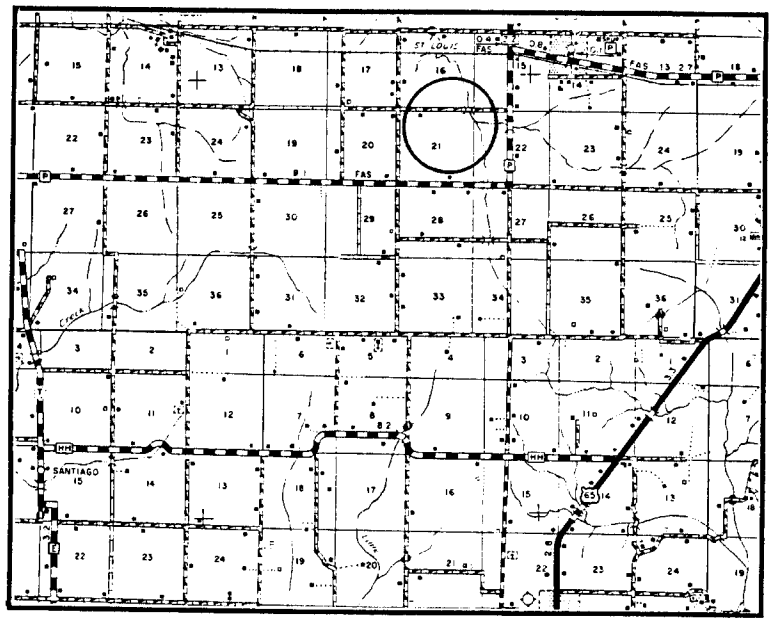
span number:	1	superstructure:	steel, 3-panel, rigid-connected Warren pony truss, skewed
span length:	36.0'	substructure:	concrete abutments and wingwalls
total length:	38.0'	floor/decking:	concrete deck over steel stringers
roadway wdt.:	13.9'	other features:	guardrail: steel

Located southwest of Ionia, this short-span steel truss carries a gravel-surfaced county road over Flat Creek. The Flat Creek Bridge is comprised of a single rigid-connected Warren pony truss, with a concrete deck and substructure. The bridge dates to 1913. That year the Benton County Court contracted with the Kansas City Bridge Company to supply and erect the structure for $512.00. Since its completion, the Flat Creek Bridge has carried vehicular traffic, with only maintenance-related repairs.

Patented in 1848 by Captain James Warren and Theobald Monzani, the Warren truss in its classic form features a web configuration that relies on simple triangulation for its rigidity. "The term Warren truss or Warren girder was originally applied only to the particular case of the Triangular truss in which the web triangles are all equilateral; but later writers generally use the name for any triangular truss," noted bridge engineer J.A.L. Waddell stated in his 1916 **Bridge Engineering**. "As there is no special advantage in making the web triangles equilateral, there does not appear to be any good raison d'etre for the use of the true Warren type." Warrens were built sparingly in the 19th century, a period in which the pin-connected Pratt dominated the bridge industry. After the turn of the century, however, rigid-connected Warren trusses began to supersede earlier pinned Pratt configurations for use on short- to intermediate-span highway bridges. The Flat Creek Bridge in Benton County is noteworthy as a well-preserved, relatively early, skewed example of the riveted Warren truss–a medium-span example of what would later become a mainstay structural type in the state.

NAME(S) OF STRUCTURE
Flat Creek Bridge

PHOTOS AND SKETCH MAP OF LOCATION



LOCATION MAP
TAKEN FROM MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT
GENERAL HIGHWAY MAP

SOURCES
Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 021001.0; Benton County Court Record, Book P, page 394 (7 May 1913), page 456 (9 August 1913), located at Benton County Courthouse, Warsaw MO.

INVENTORIED BY	AFFILIATION	DATE
Clayton B. Fraser	Fraserdesign, Loveland CO	26 February 1991

HAER INVENTORY
Missouri Historic Bridge Inventory

NAME(S) OF STRUCTURE
Spangberg Ford Bridge
MHTD: 088001.6

BENT05

DATE(S) OF CONSTRUCTION
1907

LOCATION
county road over Brush Creek; S35, T43N, R23W
7.5 miles northwest of Lincoln; Benton County, Missouri

USE (ORIGINAL / CURRENT)
roadway bridge / roadway bridge

RATING NRHP non-eligible (score: 43)

CONDITION
fair

OWNER
Benton County

span number:	1	superstructure:	steel, 3-panel, pin-connected Pratt truss leg bedstead
span length:	48.0'	substructure:	steel bedstead legs with concrete abutments and wingwalls
total length:	62.0'	floor/decking:	timber deck over railroad rail stringers
roadway wdt.:	14.0'	other features:	end post: 3 channels forming built-up H-columns; top chord: 2 channels with cover and batten plates; lower chord: 2 looped square eyebars (in center panel), 2 angles with batten plates (in outer panels); vertical: 4 angles with double lacing; diagonal: 1 or 2 looped square eyebars; lateral bracing: round rod with threaded ends; floor beam: I-beam, field-bolted to vertical; guardrail: none

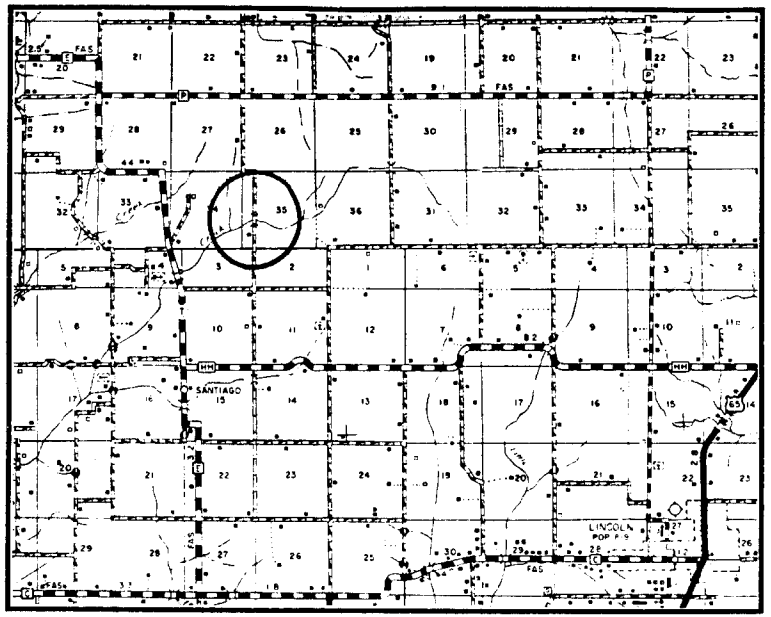
On August 6, 1907, the Benton County Court ordered County Road and Bridge Commissioner J.S. Kidwell to estimate the cost of a steel bridge at this crossing of Brush Creek northwest of Lincoln. Three days later adjacent landowner Earl Spangberg and others tendered a subscription of $325.00 and agreed to grade the approaches for the proposed bridge. That same day, the county court contracted with the Kansas City Bridge Company to fabricate and erect this and another small-scale steel span (**BENT03**). The contract cost of the Spangberg Bridge - a pin-connected bedstead - was $798.00. It was completed later that year and has carried traffic since, with only maintenance-related repairs.

In a bedstead truss, a single "leg" functioned as both end post and support at each corner of the structure. This combined super- and substructure reduced erection costs somewhat, but bedsteads were prey to flood and collision damage and suffered from inherent structural weaknesses relating to compression stress in the lower chords. Despite these weaknesses, numerous truss leg bedsteads were erected throughout Missouri in the late 1890s and early 1900s. Hundreds remain in place today - in fact, Missouri has probably more bedsteads than any other state. The Spangberg Ford Bridge is a well-preserved, though not particularly distinguished, example of this statewide bridge construction trend.

NAME(S) OF STRUCTURE

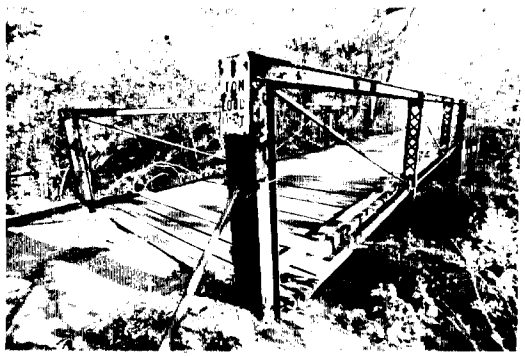
Spangberg Ford Bridge

PHOTOS AND SKETCH MAP OF LOCATION



LOCATION MAP

TAKEN FROM MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT
GENERAL HIGHWAY MAP



SOURCES

Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 088001.6; Benton County Court Record, Book N, page 463 (10 May 1907), page 530 (6 & 9 August 1907), located at Benton County Courthouse, Warsaw, Missouri; field inspection by Clayton Fraser, 10 May 1990.

INVENTORIED BY

Clayton B. Fraser

AFFILIATION

Fraserdesign, Loveland CO

DATE

26 February 1990

HAER INVENTORY
Missouri Historic Bridge Inventory

NAME(S) OF STRUCTURE
Upper Bridge
MHTD: 445500.2

BENT10

DATE(S) OF CONSTRUCTION
1928

LOCATION
county road over Osage River; S17, T40N, R22W
Warsaw; Benton County, Missouri

USE (ORIGINAL / CURRENT)
roadway bridge / closed

RATING NRHP eligible (score: 73)

CONDITION
good

OWNER
Benton County

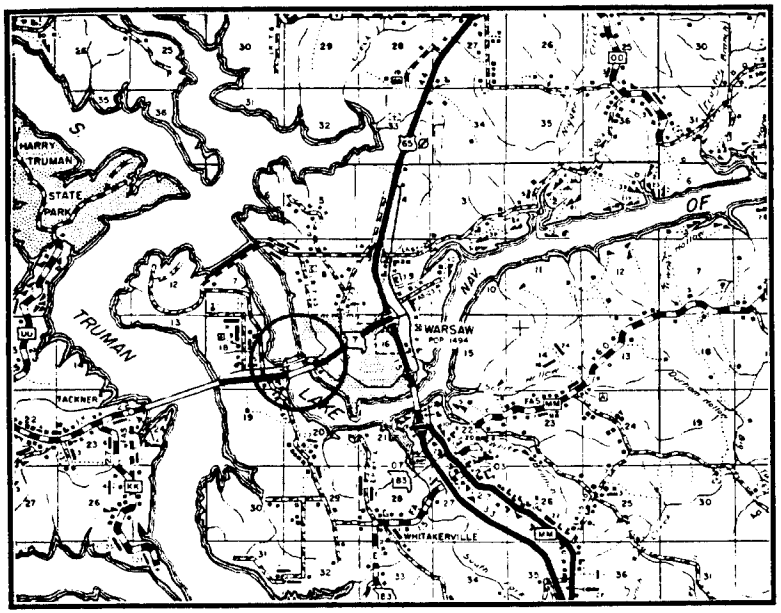
span number:	1	superstructure:	wire cable suspension bridge
span length:	600.0'	substructure:	concrete abutments, tower pedestals and cable deadmen
total length:	600.0'	floor/decking:	timber deck over steel stringers
roadway wdt.:	12.0'	other features:	steel tower column: 2 channels with cover plate and lacing (tower anchor-bolted to concrete pedestal); tower strut: 2 channels with batten plates; cable / suspender: parallel strand steel wires; cable cradle: cast steel or iron; floor beam: I beam; lateral bracing: 1 angle; guardrail: 2 channels with chain-link fencing

In 1904, J.A. Dice, local bridge contractor and Benton County road commissioner, formed the Warsaw Bridge Company with six others; the new holding company would build, and collect tolls from, a major suspension bridge over the Osage River at the west edge of Warsaw. Called the Upper Bridge to distinguish it from another nearby Osage River crossing, the structure was opened in September 1904. The Upper Bridge spanned 558 feet and cost $5500.00 to built. Like almost all of Dice's suspension bridges from the period, it consisted of two parallel-strand cables supported by timber towers. The Upper Bridge carried traffic until its destruction on June 27, 1924, by a cyclone. It was never rebuilt by the private bridge company. Instead, in August 1927 the Benton County Court ordered engineers E.W. Fristoe and W.H. Freeman of the Kansas City Bridge Company to prepare plans, specifications and estimates for a new structure here. In October the county contracted with the Midland Erection Company of Kansas City to reconstruct the bridge for $14,925.00.

Midland began work on the substructure for the towers soon thereafter. When the county court caught the Midland construction crew trying to pour footings for the west tower on mud, rather than bedrock, it ordered the work halted. According to historian Robert Hayden: "A subsequent meeting with the county officials and the company's president and attorney resulted with the latter two trying to leave town with the plans and specifications. The sheriff stopped them, demanding the papers which they finally turned over at gun point." In March 1928 Midland informed the county that it refused to work further on the project and that its bonding company would also not complete the work. The county then hired J.A. Dice to build the bridge. The extent that Dice used the original engineered design or his own empirical design is not known; the bridge appears to combine elements of both. The reconstructed Upper Bridge carried traffic until its replacement and closure in 1979, with only maintenance related repairs and replacement of some of its components. It is now being maintained in place as a pedestrian span.

NAME(S) OF STRUCTURE
Upper Bridge

PHOTOS AND SKETCH MAP OF LOCATION



LOCATION MAP
TAKEN FROM MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT
GENERAL HIGHWAY MAP

SOURCES
Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure No. 445500.2; Benton County Court Record, Book N, 8 February 1907, Book T, 28 March 1928, Book T, 2 August 1927, 7 September 1927, 3 & 4 October 1927, 8 October 1927, 28 March 1928, located at Benton County Courthouse, Warsaw, Missouri; Robert Hayden, "Historical Resources Mitigation: Bridges over the Osage," report for U.S. Army Corps of Engineers, September 1980, pages 19-20; field inspection by Clayton Fraser, 10 May 1990.

INVENTORIED BY
Clayton B. Fraser

AFFILIATION
Fraserdesign, Loveland CO

DATE
26 February 1990

Ten suspension bridges built by Missouri bridge builder J.A. Dice remain in place in central Missouri. As a group, these spans comprise the state's most important examples of vernacular bridge construction, designed and built without benefit of detailed structural analysis or computation. The Upper Bridge is distinguished as the longest and one of the best-preserved among them. Moreover, its checkered history provides an illustration of the sometimes uneasy relationship between engineered and empirical design in civil engineering. A well-preserved example of an esoteric structural type - the best remaining of Dice's suspension bridges - the Upper Bridge is among Missouri's most important early vehicular spans.