

Upper Bridge

BENT10

GENERAL DATA

structure no.:	445500.2	city/town:	Warsaw
county:	Benton	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	condition:	good
span length:	600.0'	alterations:	maintenance-related repair and replacement of parts; bridge closed to traffic, 1979
total length:	600.0'	floor/decking :	timber deck over steel stringers
roadway width:	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

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

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

span length: 600.0'

total length: 600.0'

roadway wdt.: 12.0'

superstructure: wire cable suspension bridge

substructure: concrete abutments, tower pedestals and cable deadmen

floor/decking: timber deck over steel stringers

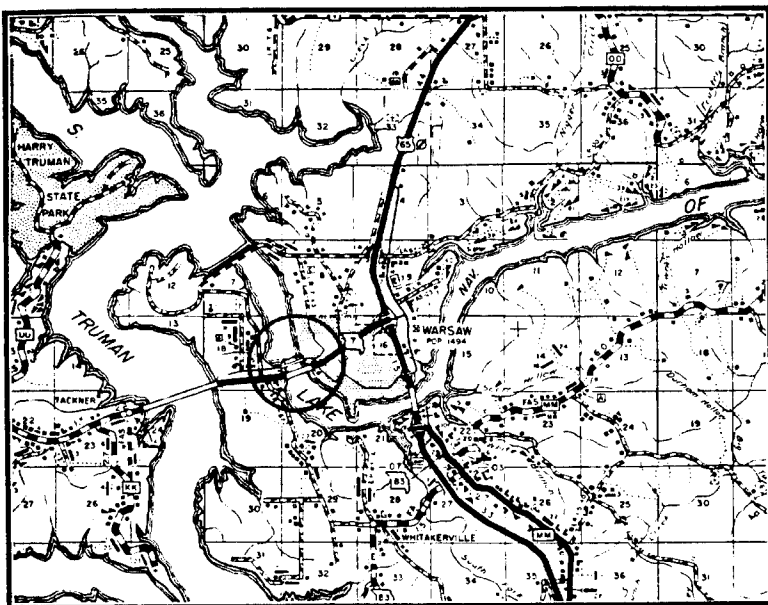
other features: steel tower column: 2 channels with cover plate and lacing (tower anchor-bolted to concrete pedestal); tower strut: 2 channels with batten plates; cable / suspender: parallel strand steel wires; cable cradle: cast steel or iron; floor beam: I beam; lateral bracing: 1 angle; guardrail: 2 channels with chain-link fencing

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 build. 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

DATE26 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.