

# Meramec River Bridge

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STLO09

## GENERAL DATA

structure no.:	K 637R	city/town:	3.2 miles northwest of Arnold
county:	St. Louis / Jefferson	feature inters.:	Meramec River
		cadastral grid:	
		highway route:	State Highway 21
		highway distr.:	6
		current owner:	Missouri Highway and Transportation Department

## STRUCTURAL DATA

superstructure: steel, 11-panel, rigid-connected, cantilevered tied arch  
substructure: concrete abutments, wingwalls and piers

span number:	1; 2	condition:	good
span length:	264.0'; 192.0'	alterations:	deck replaced, 1985
total length:	648.0'	floor/decking :	concrete deck over steel stringers
roadway width:	46.0'	other features:	upper chord, inclined end post and arch ribs: 2 built-up channels with cover plate and lacing; lower chord, vertical and diagonal: H-section beam; lateral bracing: 2 angles; strut: 4 angles with lacing; floor beam: I-beam; guardrail: ornamental steel

## HISTORICAL DATA

erection date: 1940  
erection cost: \$323,154.04  
designer: Missouri State Highway Department  
fabricator : Stupp Brothers Bridge and Iron Company, St. Louis MO  
contractor: Massman Construction Company, Kansas City MO

references: Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure Number K 637R; Primary System Bridge Record, located at the Missouri Highway and Transportation Department, Jefferson City MO; **Twelfth Biennial Report of the State Highway Commission of Missouri**, 1939-40, pages 189-190; Howard H. Mullins, "Continuous Tied Arch Built in Missouri," **Engineering News-Record** 126 (5 June 1941), pages 84-87; field inspection by Clayton Fraser, 10 June 1994.

sign. rating: 76  
evaluation: NRHP eligible (first of its structural type built in the United States)

inventoried by: Clayton B. Fraser 2 August 1994

# HAER INVENTORY

Missouri Historic Bridge Inventory

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**NAME(S) OF STRUCTURE**

Meramec River Bridge  
MHTD: K 637R

STLO09

**DATE(S) OF CONSTRUCTION**

1940

**LOCATION**

State Highway 21 over Meramec River;  
3.2 miles northwest of Arnold; St. Louis / Jefferson County, Missouri

**USE (ORIGINAL / CURRENT)**

highway bridge / highway bridge

**RATING** NRHP eligible (score: 76)

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**CONDITION**

good

**OWNER**

Missouri Highway and Transportation Department

span number: 1; 2  
span length: 264.0'; 192.0'  
total length: 648.0'  
roadway wdt.: 46.0'

superstructure: steel, 11-panel, rigid-connected, cantilevered tied arch  
substructure: concrete abutments, wingwalls and piers  
floor/decking: concrete deck over steel stringers  
other features: upper chord, inclined end post and arch ribs: 2 built-up channels with cover plate and lacing; lower chord, vertical and diagonal: H-section beam; lateral bracing: 2 angles; strut: 4 angles with lacing; floor beam: I-beam; guardrail: ornamental steel

This three-span steel bridge carries State Highway 21 over the Meramec River on the line between St. Louis and Jefferson counties northwest of Arnold. The Meramec River Bridge was designed by the Missouri State Highway Commission Bureau of Bridges in 1939. "Since the Meramec River Bridge is located in a region that has been called the playground of St. Louis," bridge engineer Howard Mullins stated, "an effort was made to secure a structure of reasonable esthetic fitness." MSHD engineers considered several configurations for the bridge: a continuous plate rib tied arch, a three-span continuous truss, three single-span tied arches and a suspension bridge, among others, before developing the plan for a cantilevered tied arch. As delineated by the highway department, the structure would feature a 264-foot tied arch span, cantilevered on both sides by 192-foot anchor spans. "The continuity of the trusses and the action of the arch tie produce a structure which is threefold indeterminate," Mullins wrote. "A condition of single redundancy was also produced by the double intersection diagonals at the center of the arch truss. These double diagonals were used to permit a pleasing truss outline." The superstructure was supported by concrete spill-through piers, which were in turn founded on bedrock.

Designating the project as Federal Aid Project 806C(1), the highway department solicited competitive proposals in December 1939. A month later the state highway commission awarded a construction contract to the Massman Construction Company. The Kansas City-based contractor commissioned the superstructural fabrication to the Stupp Brothers Bridge and Iron Company of St. Louis. Massman's construction crew used traditional falseworks under the anchor spans and erected the center span by cantilevering from the sides. To connect the arch at center-span, the men removed the end bearing shoes on the anchor spans, lifting the two arch halves slightly, before the arch was riveted and the shoes replaced. Opened to traffic later in 1940, the Meramec River Bridge consumed some 1087 tons of structural steel. Since its completion, it has functioned in place, with the replacement of its original steel grid deck with concrete as the only alteration of note.

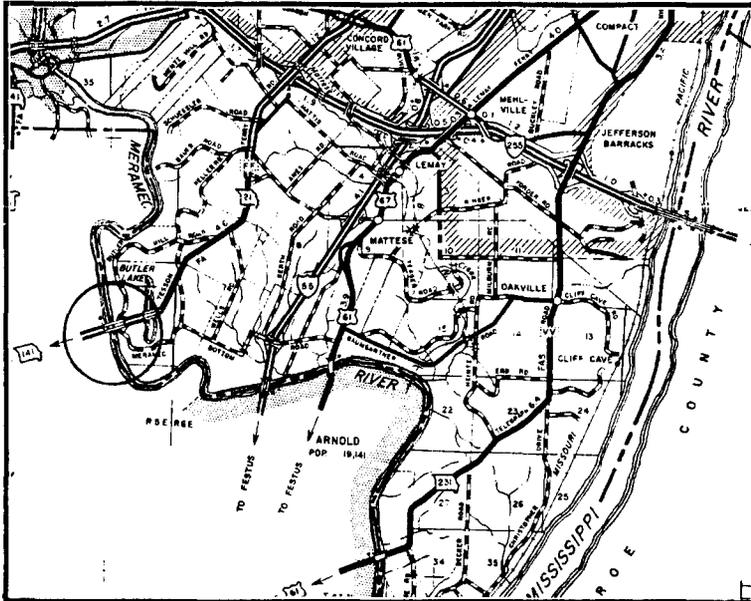
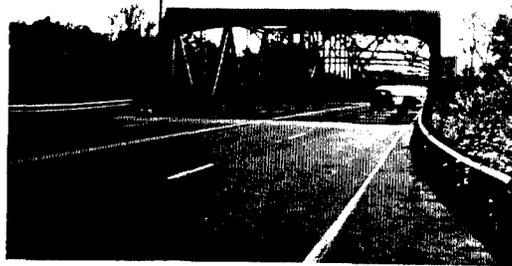
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Not only was the Meramec River Bridge the first continuous tied arch built in Missouri, it was the first of its kind built in the United States. "Of the many unusual highway bridges built in recent years few were more novel than one recently constructed over the Meramec River, a short distance south of St. Louis, by the Missouri state highway department," Mullins stated. Although its 264-foot span was modest by most standards and was dwarfed by the 845-foot Julien Dubuque Bridge built over the Mississippi River three years later, the Meramec River Bridge is technologically significant as a rare incidence of structural experimentation by the state highway department and an uncharacteristic acknowledgement by the department of bridge aesthetics. It is thus noteworthy for its distinctive appearance and its atypical configuration. In essentially unaltered condition, the Meramec River Bridge is a well-preserved example of highway bridge design in the pre-war years.

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**NAME(S) OF STRUCTURE**

Meramec River Bridge

**PHOTOS AND SKETCH MAP OF LOCATION****LOCATION MAP**TAKEN FROM MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT  
GENERAL HIGHWAY MAP

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**SOURCES**

Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure Number K 637R; Primary System Bridge Record, located at the Missouri Highway and Transportation Department, Jefferson City MO; Twelfth Biennial Report of the State Highway Commission of Missouri, 1939-40, pages 189-190; Howard H. Mullins, "Continuous Tied Arch Built in Missouri," Engineering News-Record 126 (5 June 1941), pages 84-87; field inspection by Clayton Fraser, 10 June 1994.

**INVENTORIED BY**

Clayton B. Fraser

**AFFILIATION**

Fraserdesign, Loveland CO

**DATE**4 August 1994

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