

# Eads Bridge

STLC08

## GENERAL DATA

structure no.:	260.07	city/town:	St. Louis
county:	St. Louis	feature inters.:	Mississippi River
		cadastral grid:	T45N R7E
		highway route:	Washington Street, St. Louis / Broadway, East St. Louis
		highway distr.:	6
		current owner:	City of St.Louis

## STRUCTURAL DATA

superstructure:	wrought iron/steel deck arch with stone arch approach spans		
substructure:	stone masonry abutments and piers with angled cutwaters		
span number:	3	condition:	fair
span length:	533'	alterations:	railroad tracks removed, 1977; numerous repairs
total length:	4026.0'	floor/decking :	timber and concrete
roadway width:	40.0'	other features:	steel guardrails

## HISTORICAL DATA

erection date:	1867-74
erection cost:	\$10,000,000.00
designer:	James Buchanon Eads, St. Louis MO
fabricator :	Butcher Steel Works (steel); Carnegie Kloman Company (iron)
contractor:	Keystone Bridge Company, Pittsburgh PA
references:	Missouri Highway and Transportation Department, Structure Inventory and Appraisal: Structure Number 260.07. Stephen Lissandrello, National Register of Historic Places Inventory Nomination Form, the Eads Bridge, U.S. Department of the Interior, National Park Service, 1985; Paul Watkins, "The Eads," <i>Missouri Life</i> , July-August 1974, 39; David Plowden, <i>Bridges: The Spans of North America</i> (New York: W.W. Norton & Company, 1974), pages 127-129; Donald C. Jackson, <i>Great American Bridges and Dams</i> (Washington: The Preservation Press, 1988), pages 220-221; Howard S. Miller, <i>The Eads Bridge</i> (Columbia: University of Missouri Press, 1979), pages 76-82; field inspection by Richard Collier, 23 February 1992.
sign. rating:	97
evaluation:	NRHP eligible (nationally significant example of early bridge construction located at important interstate crossing; one of America's most important spans)

Inventoried by: Lisa Schoch    4 August 1994

# HAER INVENTORY

Missouri Historic Bridge Inventory

**NAME(S) OF STRUCTURE**

Eads Bridge  
MHTD: 260.07

STLC08

**DATE(S) OF CONSTRUCTION**

1867-74

**LOCATION**

Washington Street, St. Louis / Broadway, East St. Louis over Mississippi River; T45N R7E, St. Louis; St. Louis County, Missouri

**USE (ORIGINAL / CURRENT)**

roadway and railway bridge / light rail bridge

**RATING** NRHP eligible (score: 97)

**CONDITION**

fair

**OWNER**

City of St. Louis

span number: 3

span length: 533'

total length: 4026.0'

roadway wdt.: 40.0'

superstructure: wrought iron/steel deck arch with stone arch approach spans

substructure: stone masonry abutments and piers with angled cutwaters

floor/decking: timber and concrete

other features: steel guardrails

In an effort to make their city the "gateway to the Far West," St. Louisans throughout the late 1840s and into the 1860s sought ways in which to develop their river commerce. Having watched cities such as Rock Island, Illinois, where the first Mississippi River railroad bridge was constructed in 1856, and Chicago, which had become a major railroad center by 1860, St. Louis by the late 1860s realized that a major bridge over the Mississippi River would help to make it a more competitive city. Such a bridge would link five eastern and western railroads that converged on St. Louis at that time. With the local media boosting the bridge idea, numerous bridge builders—including John A. Roebling and Lucius Boomer—submitted plans for the proposed structure.

Boomer became the leading choice for the job when he pressured the Illinois legislature to grant his Illinois and St. Louis Bridge Company a 25-year right to build bridges from the Illinois shore of the Mississippi River. In this way, if Chicago investors built the bridge they would absorb all tolls from St. Louis, possibly assuming control of St. Louis' commercial fate. At the same time, Boomer's proposal could easily allow for the blockage of any bridge building on the Missouri shore for 25 years. It was not entirely clear if it was Boomer's intention to build or prevent the building of a bridge. Although his plan eventually passed, his credibility diminished when he attempted to discredit the plans submitted by James Buchanan Eads, who distributed his own drawings for the project when he became convinced that Boomer's design was flawed. When public opinion plummeted, Boomer and his associates met with Eads to arbitrate a merger in 1868. Eads' design was adopted at that time.

With no formal education but a natural gift for engineering, Eads acquired practical experience gained from working as a purser on a Mississippi steamboat, from which he developed an intimate understanding of that river's disposition. Initially not involved in the boosterism over bridge planning, Eads was not a likely choice to design the new bridge. His background was in removing boat wreckage from the river; he had no formal training in engineering. As soon as he became the chosen builder, Eads assembled a prestigious group of assistants to aid in preparing the final plans for the bridge.

Built between 1867 and 1874, the Eads Bridge—originally the St. Louis Bridge—spans the Mississippi River, connecting St. Louis, Missouri,

with East St. Louis in Illinois. A ribbed steel arch bridge, the Eads features two decks, "granite faced limestone piers", and including its approaches, has an overall length of 6,442 feet. Originally designed and constructed for railway use, the Eads was known for its innovative building techniques and features. Although it was not entirely steel, it was one of the first bridges to employ that material extensively in its structure. The only American company that could handle the enormous task of producing the steel for the bridge was the Keystone Bridge Company, whose vice-president was Andrew Carnegie; its president was the well-known engineer Jacob J. Linville. When Eads engineers approached Linville to sign him as a consulting engineer early in the bridge's construction, Linville refused, stating "The bridge, if built upon these plans will not stand up; it will not carry its own weight." Nevertheless, by 1870, Carnegie convinced Linville to change his mind; at that time the contract for the superstructure was awarded to Keystone Bridge Company who subcontracted steel fabrication to Butcher Steel Works, and iron to Carnegie's Carnegie-Kloman Company. Work on the superstructure began in April 1873.

The Eads Bridge was also the first to use the pneumatic caisson method to affix the bridge's piers on the bedrock, which ranged from 172 to 197 feet below the water's surface. In its design, the Eads was the earliest to utilize the cantilever construction method, hollow tubular chord members, and alloy steel as a building material. It consists of a three-arch superstructure constructed with the cantilever method. Two of the arches are 502-feet long, while the third is 520-feet. From the very start the construction of the Eads was plagued with difficulties. The pneumatic caisson method caused an illness known as the "bends" in many of the workers; by the time the bridge's piers were in place in 1871, fifteen men had died and many were crippled. Other problems, such as Eads' health and his demanding personality, conflicts with steamboat operators, and difficulties with rupturing arch ribs, characterized the construction years.

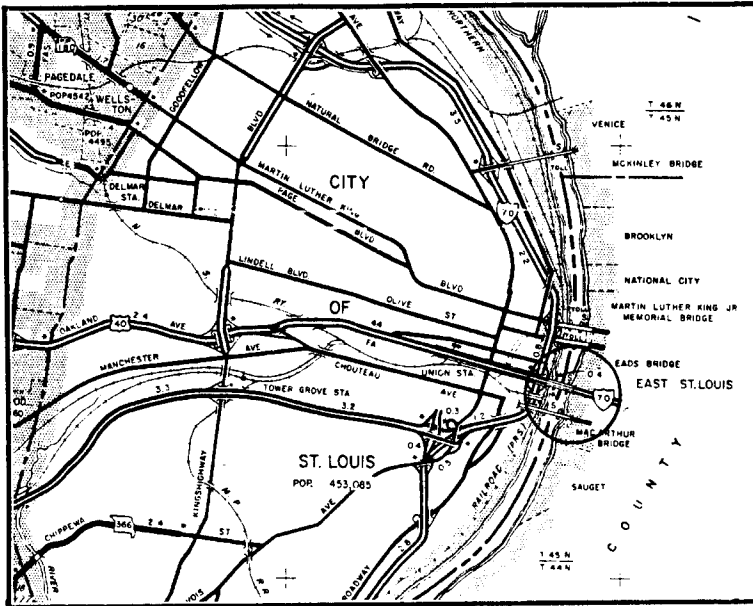
Officially opened on July 4, 1874, as the Illinois and St. Louis Bridge, the structure soon faced serious financial problems. No agreement was made with the railroad connected to the bridge—the St. Louis, Vandalia, and Terre Haute Railroad—to allow traffic across the bridge. In addition, other railroads quickly boycotted the new bridge, an act that eventually led to the demise of the bridge's owner, the St. Louis and Illinois Bridge Company. For the next fifteen years, the Eads' lease was shuttled between various companies. The Terminal Railroad Association eventually obtained the lease and has operated the bridge since 1889. The rail tracks to the bridge were removed in 1974, but the highway section is still in use. Currently the bridge is under repair, so its roadway is closed to all but light rail traffic.

Bridges over the Mississippi River comprise some of America's longest examples of vehicular steel truss construction. With over 400 miles fronting on the great river, Missouri possesses several notable Mississippi River bridges. Seven of these, including the Eads Bridge, are included in the statewide historic bridge inventory, and are all individually eligible for inclusion in the National Register. As the first span over the lower Mississippi River and a formative exercise in bridge engineering and construction, the Eads Bridge is nationally significant, clearly one of America's most important 19th century spans.

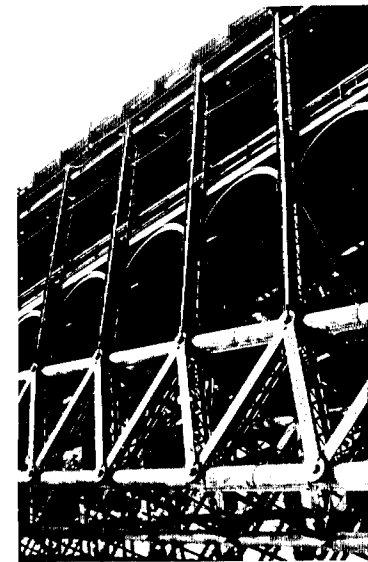
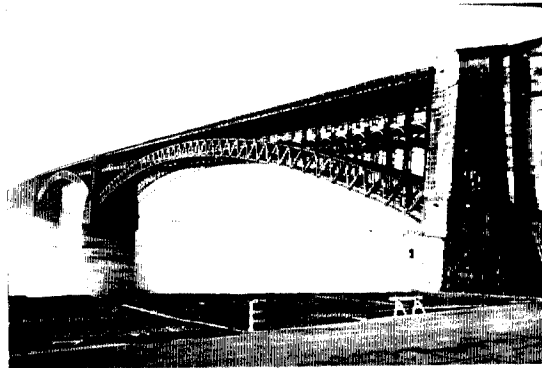
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**NAME(S) OF STRUCTURE**

Eads 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 260.07. Stephen Lissandrello, National Register of Historic Places Inventory Nomination Form, the Eads Bridge, U.S. Department of the Interior, National Park Service, 1985; Paul Watkins, "The Eads," *Missouri Life*, July-August 1974, 39; David Plowden, *Bridges: The Spans of North America* (New York: W.W. Norton & Company, 1974), pages 127-129; Donald C. Jackson, *Great American Bridges and Dams* (Washington: The Preservation Press, 1988), pages 220-221; Howard S. Miller, *The Eads Bridge* (Columbia: University of Missouri Press, 1979), pages 76-82; field inspection by Richard Collier, 23 February 1992.

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**INVENTORIED BY**

Clayton B. Fraser and Lisa Schoch

**AFFILIATION**

Fraserdesign, Loveland CO

**DATE**

4 August 1994

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