

**United States Department of the Interior
National Park Service**

For NPS use only

**National Register of Historic Places
Inventory—Nomination Form**

received

date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic Eads Bridge

and/or common Eads Bridge

2. Location

street & number Crosses the Mississippi River from Washington Ave.,
St. Louis, MO to Broadway, East St. Louis, IL not for publication

city, town St Louis vicinity of

state Missouri code 29 county St Louis code 510

3. Classification

Category	Ownership	Status	Present Use	
<input type="checkbox"/> district	<input type="checkbox"/> public	<input checked="" type="checkbox"/> occupied	<input type="checkbox"/> agriculture	<input type="checkbox"/> museum
<input type="checkbox"/> building(s)	<input checked="" type="checkbox"/> private	<input type="checkbox"/> unoccupied	<input type="checkbox"/> commercial	<input type="checkbox"/> park
<input checked="" type="checkbox"/> structure	<input type="checkbox"/> both	<input type="checkbox"/> work in progress	<input type="checkbox"/> educational	<input type="checkbox"/> private residence
<input type="checkbox"/> site	Public Acquisition	Accessible	<input type="checkbox"/> entertainment	<input type="checkbox"/> religious
<input type="checkbox"/> object	<input type="checkbox"/> in process	<input type="checkbox"/> yes: restricted	<input type="checkbox"/> government	<input type="checkbox"/> scientific
	<input type="checkbox"/> being considered	<input checked="" type="checkbox"/> yes: unrestricted	<input type="checkbox"/> industrial	<input checked="" type="checkbox"/> transportation
		<input type="checkbox"/> no	<input type="checkbox"/> military	<input type="checkbox"/> other:

4. Owner of Property

name Terminal Railroad Association of St. Louis

street & number 2016 Madison Ave.

city, town Granite City vicinity of state Illinois 62040

5. Location of Legal Description

courthouse, registry of deeds, etc. Assessor's Office, City Hall

street & number Room 114, 12th and Market Streets

city, town St. Louis, state Missouri

6. Representation in Existing Surveys

title Historic American Buildings Survey has this property been determined eligible? yes no

date 1968 federal state county local

depository for survey records Library of Congress/Prints and Photographs Division

city, town Washington, state D.C.

7. Description

Condition

excellent
 good
 fair

deteriorated
 ruins
 unexposed

Check one

unaltered
 altered

Check one

original site
 moved date _____

Describe the present and original (if known) physical appearance

Eads Bridge spans the Mississippi River at St. Louis, Missouri, crossing from Washington St. in St. Louis to Broadway in East St. Louis, Illinois. It is a three span, ribbed steel arch bridge, with lower and upper decks and granite-faced limestone piers. Materials used in the construction include 2390 tons of steel, 3156 tons of wrought iron, 806 tons of timber decking, 4556 cubic yards of concrete, and 97,571 cubic yards of stone masonry. The center span is 520 feet, the other two spans are 502 feet, and the overall length including approaches on both sides is 6442 feet. The bridge clearance is 50 feet above high water.

The piers are constructed of limestone below the average high water mark and of granite above this level. The east abutment rises 193 feet from bedrock, the west abutment, 113 feet. The east pier, which is the deepest, is 197 feet from bedrock, and the west pier is 172 feet.

There are small masonry arches on the approaches to the bridge, mostly on the lower level and larger arches on the street level next to the river. The highway deck which is 54 feet wide, is supported by concrete foundations, and runs across the top of the bridge. Only a small portion of the original railing exists, on the north side of the eastern approach. The lower deck carried dual railroad tracks which were removed in 1974. Some of the wooden ties remain on the bridge. The railroad tracks emerged from the lower deck of the bridge on the Illinois (east) side and ran above the road upon reaching the embankment.

The length of the bridge is approximately 1 mile.

8. Significance

Period	Areas of Significance—Check and justify below			
prehistoric	archeology-prehistoric	community planning	landscape architecture	religion
1400-1499	archeology-historic	conservation	law	science
1500-1599	agriculture	economics	literature	sculpture
1600-1699	architecture	education	military	social/
1700-1799	art	X engineering	music	humanitarian
X 1800-1899	commerce	exploration/settlement	philosophy	theater
1900-	communications	industry	politics/government	X transportation
		invention		other (specify)

Specific dates 1867-1874 **Builder/Architect** Captain James B. Eads

Statement of Significance (in one paragraph)

Eads Bridge was designed and built by Captain James B. Eads (1820-1887) to accommodate rail service over the Mississippi River, thus providing a link between railroads running east from East St. Louis, Illinois, and those going west from St. Louis, Missouri. Construction began on the west abutment in August of 1867 and the bridge was completed and dedicated on July 4, 1874, at a cost of \$10,000,000.

The bridge employs a three-span, ribbed steel, deck arch design, and is significant for its design, method of construction, and materials used. Construction utilized cantilever support rather than centering, a technique used most commonly in arch and truss bridges, and featured spans larger than any previously constructed bridge. It wasn't until 1932 that a bridge with larger spans was constructed. Steel was used for the first time as the primary metal on a major structure, and was supplied by the Keystone Bridge Company of Pittsburgh. Eads Bridge was also **important** as the largest bridge built at that time, with the largest caissons constructed to date, the first significant use of compressed air for subaqueous work, and the deepest compressed air work.

James B. Eads was a hydraulic river engineer. He also built iron clad gunboats for the Union during the Civil War and designed the jetty system at the mouth of the Mississippi River. Eads Bridge was the first bridge that he designed and the only one that he actually built. At one time, Eads ran a salvage business on the river, and as a diver, became familiar with the currents and the composition of the river bottom. Taking into account this knowledge of the river, he proposed to build a bridge over the Mississippi in 1865. Believing that the foundations were the most critical portion of the bridge, Eads was convinced they should rest on the bedrock to assure stability. The bridge structure would require a three-span, ribbed steel arch construction. Based on these preliminary plans, Eads was named the chief engineer of the newly formed St. Louis Bridge Company, and he proceeded to fully develop his plans with a staff of qualified engineers.

A trip to Europe in 1868 resulted in Eads' decision to use a pneumatic caisson system of construction on the piers. This allowed him to reach bedrock 136 feet below high water on the east pier, the deepest pneumatic caisson ever constructed. Eads also improved air lock designs and invented a sand pump that facilitated excavations within the caisson. A portion of the iron used in constructing the piers was salvaged from the wreck of the iron clad gunboat, Milwaukee, sunk by Confederate torpedos, March 1865 in Mobile Bay. The iron caissons were then filled with concrete which formed the foundation of the piers. Caissons disease, of the bends, was a problem encountered by men working in the deep levels of the piers. Since little was known about combating the effects of men working in highly compressed air, 119 men developed the disease, and 14 died from it before the bridge was completed. The caissons of the two river piers reached bedrock in early 1870.

(continued)

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SIGNIFICANCE (continued)

Construction of the superstructure began in April, 1873. Eads had developed a ribbed steel arch, using four pairs of steel tubes for each of the three spans. The lower and upper tubes of each pair were tied together in truss-like form using wrought iron bracings supplied by Andrew Carnegie. The arches cantilevered out from both sides of the river piers to form part of the half-span. Additional tubes were supported by cables strung from temporary towers built on top of the piers, until full half-arches were completed. Arches were closed at the center using a special threaded coupling. Rib construction was completed in less than 14 months.

The bridge was formally opened on July 4, 1874 with gala festivities marking the occasion. The excitement was shortlived. A tunnel adjoining the bridge on the west side, was plagued with numerous problems from the start. The first train through the tunnel scrapped the sides because although the wheel had been converted to standard gauge (4'9"), the body of the train was still broad gauge (6') and too wide for the narrow passage. Heat, smoke, and the smell in the tunnel also bothered passengers traveling in the open cars.

Christened the Illinois and St. Louis Bridge, the name did not last, and neither did the company which owned it. The track which crossed the bridge was connected to only one railroad, the St. Louis, Vandalia, and Terre Haute Railroad, and no arrangement had been formally made with that line to send any traffic over the bridge. Other railroads boycotted the bridge following its completion, forcing the Illinois and St. Louis Bridge Company into receivership less than one year after opening. Within four years, the company went bankrupt and the bridge was sold at auction in 1878. An English company named the St. Louis Bridge Company bought the bridge for \$2,000,000, and in 1881, Jay Gould's Missouri Pacific obtained a sole lease on the bridge, assuming all debts. Finally, in 1889, the lease was transferred to a group of railroad companies called the Terminal Railroad Association of St. Louis. This company has owned and operated the bridge ever since. Although the highway part of the bridge is still used, the tracks on the bridge were removed in 1974. Some ties are still visible on the lower deck of the bridge.

9. Major Bibliographical References

Art Museum, Dept. of Civil Engineering, Princeton University, The Eads Bridge, 1974.
 Mattison, Ray H., "Eads Bridge," Historic Sites Survey Record, 1963.
 Smith, Shirley H., The World's Great Bridges. 1953.
 Steinmen, David ., and Sarah Ruth Watson, Bridges and Their Builders, 1941.
 Work Projects Administration, Missouri--A Guide to the "Show Me" State, 1941.

10. Geographical Data

Acreeage of nominated property 6.67 acres

Quadrangle name _____

Quadrangle scale _____

UTM References

EG 2/25/97

A ¹⁵ ^{EG 2/25/97}

13	7	4	6	2	4	0	4	2	7	1	9	1	1	0
Zone	Easting			Northing										

B ¹⁵

13	7	4	5	0	0	0	4	2	7	1	9	1	0
Zone	Easting			Northing									

C

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 E

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 G

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 H

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Verbal boundary description and justification

The boundaries of the Eads Bridge NHL are described as follows: Beginning at the lower deck of the western bridge approach. Continue east over the bridge and the eastern approach, ending at a point where the highway returns to solid ground and is no (continued)

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

state	code	county	code
state	code	county	code

11. Form Prepared By

name/title Stephen Lissandrello, Historian, Landmarks Survey Project -updated by Sarah J. Pearce
 organization Historic Sites Survey, National Park Service date March 31, 1975 National Park Service, ^{RMP} 7/83

street & number 1100L Street NW 523-5464 telephone 234-2560

city or town Washington, D.C. state Denver, CO

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

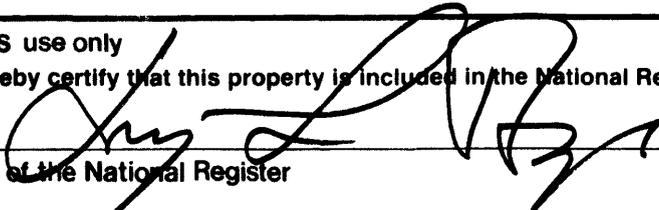
national state local

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 _____ date _____

For NPS use only
 I hereby certify that this property is included in the National Register

 date 1/22/85
 Keeper of the National Register

Attest: _____ date _____
 Chief of Registration

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Verbal Boundary Description and Justification (continued)

longer supported by the bridge structure. The boundary is drawn to include the bridge, both approaches, the foundations and piers which extend down to the bedrock of the river.

The dimensions of the structure are approximately 1 mile in length, 55 feet in width.

Photo Log:

Name of Property: **Eads Bridge** _____

City or Vicinity: **St. Louis [Independent City]** _____

County: **St. Louis [Independent City]** _____ State: **MO** _____

Photographer: **Michael Weichman** _____

Date

Photographed: **May 1983** _____

No descriptive information was captured at the time this nomination was written.









