

1845

United States Department of the Interior
National Park Service

SEP 29 1989

NATIONAL REGISTER

National Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Cedar Avenue Bridge
other names/site number Tenth Avenue Bridge (Bridge No. 2796)

2. Location

street & number Tenth Avenue over Mississippi River N/A not for publication
city, town Minneapolis N/A vicinity
state Minnesota code MN county Hennepin code 053 zip code 55114
55415

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
<input type="checkbox"/> private	<input type="checkbox"/> building(s)	Contributing	Noncontributing
<input checked="" type="checkbox"/> public-local	<input type="checkbox"/> district	_____	_____ buildings
<input type="checkbox"/> public-State	<input type="checkbox"/> site	_____	_____ sites
<input type="checkbox"/> public-Federal	<input checked="" type="checkbox"/> structure	<u>1</u>	_____ structures
	<input type="checkbox"/> object	_____	_____ objects
		<u>1</u>	<u>0</u> Total

Name of related multiple property listing:
Reinforced Concrete Highway Bridges in Minn., 1900-1945 listed in the National Register 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register criteria. See continuation sheet.
Nina M. Archabal 9/22/89
Signature of certifying official Nina M. Archabal Date
State Historic Preservation Officer
State or Federal agency and bureau Minnesota Historical Society

In my opinion, the property meets does not meet the National Register criteria. See continuation sheet.
Signature of commenting or other official _____ Date _____
State or Federal agency and bureau _____

5. National Park Service Certification

I, hereby, certify that this property is:
 entered in the National Register. Delores Beyer 11/6/89
 See continuation sheet.
 determined eligible for the National Register. See continuation sheet.
 determined not eligible for the National Register.
 removed from the National Register.
 other, (explain:) _____
Signature of the Keeper Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)

Transportation, road-related

Current Functions (enter categories from instructions)

Transportation, road-related

7. Description

Architectural Classification

(enter categories from instructions)

Other: Reinforced-concrete bridge

Materials (enter categories from instructions)

foundation

walls

roof

other reinforced concrete

Describe present and historic physical appearance.

See continuation sheet

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CEDAR AVENUE BRIDGE (BRIDGE NO. 2796)

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7. DESCRIPTION

The Cedar Avenue Bridge (also known as the Tenth Avenue Bridge; MNDOT Bridge No. 2796) is located less than one mile east of the city hall and downtown loop, and a few blocks north of the west bank campus of the University of Minnesota, in Minneapolis, Hennepin County, Minnesota. It connects Cedar Avenue on the south, across the Mississippi, with Tenth Avenue Southeast on the north; formerly, it linked with Johnson Street Southeast on the north. (The original arrangement of streets in the vicinity of the Cedar Avenue Bridge was disrupted by the alignment of Interstate 35W, which was constructed in the 1960s-70s.) In the 1980s, the environment of the bridge remains a mix of older commercial and residential, but has become very heavily influenced by the University of Minnesota's expansion campus on the west (but here, geographically south) bank of the Mississippi. The campus was opened in the mid-1960s and has continued to grow. Parallel to, and a short distance from, the Cedar Avenue Bridge on the upstream ("west") is the Interstate 35W bridge, erected in 1967; a short distance downstream ("east") is the Northern Pacific Railroad bridge, which was erected in 1884-85 and thoroughly remodeled c1917.¹

Aligned on a northeast-southwest axis, the Cedar Avenue Bridge is a reinforced-concrete, open-spandrel, two-rib, continuous-arch bridge, with an overall structure length of 2,174.9 feet. In the original, continuous-arch unit, it has two main spans of 265.5 feet each that cross the river channels, and five flanking spans of 93 feet each, two on the northeast end and three on the southwest end. The flanking spans are aligned so as to give the bridge an S-curve in plan, with the three southwest spans on a curve of 5 deg. 41 min. and the two northeast spans on a curve of 5 deg. 18 min. Thirteen minor, precast-concrete-beam, approach spans were added in 1971-76, replacing a series of I-beam approach spans. All the arch spans have two ribs 12 feet wide and 24 feet apart in the clear, with a thickness for the main spans of 3.5 feet at the crown and 7.5 feet at the haunches. A three-center radius of 154 and 48.5 feet is used for the intrados, and a single radius of 167.5 feet for the extrados. Each rib of the main spans is reinforced with five steel ribs 31.5 inches deep at the crown, having chords composed of pairs of angles, with smaller angles for the web members. In the 93-foot spans, each rib is reinforced with sixteen longitudinal bars at top and bottom, tied together with loop bars. Footings for the three river piers are 30 x 54 feet. At the east and center piers they rest on the sandstone bedrock at 11.5 feet and 22.5 feet below low water, while the west pier footings are supported on 180 piles, 32 to 42 feet long, driven in gravel formation. The main spans have a rise of 90.5 feet, with the crown about 110 feet above low water.

Transverse spandrel walls practically the full width of the arch ribs, and spaced 13.3 inches center to center in the main spans and 12 feet in the flanking spans, support floor beams that carry the deck and are cantilevered to support the sidewalks. With the 1971-76 redecking, the deck width is 68.1 feet, carrying a 55.5-foot roadway, with a sidewalk on one side and a bikeway on the other.

When built, the bridge had a simple, relatively unornamented surface, taking its beauty from the elegant line, form, and proportion of the engineering itself. A 1930 descrip-

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tion stated: "Except for the rubbing of [the concrete] railing to a smooth finish no special treatment was given to the exposed concrete surfaces for the sake of appearance."² Simple inset, vertical panels of mild Classical Revival/Art Deco style were the only stylistic additions to the piers, and these were retained in the remodeling.

1. A Guide to the Industrial Archeology of the Twin Cities, Nicholas Westbrook, ed. (St. Paul & Minneapolis: Society for Industrial Archeology, 1983), pp. 23-24.
2. "Concrete-Arch Mississippi Bridge at Minneapolis," Engineering News-Record, July 10, 1930, pp. 49-50.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

nationally statewide locally

Applicable National Register Criteria A B C D

Criteria Considerations (Exceptions) A B C D E F G

Areas of Significance (enter categories from instructions)

Engineering
Transportation

Period of Significance

1929-1939

Significant Dates

1929

Cultural Affiliation

N/A

Significant Person

N/A

Architect/Builder

Engr.: Oustad, Kristoffer Olsen

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

See continuation sheet

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8. SIGNIFICANCE

The Cedar Avenue Bridge (MNDOT Bridge No. 2796), spanning the Mississippi River in Minneapolis, Hennepin County, Minnesota, is significant under Criterion A, in the area of transportation, and under Criterion C in the area of engineering in the context of Minnesota Reinforced-Concrete Highway Bridges, 1900-1945. It is an excellent example of the monumental urban, continuous-rib-arch, reinforced-concrete bridges constructed to span the high and scenic Mississippi River bluffs during the early automobile age in the Minnesota's Twin Cities. As such, it is one of the major extant examples of the second and "golden age" of reinforced-concrete, arch-bridge design and construction in Minnesota. The first era was the 1880s, metal-bridge era. Engineering historian Kenneth Bjork points to a series of factors that created the special bridges of the great reinforced-concrete bridge era between World War I and World War II in the Twin Cities: the common transportation obstacle of the high-bluffed Mississippi River; the coming of the automobile and the truck and the converging of many highways into the cities placing a heavy burden on the early bridges, thus demanding designs recognizing greater concentrated loadings than were needed for teams and carriages; the need to support streetcar tracks; the need for joint, two-city planning and financing in some cases.¹

When completed in 1929 the Cedar Avenue Bridge was the longest and highest of the monumental concrete-arch bridges erected in Minneapolis and a significant engineering accomplishment. With an as-built overall structure length of 2,921 feet, it was 698 feet longer than its closest rival, the Third Avenue Bridge (MNDOT No. 2440). With a vertical clearance of 110 feet, it was ten feet higher than the Cappelen Memorial (Franklin Avenue) Bridge (MNDOT No. 2441). Even with the various remodelings that all the Twin Cities bridges have undergone since construction, it is still the longest of the historic, pre-1945 reinforced-concrete, continuous-arch bridges. To find a longer pre-1945 structure in the Twin Cities metropolitan area, it is necessary to look to the record-breaking, 4119-foot Fort Snelling-Mendota Bridge (MNDOT No. 4190), which was the world's longest reinforced-concrete, continuous-arch bridge when built.

An additional point of technological significance is that the Cedar Avenue Bridge was one of the first constructed using water-cement ratio specifications for proportioning concrete. Design stresses ranged from a low 2000 pse in the foundations to a high of 3000 pse in the arch ribs. Test cylinders taken from the mixing plant verified that the new procedure was successful in addition to being more economical.²

The Cedar Avenue Bridge is the crowning achievement of Kristoffer Olsen Oustad, who is significant as one of four, major, innovative and influential Norwegian-American engineers that were involved in the design of the great bridges of the Twin Cities (the others are Martin Sigvart Grytbak, Andreas W. Munster, and Frederick William Cappelen). Educated at Trondhjem's Technical College in 1882, Oustad joined the Minneapolis city engineer's office in 1883, becoming municipal bridge engineer in 1893. When the Cedar Avenue Bridge was completed in 1929, Oustad retired, 46 years after he began. He had as-

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sisted famed Norwegian-American engineer Frederick William Cappelen in the design of two earlier concrete arch-bridge landmarks, the Third Avenue Bridge and the Cappelen Memorial (Franklin Avenue) Bridge, completing the latter when Cappelen died. The Cedar Avenue Bridge, however, was Oustad's work, assisted by Frederick T. Paul, assistant bridge engineer, under the direction of N.W. Elsberg, city engineer.³

As the first bridge ever built at this location, the Cedar Avenue Bridge was planned to fill several pressing transportation needs in Minneapolis. In general, it would provide relief from downtown-loop congestion caused by limited river crossings and increased north-south traffic, including tourist traffic utilizing "the new Duluth Highway."⁴ On the north and east were several major industrial districts, including the Northwest Terminal (in the vicinity of Stinson Boulevard and East Hennepin Avenue) and the milling and terminal-elevator concentration in the Midway (north of University Avenue). These industrial areas now would have direct truss access to a proposed \$300,000 modernization of a river/rail terminal on the south and west, with the federal government scheduled to operate a fleet on barges on the Mississippi.⁵

Initial federal authorization was received in 1924 with federal plan approval in 1926. North approach spans were constructed 1923-26. Construction bids were opened in 1926 and the lowest, \$891,000, was one submitted by the City of Minneapolis, acting through the City Engineer. Work commenced on this "Engineers Contract" in June 1926, using day labor, and construction was completed in October 1929. The bridge was officially dedicated in September 1929.⁶

The bridge was redecked, and new approach spans added, in 1972-76. The alterations do not substantially reduce the structure's overall integrity since the original seven arch structures and spandrels, incorporating all of the bridge's significant engineering elements, were repaired and restored. The replaced I-beam approach spans were not an integral part of the significant reinforced-concrete superstructure, and were not even discussed in an engineering review of the bridge in 1930.⁷

1. Kenneth Bjork, Saga in Steel and Concrete: Norwegian Engineers in America (Northfield, Minn.: Norwegian-American Historical Association, 1947), pp. 139-40; Carl Condit, American Building (Chicago: University of Chicago Press, 1968), p. 255.
2. See Howard, Needles, Tammen & Bergendoff, Tenth Avenue Bridge...Engineering Report (n.p.: Minnesota Department of Highways, 1968), pp. 4; copy in MNDOT file for bridge 2796.
3. See Bjork, pp. 140-54; Engineering News-Record, July 10, 1930.
4. "Cedar Bridge to Be Finished by January 1," undated clipping (c1929) in Cedar Avenue Bridge file, Minneapolis History Collection, Minneapolis Public Library.

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5. "Cedar Bridge Links Industries," Minneapolis Journal, January 24, 1926.
 6. See HNTB, pp. 1-4; "20,000 Attend Dedication of Cedar Bridge," Minneapolis Tribune, September 21, 1929.
 7. See Engineering News-Record, July 10, 1930.

9. Major Bibliographical References

Bjork, Kenneth. Saga in Steel and Concrete: Norwegian Engineers in America.
Northfield, Minn.: Norwegian-American Historical Association, 1947.

Engineering News-Record. July 10, 1930.

Howard, Needles, Tammen & Bergendoff. Tenth Avenue Bridge...Engineering Report.
N.p.: Minnesota Department of Highways, 1968. Copy in MNDOT file for bridge
2796.

Minneapolis Journal. 1926.

Minneapolis Tribune. 1929.

See continuation sheet

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67)
has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings
Survey # _____
- recorded by Historic American Engineering
Record # _____

Primary location of additional data:

- State historic preservation office
- Other State agency
- Federal agency
- Local government
- University
- Other

Specify repository: _____

10. Geographical Data

approximately four acres

Acreage of property _____

UTM References

A	0 6 2 0	4 9 8 0 0 2 0
Zone	Easting	Northing
C		

B	1 5	4 8 0 9 0 0	4 9 8 0 6 6 0
Zone	Easting	Northing	
D			

See continuation sheet

The UTM's have been re-typed on a continuation sheet

Verbal Boundary Description

The nominated property defines an S-curved "rectangle" measuring 2,400 feet east-west by 70 feet north-south, the vertices of which coincide with the outside corners of the bridge structure.

See continuation sheet

Boundary Justification

Based on dimensions for overall structure length and overall deck width as determined by the Minnesota Department of Transportation and reported on the Structure Inventory Sheet for Bridge 2796, the boundaries are designed to enclose the total bridge superstructure, total substructure, and all other integral abutment and approach elements.

See continuation sheet

11. Form Prepared By

name/title	Dr. Robert M. Frame III, Historical Consultant		
organization	N/A	date	August 15, 1988
street & number	202 McBoal Street	telephone	612-227-9531
city or town	St. Paul	state	MN zip code 55102

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UTM References

A Zone: 15

Easting: 480620

Northing: 4980020

B Zone: 15

Easting: 480900

Northing: 4980660

Acreage of property: Approximately Four acres