Description

Bridge 5388 was constructed in 1935 to carry Trunk Highway (TH) 24 over the North Fork of the Crow River in Meeker County. In 2011 it was relocated to its current location at the entrance to Lake Louise State Park, and was renamed Bridge R0529, carrying State Highway 2 over the Little Iowa River. It serves light vehicular traffic, as well as pedestrian, equestrian, and bicycle traffic. The 100-foot span is a steel, five-panel, rigid-connected, Warren pony truss with polygonal top chords. The two truss webs are identically detailed. Two channel sections with X-lacing form the top chord, while four angle sections with battens comprise the bottom chord. The diagonal members consist of four angle sections with either V-lacing or battens. The primary vertical members are four angle sections with V-lacing, and the secondary vertical members are two angle sections with battens. The primary verticals are sway braced by paired angle sections in an outrigger configuration. Bottom lateral bracing consists of crossed angle sections. The roadway is 26.5 feet in width. The substructure consists of concrete abutments and wingwalls. As a result of the relocation and associated rehabilitation activities, cables were added above the historic railing at the height required to accommodate equestrian use of the bridge.

EVALUATION AND ANALYSIS

Historical Context

Historic Iron and Steel Bridges in Minnesota, 1873-1945

Historical Narrative

Historical background information provided here was taken from the June 2006 Minnesota Department of Transportation (MnDOT) Historic Bridge Management Plan for Bridge 5388.
Established in 1921 as part of the state's original trunk highway system, TH 24 connected the city of Litchfield on the south to the city of St. Cloud on the northwest, a distance of about 40 miles. When the state legislature expanded the trunk highway system in the 1930s, the state highway department reorganized the numbering system and retained the TH 24 designation for only the south half of the original route, stretching from Litchfield to Kimball. This portion received approximately $100,000 worth of improvements in 1935-1936, mostly in the form of grading and graveling. However, about one-quarter of the amount went to the construction of a new highway crossing, to be designated as Bridge No. 5388, over the North Fork of the Crow River. The state highway department completed plans for Bridge No. 5388 in November 1934, and a month later awarded a low-bid construction contract for the project, in the amount of $22,240, to Tiber and Berg of St. Paul. The contractor completed the bridge without incident in 1935.

The construction of Bridge No. 5388 marked the final stage in the state highway department's work with the Warren pony-truss form. When the agency issued its first bridge specifications in 1912, it stipulated the use of the rigid-connected, Warren-truss configuration for future pony-truss bridges, and set the maximum span length for the type at 80 feet. These provisions were reiterated when the agency re-issued its specifications in 1918, 1921, and 1925. In 1930, the state highway department announced that "our bridges are now being designed in substantial accordance with the approved specifications of the American Association of State Highway Officials [AASHO] which safely provides for the legal loadings specified in our own state laws." AASHO's specifications, as codified in 1928, set the maximum span length for low riveted trusses at 100 feet. To use the rigid-connected Warren pony truss in the 80- to 100-foot range, the Minnesota Highway Department revised its standard plan for the type by replacing the conventional, horizontal top chord of the truss web with a polygonal top chord. The "curved top chord," as it was sometimes called, was more economical for longer spans because it varied the depth of the web to suit the stresses produced by the load, thereby reducing the amount of steel necessary for construction. During the 1930s, the highway department designed several of the new Warren pony trusses, but only Bridge No. 5388 achieved the outer span limit of 100 feet. The crossing was the longest pony-truss span ever built under the state's supervision. When the highway department issued revised plans and specifications in the mid-1940s, it dropped the Warren pony truss as an "obsolete" type, which could be economically replaced by long-span, deep-section, I-beam bridges.

In 2011 Bridge 5388 was relocated to Mower County and renumbered as Bridge R0529.

**Significance**

In 1998 Bridge R0529 was listed in the National Register of Historic Places (National Register) for its design in the area of engineering under Criterion C, within the historic context of "Historic Iron and Steel Bridges in Minnesota, 1873-1945." The Multiple Property Documentation Form (MPDF) associated with this context states that properties may be eligible under Criterion C if "they embody distinctive characteristics of bridge engineering and construction or significant phases in the evolution of bridge engineering and construction." Representing the final evolution of the Minnesota Highway Department's standard plan for the Warren pony-truss type, Bridge R0529 satisfies this criterion.

Bridge R0529 has been relocated but continues to convey its significance under Criterion C, applying Criteria Consideration B: Moved Properties. The significance of the structure is tied to its engineering and is demonstrated through its materials.
design, and workmanship, all indicative of a standard plan Warren pony truss type constructed during the 1930s. The bridge retains its significant engineering and design features.

**Integrity**

Bridge R0529 retains integrity of design, materials, and workmanship and conveys its engineering significance under Criterion C, applying Criteria Consideration B: Moved Properties. Although the setting for the bridge has changed, its current setting is similar and since truss bridges were designed to be moved, relocation does not result in a loss of integrity under Criteria Consideration B.

**Recommendation**

Bridge R0529 was previously evaluated as eligible for the National Register under for its engineering under Criterion C, within the historic context of “Historic Iron and Steel Bridge in Minnesota.” The MPDF associated with this context recognizes that properties may be eligible under Criterion C if “they embody distinctive characteristics of bridge engineering and construction or significant phases in the evolution of bridge engineering and construction.” The bridge is significant within the context of historic steel bridges in Minnesota. It was the longest pony truss span ever built under the state’s supervision and represents the final evolution of the Minnesota Highway Department’s standard plan for the Warren pony truss type. Bridge R0529 satisfies the MPDF criteria and retains the integrity necessary to convey its engineering and design significance under Criterion C, applying Criteria Consideration B: Moved Properties. In 2014 the National Register Nomination is in the process of being updated to reflect the bridge’s new location in Mower County.

**Sources**

American Association of State Highway Officials. Standard Specifications for Highway Bridges and Incidental Structures (mimeographed, 1928). Available in Walter Library, University of Minnesota, Minneapolis;

Bridge 5388 File. Available in Minnesota Department of Transportation, Waters Edge Building, Roseville, Minnesota.

Bridge 5388 File (construction plans, contract). Available in Minnesota Department of Transportation District 8 Office, Willmar, Minnesota.

Bridge R0529 electronic record in the Minnesota Department of Transportation Bridge Database.

Field inspection by Jeffrey A. Hess, 12 August 1996.


MINNESOTA ARCHITECTURE - HISTORY INVENTORY FORM

Project: Local Historic Bridge Study - Phase II
Le Roy Township, Mower County, Minnesota


Minnesota Highway Department. General Provisions and Bridge and Culvert Specifications, 1918, Sec. 122.

Minnesota Highway Department. "Minnesota Trunk Highways Improvement Progress Map, February 1925."

Minnesota Highway Department. Trunk Highway Standard Specifications, 1921, Sec. 11-1.

Minnesota Highway Department. Trunk Highway Standard Specifications, 1925, Sec. 11-1.

Quivik, Fredric L. "Iron and Steel Bridges in Minnesota." Multiple Property Documentation Form, 1988. Available at State Historic Preservation Office, Minnesota Historical Society, St. Paul;

Consultant’s Recommendation of Eligibility
Listed – Individual

Prepared By
Mead & Hunt, Inc.

Date Surveyed
Not applicable
MINNESOTA ARCHITECTURE - HISTORY INVENTORY FORM

Project: Local Historic Bridge Study - Phase II
Le Roy Township, Mower County, Minnesota

Property Photographs

View facing west
Location Map

Bridge R0529 – STATE 2 over LITTLE IOWA RIVER

PROJECT LOCATION
MOWER COUNTY
SW 1/4, SE 1/4, SEC. 21, TO 101NN, R 14W
UTM ZONE: 15 NAD: 27
USGS QUAD NAME: LEROY
EASTING: 1768003 ft.
NORTHING: 15813764 ft.