

MINNESOTA HISTORIC BRIDGE INVENTORY

Bridge No : 001238A

County Name : Redwood

City/Township : Sanborn

Township : 109 Range : 36W Section : 36 SW-SW-NW

UTM Coordinates : 15:329950:4896845

USGS Quadrangle : Sanborn

330040:4896390

Inventory Number : RW-SBC-005

National Register Eligible : Yes

Criteria : A, C

Context : Reinforced-Concrete Highway Bridges in Minnesota

Period of Significance : 1918-1947

Retains Integrity : Yes

Structural Data

Main Span Type : 109

Superstructure : 3-span concrete slab

number main spans : 03

Substructure : concrete straight abutments with perpendicular wingwalls, 2-legged concrete piers with cutwaters on each side

number appr spans :

Floor/Decking : cellular-slab concrete deck

structure length : 68.60

Other Features : solid-parapet concrete railings decorated with recessed panels

deck width : 18.00

Historical Data

Year built : 1918

Contractor/Builder : M.A. Adams and Company, Minneapolis, Minnesota

Designer : Minnesota Highway Department

Statement of significance :

Located in a rural area within the city limits of Sanborn, Bridge No. 1238A carries an unpaved, municipally owned road across a small unnamed stream. The structure is of poured-in-place, reinforced-concrete construction, consisting of three 20-foot-long spans. The abutments have perpendicular wingwalls, and the two-legged piers have cutwaters on each side. The bridge's 18-foot-wide deck supports a gravel-covered roadway between solid-parapet concrete railings decorated with recessed panels. The state highway engineers who designed Bridge No. 1238A described its engineering type as a "concrete cellular slab span," but the bridge could also be called a T-beam structure. On each span, the underside of the deck contains six rows of convex voids that divide the slab into seven longitudinal and three transverse beams.

In September 1916, the Minnesota Highway Commission reported in *Engineering News* that it had "developed a new standard design of reinforced-concrete bridge for short spans in which the volume of concrete is reduced by cells in the under side of the slab. . . . The cells are made of arched corrugated No. 26 iron with wood bulkheads which may be taken out, nested, moved to another bridge site and used again." According to the article, "This design saves about one-third of the volume of concrete required in the flat-slab type for the same load and using the same unit stresses." In its biennial report for 1915-1916, the highway commission explained that the new "concrete cellular slab" was intended to replace the traditional I-beam stringer bridge, which had become prohibitively expensive because of advancing steel prices during World War I. The agency also noted that it was adopting "a similar form of construction for the floor slab in new standard [concrete] through girder spans." According to a bridge log compiled by Minnesota state highway engineers, the cellular-slab deck appeared in several dozen concrete-slab and concrete through-girder bridges constructed during and immediately after World War I. In 1922, the design was

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dropped, apparently because steel had decreased enough in price to make I-beam bridges competitive once again.

Because they were designed to be inexpensively built with reused formwork, cellular-deck bridges tended to cluster in a given locale. No two examples, however, show greater proximity to each other than Bridge Nos. 1238A and 1238, which stand about 450 feet apart on the same stretch of road. For didactic purposes, their location is fortuitous, for it allows the student of Minnesota bridge engineering to examine in a single place the state highway commission's cellular-deck designs for both concrete-slab and concrete through-girder bridges, Bridge No. 1238A being an example of the former and Bridge No. 1238 of the latter. Both structures appear to have been constructed by the Minneapolis bridge-building firm of M.A. Adams and Company, which placed its name plate, bearing a 1918 date, on the concrete railing of Bridge No. 1238. In its proceedings of 8 July 1918, the Redwood County Board of Commissioners noted that it had received from the Minnesota Highway Department (the newly established successor to the Minnesota Highway Commission) a "certificate as to the completion of contract" for a bridge identified as "1238B on State Road No. 10," which apparently is the structure now identified by the Minnesota Department of Transportation as Bridge No. 1238. Although the county board proceedings did not specifically mention Bridge No. 1238A, there is ample evidence that both bridges were part of a large construction project designed by the state highway agency and funded by both the federal government and Redwood County.

In a sense, the history of Bridge Nos. 1238A and 1238 goes back to 1905, when the Minnesota Legislature established a procedure for creating a network of arterial highways known as "State Roads." County governments were given the responsibility of designating and improving State Roads within their jurisdictions, with the understanding that the state highway commission would prepare the necessary engineering plans, supervise construction, and partially subsidize the cost. Although the legislature intended State Roads to be well-constructed, interconnecting, main-traveled routes, county boards were often more interested in creating political good will among voters than in achieving an efficient highway system. As the state highway commission observed in its biennial report for 1909-1910: "One of the greatest difficulties in the way of designating State Roads in some of the counties comes from a desire on the part of the county boards to accommodate all portions of their jurisdiction, and thus to designate so great a mileage as to make it practically impossible to distribute the small fund allotted to them in sufficient amounts to accomplish any tangible results." Or, as a state highway engineer more bluntly put it in 1915: "State roads were permitted to be designated by county boards regardless of the possibility of construction [resulting] in a large mileage of disconnected and aimless state roads leading no-where and in a great many cases being the poorest roads in the county."

In Redwood County, the State Road movement began quickly and then faltered. By January 1907, the county board had laid out a 25-mile route through the heart of the county, from Redwood Falls on the north to Sanborn on the south. Despite this auspicious beginning, the county failed to take full advantage of the state-aid program. Although the board added over 100 miles to its State Road network in the next five years, it used only about \$550 of its \$3,500 allotment to actually improve the system, apparently refusing to further allocate matching funds, as required for State Road work. In 1914, however, the state highway commission noted that "the general sentiment of the county seems to be in favor of better roads, especially for the main routes." Three years later, the Redwood County board wholeheartedly embraced the State Road program. It is probably no coincidence that its decision coincided with the federal government's pronouncement, under the Highway Act of 1916, that significant funds would be available for the first time to state highway departments for the construction of arterial highways. In exchange for \$15,742 in federal aid, as administered by the state, the Redwood County board on 9 July 1917 voted to appropriate \$25,174 from its own road and bridge fund to meet its share of the expense in improving the Redwood Falls-Sanborn route "as a graded road complete with culverts and bridges according to the requirements of the State Highway Commission." In anticipation of this decision, the state had already prepared engineering drawings for Bridge Nos. 1238A and 1238, dated, respectively, 12 June 1917 and 31 May 1917. In January 1918, Redwood County awarded a grading contract to Mason City Fuel and Contracting Company of Mason City, Iowa, for the construction of the Redwood Falls-Sanborn highway, designated as State Road No. 10. In its biennial report for 1918-1919, the state highway department noted that the Redwood County grading project had been completed for approximately \$41,000 in 1918. The report also noted the construction of five State Road bridges in Redwood County in 1918. Presumably Bridge Nos. 1238A and 1238 were included in this number.

In 1921, Minnesota replaced its State Roads with a State Trunk Highway system, the first highway network to be directly owned, built, and maintained by the state. Although many former state routes were dropped from the new system, State Road No. 10 in Redwood County was retained, becoming part of Minnesota Trunk Highway No. 4 (later redesignated as Trunk Highway No. 71). This route traversed the entire state, stretching from the Canadian border near International Falls to Jackson, Minnesota, near the Iowa border. The Redwood County segment was so well constructed that it received no further improvements until the mid-1930s, when its gravel surface was replaced by blacktop. At that time, the state highway department also rerouted the highway to bypass Sanborn on the east. This relocation eliminated Bridge Nos. 1238A and 1238 from the State Trunk Highway system.

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Bridge No. 1238A is eligible for the National Register in the area of transportation under Criterion A for its historical association with the State Road system, Minnesota's first attempt to create a network of well-constructed arterial highways. Although most State Roads were inconsequential routes that had been selected for political rather than engineering considerations, Bridge No. 1238A and its associated State Road 10 were a main-traveled thoroughfare, and they were incorporated into the state's first trunk highway network.

Bridge No. 1238A is also eligible for the National Register in the area of engineering under Criterion C within the historic context of "Reinforced Concrete Highway Bridges." It is an excellent example of the Minnesota Highway Commission's innovative cellular-deck design, as applied to concrete-slab bridges.

It is also possible that Bridge No. 1238A may be eligible under Criterion A as part of a National Register Historic District that embraces the former route of State Road 10 from Redwood Falls to Sanborn. The period of significance for this district would be 1918 to 1921. The first date marks the completion of State Road No. 10 in Redwood County, while the second date marks the statutory end of the State Road system, which was replaced in 1921 by the State Trunk Highway system. An intensive-level survey should be conducted of the former route of State Road 10 in Redwood County to evaluate the potential district's features, boundaries, and integrity. Such a survey, however, is beyond the scope of a historic bridge inventory.

References :

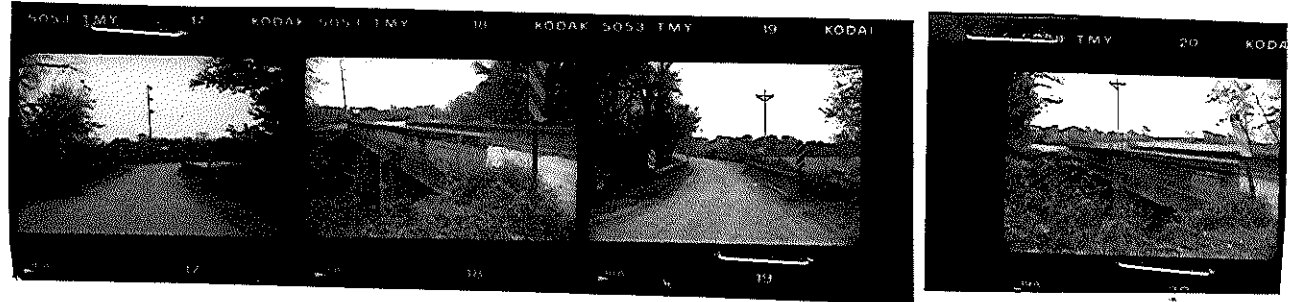
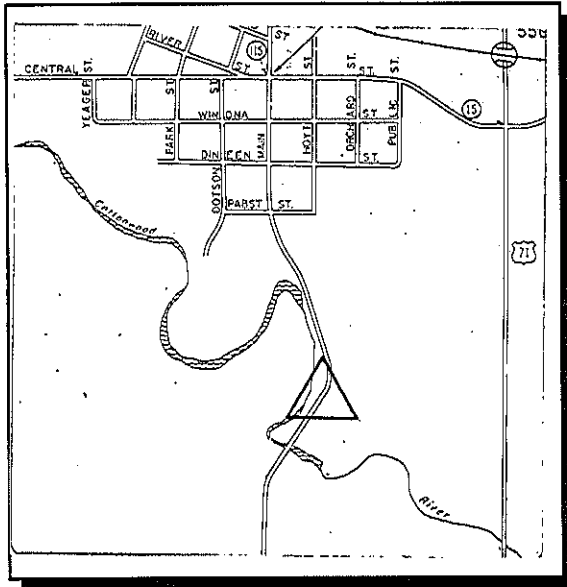
Minnesota Department of Transportation, Bridge Database; Bridge No. 1238A File, in Minnesota Department of Transportation, Waters Edge Building, Roseville, Minnesota; Bridge No. 1238A File, in Redwood County Highway Department, Redwood Falls, Minnesota; Minnesota Highway Commission, *Report, 1915-1916*, 19-23; "Test of New Type Reinforced Concrete Bridge," *Engineering News* 76 (28 September 1916):620-621; Bridge Log, in Bridge Division, Minnesota Department of Transportation, Waters Edge Building, Roseville; Redwood County Board of Commissioners, Proceedings, 9 July 1917, 24 January 1918, 8 July 1918, in Redwood County Courthouse, Redwood Falls, Minnesota; Minnesota Highway Commission, *Additional Rules and Regulations for the Construction and Improvement of State Roads. Bulletin No. 5* (N.p.: The State Highway Commission, 1910); Minnesota Highway Commission, *Report, 1909-1910*, 17; J. H. Mullen, "Highway Laws," *Proceedings of the Minnesota Surveyors' and Engineers' Society* (St. Paul: Published by the Society, 1915): 27-33; "Allotments and Payments for State Aid," in Minnesota Highway Commission, *Report, 1911*, 47; George W. Cooley, [*Map of*] *State of Minnesota Showing Proposed State Roads Designated by County Resolutions* (St. Paul: State Highway Commission, 1907); Minnesota Highway Commission, *Report, 1914*, 171; "1918 Construction of State Roads," in Minnesota Highway Department, *Report, 1918-1919*; "Minnesota Trunk Highways Improvement Progress Map, 1925," in Minnesota Highway Department, *Report, 1923-1924*, endpiece; "Construction Department Expenditures by County and Trunk Highway," in Minnesota Highway Department, *Report, 1937-1938*, 72; field inspection by Shawn P. Rounds, Jeffrey A. Hess, 22 October 1995.

Form Prepared By : Jeffrey A. Hess

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Source: Minnesota Department of Transportation