

EBYS MILL ROAD BRIDGE
(Bridge No. 207960)
Carries Ebys Mill Road over Small Creek
Ebys Mill vicinity
Jones County
Iowa

HAER IA-97
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

**HISTORIC AMERICAN ENGINEERING RECORD
EBYS MILL ROAD BRIDGE (BRIDGE NO. 207960)**

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Location: Carries Ebys Mill Road over Small Creek, Eby's Mill vicinity, Jones County, Iowa

The Ebys Mill Road Bridge (Bridge No. 207960) is located at latitude 42.19889202, longitude - 91.04674524. The coordinate represents the center of the bridge. It was obtained in 2014 from the Iowa Department of Transportation shapefile for Jones County. The location has no restriction on its release to the public.

Present Owner/ Occupant: Jones County Secondary Road Department.

Present Use: Vehicular traffic.

Significance: The Ebys Mill Road Bridge (Bridge No. 207960) is a representative example of the reinforced concrete channel beam common post-1945 concrete bridge type.

Historian(s): Camilla Deiber, Senior Architectural Historian; The Louis Berger Group, Inc.; 2014

Project Information: This documentation was prepared as mitigation for the Advisory Council on Historic Preservation (ACHP)'s *Program Comment Issued for Streamlining Section 106 Review for Actions Affecting Post-1945 Concrete and Steel Bridges*, noticed in the Federal Register on November 16, 2012. The Federal Highway Administration and the Advisory Council on Historic Preservation are the project sponsors and retained the Louis Berger Group, Inc. and Mead & Hunt, Inc. team to prepare this document. It was prepared by Camilla Deiber, Principal Investigator, The Louis Berger Group, Inc. Rob Tucher completed the photography.

Part I. Historical Information

A. Physical History:

1. **Date(s) of construction:** 1964.
2. **Engineer:** Iowa State Highway Commission.
3. **Builder/Contractor/Supplier:** F. A. Moser, Inc., Farmersburg, Iowa.
4. **Original plans and construction:** Standard Design: Precast Concrete Bridges, 18', 24' and 30' Spans, 20' and 24' Roadways, H-13 Loading. Iowa State Highway Commission, October 1954.
5. **Alterations and additions:** There are no known alterations.

B. Historical Context:

Development of Standard Bridge Designs in Iowa

In 1949, the Iowa General Assembly made sweeping changes to existing highway laws designed to increase the amount of road construction funds, to delineate the role of the Iowa State Highway Commission (ISHC) and the counties in relation to the new secondary road system and to improve the engineering of roadway and bridge construction efforts in the state. In order to increase the amount of funding for highway construction, the Iowa General Assembly created the Road Use Tax Fund. The fund was comprised of monies taken from motor vehicle registration and motor carrier fees, 10% of the state sales tax, and a four-cent motor vehicle fuel tax. Money from the Road Use Tax Fund was distributed among the different state road systems--42% to primary roads, 35% to secondary roads, 15% to farm-to-market roads, and 8% to city and town streets. A \$17 million ceiling on the primary road fund, imposed by state legislation, was also eliminated to curtail the practice of borrowing money for farm-to-market roads from the primary road fund—a practice that often left it completely depleted. Bridge building in Iowa reached an all-time high, in terms of sheer numbers, at the exact middle of the century when a total of 580 bridges were constructed during the calendar year 1950.

The new highway law also established the roles of the counties and ISHC in the construction and maintenance of the secondary road system. The law gave the ISHC control of the overall mileage of secondary roads in each county, standard road and bridge designs, construction and inspection of projects, approval of plans and projects, and accounting of the farm-to-market road fund. Each county's Board of Supervisors was responsible for initiation of projects, purchase of right-of-way, surveys and construction plans, and secondary road maintenance.¹

¹ Iowa State Highway Commission (ISHC), *Progress on Iowa Highways, 1955-1956: An Interim Report to Iowa Highway Users*. (Ames, Iowa: Iowa State Highway Commission), 1956, 14)

Perhaps the most farsighted modification to the highway law in 1949 was the creation of a fund for “financing engineering studies and research projects in connection with the construction and maintenance of secondary roads.” One-and-a-half percent of the Farm-to-Market Road Fund was dedicated to such research. The ISHC also established a Primary Road Research Fund, using a percentage of the Primary Road Fund. The legislature left the organization of research efforts in the hands of the ISHC—requiring only that biennial reports of research progress be presented to the legislature.² In December 1949, the ISHC created the Iowa Highway Research Board to guide research efforts. The 11-member board was comprised of six individuals from the Iowa County Engineers Association, three from the ISHC, one from Iowa State College and one from the State University of Iowa. Each college member was usually the Dean of the engineering college.

Modifications to Iowa’s highway law and the corresponding increase in workload prompted the creation of several new departments in the ISHC: the Research Department in 1953 and the Secondary Road Department in 1954. The inadequacy of bridge designers at the county level was seen by the ISHC as hampering needed bridge construction efforts. Two years after its creation, the Secondary Road Department began to work with the County Engineer’s Association and Bridge Engineers at the ISHC to develop bridge standards that could be made available to the counties. By 1958, standard designs were available for pretensioned, prestressed concrete bridges, I-beam bridges, and concrete slab bridges.³

In the 1960s, the Secondary Road Department continued to cater to the needs of county engineers. On April 13 and 14, 1960, the Secondary Road Department held a Bridge and Culvert Design Short Course for county engineers. The department produced a manual with secondary road standard bridge designs as well as “special designs” such as skew bridges that were available to county engineers and their contractors.⁴

Concrete Box and Channel Beam Bridges

The concrete box-beam bridge [Type 105, 106] came into use in the 1940s as a design which allowed for the reduction of dead load while providing greater rigidity due to the widening and integration of the bottom flanges. The advantages of less weight and depth were offset by the additional formwork cost and the type was therefore generally used in situations where its advantages were necessary. Some contractors reduced the labor cost by building steel forms that could be more quickly set and removed and had a greater life span than wood forms. Short, simple span box beams were also precast onsite and placed in position with a crane. All of Iowa’s twenty-four simple span box beam bridges are less than 30 feet in span length and may have been built with precast units. By the mid-1950s conventional cast-in-

² Joseph M. Isenberg, *Iowa Highway Research Board: 1949-1999*. (Ames, Iowa: Center for Transportation Research and Education, Iowa State University), 1999, 7.

³ Iowa State Highway Commission (ISHC), *Annual Report of the Iowa State Highway Commission*. (Ames, Iowa: ISHC), 1958, 37.

⁴ Iowa State Highway Commission (ISHC), *Procedures in Highway Bridge and Culvert Design: County Engineers Short Course*. (Ames, Iowa: Iowa State Highway Commission), 1960.

place and precast box beams were meeting competition from the precast/prestressed form. The concrete channel-beam bridge [Type 122] has an essentially parallel development in time to that of the box-beam with somewhat different intentions on the part of the designer. With an open bottom, like a box culvert, the form was especially adaptable to precasting for short spans with greater ease than the box-section girder. But like the box-girder, the channel beam design did not reach its efficiency potential until it was produced in the prestressed form and then utilized for continuous spans which occurred in the early 1950s.

Concrete Channel Beam Use in Iowa

According to the Structure Inventory and Appraisal Database, there are 150 concrete channel beam bridges in Iowa. The earliest was constructed in 1954; the latest in 1982. The majority of bridges are single span within the 24' to 45' span range and were built primarily in the 1960s and 1970s.

Construction of Ebys Mill Road Bridge (Bridge No.207960)

In October 1964 Jones County awarded the construction contract for the bridge to F. A. Moser, Inc. of Farmersburg, Iowa for \$15,548.¹² The firm was the lowest of three bidders for the contract.⁵ The bridge was designed using standard plans for concrete channel beam structures developed by the Iowa State Highway Commission in 1954.

The impetus for the new bridge was the likely installation of a new bridge in 1958 over the Maquoketa River approximately one-half mile to the west. The new bridge on this county road between the towns of Scotch Grove and Cascade likely increased traffic sufficiently to warrant a new bridge at this location.

Part II. Structural/Design Information

A. General Statement:

1. Character: The Ebys Mill Road Bridge (Bridge No. 207960) is a concrete channel beam bridge and is a representative example of this common post-1945 concrete bridge type.

2. Condition of fabric: Good

B. Description: The Ebys Mill Road Bridge (Bridge No. 207960) is a single span concrete channel beam bridge. The concrete channel beam bridge can be thought of as a box girder without a bottom flange. Conventionally reinforced concrete channel beams (as opposed to prestressed channel beams) are pre-cast units in standard lengths commonly between 20' and 70' although the vast majority in Iowa are in the 24' to 45' range. Like the box beam, the units are placed side-by-side with the top flanges abutting to form the roadway slab.

The Ebys Mill Road Bridge (Bridge No. 207960) has an overall structure length of 31' with a deck width of 24'. The deck accommodates a two-lane gravel roadway. The pre-cast units used to construct the bridge

⁵ "Award Contract for Bridge on Eby Mill Road." *Monticello Express*, October 22, 1964, 1.

are divided into interior deck units and curbed deck units. Both the interior deck and curbed deck units are 3' 2" wide.

Six interior longitudinal deck units and two curb units are connected together with one inch bolts that are 1' 4" long secured with washers and jam nuts. Steel guard railing is attached to the outside of the curb units with steel posts and high tensile strength bolts. Shear joints, anchor dowel holes, and lifting loop recesses are filled with concrete.

Timber pile and plank abutments support concrete sills on both ends of the bridge. The wingwalls of the abutments are also timber pile and plank.

C. Site Information: The Ebys Mill Road Bridge (Bridge No. 207960) spans Small Creek in Jones County, Iowa. The bridge is located in a rural area in the Maquoketa River valley. A second bridge spanning the Maquoketa River was constructed five years earlier. Eby's Mill Road, also known as County Road X73, serves as a connection between the towns of Scotch Grove to the southeast and Cascade to the northeast.

Part III. Sources of Information

A. Primary Sources:

"Award Contract for Bridge on Eby Mill Road." *Monticello Express*, October 22, 1964.

Iowa State Highway Commission (ISHC), *Annual Report of the Iowa State Highway Commission*. Ames, Iowa: ISHC, 1958.

———. *Progress on Iowa Highways, 1955-1956: An Interim Report to Iowa Highway Users*. Ames, Iowa: Iowa State Highway Commission, 1956.

———. *Procedures in Highway Bridge and Culvert Design: County Engineers Short Course*. Ames, Iowa: Iowa State Highway Commission, 1960.

———. *Standard Design Precast Concrete Bridges*, October 1954.

B. Secondary Sources:

The Louis Berger Group, Inc. *Highway Bridges in Iowa: 1942-1970*. Marion, Iowa: The Louis Berger Group, Inc., 2004.

Isenberg, Joseph M. *Iowa Highway Research Board: 1949-1999*. Ames, Iowa: Center for Transportation Research and Education, Iowa State University, 1999.