IOWA HISTORIC PROPERTY DOCUMENTATION STUDY OF THE FIFTH AVENUE BRIDGE (ALSO KNOWN AS THE TAVERNER BRIDGE) IN THE CITY OF DECORAH, IOWA

By Robert C. Vogel

Prepared for the City of Decorah
June 2004

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Iowa Historic Property Documentation Study of the Fifth Avenue Bridge (also known as the Taverner Bridge) in the City of Decorah, Iowa

BRM-1876(601)--8N-96

FHWA #003510

SHPO inventory #96-00235
HABD # 96-016

June 2004

There is nothing in machinery, there is nothing in embankments and railways and iron bridges and engineering devices to oblige them to be ugly. Ugliness is the measure of imperfection.

H. G. Wells

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ACKNOWLEDGMENTS

It is a pleasure to acknowledge several professionals who made valuable contributions to the preparation of the historic property documentation study. Stan Stallsmith of WHKS was the project manager and our liaison with the City of Decorah. Consultations with Berry Bennett and Ralph Christian of the State Historical; Society of Iowa, Randy Faber of the Iowa DOT's Office of Location and Environment, and Charlene Roise of the historical consulting firm of Hess Roise and Company, Minneapolis, provided helpful comments on the identity of the bridge and its builder. In Decorah, Jim Hippen shared his encyclopedic knowledge of northeast Iowa bridges and city engineer Lindsay Erdman provided copies of drawings and other documents relating to the 1981 bridge repair program. The author is also grateful for the cooperation and assistance received during visits to the State Historical Society of Iowa research library in Des Moines, the Decorah Genealogy Association research center at the Decorah Public Library, and the offices of the Winneshiek County Auditor and Engineer.

The written data, photographs and drawings were assembled and archivally processed by Kathleen Taylor of Vogel & Associates, who also provided editorial and administrative assistance. WHKS & Company supplied the situation plan and longitudinal section drawing. Custom film processing and prints were provided by Black & White Photolabs, Inc., of Minneapolis. The narrative report and attachments were printed at the White Pine Press in Saint Paul.

MANAGEMENT SUMMARY

Project:	Replacement of the Fifth Avenue Bridge
Location:	Upper Iowa River, City of Decorah, Winneshiek County, Iowa
Owner:	City of Decorah
FHWA structure number:	003510
SHPO inventory number:	96-00235
SHPO HABD number:	96-016
DOT project number:	BRM-1876(601)--8N-96
SHPO R & C number:	031296123
Bridge type:	Steel Parker through truss
Spans:	2 (main span and approach span)
Main span length:	176 ft. (53.68 m)
Approach span length:	30 ft. (9.15 m)
Other details:	Pinned and riveted connections, timber deck, concrete pier and abutments
Date erected:	Construction started November 1913, bridge opened March 1914
Builder:	Federal Bridge Company, Des Moines, for Winneshiek County Board of Supervisors
Fabricator:	Inland Steel Company, Chicago
Original owner:	Winneshiek County
Current owner:	City of Decorah
National Register status:	Determined eligible, Criterion C
Purpose of documentation:	Mitigation of adverse effects of demolition
Location of documentation:	Community Programs Bureau, State Historical Society of Iowa, Des Moines
Field/archival research dates:	4 May to 4 June 2004
Documentation prepared by:	Robert C. Vogel & Associates, New Brighton, Minnesota
Principal investigator:	Robert C. Vogel, historian
Engineers:	WHKS & Company, Mason City

INTRODUCTION

This report presents the findings of the Iowa Historic Property Documentation Study of the Fifth Avenue Bridge, also known as the Taverner Bridge, located on the Upper Iowa River within the city limits of Decorah, Winneshiek County.[1] Using written data, photographs and drawings, the report explicates and illustrates the historical significance of the bridge. Because the historic structure is expected to be demolished in 2005, the documentation serves as a form of mitigation by creating a body of information that might otherwise be lost. The intended users of the documentation include historians, preservationists, engineers, industrial archaeologists, and interested members of the public.

The documentation study arose from the City of Decorah's decision to erect a new bridge at the Fifth Avenue crossing of the Upper Iowa River. Because the planned new bridge would qualify as a Federal Aid Project, it was the responsibility of the Iowa Department of Transportation (DOT) to ensure compliance with Section 106 of the National Historic Preservation Act, which requires government agencies involved in Federally assisted undertakings to consider the effects of their projects on properties listed in or eligible for the National Register of Historic Places.[2] In fulfillment of its responsibilities under Section 106, the DOT advised the city to conduct an intensive cultural resources survey of the river crossing site to identify and evaluate the significance of any archeological resources and standing structures that would be impacted by the bridge replacement. This survey was carried out in 2003 by Bear Creek Archeology, Inc. With respect to the existing bridge, this investigation concluded that:

> The Fifth Avenue Bridge, built in 1914, is historically significant as a well preserved specimen of the Parker Truss highway bridge type. Contextually, it reflects an important trend in highway bridge engineering during the "Good Roads Movement" in Iowa and shows the influence of the Iowa State Highway Commission in the design of rural highway bridges in Winneshiek County. The Parker truss bridge property type is rare in northeastern Iowa and this

[1] The historic property is also sometimes referred to locally as the "Green Bridge," an allusion to its present-day paint color; green may or may not have been the bridge's original color.

[2] All Federal agencies, as well as state agencies and communities which receive Federal assistance, are required by law to include historic preservation in their project planning (36 CFR Part 800); see State of Iowa, "Procedures for Implementation of Section 106 Requirements Among the Iowa Department of Transportation, Iowa Division, Federal Highway Administration, and the Iowa State Historic Preservation Officer," July 2002, Iowa Department of Transportation, Ames.

particular bridge retains all of the important aspects of historic integrity, including location, design, materials, and location, required for listing under National Register Criterion C.[3]

The Iowa State Historic Preservation Officer (SHPO) concurred with this evaluation and determined the Fifth Avenue Bridge was eligible for listing in the National Register. In consultation with the city, the SHPO and the DOT, the Federal Highway Administration (FHWA) of the U.S. Department of Transportation determined that the replacement of the historic bridge represented an adverse effect upon a significant property eligible for listing in the National Register. Pursuant to federal regulations, the consulting parties entered into a Memorandum of Agreement (MOA) whereby they agreed that "it is in the public interest to expend funds to implement this project through documentation of the historic property thereby mitigating the adverse effects of the project." The MOA stipulated that the city would document the historic structure in accordance with the Secretary of the Interior's standards for historic preservation and would receive clearance to proceed with demolition of the bridge after the documentation was approved by the SHPO.[4]

The Fifth Avenue Bridge study was conducted by Robert C. Vogel & Associates for WHKS and Company, engineering consultant to the City of Decorah. Archival research and field work were carried out during May and the draft documentation was circulated for review and comment in June 2004. The study was designed to meet the Secretary of the Interior's standards for architectural and engineering documentation and followed the historic bridge recordation guidelines developed by the State Historical Society of Iowa.[5] While it built upon previous historic preservation work, the documentation study included new data that modified and amplified the findings of the 2003 bridge survey. In contrast to the survey report, which was prepared to meet technical needs, the documentation study was intended for informational use and will be made available to the general public as part of the research collections of the State Historical Society and other depositories.

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[3] *Phase I Cultural Resources Survey for the Proposed Fifth Avenue Bridge Replacement Within the City of Decorah, Winneshiek County, Iowa*, report prepared for WHKS & Company (Cresco, Ia.: Bear Creek Archeology, November 2003), 9-10. The section of the report dealing with the historic bridge was prepared by Robert C. Vogel, a BCA contractor.

[4] "Memorandum of Agreement Between The Federal Highway Administration and The Iowa State Historic Preservation Office and City of Decorah Regarding the Replacement of the 5th Avenue Bridge, Winneshiek County," 26 January 2004, Iowa Department of Transportation, Office of Location and Environment, Ames.

[5] State Historical Society of Iowa, "Iowa Historic Property Study: Bridge," version of 28 June 1997 (typewritten); cf. National Park Service, "Guidelines for Architectural and Engineering Documentation," *Federal Register*, Vol. 68, No. 139 (21 July 2003), 43159-43162.

Contained in the documentation study is a narrative that describes the Fifth Avenue Bridge and places it in its historic context; selected field photographs depicting existing conditions, reproductions of drawings and plans, and other pertinent information are attached. All of the documentation materials are intended to be readily reproducible.

In addition to the printed report and attachments, the following materials were packaged separately for archiving at the State Historical Society:

- A clean copy of the report text and attachments printed on archival bond paper.

- 35 mm black and white field photography negatives on safety film with accompanying contact prints and photo identification sheets.

- Selected 5-by-7 in. black-and-white enlargements of black and white field photographs processed according to archival standards and printed on fiber paper, with corresponding Kodachrome-64 color slide views, placed in archivally stable sleeves.

- Site plan and longitudinal section printed on Mylar

- Drawings prepared by the city engineer in 1981, printed on archival bond paper.

THE BRIDGE TODAY

The Fifth Avenue Bridge, also known as the Taverner Bridge, spans the Upper Iowa River in the western part of the City of Decorah. The historic structure is located about one-quarter mile south of the Luther College campus and one-half mile north of Pulpit Rock, in the southwest quarter and of the northeast quarter of Section 17, Township 98 North, Range 8 West. Fifth Avenue, a minor arterial street, follows an east-west axis and the bridge is situated approximately midway between the Pulpit Rock Road intersection to the west and the Riverview Drive intersection to the east. Land use on the west side of the river is a mix of agriculture, conservancy, and low-density residential development; the eastern approach to the bridge passes through a densely settled urbanized area.

The historic bridge was constructed by Winneshiek County in 1914 but is currently owned by the City of Decorah. For historic preservation purposes, it is classified as a simple span, Parker type through truss vehicular bridge. The two steel trusses of the main span (one on each side of the roadway) are its strongest visual and physical design elements. The common engineering definition of a truss is a group of straight ties and struts designed to form a skeletal structure which acts as a large beam. In a truss bridge, the structural members (top and bottom chords, diagonals, vertical posts) form triangles in a single plane, arranged so that the external loads are applied at the joints and all of the members are in axial tension or compression. The Parker truss design is distinguished by its polygonal (i.e., curved) upper chords.[6]

The bridge superstructure consists of a single 176 ft. (53.68 m) truss span over the river and a 30 ft. (9.5 m) girder approach span at the west end. The trusses are fabricated from straight sections of rolled steel plates, channels, and angles that are pinned at the joints and riveted to confer extra stiffness. Some of the truss members are themselves small trusses or parallel beams braced with steel battens, which serve to lighten the structure and contribute to its visual character. Each truss consists of nine panels, with eight vertical posts and ten diagonal members set at 45-degree angles. The three panels at each end have diagonal members which slant down toward the center of the structure, while the middle panels have crossed diagonals. The end posts, which constitute the bridge's largest structural pieces, reach diagonally from

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[6] Allan T. Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," *History News*, Vol. 32, No. 5 (May 1977); for an overview of truss bridge engineering in historic context, see the relevant chapters in Llewellyn N. Edwards, *A Record of History and Evolution of Early American Bridges* (Orono, Me.: University Press, 1959).

the top to the bottom chords. Steel struts provide top and bottom lateral bracing; the portals are also cross-braced. The tops of the arched upper chords stand approximately 19 ft. (5.79 m) above the roadway at the portal ends, 26 ft. (7.93 m) at the center of the truss span. The total weight of the bridge steelwork is about sixty-five tons (58.95 Mg).

The bridge is 16 ft. (4.88 m) wide between the trusses and the roadway consists of a laminated timber deck laid over steel stringers that are riveted to the floor beams. The original wood plank decking was replaced in 1981 and is presently covered with a thin layer of bituminous asphalt. Railings, consisting of steel channels mounted on the truss webbing, form a continuous protective barrier for the pedestrian walkways that run along the outside edges of the deck. The railings have a major impact on the overall appearance of the structure by providing a physical record of the damage inflicted by collisions with vehicles. The bridge has been fitted with a number of traffic signs to ensure travel safety, the design and placement of which do little to compliment its historic character.

The bridge has a single monolithic concrete pier that receives the superstructure loadings at the junction of the truss span and the west approach span. It is armored with steel plating on the upstream end to deflect river ice and floating debris. Poured in place concrete abutments and their adjacent retaining walls define the beginning and end of the bridge. The pier and abutments sit on wooden pilings driven into the riverbed. According to the city engineer, the west abutment was reconstructed as part of the 1981 repair program. The pier and abutments are purely functional and have little effect on the visual theme of the bridge.

The location of the Fifth Avenue crossing determined the basic geometric form of the bridge. Without the original plans or construction photographs, it is impossible to determine the extent of slope cutting and filling required to grade the approaches in 1914. However, given the fact that the bridge approaches traverse relatively flat terrain within a straight and narrow right-of-way, there was probably little grading. Overall, the bridge setting appears natural and blends in with surrounding topography.

As built, the bridge generally lacked architectural or aesthetic embellishment because it was not on a major highway and therefore was not considered a "gateway" to the community. There is no decorative metalwork, not even a bridge plate bearing the builder's name or the date of erection. "Inland," the mark of Inland Steel Company, appears in low relief on some of the structural members. The design does exhibit a sense of balanced proportion to the overall scale of the structure and its

setting, which, it could be argued, is itself an eye-catching aesthetic expression. Color was probably not a prime means of communicating aesthetic information during the era in which the bridge was built. In 1914, it is likely that the steelwork received a dull surface finish at the factory; in 1981 the structure was sandblasted and repainted in green modified.

In addition to its historical and engineering values, the Fifth Avenue Bridge is distinguished by its picturesque setting on the Upper Iowa River, one of the most scenic rivers in Iowa. Over its length, the Upper Iowa falls at an average rate of sixteen feet per mile, a characteristic that made it attractive for waterpower development during the nineteenth and early twentieth centuries. Along its upper reaches the river flows through a series of deep gorges, but within the Decorah city limits it swings through a broad valley. The narrow floodplain is prone to seasonal overflows and the riparian landscape shows abundant evidence of floods. Historically exploited for its water power, today this reach of the river is heavily used for recreational purposes, especially canoeing and tube floating.

Although some of the web steel has rusted through and it has sustained minor damage caused by automobiles, snowplows and floods, the bridge is in a good state of preservation. By modern bridge safety standards, however, it is considered structurally inadequate and functionally obsolescent because projected traffic volumes and loads exceed its design limits. Originally built to carry a single lane of traffic at light loads (in comparison with modern highway bridges), the narrow deck limits its capacity for automobiles, while the overhead structural members provide insufficient clearance for some large pieces of public safety equipment. The geometry of the bridge also makes it susceptible to structural damage and temporary closure resulting from the high water and ice jams which are recurrent conditions along the Upper Iowa River.[7]

[7] See the articles in the *Decorah Journal* of 8 June and 11 July 2000, 7 January and 6 February 2003.

HISTORICAL BACKGROUND

Winneshiek County was opened to settlement in 1848 and the town of Decorah, the county seat, was laid out in 1853.[8] Early development in Decorah was concentrated along both sides of the Upper Iowa River, which was bridged at several points within the city limits before the end of the nineteenth century. The development of the Taverner Mill in the early 1870's stimulated commercial activity and vehicular traffic, which was the impetus for constructing a bridge to carry South Street (modern-day Fifth Avenue) over the river between Decorah proper and West Decorah. The plats printed in early atlases show the location of the first bridge and its relationship to the Taverner Mill and other developments, and the structure itself is depicted in early photographs that show a Pratt Truss type bridge located slightly upstream from the Taverner Mill.[9]

Because of the importance of wagons for hauling grain, lumber and other heavy freight between facilities not directly served by railways, there was a strong interest in highway bridge building throughout Iowa during the late nineteenth century.[10] Most of these early bridges were timber or iron truss structures constructed under the authority of county

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[8] The standard sources for local history are W. E. Alexander, *History of Winneshiek County, Iowa* (Sioux City: Western Publishing Company, 1882); *An Illustrated Historical Atlas of the State of Iowa* (Chicago: A. T. Andreas, 1875), 350-353; Edwin C. Bailey, *Past and Present of Winneshiek County, Iowa*, 2 vols. (Chicago: S. J. Clark Company, 1913); Charles R. Sparks, *History of Winneshiek County, Iowa* (Decorah: James Alexander Leonard, 1877); *Standard Historical Atlas of Winneshiek County, Iowa* (Davenport: Anderson & Goodwin, 1905); *Winneshiek County, Iowa: Visions of the Past* (Marceline, Mo.: Heritage House Publishing, 1998); and Craig Williams Creative, Inc., *Decorah: Decorah Streetmap and Resource Guide, Winneshiek County, Iowa* (Pinckneyville, Ill: CommunityLink, 1999).

[9] The Taverner Mill (sometimes written "Taviner"), named for its original owners John I. Taverner and John I. Taverner, Jr., was a water-powered grist and flour mill erected ca. 1871. During the late nineteenth century, the mill complex consisted of a stone and timber mill dam and a two-story stone and timber millhouse, with the millhouse, raceway and flume located on the east bank of the river, downstream from the bridge. The mill closed circa 1918 and the buildings were razed in 1933; the mill dam was also demolished. The mill location, which includes ruins of the dam and part of the millhouse basement wall, has been assigned site number 13WH139 in the state's archaeological inventory. Historical information on the Taverner Mill is summarized in the 2003 Fifth Avenue Bridge survey report (p. 9 and passim).

[10] Clayton B. Fraser, *Iowa Historic Bridge Inventory: Final Report*, prepared for the Iowa Department of Transportation (Loveland, Col.: FraserDesign, January 1994), 7-82; this study resulted in the Multiple Property Documentation Form (usually styled "Highway Bridges of Iowa MPS") under which bridges are evaluated and nominated to the National Register. See also James Hippen, "Preliminary Report on 'Historic' Bridges in Winneshiek County, Iowa" (unpublished paper, 1971), copy on file at the SHPO, Department of Cultural Affairs, State Historical Society of Iowa, Des Moines.

government and funded by special levies -- until the 1920's, bridge construction and maintenance was left almost entirely in the hands of the rural townships and incorporated villages. The pioneer era bridges were comparatively simple structures, but there was a gradual shift toward more technologically complex designs, especially mass-produced, prefabricated metal truss spans.[11] The trend toward professionalization and standardization in bridge design is discussed in the historic property study of the Lower Bluffton Bridge:

> The 1880s saw a new era in rural bridge building in northeastern Iowa that was characterized by scientific design and the replacement of iron by steel as the principal structural material. Steel fabrication of highway bridges was a natural consequence of the rapid advancement of steel production technologies that began in the late nineteenth century with the development of the Bessemer and open-hearth processes. The first bridge in North America fabricated from hot-rolled carbon steel frames was the Eads bridge over the Mississippi River at St. Louis, built in 1867-74, and steel trusses began to appear in Iowa's rural districts shortly thereafter. By the time the Lower Bluffton Bridge was constructed in 1911, cheap structural steel was being mass produced in the form of plates, I-beams, channels, and angles which could be adapted to a wide range of bridge designs. The technique of welding mild steel, which revolutionized the fabrication of longer, lighter, open-web or latticed steel structures, was in widespread use at the time the Lower Bluffton Bridge was built.[12]

Automobiles transformed American life in the twentieth century and changed the face of both urban and rural areas throughout Iowa. It is not known when the first gasoline-powered motor cars appeared on Winneshiek County roads, but the bicycle craze of the 1890's and the introduction of rural free delivery of the mails in 1896 had already triggered a widespread movement for improved highways by the time Iowa created its first state highway commission in 1904.[13] One of the important effects of the early automobile era was a renaissance in bridge building, which was accompanied by a series of innovations in bridge

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[11] William H. Thompson, *Transportation in Iowa: A Historical Summary* (Ames: Iowa Department of Transportation, 1989), 95-96.

[12] Robert C. Vogel, *Iowa Historic Property Study of the Lower Bluffton Bridge, Winneshiek County, Iowa*, report prepared for the Office of the Winneshiek County Engineer (Cresco, Ia.: Bear Creek Archeology, Inc., January 1998), 8-9.

[13] Thompson, *Transportation in Iowa,* 71-72 and passim. The standard scholarly works on the social and cultural impacts of the automobile are John B. Rae, *The Road and Car in America* (Cambridge, Mass.: MIT Press, 1971); and James J. Flink, *The Automobile Age*, reprint (Cambridge, Mass.: MIT Press, 1990.

engineering and construction technology. Under the strain of cars and trucks many of the old bridges were found inadequate and county boards across the state rushed to make appropriations from their road and bridge funds to purchase new steel spans. In Winneshiek County, where the growth in personal automobile ownership skyrocketed after 1910, the boom in bridge construction lasted until the Great Depression.[14]

In 1913, the Winneshiek County Board of Supervisors decided to replace the old Taverner Bridge with a modern steel highway bridge based on the Parker truss design. Perfected in the 1870's by a civil engineer named Charles H. Parker, the Parker Truss represented an important modification of the prototype modern truss bridge patented by Thomas and Caleb Pratt in 1844. The advantages of the Parker truss were described by Clayton Fraser is his study of Iowa bridges:

> The inclined upper chords afforded a degree of efficiency in long span trusses, where bending moment stresses at mid-span greatly exceed the sheer stresses at the ends. The Parker's drawback was that, unlike the straight-chorded Pratt truss, the polygonal chords necessitated different-length verticals and diagonals at each panel, increasing its fabrication costs somewhat. Because trusses were generally priced on the basis of their superstructures steel weight, the lighter overall weight of a polygonal-chord truss more than offset the slight increase in fabricating costs in spans greater than 160 feet. In the highly competitive bridge industry, this economy equated directly with profit, and pin-connected Parkers superseded straight-chorded Pratts for long-span applications after the turn of the century, as bridge companies marketed them more aggressively to the counties.[15]

The Parker truss reached its peak of popularity after 1920, when it was the preferred type of prefabricated metal truss bridge built in the United States. Efficient, convenient and relatively inexpensive, small Parker trusses appeared at river crossings throughout Iowa until the 1930's, when webbed metal truss bridges gradually gave way to reinforced concrete and steel girder structures.

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[14] Abstract of Roads, No. 2 (1914-1958), County Auditor's Office, Winneshiek County Courthouse, Decorah; see also Hippen, "Preliminary Report."
[15] Fraser, *Iowa Historic Bridge Inventory*, 107.

CONSTRUCTION HISTORY

In response to the newly enacted state road law mandating replacement of unsafe bridges and culverts, on 5 May 1913 the Winneshiek County Board of Supervisors enacted a resolution, stating that:

> [I]t has been deemed necessary and advisable to replace the wood and steel combination structure known as Tavener [sic] bridge, located at the west end of 5th Ave., city of Decorah, Iowa, with a new steel structure, designed to carry a wooden floor and comply with the State Highway Commission's specifications for carrying capacity. Said new bridge to be placed on old foundations, properly strengthened, width of roadway to be sixteen feet, length of main span 175 feet, and estimated cost, including the removal of the old span and the rebuilding of the west approach with proper concrete abutments, about $6000.[16]

In June, after authorizing the sale of $65,870.40 worth of 5%, 20-year bonds for several county bridge projects, the county supervisors instructed the auditor and engineer to seek bids for the new Taverner Bridge. When the bids received from several bridge companies were opened on 18 August, however, the supervisors deemed the offers unsatisfactory and rejected all of them. With the adoption of a new "Resolution of Necessity" on 8 September, the bidding process was re-stated, based upon a $9,000 cost estimate.

On 22 September the supervisors accepted the low bid of $7,687 submitted by the Federal Bridge Company of Des Moines.[17] The contract for construction called for a steel bridge with a wood floor, spanning 175 feet with an approach span of 32 feet, and a roadway width of 16 feet; this was subsequently amended when it was found that additional pilings and concrete work would be required. Construction work began in November 1913 and progressed rapidly, notwithstanding the need for additional work on the pier and abutments. The original plan called for the new bridge to be placed on the old bridge foundations, but this appears not to have been practical and the contract was amended to include new concrete abutments. No original construction records or photographs are known to exist, but the small size of the individual truss

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[16] Unless another source is cited, all information regarding planning and construction of the Fifth Avenue Bridge was obtained from Supervisors' Record Book G, County Auditor, Winneshiek County Courthouse, Decorah.

[17] The original contract price is not mentioned in the Supervisors' minutes but was published in the *Decorah Journal* on 24 September 1913.

members made it an ideal bridge to ship by rail and assemble on-site. Erection would have required no large cranes or other heavy equipment. It is not known what became of the old bridge, though presumably it was sold for scrap.

The bridge construction work was supervised by county engineer Will M. Lee, who answered directly to the county auditor.[18] The names of the Federal Bridge Company's sales agent and contractors are not given in the county records or contemporary newspaper accounts. The company itself is not well known among historians and preservationists. Federal Bridge Company, which appears to have been established before 1900, had its office in Des Moines, and the 1914 city directory lists E. S. Carpenter as the president and secretary.[19] The company was a relatively minor bridge builder, ranking well behind Clinton Bridge Company, Iowa Bridge Company, George E. King and James B. Marsh in the number of projects completed in Iowa and neighboring states, though it appears to have carved out its own small market and outlasted many of its competitors. Des Moines city directory listings indicate it remained in business until 1942.[20]

Federal Bridge marketed highway bridges using steel trusses fabricated by Inland Steel Company of Chicago. Founded by the Block family in 1893, Inland Steel was one of the seven "Little Steel" companies that challenged the dominance of the U.S. Steel Corporation and its subsidiary the American Bridge Company. With its main rolling mill at Indiana Harbor on the southeast side of Chicago, Inland became a large-scale manufacturer of structural steel for bridges after the turn of the

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[18] William M. Lee was born in 1887 and graduated from Decorah High School in 1906; after attending business college, he completed the engineering course at the state university in Iowa City and was appointed Winneshiek County Surveyor on 24 August 1910; in 1911 the position was changed to County Engineer and on 1 May 1913 Lee was named County Highway Engineer; he died in Decorah in 1930; see the biographical sketch in Bailey, *Past and Present of Winneshiek County*, 2:74-77, and Lee's obituary in the *Decorah Journal* 4 June 1930.

[19] *Des Moines City and Valley Junction Directory*, Vol. XXIII (Des Moines: R. L. Polk & Co., 1914), 390. No published biography of Edwin Stanton Carpenter could be found. His brother, John Sanson Carpenter, is somewhat better known to historians: he was the president of the Iowa Bridge Company of Des Moines and his Oakwood Estate at 3320 Kinsey Avenue, Des Moines, was listed in the National Register primarily on the basis of his role in founding the Des Moines Association of Fine Arts (forerunner of the Des Moines Art Center). Both were sons of William Lytle Carpenter, owner of a large Des Moines barbed wire manufacturing company; *Portrait and Biographical Album of Polk County, Iowa* (Chicago: Lake City Pub. Co., 1890), 264.

[20] Carpenter died two years later; *Des Moines Tribune*, 25 January 1944. At least four Federal Bridge Company highway bridges have been listed in the National Register, all of them in South Dakota.

century.[21] The exact nature of the business relationship between Federal Bridge and Inland Steel is not known.

The minutes of the supervisors' meetings show that the board inspected the new bridge on the morning of 5 January 1914 and it appears the structure was accepted by the county in early March. On 11 March a brief news story appeared in the Public Opinion section of the *Decorah Journal*, declaring the new work "One of the Best Bridges in the Country" and noting that it "is built in a substantial manner and should last a life time."

[21] Inland Steel Company, *50 Years of Inland Steel, 1893-1943* (Chicago: Manz Corporation, 1943); Jack H. Morris, *Inland Steel at One Hundred* (Chicago: Inland Steel Industries, 1993). Inland Steel eventually became the fourth-largest steel producer in the United States and its 1,900-acre Indiana Harbor Works was well known for high-quality sheet steel and bars. Since 1998 the company has operated under the name Ispat Inland, Inc.

SIGNIFICANCE

The significance of the Fifth Avenue Bridge is entirely the result of its association, both physical and historical, with early twentieth century innovations in bridge engineering and construction technology. The Parker through truss design is the most significant aspect of the structure, which also represents a direct and compelling link to the history of transportation and the development of Decorah during the emergence of the automobile age. Historically, the old Taverner Bridge crossing played a crucial role in the development of agriculture and related industries. Since 1914, Decorah has relied on the historic Fifth Avenue Bridge as a connective link between rural and urban areas and over its ninety-year lifespan the structure's functional and aesthetic character has made it a valued part of community life.

Approximately fifty Parker truss bridges have been identified in Iowa, but the property type has suffered significant attrition in recent years. A number of the surviving specimens more than fifty years old are considered "structurally deficient" or "functionally obsolete" and many have been scheduled for replacement. Although truss bridges generally are well represented in the National Register, at present only a small handful of Parker truss bridges have been nominated or determined eligible for registration.[22]

[22] "National Eligible Road Bridges in Iowa," n.d., Office of Location and Environment, Iowa Department of Transportation, Ames (typewritten); and the online *National Register Information System (NRIS) Database*, <www.nr.nps.gov/>. The precise number of Parker truss bridges is not known: the only authoritative source, the 1994 FraserDesign inventory prepared for the Iowa DOT, does not include "off system" bridges, i.e., municipal and privately owned properties. According to information made available online from the U.S. Department of Transportation, as of December 2001 there were 1,743 through truss bridges in Iowa, of which 1,098 were classed as "structurally deficient" and 305 "structurally obsolete"; FHWA, *Count of Bridges by Structure Type 2001*, <www.fhwa.dot.gov/bridge/strtyp01.htm>.

SOURCES CONSULTED

Historical data relating to the Fifth Avenue Bridge are not particularly abundant. Relatively little in the way of published information or photographs could be found and no original construction plans or drawings are known to exist. Searches of the files maintained by the Winneshiek County Engineer and the Decorah city engineering consultant yielded some relevant historical information about the bridge, but the primary source of historical documentation was the official record of minutes of the meetings of the Winneshiek County Supervisors. These records are preserved in the Office of the County Auditor at the courthouse in Decorah. Supervisors Record Book G covers the period during which the bridge was planned and built.

Background information was obtained from a variety of secondary sources, including state and local narrative histories, historical atlases, platbooks, and general works on engineering, industrial archaeology, and the history of bridge design and construction technology. A list of previously recorded historic bridges in Iowa was made available by the DOT Office of Planning and Environment. The records of the National Register of Historic Places and the Historic American Engineering Record were consulted online via links provided by the National Park Service and the Library of Congress.

Prior to the 2003 survey carried out by Bear Creek Archeology, the Fifth Avenue Bridge had not been included in any state historic resources inventory. In 1993 the Iowa DOT initiated a statewide program to document historic bridges in Iowa. Because it was not state-owned and therefore not part of the Federal Aid Highway system, the Fifth Avenue Bridge was not included in the resulting inventory of historic bridges compiled by FraserDesign. Though it was left out of Fraser's study, Dr. James C. Hippen of Decorah, a former professor of history at Luther College and an authority on Iowa bridges, was familiar with the structure and provided helpful comments to the present writer.

ATTACHMENTS

The following attachments represent copies of materials delivered separately to the State Historical Society of Iowa:

1. Bridge location plotted on USGS topographic map

2. Situation plan and longitudinal section (1 sheet)

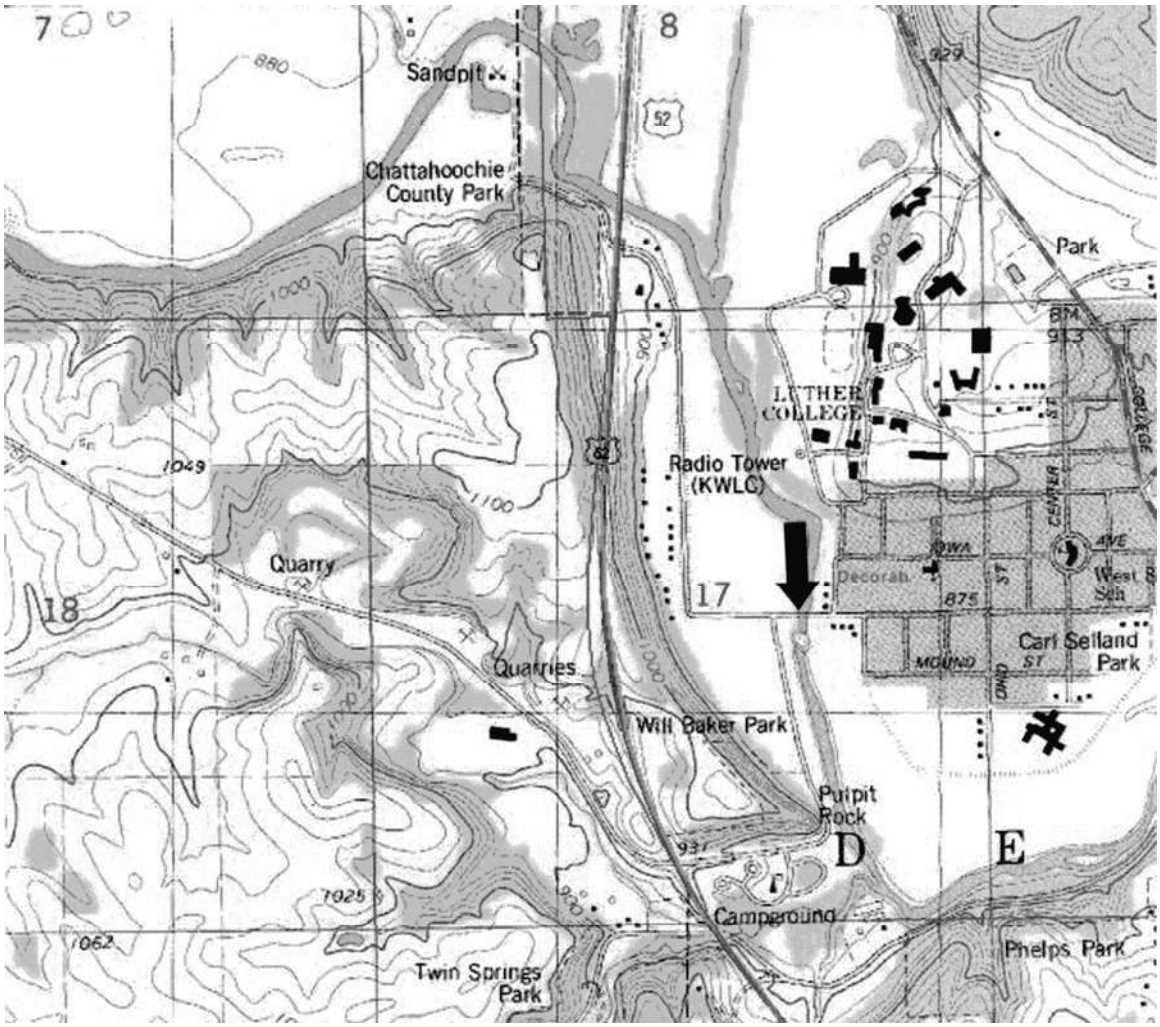
3. Photographs (10 plates)

4. 1981 drawings (6 sheets)

ATTACHMENT 1

Bridge Location Plotted on USGS Topographic Map

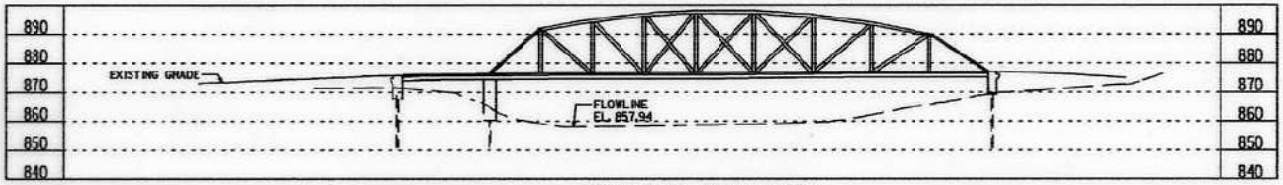
Attachment 1



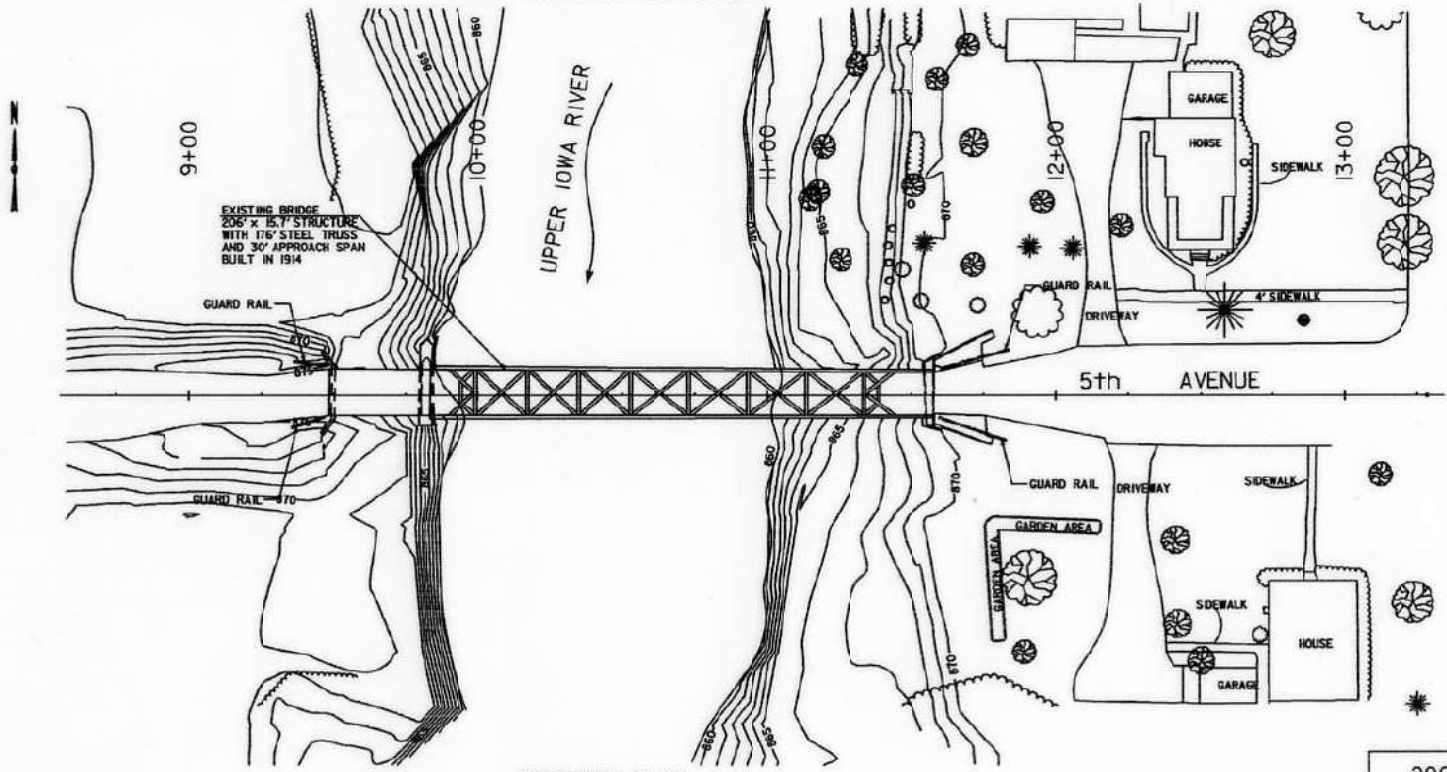
Bridge Location [↓] Plotted on USGS Topographic Map; adapted from Iowa Geographic Map Server 1:24,000-scale imagery provided by National Resources Conservation Service and the Iowa State University GIS Facility.

ATTACHMENT 2

Situation Plan and Longitudinal Section



EXISTING ELEVATION



EXISTING PLAN

LOCATION
5TH AVE. OVER UPPER IOWA RIVER
T 98 N R 8 W
SECTION 17
DECORAH TOWNSHIP
WINNESHIEK COUNTY
CITY OF DECORAH
FHWA # 003510

206'-0 x 15.7' STEEL TRUSS AND APPROACH SPAN BRIDGE

OVER UPPER IOWA RIVER

30'-0 WEST APPROACH SPAN 176'-0 TRUSS SPAN

EXISTING PLAN & ELEVATION

STATION: 10+40

CITY OF DECORAH

WHKS & CO.

DESIGNED BY S.T.S. CHECKED BY
DETAILED BY C.D.S. & D.L.A. CADD FILE H965751LS01

WINNESHIEK COUNTY

PROJECT NUMBER

SHEET NUMBER

ATTACHMENT 3

Photographs (10)

Attachment 3-A

General overview of Fifth Avenue Bridge, looking west; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 19.)

Attachment 3-B

View of bridge, looking northeast; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 1.)

Attachment 3-C

East approach, looking west; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 13.)

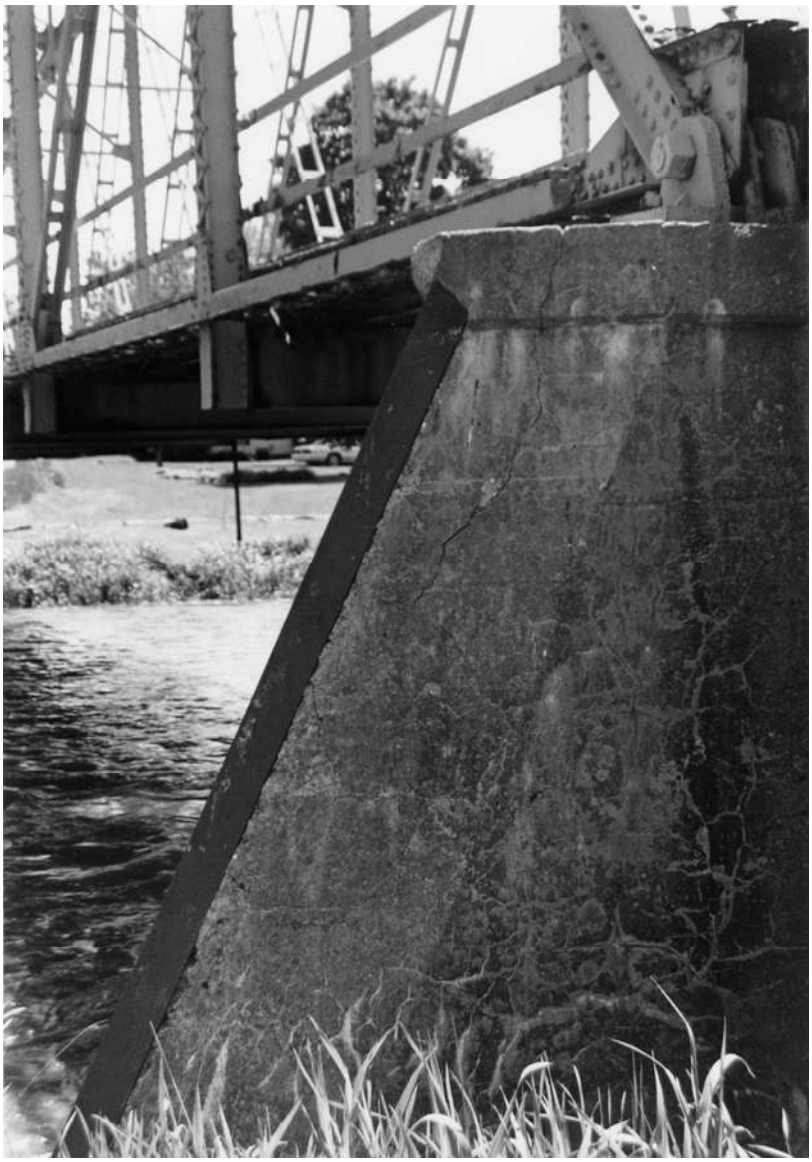
Attachment 3-D

West approach, looking east; photograph taken by Robert C. Vogel, May 2004. (Roll 11,188, frame 2.)

Attachment 3-E

West approach span and pier, looking northwest from historic Taverner Mill archeological site; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 14.)

Attachment 3-F



Detail of pier, upstream face; photograph taken by Robert C. Vogel, May 2004. (Roll 11,188, frame 6.)

Attachment 3-G

East abutment, looking north; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 15.)

Attachment 3-H

Detail of truss members, looking west; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 21.)

Attachment 3-I

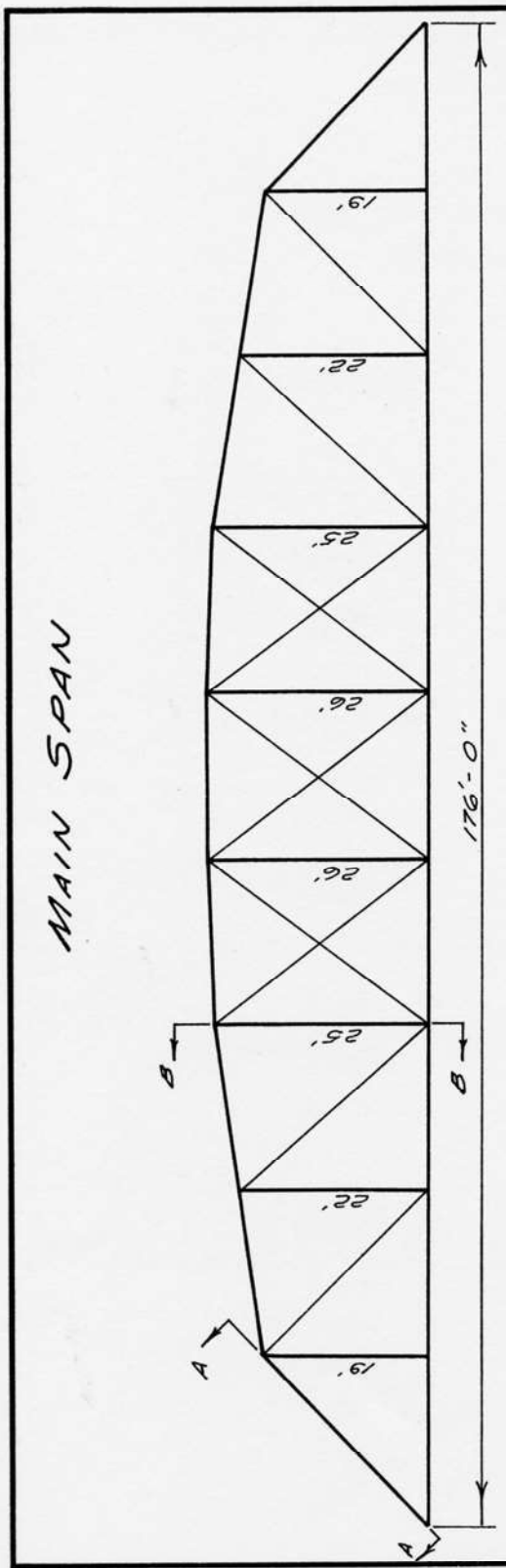
Detail of struts, with upper chord (upstream), diagonal and cross-bracing; photograph taken by Robert C. Vogel, May 2004. (Roll 11,188, frame 12.)

Attachment 3-J

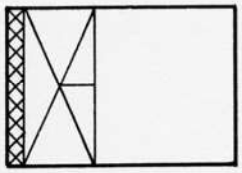
Underside of bridge deck, looking west from base of east abutment; photograph taken by Robert C. Vogel, May 2004. (Roll 11,187, frame 18.)

ATTACHMENT 4

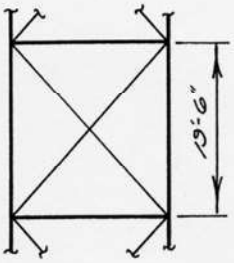
1981 Drawings (6 sheets)



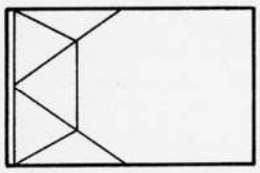
Section B-B



Typical Span
Top View



Section A-A

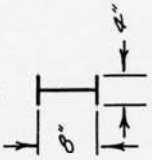


ERDMAN ENGINEERING SERVICE DECORAH, IOWA	
DRAWN BY: LCE	SCALE: 1/4" = 1'-0"
REVISED:	DATE: August, 1981

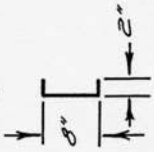
MAIN SPAN
FIFTH AVENUE BRIDGE
Decorah, Iowa 1981

RAPIDS REPRODUCTIONS, INC. N27326

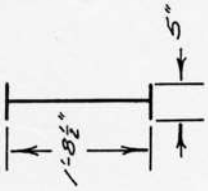
Section A-A
Scale: 1½" = 1'-0"



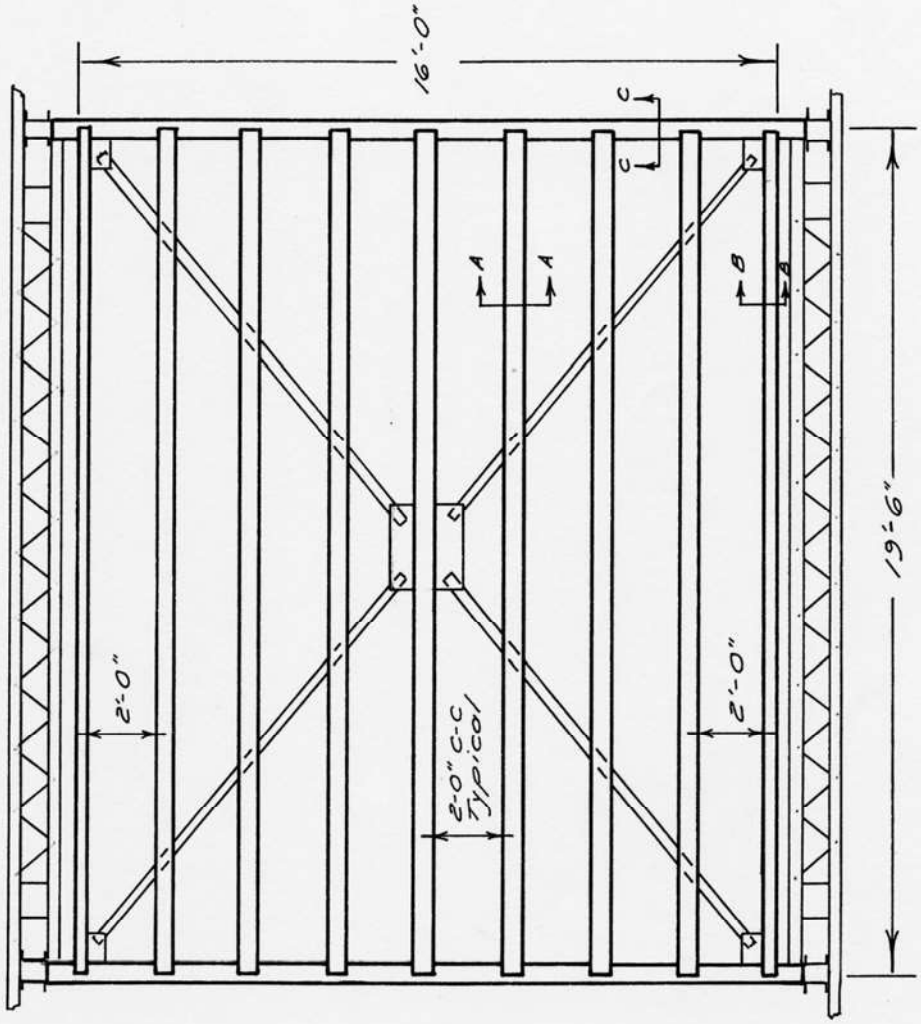
Section B-B
Scale: 1½" = 1'-0"



Section C-C
Scale: 1½" = 1'-0"

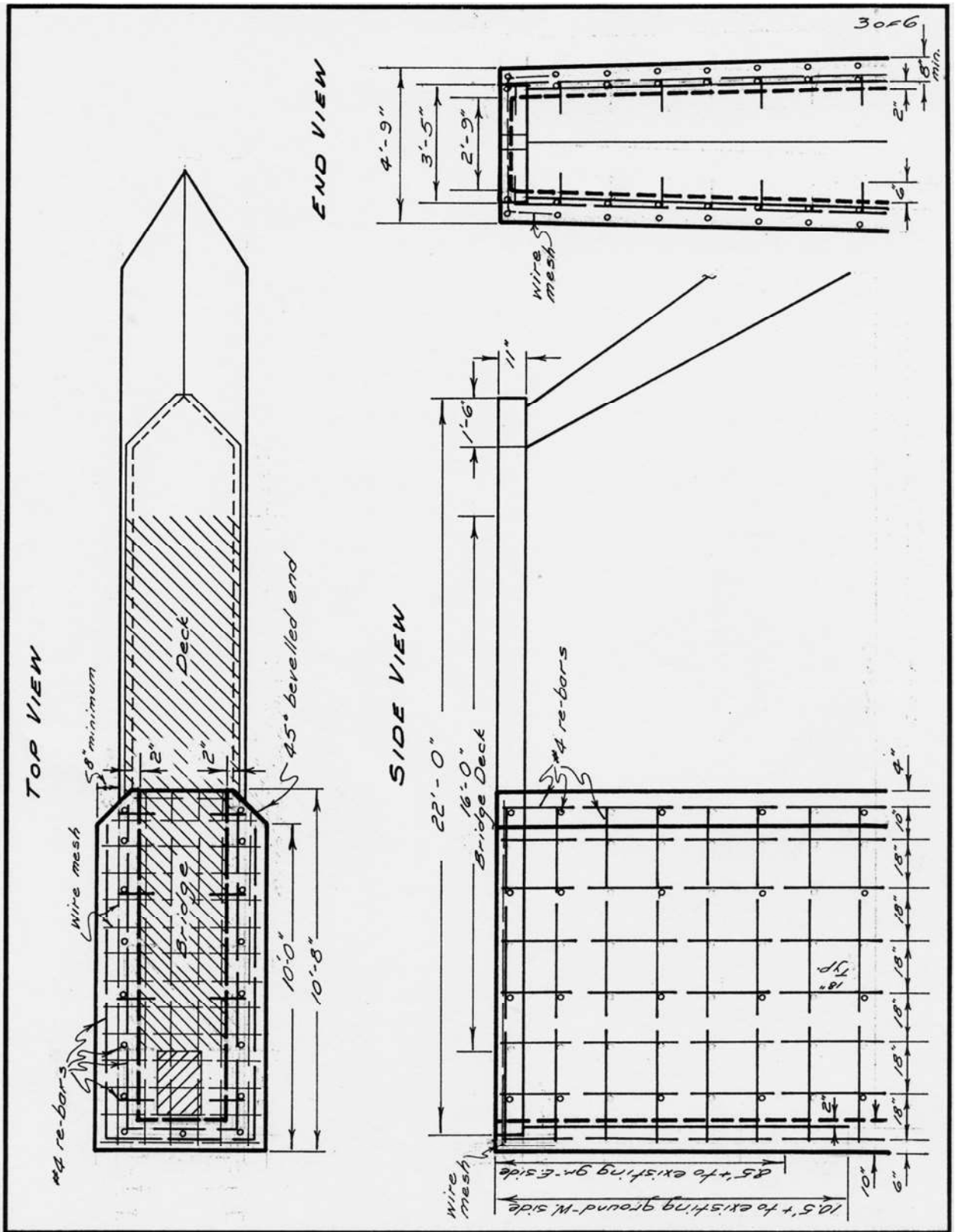


PLAN VIEW
TYPICAL FLOOR PANEL



ERDMAN ENGINEERING SERVICE DECORAH, IOWA		TYPICAL FLOOR PANEL FIFTH AVENUE BRIDGE Decorah, Iowa 1981
DRAWN BY: LCE	SCALE: ¾" = 1'-0"	
REVISED:	DATE: August, 1981	

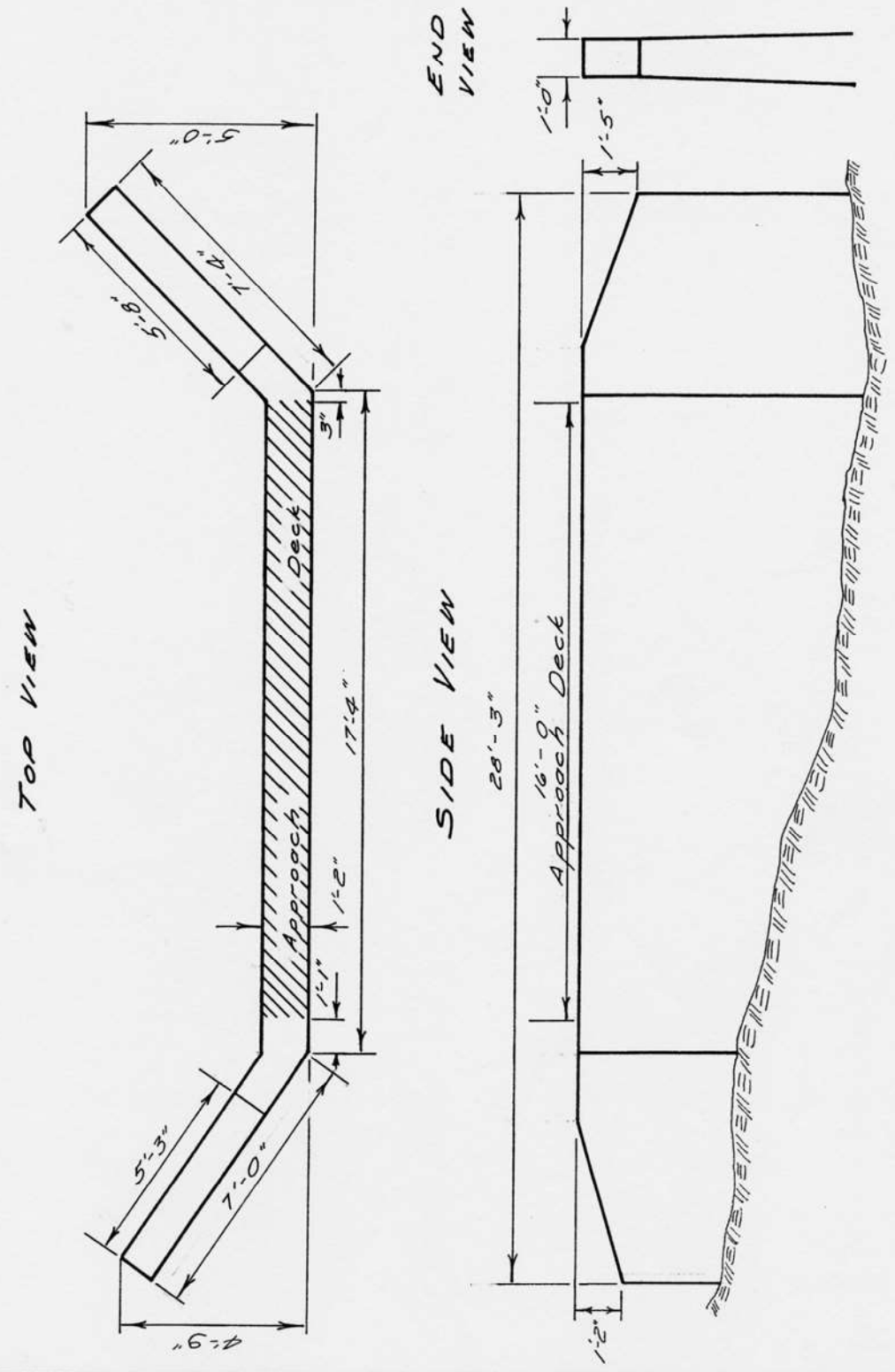
RAPIDS REPRODUCTIONS, INC. N27326



ERDMAN ENGINEERING SERVICE DECORAH, IOWA	
DRAWN BY: LCE	SCALE: 1/4" = 1'-0"
REVISED:	DATE: August 1981

WEST PIER REPAIRS
FIFTH AVENUE BRIDGE
Decorah, Iowa 1981

RAPIDS REPRODUCTIONS, INC. N27326



ERDMAN ENGINEERING SERVICE DECORAH, IOWA	
DRAWN BY: LCE	SCALE: 1/4" = 1'-0"
REVISED:	DATE: August 1981

WEST ABUTMENT
FIFTH AVENUE BRIDGE
Decorah, Iowa 1981

RAPIDS REPRODUCTIONS, INC. N27326

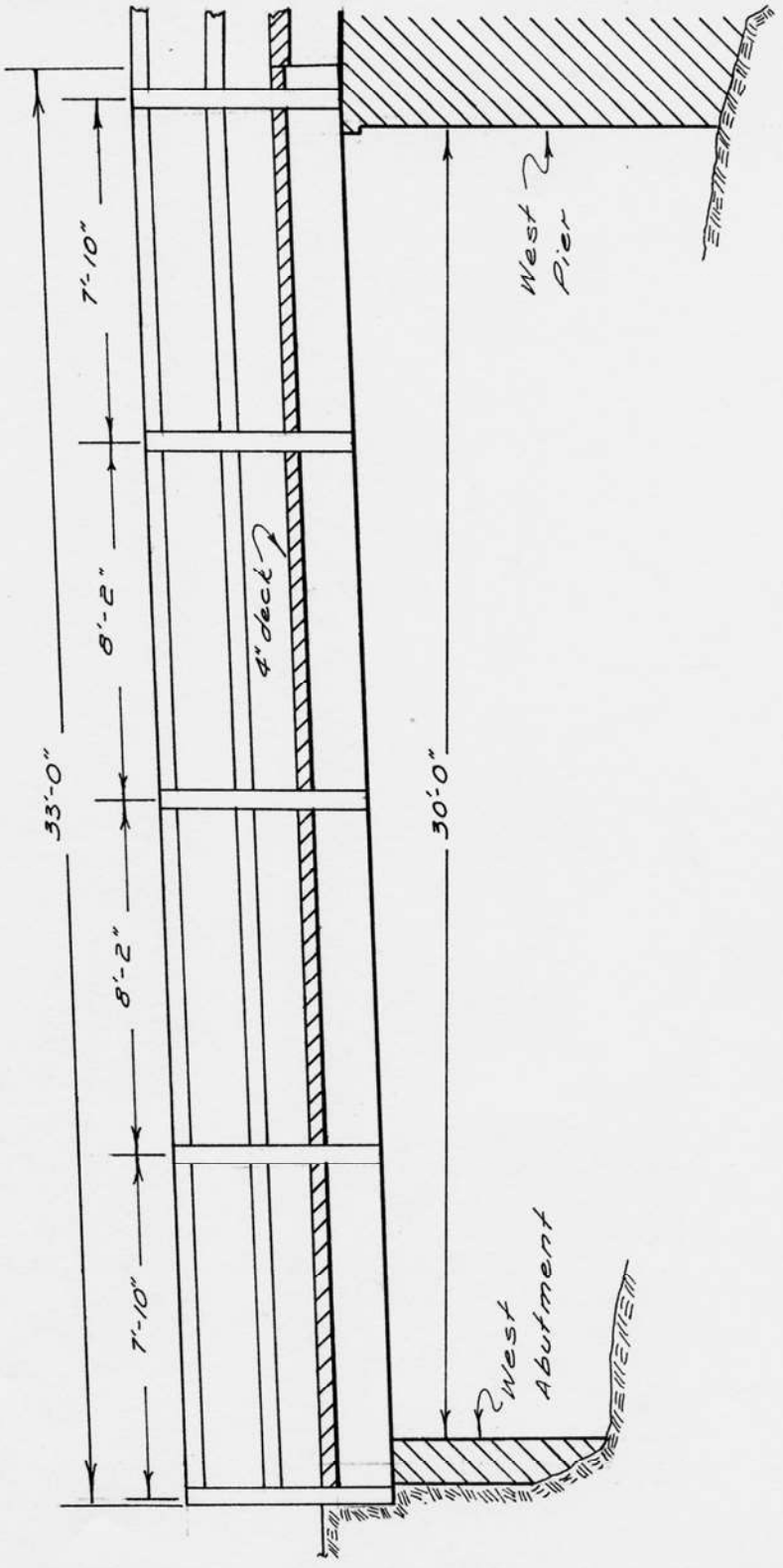
STRUCTURAL FLOOR PLAN

ERDMAN ENGINEERING SERVICE DECORAH, IOWA	
DRAWN BY: LCE	SCALE: ¼" = 1'-0"
REVISED:	DATE: August, 1981

APPROACH SPAN
FIFTH AVENUE BRIDGE
Decorah, Iowa 1981

RAPIDS REPRODUCTIONS, INC. N27326

SIDE VIEW



ERDMAN ENGINEERING SERVICE DECORAH, IOWA	
DRAWN BY: CCE	SCALE: 1/4" = 1'-0"
REVISED:	DATE: August, 1981

APPROACH SPAN
FIFTH AVENUE BRIDGE
Decorah, Iowa 1981

RAPIDS REPRODUCTIONS, INC. N27326

Reply Sent: _____

Review and Compliance Data Record

R&C #: **031296123**

Date Received: **10/29/2004**

SHPO Response Due: *11/28/2004*

Associated R&C #:

Date of Letter: **10/22/2004**

Could not find previous file ____

County: **WINNESHIEK**

Town: **DECORAH** **LOGGED OUT**

File Agency: **FHWA**

Project Title: **BRM-1876(601)--8N-96 - FHWA 003510 - BCA #1127 - PHASE I BUL RES SUR FOR PROP FIFTH AVENUE FINAL RPT OF IA HIST PROP DOC STUDY 5TH AVE BRIDGE - AND PICTS, SLIDES, NEGATIVES AND CD**

ROUTED TO:

Received		Initials	Signoff Date
	Archaeology:		_____
	Architectural History:		_____
11/6/2004	History:	**RJC**	10 Oct 04
	Architecture:		_____
	Bureau Chief:		_____
	SHPO:		_____
	106 Coordinator:		_____

Form Letter to Send:

IVF:____
No HP:____
Forego:____
FONSI:____

More Information Requested:

Site Sheets:____
Photos:____
PDQ106:____
NADB Form:____
HADB Form:____
Map:____
Other:____

Opinion: ____

No Comment: +

☐ **Send Response Card**

Send Information:

Part 800:____
PDQ106:____
Consultant List:____
106 Flow Chart:____
Guidelines:____
Site Sheets/Traces:____
106 Step by Step:____
Burials Info:____

Attachment "A" Reporting Category: Agency:

Federal Review: ___ _____
State/Local Review: ___ _____
Secondary Agencies: ___ _____

Opinion of Eligibility Property: _____
(should have an Effect checked)_____

106 Project Finding:

Noneligible Properties (Inventory Number or Archaeological Site Number):

No Properties in Impact Area: ___ _____

Effected Property (Inventory Number or Archaeological Site Number):

No Effect on Properties: ___ _____
No Adverse Effect: ___ _____
Adverse Effect: ___ _____
No Adverse Effect w/ Conditions: ___ _____
No Assessment of Effect: ___ _____

SHPO Signature Date:

Memoranda of Agreement: ___ _____
Programmatic Agreement: ___ _____
Other Agreement: ___ _____

Recon Survey Recommended: ___ _____
Intensive Survey Recommended: ___ _____
Data Recovery Recommended: ___ _____
Recordation Recommended: ___ _____
Technical Assistance Provided: ___ _____
More Information Requested: ___

Acres: Intensive - Recon

Archaeo: _____ _____
A/H: _____ _____

Filing:

Project Stays in R&C Files: ___
Project Finished - Reuse Folder: ✓
106 Bookshelf: ___

Information Disposition:

Site Data Moved to Inventory: ✓ Report Moved to HADB: ✓
File Moved to NADB: ___ File Moved to Disturbed Holding: ___
Moved to Agency Files: ___ Copy to MOA/Covenants: ___
Don't Send Response Card Until We Get Some Real Info!: ___

Staff Comments: _____

OCT 29 2004

Pathfinder CRM, LLC

Cultural Resources Management & Heritage Preservation Consultants
Robert C. Vogel, Manager/Senior Historian

Minnesota Office 319 S. Division Avenue
P.O. Box 503
Spring Grove, Minnesota 55974-0503
507-498-3810

22 October 2004

TO: State Historic Preservation Officer, State Historical Society of Iowa
FR: Robert Vogel
RE: Historical Documentation Study, Fifth Avenue Bridge in Decorah, Iowa
DOT project number BRM-1876(601)--8N-96
SHPO review & compliance number 031296123

We are pleased to transmit one bound copy and a digital version of the final report, *Iowa Historic Property Documentation Study of the Fifth Avenue Bridge (Also Known as the Taverner Bridge) in the City of Decorah, Iowa.*

Also enclosed is a folder containing the original documentation products for archiving at SHSI. These consist of 10 black & white photographs, contact sheets, negatives, 10 slides, catalog sheets, 6 photocopies of drawings, and 1 drawing on mylar.

Reply Sent: _____

Review and Compliance Data Record

R&C #: **031296123**

Date Received: **6/17/2004**

SHPO Response Due: *7/17/2004*

Associated R&C #:

Date of Letter: **6/15/2004**

Could not find previous file ____

County: **WINNESHIEK**

Town: **DECORAH**

LOGGED OUT

File Agency: **FHWA**

Project Title: **BRM-1876(601)--8N-96 - FHWA 003510 - BCA #1127 - PHASE I BUL RES SUR FOR PROP FIFTH AVENUE BRIDGE REPLACEMENT WITHIN CITY OF DECORAH - SEC 17, T98N-R8W - COPY OF SIGNED MOA - DRAFT RPT OF IA HIST PROP DOC STUDY 5TH AVE BRIDGE**

ROUTED TO:

Received		Initials	Signoff Date
6/17/2004	Archaeology:	**DWJ**	DWJ 6/18/04
	Architectural History:		
6/18/04	History:	**RJC**	7/7/04
	Architecture:		
	Bureau Chief:		
	SHPO:		
	106 Coordinator:		

Form Letter to Send:

IVF:____
No HP:____
Forego:____
FONSI:____

More Information Requested:

Site Sheets:____
Photos:____
PDQ106:____
NADB Form:____
HADB Form:____
Map:____
Other:____

No Comment: X

☐ **Send Response Card**

Send Information:

Part 800:____
PDQ106:____
Consultant List:____
106 Flow Chart:____
Guidelines:____
Site Sheets/Traces:____
106 Step by Step:____
Burials Info:____

Attachment "A" Reporting Category: Agency:

Federal Review: ____ _____
State/Local Review: ____ _____
Secondary Agencies: ____ _____

Opinion: ____

Opinion of Eligibility Property: _____
(should have an Effect checked) _____

106 Project Finding:

No Properties in Impact Area: ___

Noneligible Properties (Inventory Number or Archaeological Site Number):

_____
_____
_____

Effected Property (Inventory Number or Archaeological Site Number):

No Effect on Properties: ___ _____
No Adverse Effect: ___ _____
Adverse Effect: ___ _____
No Adverse Effect w/ Conditions: ___ _____
No Assessment of Effect: ___ _____

SHPO Signature Date:

Memoranda of Agreement: ___ _____
Programmatic Agreement: ___ _____
Other Agreement: ___ _____

Recon Survey Recommended: ___ _____
Intensive Survey Recommended: ___ _____
Data Recovery Recommended: ___ _____
Recordation Recommended: ___ _____
Technical Assistance Provided: ___ _____
More Information Requested: ___

Acres: Intensive - Recon

Archaeo: _____ _____

A/H: _____ _____

Filing:

Project Stays in R&C Files: X

Project Finished - Reuse Folder: ___

106 Bookshelf:___

Information Disposition:

Site Data Moved to Inventory: ___ Report Moved to HADB: ___
File Moved to NADB: ___ File Moved to Disturbed Holding: ___
Moved to Agency Files:___ Copy to MOA/Covenants:___
Don't Send Response Card Until We Get Some Real Info!:___

Staff Comments: _____
_____
_____

Robert C. Vogel & Associates

Historians, Archeologists and Preservation Planners
216 Cleveland Avenue S.W.
New Brighton, Minnesota 55112-3508

Telephone (651) 604-0175
Fax (651) 604-0250

15 June 2004

Ralph Christian
State Historic Preservation Office
Iowa Historical Building
600 East Locust
Des Moines, Iowa 50319-0290

RE: Historic Property Documentation Study
Fifth Avenue Bridge, Decorah
BRM-1876(601)--8N-96
SHPO r/c 031296123

Dear Ralph:

I am pleased to submit for SHPO review and comment the draft report, *Iowa Historic Property Documentation Study of the Fifth Avenue Bridge (also known as the Taverner Bridge) in the City of Decorah*, Iowa, which we have prepared for the City of Decorah and its engineering consultant, WHKS & Company.

You will note that the original documentation products, including black-and-white photographs, negatives, color slides, drawings, and catalog sheets, will be delivered with the final report. Our agreement with the city specifies delivery of a number of bound copies of the final report for deposit in various local libraries. A CD-ROM version will also be made available upon request.

We look forward to your comments. If you have any questions about the study or the findings of the report, please do not hesitate to contact me directly by telephone, (651) 604-0175, or e-mail <rcvogel@earthlink.net>.

Sincerely,

Robert C. Vogel
Principal