

United States Department of the Interior  
National Park Service

**National Register of Historic Places  
Inventory—Nomination Form**

See instructions in *How to Complete National Register Forms*  
Type all entries—complete applicable sections

For NPS use only

received MAY 28 1982  
date entered

**1. Name**

historic Marsh Rainbow Arch Bridge

and/or common Spring Street Bridge

**2. Location**

street & number Spring Street

not for publication

city, town Chippewa Falls

vicinity of

congressional district

state Wisconsin

code 55

county Chippewa

code 017

**3. Classification**

Category	Ownership	Status N/A	Present Use
<input type="checkbox"/> district	<input checked="" type="checkbox"/> public	<input type="checkbox"/> occupied	<input type="checkbox"/> agriculture
<input type="checkbox"/> building(s)	<input type="checkbox"/> private	<input type="checkbox"/> unoccupied	<input type="checkbox"/> commercial
<input checked="" type="checkbox"/> structure	<input type="checkbox"/> both	<input type="checkbox"/> work in progress	<input type="checkbox"/> educational
<input type="checkbox"/> site	Public Acquisition N/A	Accessible	<input type="checkbox"/> entertainment
<input type="checkbox"/> object	<input type="checkbox"/> in process	<input type="checkbox"/> yes: restricted	<input type="checkbox"/> government
	<input type="checkbox"/> being considered	<input checked="" type="checkbox"/> yes: unrestricted	<input type="checkbox"/> industrial
		<input type="checkbox"/> no	<input type="checkbox"/> military
			<input type="checkbox"/> museum
			<input type="checkbox"/> park
			<input type="checkbox"/> private residence
			<input type="checkbox"/> religious
			<input type="checkbox"/> scientific
			<input checked="" type="checkbox"/> transportation
			<input type="checkbox"/> other:

**4. Owner of Property**

name City of Chippewa Falls, Leo Richard Hamilton, Mayor

street & number 30 W. Central Street

city, town Chippewa Falls

vicinity of

state Wisconsin

**5. Location of Legal Description**

courthouse, registry of deeds, etc. Chippewa County Courthouse

street & number Rushman Drive

city, town Chippewa Falls

state Wisconsin 54729

**6. Representation in Existing Surveys** (Continued)

title Wis. Inventory of Historic Places has this property been determined eligible? ☐ yes ☒ no

date 1978 ☐ federal ☒ state ☐ county ☐ local

depository for survey records State Historical Society of Wisconsin, 816 State Street

city, town Madison

state Wisconsin 53706

## 7. Description

Condition  
☒ excellent  
☐ good  
☐ fair

☐ deteriorated  
☐ ruins  
☐ unexposed

Check one  
☒ unaltered  
☐ altered

Check one  
☒ original site  
☐ moved date \_\_\_\_\_

### Describe the present and original (if known) physical appearance

MARSH RAINBOW ARCH BRIDGE, Chippewa Falls

Located about one block to the northeast of Highway 124 - Rushmore Drive, the major commercial axis in Chippewa Falls, the Marsh Rainbow Arch Bridge on Spring Street over Duncan Creek is a ninety-three-foot single span reinforced concrete arch. Each arch spans eight concrete vertical intermediate posts, which are joined by concrete floor beams under the asphalt-covered deck. The concrete balustrade is carried across the arches and over the massive concrete abutments at each end; both ends are terminated with the original lamp posts with glass globes intact.

Of the "fixed" type of the patented design, the ends of the arch are anchored in the concrete abutments below the deck. With abutments, the overall length of the span is one hundred eleven feet,<sup>1</sup> and overall width is twenty-nine feet. The condition of the bridge appears to be excellent, with no visible major repairs or retrofits.

1. Wisconsin Department of Transportation bridge file.

**United States Department of the Interior  
Heritage Conservation and Recreation Service****National Register of Historic Places  
Inventory—Nomination Form**

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received

date entered

Continuation sheet MARSH RAINBOW ARCH BRIDGE Item number 6

Page 1

Representation In Existing Surveys (Continued)

Wisconsin Department of Transportation Bridge Files

1970s

State

Wisconsin Department of Transportation, Hill Farms State Office Building

Madison

Wisconsin



## 8. Significance

Period	Areas of Significance—Check and justify below			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400–1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500–1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600–1699	<input type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/
<input type="checkbox"/> 1700–1799	<input type="checkbox"/> art	<input checked="" type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> humanitarian
<input type="checkbox"/> 1800–1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> theater
<input checked="" type="checkbox"/> 1900–	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input type="checkbox"/> transportation
		<input type="checkbox"/> invention		<input type="checkbox"/> other (specify)

**Specific dates** 1916<sup>1</sup> **Builder/Architect** Iowa Bridge Co.<sup>1</sup>

### Statement of Significance (in one paragraph)

The Marsh Rainbow Arch Bridge on Spring Street over Duncan Creek in Chippewa Falls is of state-level significance in the history of engineering in Wisconsin as the state's only example of a patented reinforced concrete bridge design of the early twentieth century.

Developed and patented by engineer James Barney Marsh, a native of North Lake, Wisconsin, the Marsh Rainbow Arch Bridge represented an attempt to prove the superiority of reinforced concrete construction in bridge design in America. In the late nineteenth century, the use of a concrete casing to preserve a steel skeleton was advocated and successfully tested in Austria,<sup>2</sup> and after initial reluctance, was widely accepted by engineers in the design of now ubiquitous slab and girder bridges. Marsh's design, following experimentation (as president and chief engineer of the Marsh Bridge Company) with the use of concrete and steel, has been cited for its resemblance to the earlier metal bowstring arch, patented by the King Bridge Company of Cleveland for which Marsh had worked earlier in his career. Like metal truss bridges the rainbow arch's steel lattice core was assembled on the ground, installed on the abutments, then cast in place with concrete. The Chippewa Falls example is of the originally patented type whose arch "flowed below the bridge deck and was 'fixed' directly into the abutment;"<sup>3</sup> the arch of a later variation was "tied" to steel rocker or expansion rocker bearings on top of the abutment.

James Marsh was graduated from Iowa State College of Agriculture and Mechanical Arts in 1882 with a B.M.E., and the following year went to work in the Des Moines office of the King Bridge Company. While serving as general western agent for King, Marsh also became head of the Northern Agency for the Kansas City Bridge and Iron Company. In 1896 he formed the Marsh Bridge Company, which was incorporated in 1904, and became the Marsh Engineering Company in 1909.<sup>4</sup> The patent for the Marsh Rainbow Arch Bridge was granted on August 6, 1912.

J. B. Marsh himself, "expert engineer,"<sup>5</sup> visited Chippewa Falls on June 3, 1916 to inspect the previous concrete bridge on Spring Street, which had been "wrecked beyond repair" by a flood on April 1, 1916. (Thomas Wooly's 1915 concrete bridge "looked good to everybody," and was supposed to have been designed to withstand the periodic flooding of Duncan Creek, but "the mistake of the work" was attributed to improper footing of the center pier and hasty completion before the cold weather; Marsh was quoted as asking about it, "'Why did you have so much reinforcing steel in your concrete bridge?'"<sup>6</sup>) Marsh pronounced the plans of city engineer J. T. Hurd for a 95–100 foot single span replacement bridge "first class," but recommended additional

(continued)



## 9. Major Bibliographical References

Kansas Preservation, Vol. II., No. 6, September - October, 1980

(Chippewa Falls) Weekly Herald, April - October, 1916.

## 10. Geographical Data

Acreage of nominated property less than one

Quadrangle name Chippewa Falls

Quadrangle scale 1:24,000

UMT References

A 

1	5
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6	2	7	0	0	0
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4	9	7	6	9	2	0
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Zone Easting Northing

B 

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Zone Easting Northing

C 

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### Verbal boundary description and justification

The nominated property shall consist of a rectangle conforming to the 30-foot width and 125-foot length (including approaches) of the span over Duncan Creek on Spring Street between Rushman Drive and High Street in the city of Chippewa Falls, Chippewa Co., Wisc.

### List all states and counties for properties overlapping state or county boundaries

state	code	county	code
state	code	county	code

## 11. Form Prepared By

name/title Diane H. Filipowicz/Architectural Historian

organization State Historical Society of Wisconsin date January, 1982

street & number 816 State Street telephone (608) 262-2970

city or town Madison state Wisconsin 53706

## 12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

☐ national ☒ state ☐ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature

title Director, State Historical Society of Wisconsin

date

5/19/82

For NPS use only

I hereby certify that this property is included in the National Register

Delores Byers

Entered in the  
National Register

date

6/25/82

Keeper of the National Register

Attest:

date

Chief of Registration

**United States Department of the Interior  
Heritage Conservation and Recreation Service****National Register of Historic Places  
Inventory—Nomination Form**

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received

date entered

Continuation sheet MARSH RAINBOW ARCH BRIDGE

Item number 8

Page 1

Significance (Continued)

features of his own design. After heated argument several weeks later, the Chippewa Falls city council voted unanimously to construct a Marsh Rainbow Arch Bridge on Spring Street at the cost of \$13,950 (a price judged to be equivalent to an all-steel structure), to be constructed by the Iowa Bridge Company.<sup>7</sup> The Chippewa Falls Weekly Herald of Friday, July 21, 1916 reported that "the Marsh Rainbow type of bridge is frequently used in Germany and Hungary where there is low clearance and great strength required of bridges." Iowa Bridge Company agent G. Montgomery affirmed that the bridge would prove "extraordinarily strong" and "...will stand the test of time;" further, the company would guarantee the structure for five years. The press and citizenry followed construction of the span from August through October of 1916, and recommended the spectacle to bridge buffs traveling to the N. Wisconsin State Fair that season as a "...new type of bridge for this section of the country..."<sup>8</sup>

Indeed, now more than sixty-five years old and unique in the state and distinctive in the region, the Spring Street Marsh Rainbow Arch Bridge has stood the test of time as a functional span and an important engineering artifact. Well-preserved in its handsome and graceful form, the structure is no less an urban amenity to the city of Chippewa Falls.

Footnotes

1. Bridge plate.
2. Kansas Preservation, Vol., II, No. 6, p. 1.
3. Ibid., p. 2.
4. Ibid., p. 3
5. (Chippewa Falls) Weekly Herald, Friday, June 9, 1916.
6. Ibid.
7. Weekly Herald, Friday, July 21, 1916.
8. Weekly Herald, Friday, September 22, 1916.



**United States Department of the Interior  
National Park Service**

**National Register of Historic Places  
Inventory—Nomination Form**

Marsh Rainbow Arch Bridge, Chippewa Falls, Chippewa Co., WI

Continuation sheet

Item number 7.

Page 1.

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received

date entered

Addendum, 7/82 - DESCRIPTION

Located about one block to the northeast of Highway 124 - Rushmore Drive, the major commercial axis of Chippewa Falls, the Marsh Rainbow Arch Bridge on Spring Street spanning Duncan Creek, is a reinforced concrete "fixed" arch of a patented design.

The bridge spans 90 feet clear between abutments. The walls of the reinforced concrete abutments extend 20 feet either side and rest on reinforced concrete footings. The arch has a rise of 22 feet 6 inches and the top of the arch at bridge midspan is 26 feet above the spring line. The spring line is 13 feet below the bridge deck. The cross section of the concrete arch decreases from 26 by 48 inches to 26 inches wide by 36 inches deep at midspan, adding a feeling of grace to its design. The arch reinforcement system is composed of four rolled steel angles that were held in position by a series of lattice arranged small sized rolled steel angles while the concrete was poured in place.

The bridge bed, originally consisting of a 20 foot roadbed and an 8 foot walk was supported on reinforced concrete beams, with a depth of four feet and a width of 16 inches at the bridge ends, and 3 feet 8 inches deep by 12 inches wide at 8 foot 8 inch intervals throughout the span. The intermediate beams were reinforced with a combination of rolled steel angels and reinforcing bars, while the end beams used only reinforcing bars. The beams were suspended from the arch by eight equally spaced hangers containing four steel angles, encased in concrete, providing the appearance of an all concrete structure.

The rails on either side of the bridge are of reinforced concrete with rebar reinforcing. The design simulates a rail with balustrades. The bridge deck is a reinforced concrete slab, 8 inches deep.

The overall dimensions of the bridge are 32 feet 10 inches to the outside of the concrete arches, and one hundred thirty feet to the extremes of the abutment walls. Originally paved with blocks, the wearing surface is now bituminous. The condition of the bridge is excellent and has only insignificant repairs and modifications.

Gordon D. Orr, Jr., FAIA  
23 June 1982



# NATIONAL REGISTER OF HISTORIC PLACES

United States Department of the Interior  
National Park Service

## EVALUATION / RETURN SHEET

Property: Marsh Rainbow Arch Bridge  
State, County: WI, Chippewa  
Federal Agency: \_\_\_\_\_

Working No. 5628/82-1589  
Fed. Reg. Date: 2-1-83  
Date Due: 6/25/82 - 7/12/82

Action: ☒ ACCEPT 6/25/82  
Entered in the ☐ RETURN  
National Register ☐ REJECT  
photos \_\_\_\_\_  
maps \_\_\_\_\_

- ☐ resubmission  
☐ nomination by person or local government  
☐ owner objection  
☐ appeal

Substantive Review: ☐ sample ☐ request ☐ appeal ☐ NR decision

Reviewer's comments:

Recom./Criteria \_\_\_\_\_  
Reviewer \_\_\_\_\_  
Discipline \_\_\_\_\_  
Date \_\_\_\_\_  
☐ see continuation sheet

Nomination returned for: ☐ technical corrections cited below  
☐ substantive reasons discussed below

### 1. Name

### 2. Location

### 3. Classification

Category	Ownership	Status	Present Use
	Public Acquisition	Accessible	

### 4. Owner of Property

### 5. Location of Legal Description

### 6. Representation in Existing Surveys

has this property been determined eligible? ☐ yes ☐ no

### 7. Description

Condition		Check one	Check one
<input type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input type="checkbox"/> unaltered	<input type="checkbox"/> original site
<input type="checkbox"/> good	<input type="checkbox"/> ruins	<input type="checkbox"/> altered	<input type="checkbox"/> moved date _____
<input type="checkbox"/> fair	<input type="checkbox"/> unexposed		

Describe the present and original (if known) physical appearance

- ☐ summary paragraph  
☐ completeness  
☐ clarity  
☐ alterations/integrity  
☐ dates  
☐ boundary selection

## **8. Significance**

Period \_\_\_\_\_ Areas of Significance—Check and justify below

Specific dates \_\_\_\_\_ Builder/Architect \_\_\_\_\_

Statement of Significance (in one paragraph)

- \_\_\_\_\_ summary paragraph
- \_\_\_\_\_ completeness
- \_\_\_\_\_ clarity
- \_\_\_\_\_ applicable criteria
- \_\_\_\_\_ justification of areas checked
- \_\_\_\_\_ relating significance to the resource
- \_\_\_\_\_ context
- \_\_\_\_\_ relationship of integrity to significance
- \_\_\_\_\_ justification of exception
- \_\_\_\_\_ other

## **9. Major Bibliographical References**

## **10. Geographical Data**

Acres of nominated property \_\_\_\_\_

Quadrangle name \_\_\_\_\_

USIT References \_\_\_\_\_

Verbal boundary description and justification \_\_\_\_\_

## **11. Form Prepared By**

## **12. State Historic Preservation Officer Certification**

The evaluated significance of this property within the state is:

\_\_\_\_\_ national \_\_\_\_\_ state \_\_\_\_\_ local

State Historic Preservation Officer signature \_\_\_\_\_

Site \_\_\_\_\_

date \_\_\_\_\_

## **13. Other**

- \_\_\_\_\_ Maps
- \_\_\_\_\_ Photographs
- \_\_\_\_\_ Other

Questions concerning this nomination may be directed to \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_ Phone: 202 272-3504

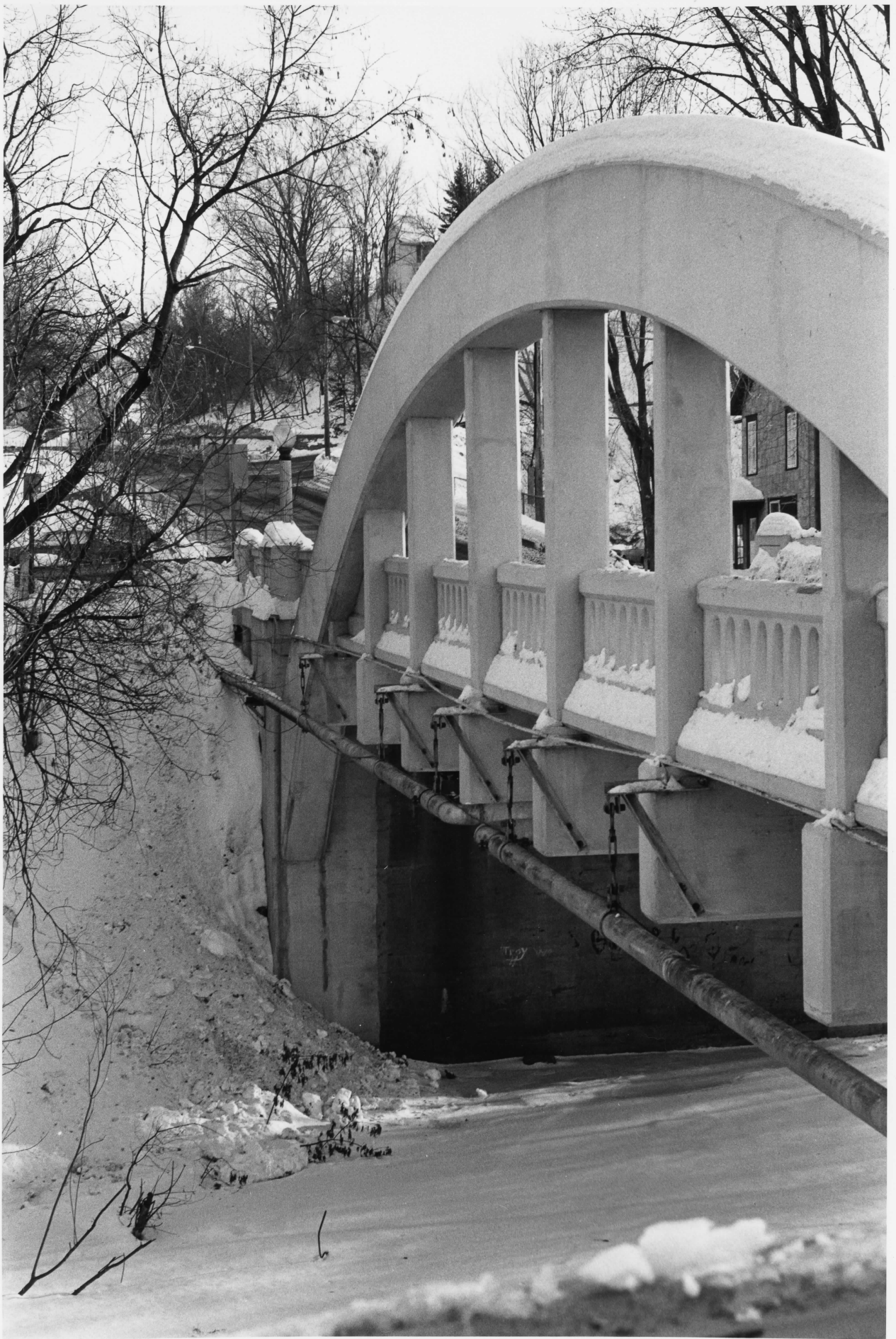
Comments for any item may be continued on an attached sheet





MARSH RAINBOW ARCH BRIDGE, Spring St.,  
Chippewa Falls, Chippewa Co., Wisc. Photo  
by Barbara Wyatt, February 1982. Neg. at  
Wisc. Hist. Society. Facing NE. Photo  
#1 of 4.

3



MARSH RAINBOW ARCH BRIDGE, Spring St.,  
Chippewa Falls, Chippewa Co., Wisc. Photo  
by Barbara Wyatt, February 1982. Neg.  
at Wisc. Hist. Society. Facing NE. Photo  
#2 of 4.

6





MARSH RAINBOW ARCH BRIDGE, Spring St.,  
Chippewa Falls, Chippewa Co., Wisc. Photo  
by Barbara Wyatt, February 1982. Neg. at  
WI Hist. Society. Facing west. Photo  
#3 of 4.

2

MARSH RAINBOW ARCH BRIDGE

PATENTED AUG. 6. 1912

BUILT BY

IOWA BRIDGE COMPANY

DES MOINES

1916.

BOARD OF PUBLIC WORKS

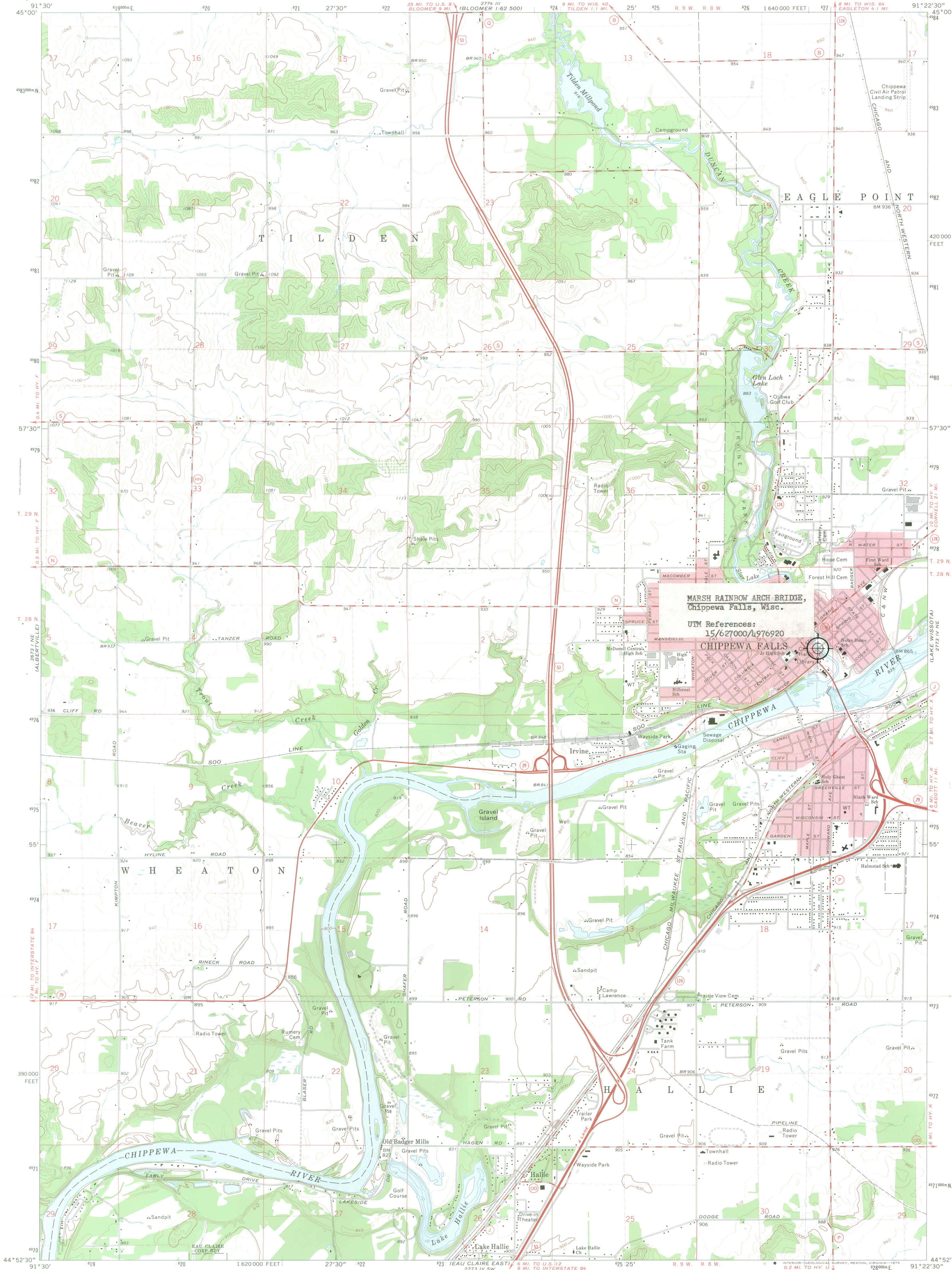
GEORGE E. DEE MAYOR W. M. BOWEN CITY ATTY. J. T. HURD CITY ENG.



MARSH RAINBOW ARCH BRIDGE, Spring St.,  
Chippewa Falls, Chippewa Co., Wisc. Photo  
by Barbara Wyatt, February 1982. Neg. at  
WI Hist. Society. Detail: bridge plate.  
Photo #4 of 4.

9





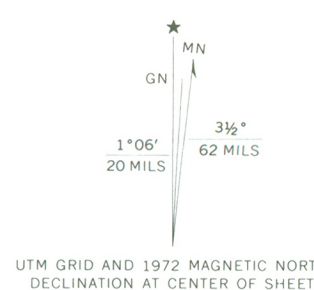
Mapped, edited, and published by the Geological Survey  
in cooperation with the Wisconsin Highway Commission  
and Wisconsin Geological and Natural History Survey  
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial  
photographs taken 1972. Field checked 1972  
Hydrography compiled from information furnished by  
Wisconsin Department of Natural Resources

Projection and 10,000-foot grid ticks: Wisconsin coordinate  
system, central zone (Lambert conformal conic)  
1000-meter Universal Transverse Mercator grid ticks,  
zone 15, shown in blue. 1927 North American datum

Red tint indicates areas in which only landmark buildings are shown

Fine red dashed lines indicate selected fence and field lines where  
generally visible on aerial photographs. This information is unchecked



SCALE 1:24,000

CONTOUR INTERVAL 20 FEET  
DOTTED LINES REPRESENT 10-FOOT CONTOURS  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U.S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092  
AND BY THE WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY, MADISON, WISCONSIN 53706  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION  
Primary highway, hard surface  
Secondary highway, hard surface  
Light-duty road, hard or improved surface  
Unimproved road  
Interstate Route  
U.S. Route  
State Route

CHIPPEWA FALLS, WIS.  
NW/4 CHIPPEWA FALLS 15' QUADRANGLE  
N4452.5—W9122.5/7.5

1972

AMS 2773 IV NW—SERIES V861



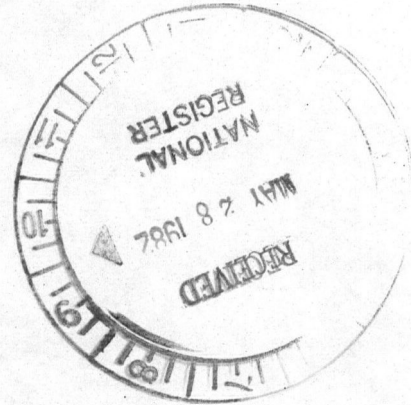


HISTORIC PRESERVATION DIVISION

TO: Carol Shull, Acting Keeper  
National Register of Historic Places

FROM: ☒ Diane Filipowicz  
☐ Leonard Garfield  
☐ Barbara Wyatt

SUBJECT: National Register Nominations



The following materials are submitted on this 25 day of May, 1982,  
for the nomination of the Marsh Rainbow Arch Bridge, Chippewa Falls  
to the National Register of Historic Places:

1 original National Register inventory-nomination form

       supplementary survey forms

       district survey form(s)

1 original USGS map(s)

4 photographs

       sketch map(s)

       pieces of correspondence

       other: \_\_\_\_\_

       PLEASE INSURE THAT THIS NOMINATION IS REVIEWED

BW:ch

Enclosures

THE STATE HISTORICAL SOCIETY OF WISCONSIN

816 STATE STREET • MADISON, WISCONSIN 53706 RICHARD A. ERNEY, DIRECTOR





JUN 29 1982

HISTORIC PRESERVATION DIVISION

TO: Carol Shull, Acting Keeper  
National Register of Historic Places

FROM: ☒ Diane Filipowicz  
☐ Leonard Garfield  
☐ Barbara Wyatt

SUBJECT: National Register Nominations



The following materials are submitted on this 28 day of June, 1982,  
for the nomination of the Marsh Rainbow Arch Bridge, Chippewa Falls  
to the National Register of Historic Places:

- ☒ original National Register inventory-nomination form
- ☐ supplementary survey forms
- ☐ district survey form(s)
- ☐ original USGS map(s)
- ☐ photographs
- ☐ sketch map(s)
- ☐ pieces of correspondence
- ☒ other: supplementary descriptive information

☐ PLEASE INSURE THAT THIS NOMINATION IS REVIEWED

BW:ch

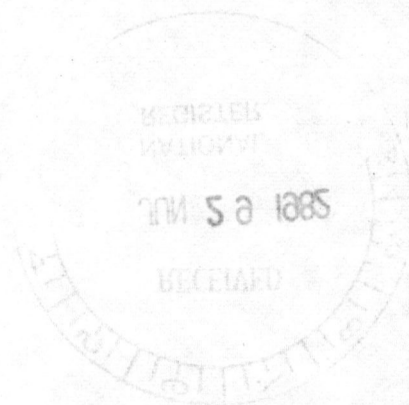
Enclosures

JUN 30 1982

THE STATE HISTORICAL SOCIETY OF WISCONSIN

816 STATE STREET • MADISON, WISCONSIN 53706 RICHARD A. ERNEY, DIRECTOR

THE NATIONAL REGISTER OF HISTORIC PLACES	
DATE REC'D	<b>JUN 30 1982</b>
_____	INDIVIDUAL RESPONSE (ATTACHED)
_____	INFORMATIVE MATERIAL SENT
_____	TELEPHONE CALL (ATTACHED)
DATE ACTION TAKEN _____	
INITIALS _____	



JUN 5 1985