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United States Department of the Interior
National Park Service

National Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Hale Bridge

other names/site number _____

2. Location

street & number 100th Street over Wapsipinicon River not for publication

city or town 5.8 miles northwest of Oxford Junction vicinity

state Iowa code IA county Jones code 105 zip code 52323

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register criteria. I recommend that this property be considered significant nationally statewide locally. (See continuation sheet for additional comments.)

Patricia Ohlerking DSHPD 4-7-98
Signature of certifying official/Title Date

STATE HISTORICAL SOCIETY OF IOWA
State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria. (See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

- entered in the National Register
 - See continuation sheet
- determined eligible for the National Register
 - See continuation sheet
- determined not eligible for the National Register
- removed from the National Register
- other, (explain): _____

Edson H. Ball 5-15-98

5. Classification

Ownership of Property

(Check as many boxes as apply)

- private
- public-local
- public-State
- public-Federal

Category of Property

(Check only one box)

- building(s)
- district
- site
- structure
- object

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	objects
1	0	Total

Name of related multiple property listing

(Enter "N/A" if property is not part of a multiple property listing)

Highway Bridges of Iowa

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions

(Enter categories from instructions)

TRANSPORTATION/road-related

Current Functions

(Enter categories from instructions)

TRANSPORTATION/road-related

7. Description

Architectural Classification

(Enter categories from instructions)

other: bowstring through arch-truss

Materials

(Enter categories from instructions)

foundation Stone/concrete

walls

roof

other Wrought iron

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets)

Located 5.8 miles northwest of Oxford Junction, the Hale Bridge spans the Wapsipinicon River in a rural Jones County setting that has changed little since the structure's period of significance. A description of the structure follows:

span number: 3	construction date: 1877-79
span length: 100.0'	construction cost: unknown
total length: 296.0'	current condition: fair
roadway wdt.: 15.0'	alterations: various members replaced, Armco railings and concrete extensions to piers added

superstructure: wrought iron bowstring through arch-truss
 substructure: stone abutments and piers with concrete extensions
 floor/decking: timber deck over timber stringers
 other features: arch: built-up box, with 2 channels and continuous plates; bottom chord: 2 rectangular eyebars; vertical: 1 star iron, 2 asymmetrical T-sections with lacing; diagonal: 1 round rod with threaded end; floor beam: I-beam, U-bolted to lower chord; lateral bracing: 1 round-section rod; strut: 2 angles with battens; railing: Armco; bridge plate: 1879 / Built by King Iron Bridge Co. / Cleveland, O.

Other than maintenance-related repairs and alterations noted above, the bridge remains essentially unaltered as it continues to carry vehicular traffic. The Hale Bridge today retains a high degree of integrity of location, design, setting, materials, workmanship, feeling and association.

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
B Property is associated with the lives of persons significant in our past.
C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply)

Property is:

- A owned by a religious institution or used for religious purposes.
B removed from its original location.
C a birthplace or grave.
D a cemetery.
E a reconstructed building, object, or structure.
F a commemorative property.
G less than 50 years of age or achieved significance within the past 50 years.

Narrative Statement of Significance

(Explain the significance of the property on continuation sheets.)

Areas of Significance

(Enter categories from instructions)

ENGINEERING

Period of Significance

1877-79

(The period of significance is derived from the original construction date.)

Significant Dates

1877-79 (construction date)

Significant Person

(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

designer:

King Iron Bridge and Manufacturing Co.

fabricator:

King Iron Br./Mfg. Co.; Trenton Iron Works

builder:

King Iron Bridge and Manufacturing Co.

9. Major Bibliographical References

Bibliography

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67) has been requested
previously listed in the National Register
previously determined eligible by the National Register
designated a National Historic Landmark
recorded by Historic American Buildings Survey
recorded by Historic American Engineering Record

Primary location of additional data:

- State Historic Preservation Office
other State agency
Federal agency
Local government
University
other
name of repository:

10. Geographical DataAcreage of Property less than one acre**UTM References**

(Place additional UTM references on a continuation sheet)

1 15 660240 4651810
zone easting northing2 15 660300 4651905
zone easting northing**Verbal Boundary Description**

(Describe the boundaries of the property)

The nominated property is a rectangular-shaped parcel measuring 17 feet by 296 feet, which is centered on the UTM point(s) listed above. Included within this rectangular parcel are the bridge's superstructure, substructure, approach spans and floor system.

Boundary Justification

(Explain why the boundaries were selected)

The nominated structure includes the bridge's superstructure, substructure, floor system, any approach spans and the property on which they rest. These boundaries encompass, but do not exceed, all of the property that has been historically associated with the bridge.

11. Form Prepared Byname/title Robert Hybben, Charlene Roise and Clayton Fraserorganization Fraserdesign date 31 August 1994street & number 1269 Cleveland Avenue telephone 303-669-7969city or town Loveland state Colorado zip code 80537**Additional Documentation**

Submit the following items with the completed form:

Continuation Sheets**Maps**A **USGS map** (7½ or 15 minute series) indicating the property's locationA **Sketch map** for historic districts and properties having large acreage or numerous resources**Photographs**Representative **black and white photographs** of the property**Additional Items**

(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO)

name/title Jones Countystreet & number P.O. Box 368 telephone 319-462-3785city or town Anamosa state Iowa zip code 52205

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20503.

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

**National Register of Historic Places
Continuation Sheet**

Section Number 8 Page 1 Hale Bridge Jones County; Iowa

Located at the small village of Hale, this structure crosses the Wapsipinicon River in Hale Township, some six miles northwest of Oxford Junction. This extraordinary three-span bowstring structure is supported by stone abutments and massive piers with concrete vertical extensions and angled cutwaters. The history of the bridge can be traced to 1877. In April of that year the Jones County Board of Supervisors let a comprehensive contract to the King Iron Bridge and Manufacturing Company to furnish all iron bridges in the county from April 1877 until early 1878. Evidently, the Hale location had already been slated for a permanent crossing, because pile driving for the bridge's substructure was begun shortly thereafter. The piling for the center pier was recorded as being "drove and capped" in early fall. The Cleveland, Ohio, fabricator used wrought iron components rolled by the Trenton (New Jersey) Iron Works to construct a 100-foot through arch-truss and one shorter pony arch that winter, using King's patented tubular bowstring design. The county evidently changed the bridge's configuration the following spring and contracted with King Bridge to fabricate and erect one additional pony arch to replace the earlier timber approaches. The Hale Bridge was finally completed in June 1879. It has functioned in place since that time, with the replacement of various superstructural members and buttressing and raising of the piers as the most serious alterations.

The bowstring arch-truss was the iron span of choice for Iowa counties in the late 1860s and 1870s. Marketed exclusively throughout the Midwest by such industry giants as the King Iron Bridge and Manufacturing Company and the Wrought Iron Bridge Company, these often-patented bridge configurations featured a wide range of span lengths, economical fabrication cost and relatively quick erection. The proliferation of the bowstring corresponded with the initial development of Iowa's road system; as a result, perhaps thousands of these prototypical iron spans were erected throughout the state. The bowstring had some rather severe structural flaws, however, relating primarily to lateral stability of the arches, and it was largely superseded by the pin-connected truss in the early 1880s. Despite this, some bowstrings were still erected in Iowa in the 1880s, although the number dwindled precipitously by the decade's end. Through subsequent attrition, almost all of Iowa's bowstrings have since been replaced and demolished. Now less than twenty remain in place. Through its association with the King Iron Bridge and Manufacturing Company and owing to its multiplicity of spans, the Hale Bridge is both historically and technologically significant as one of the last remaining examples in the state of what was once a mainstay structural type.

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

**National Register of Historic Places
Continuation Sheet**

Section Number 9 Page 2 Hale Bridge Jones County; Iowa

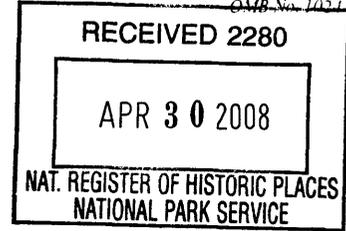
Iowa Department of Transportation, Structure Inventory and Appraisal: Structure No. 206270.

Jones County Supervisors' Minutes, Book C: page 238 (5 April 1877), page 265 (3 September 1877), page 308 (11 January 1878), page 323 (4 April 1878), page 413 (8 April 1879), page 418 (9 April 1879), page 433 (4 June 1879), page 528 (11 June 1880); Book E: page 19 (5 January 1888), located at the Jones County Courthouse, Anamosa IA.

History of Jones County, Iowa (Chicago: Western Historical Company, 1879), page 349.

Field inspection by Clayton Fraser, 8 December 1990.

98000539



United States Department of the Interior
National Park Service

National Register of Historic Places
Registration Form

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1. Name of Property

historic name HALE BRIDGE (AMENDMENT)

other names/site number _____

2. Location

street & number Wapsipinicon River near Mouth of Dutch Creek N/A not for publication

city or town .75 mile south of Anamosa _____ vicinity

state Iowa code IA county Jones code 105 zip code 52205

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this (nomination request for determination of eligibility) meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property (meets does not meet) the National Register criteria. I recommend that this property be considered significant (nationally statewide locally). (See continuation sheet for additional comments.)

Barbara A. Mitchell DSHP April 24 2008
Signature of certifying official/Title Date

STATE HISTORICAL SOCIETY OF IOWA

State or Federal agency and bureau

In my opinion, the property (meets does not meet) the National Register criteria. (See continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is: _____ Signature of Keeper _____ Date of Action _____

- entered in the National Register.
 - See continuation sheet.
- determined eligible for the National Register
 - See continuation sheet
- determined not eligible for the National Register
- removed from the National Register.
- Other. (Explain) **Additional Documentation Accepted**

LA
Signature of Keeper _____ Date of Action _____
Edouard H. Beall 6.4.08

Hale Bridge (Amendment)
Name of Property

Jones County, Iowa
County and State

5. Classification

Ownership of Property **Category of Property**
(Check as many lines as apply) (Check only one line)

- | | |
|--|---|
| <input type="checkbox"/> private | <input type="checkbox"/> building(s) |
| <input checked="" type="checkbox"/> public-local | <input type="checkbox"/> district |
| <input type="checkbox"/> public-State | <input type="checkbox"/> site |
| <input type="checkbox"/> public-Federal | <input checked="" type="checkbox"/> structure |
| | <input type="checkbox"/> object |

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
<u>1</u>		buildings
		sites
		structures
		objects
		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

"Highway Bridges of Iowa"

Number of contributing resources previously listed in the National Register

1

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION/road-related

Current Functions
(Enter categories from instructions)

TRANSPORTATION/pedestrian-related

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: bowstring through arch-truss bridge

Materials
(Enter categories from instructions)

foundation	<u>Stone</u>
walls	<u>N/A</u>
	<u>N/A</u>
roof	<u>N/A</u>
other	<u>Metal/iron</u>
	<u>Wood</u>

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

Hale Bridge (Amendment)
Name of Property

Jones County, Iowa
County and State

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" on one or more lines for the criteria qualifying the property for National Register listing)

- A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B** Property is associated with the lives of persons significant in our past.
- C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" on all the lines that apply)

Property is:

- A** owned by a religious institution or used for religious purposes.
- B** removed from its original location.
- C** a birthplace or grave.
- D** a cemetery.
- E** a reconstructed building, object, or structure.
- F** a commemorative property.
- G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance

(Enter categories from instructions)

ENGINEERING

Period of Significance

1877-1879

Significant Dates

1877-1879

Significant Person

(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

Architect/Builder

King Iron Bridge and Manufacturing Co.

Trenton Iron Works

Narrative Statement of Significance - (Explain the significance of the property on one or more continuation sheets)

9. Major Bibliography References

Bibliography

(Cite the books, articles and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- previous determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Record
- designated a National Historic Landmark
- recorded by American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____

Primary location of additional data:

- State Historical Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other

Name of repository

Hale Bridge (Amendment)
Name of Property

Jones County, Iowa
County and State

10. Geographical Data

Acreage of Property Less than one acre

UTM References

(Place additional UTM references on a continuation sheet.)

1	15	6	42.6	45	46.6	1	35	0
---	----	---	------	----	------	---	----	---

Verbal Boundary Description

(Describe the boundaries of the property on a continuation sheet)

Zone Easting Northing

2	--	--	--	--	--	--	--	--
---	----	----	----	----	----	----	----	----

Boundary Justification

(Explain why the boundaries were selected on a continuation sheet)

Zone Easting Northing

3	--	--	--	--	--	--	--	--
---	----	----	----	----	----	----	----	----

Zone Easting Northing

4	--	--	--	--	--	--	--	--
---	----	----	----	----	----	----	----	----

11. Form Prepared By

name/title William C. Page, Public Historian
organization Jones County Historic Preservation Commission date November 1, 2007
street & number 520 East Sheridan Ave. (Page) telephone 515-243-5740
city or town Des Moines state IA zip code 50313-5017

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs - Representative **black and white photographs** of the property.

Additional items - (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

name State of Iowa Department of Natural Resources
street & number Post Office Box 368 telephone 319-462-3785
city or town Anamosa state IA zip code 52205

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 7

Page 1

CFN-259-1116

Hale Bridge (Amendment), Jones County, Iowa.

GENERAL DESCRIPTION

This National Register Registration Form amends the 1998 nomination of the Hale Bridge by re-listing the property at a new location.

The Hale Bridge is a bowstring through arch-truss bridge originally erected between 1877 and 1879 over the Wapsipinicon River in Jones County, Iowa. Listed on the National Register of Historic Places in 1998, the bridge became a concern because it could not bear the weight of present-day usage.

Following a determination by the Jones County Secondary Roads Department in 2002 to replace the bridge, the Jones County Historic Preservation Commission made the preservation of the bridge its top priority. Because the bridge could not be preserved at its original site, the commission, under the chairmanship of Rose Rohr of Monticello, Iowa, launched a multi-fronted campaign to find a new home for it. Lengthy negotiations followed with Jones County officials and the Iowa Department of Transportation, Iowa Department of Natural Resources, State Historical Society of Iowa, Iowa Army National Guard, Federal Highway Administration, Iowa Department of Economic Development, Regional East Central Iowa Council of Government, Silos and Smokestacks, and Jones County Historic Preservation Commission.

All parties reached an agreement. In 2003, the bridge's three spans were dismantled and relocated to a nearby site for mothballing. In the meantime, a new bridge was erected where the old bridge had stood.

The next step required agreement on a new site for the old bridge. One location in Center Park, a rural park owned and operated by Jones County, was considered. There, the bridge would have spanned a pond. Then, a location in Wapsipinicon State Park emerged. It better fulfilled integrity requirements because it spanned a river. The new site was prepared for the old bridge, and, on March 8, 2006, to the amazement of onlookers and delight of state and national media, Iowa National Guard Chinook helicopters airlifted the bridge's three spans to the new upstream site about 15 miles from its original home. Following the construction of new approaches and landscaping, the relocated Hale Bridge was dedicated in September 2006. The bridge now provides a river crossing for pedestrians and bicyclists and a destination for many, who come to enjoy the scenery and wildlife from its vantage point.

United States Department of the Interior
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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 7

Page 2

CFN-259-1116

Hale Bridge (Amendment), Jones County, Iowa.

FORMER SITE

The Hale Bridge originally spanned the Wapsipinicon River to provide a crossing for a Jones Country road, now known as 100th Avenue, about six miles northwest of Oxford Junction and one-half mile south of Hale, Iowa. The latter is a small village in Hale Township, Jones County.

From the village of Hale, 100th Avenue runs south, jogs to the west above the Wapsipinicon River valley, and then turns south in a tight, 45-degree bend to approach the river. The Hale Bridge stood at this site. The surrounding countryside is rural and used for agricultural purposes.

On the south side of the river, 100th Avenue intersects Jungle Town Road. The latter runs along the south bank of the river, while 100th Avenue climbs a steep hill to crest on a ridge above the river valley. A narrow flood plain is situated on the south side of the river. Limestone bluffs rise on the north side.

The historic Hale Bridge ran on a level course to the south bank of the river. Stone abutments were situated on both ends of the bridge. Locally quarried, limestone piers supported the bridge. The flood of 1993 damaged the bridge; and, although it was subsequently repaired and listed on the National Register in 1998, it lacked the strength for the rigorous life of a rural bridge capable of handling heavy farm machinery. In 1997, Jones County officials closed the bridge to traffic because of safety concerns. At the time of its National Register listing, the Hale Bridge was said to be the longest standing bowstring arch bridge in Iowa.

Following the removal of the historic Hale Bridge in 2003, Jones County erected a new, reinforced concrete bridge to span the river at this site.

PRESENT SITE

The present location of the Hale Bridge possesses a high degree of similarity in setting, feeling, and association with its original site 15 miles away. Both the former and the present locations are situated on the Wapsipinicon River, a stream in northeastern Iowa, which flows from the northwest to the southeast to join the Mississippi River south of Clinton, Iowa. Both sites are rural in feeling and are surrounded by rolling hills and open spaces with trees along the valley and river banks. Little vehicular traffic impinges on either site. A stillness pervades both environments. Birds, deer, small animals, and other indigenous wildlife frequent both sites.

United States Department of the Interior
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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 7

Page 3

CFN-259-1116

Hale Bridge (Amendment), Jones County, Iowa.

Planning for the relocation of the Hale Bridge established a series of priorities. High priority was given to the selection of a new site, where the historic bridge could find a compatible environment and where it could serve as a working bridge rather than a decorative object in an artificial setting. Publicly owned property was also preferred. Because the State of Iowa had invested heavily in the project, a site owned by the State was preferred, as well as a site in Jones County.

It became clear that Wapsipinicon State Park would provide a good setting. Located about 15 miles northwest of the original location of the bridge, this 394-acre park is owned by the State of Iowa and maintained by its Department of Natural Resources. Dedicated in 1923, this park was one of the first state parks in Iowa. Wapsipinicon River and its valley form the focus of the park. Limestone and sandstone bluffs edge the river on the west and provide scenic views of the valley.

How to select the new site for the Hale Bridge as a working structure? This challenge required careful consideration, as engineers sought to identify a spot in the park where they could match the length of the bridge with the width of the river and the topography of the surroundings.

A site was selected near the mouth of Dutch Creek and about 300 feet west of Schaal Road, a county road, which connects Iowa 151 and Anamosa. This site would allow access to the bridge from both sides of the Wapsi at a point where such a structure would serve a useful function. The bridge would link Schaal Road with the pedestrian trail system within the park. This intention has proved much more successful than planners envisioned because, in addition to the structure's function as a bridge, it has captured the public's imagination and become a destination point for pedestrians, who drive to the park just to experience it.

The new site required certain site modifications to make the bridge work as a functioning structure. A narrow flood plain flanks both sides of the Wapsipinicon River at this site. This is somewhat different from the original Hale site, where limestone bluffs lined the north side and a flood plain stood on the south side of the bridge. At the new site, two new, reinforced concrete piers were built midstream in the Wapsipinicon and faced with Jones County limestone, donated by the Weber Stone Company, Inc., of nearby Stone City, Iowa. Wood bridge abutments were constructed on the east and west banks of the river and rubble limestone laid at their bases to control erosion. The need to avoid flooding dictated the height of the bridge.

Following the placement of the bridge's three spans at their new location on March 8, 2006 (see Section 8), the relocation project was completed. Stringers were placed to support the recycled deck planks. Earthen ramps in switchback designs were built on both banks of the river to provide the height necessary for pedestrian paths to reach the deck of the bridge. These paths were then surfaced

United States Department of the Interior
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NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section number 7 Page 4

CFN-259-1116

Hale Bridge (Amendment), Jones County, Iowa.

with gravel. Finally, the grounds surrounding the approaches were seeded with grass, and a parking lot for vehicles built on the east side of the bridge.

The total cost to relocate the bridge amounted to about \$445,000. These funds came from federal, state, and local government sources, and from the private sector.

INTEGRITY

The Hale Bridge remains now, after its relocation, very much as originally completed in 1879 and at the time of its National Register listing in 1998.

Although the bridge's integrity of location has been lost, its new setting mitigates this loss because of its similarity with the bridge's original site, as described above. The feeling of the bridge as an historic structure is strong. No visual intrusions on the new site detract from the bridge's practical function.

The relocation of the Hale Bridge has reduced the integrity of its associational authenticity as a structure serving a specific rural community. Its relocation to a public property in a similar setting helps to offset this loss.

A comparison of the bridge today and in 1998 justifies the claim that the relocation project preserved the integrity of the bridge's engineering design, building materials, and workmanship. As described in its original National Register nomination, the Hale Bridge featured the following attributes:

span number:	3
span length:	100.0 feet
total length:	296.0 feet
roadway wdt:	15.0 feet
construction date:	1877-1879
construction cost:	unknown

United States Department of the Interior
National Park Service

**NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET**

Section number 7

Page 5

CFN-259-1116

Hale Bridge (Amendment), Jones County, Iowa.

current condition:	fair
alterations:	various members replaced, Armco railings and concrete extensions to piers added
superstructure:	wrought iron bowstring through arch-truss
substructure:	stone abutments and piers with concrete extension
floor/decking:	timber deck over timber stringers
other features:	arch: built-up box, with 2 channels and continuous plates; bottom chord: 2 rectangular eyebars; vertical: 1 star iron, 2 asymmetrical T-sections with lacing; diagonal: 1 round rod with threaded end; floor beam: I-beam, U-bolted to lower chord; lateral bracing: 1 round-section rod; strut: 2 angles with battens; railing: Armco; bridge plate: 1879/Built by King Iron Bridge Co./Cleveland O.

Source: National Register of Historic Places Nomination, 1994, Robert Hybben,
Charlene Roise and Clayton Fraser.

The relocated bridge retains the same number of spans, total length, roadway width, superstructure, floor/decking, and other features, as noted above, although the total length of the spans is a little shorter than measured in 1998. Its main span does measure 100 feet. The shorter spans actually measure 81 feet and 82 feet. This reflects an error in the original nomination rather than a change made to the bridge for the new location.

When the bridge was dismantled in 2003, its original wooden plank decking was removed from the substructure and stored. Following the relocation of the bridge's spans, this decking was reinstalled. The preservation of this wooden deck is particularly appealing. The rich textures of these weathered and worn planks lend authenticity to the structure, as modern materials could not.

Although the original stone abutments and piers of the bridge's substructure could not be relocated to this site, Jones County limestone was used to face the two piers needed to support the relocated superstructure. These piers stand 25-feet high above the river. The wooden post and plank design of the present abutments are also modifications from the limestone ones at the original site. A new chain-link handrail was installed on both sides of the bridge.

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Hale Bridge (Amendment), Jones County, Iowa.

Further inspection of the Hale Bridge for this amendment discovered that certain of its iron members feature the letters "TRENTON NJ" embossed on them. (See Photograph #6.) The Trenton Iron Works, the firm that fabricated the members of the Hale Bridge, was based in Trenton, New Jersey.

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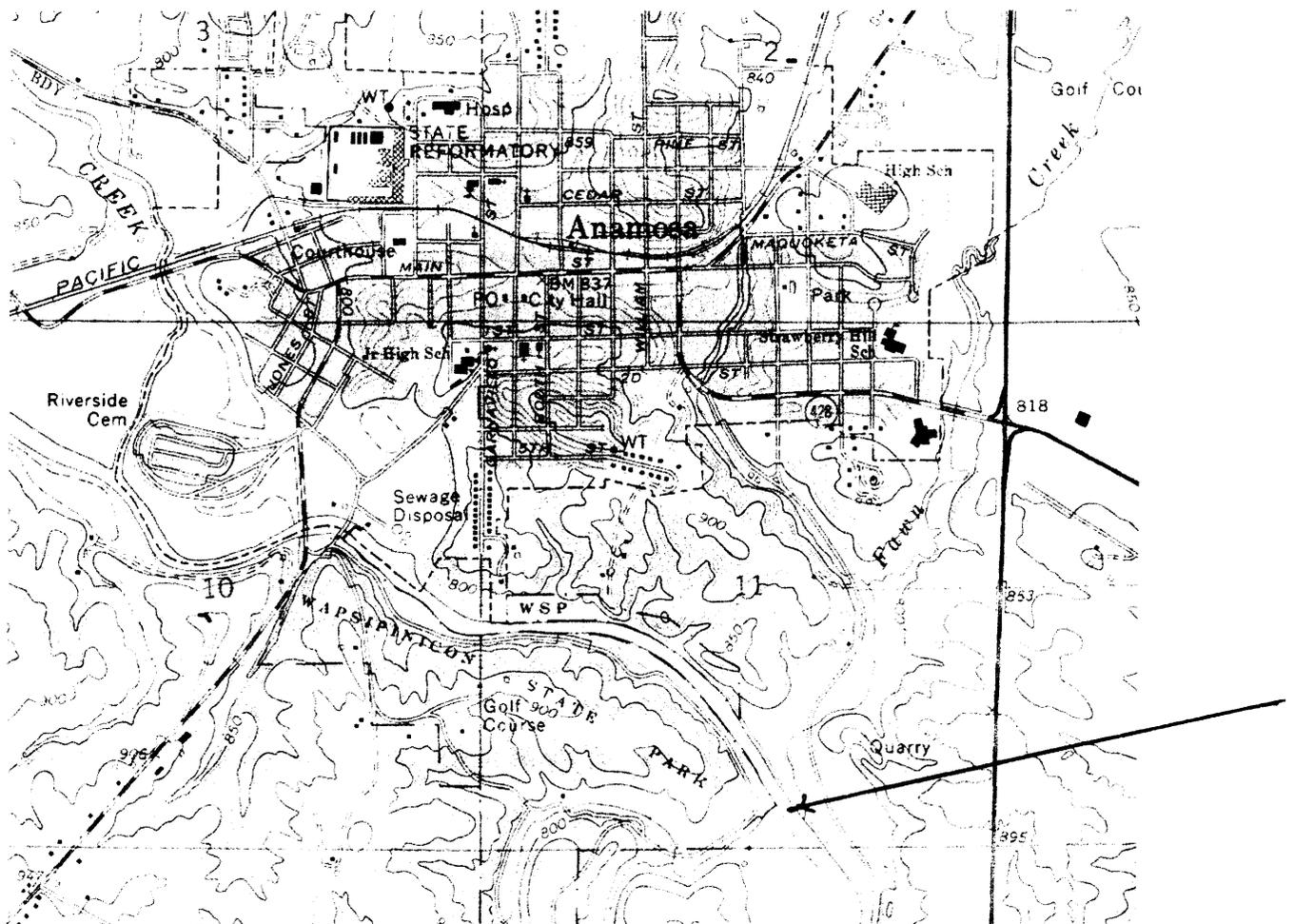
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Hale Bridge, Jones County, Iowa.

MAP OF PRESENT SITE

ARROW LOCATES NEW SITE OF BRIDGE



Source: U.S.G.S. Map (7.5 Minute Series), Anamosa, 1973.



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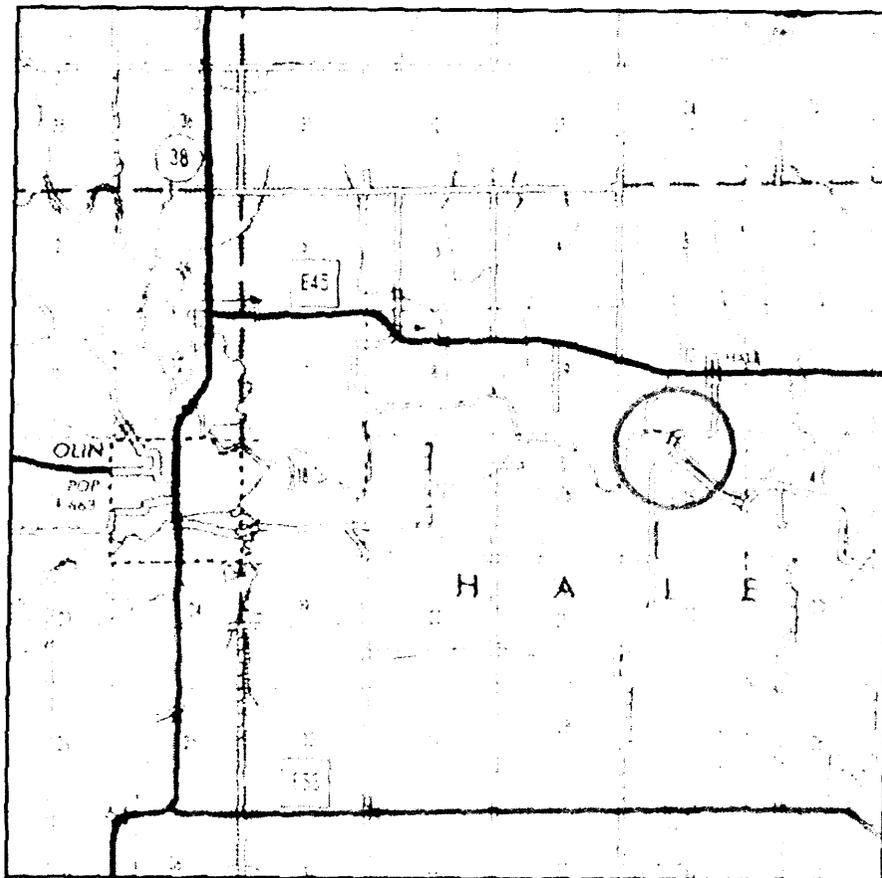
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Hale Bridge, Jones County, Iowa.

MAP OF FORMER SITE

CIRCLE LOCATES PREVIOUS SITE OF BRIDGE



Source: Finn: 31.



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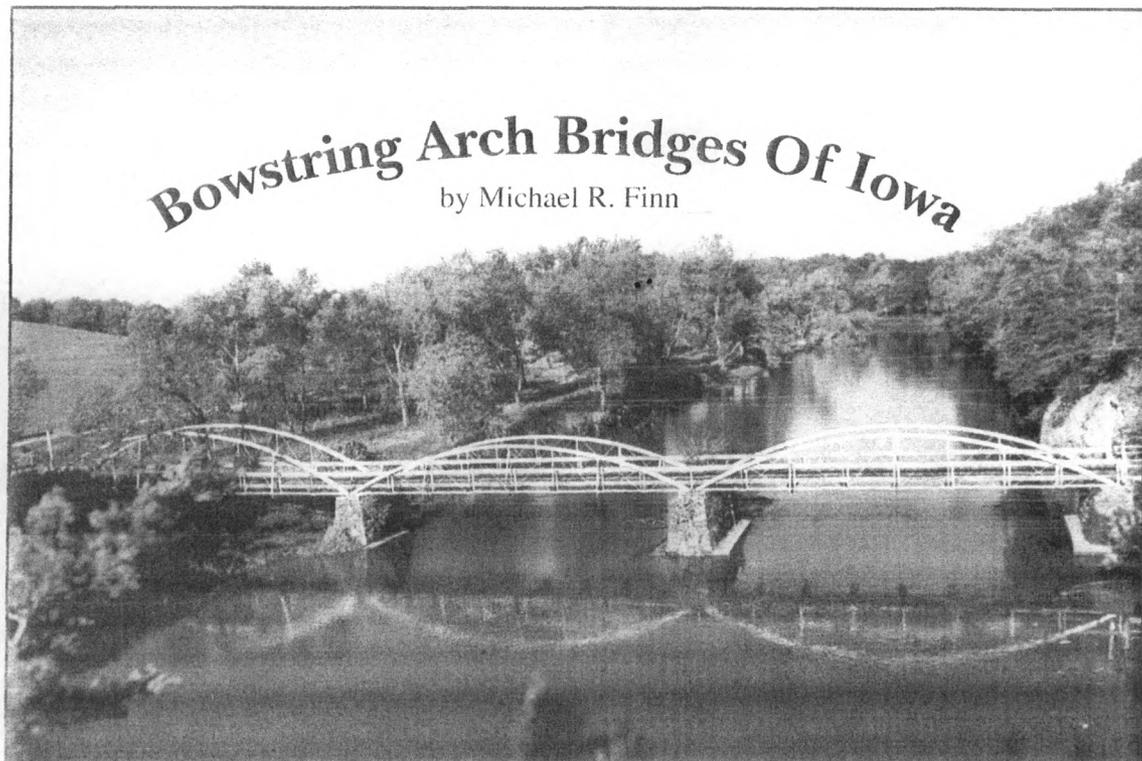
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Hale Bridge, Jones County, Iowa.

FAME



The front cover of this brochure, an historical survey of Iowa's bowstring arch bridges, pictures the Hale Bridge at its original site. The brochure's text describes the mothballing of the bridge.

Source: Michael R. Finn, 2004.

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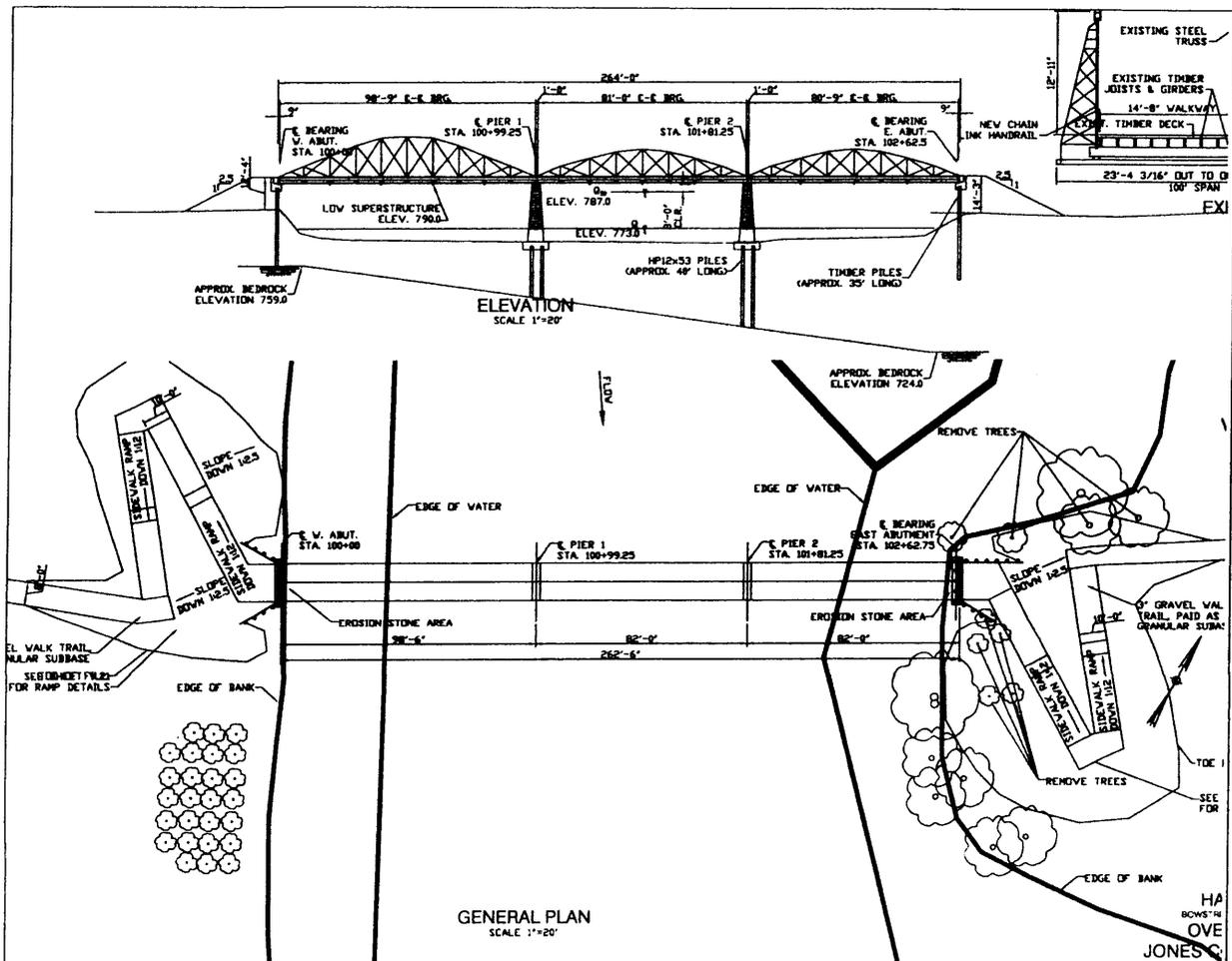
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Hale Bridge, Jones County, Iowa.

PLANNING



NNW, Inc., consulting engineers based in Iowa City, Iowa, prepared the site plans for the relocated Hale Bridge. The plans included designs for the bridge's piers, abutments, and approaches.

Source: NNW, Inc., Iowa City, Iowa, 2005.

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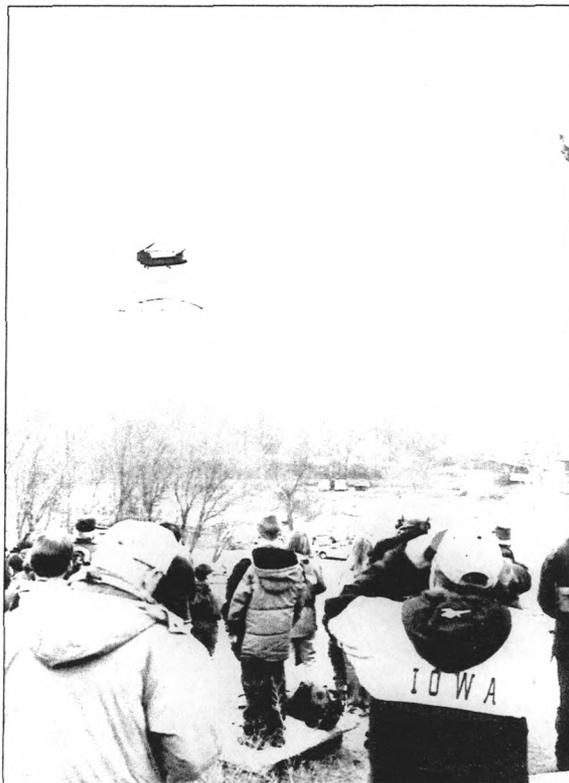
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Hale Bridge, Jones County, Iowa.

A DAY TO REMEMBER

MARCH 8, 2006



Hundreds of onlookers cross their fingers, as a
Chinook helicopter flies one span of the Hale Bridge to its new location.

Source: William C. Page, Photographer.

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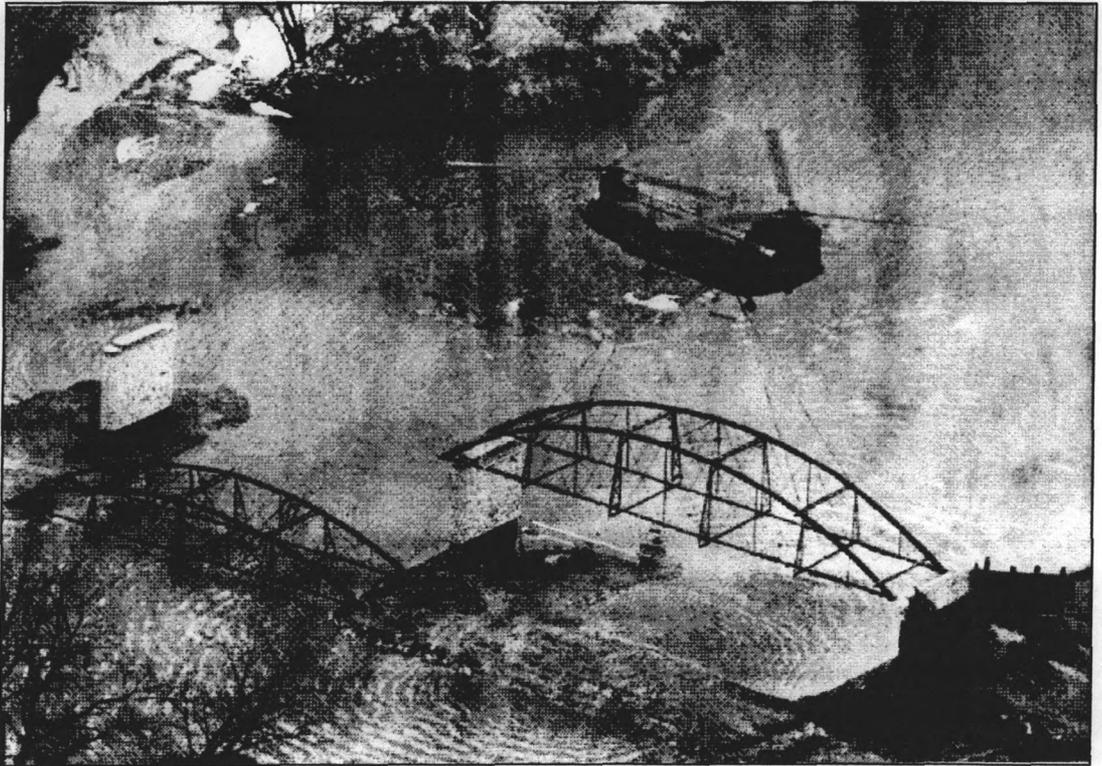
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Hale Bridge, Jones County, Iowa.

“STEADY, STEADY”

MARCH 8, 2006



Photographer David Lienemann of *The Cedar Rapids Gazette* captured this view of the north span's placement. The downdraft from the rotors sprayed the hovering helicopter with river water and compounded the difficulty of placing the spans on their piers. Placement was made by a spotter, hanging out the helicopter's door and shouting instructions to the pilot.

Source: < www.kingbridgeco.com/iowa1.htm >, 2007.

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Hale Bridge (Amendment), Jones County, Iowa.

SUMMARY OF SIGNIFICANCE

The Hale Bridge is significant, under National Register Criterion C and on the state level, for the following reasons, as stated in its original National Register nomination.

Through its association with the King Iron Bridge and Manufacturing Company and owing to its multiplicity of spans, the Hale Bridge is both historically and technologically significant as one of the last remaining examples in the state [of Iowa] of what was once a mainstay structural type [the bowstring arch-truss]. (Hybben *et al.*: 8-1)

This document notes that, of these bowstring arch-truss bridges, “now less than twenty remain in place” in Iowa. (*Ibid.*) A more recent inventory, cited below, states that number to be less.

The period of significance for the Hale Bridge remains, as in its original nomination, 1877-1879, the time in which it was erected and first placed in service. Significant dates include 1877-1879 for the same reason.

The Hale Bridge is counted as one resource for this nomination and is classified as a structure. Although it has been relocated from its original location, Criteria Consideration B is satisfied because the bridge is significant primarily for its value as an engineering work, whose structural elements have been carefully preserved in order to convey its significance and retain integrity of design, materials, workmanship, and feeling. The bridge’s integrity of association is now somewhat reduced because of its relocation from a rural community to a public park, but it still possesses an orientation, setting, and general environment compatible to its historic location and compatible with the property’s significance as explained in Section 7.

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Hale Bridge (Amendment), Jones County, Iowa.

HISTORICAL CONTEXT

Since the National Register nomination of the Hale Bridge in 1998, research has fleshed out the sketchy account of its history as contained in that nomination. In 2004, Michael R. Finn of Wapsi Valley Archaeology, Inc., published *Bowstring Arch Bridges of Iowa*, a 50-page booklet, prepared for Jones County, Iowa. Finn's publication expands the historic context surrounding the Hale Bridge and provides a detailed account of its construction. The Hale Bridge is shown to be a case study of the Industrial Revolution's effects in Iowa during the 19th century, as locally fabricated timber bridges gave way to those fabricated of wrought iron by distant factories.

The growth of Iowa's cash crop economy following the Civil War required improved transportation links between farmers and their markets. By the 1870s, American engineering had made huge strides in bridge technology, prompted largely by the demands of the nation's rapidly expanding railroad network. Increased production of the nation's iron and steel foundries provided the raw materials for these bridges; and, coupled with market demands, bridge manufacturers like the Wrought Iron Bridge Company (Canton, Ohio), King Iron Bridge & Manufacturing Co. (Cleveland, Ohio), and others emerged to offer cost-effective and reliable solutions able to bear great weight and withstand heavy use without frequent repair.

By the 1870s, the Jones County Board of Supervisors faced increased petitions from county residents for bridge improvements. The timber bridges, which to this time had served local needs, lacked durability and required costly maintenance. In 1877, the board of supervisors contracted with the King Iron Bridge and Manufacturing Company to build three iron bridges in Jones County. The Hale Bridge was one of these. The second was a 2-span, bowstring arch truss bridge over Buffalo River on the western edge of Anamosa. Known as the Fisher's Mill Bridge, it remains extant. (Finn: 5-7) The location of the third bridge and its fate are unknown.

The Hale Bridge incorporated modern bridge engineering in its design. According to Allen King Sloan, great-great grandson of Zenas King, the bridge's builder:

The bowstring arches in all three spans are made out of wrought iron boiler plate shaped into hollow tubes in accordance with the "Z. King Patent Tubular Arch" design created by Zenas King in the 1860s. The design allowed for the making of a relatively light truss structure that was very strong and easy to assemble. Most of the elements of the trusses were manufactured in the King Bridge Company factory in Cleveland, Ohio and shipped by railroad to a location close to the bridge site where they were assembled by local crews. (<www.kingbridgeco.com/iowa1.htm> viewed November 5, 2007)

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Hale Bridge (Amendment), Jones County, Iowa.

Michael R. Finn's recent work has explained how this technology found application at Hale, Iowa:

In the case of the Hale Bridge, project work began in the spring of 1877, and each span was approved and erected at different times. Once again Jones County officials selected the King Iron Bridge and Manufacturing Company of Cleveland, Ohio. This company also was erecting bridge spans at Olin [Jones County] on the Wapsipinicon River. At the Hale location, what was to be a three-span iron arch would replace a 349-foot wooden span built in 1870. . . This project was reported in the Anamosa Eureka on October 13, 1870. Cost of the structure was reported as \$7,995.

In the spring of 1877, the supervisors ordered a strong central pier be built on the site of the wooden structure "to support one iron structure." Bids were requested from local contractors for the stone work. This pier was completed by September and the first 81 foot span was put in place. The County Supervisors then ordered a second 82 foot iron span, which was erected in the spring of 1878. By the end of the year, however, the county Bridge Fund was depleted and the supervisors were forced to order all bridge work stopped and petitions for new bridges "laid over until January 1879." In January, all petitions were again put off until April 1879. At that time, the King Iron Bridge and Manufacturing Company was given a contract for the third span of 100 feet at a cost of \$14 a lineal foot. The bridge finally was completed in June 1879. The records do not show a total amount paid for the three-span bridge, but Hale Bridge construction warrants from June 1877 to June 1879 total approximately \$8,000, of which the King Iron Bridge and Manufacturing Company received \$3,640. Along with the three iron spans, totaling 281 feet, the wooden approaches rendered the Hale Bridge 296 feet in length. (Finn: 10)

Finn's work made extensive use of "Highway Bridges of Iowa," a 1994 Multiple Property Submission prepared by Fraserdesign of Loveland, Colorado. This MPS inventoried, surveyed, and evaluated scores of historic highway bridges across Iowa. From these works, a definitive inventory of Iowa's bowstring arch bridges has emerged. According to Finn:

Of the hundreds that were built in the state of Iowa, there are only 20 bowstring arch bridges still standing today. Seventeen of these are publicly owned, while three are on private property. Only three of the bowstring arch bridges are still in use in their original locations. The remainder have been closed or moved. (*Ibid.*: 19)

As to the history of the King Iron Bridge and Manufacturing Company, Zenas King organized this firm in 1860 in Cleveland, Ohio. Although King was not a civil engineer, his entrepreneurship and

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Hale Bridge (Amendment), Jones County, Iowa.

innovative genius propelled the new company to success. It specialized in custom-built bridge components, which could be quickly shipped and assembled. In another innovation, King established a cadre of local sales representatives to market the firm's products to state and local governments. By 1882, the company had constructed some 5,000 bridges. The firm based its Midwest headquarters in Des Moines, Iowa. Following King's death in 1892, the U. S. Government won an anti-trust suit against his firm. The company subsequently relocated to New Jersey, where it ceased operations in 1922. (*Ibid.*: 12-13)

RELOCATION

The relocation of the Hale Bridge initially met resistance. At first, the Iowa National Guard declined assistance in moving the bridge by helicopters as a result.

Unconvinced, the Jones County Historic Preservation Commission, under the leadership of Rose Rohr, chair, approached NNW, Inc., consulting engineers of Iowa City, Iowa, for a second opinion. In a 2002 report, that firm's Dennis Waugh advised that the bridge could be successfully dismantled, moved by helicopter, and reassembled at a new site. NNW subsequently prepared restoration plans for the bridge and designed new bridge abutments, piers and approaches. The firm also developed plans to stabilize and reinforce the bridge for its flight from Hale to Anamosa.

The airlift itself required about three hours to accomplish. About two-dozen guardsmen from Company B, 2nd Battalion, 211th Aviation Unit of the Iowa National Guard provided the manpower. The center span of the Hale Bridge arrived first. It was placed on causeways at the base of the piers. The south span arrived next and was placed on its piers. It was the heaviest of the three spans and weighed about 19,600 pounds, just 400 pounds shy of the maximum carrying capacity of a Chinook helicopter. To lighten the overall load, the helicopter carried only the requisite amount of fuel to accomplish the flight, flying at 1,000 feet in the air. The north span followed about 45 minutes later and was positioned on its piers. This sequence of placements insured that if one span swung out of control during placement, it would not collide with its neighbor already in place. The helicopter pilots had instructions to abort the mission and drop the bridge in the event of emergency. This was the sixth time the Davenport-based Guard unit had relocated an historic bridge (*Cedar Rapids Gazette*, 2a), and its experience was evident, in spite of long minutes of anxiety for the estimated 1,000 spectators on hand. Later in the afternoon, two cranes from Iowa Bridge Company lifted the center span from the causeway along the river, positioned it into place between the two other spans, and completed the relocation of the bridge.

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Hale Bridge (Amendment), Jones County, Iowa.

Emergency vehicles from surrounding towns and utility crews from local power companies stood ready in case of emergency. About 700 schoolchildren from three neighboring school districts gathered on a ridge above the Wapsi to view the event. Allen King Sloan, great-great grandson of Zenas King, the founder of the firm, which originally built the bridge, traveled from his home in Lexington, Massachusetts, to witness it. Sloan's gift of \$2,000.00 originally had set in motion the fund-raising needed for the project.

STARDOM

The Hale Bridge airlift electrified Iowa. Front-page newspaper stories and television coverage featured the event in the *Des Moines Register*, *Cedar Rapids Gazette*, *Sioux City Journal*, KCCI-TV, WOI-TV, and Iowa Public Television, among others. The *New York Times* also reported the event.

The *Quad City Times* captured the fair-like atmosphere that pervaded the scene.

Pickups loaded with the curious lined gravel roads and farmfields to see the huge Chinook lowering down to a bridge span. Alliant Energy supplied trucks and cranes to help connect a helicopter's steel cables to the span, and the Chinook stately rose up in the air with its historic load. "It's very impressive," said Margo Ahrendsen, who farms near Oxford Junction.

Teenagers, including Joel Ahrendsen, 18, a senior at nearby Olin High School, and his buddy, Travis Holmes, 19, of Olin, said the whole operation was quite a sight.

Mike Franks, 84, took a special interest in the liftoff. A former Marine who worked in aviation during World War II, Franks saw duty in the Solomon Islands in the South Pacific Ocean. "These Chinook helicopters were just in the hatching stage when I was in," he said as he filmed the operation.

About 20 miles away at the Wapsipinicon State Park, hundreds of school students lined a hillside, some bearing large signs of welcome for the helicopter crews. "History is dynamic and this is a way to make it come alive," said Dick Stout, the science and Iowa history teacher at Anamosa Middle School who promoted the unusual field trip. "All of them will remember this for the rest of their lives," he said. (*Quad City Times*, March 9, 2006)

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Hale Bridge (Amendment), Jones County, Iowa.

The story of the flying bridge reached the nation. Videographers from The History Channel recorded the event from a chartered Black Hawk helicopter, supplied by Company C, 2nd Battalion, 147th Aviation Unit of Boone, Iowa. The History Channel subsequently broadcast the story on its "Mega Movers" program on June 27, 2006.

POTENTIAL FOR ARCHAEOLOGY

The Office of the State Archaeologist had conducted two Phase I investigations in the area before the Hale Bridge project began. Some areas of interest were found nearby but nothing at the specific site of the bridge. Michael R. Finn of Wapsi Valley Archaeology conducted two Phase I investigations at that specific site. That firm also found nothing of note, the Wapsipinicon River having washed any historic or prehistoric materials from the site with only alluvial deposits remaining. Given these findings, the Hale Bridge project received notice-to-proceed for Section 106 purposes.

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Hale Bridge (Amendment), Jones County, Iowa.

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- Des Moines Register*
2006b "'I've never seen a flying bridge before'." March 9, 2006, p. 6B.
- Des Moines Register*
2006c "No troubles for this bridge." "Roses & Thistles." March 19, 2006, IOP.

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Hale Bridge (Amendment), Jones County, Iowa.

Fraserdesign

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MAPS

United States Geological Survey; Anamosa Quadrangle; 1973.

ORAL HISTORY

Rohr, Rose, with William C. Page, 2006 and 2007. Rohr, who served as Project Director for the Hale Bridge Project, answered questions about planning and implementation of the Hale Bridge relocation.

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Hale Bridge (Amendment), Jones County, Iowa.

VERBAL BOUNDARY DESCRIPTION

The nominated property is a rectangular parcel measuring 17 feet by 296 feet, which is centered on the UTM point listed on page 4 of this nomination. Included within this rectangular parcel are the bridge's superstructure, substructure, approach spans, and floor system. The site is less than one acre.

BOUNDARY JUSTIFICATION

The nominated structure includes the bridge's superstructure, substructure, floor system, approach spans, and the property on which they rest.

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Hale Bridge (Amendment), Jones County, Iowa.

LIST OF PHOTOGRAPHS

1. Hale Bridge (Amendment)
Anamosa, IA 52205
Looking north
William C. Page, Photographer
October 18, 2007
2. Hale Bridge (Amendment)
Anamosa, IA 52205
Looking north
William C. Page, Photographer
October 18, 2007
3. Hale Bridge (Amendment)
Anamosa, IA 52205
Looking east
William C. Page, Photographer
October 18, 2007
4. Hale Bridge (Amendment)
Anamosa, IA 52205
Looking west
William C. Page, Photographer
October 18, 2007
5. Hale Bridge (Amendment)
October 18, 2007
Anamosa, IA 52205
Interior view, deck detail looking northeast
William C. Page, Photographer
October 18, 2007
6. Hale Bridge (Amendment)
Anamosa, IA 52205
Detail of "Trenton NJ" on iron member
William C. Page, Photographer
October 18, 2007