

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 Pugh Ford Bridge
other names/site number Bartholomew County Bridge #73

2. Location

street & number CR 900 North over Flat Rock River N/A not for publication
city or town Taylorsville N/A vicinity
state Indiana code IN county Bartholomew code 005 zip code 47280

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 36CFR 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.)

[Signature]
Signature of certifying official/Title

7-26-99
Date

Indiana Department of Natural Resources

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 the 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:)

5. Classification

Ownership of Property (Check as many boxes as apply)

Category of Property (Check only one box)

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

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

- building, district, site, structure, object

Table with columns: Contributing, Noncontributing, buildings, sites, structures, objects, Total

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

Number of contributing resources previously listed in the National Register

N/A

0

6. Function or Use

Historic Functions (Enter categories from instructions)

Current Functions (Enter categories from instructions)

TRANSPORTATION: Road-Related (vehicular)

TRANSPORTATION: Road-Related (vehicular)

7. Description

Architectural Classification (Enter categories from instructions)

Materials (Enter categories from instructions)

OTHER: Pratt Through Truss

foundation CONCRETE

walls

roof

other METAL: Iron

WOOD

Narrative Description

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

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.

Areas of Significance

(Enter categories from instructions)

ENGINEERING _____
 TRANSPORTATION _____

Period of Significance

1911 _____

Significant Dates

1911 _____

Significant Person

(Complete if Criterion B is marked above)

N/A _____

Cultural Affiliation

N/A _____

Architect/Builder

Rights, William H. _____

Elkhart Bridge and Iron Company _____

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographic 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:

Pugh Ford Bridge
Name of Property

Bartholomew IN
County and State

10. Geographical Data

Acreage of Property less than 1

UTM References

(Place additional UTM references on a continuation sheet.)

1	16	597920	4354200	3			
	Zone	Easting	Northing		Zone	Easting	Northing
2				4			

See continuation sheet

Verbal Boundary Description

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

Boundary Justification

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

11. Form Prepared By

name/title Laura Thayer, James Cooper, Monica Fry, Marc Holma
organization Historic Landmarks Foundation of Indiana date 11/10/98
street & number 340 West Michigan Street telephone 317-639-4534
city or town Indianapolis state IN zip code 46202-3204

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 Bartholomew County Commissioners
street & number 440 Third Street telephone (812)379-1515
city or town Columbus state IN zip code 47201

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.

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National Register of Historic Places Continuation Sheet

Pugh Ford Bridge
Bartholomew County, Indiana

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Narrative Description

The Pugh Ford Bridge is located along Bartholomew County route 900N, approximately six miles north of the county seat, Columbus. It crosses the Flatrock River, which divides German Township to the west, from Flatrock Township on the river's eastern bank. The scattered hardwood vegetation and slightly rolling farmland near the site provide a glimpse into the bridge's historic context. Constructed in 1911, the Pugh Ford Bridge remains an important transportation link for the residents of Bartholomew County.

Fabricated and erected by the Elkhart Bridge and Iron Company in 1911, the Pugh Ford Bridge is a two-span, pinned Pratt through-truss structure. Identical spans measure 128-ft each and contain eight 16-ft panels apiece. The end panels rest on concrete abutments, while a concrete pier rises from the Flatrock River to anchor the spans at the bridge's center. The National Concrete Company of Indianapolis constructed the abutments and pier.

Inclined end posts horizontal and parallel chords placed about 17-ft apart mark the perimeter of the trusses. The end posts and top chords are constructed of a pair of channels with cover plates riveted above and lacing bars and battens below. Pairs of die-forged eyebars provide the bottom chord for each pane. Because the amount of tension varies across the span, eyebars differ from 2 inches at the end panels to 3 inches across the midspan.

The truss webbing is also adjusted for the nature and amount of anticipated stress. The outer or hip vertical of each span consists of a pair of 1.5-in. eyebars, which act as hangers for floor beams. The bridge's inner vertical posts are constructed of two channel beams laced together. To address anticipated compression, the channels in the posts range in width from 8 in. to 6 in. for the outer panels, and 5 in. for the inner ones.

Pratt diagonals are designed for tension with greater stress expected toward the span's ends. On the Pugh Ford Bridge, pairs of die-forged eyebars, ranging from 3.12 to 2.5 and 2 inches (outer to inner), supply the diagonal members. The four most central panels of each span have adjustable rods serving as counter-braces.

Bracing between the trusses helps to stabilize the structure. The upper struts consist of two pairs of laced angles, supplemented with knee-braces made of a pair of angles. For

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Pugh Ford Bridge
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additional protection against stress induced by swaying, rods run diagonally from one truss to the other within the boundaries of parallel panels as upper lateral bracing.

U-bolted to the lower pins, 18-inch deep rolled I-beams provides the floor beams. They in turn support eight longitudinal I-beam stringers that undergird the timber deck. The top lateral bracing is mirrored in the substructure's bottom lateral bracing. Round-rod sway braces run diagonally from one truss to the other within the boundaries of parallel panels below. Each of the rod's threaded ends extend through an opening in the floor beam where plates and nuts allow the rod to be tightened. A latticed guardrail is fastened to the inside of each truss and extends the length of both spans, terminating on the interior side of each inclined end post.

Pairs of angles latticed together with other angles bound the portal struts. A pair of curved angles brace the struts and add a decorative touch. The bridge allows a clearance of 15 ft, 4 in. between the struts and the riding deck. The Pugh Ford Bridge lacks its plaques, although the portal struts at the east and west still carry brackets for the original name plates.

The Pugh Ford Bridge remains in service. Plans are currently underway to restore the bridge for continued use.

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Narrative Statement of Significance

The Pugh Ford Bridge is eligible for inclusion in the National Register of Historic Places under Criterion C for engineering and under Criterion A for transportation. The bridge is important regionally as one of the few surviving spans built by the Elkhart Bridge and Iron Company.

Pugh Ford derives its name from the Irish-born farmer, Francis Pugh, on whose land the shallow water crossing was located. Prior to the construction of a bridge, Pugh Ford provided the northern residents of Flatrock Township convenient access to and from Indianapolis via "the state road" (the predecessor to U.S. 31) or the old Jeffersonville and Indianapolis Railroad.¹ Passage to both was essential for transporting the crops of area farmers to market. Without a proper bridge, however, local citizens were at the seasonal mercy of the flood-prone Flatrock River.

By the dawn of the twentieth century, rising population and commercial requirements aroused local interest in a more reliable alternative. In June 1903, "divers resident freeholders of Flatrock and German Townships" petitioned the Board of County Commissioners to build a bridge across Flatrock River at Pugh Ford on the "public highway" now known as county route 900N.² The petitioners noted that local citizens as well as "others having business therein" already "considerably traveled" the road which ran east and west to and from Pugh Ford.³ The commissioners, however, took no immediate action, allowing the question of a bridge at Pugh Ford to lay dormant for six years.

In early 1909 the commissioners hired William H. Rights to prepare plans and specifications for a "steel truss bridge" at Pugh Ford. Rights was an 1890 graduate of Purdue University with a degree in civil engineering, and served as the Columbus (Indiana) city engineer from 1897 to 1913. He had also worked as the Bartholomew County surveyor through 1907. In April, the commissioners approved Rights' plans for a metal-truss structure and began soliciting bids on the Pugh Ford Bridge among others.

¹ James L Cooper. "County Commissioners Among Engineers and Industrialists, Bartholomew County's Pugh Ford (#73) and New Hope (#133) Bridges." October 1993, p. 3.

² Ibid.

³ Ibid.

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Pugh Ford Bridge
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It is doubtful that county officials were prepared for the "considerable squabble" that arose when bidding for the Pugh Ford and Barbour Lucas bridges opened on 3 May. A local newspaper commented that "nearly every contractor was ready to declare that all other bids but his has some defects."⁴ It is unclear whether the uproar, which caused the commissioners and county attorney to adjourn until they could meet "behind a locked and bolted door",⁵ concerned the Pugh Ford or Barbour Lucas bridges together or separately. What is certain is that when the doors were reopened, county officials awarded the contract for the Pugh Ford Bridge to the National Concrete Company for the construction of reinforced-concrete arches.

The commissioners' decision to bypass Rights' plans for a metal bridge at Pugh Ford in favor of a Daniel B. Luten designed concrete span outraged the City Engineer. The National Concrete Company submitted the lowest bid for the project (\$7,550 plus piling, if needed).⁶ Rights, however, was contemptuous of the proposed building material. He vigorously "protested against the construction of a concrete bridge over the ford and declared to the commissioners that if such a bridge was constructed it would wash out."⁷ Rights' motivation for condemning the commissioners' decision is uncertain. His conclusions may have reflected his training at Purdue University before Luten and others who promoted the use of concrete had joined the civil Iron Works—one of Columbus' largest industrial employers—in his endorsement of metal spans. Whatever Rights' reasons, and despite his objections, construction began on a concrete bridge at Pugh Ford in late-spring, 1909.

When completed in the summer of 1909, the Pugh Ford Bridge consisted as planned of a 90-foot, symmetrical center span flanked on each end by a 75-foot, unsymmetrical one. The arch pattern and its reinforcement followed Luten's patented designs. The substructure, however, was not built to specifications. The county commissioners apparently preferred to carry the concrete piers to a greater depth than Luten had suggested rather than build the pile foundations noted in the original plans. This modification would soon prove disastrous.

The torrential rains of February 1910 quickly raised the waters of the Bartholomew County streams over their banks. At 11 a.m. on the twenty-fifth, the two west spans of the

⁴ Ibid.

⁵ Ibid.

⁶ Ibid., p.4.

⁷ Ibid.

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Pugh Ford Bridge
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Pugh Ford Bridge “went out without a crash”⁸ as a witness later remembered. Believing that the bridge was guaranteed for a year, county commissioners notified the National Concrete Company demanding compensation. Within a week of the accident Daniel Luten traveled to Columbus to inspect the site. He remarked “that he did not see how the bridge could be washed out with the amount of piling that the specifications provided.”⁹ When Luten was informed that the bridge has no piling, he said, “there was no wonder it washed out.”¹⁰ Bartholomew County officials saw otherwise and expected a replacement without cost. The president of National Concrete Company refused, and the two sides went to court.

The washout and ensuing court battle aroused considerable national attention. Luten was a nationally known concrete bridge designer over a hundred of whose structures already dotted the country from California to Massachusetts. Engineering News, the most prestigious publication among engineers nationally, sent a member of its editorial staff to Bartholomew County to assess the causes of the bridge’s collapse. The editor concluded that changes in the original design caused, in great part, the failure of the bridge. This authoritative opinion did considerable damage to Bartholomew County’s case, and the commissioners opted for an out-of-court settlement, which favored the National Concrete Company.

When the time came to replace the concrete spans, the county commissioners revisited Rights’ original plan for a steel-truss bridge and accepted it in slightly amended form. In April 1911, contracts were awarded to the Elkhart Bridge Company for the two-span steel superstructure, and to the National Concrete Company for the abutments and pier.

After the results of their recent dealings with the National Concrete Company, the commissioners were taking no chances. They appointed a superintendent, Ralph Gosch, to monitor the bridge’s construction. Even when Gosch reported to the commissioners that the National Concrete Company had completed the abutments and pier “better and stronger”¹¹ than the specifications had called for, the skeptical officials sent engineer Henry C. Deist to verify the claim. Only after Deist reported “that the pier has been built better than the plans called for and that some steel was placed in the abutments when no

⁸ Ibid.

⁹ Ibid., p. 5.

¹⁰ Ibid.

¹¹ Ibid., p. 7.

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steel was specified" did the commissioners authorize payment of the contract amount of \$1,050 to the National Concrete Company.¹²

The Elkhart Bridge and Iron Company was a major bridge builder across the Midwest by the time it fabricated and erected the two steel-truss span at Pugh Ford in 1911. The company's success was in large part due to Frank Brumbaugh, who signed a contract for EB&I with the Bartholomew County commissioners. Brumbaugh had gained his early experience with the Canton Bridge Company in Ohio at the age of twenty-one. He expanded his experiences greatly as agent for the Bellefontaine Bridge Company across northeastern Indiana. In 1901 Brumbaugh played a key role in the organization of the Elkhart Bridge and Iron Company. By 1910, Brumbaugh's Elkhart Bridge company employed one hundred and twenty-five, annually riveted 4,000 tons of rolled steel, and earned \$40,000 annually in a plant which covered 17,300 square feet.

The bridge at Pugh Ford was completed in late-summer 1911 at a cost of \$1,050 to the National Concrete Company and \$3,400 to the Elkhart Bridge and Iron Company. Today, the standard and solid design of the Pugh Ford span bears witness to the quality of Hoosier steel bridge design and building, as well as to solidly constructed reinforced-concrete substructures.

The Pugh Ford Bridge is an increasingly rare example of a heritage resource. Dr. James L. Cooper identified twenty-seven existing iron bridges in Bartholomew County in his 1987 book Iron Monuments to Distant Posterity: Indiana's Metal Bridges, 1870-1930. Six years later, Dr. Cooper noted that number had already shrunk by almost two-thirds to twelve.

The significance of the Pugh Ford Bridge has been generally recognized. It was listed as "Outstanding" and worthy of listing in the National Register of Historic Places in the Bartholomew County Interim Report. Dr. Cooper echoes this sentiment in his paper "County Commissioners Among Engineers and Industrialist, Bartholomew County's Pugh Ford (#73) and New Hope (#133) Bridges" (October 1993) in which he describes the two spans as "culturally significant and worthy of being recorded in the National Register of Historic Places."

¹² Ibid.

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Pugh Ford Bridge
Bartholomew County, Indiana

Bibliography

Bartholomew County Interim Report. Indianapolis, Indiana: Historic Landmarks
Foundation of Indiana, 1980.

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October 1993.

Cooper, James L. Iron Monuments to Distant Prosperity: Indiana's Metal Bridges, 1870-
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Verbal Boundary Description

The Pugh Ford Bridge over the Flatrock River, located on the border of German and Flatrock townships, Bartholomew County, Indiana, NE $\frac{1}{4}$ of NW $\frac{1}{4}$ of NW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 9 T10N R6E. The boundary includes the bridge itself, its historic abutments, and an area 15 feet in length and as wide as the portals in front of the edge of the bridge structure which contains the approaches on either side.

Boundary Justification

The boundary includes the steel truss structure and its historic abutments.