

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

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SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 89002178

Date Listed: 1/4/90

Walnut Creek Bridge
Property Name

Barton
County

KS
State

Metal Truss Bridges in Kansas 1861--1939 MPS
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Beth Boland
Signature of the Keeper

1/4/90
Date of Action

=====
Amended Items in Nomination:

Item #7, Description: Materials are 1) Metal" wrought iron; and 2) Wood.

Item #8, Significance: The applicable area of significance is engineering only.

DISTRIBUTION:

- National Register property file
- Nominating Authority (without nomination attachment)

2178

United States Department of the Interior National Park Service

National Register of Historic Places Registration Form

NOV 28 1989

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in Guidelines for Completing National Register Forms (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Walnut Creek Bridge other names/site number Walnut Creek Bridge

2. Location 5 miles west and 5 miles north of Heizer

street & number on unimproved, unmarked county road not for publication city, town Heizer vicinity state Kansas code KS county Barton code 9 zip code none

3. Classification

Table with 3 columns: Ownership of Property, Category of Property, and Number of Resources within Property. Includes checkboxes for private/public ownership and building/site/structure/object categories. Total contributing resources: 1.

Name of related multiple property listing: Metal truss bridges in Kansas Number of contributing resources previously listed in the National Register 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, 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. See continuation sheet. Signature of certifying official: Ramon Powers Date: Nov. 16, 1989

In my opinion, the property meets does not meet the National Register criteria. See continuation sheet. Signature of commenting or other official Date State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is: entered in the National Register. determined eligible for the National Register. determined not eligible for the National Register. removed from the National Register. other, (explain:)

Signature of the Keeper: Beth Bolard Date of Action: 1/4/90

6. Function or Use

Historic Functions (enter categories from instructions)

Transportation: Road related (vehicular): Bridge

Current Functions (enter categories from instructions)

Transportation: Road related
(vehicular): Bridge**7. Description**

Architectural Classification

(enter categories from instructions)

Other: Pratt Through Truss

Materials (enter categories from instructions)

foundation

walls

roof

other

Metal: wrought iron

Describe present and historic physical appearance.

The Walnut Creek bridge, erected in 1887, is a pin connected Pratt through truss. The single span is 115' long and 16' wide. The wood deck is situated 21' above the water level. The bridge is located on a slight bend in the road and sits on a slight northeast-southwest alignment. This is often true with early bridges as this misalignment allowed a right angle approach to the river and a saving in money in both bridge length and amount of fill required.

The members of a truss bridge are designated either as chord members or web members. Chord members are those mainly defining the outlines of the structure and they are termed lower or upper chord members depending on whether they are found at the bottom or the top of the structure. Members between the chords are web members. They are called posts or ties if they sustain compression or tension respectively. In the instance of the Walnut Creek bridge, as with all Pratt trusses, the web members are alternately vertical and inclined. The inclined members are in tension and the verticals in compression.

The inclined end posts and top chord of the Walnut Creek bridge are fabricated from sections of channel iron, tied together by single bar lacing. The girders thus formed are topped with an iron cover plate. Hip verticals consist of a wrought iron round rod with an eye loop at the end which enables its connection with the panel pin. The compression posts are made up of single bar lacing and channel pieces. The portal bracing is fabricated from angle stock and forms an interlocking triangle design. Individual components are fabricated of stock angles and straps by being riveted together. The main members of the bridge, however, are connected at panel points by the use of a pin. An extremely ornate cast iron builders plaque adorns the south portal.

The bridge has not been altered and retains a high degree of its structural integrity.

 See continuation sheet

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

nationally statewide locally

Applicable National Register Criteria A B C D

Criteria Considerations (Exceptions) A B C D E F G

Areas of Significance (enter categories from instructions)

Engineering
Transportation

Period of Significance

1887
1887

Significant Dates

1887
1887

Cultural Affiliation

n/a

Significant Person

n/a

Architect/Builder

P.E. Lane Bridge & Iron Works

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The great evolution of truss bridge construction began in the United States soon after the publication of Squire Whipple's historic work on stresses in 1840. Prior to this the design work was essentially that of trial and error, experience and judgement. The Warren and Pratt trusses were rational designs and lent themselves readily to the system of analyses postulated by Whipple. They were therefore readily and rapidly accepted and formed the foundation for a greater part of American truss design.

The basic Pratt truss was patented in 1844 by Thomas and Caleb Pratt and the Warren, a design patented by two British engineers in 1848, demonstrated their versatility, durability, and most important for the west, cost effectiveness.

In the Pratt design the diagonals were placed in tension and vertical members in compression, with the exception of the hip verticals. Generally, until the 20th century, all panel point connections were made with the use of a pin. This became such a widespread practice that it became one of the distinctive features of United States bridge construction. The pin was selected for several reasons. It was simple in design and it was much easier for period engineers to calculate stress at the panel points and throughout the structure than if the members were connected by the use of rivets. Although the riveted structure was much more rigid, the inability to insure that the individual rivets had not been damaged during insertion made early failure an unknown quantity. It was extremely difficult to calculate the stress throughout the joint. The pin could be considered basically as a single rivet.

Time was always a consideration in American construction. Logically labor costs would be less if the bridge went in quickly but also the falsework in the river would not have to be in place long. Flash floods were the bane of any bridge contractor. The pin connected bridge could be

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put up more quickly and the use of less skilled employees. The portable pneumatic riveter was also in its infancy in the 1890s and without it, erection of totally riveted bridges was almost impossible. It was much easier to have the bridge members fabricated and riveted in a shop setting and pin them together on the job site.

The use of wrought iron in bridge construction was popular in 1887. By 1910 it was almost entirely replaced by steel.

Out of approximately 262 Pratt through trusses only one has been identified as having been built by P. E. Lane.

Bids were opened May 23, 1887 for four iron bridges in Barton county. The Walnut Creek bridge was one of these four. C. R. Lane of Topeka was given the Walnut Creek bridge contract for the sum of \$3,700. The remaining three were given to Kansas City Bridge and Iron for the sum of \$2,730. Construction went smoothly and by early fall the Walnut Creek bridge was completed.

C. R. Lane was the manager of the Lane Bridge and Iron Works office in Topeka, Kansas. Originally located in the "Office Block" at 5th and Quincy, he would later move his headquarters to 621 Kansas Avenue. P. E. Lane, company owner, directed the operation of the company from the general office at 177 LaSalle Street in Chicago. The bridge works was located at 57th Street and Stewart Avenue in Chicago. In addition to Topeka, branch offices were also located in Denver and Fort Worth, Texas.

The company offered a full line of iron work. In addition to bridges, viaducts, and substructures for railroads and highways they could provide architectural, ornamental and structural steel and iron work of every description. Even modern prison work for jails, station houses and lock ups was available upon demand. The structural iron work for the library and central portion of the Kansas State House was provided by Lane.

The company first appears in the Topeka city directories in 1887, and disappears with the 1894 issue. Evidence suggests that the Chicago office was open until 1896 and the Denver one until 1898.

The firm's illustrated catalog for 1889 indicates there were at least 42 Lane bridges in Kansas at the time. The Walnut Creek bridge is presently the only documented remnant in the state.

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The Kansas Department of Transportation (KDOT) carried out a statewide inventory of historic bridges between 1980 and 1983. The bridges to be included were identified through computer printouts developed by KDOT, from information supplied by the counties (since almost all of the historic bridges were located on secondary rather than the primary road system), and by direct observation by field personnel. All bridges were inspected by KDOT personnel to verify the data on file. That information was jointly evaluated by representatives of KDOT, Kansas State Historical Society, and the State Historic Preservation Officer.

Each structure was evaluated using a points rating system adapted from the points evaluation rating developed by the Ohio Department of Transportation and Ohio Historic Preservation Office. Consideration was given to areas such as age, builder, number of spans, length, special features, history, integrity, surviving numbers, and preservation potential.

In many instances there is little information about individual structures. Often bridge plaques which may have contained information have been removed, or the county's records are not complete or have been destroyed. Due to the large numbers of similar structures there is often little to choose from in differentiating among individual bridges other than condition and the likelihood of preservation.

The purpose of the KDOT study and subsequent evaluation was to identify a representative selection of bridges of each class. Through this approach KDOT and KSHS hope to preserve for posterity some examples of each type.

The Walnut Creek Bridge was rated quite high in significance because of its age (it is one of the oldest Pratt's remaining in the state) because it was the work of a known prolific out-of-state builder, retained a good degree of its integrity and possesses a fair bypass potential.

9. Major Bibliographical References

Topeka City Directory, 1887-1894.

P.E. Lane, Illustrated Catalog: 1889, Lane Bridge and Iron Works, N.p. Chicago, Illinois.

Victor Darnell, A Directory of American Bridge Building Companies 1840-1900, Washington, D.C.: Society of Industrial Archeology, 1984..

"Notice of Bridge Letting," Great Bend Tribune, April 29, 1887, p. 1, c. 2.

"Notice To Contractors," Great Bend Barton County Democrat, June 23, 1887, p. 4, c. 5.

"County Commissioner's Proceedings," Great Bend Register, June 2, 1887, p. 2, c. 4.

Victor C. Darnell, American Bridge Building Companies, Washington, DC: Society for Industrial Archeology Occasional Publication 4, 1984.

"Eight New Bridges," Belleville Freeman, May 4, 1899, p. 4. c. 3.

David Weitzman, Traces of the Past: A Field Guide to Industrial Archeology, New York: Charles Saibner's Sons, 1980.

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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

Specify repository:

Kansas State Historical Society

10. Geographical Data

Acreeage of property less than 1 acre

UTM References

A 1 4 5 0 9 2 2 1 0 4 2 5 3 5 1 1 0
Zone Easting Northing

C

B
Zone Easting Northing

D

See continuation sheet

Verbal Boundary Description

The nominated property is located on the NW $\frac{1}{4}$, SW $\frac{1}{4}$, NW $\frac{1}{4}$, NE $\frac{1}{4}$, section 5, township 18 south, range 14 west, on a tract measuring 115' x 16' whose northeast corner is represented by the northeast corner of the bridge. Beginning at the northeast corner the boundary proceeds 115' southwest, 16' northwest, 115' northeast, and 16' southeast to the point of beginning.

See continuation sheet

Boundary Justification

The boundary includes only that area that is historically associated with the nominated property.

See continuation sheet

11. Form Prepared By

name/title Larry Jochims

organization Kansas State Historical Society date September 20, 1989

street & number 120 W 10th telephone (913) 296-3251

city or town Topeka state Kansas zip code 66612