NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

177-0000-0125

National Register of Historic Places Registration Form

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 Thomas Arch Bridge
other names/site number Waveland Bridge

2. Location

street & number SW¼, NW¼, NW¼, SW¼, S33, T13S, R15E ☐ not for publication
city, town Auburn ☒ vicinity
state Kansas code KS county Shawnee code 177 zip code 66402

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
☐ private	☐ building(s)		buildings
☒ public-local	☐ district		sites
☐ public-State	☐ site	1	structures
☐ public-Federal	☒ structure		objects
	☐ object	1	Total

Name of related multiple property listing:
Masonry Arch Bridges of 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 — April 2, 1990 (Date)

State Historic Preservation Officer, Kansas State Historical Society
State or Federal agency and bureau

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.
☐ 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:) _____

Signature of the Keeper — Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)

Trasportation: Road related

(Vehicular): Bridge

Current Functions (enter categories from instructions)

Transportation: Road related

(Vehicular): Bridge

7. Description

Architectural Classification
(enter categories from instructions)

Other: Masonry Arch

Materials (enter categories from instructions)

foundation

walls

roof

other Concrete

Describe present and historic physical appearance.

The Thomas Arch Bridge (c. 1916) spans the Wakarusa River on the SW 1/4, NW 1/4, NW 1/4, SW 1/4, S. 33, T. 13S, R. 15E at Wanamaker Road and 105th Street in Auburn Township in southern Shawnee County, Kansas. The structure is an example of a reinforced concrete, triple hinged, open spandrel bridge. The bridge spans the river with a northeast to southwest orientation. The northern paved approach curves to meet the bridge, allowing a span that is perpendicular to the waterway. Wanamaker Road is paved when it crosses the bridge but becomes a gravel road just south of the bridge. The Thomas Arch Bridge serves a still very rural part of Shawnee County.

The Thomas Arch Bridge measures 113' 1" from out and out on the west side and 112' 6" from out and out on the east side, its skewed dimensions making it somewhat unusual. The bridge measures 16' 1" from curb to curb. A classical balustrade is located on both sides of the floor line, measuring 2' 5 1/2" high and 1' 3 1/2" wide. The distance from the deck to the base of the supporting piers is 16' 7". The distance from the base of apex of the arch to the water is 18' 6".

The bridge consists of concrete piers featuring hinges on each side. Each hinge is a concave seat with raised flanges at each end. Arch ribs, made up of two arch beams each, feature pivot plates that fit into the concave seat are are kept in place with flanges. The arch ribs have crown hinges that are fabricated from convex plates. These plates are ribbed on the site and the connections are recessed. They also feature longitudinal webs and transverse side plates and are secured using U-bolts. The spandrel section consists of the spandrel arches, the spandrel posts and shouldered cross beams. These cross beams have upwardly extending portions which extend the cut away portion. The spandrel posts rest on the arch beams and are attached by tie bolts that have been embedded in the beams and posts, the shouldered cross members between the arch beams are similarily attached by the use of imbedded bolts. The roadway is cantilevered slightly over the arch ribs. The bridge springs from concrete abutments.

The main components of the superstructure of a concrete bridge, the concrete floorbeams, the ribs and the arch, are all dependent on the deck's overall condition. If the deck is in good condition the superstructure components are likely to be in good condition. It is critical that the drainage system operate properly, otherwise accelerated deterioration of the deck, sidewalk, and parapets can occur.

☐ See continuation sheet

By the early twentieth century reinforced concrete was well established as one of the preferred materials for highway and rail bridges.

Open spandrel arch construction was gènerally cheaper if the arch was large and semi-circular, as it reduced the load on the foundations. The loads on the arch rings with open cross spandrel chambers or arcades are concentrated loads. Open spandrel construction also prevented water from collecting and soaking into the arch masonry. By building open chambers crosswise and having the openings appears on the spandrel faces, the design presented a lighter appearance and at the same time plainly showed the plan of construction.

The patent for the Thomas Arch reinforced concrete bridge was issued on Tuesday, December 8, 1914 to William M. Thomas. The patent number was 1,120,104. The patent details a concrete bridge that is made up of piers featuring hinges on each side. Each hinge is a concave seat with raised flanges at each end. Arch ribs, made up of two arch beams each, feature pivot plates that fit into the concave seat and are kept in place with flanges. The arch ribs have crown hinges that are fabricated from convex plates. These plates are ribbed on the site and the connections are recessed. They also feature longitudinal webs and transverse side plates and are secured using U-bolts. The spandrel section consists of the spandrel arches, the spandrel posts and shouldered cross beams. These cross beams have upwardly extending portions that allow it to be attached to the spandrel post and downwardly extending portions which extend the cut away portion. The spandrel posts rest on the arch beams and are attached by tie bolts that have been embedded in the beams and posts, the shouldered cross members between the arch beams are similarily attached by the use of imbedded bolts.

In May, 1916 the Shawnee County Commissioners let contracts for five new bridges in the county. Allen and Fulton of Topeka submitted a plan for a Thomas Arch, reinforced concrete bridge over the Wakarusa between Williamsport and Auburn Townships in the Waveland community. Allen and Fulton's bid of $10,141 came in low against Midland Bridge Co. of Kansas City, Missouri and Topeka Bridge and Iron. A bond was required from the contractor for the county's protection against patent litigation in connection with the use of plans for the new Waveland bridge.

Arthur Elmer Allen (1870- ?) of Topeka was a general contractor. In 1909 he formed a partnership with Henry Bennett, under the name of Bennett and Allen. The firm was responsible for Topeka's Santa Fe Office Building, Grace Cathedral and Dillon residence.

Work on the Waveland bridge began in October, 1916. The crossing was

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)	Period of Significance	Significant Dates
Engineering	c. 1916	c. 1916

Cultural Affiliation: N/A

Significant Person: N/A

Architect/Builder: Thomas, Williams M.; Allen and Fulton

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

The Thomas Arch Bridge (c. 1916) is being nominated to the National Register under criterion C for its architectural significance as reinforced concrete, triple hinged, open spandrel arched bridge and is to be included in the "Masonry Arch Bridges of Kansas" thematic resources nomination. This is Kansas' only known example of triple hinged, reinforced concrete construction.

The Thomas Arch Bridge spans the Wakarusa River at Wanamaker Road and 105th Street, near the Osage County line. This is a very rural area of Shawnee County. Wanamaker Road is paved when it crosses the bridge but becomes a gravel road just south of the bridge.

Arch bridges made of reinforced concrete had many advantages over masonry arches. Stone bridges were generally constructed with arches following a semi-circular, or segmental curve. These forms necessarily limited the span length. Stone bridges having a low rise to span ratio were extremely rare, but reinforced concrete lent itself to a low rise to span ratio, and this allowed for longer span length. In addition, concrete bridges generally required less handwork during the erection than stone arch bridges, which decreased their cost and construction time.

Many claims were made for concrete and the positive aspects of its use in bridge building. It was said to be a permanent material, far more durable than stone, and one which actually increased in strength with age. A concrete bridge was said to be frostproof, fireproof, and floodproof. The concrete, it was thought, would permanently protect the steel.

Concrete was first used in the mid-nineteenth century as a monolithic masonry without metal reinforcement, commonly called plain concrete. By itself, concrete can work only in compression, but if reinforced with iron or steel bars, the elastic metal will take the tensile stresses. Reinforcing schemes of varying shapes and types were introduced in the late nineteenth century. Because of the plasticity of concrete, various architectural and aesthetic designs can be incorporated into these bridges.

☒ See continuation sheet

closed and people forded the Wakarusa at Mr. McGowan's place. In November carpenters began putting up forms for the concrete work of the south abutment of the new bridge. By December, 1916 the bridge gang was working overtime, removing the forms from the abutment on the north side of the bridge and beginning cement work on the south side. Worked stopped on the bridge for the winter and resumed in March, 1917 with the pouring of the cement floor and the construction of the forms for the balusters. The May 25, 1917 issue of the Shawnee Chief wrote that "the township began the work of grading up the Waveland bridge last week. After having to ford the Wakarusa at this place for two years, the people of this neighborhood will particularly appreciate the new bridge."

Douglass Wallace and Roy Bird write of Waveland in Witness of the Times:

> For a time Waveland was the only settlement between Pauline and Burlingame. As such, it had aspirations of being the trade center for southern Shawnee County...When the Atchison, Topeka, and Santa Fe was built south to Burlingame it went through Wakarusa rather than Waveland. A railroad was essential to a 19th century village, and the lack of one marked the end of Waveland's aspirations.

The Thomas Arch Bridge is significant for its type and location in the Waveland community. The bridge retains a high degree of integrity and maintains one of the highest structural ratings among older bridges in Shawnee County. National Register listing of the bridge is being sought to preserve the bridge. Over 500 local residents have signed a petition in support of the bridge's preservation and continued active use. One landowner that would be directly affected if a new bridge were constructed said, "What they would do to my property, it wouldn't be my home anymore."

9. Major Bibliographical Referenc

Shawnee Chief, 12 May 1916; 13 October 1916; 20 October 1916; 17 November 1916; 24 November 1916; 8 December 1916; 23 March 1917; 27 April 1917; 4 May 1917; 25 May 1917.

Shawnee County, Kansas Commission Journal "P". (Shawnee County, Kansas County Clerk's Office). 8 May 1916; 9 June 1916; 11 August 1916; 18 August 1916; 8 September 1916; 9 September 1916; 15 September 1916.

Topeka Daily Capital, 9 September 1916.

United States Patent Office. The Official Gazette of the United States Patent Office, Containing the Patents, Trade-Marks, Designs, and Labels. (Washington: Government Printing Office, 8 December 1914).

Wallace, Douglass W. and Bird, Roy D.: Witness of the Times: A History of Shawnee County, (Topeka: Shawnee County Historical Society, 1976).

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:

- [X] State historic preservation office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Specify repository: Kansas State Historical Society

10. Geographical Data

Acreage of property Less than 1 acre

UTM References

	Zone	Easting	Northing
A	15	260445	4306325
B			
C			
D			

- [ ] See continuation sheet

Verbal Boundary Description The nominated property is located on the SW¼, NW¼, NW¼, SW¼, S33, T13S, R15E in Auburn Township, Shawnee County, Kansas on a tract measuring 113'1" x 16'1" whose northeast corner is represented by the northeast corner of the bridge. Beginning at the northeast corner of the bridge the boundary proceeds 113'1" to the southwest, 16'1" to the northwest, 113'1" to the northeast, and 16'1" to the southeast.

- [ ] See continuation sheet

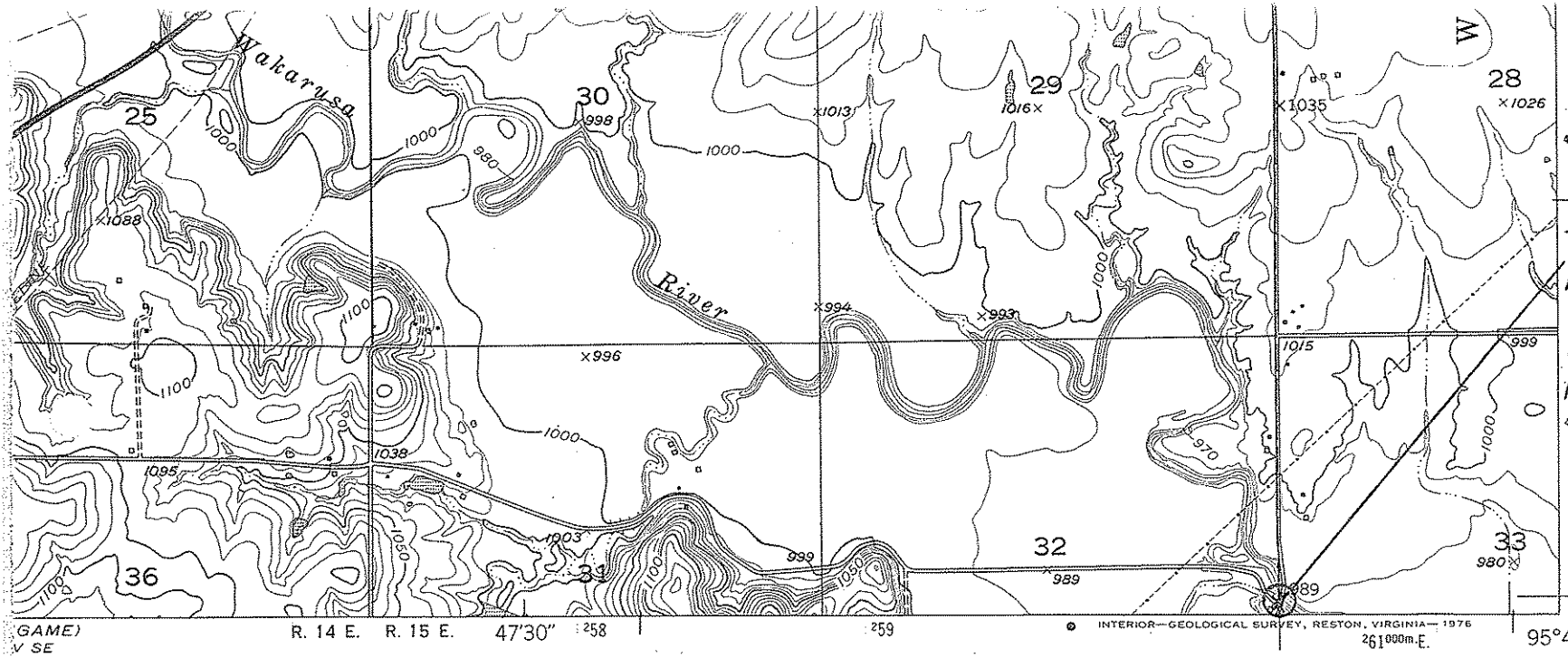
Boundary Justification

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

- [ ] See continuation sheet

11. Form Prepared By

name/title Martha Hagedorn-Krass, Architectural Historian
organization Kansas State Historical Society date March 30, 1990
street & number 120 W. 10th telephone 913-296-5264
city or town Topeka state Kansas zip code 66612



THOMAS ARCH BRIDGE
AUBURN TOWNSHIP
AUBURN QUAD
UTM COORDINATES
15 260445
4306325

(GAME)
V SE
:24 000

1 MILE
0 4000 5000 6000 7000 FEET
1 KILOMETRE

RVAL 10 FEET
RTICAL DATUM OF 1929

NAL MAP ACCURACY STANDARDS
COLORADO 80225, OR RESTON, VIRGINIA 22092
EY, LAWRENCE, KANSAS 66044
AND SYMBOLS IS AVAILABLE ON REQUEST

KANSAS
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty	4 LANE | 6 LANE	Light-duty
Medium-duty	4 LANE | 6 LANE	Unimproved dirt

U. S. Route State Route
Interstate Route

(CARBONDALE)
6861 I SW

AUBURN, KANS.

N3852.5—W9545/7.5

1952

PHOTOREVISED 1970 AND 1975

AMS 6861 IV NE—SERIES V878