Cloud Creek Bridge
Structure #51E0930N4140009
Northeast of Boynton
Muskogee County
Oklahoma

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

Oklahoma State Historic Preservation Office
Oklahoma Historical Society
Oklahoma History Center, 800 Nazih Zuhdi Dr.
Oklahoma City, Oklahoma 73105

DOCUMENTATION
BRIDGE #51E0930N4140009

I. INTRODUCTION

Location:	Spans Cloud Creek on section line road EW-93 approximately 1 mile northeast of Boynton. (Township 14N, Range 16E, on the section line between sections 20 and 29). UTM: Zone 15, 3950110N, 262380E
Map Reference:	U.S.G.S. 7.5' series, *BOYNTON, OKLA.* (1971)
Date of Construction:	1911
Present Owner:	Silver Spur Construction
Present Use:	Relocated from section line road EW-93 and put to use at a new site by Silver Spur Construction
Significance:	The Cloud Creek Warren with polygonal top chord pony truss is significant because of its construction by the Vincennes Bridge Company, an important builder; because it is a rare bridge design; and because it is a good example of the development of the transportation system in Muskogee County.
Preparer:	Anna Marie Eddings, Historian/ Architectural Historian, Oklahoma Department of Transportation Cultural Resources Program, November 3, 2011

II. HISTORICAL SUMMARY

Bridges can be significant because they represent the evolution of the transportation system in a given area, and by extension they represent the social and commercial patterns which shaped that system. Muskogee County is part of the Creek Nation in the former Indian Territory, which was sparsely settled in the years after the Civil War. Roads were only trails that were often winding, detouring around the inhabitants' fenced enclosures, and were haphazardly maintained under a law that required all men to spend four days a year working on the roads, supervised by a foreman. Numerous remote small towns or trading centers served the local citizenry. In the area where the Cloud Creek Bridge would later be located was Wellington, one of these small towns. It was the location of the district court, a store, and a stage stop on the line from Muskogee to Okmulgee. It acquired a post office on 3 June 1890, and its name changed to Lee on 22 July 1892, for David A. Lee, judge of the court and postmaster. As was happening throughout the Indian Territory, in the Creek Nation the process of allotting the Indians' land and the expansion of the railroads brought many more non-Indian residents, and led to the formation of new towns that were larger than the older settlements. In 1902-1903, the Shawnee, Oklahoma and Missouri Coal and Railway Company (later acquired by the Saint Louis-San Francisco Railway Company) built forty miles of track from Okmulgee to Muskogee. Townsite promoters selected a site on the rail line approximately three miles southeast of Lee for the new town of Boynton, named after E. W. Boynton, chief engineer of the Shawnee, Oklahoma and Missouri Coal and Railway Company. The Boynton post office was established on 10 September 1902, and by 1903 the town included a school and soon it had two banks, a weekly newspaper, grain elevators, and numerous retail establishments. Boynton had eclipsed Lee, although the Lee post office continued in operation until 1911.[i]

It was during these early years, while Oklahoma's population expansion and urban growth necessitated transportation improvements, that the state benefitted from the nation's numerous bridge-building companies that had already reached their high point of productivity. Standard metal truss bridge types, their assembly in a fabrication shop, and quick on-site construction led to the development of large bridge-building companies. These standardized bridge designs, often marketed through a company's catalog, made up the majority of truss bridges sold. Generally, steel manufacturers mass produced the bridge components such as rolled beams, plates, bars, and rods. The bridge companies would buy and use these parts to construct the bridge by means of separate departments such as drafting, forging, and the riveting or truss shop where the bulk of the work was done, readying a bridge for on-site assembly.[ii]

The Vincennes Bridge Company was founded in 1899 by John Oliphant in Vincennes, Indiana, during a time of industrial expansion for this state. Indiana bridge builders of this era fit the

pattern described above in that they focused on standardized bridge designs in a variety of lengths, specializing in efficient fabrication and quick to adopt new manufacturing techniques. By 1911, the Vincennes Bridge Company had constructed over 2,000 miles of bridges, and its annual production grew to 1,200 spans. Like other bridge companies, Vincennes sought markets outside of the very competitive Midwest by aggressively marketing their bridges in distant locales such as Oklahoma by means of branch offices or local agents. For example, Vincennes had an agent in Muskogee named E. B. Martindale.[iii]

Oklahoma's expansion came not only concurrent with the rise of bridge building companies, but also concurrent with the growth of the national good roads movement, which sought to improve the country's roads that were on average poorly-maintained and sometimes impassable. In the 1890s into the early 1900s, there was a National Good Roads Association headquartered at Saint Louis, Missouri, while in 1908, the Democratic Party made good roads a part of their platform. In 1904, the first Oklahoma territorial good roads convention met at Guthrie and organized the Oklahoma-Indian Territory Good Roads Association. Local good roads associations increased as well. In 1910, the Muskogee County Commissioners proposed a $150,000 bond issue to fund bridge construction throughout the county, and Muskogee businessmen formed the Muskogee Good Roads Association to campaign for its passage. The letters that this association mailed to county taxpayers used the typical arguments of the good roads movement–that improved roads making it easier for farmers to bring crops to market and patronize a town's merchants benefitted everyone. Naturally, the Muskogee Retailers' Association supported the bond issue as well. Although the bond issue carried in the election of November 22, 1910, controversy seems to have followed because it was reported immediately after the election that some planned to test its legality because of the way that precinct election officers were selected.[iv]

Some contention continued to attend the bridge construction program, which included the Cloud Creek Bridge, that this bond issue funded. Although the Muskogee County Commissioners advertised for bids for the thirty-three bridges included in the bond, their meeting of 29 December 1910 records that they were restrained from letting the contracts. Then in January of 1911they awarded the contracts to the Vincennes Bridge Company and the Missouri Valley Bridge and Iron Company, but several weeks later canceled the contracts. Finally, at their meeting on 29 March 1911, the commissioners voted to re-advertise these bridges for bids, and on 3 May 1911, awarded these contracts to the Vincennes Bridge Company and the Midland Bridge Company. The Cloud Creek Bridge was designated as bridge #34, and it was among those awarded to Vincennes at a contract price of $2,515. They awarded this contract despite the dissenting vote of one of the three commissioners. According to the meeting minutes, he felt "the record of the Vincennes Company was such he could not consent to the awarding of the contract to them."[v]

The town of Boynton had added a cotton gin and the Francis Vitrified Brick Company brick plant by 1911; moreover, the Cloud Creek Bridge, to be located approximately one mile northeast of the town, would soon be of benefit in improving its transportation links and helping foster its growth. On 25 August 1911, the local newspaper *Boynton Index* reported that commissioner W. T. Cole was responsible for the construction of "some substantial bridges" north of town, and that the roads were also graded and in good condition north to Haskell. This newspaper specifically mentioned the Cloud Creek Bridge's construction on 6 October 1911, in a news item reporting that John Charlie from Vincennes, Indiana was erecting a bridge over Cloud Creek northeast of town for the Vincennes Bridge Company.[vi]

The Cloud Creek Bridge follows the Warren with polygonal (curved) top chord design, which is relatively rare and demonstrates the ingenuity of bridge-building companies such as Vincennes. Bridge designers developed a variety of truss types, attempting to make bridges that were affordable and efficient in their use of metal, but still strong and durable. In this process, designs that didn't work effectively gradually fell out of use, and those that did work became more common. In a standard Warren (or Warren with verticals) pony truss, the top chord is flat, and diagonal beams form a "W" pattern. The diagonals carry both compressive (pushed together) and tensile (pulled apart) forces. The Warren with verticals design became one of the most basic and common bridge types, in Oklahoma especially. However, Warrens with polygonal top chords are relatively rare–the 2007 Oklahoma Historic Bridge Survey identified only ten bridges of this type out of a total of 1,061 truss and arch bridges documented in the state. The polygonal top chord feature was applied more often to the Pratt (diagonals in tension, verticals in compression) design. Because a truss bridge's stresses are greater at mid-span than at the ends, a curved top chord allowed for more depth (that is, taller verticals and diagonals) at the center of the truss where stresses were highest, and less depth (that is, shorter verticals and diagonals) at the ends of a truss where the stresses were lighter and the extra metal was not needed. Thus, polygonal top chord bridges brought about a reduction in weight compared to flat top chord bridges, which made the curved top chord design favorable for longer spans. The Cloud Creek Bridge, with its eighty-foot length, is longer than flat top chord, Warren with verticals pony trusses of the same era generally were. More specifically, it is longer than other flat top chord, Warren with verticals pony trusses that the Vincennes Bridge Company was building in Muskogee County around this time.[vii]

III. DESCRIPTION

The Cloud Creek Bridge is a single-span Warren with polygonal top chord pony truss that is 80 feet long and 14.5 feet wide. It has a timber deck, and riveted connections. A pony truss is a truss bridge which has no bracing over the top of the roadway. In describing metal truss bridges, the topmost beam of the truss is called the top chord, the bottom beam is called the bottom chord, and linking the top and bottom chords are vertical and diagonal beams. Following is a description of the truss members of the Cloud Creek Bridge:

Top Chord: Pair of C-beams with a riveted top plate and zig-zag lacing on bottom
Inclined End posts: Same as the top chord
Bottom Chord: Pair of L-beams connected with batten plates, except in the middle panel, where there are two pair of L-beams connected with batten plates
Diagonals: Two pair of L-beams connected with batten plates
Verticals: Two pair of L-beams connected with zig-zag lacing

Underneath the deck there are I-beams running longitudinally the length of the truss, and larger I-beam floor beams spanning the width of the truss. The floor beams are connected to the verticals above the bottom chord. Bottom lateral bracing consists of rods in an "X" pattern between the floor beams. The bridge rests on concrete full-height abutments with flared wing walls–flared is defined as forming an acute angle with the roadway leading to the bridge.

Under a Memorandum of Agreement with the Oklahoma State Historic Preservation Office, the bridge is being replaced by a modern two-lane structure. The historic bridge was marketed for relocation and a new owner has removed it and put it to use in a new location. Before removal, the bridge had no major alterations and no obviously bent or damaged beams. The truss members do, however, have heavy rust and some pitting. The abutments exhibited spalling and cracks.

IV ENDNOTES

i. Angie Debo, *The Road to Disappearance* (Norman, OK: University of Oklahoma Press, 1941), 287, 289-90; Indian Pioneer History Collection, 112 vols., vol. IV, p. 321, vol. XXXV, p. 233, vol. LX, p. 195, Research Division, Oklahoma Historical Society, Oklahoma City, Oklahoma; George H. Shirk, *Oklahoma Place Names*, 2d ed. (Norman, OK: University of Oklahoma Press, 1974), 30, 139, 253;Ohland Morton, "Reconstruction in the Creek Nation," *Chronicles of Oklahoma* 9 (June 1931): 174; Chester M. Davis, *Railroads of Oklahoma* (Oklahoma City, OK: State of Oklahoma Department of Transportation Survey Division, 1976), 66-67, 69, 79; John Downing Benedict, *Muskogee and Northeastern Oklahoma*, vol. 1 (Chicago, IL: S. J. Clarke Publishing Company, 1922), 485-86; Odie B. Faulk, *Muskogee: City and County* (Muskogee, OK: The Five Civilized Tribes Museum, 1982), 75, 77; *R. L. Polk & Co.'s Oklahoma and Indian Territory Gazetteer and Business Directory, 1907-08* (Memphis, TN: R. L. Polk & Co., 1907), 523-24.

ii. Joseph E. King, *Spans of Time: Oklahoma Historic Highway Bridges* (Oklahoma City, OK: Oklahoma Department of Transportation Planning Division, 1993), 9, 34; Pennsylvania Historical and Museum Commission, Pennsylvania Department of Transportation, *Historic Highway Bridges in Pennsylvania* (n.p.: Commonwealth of Pennsylvania, 1986), 16; Dan Grove Deibler, *A Survey and Photographic Inventory of Metal Truss Bridges in Virginia 1865-1932*, vol. 1 (Charlottesville, VA: Virginia Highway & Transportation Research Council, 1975), 13; Lichtenstein Consulting Engineers, Inc., *Delaware's Historic Bridges: Survey and Evaluation of Historic Bridges with Historic Contexts for Highways and Railroads*, 2d ed., revised (n.p.: Delaware Department of Transportation, Division of Highways, Location and Environmental Studies Office, 2000), 71; Ohio Department of Transportation, *The Ohio Historic Bridge Inventory Evaluation and Preservation Plan* (Couumbus, OH: Ohio Department of Transportation, 1983), 49; *Historic Highway Bridges in Wisconsin*, vol. 2, part 1 (n. p.: Wisconsin Department of Transportation, 1998), 67.

iii. James L. Cooper, *Iron Monuments to Distant Posterity: Indiana's Metal Bridges, 1870-1930* (n.p.: DePauw University, Federal Highway Administration, Indiana Department of Highways, Indiana Department of Natural Resources, National Park Service, 1987), 22, 28-29; King, *Spans*, 10; Muskogee County Commissioners, *Muskogee County Commissioners' Record*, vol. 2, 29 December 1910 (County Clerk's Office, Muskogee County Courthouse, Muskogee, Oklahoma).

iv. King, *Spans*, 14; William Paul Corbett, "Oklahoma's Highways: Indian Trails to Urban
Expressways," (Ph.D. dissertation, Oklahoma State University, 1982), 170-72; *Muskogee Times-Democrat*, 10, 14, 18, 21, 23 November 1910.

v. Muskogee County Commissioners, *Commissioners' Record*, vol. 2, 26, 27 November 1910, 29 December 1910, 3 January 1911, vol. 3, 30 January 1911, 29 March 1911, 3, 8 May 1911.

vi. *Boynton Index*, 10 March 1911, 25 August 1911, 6 October 1911.

vii. King, *Spans*, 40; John Alexander Low Waddell, *Bridge Engineering*, vol. 1 (New York, NY: John Wiley & Sons, Inc., 1916), 468; Anna Marie Eddings, *Oklahoma Historic Bridge Survey Phase I* (Oklahoma City, OK: Oklahoma Department of Transportation Planning and Research Division, 2007), 50-51; Cooper, *Iron Monuments*, 70, 91; FRASERdesign, *Missouri Historic Bridge Inventory: Draft Inventory Report*, vol. 1 (n. p.: Missouri Highway and Transportation Department, April 1996), 102; Clayton B. Fraser, "Highway Bridges in Colorado," National Register of Historic Places, Multiple Property Documentation Form (On file at the Office of Archaeology and Historic Preservation, Denver, Colorado, 2000), 95; Larry Jochims, "Metal Truss Bridges in Kansas, 1861-1939," National Register of Historic Places, Multiple Property Documentation Form (On file at the Kansas State Historic Preservation Office, Topeka, Kansas, 1990), section E, page 2; Bridge Survey Files, Oklahoma Department of Transportation Cultural Resources Program, Norman, Oklahoma.

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Structure #51E0930N4140009
Northeast of Boynton
Muskogee County
Oklahoma

LIST OF PHOTOGRAPHS

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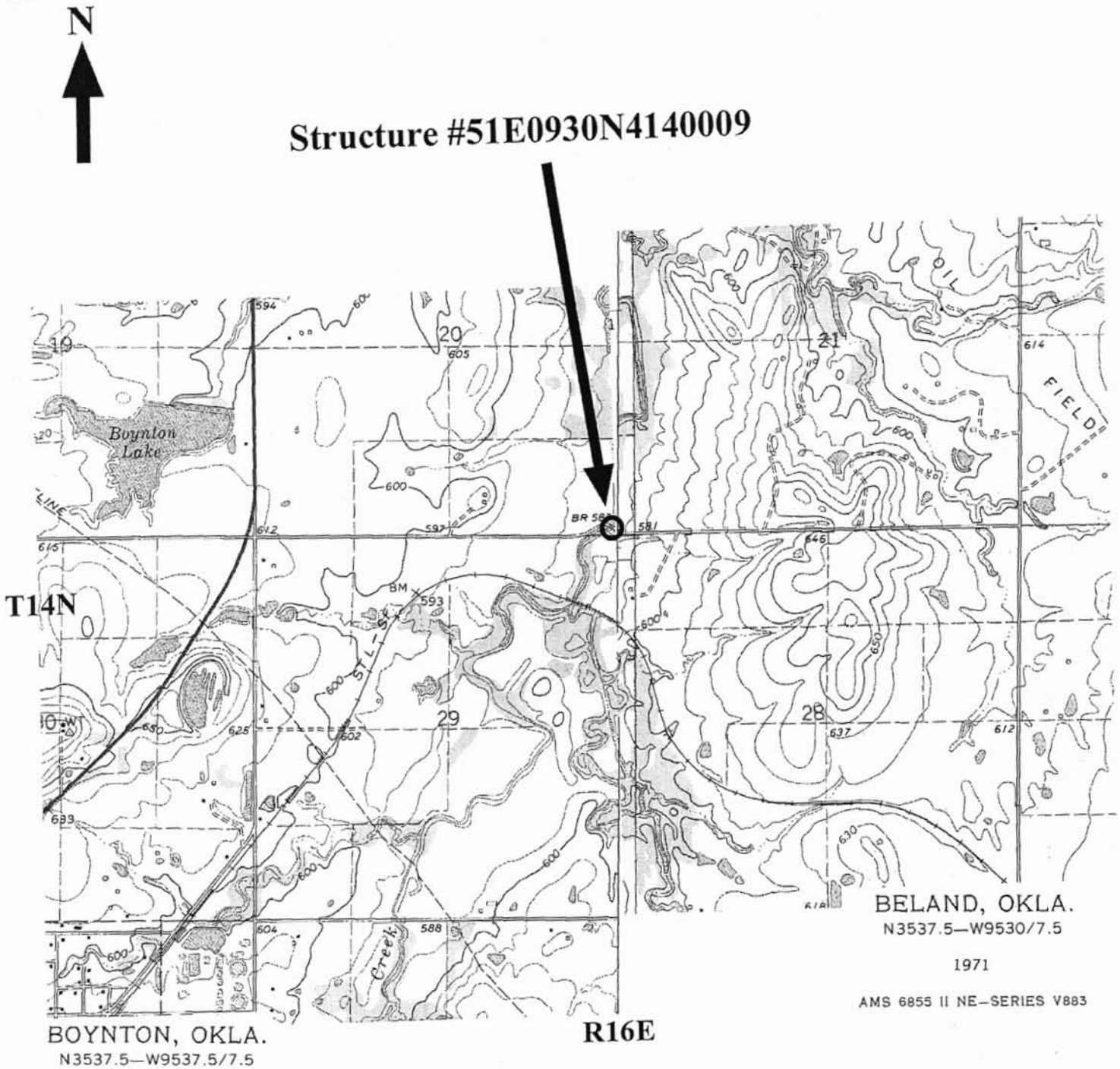
N
Structure #51E0930N4140009
T14N
R16E
Boynton Lake
BR 58
BM
ST L-SF
OIL FIELD
Creek
BOYNTON, OKLA.
N3537.5—W9537.5/7.5
1971
AMS 6855 II NW—SERIES V883
BELAND, OKLA.
N3537.5—W9530/7.5
1971
AMS 6855 II NE—SERIES V883