

**FORT GRIFFIN IRON TRUSS BRIDGE**  
Texas Historic Bridges Recording Project  
Spanning Clear Fork of the Brazos River  
at County Route 188  
Fort Griffin Vicinity  
Shackelford County  
Texas

HAER No. TX-63

HAER  
TEX  
209-F0GRIF.V  
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**BLACK AND WHITE PHOTOGRAPHY**  
**WRITTEN HISTORICAL AND DESCRIPTIVE DATA**

**HISTORIC AMERICAN ENGINEERING RECORD**  
National Park Service  
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1849 C St., NW  
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**Location:** Spanning Clear Fork of the Brazos River at County Route 188, Fort Griffin vicinity, Shackelford County, Texas.  
UTM: 14/479060/3643880  
USGS: Fort Griffin, Texas, quadrangle (1981).

**Date of Construction:** 1885.

**Designer:** King Iron and Bridge Manufacturing Company, Cleveland, Ohio.

**Builder:** King Iron and Bridge Manufacturing Company, Cleveland, Ohio.

**Present Owner:** Shackelford County.

**Present Use:** Vehicular bridge.

**Significance:** The Fort Griffin Iron Truss Bridge is the oldest functioning bridge in Shackelford County, Texas, and one of the state's oldest remaining trusses. It is also the last remaining pin-connected Pratt through truss in the county. Because it has survived with few alterations, the Fort Griffin Iron Truss Bridge is a remarkably intact example of an early metal truss bridge in Texas. Built to accommodate traffic between the county seats at Albany and Throckmorton, the bridge cuts through what used to be Fort Griffin, a military checkpoint and cattle town. The Fort Griffin Iron Truss Bridge was nominated to the National Register of Historic Places in 1979.

**Historian:** Estella M. Chung, August 1996. Revised by Justin M. Spivey, September 1998.

**Project Information:** This document was prepared as a part of the Texas Historic Bridges Recording Project performed during the summer of 1996 by the Historic American Engineering Record (HAER). The project was sponsored by the Texas Department of Transportation (TxDOT).

## Introduction

"Gamblers, cowboys, loose women, soldiers, and decent folks" have used the Fort Griffin Iron Truss Bridge. The bridge, spanning the Clear Fork of the Brazos River, was built when Fort Griffin was ending its era as a bustling recreation area and trading center. According to Don H. Biggers, who visited the fort in its heyday, "The whole town was a babel of boisterous talk, whoops, curses, laughter, songs and miserable music." Saloons and dance halls were filled with cattlemen that crossed the bridge on the routes to and from San Antonio and Fort Worth.

There must have been 300 or 400 cowboys in town, many of them belonging with trail herds. In the front of every store or place of business there was a long hitching rack, and these hitching racks were lined with horses . . . thousands of buffalo hides were stacked here and there and thousands more were loaded on wagons ready to depart for Fort Worth.<sup>1</sup>

The cowboys stopped at Fort Griffin because it was on the route to Fort Worth. Their dollars supported the commercial growth of the area. It would not have been economically possible for Fort Griffin to become a bustling cattle town if it was not located on the road to Fort Worth.

Not only cowboys frequented the roads and bridges of this area of Shackelford County. Fort Griffin, part of a streamlined defense system which eliminated small forts in favor of larger regional forts, was established in 1866. It was the largest U.S. Army post in West Texas and a major dispatch point to western Texas and New Mexico. The land surrounding the fort was popular with Anglo-American settlers because the fort's presence discouraged Native Americans from entering the area. In 1881, the fort was closed and the Texas Central Railroad bypassed Fort Griffin. By 1885, when the Fort Griffin Iron Truss Bridge was built, the bridge probably received some local traffic from the fading town. More importantly, the bridge was on the route that connected county seats Albany and Throckmorton.<sup>2</sup>

## King Iron and Bridge Manufacturing Company

On June 10, 1885, King Iron and Bridge Manufacturing Company was awarded an \$8,050.00 contract to build a bridge on Fort Griffin and Throckmorton Road.<sup>3</sup> Four bridge companies bid for the all-weather bridge over the Clear Fork of the Brazos: the King Iron and

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<sup>1</sup> Don H. Biggers, *Shackelford County Sketches* (Albany, Texas: Albany News Office, 1908), p. 39.

<sup>2</sup> Shackelford County Historical Survey Committee, *Shackelford County 1874-1974* (privately printed, 1974), pp. 7, 38-45.

<sup>3</sup> Shackelford County, Texas, *Commissioners' Court Minutes*, vol. 2 (Shackelford County Courthouse, Albany, Texas), p. 261 (June 10, 1885).

Bridge Manufacturing Company of Cleveland, Ohio; the Wrought Iron Bridge Company of Canton, Ohio; the Penn Bridge Works of Beaver Falls, Pennsylvania; and the Kansas City Iron Bridge Company of Kansas City, Missouri.<sup>4</sup> The successful low bidder, King Iron and Bridge Manufacturing Company, placed a \$12,000.00 bond for the bridge.<sup>5</sup>

The Cleveland-based company was able to sell to distant areas like Texas because of its organizational structure. The company's plant was specifically designed to suit the transportation needs of a bridge building company. Because the plant was built near a railroad, raw materials could be brought in efficiently and products could be shipped out promptly. In addition, King expanded his market by advertising his bridges and staff of professional engineers in city and state directories. The King Iron and Bridge Manufacturing Company had an office in San Antonio.<sup>6</sup>

### Description

The Fort Griffin Iron Truss Bridge features a pin-connected Pratt through truss of 110'-0" span, with inclined end posts. The Pratt truss, typically used for spans from 125'-0" to 250'-0", was a common form in the late nineteenth and early twentieth century. Both Howe and Pratt trusses are divided into rectangular panels each crossed by two diagonals. The Pratt truss carries loads with diagonals in tension and verticals in compression; this situation is reversed in the Howe truss. The Pratt truss' verticals, shorter than the diagonals in the Howe truss, are less likely to buckle under compression.<sup>7</sup> The Pratt form was created by Thomas Pratt, probably around 1842; he and his father Caleb patented it in 1844.<sup>8</sup> Technology historians such as Carl Condit recognized the practicality of the Pratt truss:

Among truss bridges, the nearly universal reliance on Pratt and Warren trusses has helped to make possible the elegance and precision of form that was once

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<sup>4</sup> In *ibid.*, vol. 2, p. 305 (February 11, 1885), the Commissioners' Court instructed the clerk to request plans and specifications from bridge companies. On June 10, 1885, bids were read. Wrought Iron Bridge Manufacturing Company bid \$8,465.00, Penn Bridge Works bid \$8,200.00, and Kansas City Iron Bridge Company bid \$8,250.00.

<sup>5</sup> *Commissioners' Court Minutes*, vol. 2, p. 262 (June 11, 1885).

<sup>6</sup> David A. Simmons, "Bridge Building on a National Scale: The King Iron Bridge and Manufacturing Company," *Iron Age* 14, No. 2 (1989): 23-32.

<sup>7</sup> David Plowden, *Bridges: The Spans of North America* (New York: Viking Press, 1974), p. 40.

<sup>8</sup> Carl W. Condit, *American Building Art: The Nineteenth Century* (New York: Oxford University Press, 1961), p. 110.

regarded as hopelessly unattainable in such structures. Simplicity has led to a unity of line and surface which has nothing to obscure or interrupt the clarity of the main elements and the naturally pleasing geometric pattern arising from their necessary relations. . . .<sup>9</sup>

Limestone piers support either end of the 18'-0"-tall Pratt through truss. Such massive piers are rare and indicate the crossing's importance at the time, because stone masonry was relatively expensive and lesser bridges would have been supported by timber or metal piers. Its overall width is 20'-0", with a 13'-6" clear roadway. The truss is divided into six panels — the endmost are 15'-0" long, and the four intermediate panels are each 20'-0" long.

The bridge's metal components would have been shop-riveted at the King Iron and Bridge Manufacturing Company's Cleveland shops and shipped by railroad to the site. The truss span was assembled by local labor on temporary wooden falsework.<sup>10</sup> Channels riveted to a continuous top plate and tie plates underneath form the upper chord's rectangular section. Crossed rods provide overhead lateral bracing. Verticals U2-L2, U3-L3, and U4-L4, as well as the overhead struts, are pairs of channels connected by riveted single lacing. Because no diagonals are connected to panel points L1 and L5, verticals U1-L1 and U5-L5 act as hangers in tension. The slender looped eye bar verticals at these locations reflect their design for tensile forces only.

The verticals are pin-connected to the diagonals and the lower chord, which consists of double eye bars of rectangular section. U-bolts are looped over each lower-chord pin, each carrying a plate which supports the tapered deck beams. Crossed rods form the lower lateral bracing. Heavy timber stringers span between the deck beams, carrying a floor of transverse wooden planking. A pair of longitudinal steel treads form a smooth path for wheels; two stringers are concentrated beneath each. The railings of 2"- and 3"-diameter wrought iron pipe are apparently original.<sup>11</sup> Given the frequency of railing replacement on older bridges throughout the state, the Fort Griffin Iron Truss Bridge is rare for its lack of alteration.

Girder approach spans, totaling 72'-0" on the northeast end, and 44'-0" on the southwest end, bring the structure's total length to 226'-0".<sup>12</sup> Steel bents on limestone foundations support the approach spans. Each bent is formed from double pipe columns on the outside, an intermediate post of two I-beams, braced by angles in a criss-cross pattern. Perhaps a later

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<sup>9</sup> Condit, *American Building Art: The Twentieth Century* (New York: Oxford University Press, 1961), p. 302.

<sup>10</sup> T. Lindsay Baker, *Building the Lone Star: An Illustrated Guide to Historic Sites* (College Station: Texas A&M University Press, 1986), p. 85.

<sup>11</sup> *Ibid.*, p. 86.

<sup>12</sup> *Ibid.*

addition, the two I-beams are clamped to either side of the bracing. Nonetheless, this unusual design has survived with little alteration over the years.

Concerns about the bridge's safety arose almost immediately. On September 30, 1885, Olin and Alexander, agents for the King Iron and Bridge Manufacturing Company, were told by the county that the bridge was not approved. The Commissioners' Court found the limestone of the northeast pier unsatisfactory. The matter was settled on October 24, 1885, when the King Iron and Bridge Manufacturing Company posted a bond of \$4000.00 to guarantee that the bridge would stand for two years.<sup>13</sup> In addition, a \$5,000.00 fine was an insurance policy that people would not drive on the bridge "faster than a walk" or drive "more than 20 head of cattle or horses on the bridge at the same time," thus damaging the bridge.<sup>14</sup> Truck traffic is currently prohibited from using the bridge.

County commissioners solicited a separate bid for the abutments on October 5, 1885.<sup>15</sup> The northeast and southwest abutments were constructed by S. R. Weaver for \$45.00.<sup>16</sup> By November 9, 1886, Weaver had constructed dry limestone walls, level with the approach spans, and filled the space between the walls with stones and river gravel. The northeast abutment was 20'-0" long and the southwest 30'-0" long.<sup>17</sup>

Rich in frontier and local history, the Fort Griffin Iron Truss Bridge is the oldest functioning and surviving bridge in Shackelford County, and one of only three trusses surviving in Texas from 1885 or earlier. The lack of substantial alteration makes it an unusually complete example of early truss construction. It is the last remaining bridge employing a pin-connected Pratt through truss in Shackelford County and one of eighty-three bridges employing a pin-connected Pratt through truss in the state.

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<sup>13</sup> *Commissioners' Court Minutes*, vol. 2, p. 276 (September 30, 1885), pp. 278-79 (October 24, 1885).

<sup>14</sup> *Ibid.*, vol. 2, p. 305 (February 11, 1886). The bridge was repaired by W. Jones for \$700.00, who placed a \$1,400.00 bond on his work. No reason for the repairs is stated. See *Commissioners' Court Minutes*, vol. 3, p. 450 (May 28, 1895). The floor of the bridge was repaired, see *ibid.*, vol. 3, p. 582 (August 17, 1897).

<sup>15</sup> *Commissioners' Court Minutes*, vol. 2, p. 276 (September 30, 1885).

<sup>16</sup> *Ibid.*, vol. 2, p. 278 (October 24, 1885).

<sup>17</sup> *Ibid.*, vol. 2, p. 276 (September 30, 1885), p. 283 (November 9, 1885).

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APPENDIX: Sketch Plan and Elevation

