RED RIVER MIXED TRUSS
Spanning Red River
Hendrix Vicinity
Bryan County
Oklahoma

PHOTOGRAPHS

AND

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Submitted to:
Oklahoma State Historic Preservation Office
800 Nazih Zuhdi Drive
Oklahoma City, Oklahoma 73105

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Tanya McDougall, Photographer, May 2012

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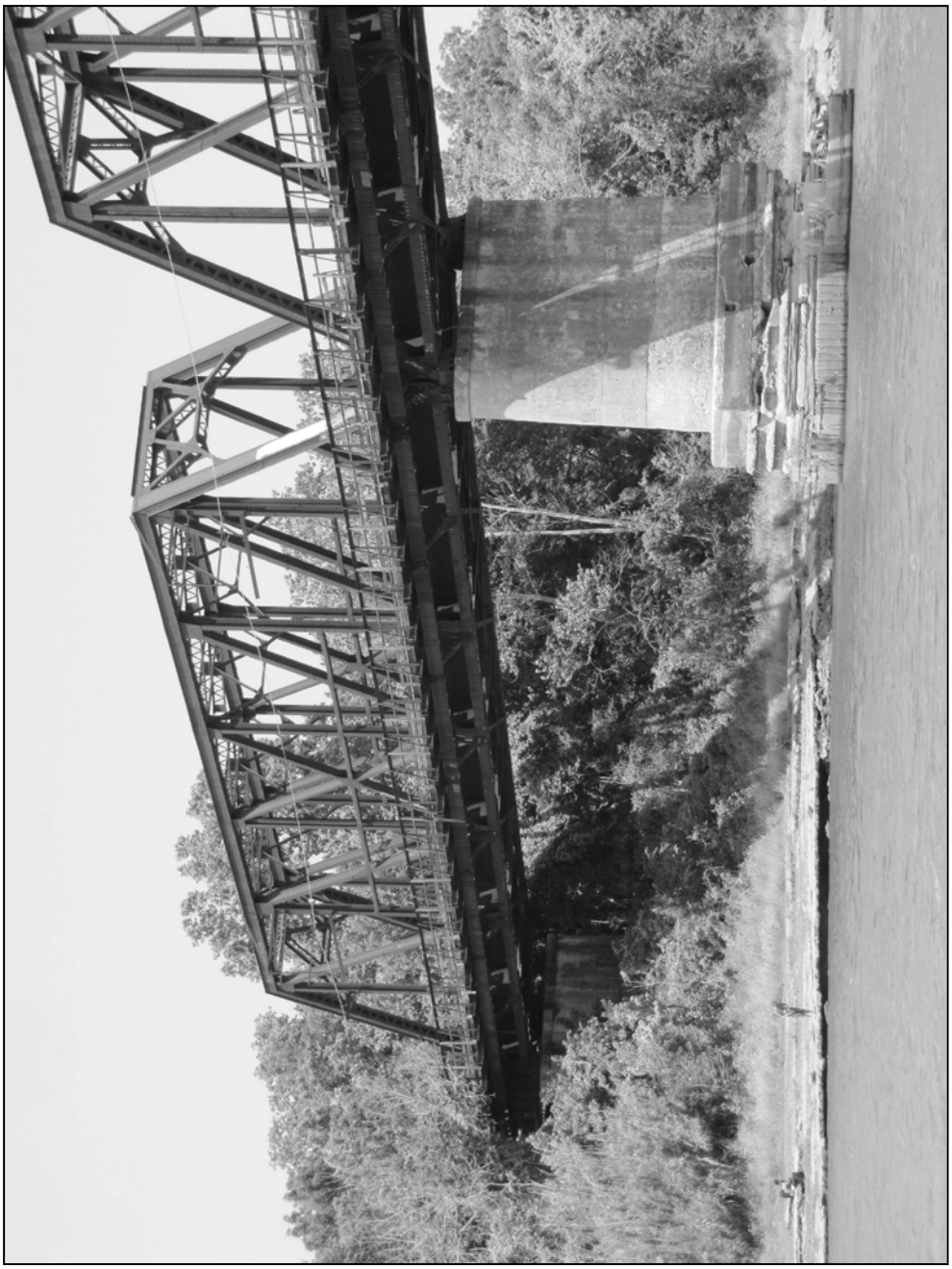

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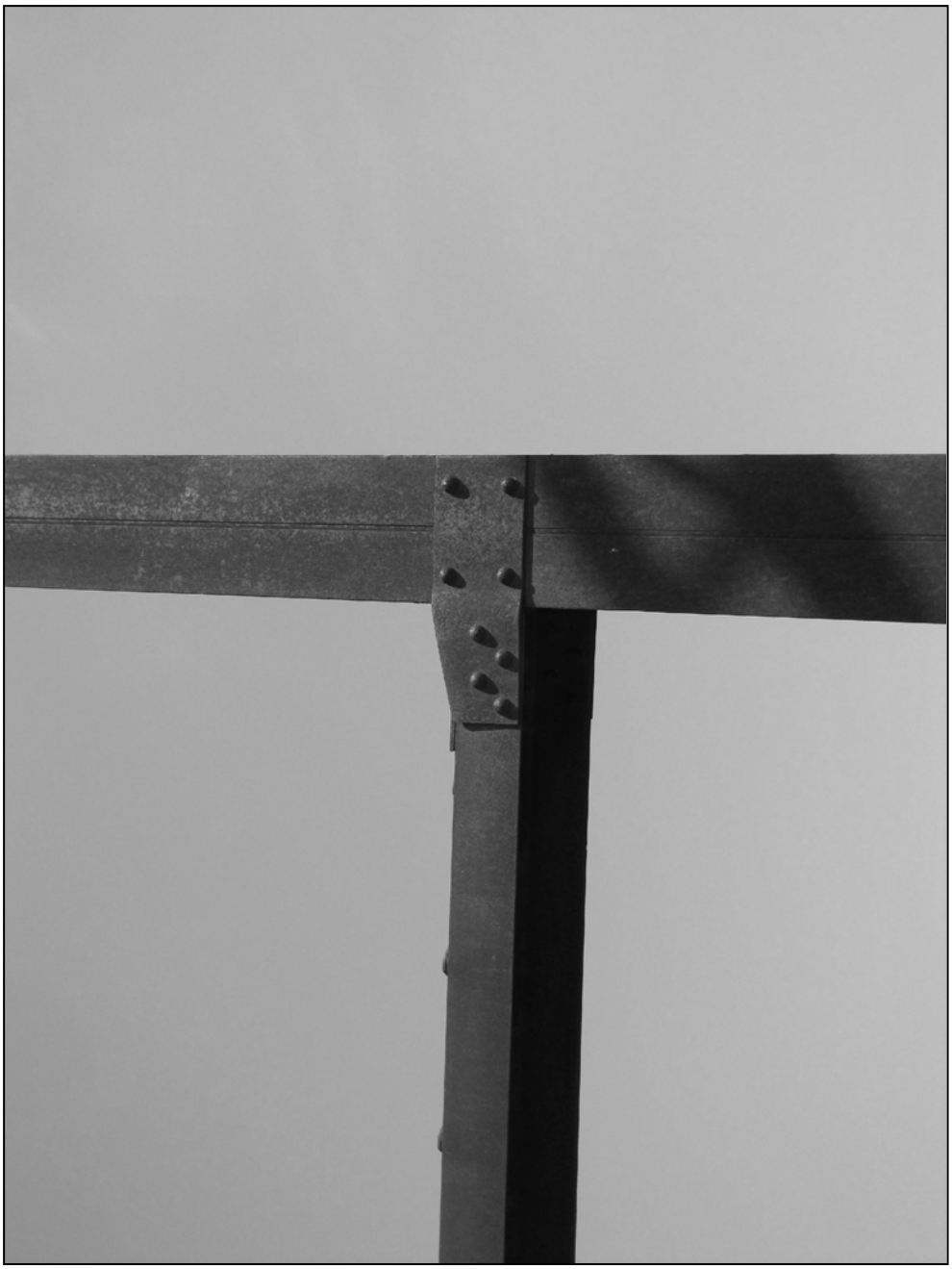

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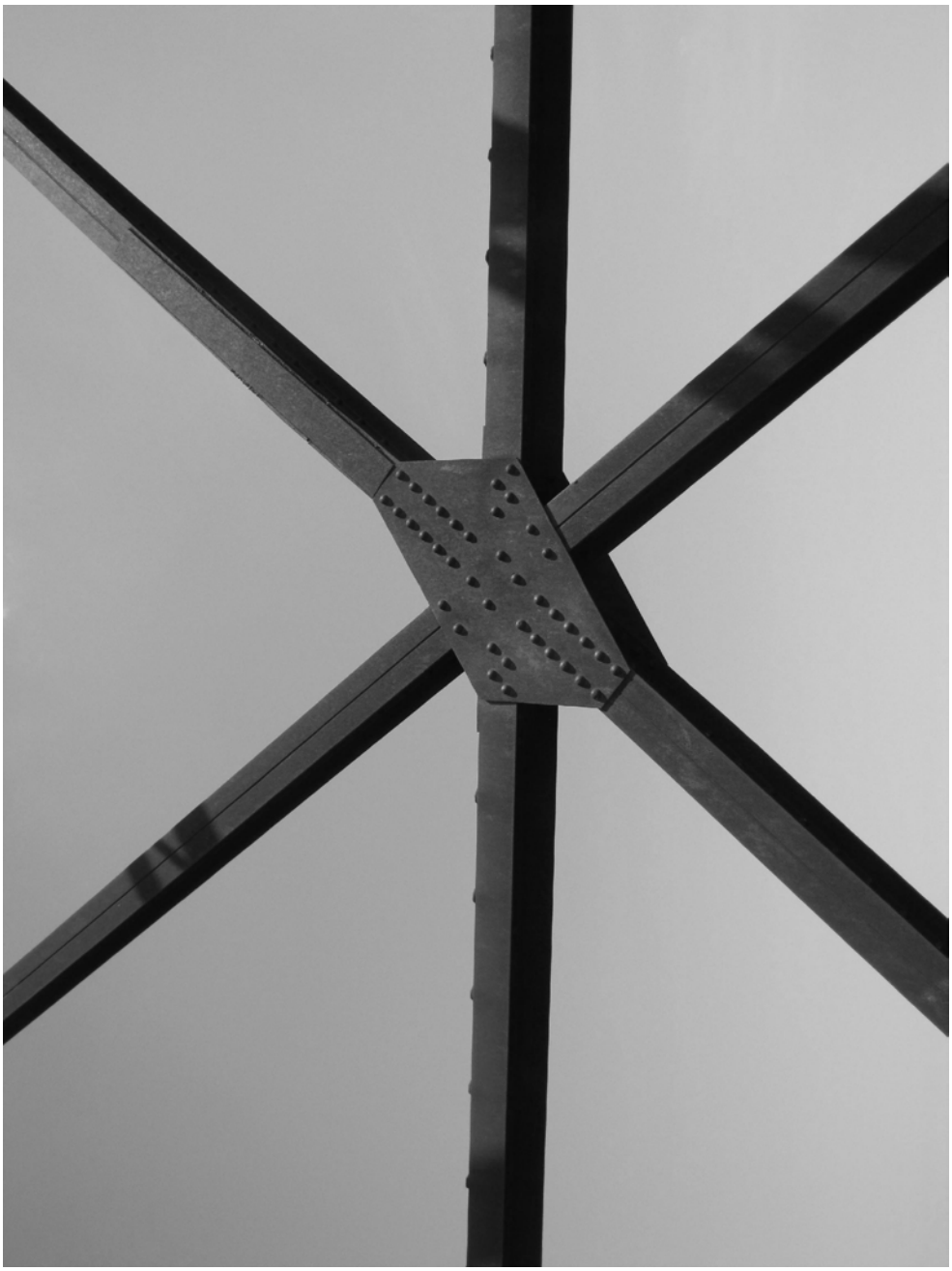

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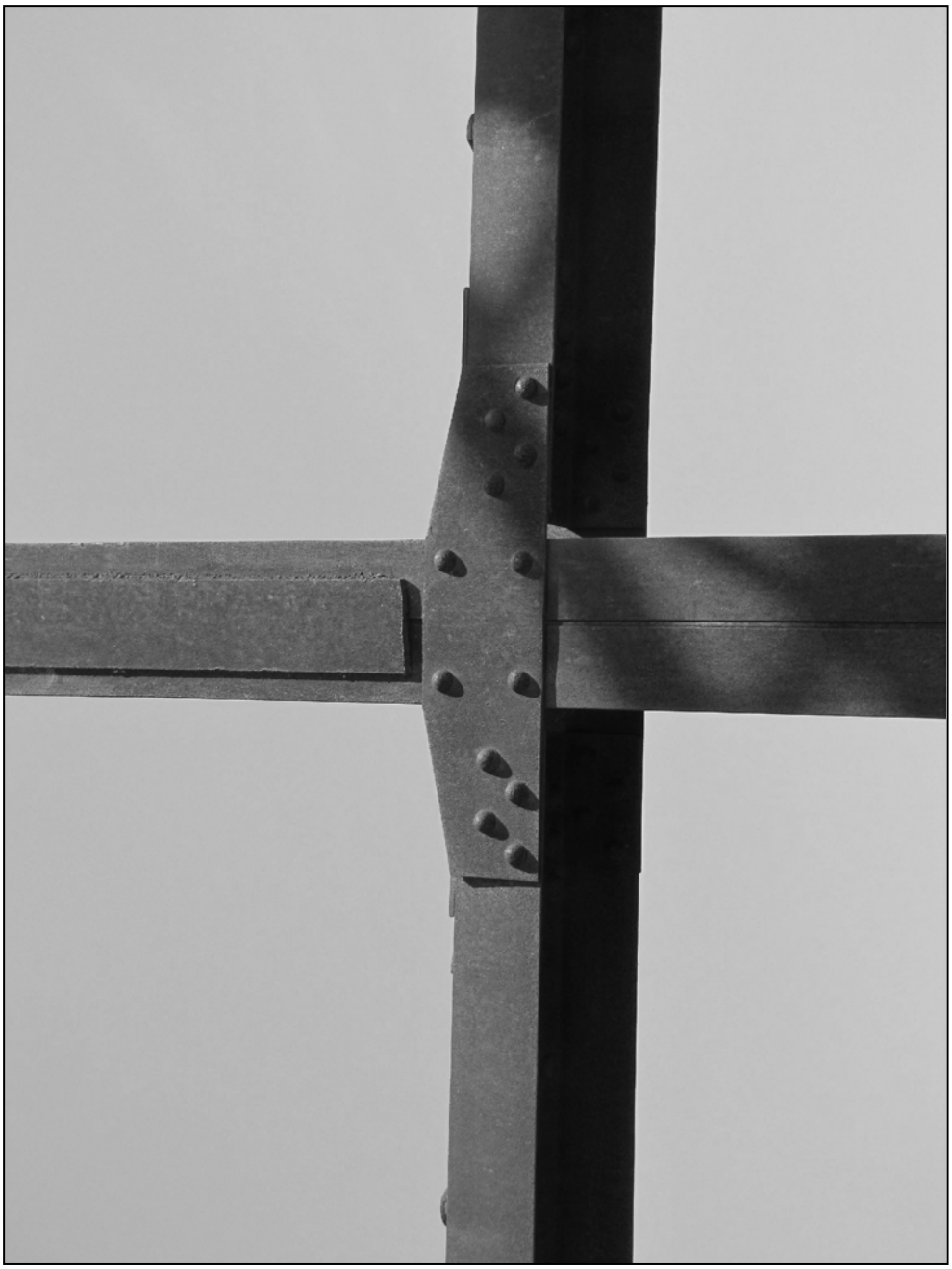

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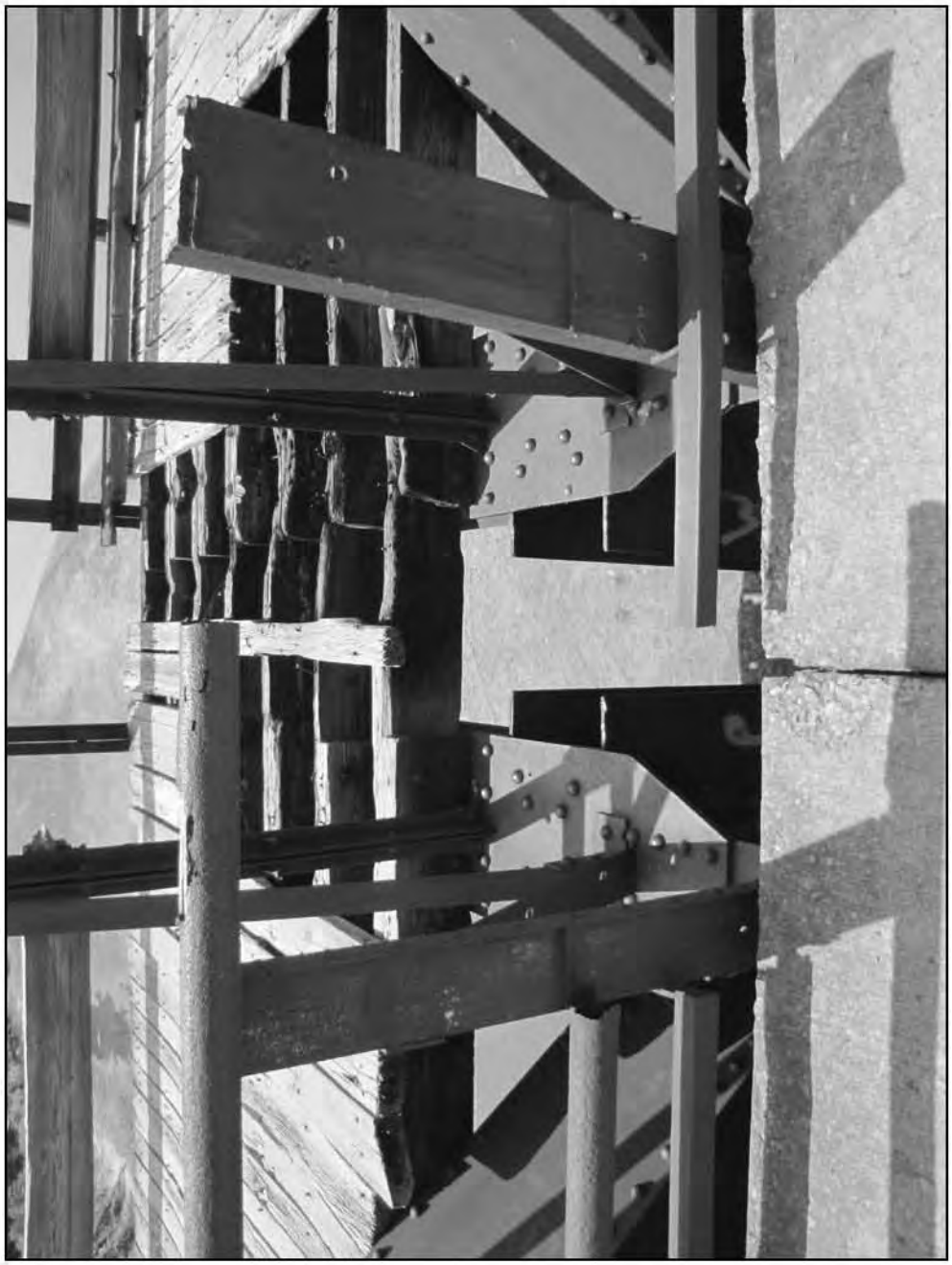

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

RED RIVER MIXED TRUSS

Location: Spanning the Red River, at Road N3715, in the Hendrix vicinity, Bryan County, Oklahoma.
UTM: 14/E0739801/N3738131
Quad: Achille

Present Owner: Bryan County, Oklahoma, and Grayson County, Texas
ODOT Structure Number 07N3715E2245003
TxDOT Structure Number 010920AA0474001

Present Use: Vehicular Bridge

Significance: The Red River Mixed Truss Bridge, a combination Pratt through truss and deck truss, was constructed as a railroad bridge at Carpenters Bluff in 1910, for the Missouri, Oklahoma and Gulf Railway. The railroad bridge was originally constructed with a shelf on the southeast side for the addition of a wood plank wagon bridge. Prior to the construction of the Red River Mixed Truss Bridge, a ferry was used to cross the river. The ferry crossing was established in ca. 1850 by Thomas Carpenter. The bridge was used by the railroad from 1910 through 1965, at which time the Texas and Pacific Railroad, the bridge's owner at the time, abandoned the line and donated the bridge equally to Bryan County, Oklahoma, and Grayson County, Texas. The following year, the railroad tracks were removed and a concrete slab placed over the deck. The wagon bridge was closed to vehicular traffic and opened for pedestrian use. The Red River Mixed Truss Bridge demonstrates the unique development of transportation routes along the Red River, specifically the transition from ferry crossings to bridges. Furthermore, the bridge is an excellent example of a structure specifically constructed for both commercial and domestic transportation purposes (railroad and wagon).

Project Information: Historic American Engineering Record (HAER) Level II equivalent documentation was performed in May 2012. Tanya McDougall, Architectural Historian, conducted the on-site recordation and compiled the historical information. During the on-site recordation, photographs following National Park Service (NPS) standards for digital images were taken of the structure, and observations on existing conditions were noted. This HAER recordation serves as mitigation for the removal of the structure from vehicular traffic.

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PART I. HISTORICAL INFORMATION

A. Physical History:

1. **Date of Construction:** 1910

2. **Architect/Engineer:** Not Known

3. **Builder/Contractor/Supplier:** Constructed by the Missouri, Oklahoma, and Gulf Railroad Company, for the Missouri, Oklahoma, and Gulf Railway

4. **Original Plans:** Not Available

5. **Alterations and Additions:** The Red River Mixed Truss Bridge was originally constructed as a railroad bridge for the Missouri, Oklahoma, and Gulf Railway, with a one-lane wagon bridge attached to the southeast side. In 1965, the Texas and Pacific Railroad, the bridge's owner at the time, discontinued use of the railroad bridge and donated it equally to Bryan County, Oklahoma, and Grayson County, Texas. By 1966, the bridge was converted from a railroad bridge to a one-lane vehicular bridge with a concrete slab covering the deck. The one-lane wagon road was closed to vehicular traffic and opened for pedestrian use. Since its conversion from railroad bridge to road bridge, the Red River Mixed Truss Bridge has been used for vehicular traffic; however, the wagon road is now closed to all traffic.

B. Historical Context:

1. Introduction

The Red River Mixed Truss Bridge is located on the Red River between Bryan County, Oklahoma, and Grayson County, Texas. The nearest populated centers to the bridge are Carpenters Bluff, a small community located on the southwest end of the bridge in

Grayson County, and the town of Hendrix, located approximately 1.3 miles northeast in Bryan County. Beginning in 1831 and through 1855, the area now encompassed by Bryan County was part of the Chickasaw and Choctaw nations in Indian Territory.[1] It was during this period that important transportation routes crossing the Red River from Indian Territory into Texas developed through the area.[2] However, at that time there were no bridges and crossing was dangerous due to the potential for drowning or sinking in quicksand. To remedy this, privately owned ferry crossings began operating along the river. Many of these early ferry crossings were located at natural fords and along known trails used by early Native Americans. The ferries themselves consisted of a flat boat pulled by ropes and/or poles (O'Dell 2012a; Thoburn 1916:1465).

By the 1850s, development along the Red River between Grayson County and Indian Territory began increasing, a trend largely due to the establishment of the Peters colony (located in North Texas) in the 1840s, and a growing cattle industry along the Red River (Kumler 2012). Well-known trade and market centers, including Preston Bend in Grayson County and Colbert's Ferry in Indian Territory, quickly emerged. The combination of increased traffic and lack of bridges spurred additional ferry operations; however, during this time, local governments began to implement regulations on ferry crossings. In the Chickasaw and Choctaw nations, ferry operators were required to obtain a license and pay annual taxes on fees collected, which were also regulated by the local government (O'Dell 2012a).

In ca. 1850, Thomas Carpenter established his own ferry crossing approximately 10 miles southeast of Preston Bend and Colbert's Ferry. The location is now known as Carpenters Bluff, but according to the Texas General Land Office (GLO) 1859 and 1871 maps, the location was previously known as Shortstone Bluff (GLO 1859 and 1871).[3] In addition to the ferry crossing, Carpenter operated a blacksmith shop and maintenance station, both located near the ferry (*Paris News* 21 July 1974). Providing additional services at a crossing was common practice, and likely helped to entice customers to the location. It is unknown when Thomas Carpenter stopped operating the ferry, but subsequent ferry operators include Allen Lattie (pre-1886), William P. Lemon (ca. 1886), and Robert B. Lemon (son of William P. Lemon; ca. 1900) (Thoburn 1916:1465).

From ca. 1850 to 1910, the ferry crossing at Carpenters Bluff remained the only local means of crossing the Red River. Small communities such as Bloomfield Academy, Carpenters Bluff, Kemp, and Hendrix developed in the areas north and south of the ferry crossing. The crossing at Carpenters Bluff was important to these communities,

[1] The area now encompassed by Bryan County, Oklahoma, was part of the Choctaw and Chickasaw nations from 1831 through 1855, at which time it became part of the Chickasaw Nation. The area remained part of the Chickasaw Nation until Oklahoma statehood in 1907, when Bryan County was officially established (Morris et al. 1986:23).

[2] One of the most important routes to develop through Grayson and Bryan counties was the Texas Road. During the nineteenth century, the road was the primary north-south route and in 1857 became part of the Butterfield Overland Mail Route and stage line. One of the route's stop stations was located approximately 10 miles north of Carpenters Bluff, at a ferry crossing known as Colbert's Ferry (Milligan 2012).

[3] No other reference could be found for Shortstone Bluff, but it appears the name of the location did not change to Carpenters Bluff until well after the ferry crossing had been established.

particularly to those located north of the river, where the nearest trading posts were located in North Texas (Thoburn 1916:1465). The earliest of these communities was Bloomfield Academy, an Indian School and Seminary for Chickasaw girls established in 1853. The school was located north of the present town of Hendrix (Scott 1984:18). Soon after, in ca. 1860, a small community developed near the ferry crossing at Carpenters Bluff and included a general store and saloon (Hart 2012). Later developments comprise the town of Kemp, established approximately 3.5 miles northeast of Carpenters Bluff in ca.1880, and the town of Hendrix, established in 1909 as a post office in the general store of James Hendrix. However, the town of Hendrix (also known as Kemp City) was not officially created until 1910, after the Missouri, Oklahoma, and Gulf Railway (MO&G) constructed a sidetrack and stop station off its southern extension line near the store location (O'Dell 2012b).

Through the early 1900s, the towns and communities near the ferry crossing at Carpenters Bluff remained rural with agriculturally based economies. The most dramatic change to the area came in late 1910, when the MO&G constructed a rail line from Durant to Carpenters Bluff and opened a railroad/wagon bridge over the Red River. The new bridge, a combination Pratt through truss and deck truss, took much of the business from the ferry crossing, but until ca. 1916, a crossing known as Bloomfield Ferry continued to operate approximately 1 mile northwest of the bridge (Bryan County Clerk [BCC] 1910:Commissioner Minutes [CM] 1:217; Thoburn 1916:1465). Although the records do not indicate when the ferry at Carpenters Bluff discontinued service, it is clear that the construction of the MO&G railroad bridge represented a new means of transport across the river. Not long after, ferry crossings like the one at Carpenters Bluff vanished from the landscape.

2. Development of the Bryan County, Red River Mixed Truss Bridge

In January 1909, the MO&G, originally chartered in 1904, began planning for a southward extension from Kansas to Texas. The route planned for the new line would pass south through Durant to the Red River and into Texas (*Muskogee Times Democrat [MTD]* 4 January 1909). In January 1909, the company was granted approval to construct their southern extension line, and by December 1909, was granted permission to build the necessary railway and wagon bridge across the Red River at Carpenters Bluff (*New-State Tribune* 23 December 1909).

Although all seemed to be in order for construction of the railroad line, legal issues caused delays in the project. Specifically, the MO&G was forced to charter two additional corporations to comply with both Texas and Oklahoma state regulations. The first of the two additional corporations was chartered in March 1910 and named the Missouri, Oklahoma & Gulf Railroad of Texas. By chartering this corporation, the MO&G could comply with Texas constitutional requirements that did not allow out-of-state companies to operate in-state railroads. The second corporation, chartered in July 1910, was named the Missouri, Oklahoma & Gulf Railroad Company. This corporation was specifically organized for the construction of the bridge over the Red River, likely to comply with additional state regulations in either Texas or Oklahoma (Hotsommer 1977:55).

In addition to having to meet state requirements, the MO&G had to also pacify angry citizens. The planned route from Durant to Carpenters Bluff bypassed the town of

Kemp. When Kemp citizens heard of this, they petitioned the Oklahoma Corporation Commission to force the railroad company to build a sidetrack and a stop station—to be named Kemp City. The Kemp City stop station was to be west of Kemp near the Hendrix general store. The commission approved the citizen's request, but it was appealed by MO&G only to be upheld by the Oklahoma Supreme Court in 1911 (Hart 2012). Although the citizens of Kemp got what they had asked for, they had to endure confusion over the town's name for a number of years. Since a post office had already been established in the Hendrix general store, the town was forced to use both the postal designation of Hendrix and the new name of Kemp City. The name was not officially changed to Hendrix until sometime around 1950. The original town of Kemp also suffered, as a number of businesses relocated to Kemp City to take advantage of the railroad (O'Dell 2012b).

With the legal issues somewhat sorted through, MO&G president, William Kenefick, announced in May 1910 that "[a]ll of the concrete work for the piers and approaches are [*sic*] in . . ." (*MTD* 11 May 1910), and by September 1910, the railroad portion of the bridge—five Pratt through trusses and two deck trusses—was opened. Two months later, the attached wagon bridge and railroad support structures were also officially opened. The support structures included a depot and section house located on the southwest end of the bridge (*Bryan County Democrat* 24 November 1910).

Eventually, the railroad line was constructed past Carpenters Bluff, turning west to Denison, Texas, where it continued south through Sherman, Texas (United States Geological Survey 1958). Construction of the Red River Mixed Truss Bridge and railroad line not only provided a transportation outlet, but also promoted the development of good roads in both Texas and Oklahoma. The roads south of the bridge in Texas were kept in good condition by local residents as a cooperative effort. In August 1910, the residents were praised for their work (*Galveston Daily News* 28 August 1910). In Oklahoma, the1910 County Commissioners of Bryan County approved the construction of a new road leading from just north of the Red River to the Main Street in Hendrix and west past the MO&G railroad tracks (BCC 1910:CM 1:217).

In 1919, the MO&G was reorganized and incorporated into the Kansas, Oklahoma, and Gulf Railway Company (Veenendaal 2012). The railroad line was eventually acquired by the Texas and Pacific Railroad, which maintained ownership of the bridge until 1965 (Fox 1982:82; Texas Historical Commission 2002). Due to a decrease in demand, the Texas and Pacific Railroad abandoned the tracks in 1965 and donated the Red River Mixed Truss Bridge to both Bryan and Grayson counties (Fox 1982:82; *Lubbock Avalanche Journal* 21 December 1965). In 1966, the railroad tracks were removed and replaced with a concrete slab, as a collaborative effort between the two counties. That same year the new concrete slab deck was opened to vehicular traffic, and the wagon bridge was opened for pedestrian use.

PART II. STRUCTURAL/DESIGN INFORMATION

A. General Description: The Red River Mixed Truss Bridge is located on Road N3715 over the Red River on the border of Bryan County, Oklahoma, and Grayson County, Texas. The structure runs northeast–southwest to accommodate the northwest to southeast drainage of

the Red River. The Red River Mixed Truss Bridge is a combination of five Pratt through trusses and two deck trusses with a one-lane concrete slab deck and attached wood deck. The structure was originally constructed as a railroad bridge with a wood deck wagon bridge along the southeast side. The wagon bridge was attached to the railroad bridge as a shelf with a separate deck floor not encompassed by the Pratt through trusses. The structure as a whole consists of seven spans. The total length of the structure is approximately 1,115 feet (ft) with the longest span measuring 190 ft.

The Pratt through trusses are simple spans (spans that could be independent of one another). This truss type is a common truss design and typical for rural bridge construction. Each of the truss walls consists of seven panels, two built-up inclined end posts connected with v-lacing, and five vertical and six diagonal members consisting of built-up I-beams. Two of the diagonal members cross at the center panel forming an X. The web connecting the top chords consists of five panels with lateral bracing, four struts, and two portal struts, all of which have v-lacing. The structure is riveted together with gusset plates located at each connection.

The one-lane concrete deck is approximately 12 ft wide and consists of a concrete slab supported by wood floor beams, lateral bracing, and metal floor beams that extend southeast to support the wood deck used for the wagon bridge. In addition, both decks are supported by large metal plates placed perpendicular at each connection, where the truss members meet the bottom chord. Metal bracing extends from the southeast end of the metal support plate to provide added support for the wood deck. The deck floor of the wagon bridge is approximately 12 ft wide and consists of perpendicular wood planks supported by the previously mentioned support system. The wood planks vary in width from 7.9 inches to 12.2 inches. The railing along the wood deck is a combination of metal post railing and wood post railing that is likely due to deterioration and replacement of materials.

The bridge substructure consists of eight formed concrete solid piers. Each pier sits on a pedestal consisting of concrete slabs reinforced by wood planks. The concrete piers are original to the structure and positioned at the ends of each span, but are positioned only below the concrete deck and not the wood deck.

1. **Character:** The bridge structure is a multi-span bridge with five Pratt through trusses and two deck trusses and has a one-lane concrete deck and a one-lane wood deck. The two-deck configuration and simple-span design is indicative of its rural location. The two decks allowed the bridge to be used for commercial and domestic transportation purposes, and the simple-span design was easier to construct than one large continuous span. Furthermore, the small spans are easier to transport, particularly to rural areas.

   The riveted connections are also a defining feature of this structure. After World War I, riveted connected trusses became standard for bridge construction. Riveted connections were used until 1960, when bolt connections became popular (Solomon 2007:52). Although the Pratt Truss is a common truss design used throughout Oklahoma and Texas, the bridge itself demonstrates the unique development of transportation routes along the Red River, and specifically the transition from ferry crossings to bridges.

2. **Condition of Fabric:** The Red River Mixed Truss retains its character and integrity. The structure shows evidence of normal deterioration due to exposure to the elements and lack of maintenance along the wagon bridge. Noted deterioration includes damaged or missing metal railing and damage to the wood plank floor along the wagon bridge.

B. Site Information: The area surrounding the Red River Mixed Truss Bridge is lightly developed, with a higher concentration of development on the southwest side. However, the area immediately surrounding the bridge is extensively covered by native vegetation.

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RED RIVER MIXED TRUSS
Spanning Red River
Hendrix Vicinity
Bryan County
Oklahoma

LOCATION MAP

RED RIVER WARREN MIXED TRUSS
BRYAN COUNTY, OKLAHOMA
LOCATION MAP