WALNUT CREEK BRIDGE
Structure #44N3070E1330004
Washington
McClain County
Oklahoma

PHOTOGRAPHS

WRITTEN AND DESCRIPTIVE DATA

WALNUT CREEK BRIDGE
WASHINGTON, McCLAIN COUNTY, OKLAHOMA

Structure #: 44N3070E1330004

Location: The bridge is located off of 260th Street on Western Avenue over Walnut Creek in the Washington vicinity of McClain County, Oklahoma.

USGS Quadrangle map: Cole, OK.

UTM Coordinates: Zone 14 E634027 N3883051

Date of Construction: The bridge was constructed in 1913.

Designer/ Builder: Kansas City Bridge Company

Present Owner: McClain County

Previous Use: Roadway Bridge (public)

Present Use: Roadway Bridge (public)

Significance: This bridge is believed to be a span from the old Norman Toll Bridge constructed in 1913.

Author: Erica L. Howard, Sherry N. DeFreece Emery, and Kate Singleton; URS Corporation, Dallas, Texas; April 2012

Project Information: This project consists of Historic American Engineering Record (HAER) Level II equivalent documentation of the Walnut Creek Bridge in McClain County, Oklahoma. This HAER recordation serves as mitigation for the removal of this structure from the transportation system. Field work was accomplished by Kate Singleton on December 21, 2011. At the site, 35mm format, black and white photographs were taken and the character and conditions of the structure were recorded. No original drawings were available at the time of the field work. Newspaper articles from the time period were consulted, but the information was limited.

Research was conducted at the McClain County Courthouse and the County Clerk's office. The County Commissioner's Minutes and the Minutes of the Excise Board date back to 1910. These records were researched to find information about the bridge and its construction. The research in these records was

inconclusive. There are several mentions of money being appropriated for bridge construction and mention of several bridges being constructed. However, it is difficult to ascertain which bridge this is as there were other bridges constructed in the area and along Walnut Creek. Further, there is no reference of this bridge being moved from the Norman Toll Bridge but there are references to a “new” Norman bridge to be constructed. Newspaper articles detailed the construction of the “new” bridge but do not detail the dismantling of the other bridge and the dispersal of the sections of the bridge.

PART I: HISTORICAL INFORMATION

Oklahoma has two main drainage systems: the Arkansas River and the Red River. These rivers along with their tributaries flow into Oklahoma by the six surrounding states. The waters flow out of the state by way of the Red, Arkansas, and Little Rivers, and Lee Creek. These rivers and creeks proved a challenge as Oklahoma travel evolved from horseback and foot travel to motorized transportation, necessitating the construction of ferries, and later bridges over many of these creeks and rivers.[1,2,3]

When people and goods first came across Oklahoma, trails were developed based on the easiest route to travel or from animal tracks. Osage Indian trails were later used for resettlement of additional tribes and by Anglos, and by their arrival an established network of roads and fords had formed. From these routes, later highways developed, including the Texas Road (later U.S. Highway 69). Individuals established better crossings at rivers and streams beginning in the 1820s using wooden rafts, flatboats, and later ferries powered by steam engines.

Military roads were begun in the early 1800s when the U.S. Army arrived to the territory. The first surveyed road in the state was conducted by the army under Lieutenant James L. Dawson in 1826; this route extended 55 miles from Fort Gibson to Fort Smith. Military roads became the chief routes for travel, supplies, livestock, and communication not only for the military but for other settlers and tradespeople, and continued to be developed into the 1870s. The army also built and operated ferries, most of which were timber plank bridges intended only for temporary use.

After Indians were relocated to Oklahoma Territory in the 1830s and 1840s the tribes gained control of travel routes and ferries and the governments of the Cherokee, Choctaw, Chickasaw, and Creek tribes began a series of legislative actions that further established public roads, primarily along section lines. In 1849 the Cherokee Nation approved annual taxes for the ferries they regulated on the Arkansas, Canadian, Neosho, Illinois, and Verdigris rivers. Each tribal government established ferry regulations that applied to its landholdings, and individual landholders operated ferries and toll bridges on the creeks and rivers on their land. Traders often operated ferries associated with their stores. By the 1850s, the army built more permanent wooden and wrought iron bridges.

Oklahoma Territory roads became popular routes during this time, and travelers to the frontiers of Texas and California passed through the area. Along the Texas Road turnpikes, toll bridges, and ferries were built by the 1870s. As railroads extended their lines through the territory, they also brought iron and steel truss bridges that were often the first permanent bridges erected in some areas. Railroad bridges were often adapted to allow crossing by horse and wagon; other times railroad bridge designs, or actual retired railroad bridges were used for road use. By the 1880s, cattle trails became important, and the Chisholm (later U.S. Highway 81) and Great Western trails were extended through Oklahoma Territory. Ferries began being regulated by Oklahoma Territory in 1890, which allowed counties to fix tolls, license ferries, and regulate their locations; after statehood, these regulations became state law.[4,5,6]

Prior to statehood, a system of county-led road construction and maintenance had been established, but roads and bridges on tribal lands were controlled by the Bureau of Indian Affairs. The mostly dirt roads were only sporadically maintained. Since the Indian nations and Oklahoma Territory did not have the financial resources nor the technology to properly maintain the roads, the public found they often had to deal with washed out crossings, quicksand filled stream and river beds, and other problems. Although railroad bridges were in use, most were simple wooden structures or "straw bridges" that consisted of straw mats which were laid on the river bottom.

The national campaign known as the "Good Roads" movement was founded in St. Louis in 1893 and found a foothold in Oklahoma in 1902 after a series of disastrous floods. The movement was sponsored by the U.S. Department of Agriculture's Office of Road Inquiry (later Office of Public Roads) and railroad companies. The railroad had just as much of an interest in good roads as the public, since better access meant that farmers could reach rail lines and markets more easily. In fact, railroads such as the St. Louis and San Francisco even used excursion trains to showcase the demonstration roads it had helped build in the Oklahoma Territory. The movement was able to secure provisions (including the establishment of a state highway department) during the 1906 Oklahoma State Constitutional Convention.

During the early years of statehood, individual townships had the responsibility of maintaining roads and local individuals were required to maintain the section-line roads, which were often the only roads that existed in the area. By 1911, the highway department existed, but received no funding for construction or maintenance of roads, nor did they have any authority. In fact, Oklahoma claimed only 23 miles of hard surfaced roads, the fewest in the United States. Only with the passage of the 1916 Federal Aid Highway Act were matching funds provided and state legislators made funding for state roads available. Previously, funding was channeled through county road improvement districts that had been established in 1909. Between 1917 and 1919, $690,834.00 in federal money was appropriated for Oklahoma roads, and counties matched this 50-50. Primarily due to the efforts of the Good Roads Association, rural roads continued to improve; farmers had better access to towns, railroads, and markets, which in turn improved the values of farm property and businesses.[7,8,9,10]

The turn of the twentieth century also brought advancements in bridge construction to Oklahoma. Counties increasingly purchased prefabricated, often mass-produced, metal trusses and suspension bridges (often tolled to save public money) from Midwestern bridge companies such as the Central States Bridge Company, Rochester Bridge Company, Vincennes Bridge Company of Indiana; the Canton Bridge Company of Ohio; John Gilligan Company and Monarch Engineering of Nebraska; Midland Bridge Company, Kansas City Bridge Company, and Canton Bridge Company of Kansas City, and the Missouri Valley Bridge and Iron Company of Kansas. These bridges could be transported to the site by railroad gondolas and erected by local workers supervised by a bridge company representative. This mode of bridge construction became a regular practice in the state, and several bridge companies benefited from opening an office in Oklahoma; the J. B. Klein Iron and Foundry Company (later Robberson Steel Company) and the Boardman Company both opened offices in Oklahoma City. Generally these metal truss and suspension bridges were good durable designs, and the convenience of "turnkey" service by bridge companies proved to be a successful solution for many small creeks and streams. Toll bridges lost

favor in the late 1920s, and public money was spent to buy out owners and transfer ownership to the state.[11]

Around 1915 the type of trusses used for shorter spans shifted from pin-connected Pratt pony trusses to half-hip, truss leg bedstead, and most commonly, the Warren pony truss with vertical members. Construction of bridges stalled with the United States' entry into World War I as labor and construction materials were reallocated to the war effort. After the war bridge construction resumed and transportation demands of the oil industry further spawned their construction. Steel truss bridges became the most popular choice for shorter spans, and were also used in combination with each other or with other span types for larger spans. Later, longer spans and heavier loads necessitated a further shift to the use of Parker through-trusses, and concrete pile trestles also saw wider use. In the 1920s, the camelback pony truss became the preferred type of state highway department engineers and was most commonly used from the 1930s through the 1950s on federally funded roads. This truss was also used in combination with other trusses such as K-trusses on larger spans. Automobile travel had arrived in Oklahoma in the 1920s and by 1926 there were 500,000 cars registered in the state. In 1924 Governor Martin Trapp established a state highway system to comply with a demand from the federal government for accountability for the funding it provided for roads; the newly created department was responsible for road construction and maintenance. The legislation also allowed for a gasoline tax and created the state highway commission. Roads in Oklahoma continued to expand, with asphalt, brick, and concrete roads replacing dirt roads. Even in the early 1930s, ferries and fords were still used, but had increasingly been replaced by bridges, and their types became more standardized as a result of more centralized control.[12]

During the Depression, construction of bridges and roads slowed, with the exception of those funded by federal programs like the Works Progress Administration (WPA) and the Civilian Conservation Corps. WPA grants amounted to over $4 million in 1937 alone. Funds were typically allocated to smaller projects and repairs, and it also provided for dismantling and moving trusses to new locations; however, some of the largest bridges in the state were built during the Depression. In all, 24 bridges that each spanned over 700 feet were built during that period. [13]

Bridge and road construction again slowed as the United States entered World War II; 24 road projects were stalled, and maintenance was deferred even as roads saw increased heavy use. The budget for the highway department was cut to below 1922 levels, and older metal bridges were demolished for scrap for the war effort. Road and bridge work was restricted to military and oil field purposes, which did lead to the construction of 65 bridges during the war years. Interstate highways and state sponsored turnpikes were constructed in the state after the war to meet increased demand and repair infrastructure damaged by wartime use and even in 1955 twenty percent of Oklahoma roads were unpaved. Standardized highway and bridge designs became the norm in the 1950s; concrete was increasingly used for both, and the use of metal truss bridges declined. Oklahoma's economy was jolted by the booming oil industry, and so was its transportation infrastructure by the time that the 1956 Interstate Highway program was created. By 2000, Oklahoma had 10 turnpikes and two Interstate highways carrying goods and travelers across the state. [14,15]

McClain County

McClain County is situated in Central Oklahoma and encompasses 580 square miles. The county is bordered on the north by Cleveland and Pottawatomie Counties, on the east by Pontotoc County, Garvin County on the south and Grady County on the south. The Southern Canadian River is at the northern border of the county and the Washita River flows near the southwestern corner.

This area was part of the 1803 Louisiana Purchase. American explorers and traders crossed the area, including Stephen H. Long, the Dodge-Leavenworth Expedition and Randolph Marcy. The U.S. government purchased this area from the Quapaw Indians in 1818 and then gave the land to the Choctaws. The U.S. Army built Camp Arbuckle in 1850 to protect the California Road. Other roads included a military road that connected Fort Smith, Arkansas to Fort Sill and a road to Fort Arbuckle. There was also the "Main Cattle Trail" laid out by Jesse Chisholm and other cattle trails connecting to Kansas City.[16,17,18]

In 1887, the Southern Kansas Railway came to McClain County. The Gulf, Colorado and Santa Fe Railway constructed a line north from Texas to what became the town of Purcell. The Eastern Oklahoma Railroad built tracks from Newkirk to Pauls Valley in 1900 to 1904. The Oklahoma Central Railway also built a railway line in 1906. All of these railroad lines were acquired by the Atchison, Topeka and Santa Fe Railway.[19]

Purcell is the county seat and was established as a railroad stop in 1887 at the junction of the Santa Fe and Gulf Coast Railroads. Purcell also served as a starting point for the Land Run of 1889 for the Oklahoma Territory. Purcell was also a transportation center where cattle were shipped north to markets.[20]

The county was a center of beef and dairy cattle ranching and farm crops included corn and cotton. After the Civil War, Montford Johnson, part Chickasaw, established a cattle ranch in the county. The ranch eventually covered much of the "Unassigned Lands" of Oklahoma as well as McClain, Grady and Garvin Counties. Cotton and corn as cash crops declined sharply by the 1960s as they were replaced by alfalfa, wheat, soybeans, and hay.[21]

The county's population at statehood was 12,888 and almost doubled to 21,575 by 1930. In the 1940s, the population declined to 19,205; and continued to decline until the 1980s. The proximity of the county to Oklahoma City attracted people who commute to work and the population in the county began to steadily increase.[22]

Research in the McClain County records proved somewhat inconclusive. There are several notations for bridge construction from 1910 through the 1940s in the records that were reviewed. The "Norman Bridge" is mentioned several times in the records over the years, however it is not known if this is the former toll bridge or the other "Norman Bridge" that was constructed. In 1917, the McClain County Commission voted to build "a free bridge across the Canadian River" from Purcell.[23] In the 1930s, during the 12th Legislature, a bill was passed to allow the State Highway Commission to purchase the toll bridges including this bridge. [24] Interestingly, the Purcell-Lexington Bridge Company filed to amend and

extend its charter which would have expired in 1931. The legislature must have been ready to pass the bill to purchase private bridges and toll roads around this time because the Governor refused to sign the charter. The toll bridge company took the state to court to force the Governor and the Secretary of State to sign the amended charter but they lost the case.[25] Additionally, a case was brought before the U.S. Supreme Court in 1932 and decided in 1933. This case was brought when the toll bridge company claimed to have a "perpetual" franchise and the state of Oklahoma refuted this. The case went to District Court, the Court of Appeals and then the Supreme Court. By the time it had reached the U.S. Supreme Court, the state had passed the law and started purchasing the toll bridges.[26] These cases were detailed in "The Oklahoman" as was the construction of the "new" adjacent to the toll bridge.[27] This new bridge was constructed because the old toll bridge was not wide enough to carry the traffic on the bridge.[28] The toll bridge remained in situ but was torn down in some time after the new bridge opened, possibly in the late 1930s, and a portion of the bridge was then placed over Walnut Creek at this time.[29]

PART II – ARCHITECTURAL AND ENGINEERING INFORMATION

General Description

The Walnut Creek Bridge carries vehicular traffic over the creek. The bridge was constructed circa 1913 and is a one-span Parker through truss. The Walnut Creek Bridge was originally part of the Norman Toll Bridge, which was completed in 1913 by the Kansas City Bridge Company in Norman. At 2,200 feet long, it was a major route for travel and trade in central Oklahoma. Spans from the bridge can be found throughout the state.[30]

The bridge is approximately 152 feet long with a width of approximately 17 feet. The top chord and end posts of the bridge have steel channels with lace. The bottom chord and diagonals have steel eye bars. The decking of the bridge is constructed of timber along the whole length. The substructure of the bridge has concrete abutments on either creek bank.

There is significant structural damage to the bridge. The wood decking has large holes in several locations. The steel guard rail is missing and steel bracing is bent is several locations.

Parker through Truss

The Parker truss was developed by mechanical engineer Charles H. Parker, who worked for the National Bridge and Iron Works of Boston. His patent for a variation of the Pratt truss (containing a polygonal or inclined top chord instead of a straight or curved top chord) was awarded on February 22, 1870. This variation allowed for reduced depths at the ends than at mid-span, where the loads were not as high, and shortened the vertical and diagonal members from the center to the ends of the truss, which reduced the amount of metal (and materials cost) for each bridge. Fabrication and erection costs were higher than the Pratt as the lengths for the diagonals and verticals at each panel were different; however, labor was not as driving a cost factor as materials at the time, and eventually the Parker became the dominant truss type over the Pratt for long spans after the turn of the twentieth century. The Parker became the most used highway department standard pony truss design for 30- to 60-foot

spans and through truss for 100- to 300-foot spans. Originally iron with pin connections, later Parker trusses were fabricated steel trusses with rigid riveted connections. Parker pony trusses were built until 1950.[31,32]

The Parker truss patent identified three areas of improvement over earlier truss types. The slope of the inclined end posts could be changed to allow for different bridge lengths; the top and bottom chord connections were new; and the connection of the top and bottom chords was simplified by the casting at the bottom of the end post. The way in which the Parker truss utilized inclined end posts and simple cast iron connections is identified as the most innovative changes with this truss design. Like many other truss designs, the Parker truss had many variations, although the Parker truss is typically classified through its inclined top chords consisting of straight members with changing degrees of inclination at the panel points.[33]

The most historically significant Parker trusses are early versions with pinned connections. The second most significant are those from the early twentieth century constructed by state transportation departments as a standard bridge type, with earlier examples (1900-1920) being the most important. Character defining features of the Parker truss include the polygonal top chord, inclined end posts, diagonals in each panel, verticals of different lengths that shorten going outward from the center panel, floor beams, stringers, struts, method of connection (pinned versus rigid rivets), and portal features such as struts and bracing.[34]

PART III – SOURCES OF INFORMATION

Original Drawings and Other Sources

No original drawings were found. The County Clerk's Office did have the County Commissioners' Meeting Minutes dating back to 1910. (Personal Communications, May 9, 2012, Visit to County June 29, 2012).

PART IV END NOTES

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[10] King, 5.

[11] King, 6-10.

[12] King, 10-17, 21.

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[14] Corbett.

[15] King, 32.

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[20] Smith, Charles, "McClain County", WPA Article, Vertical Files, Oklahoma Historical Society, Oklahoma City: 19 February 1936, 3.

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[27] The Oklahoman, *"U.S. High Court to Hear Toll Row",* October 11, 1932, p.16.
[28] The Oklahoman, *"No More of This: After 22 Years, the New Bridge is Being Built",* February 26, 1933.
[29] The Oklahoman, *"Day of Dreams Rolls Around, New Bridge Opens",* August 11, 1938, p. 3.
[30] King, 9.
[31] Guise, David. Abstracts & Chronology of American Truss Bridge Patents, 1817-1900. Society for Industrial Archeology, 2009.
[32] Parsons Brinkerhoff, "A Context for Common Historic Bridge Types" for NCHRP Project 25-25, October 2005: 3-35.
[33] Ibid.
[34] Ibid.

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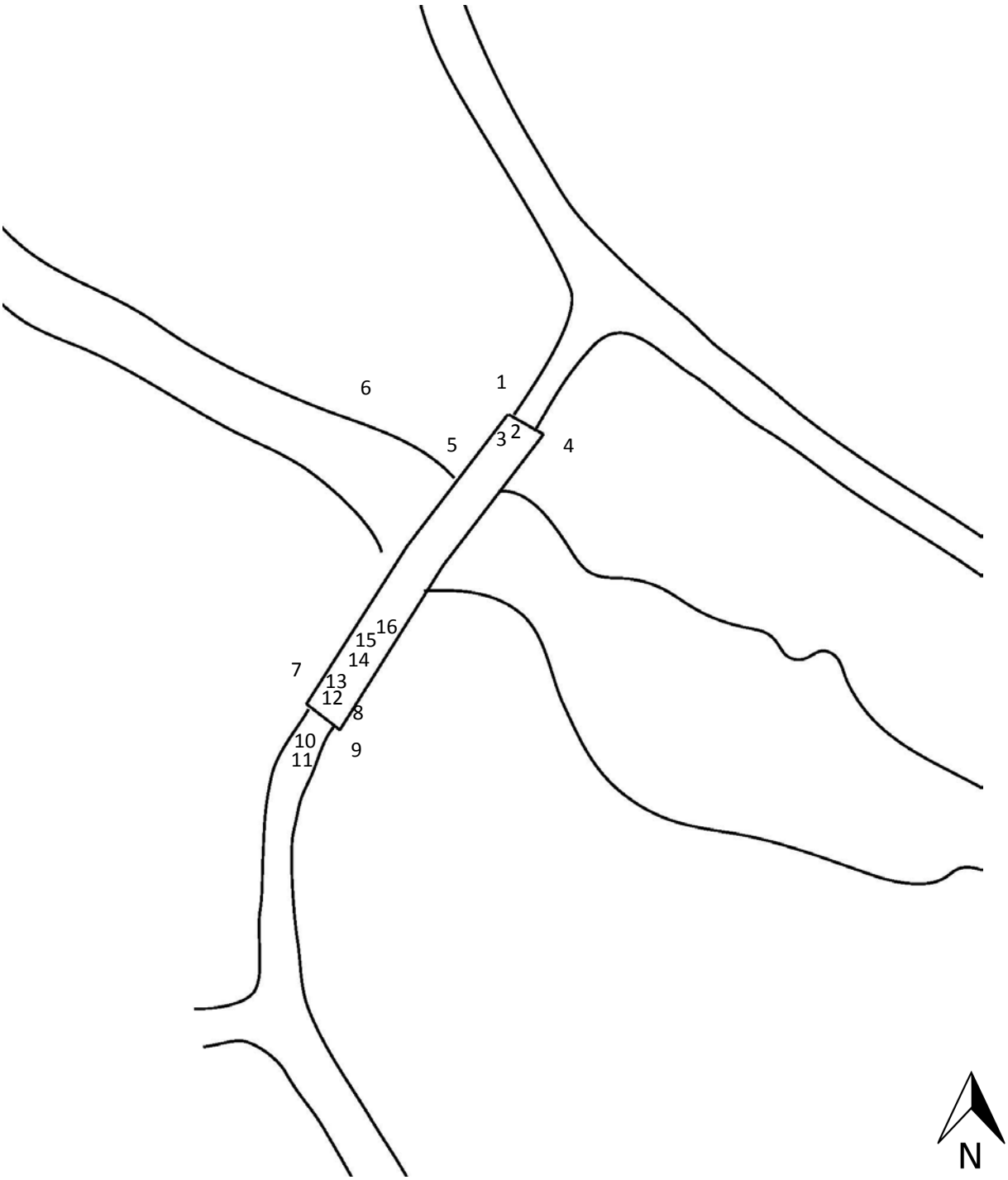
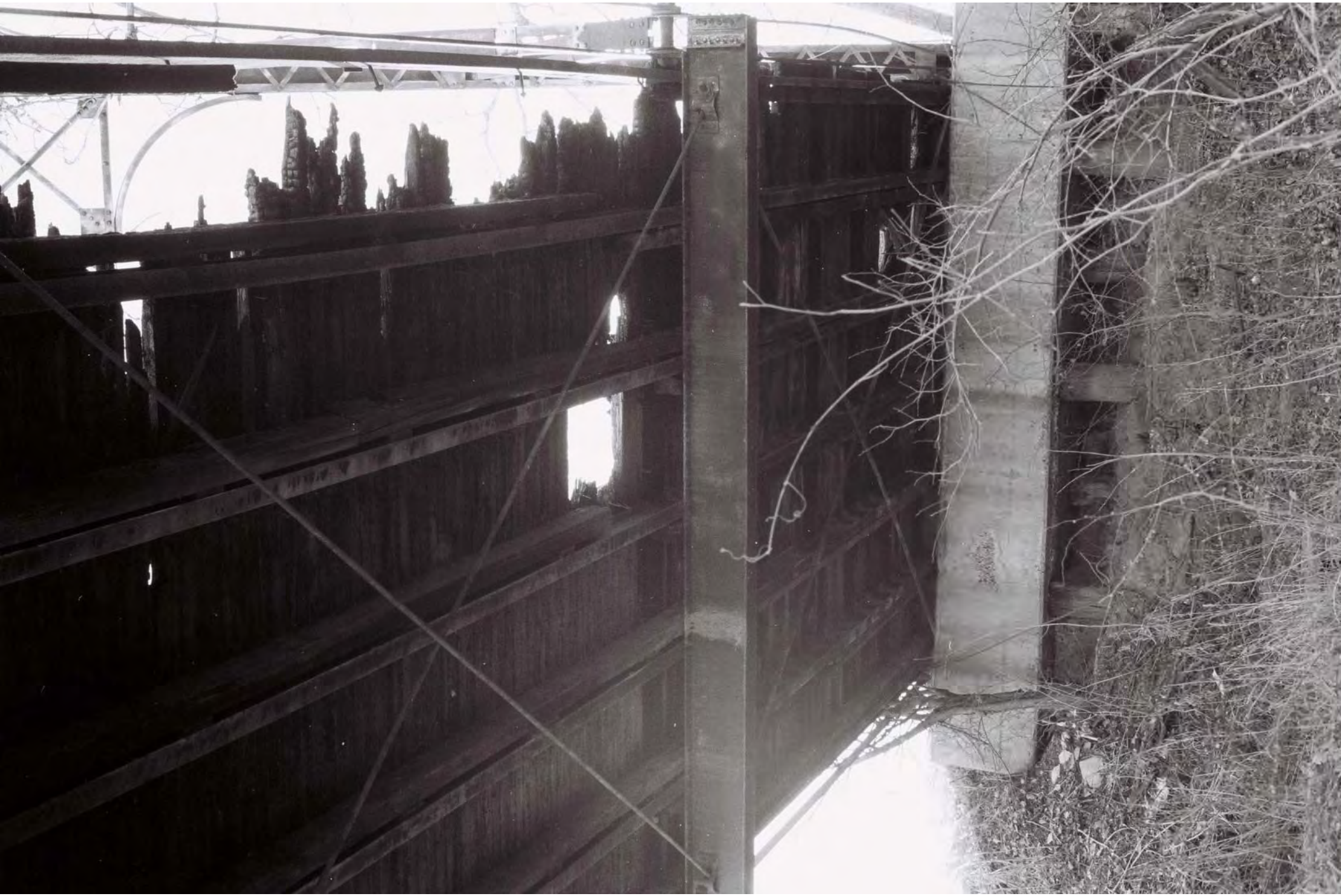
PHOTO KEY



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