West Virginia
Historic Bridge Inventory Form

Bridge No. 26-005/00-003.98 **BARS No.** 26A020 **Federal Bridge No.** 00000000026A020 **Bridge Design No.** 7526.0

IDENTIFICATION INFORMATION

SHPO Survey No. MR-0102
Local Name RUDE BRIDGE
Other Local Name

Owner State Highway Agency
Status Extant - in service

LOCATIONAL AND SETTING INFORMATION

District 06 **County** Marshall
Location 2.25 MI NORTH CR 16
Facility Carried By Structure COUNTY ROUTE 5
Features Intersected BIG WHEELING CREEK

Latitude 39594200 **Longitude** 080380600
UTM-Northing
UTM-Easting
UTM Zone
Surrounding Land Use Agricultural
Type of Development Rural - (undeveloped area outside communities)

STRUCTURAL INFORMATION

Main Span Type Steel Truss - Through/Pin Connected
Main Span Type Code 331
Number of Spans in Main Unit 001
Number of Approach Spans 0001

Structure Length (ft) 215
Length of Maximum Span (ft) 170
Average Daily Traffic 000350 **Year** 2002
Sufficiency Rating 0115 **Skew** 05
(Note: Data current as of April 2006 database)

BRIDGE DESCRIPTIVE INFORMATION

Year Built 1896
Year Reconstructed
Truss Bridge Type Whipple

Arrangement Through
Connection Type Pin/bolt
Truss Details Double Trapezoidal

Alteration(s)	Date of Alterations (Year)
Replacement of main members	1975
Added main members	1988

Architectural Treatment(s)

Bridge Plate Text
(1) plaque. "1896, WROUGHT IRON BRIDGE CO., BUILDERS, CANTON, OHIO"

BRIDGE HISTORY

Engineer or Designer
Builder or Fabricator Wrought Iron Bridge Company
Bridge Plan Location Repair plans are available in the District.
Additional Details: Open metal grate deck with timber curbs, metal lattice railing, and guardrail. Pin connections with bolts on steel girder approach spans. Concrete abutments and wingwalls with a steel column pier. According to inspection files, main members were replaced in 1975 and added in 1988. The alterations appear to be in-kind. This bridge is an example of a Double Whipple Trapezoidal through truss which is an uncommon type in West Virginia and was designed or constructed by a national engineer or firm.

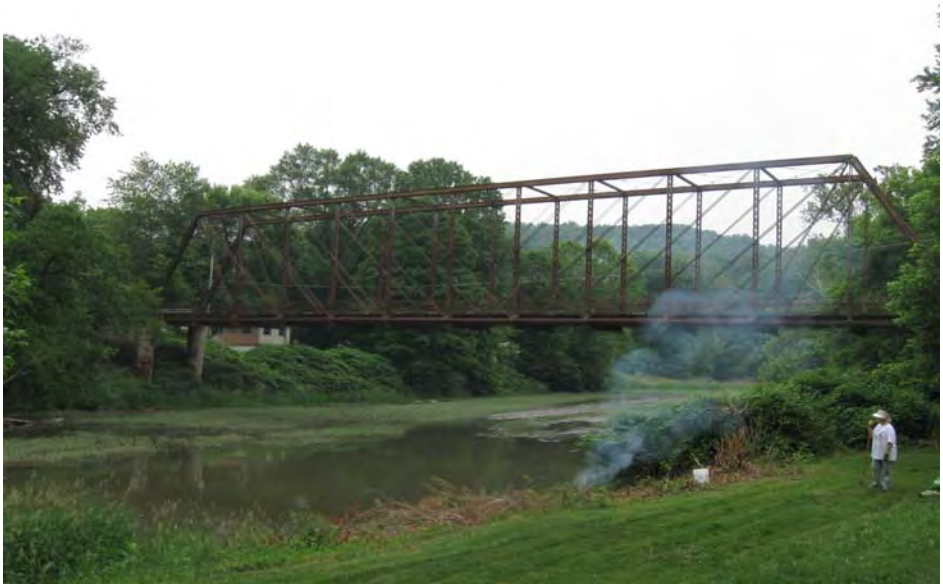
Bridge No.	26-005/00-003.98	BARS No.	26A020	Federal Bridge No.	00000000026A020	Bridge Design No.	7526.0

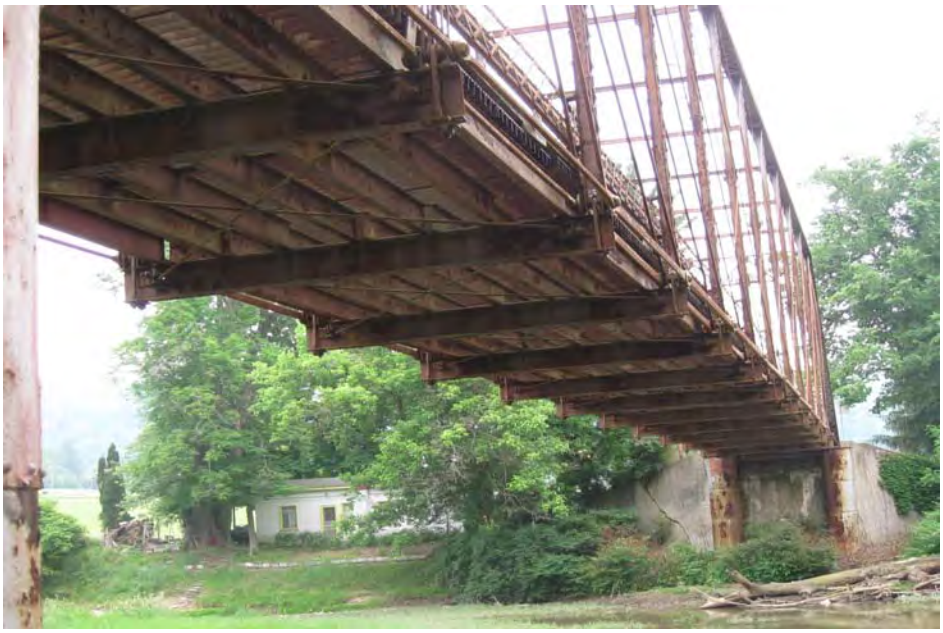
NATIONAL REGISTER EVALUATION INFORMATION

National Register Determination **Reason Not Evaluated**

National Register Determination Date

This bridge is an example of an uncommon type or displays an unusual design element that represents the individuality or variation of features particular to this bridge type.
This bridge was designed or constructed by an engineer or firm whose work is distinguishable on the national level.
Although this bridge has undergone alterations, it still retains the historic integrity necessary to convey its engineering significance and, therefore, is eligible for the National Register under Criterion C.





West Virginia Historic Bridge Inventory Form
Form Prepared By Mead & Hunt and KCI
Form Preparation Date 2011

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

Name: Rude Bridge Replacement Project
Survey #: State Project: S326-5-3.98
Survey / FR#: STP-0005 (109)D
Form Prepared by Tracy D. Bakic (WVDOH) on March 24, 2015

Setting: The existing Rude Bridge carries County Route (CO) 5 over Big Wheeling Creek in northern Marshall County. CO 5 is also known as Big Wheeling Creek Road. The crossing is approximately 2.25 miles north of the CO 5 intersection with CO 16. Big Wheeling Creek (also simply called Wheeling Creek) flows northwesterly into the Ohio River at Wheeling approximately 13 miles northwest of Rude Bridge. CO 5 is functionally classified as a Rural Major Collector and is used by mail carriers and school buses. The 2013 average daily traffic (ADT) count for Rude Bridge is 500 vehicles per day. The surrounding landscape is a hilly rural setting that includes farm structures and private recreational camp residences and other associated structures.

Description of Bridge: Rude Bridge was built in 1896 by the Wrought Iron Bridge Company of Canton, Ohio. The single lane structure has an overall length of 215 feet, four inches (out to out of backwalls) and consists of a two spans – the main through truss span and a shorter deck girder span at the east end. This bridge has a 12-foot, six-inch (min.) road width (between wood curbs). The horizontal clearance (railing to railing) is 13 feet, eighth inches for the main span and 13 feet, two-and-one-half inches for the deck girder span. The vertical clearance for the truss span is generally 19 feet, three inches. Due to the narrow width, hazard warning paddles alert traffic to the narrow conditions and the weight limit on the bridge is currently posted at 12 tons.

Main Truss Span. The main bridge span is a wrought iron pin-connected through truss of a bridge design type known as the Whipple Trapezoidal Truss or Double-Intersection Pratt Truss. This span is 170 feet long, measured from center to center of the truss end bearing pins. The width measurement from centerline of the north (upstream) truss to centerline of the south (downstream) truss is 15 feet, three inches. The steel superstructure consists of a pair of trapezoidal-shaped trusses – each composed of top and bottom chords, end posts, hip verticals, vertical posts and diagonal tension members – that are connected by floor beams and lower lateral bracing below and by portal struts, sway struts and upper lateral bracing above.

The truss span's superstructure components include:

Lower Chords. The original lower chord of each truss is composed of paired sets of wrought iron eyebars. The pairings at the first two bays from each truss end consist of square-profile eyebars. The remaining mid-span lower chord pairings consist of rectangular-profile eyebars.

Upper Chords and End Posts. Each upper chord and slanted end post is composed of two steel channel beams with steel plate riveted onto the upper/outer side and lattice bracing bolted at the undersides. Steel angles are bolted to the bottom of the upper chords and end posts and are welded at hip joints (via gusset plates) and at bearing plates; the steel angles were added in 1975..

Hip Verticals. Each hip vertical – the first tension member in from each truss end – is composed of an original round-profile eyebar. All four hip verticals were later (in 1975) supplemented by steel loop bar hangers (with turnbuckles).

Main Vertical Posts. The main vertical posts are each composed of two steel channels and lattice bracing on two sides (riveted to the channel flanges); midway up each post are steel batten plates with retainer clips used to secure the diagonal tension members. The area between each vertical (and hip) post creates a "panel."

Diagonal Tension Members. The diagonal tension members of each truss are mainly composed of paired square/rectangular-profile eyebars. All of the eyebars extend the length the two truss panels, which is the prominent design feature of a Whipple Trapezoidal Truss (Double-Intersection Pratt Truss). The central four panels of each truss include "criss-crossed" diagonals; unlike the majority of the diagonal tension member on the two trusses, four of the diagonal tensions members in this central area of each truss are composed of paired round-profile eyebars (with turnbuckles). All diagonal tension members are secured to the main vertical posts via retainer clips.

Portal and Sway Struts. The portal struts and associated bracing are composed of steel L-shapes and are attached between the end posts at each end of the truss span. The sway struts are each composed of a channel with steel plate riveted to the top and bottom flanges; they are attached between the upper chords and match the spacing of the main vertical posts.

Top Lateral Bracing - Top lateral bracing are the crossed round-profile eyebars (with turnbuckles) between each upper panel (area between each portal/sway strut).

Floorbeams. There are 13 equally-spaced steel floorbeams. Each is a 15-inch-deep I-beam that measures 15-feet, nine inches across and is affixed between the two trusses. Two of the floorbeams are associated with the bents at the span ends. The original floorbeams were removed and replaced in 1975.

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Description of Bridge (cont'd):

Bottom Lateral Bracing – Bottom lateral bracing is crossed eyebars between each lower panel (area between each floorbeam).

Stringers– There are seven steel stringers per each of the span's 12 lower panels that are aligned east-west from floorbeam top to floorbeam top. Each is a 12-inch-deep wide-flange steel beam. The original steel stringers were removed and replaced in 1975.

Railings. Railings are attached to the inward-facing side of each truss are composed of an upper and lower parallel run of steel L-shape rails with steel lattice-work between. The railing measures 21 inches from upper rail to lower rail, and the height of the railing from the bridge deck surface to upper rail is two feet, eight inches.

Plaques. No plaques presently exist on the structure; however, WVDOH District 6 removed the two plaques sometime between July 2012 and July 2013 and they are presently held at that district's office. The plaques were originally attached to the portal bracing at each end of the bridge.

Deck Girder Span. The deck girder span at the east end of the bridge is 39-feet-long and has a superstructure that consists of two 24-inch-deep wide-flange steel beam girders connected via steel floorbeams below. The floorbeams are 16-inch-deep I-beams, each 16 feet, six inches across. The floorbeam at the caisson bent (shared with the main truss span) has tapered ends that are supported on the caissons. The two mid-span floorbeams are attached to the girders via steel connectors, each composed of a steel plate welded to the girder and a length of steel angle bolted to each side of the plate and floorbeam web below. The floorbeams are topped by smaller profile steel beam stringers (12-inch-deep wide-flange beams). There are seven stringers per each of the span's three lower panels. The original floorbeams and stringers were removed and replaced in 1975 and the extant angle diaphragms (between the stringers) were added in the same year. There is a standard steel guardrail on each side of the span.

Decking. Both spans of the extant bridge have non-original steel five-inch (depth) open grid decking with timber curbing. This replaced timber decking in 1988. The modern curbing (with scuppers) is composed of a double-thickness of three-inch by eight-inch timber board bolted to the timber decking beneath. There are no sidewalks or approach railings at either end of the bridge.

Substructure. The bridge's substructure includes two steel caisson bents that support both ends of the main truss span and the west end of the deck girder span. Both bents include a pair of crossed diagonal tension members (round-profile eyebar with turnbuckles) attached between the caissons. The west bent has a concrete backwall with wingwalls constructed up against it. The east end of the deck girder span is supported on a full height reinforced concrete abutment that includes a breastwall, backwall and wingwalls.

The maintenance history of the bridge includes the following work completed by WVDOH District bridge repair crews (WVDOH 1995, 2015):

1975 At the truss span, the stringers were removed and replaced and angle diaphragms were added. Angles were attached to the end posts and top chord members. Loop bar hangers were added at the hip verticals at both ends of each truss. The floor beams were reinforced by welding 1/4" plates at the top and bottom flanges. At the deck girder span, the original girders, floor beams and stringers were all removed and replaced and angle diaphragms were installed. A new timber deck was added.

1988 The timber deck was replaced with steel grid decking and timber curbing was installed. The floor system and lower chord was sandblasted and painted with one coat of primer. Two additional stringers were added to the deck girder span.

1989 At the west end of the truss span, repairs were made to the floor beam at the bent.

2009 Steel angles were added to strengthen the bearings at the east end of the truss. A crack was welded at the top of the south (downstream side) cap at the eastern bent. Steel plates were welded to the web and bottom flange of the floor beam at the eastern bent.

2012 At the truss span, the stringer bearing at the west bent was repaired along with stringer replacement and floor beam repair, and the north (upstream side) end post was repaired at the west bent. At the deck girder span, the south (downstream side) girder was repaired, floorbeam repairs were made, and stringers were replaced.

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Description of Bridge (cont'd):

The bridge currently has a sufficiency rating of 14.4 and is considered in poor condition and structurally deficient. In WVDOH's January 2015 bridge inspection report the most serious deficiencies observed are: the wrought iron fracture critical pin connected eyebars are in poor condition with up to 40% eyebar loss with some members affected by foundation settlement, overloading and/or impact damage; fracture critical loop bar supplemented hangers display stress sensitive butt welds and unequal load distribution; fracture critical wrought iron diagonal eyebars exhibit major corrosion, unequal tension, welded repairs, were from cross members, and impact damage, with lower chord eyes having up to 61% loss; and vertical posts display major packed rust at the lower chord pin plates, with up to 62% loss to pin plates, and batten plates at mid-panel have up to 100% lost with diagonal retainer support components missing at random locations.

Statement of Significance:

Marshall County was established by an act of Virginia General Assembly on March 12, 1835, formed from part of Ohio County. However, the present county area had its earliest documented white settlers by the 1760s-70s (Forbes 2013). After the State of West Virginia was created in 1863, Marshall County was subdivided into nine townships. Then in 1872 a new state constitution was ratified and the nine townships were reestablished as magisterial districts. Thus, Big Wheeling Creek became the boundary line between Union and Sand Hill districts, and Rude Bridge spans between them. The historic use of both districts in this area has been agricultural (MCHS 1984:28; Newton et al. 1879:406,425; Snell 2012; WV 1866 [*Acts of Legislature*]:27-28; WV 1905:24; WV Dept. of Free Schools 1866:62; White 1873).

To the east side of Rude Bridge is a large landholding that, by 1871, was owned by J. Downing, likely James Downing (Beers 1871). James was a farmer and his wife, Maria Grandstaff Downing, kept house. They had 12 children. By 1920 Henry Gus Hummel owned this property and operated it as a farm. Henry and his wife, Elizabeth, had at least five children. Eventually, one of their sons - George Oscar Hummel - took over the property. George married Ruth Hipsley in 1927 and they had their only child – a son, George Robert Hummel in 1934. George Oscar was a farmer and dairy man. HIs son, who went by Robert, inherited the farm and later transferred it to a friend, John Gray (Ancestry.com; Schafer 2015; WVGenWeb.org). Today the majority of this property (126.23 acres) is owned by John Alvin Gray (Marshall County Assessor).

To the west of Rude Bridge is another large landholding that was associated with John Rodefer by the early quarter of the 1800s. The property then went to Albert Davis, who married John's daughter in 1827. Albert operated the land as a farm. One of Albert's sons - Silas Rodefer Davis – continued the farm use of the property, as did Silas' son, Harry Albert Davis until ca. 1920. Until at least 1909, the landholding was 357+ acres (. Around 1920 Edward J. Rude and his wife, Mabel S., came to the property and operated it as a dairy and poultry farm. They had one child in 1923 – a daughter named Betty Jane. Betty Jane married Roy Alvin Schafer in 1943 and by the late 1950s the couple was living on the family property. Today, Betty Jane and one of her sons - Roy Schafer, Jr. – live on the property which is now 213.4 acres, renting out the farmland for grazing/pasture land (Ancestry.com; Hogg 1909; MCHS 1984:132-33; Schafer 2015).

Both the Gray and Schafer properties include recreational camp-type rental lots along the banks of Big Wheeling Creek.

Big Wheeling Creek Road (CO 5)

A local or country road (or roads) associated with Big Wheeling Creek likely existed before the 1850s-1860s. However, the earliest formal documentation located regarding intended road improvements along the waters of Wheeling Creek to the Pennsylvania state line was in 1853 (VA 1853:51,123,141). The Wheeling Creek Turnpike Company was incorporated in 1858 with Albert Davis - who owned the property directly west of Rude Bridge - listed amongst the Marshall County directors for the company. The road was to extend from a point on the National Road (to the north is Ohio County), "up the valley of Wheeling creek, to the forks thereof; then with the branch of each fork of said creek to the Pennsylvania line" (VA 1858:141).

Once the State of West Virginia was created, it appears that the Wheeling Creek Turnpike Company was reorganized as the Wheeling Creek & Pennsylvania Turnpike Company. The new company was incorporated on October 30, 1863 with Albert Davis again listed as a director. This company planned for a 20- to 30-foot-wide graded toll road "from a point near Mrs. Lydia Cruger's, on the National Road, in Ohio County, and then along the ravine or valley of Wheeling Creek, to a point on the line between the State of Pennsylvania and this state, so as to connect with a road which may be made in the state of Pennsylvania" (WV 1866 [*Constitution*]:89-90). An early clear map depiction of a road following the banks of Big Wheeling Creek is in 1871 (Beers 1871).

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Statement of Significance (cont'd):

With no other information available, it can only be speculated that today's Big Wheeling Creek Road (CO 5) through the Project Area may have resulted from planning the above turnpike, particularly due to the interest of Albert Davis and others along Big Wheeling Creek such as Sherrard Clemens, Alexander Caldwell, Joseph Sheppard and William McCreary (WV 1866 [*Const.*]:90). However, it is presently unknown if this road was ever used as a toll road. Previous research conducted of turnpikes by WVDOH or other turnpike information available does not include information related to a Wheeling Creek & Pennsylvania Turnpike Company or the present CO 5 alignment being part of any known turnpike road.

Bridge and Road Improvements. It was not until the year 1882 that an iron bridge was erected in Marshall County. Three iron/steel truss bridges were reportedly erected that year by the order of the county court - one over Big Grave Creek, the Graysville Bridge over Fish Creek, and the Shepard (or Shepherd) Bridge over Big Wheeling Creek near Burch Run (Powell 1998:89). (WVDOH records give the Graysville Bridge an 1886 construction date, but the correctness of the date is uncertain with information available.) The Shepard and Graysville bridges, both built by the Wrought Iron Bridge Company of Canton, Ohio, are of similar construction detailing and still exist today, although both closed to traffic. Other steel truss bridges were soon to be built through the county including Adaline Bridge over Fish Creek (1892; to be demolished ca. 2015-16), County Line Bridge (ca. 1895, dem. ca. 1960), Rude Bridge over Big Wheeling Creek (1896), Langmyer Bridge over Big Wheeling Creek (1897, dem. ca. 1980) and Shepherd Bridge over Fish Creek (1897, dem. 2010; *Engineering News* 1895:188; *Paving and Municipal Engineering* 1895:49). It can only be speculated that the iron/steel truss structures replaced earlier wood bridges.

By 1925 many miles of Marshall County roads had reportedly been macadamized or paved with brick (Powell 1998:90). As early at 1909, residents living along the northernmost approximate four miles of Big Wheeling Creek Road raised $1500 to repair the road, including grading and macadamizing (*Municipal Journal and Engineer* 1909:865). "Wheeling Creek Road" and "Big Wheeling Creek Road" are earliest referenced in Marshall County in WV State Road Commission (SRC) annual reports dating to the late 1920s. The two names are considered related to the same road since, of the main Wheeling Creek waterway and its three major branches, Big Wheeling Creek is the only portion in Marshall County. The earliest district-county work mentioned for the road is the paving of two miles with waterbound macadam by June 1927 (WV SRC 1927:87). By 1933 the approximately 7.5-mile-long Big Wheeling Creek Road (CO 5) was depicted as paved from the Ohio County line and through the Rude Bridge area with the remaining approximately three miles to the south shown as having gravel- or shale-surfaced and unimproved sections (WV SRC 1928:85, 1931:110, 1932:123, 1933:119 & 1933 map).

By the late 1930s improvements to Big Wheeling Creek Road, or Secondary Route 5 as SRC called it then, appear to have been handled by state forces. State Project No. 5405 was authorized in 1938 to grade, drain and apply road mix to 6.08 miles of the roadway from the Ohio County line to Shepard (Shepherd) Bridge. This work, which included the Rude Bridge area, was completed by the early half of 1940 under contract with Tri-State Asphalt Corp (WV SRC 1937 map & 1941:311). The paved portions of the road received bituminous sealing by Winter 1945 and was completed by state forces (WV SRC 1943:69, 1945:159). The southernmost 1.5 miles between CO 5's intersection with CO 16 and CO 7 has never been more than gravel/stone-surfaced to the present (WVDOT 2014).

Over time, three of the four steel truss bridges known to have been installed along Big Wheeling Creek Road prior to 1900s automotive highway development were replaced by newer structures. The Marshall-Ohio County Line Bridge's truss superstructure was removed to be replaced in 1960 with the extant steel girder and floorbeam span; however caisson bents from the truss bridge were reused for the new structure (Bridgemapper.com). The Langmyer Truss Bridge was removed, having been replaced in 1980 with the existing two-span steel stringer structure. Finally, the Shepard Truss Bridge was replaced in 2003 with a prestressed concrete box beam span installed west of the original CO 5 alignment. However, the Shepard truss bridge was retained in its original location and closed to traffic; the associated road alignment is now overgrown and unnoticeable. Rude Bridge is the only steel truss bridge that remains in use along CO 5 today.

Rude Bridge – As mentioned above, Rude Bridge was built in 1896 by the Wrought Iron Bridge Company. No information has been found about maintenance of this bridge through 1941. Sometime between June 1942 and February 1943, state forces performed unspecified maintenance on the bridge (WV SRC 1942:52 & 1943:69). There was an authorization in August 1949 for the repair and re-flooring of the Big Wheeling Creek bridges. This work was completed by August 1951 and it can only be speculated that Rude Bridge received the repairs (WV SRC 1952:313). It is known that in July 1969 bids were being requested to repaint this bridge (*Charleston Daily Mail* 1969).

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Statement of Significance (cont'd):

The 1943 annual SRC report is the earliest documentation found in the present research that identifies this structure by the name "Rude Bridge." (WV SRC 1942:52 & 1943:69). This name was likely attributed to the bridge since ca. 1920 when the Rude Family's residence began on the property west of the bridge and/or was assigned the name by WV SRC sometime thereafter. Identifying a local bridge by using and adjacent property owner's name is common throughout state. However, this bridge was constructed about 24 year prior to the coming of the Rudes to the area.

Rude bridge was actually built during the tenure of the Davis family. In the *History of Marshall County* (MCHS 1984) it is noted on page 132 that Silas R. Davis "served as a Marshall County commissioner, and was responsible for the bridge near his property still called the Davis Bridge"; it is speculated that this is the same structure as the Rude Bridge. It also appears that Silas' father, Albert, had interests in improvements to Big Wheeling Creek Road as early as the 1850s. It is not historically uncommon that farmer's became active/involved in local government, such a county commissioner, or organizations/corporations to improve and maintain infrastructure that would benefit the agricultural business in their area. Silas was just one of a group of commissioners in his term(s) to approve any local bridge construction.

Wrought Iron Bridge Company of Canton, Ohio

"David Hammond formed the Wrought Iron Bridge Company in 1866 in Canton, Ohio. This firm was one of the most productive bridge companies in the United States (US) in the nineteenth century and energized the bridge building industry with its diverse patents. As one bridge historian had noted, 'it would be difficult to overestimate the importance of this firm to the history of metal bridge engineering in [Ohio] and [the] nation' (Simmons 1978) . . . The company erected nearly all forms of truss, arch, swing and plate bridges and iron piers . . . The firm grew steadily through the 1870s, 'perhaps becoming the most prolific 19th century iron bridge fabricator in the country' (Ashback-Sladik and Fraser 1991:1)" (Carver 2008:218). Hammond later (ca. 1891-92) helped form a rival bridge works, the Canton Bridge Company (Carver 2008:219).

"By 1881 the [Wrought Iron Bridge] company had built bridges in 25 states and Canada for a total of approximately 3,300 bridges." By 1883 the number reportedly had risen to 4,600 spans in 26 states, Canada and Mexico. By 1885, the company claimed to have erected bridges in 30 states, Canada and Mexico (Carver 2008:219). In 1901-1902, the American Bridge Division of U.S. Steel purchased 28 companies, including the Wrought Iron Bridge Company, and merged these companies to form the US Steel subsidiary known as American Bridge Company. Due the Great Depression, US Steel closed the Canton plant in the fall of 1930 and sold the property (Carver 2008:219).

Whipple Trapezoidal Truss (aka, Double-Intersection Pratt Truss, Whipple-Murphy Truss, Linville Truss).

Squire Whipple was an engineer from New York. He built his first iron truss bridge – a bowstring arch truss - in 1840 over the Erie Canal. It was the second all-metal truss bridge built in the US. Whipple received a patent for this design in 1841 and it became the first metal truss to be used widely and was the first based on scientific principles (Carver 2008:267; PB & EIH 2005: 2-7, 3-22; Solomon 2008:34-35). Reportedly, there are no Whipple Bowstring Arch bridges in West Virginia (KCI et al. 2013:61).

About a year later, engineer Thomas Pratt designed the first Pratt Truss. In 1844 Thomas and his father, Caleb, were granted the patent for the design, which used wood vertical compression members and wrought iron diagonals in tension. Initially not popular due to the expense of the metal, things turned around when all-iron bridges became a favored type for the nation's railroads (PB & EIH 2008:3-25). Squire Whipple's take on the Pratt Truss, was a design he called a "Trapezoidal Truss" which is often today also labeled as a "Double-Intersection Pratt Truss." He built his first trapezoidal truss in 1846 and patented the design in 1847 (Carver 2008:298; PB & EIH 2008:2-7, 3-28; Solomon 2008:36). Whipple determined that by "extending the diagonal members over two panel lengths, the depth of the panel was increased without altering the optimal angle of 45 degrees; thus, the span length could be increased" (PB & EIH 3-25).

The first Whipple Trapezoidal Truss bridge was erected in 1853 near Troy, NY for the Albany & Northern Railroad. The early bridges of this design had cast iron top chords and end post and wrought iron lower chords; connects were with cast iron trunnions. In 1861 Engineer Jacob H. Linville built a Whipple Trapezoidal Truss bridge over the Schuylkill River using wrought iron eyebars and posts for the first time. In 1863 Engineer John W. Murphy erected a his version of the Whipple bridge over the Lehigh River in Mauch Chunk (now Jim Thorpe, PA) using all wrought iron members, including the replacement of the trunnions with wrought iron pin connections. It has been considered the first truss bridge in which pin connections were used throughout (*Engineering News* 1889; PB & EIH 2008:3-28, -29).

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Statement of Significance (cont'd):

The Whipple Trapezoidal Truss was not fully favored until the 1860s after Murphy's pin connection improvement made for easier factory manufacture of components and simpler assembly on site. As well, the wrought iron pin insulated bending stresses (Solomon 2008:40). From that point the Whipple became a well-used bridge type for railroad and vehicular bridges of the late 19th century (PB & EIH 2008:3-28). Although extremely popular from about 1865 to 1885, the use of this bridge type lessened afterward with preference going toward the Camelback or Parker trusses which were less complex to erect (Carver 2008:298).

Criterion A

Rude Bridge was constructed in 1896 and was part of a transition to iron/steel truss bridges in Marshall County that began in 1882. Although there appear to have been plans in the 1850s and 1860s for improvements to create a turnpike road along Big Wheeling Creek, it is presently unknown if the extant Big Wheeling Creek Road (CO 5) was actually used as a toll road. Regardless, a road along the creek existed by the 1800s and at least four iron/steel truss bridges were associated with it – County Line Bridge, Langmyer Bridge, Rude Bridge and Shepard (Shepherd) Bridge. Presently only two of these truss bridges still exist. Shepard (Shepherd) Bridge was abandoned for a new road alignment and bridge; the 1882 was left in place and the associated abandoned road approaches are overgrown and unnoticeable. Rude Bridge is the only extant example of a steel truss bridge still in use on the historic Big Wheeling Creek Road alignment. Thus, Rude Bridge meets Criterion A of the National Register for Historic Places (NRHP) at a local level for its association with 19th-century rural road development in Marshall County.

Criterion B

This structure has been known as the Rude Bridge since some point after the Rude Family moved onto the property just west of the bridge around 1920. No information of notable significance relates to Edward J. Rude or his relatives associated with the property. Prior to this, the bridge was likely identified with the prior owners of this property, the Davis Family. Silas R. Davis was a county commissioner and may have had some influence, along with colleague commissioners during his term(s), over the building of this bridge and others in the county. However, involvement of farmers in local government was common and Silas Davis' speculated bridge-related contribution is not unique. Thus, this structure is not known to have been associated with the significant productive period of some notable person's life, nor to have been associated for any length of time with such a person, nor to be the best representation of such a person's historic contribution (NRHP Criterion B).

Criterion C

Rude Bridge, built 1896 by Wrought Iron Bridge Company of Canton (Ohio), was previously evaluated for the West Virginia Statewide Historic Bridge Survey and was determined eligible for the NRHP under Criterion C for its engineering significance and its association with a master builder (KCI et al. 2011 & 2013: 25, App. F p.247). Per the 2013 Survey there are approximately 120-130 metal through truss bridges (wrought iron and steel; pin-connected and riveted) remaining in WV that were built prior to 1965. They are dispersed amongst 46 counties. In the survey, eight such truss bridges are identified in Marshall County (KCI et al. 2013: Hist. Cont. pp. 29,63 & App. F pp.247, 253). However, two of the eight – the Shepherd and Denver bridges over Fish Creek have been demolished (Bridgehunter.com). Thus, Marshall County currently appears to have six remaining metal through truss bridges - Adaline, Meighen, Kausooth and Graysville bridges, all over Fish Creek, and the Shepard(or Shepherd) and Rude bridges, both over Big Wheeling Creek. Of these, four - Adaline, Graysville, Rude and Shepard bridges - are Whipple Trapezoidal through truss structures, and all happen to be constructed by the Wrought Iron Bridge Company. All four bridges have previously been found NRHP-eligible under Criterion C (KCI et al. 2013: App F p. 247; WVDOH files). Adaline Bridge is set to be removed and replaced ca. 2015-16.

The four remaining Whipple Trapezoidal through trusses in the county appear to represent at least two different phases or types of construction detailing related to Wrought Iron Bridge Company. For example, the Shepard Bridge (blt. 1882), Graysville Bridge (1886) and Adaline Bridge (1892) have similar latticed portal and sway strut details, while Rude Bridge (1896) demonstrates A-frame portal and simple channel sway struts. The only other Marshall County bridge presently known with similar portal and sway strut detailing to Rude Bridge was Langmyer Bridge over Big Wheeling Creek, which was a regular Pratt through truss built in 1897 and demolished ca. 1980 (Harding 1978). The A-frame portal was a common metal through truss detail not limited to one specific contractor/designer.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

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Statement of Significance (cont'd):

Rude Bridge's steel caisson bent substructure appears to have been commonly used by the 1890s on bridges. They are/were also demonstrated on the following Marshall County spans: Kausooth Bridge (blt. 1906), Meighen Bridge (blt. 1913), the reused ca. 1895 bents at present County Line Bridge, Langmyer Bridge (blt. 1897, dem. ca. 1980) and Shepherd Bridge over Fish Creek (blt. 1897, dem. 2010). The deck girder portion of the overall span is of common construction for the period built.

Although Rude Bridge has undergone alterations (mainly to decking and floor beams/stringers below), it still retains good overall integrity in conveying the engineering significance of its truss design and builder. WVDOH continues to agree with the 2013 Statewide Historic Bridge Survey finding that Rude Bridge is eligible under NRHP Criterion C. It is eligible under this criterion for its engineering significance as an example of Whipple Trapezoidal through truss, an increasingly uncommon bridge type in Marshall County and all of West Virginia, and as a representation of the work of the Wrought Iron Bridge Company, a bridge builder distinguishable on a national level.

Criterion D

This structure is not likely to have important information that will contribute to our understanding of human history or prehistory. Construction appears to have utilized commonly known techniques, tools and materials. The potential for information is minimal, so it does not meet NRHP Criterion D.

Due to conflicting periods of construction and/or lack of integrity of farm structures and residences in the vicinity, this property is not a contributor to a significant historic district or historic landscape.

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Name: Rude Bridge Replacement Project
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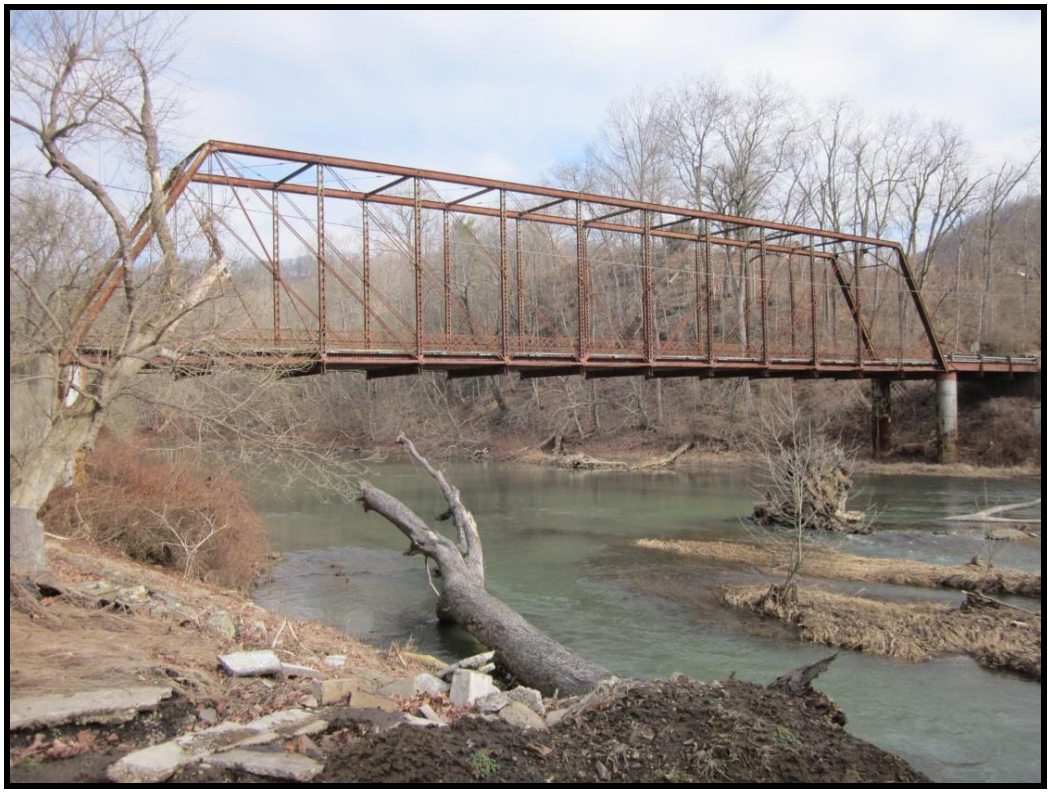

South (Downstream) Side Elevation. View Northeast (WVDOH Feb. 10, 2015)

North (Upstream Side) Elevation. View Southeast (WVDOH Dec. 3, 2013)

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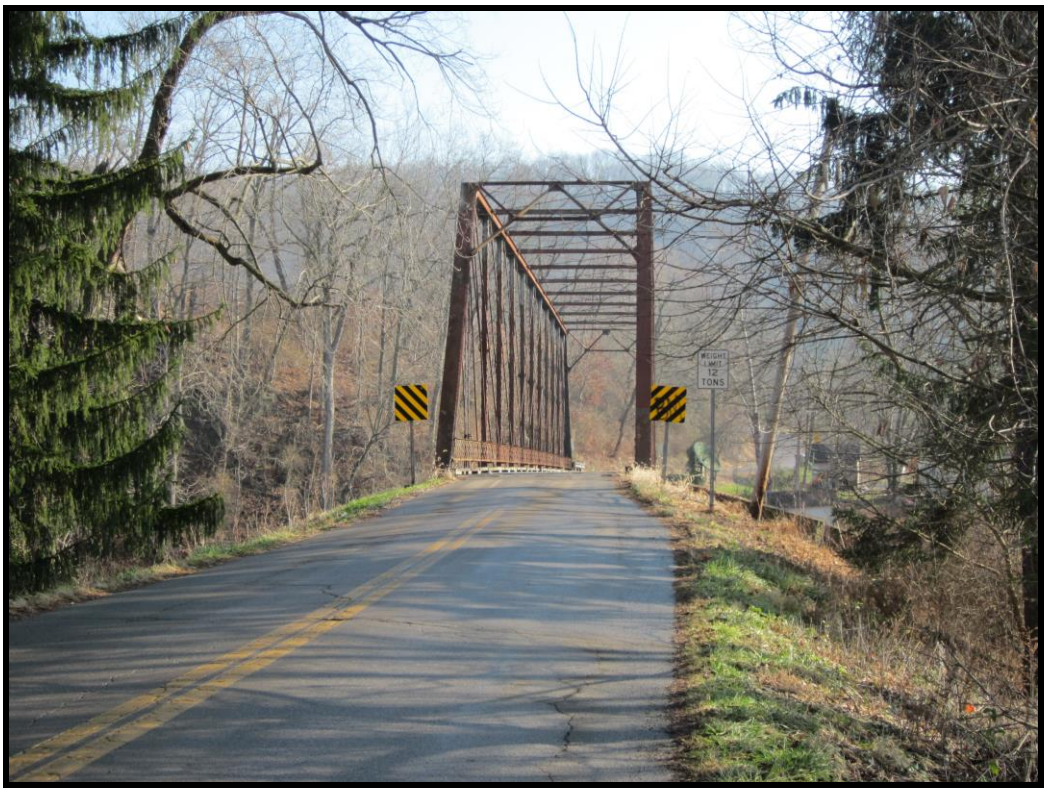
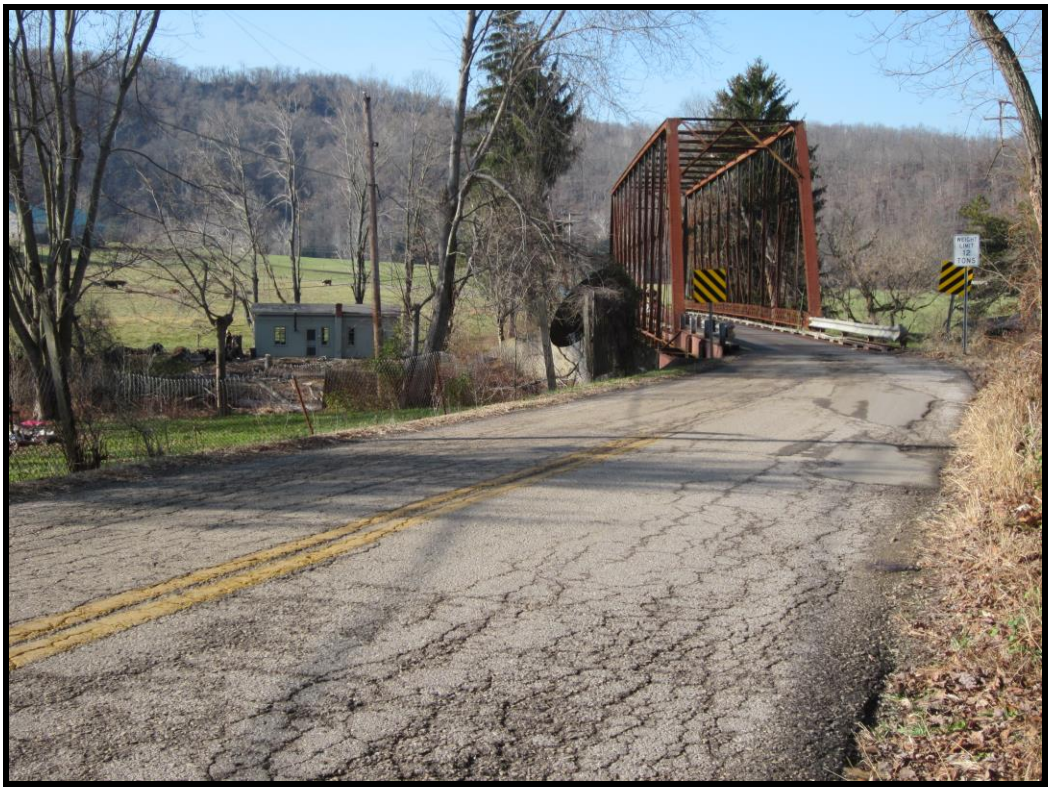


West Approach. View Northeast (WVDOH Dec. 3, 2013).



East Approach. View West/Northwest (WVDOH Dec. 3, 2013).

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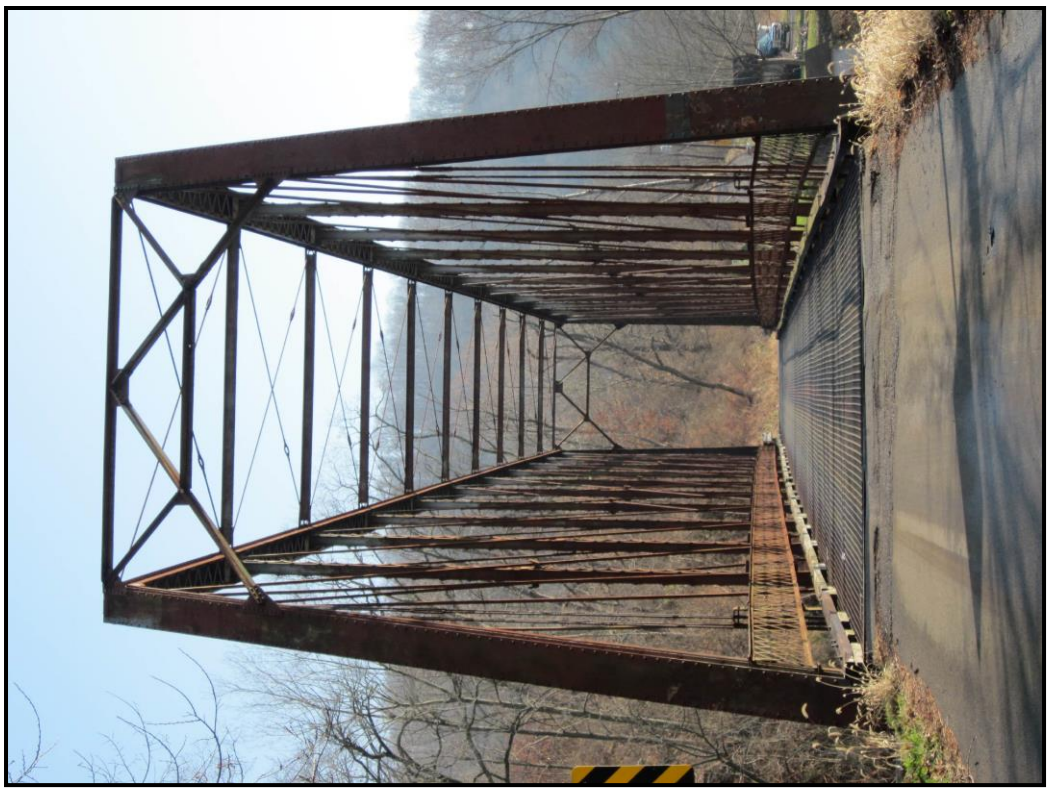
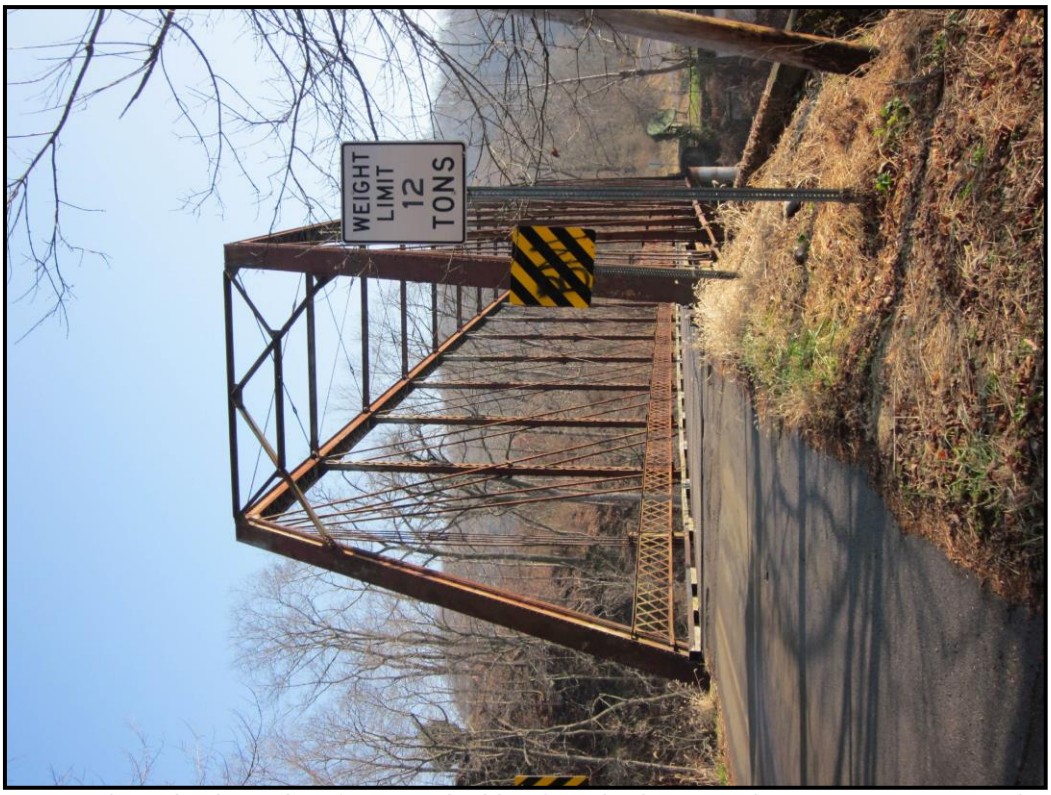


West End. View Southeast (WVDOH Dec. 3, 2013)



West End, angle view taken from south side of road. View East (WVDOH Dec. 3, 2013)

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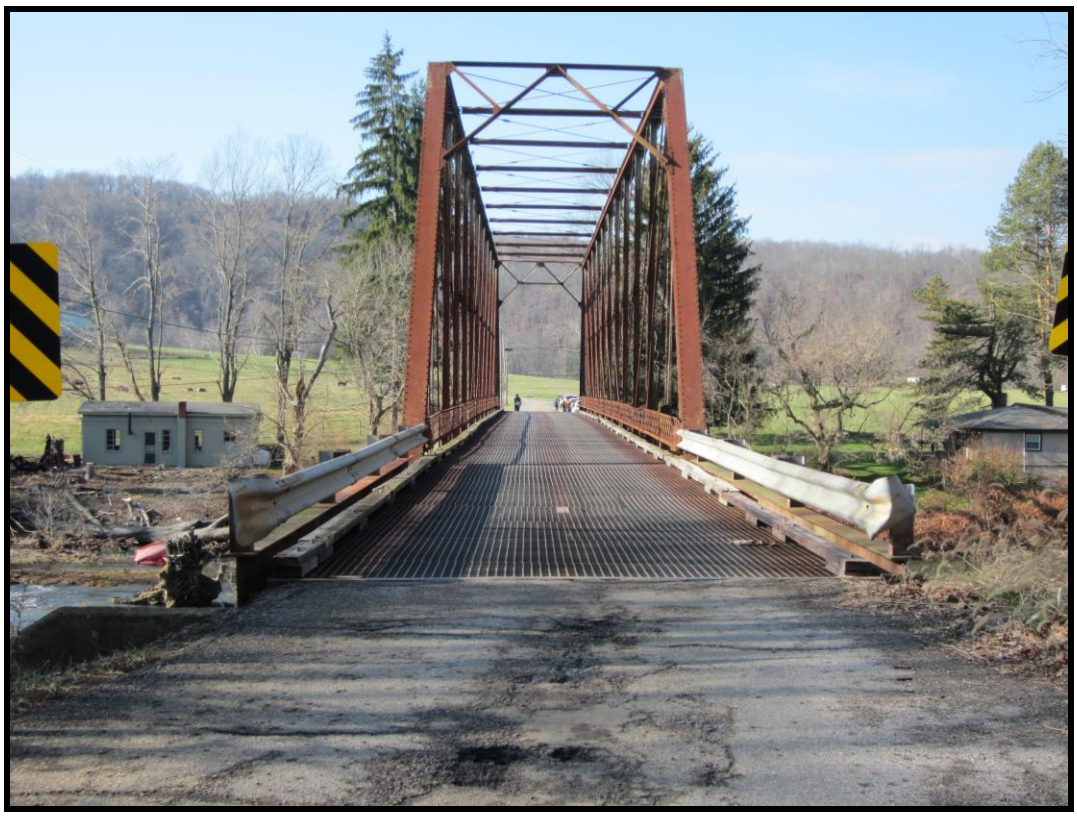
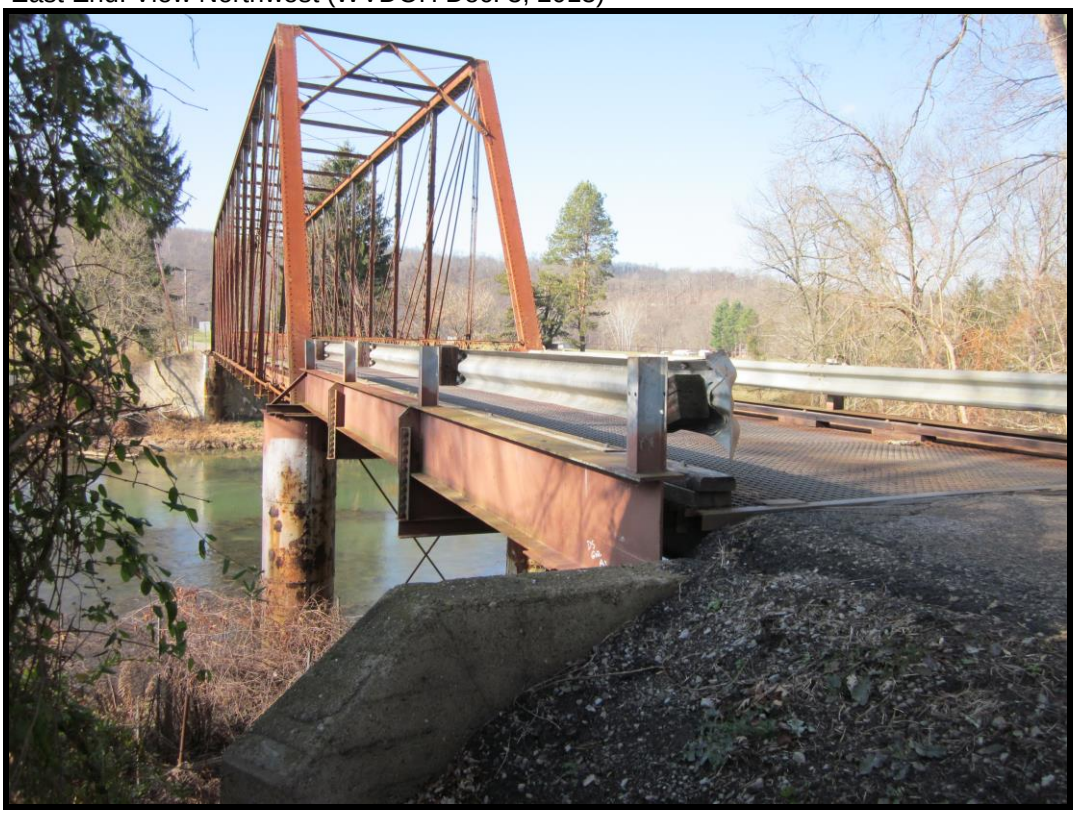


East End. View Northwest (WVDOH Dec. 3, 2013)



East End, angle view taken from south side of road. View Northwest (WVDOH Dec. 3, 2013)

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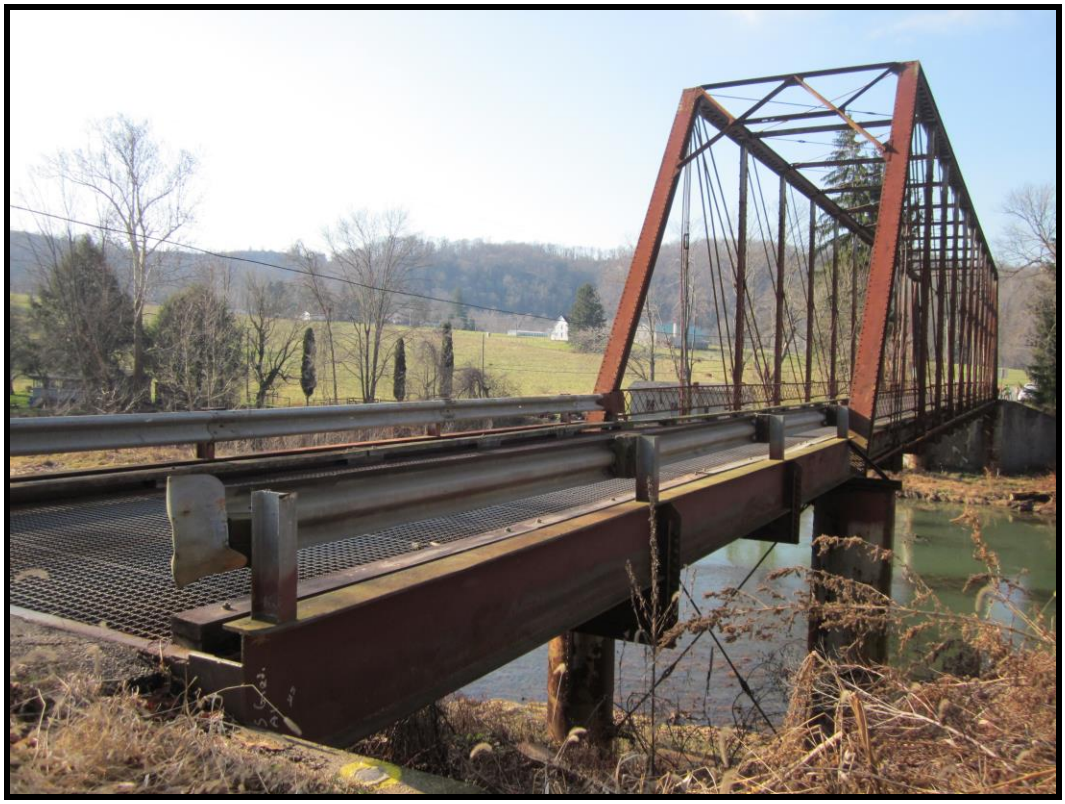
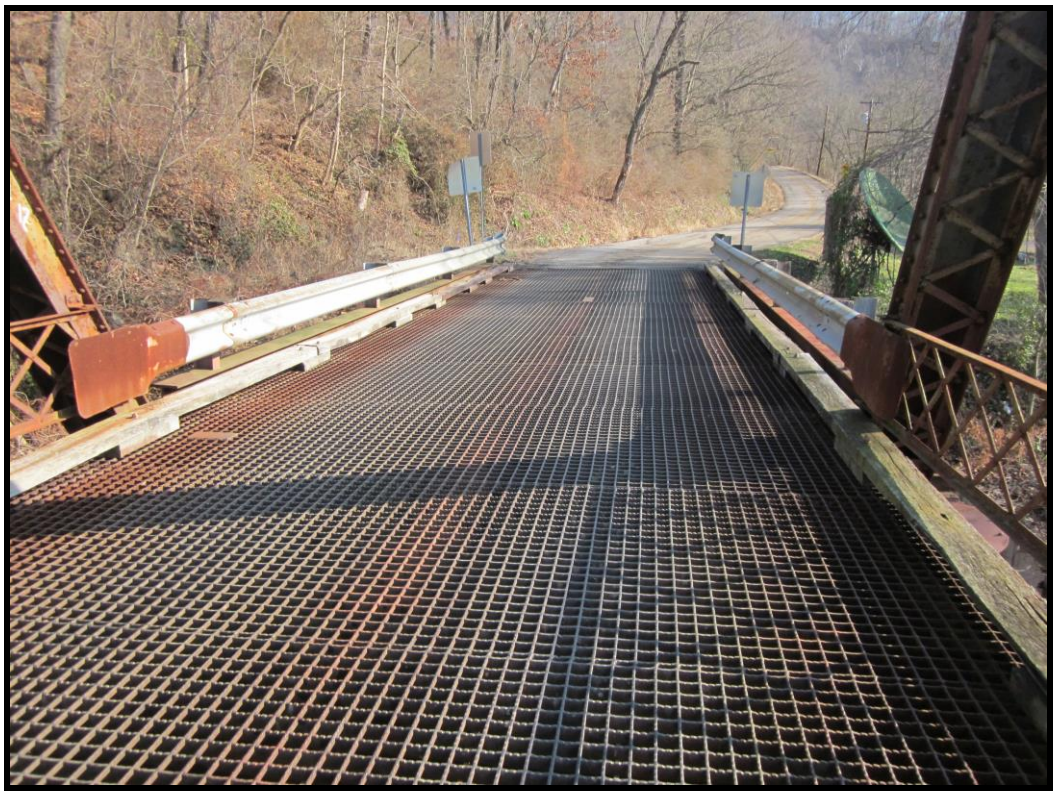


East End, angle view taken from north side of road. View West (WVDOH Dec. 3, 2013)



Thru Girder Span at East End of Bridge. View East/Southeast (WVDOH Dec. 3, 2013)

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

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Detail View of Typical Truss Members, incl. Endpost, Lower Chord Eyebars, and Hip & Main Tension Verticals. View East of South (Downstream Side) Truss (WVDOH Dec. 3, 2013)

Detail View Highlighting the Hip Vertical Tension Member at the South Truss, West End. This member includes the original thicker diameter central eyebar with four later-added (1975) loop bar hangers around it. View SE (WVDOH Dec. 3, 2013).

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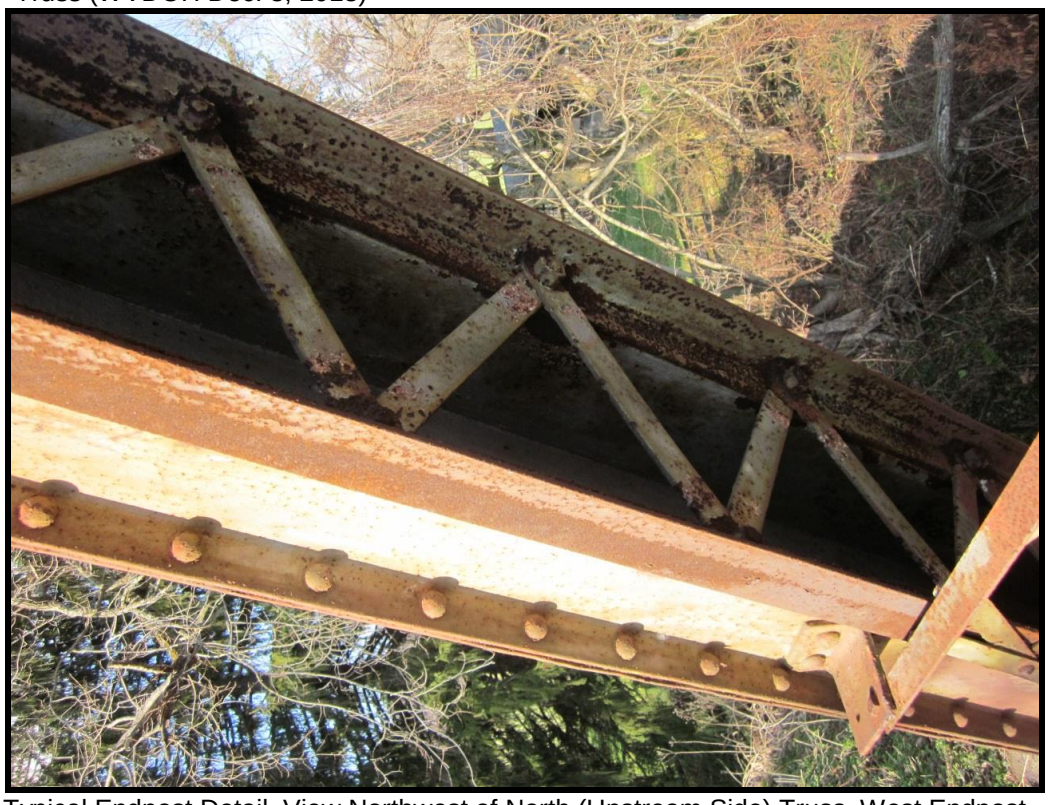
Typical Main Vertical Tension Member Detail. View Southeast of South (Downstream Side) Truss (WVDOH Dec. 3, 2013)



Typical Endpost Detail. View Northwest of North (Upstream Side) Truss, West Endpost (WVDOH Dec. 3, 2013).

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

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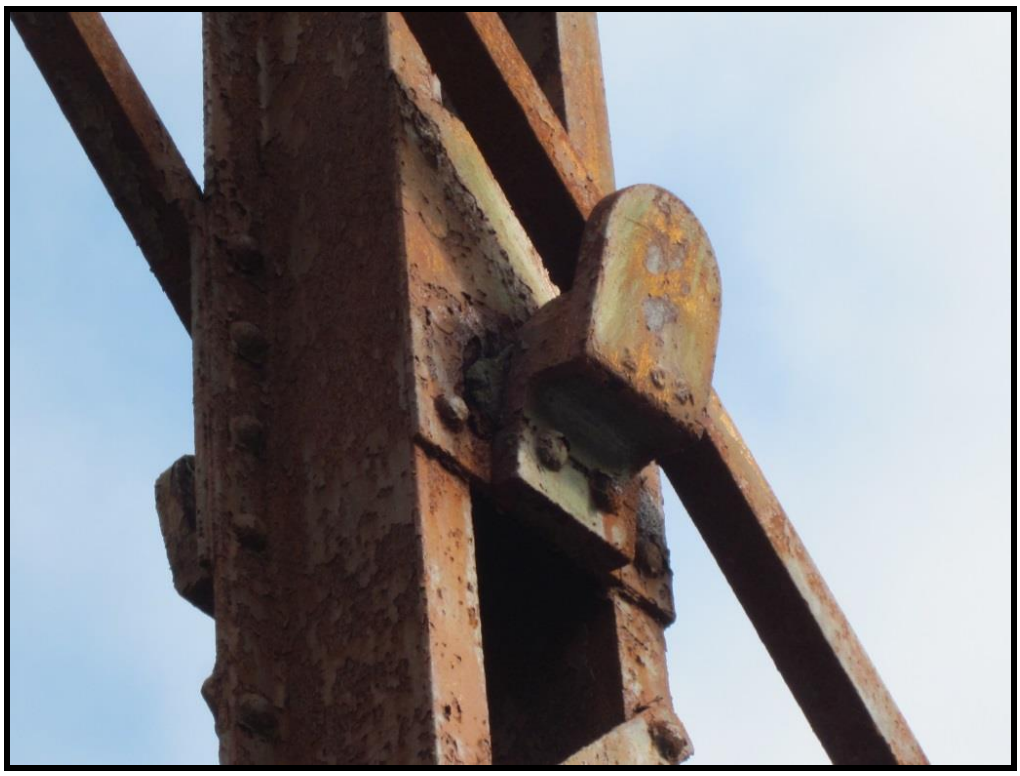
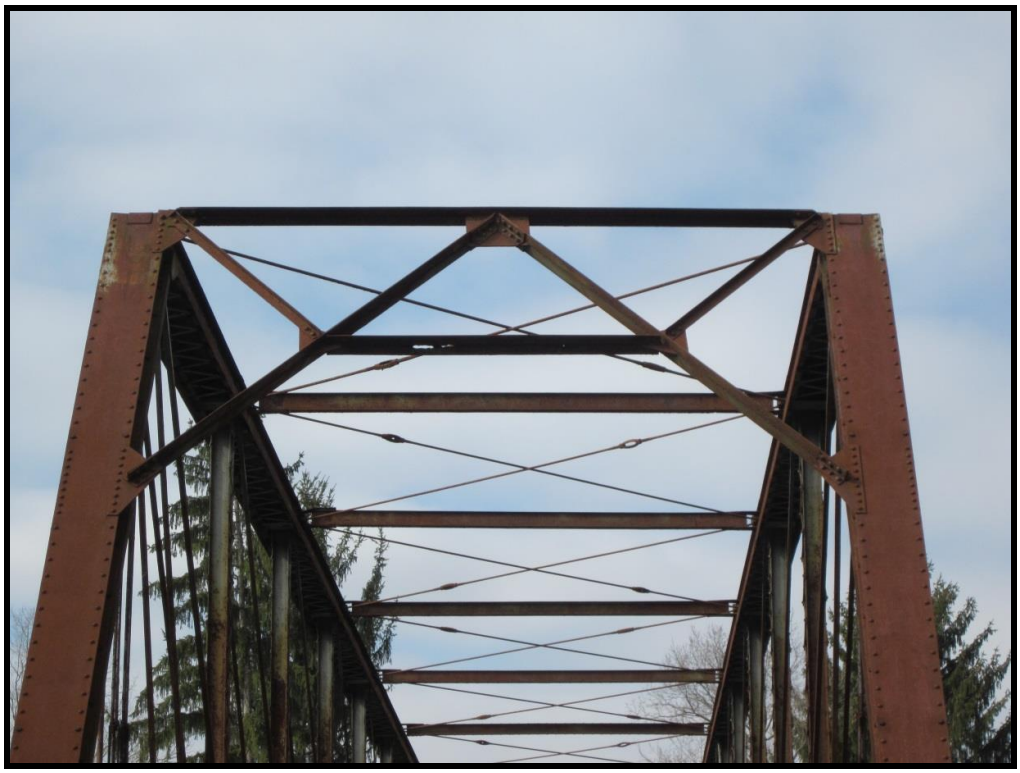


Typical Detail of a main vertical Post with retainer clps that attached to the hold the diagonal tension members in place (WVDOH Feb. 2, 2015).



East end of bridge, Highlighting the typical Portal Strut/Bracing between Endposts, Sway Struts, and Top Lateral Bracing (crossed eyebars). View NE (WVDOH 2-10-2015)

WEST VIRGINIA HISTORIC PROPERTY FORM
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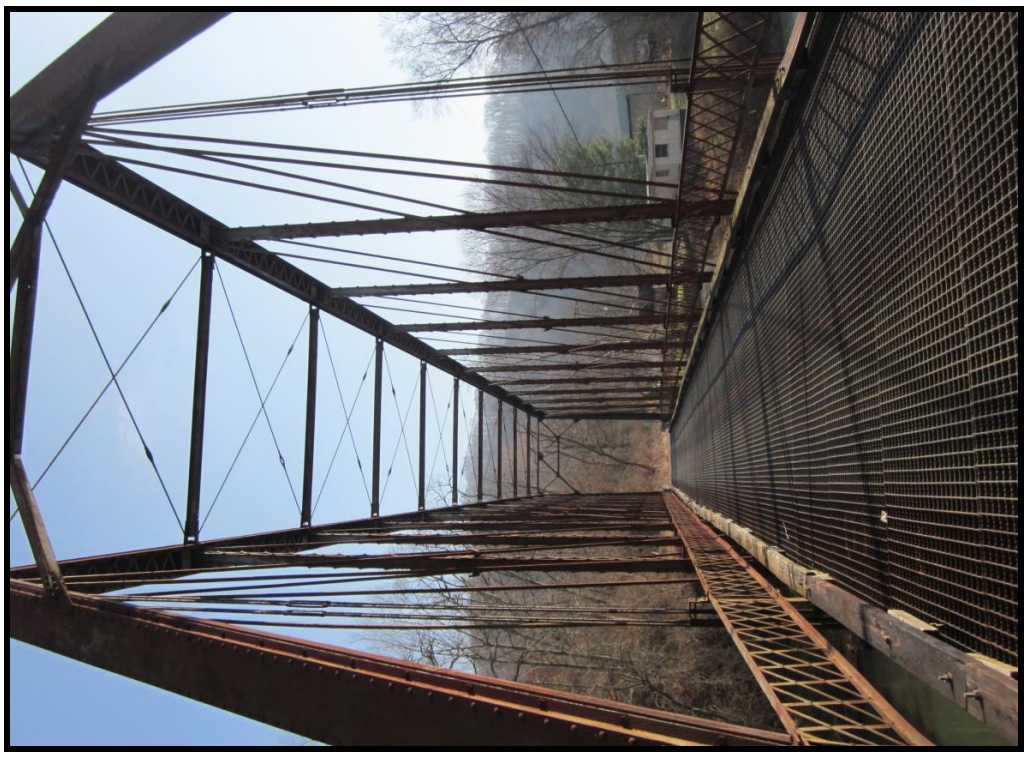
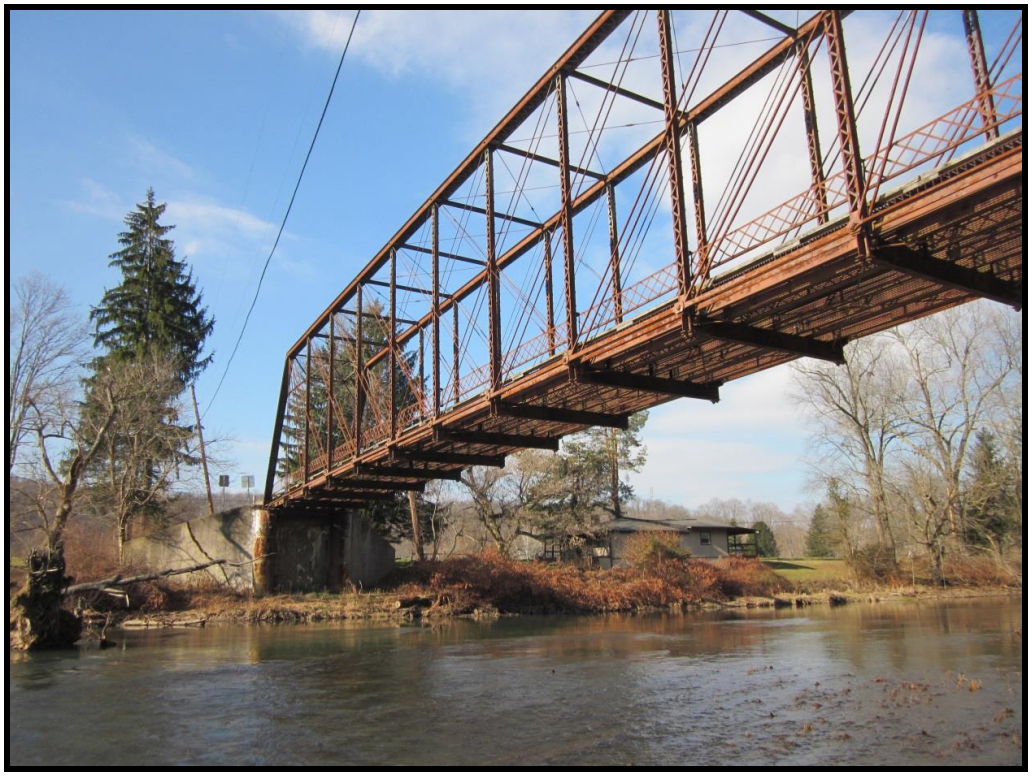


Interior of Bridge, Highlighting Sway Struts & Top Lateral Bracing (crossed eyebars) and extant steel grid decking (replaced timber decking in 1988). View SE (WVDOH Dec. 3, 2013)



South (Downstream Side) Elevation, Highlighting Floorbeams between trusses. West pier/abutment is also in view. View Northwest (WVDOH Dec. 3, 2013).

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Underside of Truss Deck, Highlighting Floorbeams, Stringers and lateral bracing. View NW (WVDOT Dec. 3, 2013). East end caisson bent/pier (with eyebar tension members) is in foreground.

Underside of Truss Deck , Highlighting the floorbeams, stringer and lateral bracing. View NW (WVDOH Dec. 3, 2013).

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Typ. Railing & Curb Detail. View East of North (Upstream Side) Truss (WVDOH Dec. 3, 2013)

West Approach to Rude Bridge in 2008, highlighting the bridge plaque still in place with the portal. View E/SE (WVDOH District 6 July 15, 2008)

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

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East Approach to Rude Bridge in 2008, highlighting the bridge plaque still in place with th portal. View W/NW (WVDOH District 6 July 15, 2008)

View of one of the Rude Bridge ortals before Wrought Iron Bridge Company plaques were removed (WVDOH District 6 August 28, 2009).

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

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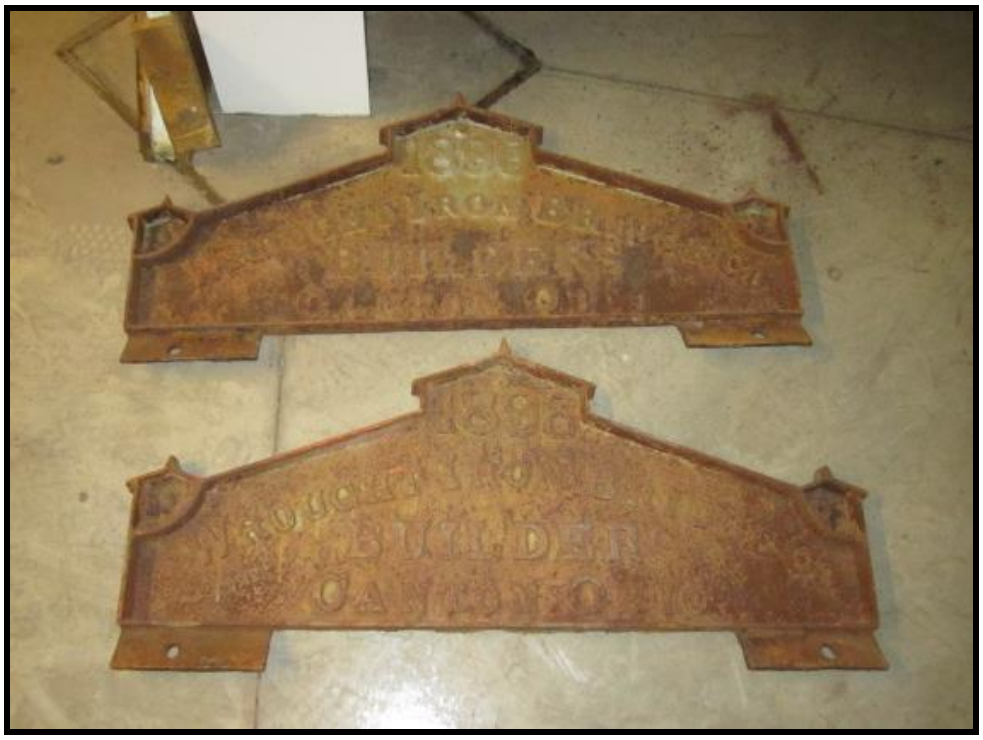

View of Rude Bridge plaques presently held at the WVDOH District 6 main office. Each reads “1896 / WROUGHT IRON BRIDGE COMPANY / BUILDERS / CANTON, OHIO.”(WVDOH District 6 December 12, 2013).

Deck Girder Span, Highlighting the understructure of Girders, Floorbeams and Stringers. East end Caisson Bent/Pier (with eyebar tension members in foreground) View SE (WVDOH Feb 10, 2015)

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APE B1 - Rude Bridge. Caisson Bent & Abutment at West End of Bridge. View Northwest (WVDOH Feb. 10, 2015). Note cracks in abutment/wingwalls.

Caisson Bent at East End of Bridge. View Southeast (WVDOH Feb. 10, 2015).

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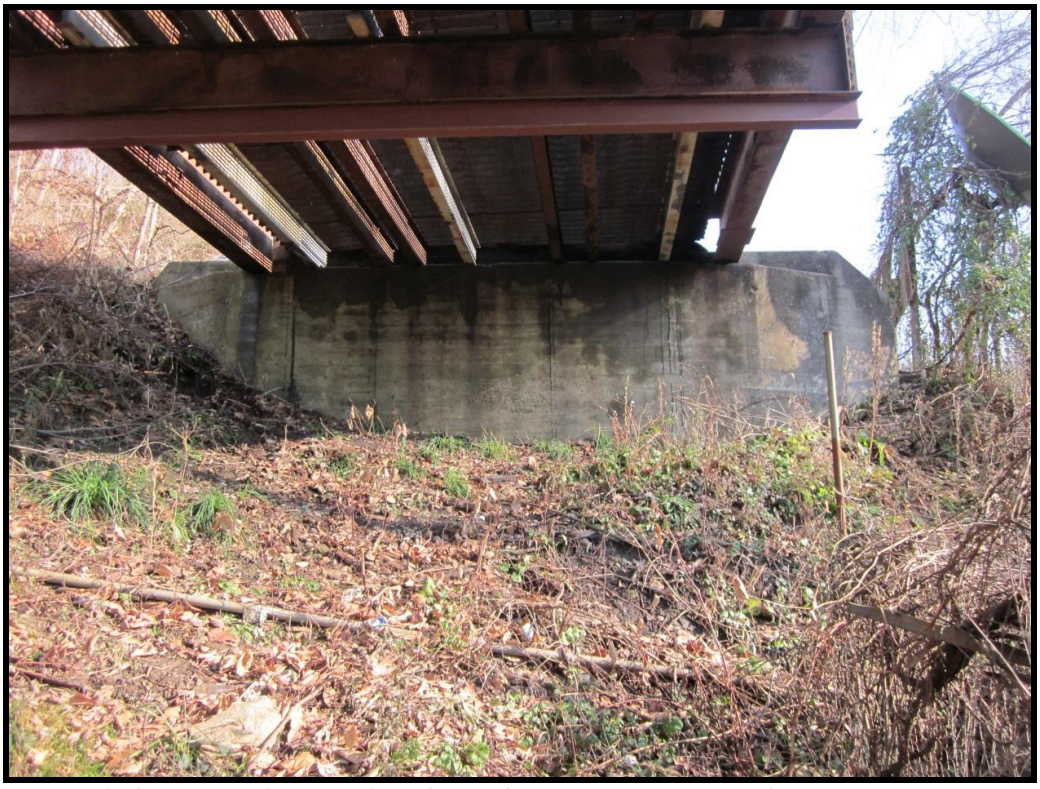
East End Caisson Bent. Taken from South (Downstream) Side of Bridge. View North/NE (WVDOH Feb. 10, 2015).



East End Abutment. View East/Southeast (WVDOH Dec. 3, 2013).

RATING: CE

CONTEXT:

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

STREET ADDRESS	COMMON/HISTORIC NAME	NO. IN SURVEY	NO. OF BAYS
BIG WHEELING CREEK ROAD COUNTY ROAD 5		MAR 0~~8~~ 0011	FRONT ☐ SIDE ☐
TOWN OR COMMUNITY	**COUNTY**	**NEGATIVE NO.**	**NOT VISIBLE FROM ROAD** ☐
Wheeling Vic.	MARSHALL	NRO 1-33	
ARCHITECT/BUILDER	**DATE OF CONSTRUCTION**	**EXTERIOR BUILDING FABRIC**	
WROUGHT IRON BRIDGE CO. CANTON, OHIO	1896	IRON	
DATE **NAT. REGISTER LISTED** _____ **STATE REGISTER LISTED** _____	**ROOFING MATERIAL**	**STYLE (STAFF USE ONLY)**	
		PRATT THROUGH-TRUSS	
PROPERTY USE OR FUNCTION	**TYPE OF FOUNDATION**		
BRIDGE	METAL & CONCRETE		
	QUADRANGLE NAME		
	~~MAJORSVILLE~~ Moundsville		
SURVEY ORGANIZATION AND DATE	**PART OF WHAT SURVEY**		
SHPO-NRO			

GM-

MR111

SITE NO.

PRESENT OWNERS	OWNER ADDRESS

GENERAL CONDITION OF PROPERTY

ADDITIONS ☐ YES ☐ NO IF YES, DESCRIBE

ALTERATIONS ☐ YES ☐ NO IF YES, DESCRIBE

NO. AND NATURE OF OUTBUILDINGS

DESCRIPTION OF PROPERTY (ORGINAL AND PRESENT)

Iron, pratt through-truss bridge, metal grating for deck, early guard rail, metal & concrete foundation. Single span, estimate 40 yards long, 10 yards wide.
Plaque at end reads "WROUGHT IRON BRIDGE/BUILDERS/CANTON, OHIO" Weight Limit 12 tons.

HISTORICAL/CULTURAL SIGNIFICANCE

Catalog bridge from the Wrought Iron Bridge Co., Canton, Ohio.

BIBLIOGRAPHICAL REFERENCES

FORM PREPARED BY

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ADDRESS Wheeling, WV

DATE

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