




Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

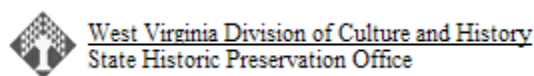
Street Address West Virginia Route 25 Spur (Third Street/Center Street) over Kanawha River	Common/Historic Name/Both <div style="text-align: center;"> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE / ST. ALBANS-NITRO BRIDGE	Field Survey # N/A	Site # (SHPO Only)
Town or Community ST. ALBANS NITRO	County KANAWHA	Negative No.	NR Listed Date
Architect/Builder J.E. GREINER, ENGINEER MCCLINTIC-MARSHALL CONSTRUCTION COMPANY (Superstructure) E.R. MILLS (Substructure)	Date of Construction 1934	Style CANTILEVERED WARREN THROUGH TRUSS	
Exterior Siding/Materials N/A	Roofing Material N/A	Foundation REINFORCED CONCRETE	
Property Use or Function Residence <input type="checkbox"/> Commercial <input type="checkbox"/> Other <input checked="" type="checkbox"/>	UTM# S 17 E 427349 N 4249621		
Survey Organization & Date Michael Baker Jr., Inc. August, 2012	Quadrangle Name Saint Albans, W. VA Part of What Survey/FR# Richard J. "Dick" Henderson Bridge (St. Albans-Nitro Bridge) Project Federal Project No. BR-0025(102)E State Project No. S220-P25-0.05 00		

Sketch Map of Property
Or Attach Copy of USGS Map

- PLEASE SEE ATTACHED -

Site No.

Present Owners THE STATE OF WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS Phone # 304-558-9487	Owners Mailing Address 1900 KANAWHA BLVD E BUILDING 5, ROOM 317 CHARLESTON, WV 25305
Describe Setting	
Originally constructed in 1934 as the St. Albans–Nitro Bridge (NBI Structure No. 20A068) and in 1999, renamed the Richard J. “Dick” Henderson Memorial Bridge, the structure carries Third Street / Center Street across the Kanawha River, connecting US 60 (south side of river) in St. Albans with WV 25 (north side of river) in Nitro, just west of Charleston, West Virginia. The City of St. Albans, twelve miles from Charleston, is a community of approximately 11,044 people. Situated in the Kanawha River valley, at the confluence of the Coal River, surveyors platted most of the town along flat topography adjacent to the Kanawha (initially laid out in 1832; named St. Albans in 1871). As it grew, St. Albans expanded somewhat into the neighboring rolling hillsides to the south. Across the Kanawha River to the north and west, the town of Nitro (incorporated in 1932) takes a similar linear plan, it follows the path of the Kanawha and Michigan Railroad north around the bend in the river. As in St. Albans, later commercial and residential developments in Nitro, a community of approximately 7,178, spread into the mountainous hillsides to the north and east of the Kanawha River.	
Description of Building or Site (Original and Present)	
See Continuation Sheets	
~0.60 Acres Archaeological Artifacts Present	
_____ N/A Stories _____ N/A Front Bays	
<i>(Use Continuation Sheets)</i>	
Alterations	If yes, describe:
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	In 1977, a major renovation to the bridge by the Department of Highways included the widening of the bridge roadway (along four of the St. Albans approach spans), the installation of a new deck, and the replacement of damaged railings in several areas.
Additions	If yes, describe:
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Describe All Outbuildings	
N/A	
<i>(Use Continuation Sheets)</i>	
Statement of Significance	
See Continuation Sheets	
<i>(Use Continuation Sheets)</i>	
Bibliographical References	
See Continuation Sheets	
<i>(Use Continuation Sheets)</i>	
Form Prepared By: Katherine J. Molnar	
Date: September 10, 2012	
Name/Organization: Michael Baker Jr., Inc.	
Address: 100 Airside Drive, Moon Township, PA 15108	
Phone #: 412-269-4619	



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WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 3 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Description of Building or Site (Original and Present)

Originally constructed in 1934 as the St. Albans–Nitro Bridge (NBI Structure No. 20A068) and in 1999, renamed the Richard J. "Dick" Henderson Memorial Bridge, the structure carries Third Street / Center Street across the Kanawha River, connecting US 60 (south side of river) in St. Albans with WV 25 (north side of river) in Nitro, just west of Charleston, West Virginia. The City of St. Albans, twelve miles from Charleston, is a community of approximately 11,044 people. Situated in the Kanawha River valley, at the confluence of the Coal River, surveyors platted most of the town along flat topography adjacent to the Kanawha (initially laid out in 1832; named St. Albans in 1871). As it grew, St. Albans expanded somewhat into the neighboring rolling hillsides to the south. Across the Kanawha River to the north and west, the town of Nitro (incorporated in 1932) takes a similar linear plan; it follows the path of the Kanawha and Michigan Railroad north around the bend in the river. As in St. Albans, later commercial and residential developments in Nitro, a community of approximately 7,178, spread into the mountainous hillsides to the north and east of the Kanawha River.

Connecting St. Albans and Nitro, the 1,367-foot bridge, consists of a three-span, cantilever, Warren through-truss and eleven viaduct spans (five comprise the southwest viaduct and six comprise the northeast viaduct). It is the oldest extant cantilever bridge over the Kanawha River. Designed by prominent bridge engineering company J.E. Greiner Company of Baltimore, the 1934 structure was manufactured and built by the McClintic-Marshall Company of Bethlehem, Pennsylvania (the same company that built locks for the Panama Canal, the Golden Gate Bridge, and the George Washington Bridge and which was the largest independent steel manufacturing company in the country). The bridge deck is 20 feet wide, and has a vertical clearance of 16 feet. The truss connections on the bridge are secured by rivets and gusset plates. The bridge is noted for its unusual nine-section top chord arrangement, which demonstrates a linear upwards slope and incorporates towers with flat tops. The bridge is also unusual for its H-section rolled beam members, which were introduced in the 1920s, but were not common until the 1940s and beyond. Because of this feature, the bridge appears to be newer than it is.

The bridge retains a high level of integrity and retains character-defining elements such as its two "flattened" towers or piers with a pair of cantilever arms, or beams sticking out from the support towers; the beams taper in depth as they project from the towers and are truss-like in appearance; the central span suspended over the water way; and the counterweight, truss-like back spans complete the connection to land. In 1977, four spans of the southwest viaduct were widened to accommodate a right turn lane.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 4 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Historic Context

Early History (pre-1800s)

According to a local history of St. Albans, West Virginia, the area at the confluence of the Kanawha and Coal rivers is one of the oldest and longest-occupied settlements in North America. Early artifacts from the area reportedly date from 13,000 BC to 1670 AD. Native populations included the Adena, Ft. Ancient, Monetan, and Shawnee.¹

Early non-native explorers in the area included John Peter Sally, who named the Coal River for the outcroppings of coal he saw while travelling to New Orleans via canoe in 1742; Samuel Cole who "re-discovered" the Coal River while on a military expedition in 1756; Christopher Gist, a surveyor, in 1751; Mary Ingles, during her escape from Indians in 1755; and Simon Kenton, a hunter and frontiersman who lived in the upper Kanawha Valley in 1771. By 1789,² the first permanent settlers arrived one-half mile below present St. Albans (then called Coalsmouth) at the location of Fort Tackett. In 1790, the fort was abandoned after multiple attacks by the Shawnee Indians, and its subsequent burning.³ Another early settler, Thomas Teays and his son Stephen, owned land and built a cabin on the west side of Coal River in 1793. Stephen Teays operated a ferry service and inn, which accommodated travelers traversing the "old state road" (also called the James River and Kanawha Turnpike) from Fort Lee (Charleston) to Point Pleasant.⁴

St. Albans (1800-1900)

Present day St. Albans is situated on land once owned by George Washington, acquired after his service in the French and Indian War (1754–1763). Washington had passed through the land during the war, following which he proceeded to survey several large tracts of land in and around present day St. Albans.⁵

Washington willed approximately 2,000 acres to his niece Elizabeth Spotswood, who transferred 400 acres to Morris Hudson in 1810. Hudson became the first permanent settler in present day St. Albans.⁶ Spotswood also sold approximately 1,000 acres near the Coal River to Phillip Thompson, who built a large stone house after moving to the area in 1817. Thompson, along with James Teays, built a covered toll bridge across the Coal River in 1832. The bridge was burned during the Civil War by retreating Confederate soldiers in 1861.⁷

In 1832, Phillip Thompson began platting the area known as Coalsmouth (later St. Albans); he named the town Phillipi. The James River and Kanawha Turnpike which crossed over the Coal River at Thompson's toll bridge, brought travelers and businesses through the new town, which began to develop. One of the industries that began to develop was that of coal extraction. Between 1854 and 1857, eight locks and dams were built on the Coal River to facilitate the movement of "cannel coal." Cannel coal was used to create fuel oil (coal oil) for lamps. The Navigation Company of Coal River, which

¹ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*, nd [on-line website]: available from <http://stalbanshistory.com/History.html>; Internet; accessed 8 August 2012.

² Accounts vary regarding the construction date of the fort. Some sources indicate the fort was built in 1786 (St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*).

³ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*. and City of St. Albans, West Virginia, "The History of St. Albans," *St. Albans, WV*, nd [on-line website]: available from <http://www.stalbanswv.com/history.shtml>; Internet; accessed 8 August 2012.

⁴ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

⁵ George Wesley Atkinson, *History of Kanawha County From its Organization in 1789 until the Present Time* (Charleston: The Office of the West Virginia Journal, 1876), 200.

⁶ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

⁷ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 5 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

shipped the product, ceased operating in 1881 after the discovery of petroleum.⁸ The community of Phillipi underwent several name changes at mid-century. In 1857, after Colonel John Cunningham (a Union soldier) acquired most of Phillip Thompson's land, the place was renamed Jefferson. In 1868, the name changed again to Kanawha City, as the village was incorporated.⁹

In addition to coal, timbering and milling were dominant industries, and were accompanied by planing mills and "log booms" along Coal River. In 1871, Collis P. Huntington, the railroad baron who built the C&O Railroad through town, changed the name of the community from Kanawha City to St. Albans, after his hometown of St. Albans, Vermont. The railroad was completed through town in 1873.¹⁰ By 1876, St. Albans was "flourishing and prosperous" in condition.¹¹

Across the Kanawha River from St. Albans, the community of Sattes welcomed a rail line, built by the Ohio Central Railroad Company, in 1883.¹² A major industry in Sattes, owned by F.A. Sattes, was a sandstone quarry for "building stones and grindstones."¹³ The quarries in Sattes provided stone for the Kanawha River locks and for bridges on the Kanawha & Michigan Railroad (originally built by the Ohio Central Railroad Company).¹⁴

St. Albans (Post 1900)

Between 1900 and 1910, the population of St. Albans grew from 816 to 1,209. Despite a disastrous downtown fire in 1906, by 1910, the community had two banks, thirty-three stores, six churches, and two schools. The numerous active lumber mills, including American Column and Lumber Company, Bowman Lumber Company, and George Weimer and Sons, helped make the town prosper.¹⁵ In 1913, streetcar lines were extended from Charleston to St. Albans (though buses replaced them in 1939). By the 1920s, however, St. Albans began to change, as many of the lumber mills closed, and the town slowly began to shift away from its industrial character. Many homes were built in St. Albans in the 1940s and during the Post-World War II period. The Naval Ordnance and Armor Plant, originally built in South Charleston in 1918, was rehabilitated starting in 1941 for production during World War II. Some of the workers who worked there, and others working in chemical plants throughout the valley, lived in St. Albans.

Nitro (Post 1900)

The town of Nitro essentially did not exist prior to 1918. A government product of World War I, Nitro (derived from the word "Nitro-Cellulose", describing the type of gunpowder to be produced¹⁶) developed because of the existence of American ammunition facilities and a federal plant for the manufacture of explosives. At the advent of this industry, the Kanawha & Michigan railroad transported all of the materials necessary to build the new town, including the "first pre-fab

⁸ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

⁹ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

¹⁰ St. Albans Historical Society, "Brief History of St. Albans," *St. Albans History*.

¹¹ Atkinson, *History of Kanawha County*, 338.

¹² Donald L. Mills Jr., *The Kanawha & Michigan Railroad: Bridgeline to the Lakes 1888-1922* (Huntingdon, West Virginia: Mid-Atlantic Highlands, 2010), 1.

¹³ Charles E. Krebs, D.D. Teets Jr., and W. Armstrong Price, *West Virginia Geological Survey: Kanawha County* (Wheeling: Wheeling News Litho Co., 1914), 590.

¹⁴ Krebs, Teets, and Price, *West Virginia Geological Survey*, 590.

¹⁵ Krebs, Teets, and Price, *West Virginia Geological Survey*, 9, and City of St. Albans, West Virginia, "The History of St. Albans," *St. Albans WV*.

¹⁶ Mills, *The Kanawha & Michigan Railroad*, 81.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 6 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

houses built in the country (one to a boxcar), lumber, food, medicine, clothing, stone, coal, gravel, etc."¹⁷. Government records indicate that "over 110,000 people were on the payroll during the eleven months it took to build the plant."¹⁸

The U.S. Government reported that building Nitro took 36,236 railroad carloads of materials, equaling "an average of 104 railroad cars every day for 365 days," and including 110,152,000 board feet of lumber. In addition to building materials, the K&M shipped out laundry (since no laundry facility existed in Nitro), shipped in 14,000 loaves of bread daily (since there was no bakery), and delivered other essentials such as meats, poultry, groceries, fruits and vegetables, and general supplies. The railroad even delivered a "chapel car" from The Baptist Association, which remained there for the duration of the war.¹⁹ By the end of World War I, Nitro was producing 350 tons of gunpowder a day, and the town contained homes, a hospital, an independent school system, segregated YMCA buildings, police and fire departments, and a population of 23,951. Within the first two weeks after the war ended, 12,000 people lost their jobs and moved out of town. In 1919, the Charleston Industrial Corporation purchased the Nitro plant, helping to turn the town into a self-sustaining community.²⁰ On a smaller scale, the chemical plants also supported war efforts during World War II, and some continue to operate to this day.

The St. Albans-Nitro Bridge

On April 19, 1925, the *Charleston Daily Mail* reported that the West Virginia State Senate would soon consider a house bill, known as the Kanawha County Bridge Bill, which provided for the construction of four bridges over the Kanawha River. Funded through a special bond measure at a cost not to exceed \$1,750,000, the bridges would be paid for through the collection of tolls over a four-year period. The four bridges were planned to connect the "districts of Jefferson and Union; one shall connect the districts of Charleston and Loudon... one shall connect the city Kanawha City... the other bridge shall be located at some point in Cabin Creek district." The proposed bill stipulated that the newly constructed bridges would be "free and open to public travel without toll on and after five years after purchase or construction."²¹

Some contention over the cost of the bridges and their various tolls was documented in a June 29, 1925, newspaper editorial article. That writer reiterated the court's assumption that the proposed St. Albans Bridge would generate \$25,000 per year in toll fees. Continuing, he disagreed with the number, saying approximately 1,370 people would need to cross the bridge each day of the year to reach that number. In the article, he testified against the passing of the levy, citing economic miscalculation on the part of the government.²² The county bond issue providing for the four new bridges was defeated in a general election, which prompted several smaller movements to raise capital for the construction of bridges at Charleston, Cabin Creek and in the Union District (between Dunbar and St. Albans).²³

By 1928, none of the proposed measures to construct bridges across the Kanawha River had been successful. However, it was announced in February that two private ventures, the St. Albans-Nitro Bridge Company and the Cabin Creek-Kanawha Bridge Company, had obtained charters to build toll bridges at those locations. When the news was announced, the companies expected to start construction work within three weeks. They had already completed preliminary engineering studies and conducted a traffic survey. The remaining task, securing a permit

¹⁷ Mills, *The Kanawha & Michigan Railroad*, 80.

¹⁸ Mills, *The Kanawha & Michigan Railroad*, 81.

¹⁹ Mills, *The Kanawha & Michigan Railroad*, 87.

²⁰ William D. Wintz, *Nitro: World War I Boom Town* (Charleston: Jalamap, 1985) 3-4 and Mills, *The Kanawha & Michigan Railroad*, 81.

²¹ "Bridge Bill Will Come up Monday," *Charleston (WV) Daily Mail*, 19 April 1925, p. 19.

²² "Disagrees with the Court on Bridge Bond Proposal," *Charleston (WV) Daily Mail*, 29 June 1925.

²³ "Cabin Creek Out after Free Bridge," *Charleston (WV) Gazette*, 14 October 1925, p. 16.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 7 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

from the federal government, was hoped to be completed within the week.²⁴ However, construction did not start as the St. Albans-Nitro Bridge Company filed for a permit extension in May 1929, pending negotiations with the West Virginia State Bridge Commission. The Commission's ability to "acquire toll bridge rights" had the potential to take profits from the construction company, thus delaying the project.²⁵ By June, Senator Goff (R – WV) succeeded in passing a bill that allowed the State of West Virginia to acquire the rights (from the St. Albans-Nitro Bridge and the Cabin Creek-Kanawha Bridge companies) to build the two bridges.²⁶

By late June, work was "under way" to construct an "under-ground crossing improvement" along Third Street, south of the bridge's proposed approach in St. Albans. The below-grade railroad crossing was designed to "relieve danger from Chesapeake and Ohio trains," and required a "structure supporting the railroad tracks, a paved lowered street, and approaches leading a quarter of a block away both north and south." Engineers understood that the new crossing structure would connect directly to the proposed bridge's southern approach, and designed the structure accordingly.²⁷ A blow came to the bridge development plans in late July, when, though construction had already started, it was announced that the state bridge commission "dropped consideration of plans to finance the construction of a bridge at St. Albans" because it could not agree upon a price with the selling bridge company.²⁸

The state bridge commission revisited the topic of purchasing the rights to the St. Albans and Cabin Creek bridges at their November 1929 meeting.²⁹ Finally, in the spring of 1930, the state bridge commission and the stockholders of the bridge companies agreed upon purchase terms for the franchise and the right-of-way for the proposed St. Albans Bridge and for the completed toll bridge at Cabin Creek. The newspaper announced that construction of the St. Albans Bridge would be completed within eighteen months. Also at this time, the state bridge commission announced its decision to employ the J.E. Greiner bridge engineering company of Baltimore for "designing and consulting" work.³⁰

Founded in 1908 by John Edwin Greiner (1859-1942), the J.E. Greiner Company (later Greiner Engineering, Easco Engineering Corp., and URS Corporation) was a prolific and successful bridge design company. John Greiner graduated from Delaware College in 1880 with a degree in Civil Engineering. Initially finding work as a draftsman at the Edgemore Bridge Works in Wilmington, Delaware, Greiner soon became employed as assistant engineer in the Keystone Bridge Works. Working with Gustav Lindenthal, the celebrated bridge engineer (and designer of the Smithfield Street Bridge in Pittsburgh), Greiner was heavily involved with the design and erection of Pittsburgh's Seventh Street Bridge in 1884.³¹

Within a few years, Greiner became employed by the Baltimore and Ohio Railroad, where he "designed and erected just about every bridge constructed for the B&O Railroad from 1885 until 1908."³² At this point, Greiner opened his

²⁴ "Two Toll Spans At Cabin Creek, Nitro Planned," *Charleston (WV) Gazette*, 4 February 1928.

²⁵ "Approves St. Albans Bridge Application," *Charleston (WV) Gazette*, 19 May 1929, p. 9.

²⁶ "Goff Bridge Bill Passed by Senate," *Charleston (WV) Gazette*, 13 June 1929, p. 2.

²⁷ "Crossing Project Contract is Made," *Charleston (WV) Daily Mail*, 23 June 1929, Sunday Edition, p. 4.

²⁸ "Commission Drops the Purchase of St. Albans Bridge," *Charleston (WV) Gazette*, 24 July 1929, p. 7 Section F.

²⁹ "Bridge Franchise is Commission's Topic," *Charleston (WV) Daily Mail*, 17 November 1929, p. 9.

³⁰ "Prepare to Start Kanawha Bridges," *Charleston (WV) Daily Mail*, 28 March 1930, p. 14.

³¹ Geoff Dobson, "Historic City Memories: The Bridge of Lions II," *Historic City News*, 17 March 2010 [on-line website]: available from <http://www.historicity.com/2010/staugustine/news/florida/historic-city-memories-the-bridge-of-lions-ii-2806>; Internet; accessed 8 August 2012, and "Architects & Engineers: John Edwin Greiner (2-24-1859 to 1942)," *German Marylanders*, nd [on-line website]: available from <http://www.germanmarylanders.org/profile-index/architects-engineers>; Internet; accessed 8 August 2012.

³² "Architects & Engineers," *German Marylanders*, nd.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 8 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

own firm, where he proceeded to design large bridges including: the Susquehanna River Bridge at Havre de Grace, Maryland; the 12th Street Bridge (Ben Williamson Memorial Bridge) over the Ohio River at Coal Grove, Ohio; the Soldiers' & Sailors' Memorial Bridge over Paxton Creek & Cameron Street at State Street, Harrisburg, Pennsylvania; the Bridge of Lions over Matanzas Bay, St. Augustine, Florida; the Bellaire Bridge over the Ohio River at Benwood, West Virginia; and the Silver Bridge over the Ohio River at Point Pleasant, Ohio, among many others.

Greiner's company also designed many significant bridges for the Maryland State Roads Commission, including the first Chesapeake Bay Bridge (1947-1952). Some critics today recognize J.E. Greiner as one of the "three major icons of American bridge engineers," alongside John Augustus Roebling and Gustav Lindenthal.³³

On April 22, 1930, the West Virginia state bridge commission secretary, A.C. Kimpel, formally announced plans to start construction on the St. Albans-Nitro Bridge during the summer months.³⁴ However, within a month it was evident that the bridge construction would be delayed for over a year pending the decision of the State Supreme Court regarding two unrelated bridge suits. Expected to "clear up certain points of law as to the powers of the state bridge commission," the cases involved suits from two private interests regarding land condemnation (for seizure) and "chancery."³⁵ Despite the hold-up, the state bridge commission submitted construction plans for the new St. Albans Bridge to the state road commission in August.³⁶ On September 3, bids were opened for the construction of two bridges crossing the Kanawha River, including the span at St. Albans. Through the process, the General Construction Corporation of Pittsburgh submitted the low bid for the construction of the substructure at \$84,494, while the Independent Bridge Company of Pittsburgh submitted the low bid for the superstructure at \$291,020. To pay for the bridge, the state bridge commission stipulated that the structure be used as a toll bridge until "the tolls received paid for their costs, at which time the bridges [would] be made free of tolls."³⁷

Just when it seemed the St. Albans Bridge was finally underway, the state bridge commission announced an "indefinite postponement" of its construction in October. Apparently, a traffic study (requested by state bridge bond holders) indicated the bridge would not be able to pay for itself, and "pooling" tolls from other bridges (which would make the bridge financeable) was not permissible through the 1929 bridge commission act.³⁸ It seemed that bridge proponents would have to change the law, thus enabling its funding, before constructing the bridge. On February 11, 1932, State Representative Robert L. Hogg introduced a bill to the United States Congress that proposed to amend a similar bill, passed in 1930, that allowed "grouping bridges for purposes of financing bonds." The amendment included language providing specifically for the St. Albans span over the Kanawha, which had been "inadvertently omitted" from the original bill.³⁹

In June 1933, St. Albans City Solicitor, D.N. Mohler, planned a trip to Washington, D.C. to apply for \$365,000 in funding through the Reconstruction Finance Corporation (an independent agency of the U.S. government that

³³ "Bridge Builders and Designers Active in Maryland," Maryland State Archives, nd [on-line website]; available from <http://www.msa.md.gov/megafile/msa/speccol/sc5300/sc5339/000113/002000/002558/unrestricted/20065547-0063e.pdf>; Internet; accessed 8 August 2012.

³⁴ "State Will Start Bridge Work Soon," *Charleston (WV) Gazette*, 23 April 1930, front page.

³⁵ "Delay Building Of St. Albans Bridge," *Charleston (WV) Gazette*, 8 May 1930, front page.

³⁶ "New Bridge Plans Before Commission," *Charleston (WV) Daily Mail*, 7 August 1930, p. 3.

³⁷ "Open Bids for Kanawha Spans," *Charleston (WV) Gazette*, 4 September 1930, front page.

³⁸ "Bridge at St. Albans Held up Indefinitely," *Charleston (WV) Daily Mail*, 3 October 1930.

³⁹ "Clear Way For St. Albans Span," *Charleston (WV) Gazette* 12 February 1932, front page.

WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 9 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

provided loans to banks, railroads, and other businesses) to secure a loan for the bridge construction.⁴⁰ He was advised by the corporation to wait to seek the funding until after the appointment of the new Public Works administrator, a position provided for under the National Industrial Recovery Act (NIRA).⁴¹ Mohler was informed that the impending passage of the NIRA (on June 16, 1933 – within 10 days of his inquiry) potentially would mean that the needed funds could take the form of a grant/loan package.

St. Albans did not have to wait long to make application for the grant program; they had filed an application almost immediately. In late June, the St. Albans-Nitro Bridge Company received a permit from the Army department (Army board of engineers) to construct the bridge.⁴² After nearly four months of waiting, St. Albans received notification of its \$410,000 loan/grant package from the federal Public Works Administration. Of the total, thirty percent was a grant to cover the cost of labor, while the remaining seventy percent was a "self-liquidating" loan, paid through toll fees, and secured by state issued bonds. Through tolls, the estimated period to "retire the bonds" was twenty years. The St. Albans Bridge package was part of a five-and-a-half million grant/loan package approved for public works projects in West Virginia. A newspaper article announcing the funds estimated that 6,000 people would be employed as a result of the cash stimulus, including 107 in St. Albans.⁴³

Within a month, bids were let and awarded to the McClintic-Marshall Company of Bethlehem, Pennsylvania for the superstructure (at \$158,607), and to E.R. Mills of Charleston, West Virginia for the substructure (at \$95,405). By January 1934, an estimated 50 to 75 men were needed to begin construction on the substructure, which was expected to "get under way" immediately. Officials preferred to employ residents of St. Albans, where possible.⁴⁴ Construction officially started on February 16, 1934.⁴⁵

After nine months, the people of St. Albans and Nitro celebrated the grand opening of the St. Albans-Nitro Bridge, on November 12, 1934.⁴⁶ People turned out from all over the region to attend the elaborate opening ceremony and parade. Mayors from St. Albans, Nitro, Charleston, Hurricane, Dunbar, South Charleston, and Winfield attended, in addition to the honorable Herman Guy Kump, governor of West Virginia, who delivered the address. Other attendees included the state Public Works Administration engineer, and representatives from McClintic-Marshall Company and E.R. Mills, who "delivered" the bridge to the City of St. Albans. The United States Engineering Office and the engineers (The J. E. Greiner Company of Baltimore, Maryland) were also listed in the program.⁴⁷ Following the program, the bridge was free for the remainder of the day; at midnight, the twenty-five cent toll per car and driver was implemented. The rate for each additional passenger was five cents.⁴⁸

⁴⁰ "St. Albans Seeks Fund for Bridge," *Charleston (WV) Gazette* 9 June 1933.

⁴¹ "Advises Delay in Bridge Financing," *Charleston (WV) Gazette*, 14 June 1933.

⁴² "Approval Given Bridge Project," *Charleston (WV) Gazette*, 21 June 1922, front page.

⁴³ "Funds Allotted for State Highways, St. Albans Bridge," *Charleston (WV) Daily Mail*, 10 November 1933, front page.

⁴⁴ "Await Action on St. Albans Span," *Charleston (WV) Daily Mail*, 31 December 1933, Sunday Morning, p. 5; and "Contracts Let for New Bridge," *Charleston (WV) Daily Mail*, 9 January 1934, front page.

⁴⁵ "Grade Crossings," *Charleston (WV) Gazette*, 29 March 1934, p. 6.

⁴⁶ Rich Hively, "History and Timetable of the St. Albans – Nitro Bridge (aka Sattes Bridge, Toll Bridge, Dick Henderson Bridge)," *Nitro, West Virginia 25143*, 2012 [on-line website]; available from <http://www.cityofnitrowv.com/History/bridges/StAlbans-NitroBridge/BridgeTimeline.pdf>; Internet; accessed 8 August 2012.

⁴⁷ "Program – St. Albans-Nitro Bridge Opening," 12 November 1934 [electronic document]; available from http://www.cityofnitrowv.com/History/bridges/StAlbans-NitroBridge/1934-11-12Program-SA_N_bridge.pdf; Internet; accessed 8 August 2012.

⁴⁸ Hively, "History and Timetable of the St. Albans-Nitro Bridge," *Nitro, West Virginia 25143*.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 10 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Over the next few years, St. Albans began to generate some revenue through toll fares to begin paying back its construction loan. In 1935, the average daily income from bridge tolls was \$43.72. In 1936 "it was \$60.38; 1937, \$68.13; 1938, \$54.20, and 1939, \$72.11." Fares were reduced in 1939 to a flat rate of twenty-five cents per car, regardless of number of passengers.⁴⁹ In just over a decade, in June 1945, the people of St. Albans began looking forward to a toll-free bridge, which the road commissioner promised to them by the fall of 1946.⁵⁰

By 1977, the bridge had fallen into disrepair. A major renovation to the bridge by the Department of Highways included the widening of the bridge roadway (along four of the St. Albans approach spans), the installation of a new deck, and the replacement of damaged railings in several areas.

In 1999, the bridge was officially renamed the Richard J. "Dick" Henderson Memorial Bridge by way of House Resolution 56. Delegates Armstead, Ashley, Harrison, and Webb sponsored the bill to honor Richard J. "Dick" Henderson, who served the thirty-second delegate district of Kanawha County from 1992 through the year of his passing in 1998. Mr. Henderson, who had "adopted" St. Albans as his hometown, was a veteran of World War II. The bridge was renamed as "a lasting tribute to a remarkable individual who left a lasting impression on the West Virginia Legislature."⁵¹

⁴⁹ Hively, "History and Timetable of the St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, citing "Announcing Reduction in Tolls on the St. Albans-Nitro Bridge," *Charleston (WV) Gazette*, 15 January 1939.

⁵⁰ Hively, "History and Timetable of the St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, citing *Charleston (WV) Daily Mail*, 1 June 1954.

⁵¹ West Virginia Legislature, House of Delegates, *House Concurrent Resolution No. 56* (1999): 1.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 11 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Statement of Significance

The St. Albans Bridge (later named the Richard J. "Dick" Henderson Memorial Bridge) is significant under Criterion C as one of the earliest surviving examples of a cantilevered Warren through truss bridge in West Virginia, and because it represents the work of a master bridge engineer.⁵² The bridge is also significant under Criterion A because it was constructed through, and associated with, the federal government's Public Works Administration (PWA) during the Great Depression years.

A cantilever is essentially a beam that is supported on one end, but not at the other, much like an arm held away from the body at a right angle. In engineering terms, "a cantilever is a continuous girder with hinges at the points of zero moments."⁵³ Typically, cantilever bridges are comprised of cantilevered spans and suspended spans (held between two cantilevers). Truss-like back-spans counterweight the cantilever and suspended spans, and complete the connection to land (see Figure 1 for parts of the cantilever bridge). In bridge design, the cantilever became popular in places where unstable soils had the potential to affect the stability of bridge foundations, piers, and abutments. In these areas, the cantilever bridge's superstructure had the ability to adjust in instances where one of the piers or abutments might sink.⁵⁴ Another advantage to the cantilever bridge was that it afforded the possibility of a longer span than a simple beam or arch bridge, which were generally limited to 200 or 300 feet.⁵⁵ Finally, the cantilever proved useful in situations where access to the river or channel below was limited; the bridge could be constructed outwards from the towers, with the central suspended span lifted into place.

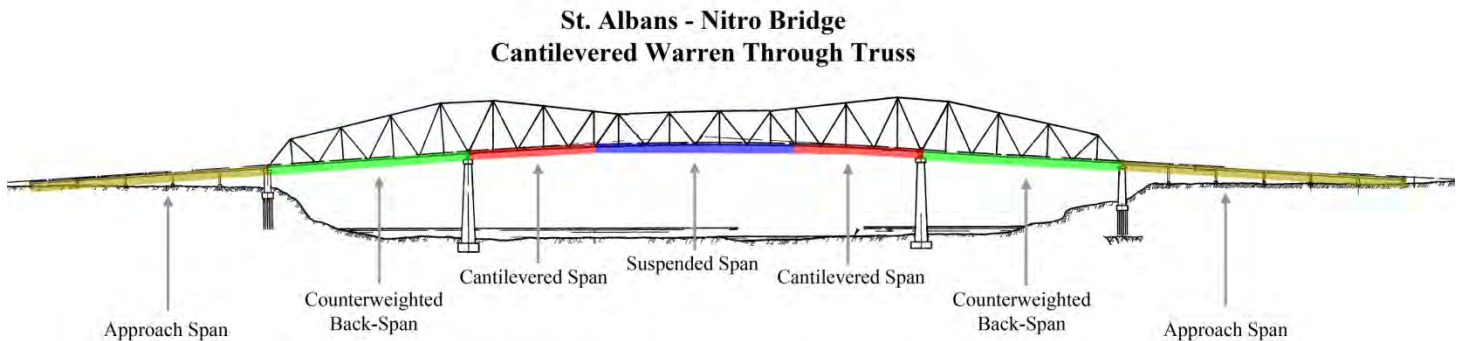


Figure 1: Elevation view of the St. Albans-Nitro Bridge, showing the various components of the cantilevered design.

⁵² More information on the Determination of Eligibility for the bridge can be found in the 2011 *Historic Resources Survey and Determination Of Eligibility Report: Richard J. "Dick" Henderson Bridge (St. Albans-Nitro Bridge) Project* (Michael Baker Jr., Inc.).

⁵³ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-142.

⁵⁴ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-142.

⁵⁵ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-142.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 12 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Statement of Significance, Continued

Charles Conrad Schneider helped develop the cantilevered bridge technology in the United States in the 1880s. Typically used first by the railroads, the cantilever bridge soon found popularity among highway bridges.⁵⁶ The cantilever bridge fell out of popularity in the 1960s due to the development of additional bridge technologies. Cable-stayed suspension bridges, for example, had begun to "supplant cantilevers because they are visually appealing and sometimes more economical."⁵⁷ Cantilevered truss bridges are generally significant in the context of historic bridge types, especially the earlier structures and those of great length.⁵⁸

The cantilevered Saint Albans-Nitro Bridge was built using a Warren through truss superstructure. In this way, roadway traffic passes through the structure, rather than above or below it. This design is sometimes referred to as an "Overhead Warren" because overhead lateral bracing and cross-bracing above the deck reinforce the trusses. Through trusses typically can carry heavier traffic loads and can be longer spans than the pony trusses. The Warren truss is designed to act in compression and tension, where diagonal equilateral triangles connect the top and bottom chords.⁵⁹ In the case of the St. Albans-Nitro Bridge, the traditional "diagonals only" design was modified by the addition of vertical members at the apex of each triangle (See Figure 2 for a depiction of these bridge parts). Generally, Warren trusses constructed after the first two decades of the twentieth century are less significant than those built earlier, due to their relatively abundant nature.⁶⁰

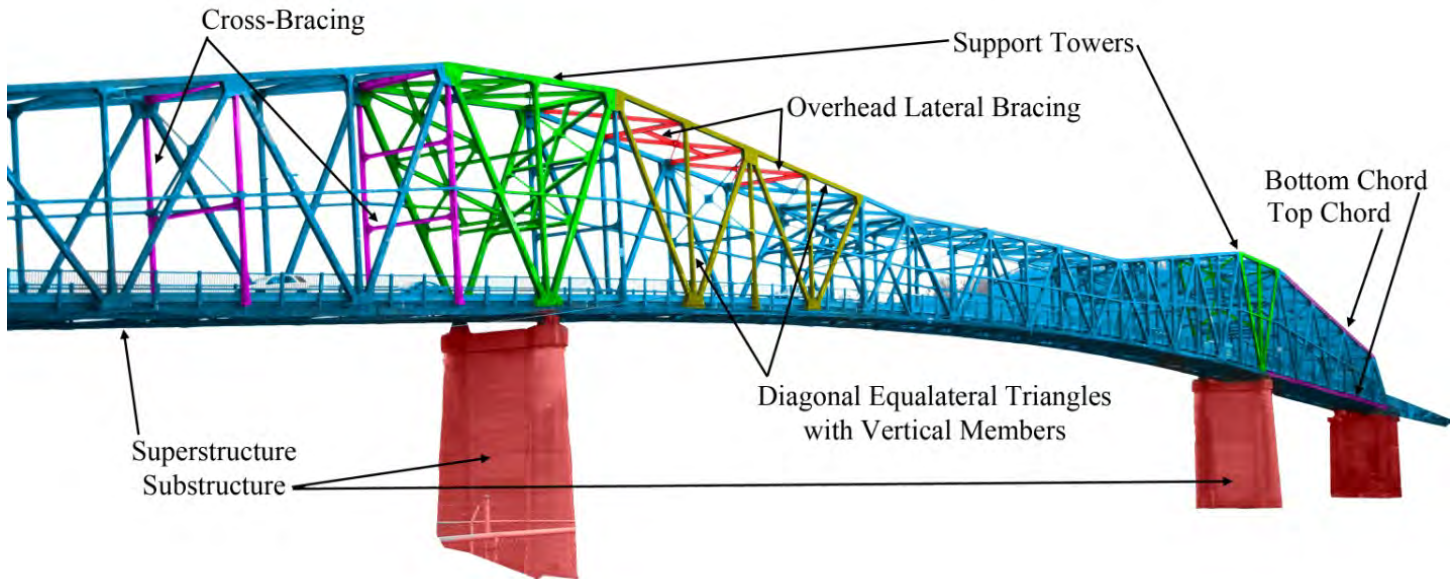


Figure 2: Modified photograph of the St. Albans-Nitro Bridge, labeling various bridge parts.

⁵⁶ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-142.

⁵⁷ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-143.

⁵⁸ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-144.

⁵⁹ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-39.

⁶⁰ Parsons Brinckerhoff, *A Context for Common Historic Bridge Types*, 3-39.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 13 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Statement of Significance, Continued

In addition to its technological and engineering significance, the bridge is also significant for its association with events that have made a significant contribution to the broad pattern of our history. Funding for the construction of the Saint Albans-Nitro Bridge was made possible by the passage of the National Industrial Recovery Act (NIRA), which was passed on June 16, 1933, and created the Federal Emergency Administration of Public Works (FEAPW). The PWA was part of the FEAPW and funded large-scale construction projects such as schools, bridges, and dams. The PWA's goal was to spend over \$6 billion dollars, including \$3.3 billion during its first year, in an effort to stimulate the economy and to increase employment.⁶¹ In the fall of 1933, the state of West Virginia received \$5.5 million grant/loan dollars for public works projects through this program, including \$410,000 for the Saint Albans-Nitro Bridge. The Saint Albans-Nitro Bridge, therefore, was one of the first projects applied-for and funded through this New Deal program. In 1939, the PWA was reorganized as part of the Federal Works Agency (FWA).

⁶¹ Jason Scott Smith, *Building New Deal Liberalism: The Political Economy of Public Works, 1933–1956* (New York: Cambridge University Press, 2006), np.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 14 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

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WEST VIRGINIA HISTORIC PROPERTY FORM

CONTINUATION SHEET (Page 15 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

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WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 16 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Figures

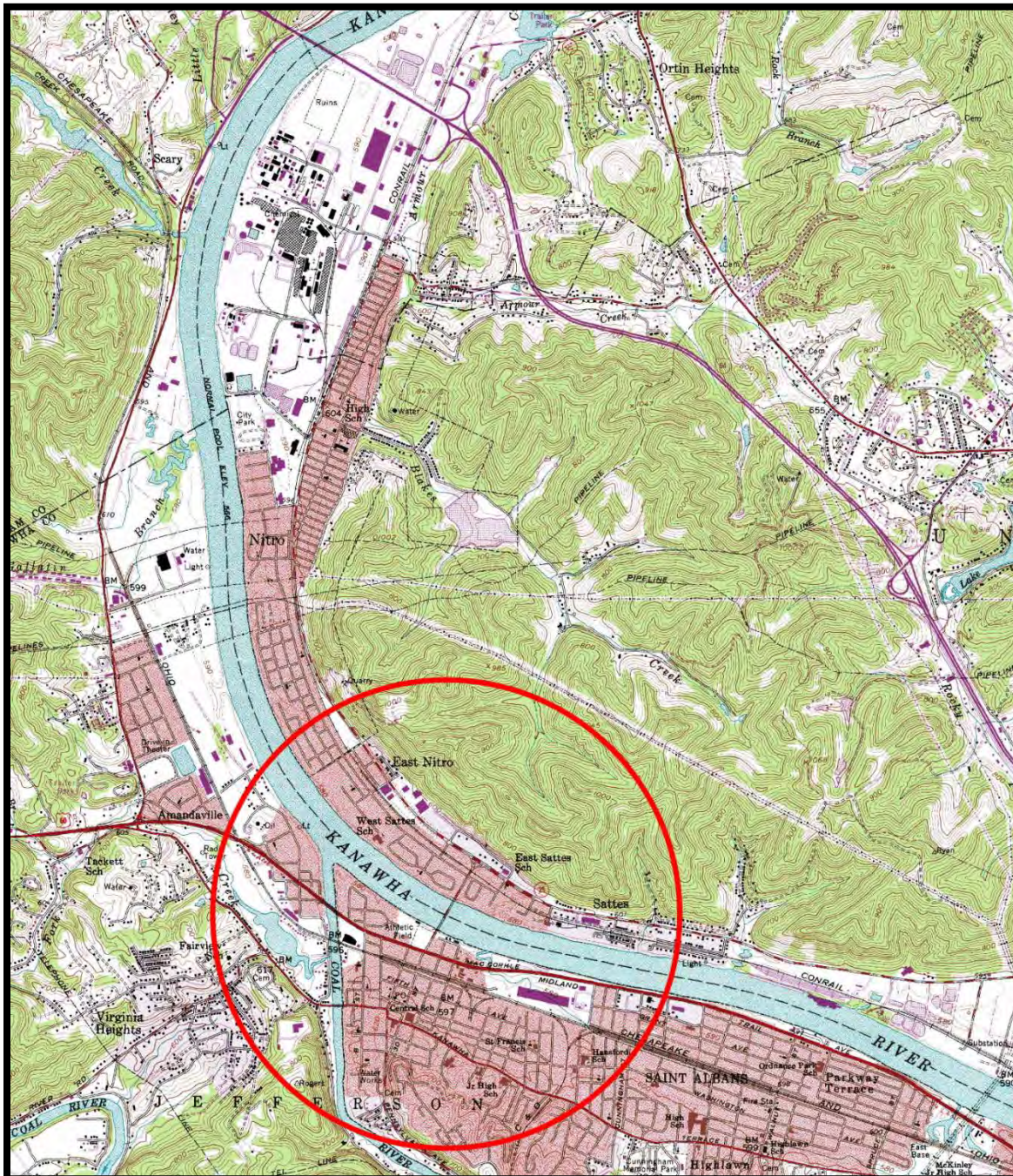


Figure 3: Bridge location map as depicted on the St. Albans, WV (USGS 1958/1971/1978) 7.5 minute topographic quadrangle map. The red circle represents a one-mile radius from the center of the bridge.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 17 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE **SITE#** _____

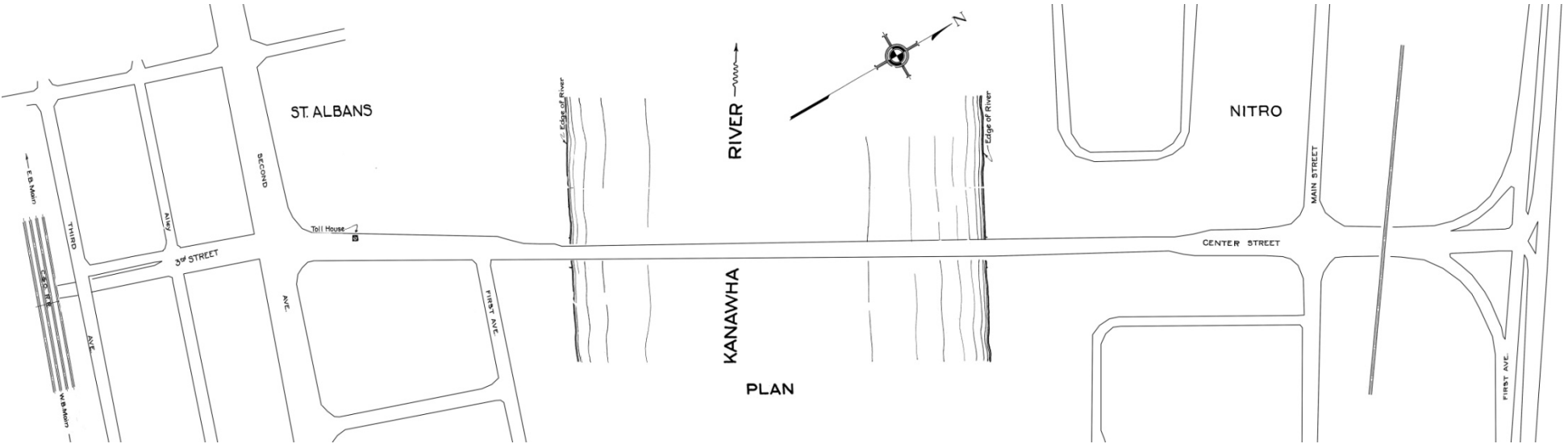


Figure 4: Site Plan showing the Richard J. "Dick" Henderson Memorial Bridge, between St. Albans and Nitro, West Virginia.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 18 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



Figure 5: 1934 photograph of the St. Albans-Nitro Bridge under construction. Photograph available from St. Albans Historical Society.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 19 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

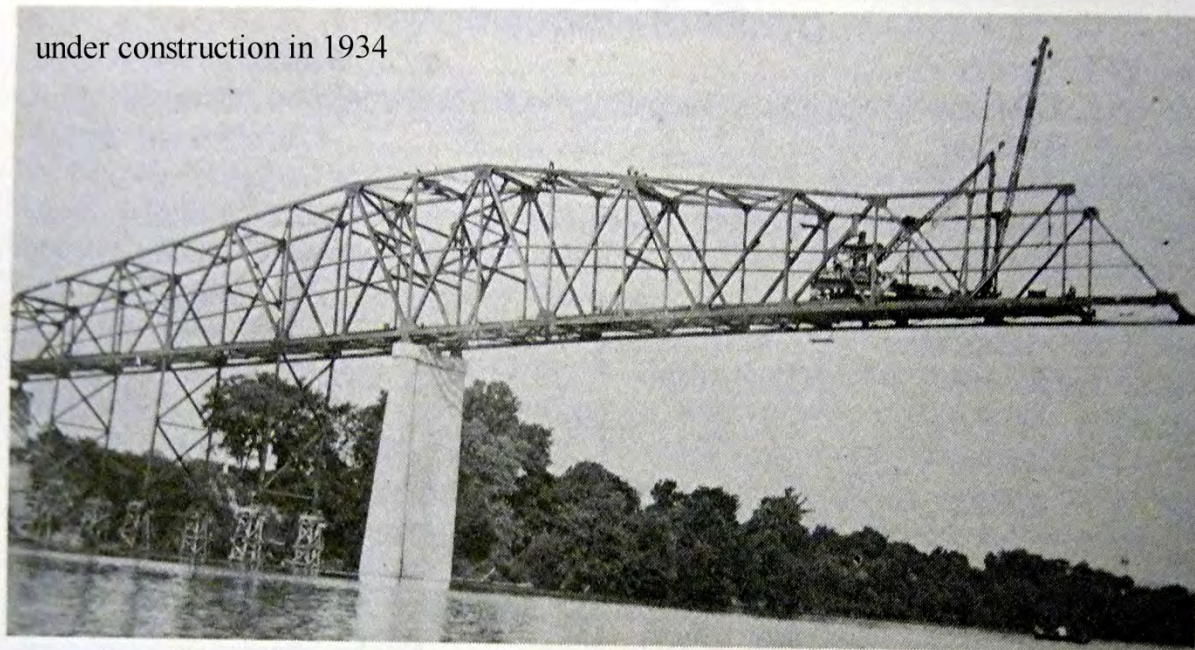


Figure 6: 1934 photograph of the St. Albans-Nitro Bridge under construction. Photograph available from St. Albans Historical Society.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 20 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



Mr. W.H. Miller was Mayor and J.W. Kiser, Troy D. Sutler, J.O. Murray, W.L. Lynch, C.A. McClung and H.H. Stollings were councilmen at the time it was erected.

Figure 7: 1934 photograph of the St. Albans-Nitro Bridge under construction. Available from, Rich Hively, "St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, 2012.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 21 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



Figure 8: 1934 photograph of the St. Albans-Nitro Bridge under construction. Available from, Rich Hively, "St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, 2012.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 22 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

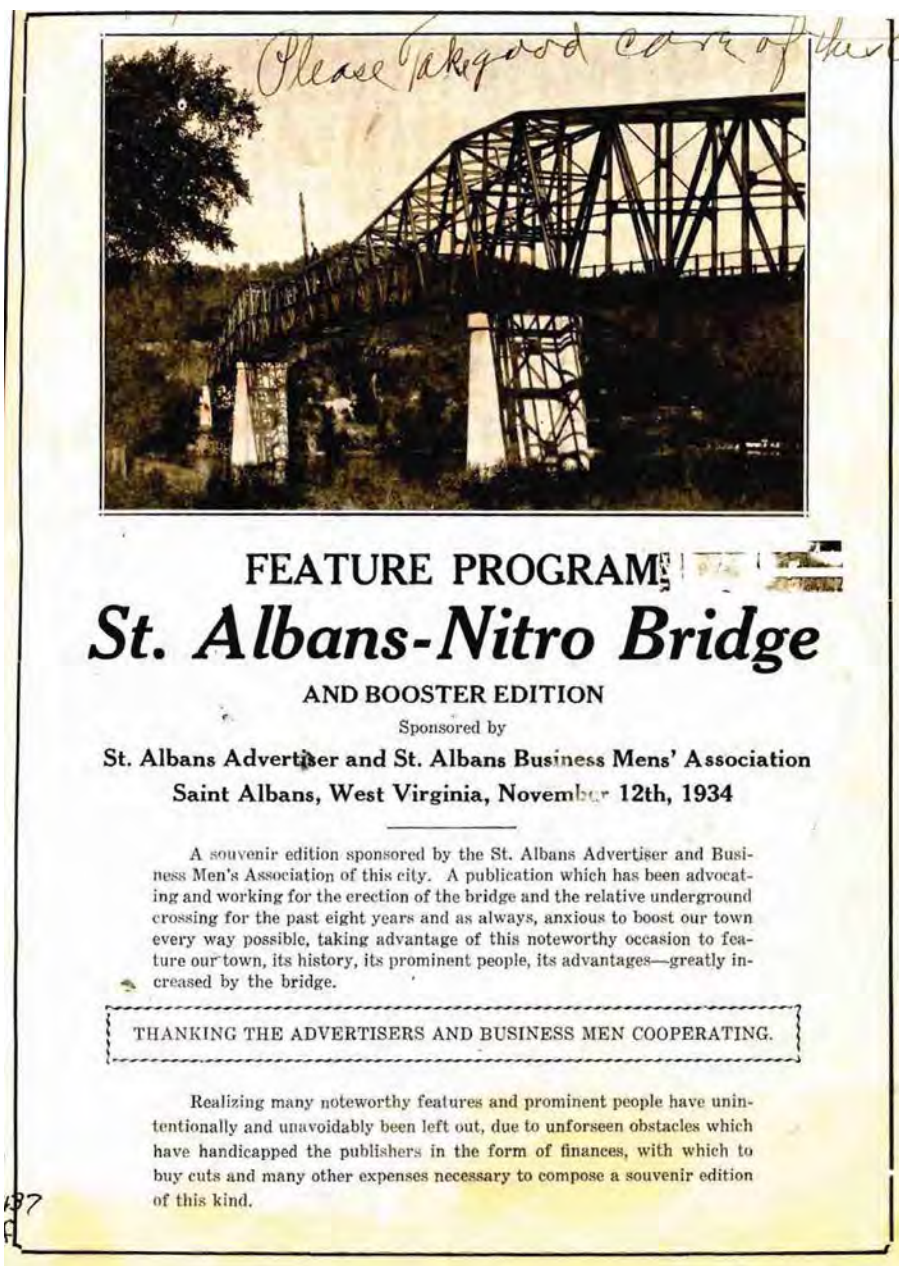


Figure 9: Opening day program, November 12, 1934. Available from, Rich Hively, "St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, 2012.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 23 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

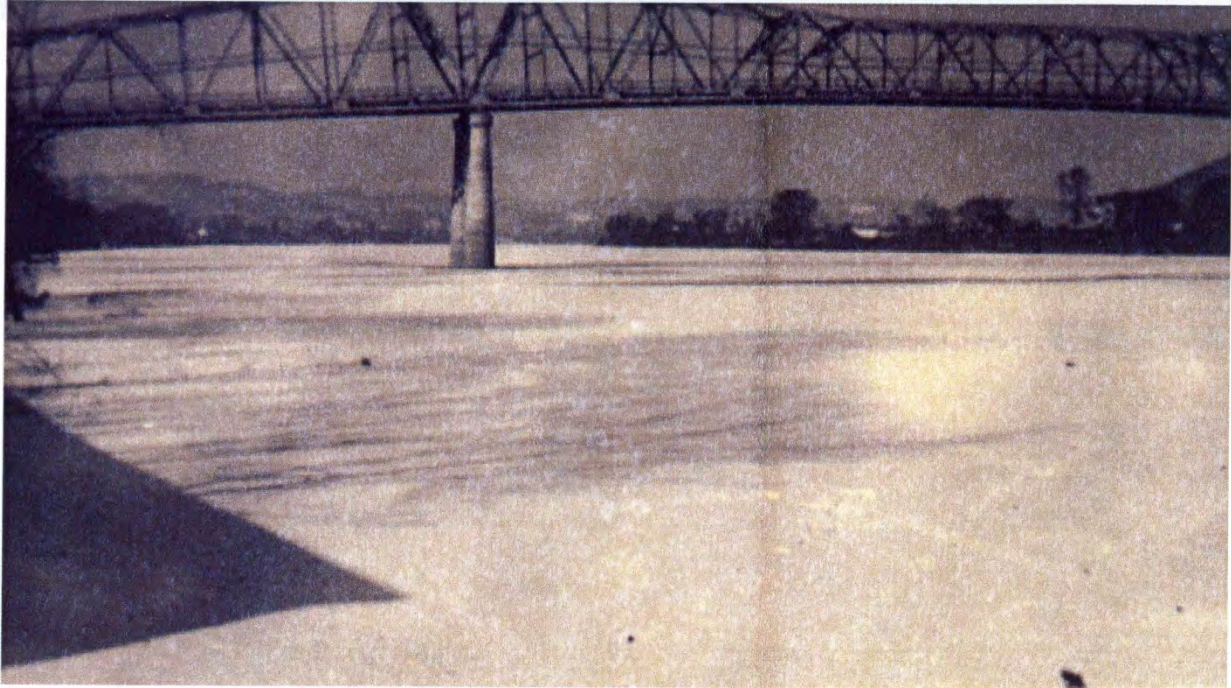


Figure 10: Photograph of the St. Albans-Nitro Bridge in the winter with the Kanawha River frozen over. Available from St. Albans Historical Society.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 24 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

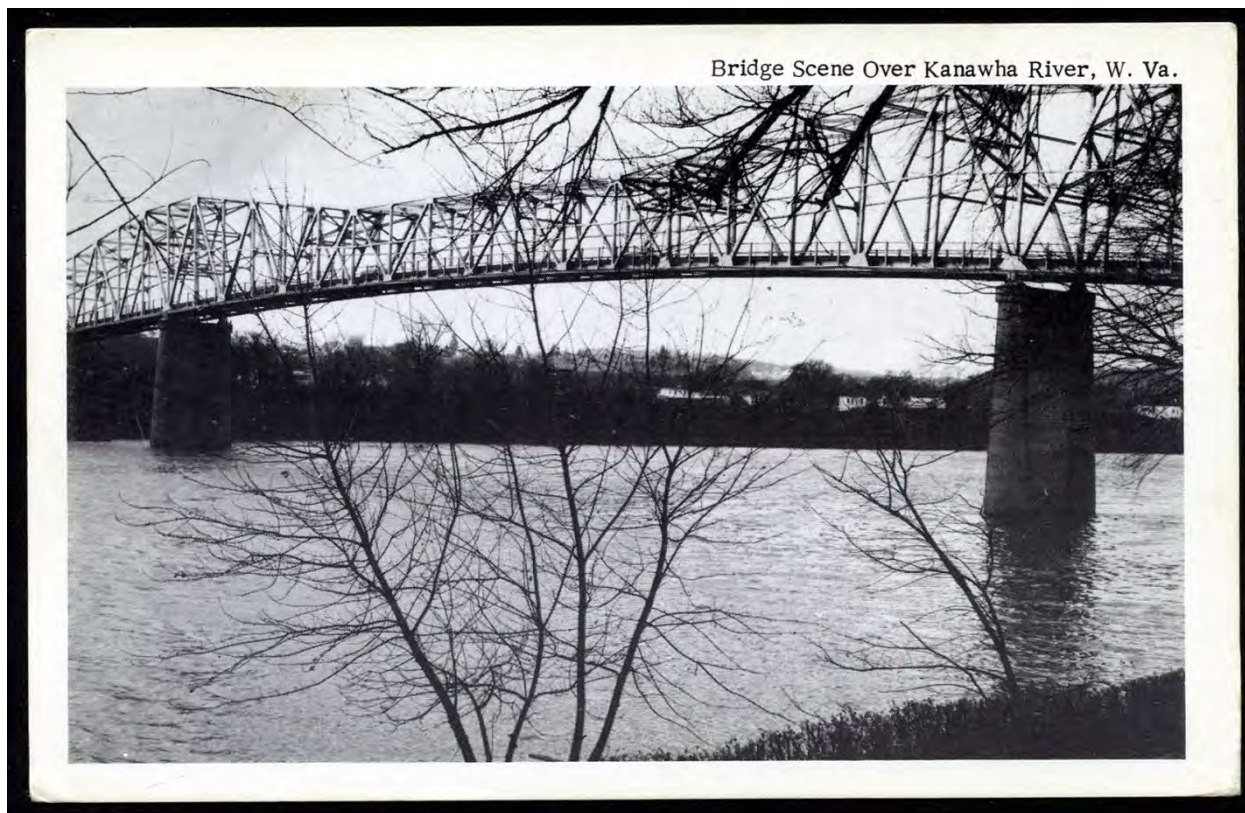


Figure 11: Historic postcard of the St. Albans-Nitro Bridge. Available from, St. Albans Historical Society.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 25 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



Figure 12: Ca. 1939 historic postcard depicting the St. Albans-Nitro Bridge, looking north toward the St. Albans approach and toward the toll house. Available from St. Albans Historical Society.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 26 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE **SITE#** _____



Figure 13: Coupons for passage across the St. Albans-Nitro Bridge. Available from, Rich Hively, "St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, 2012.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 27 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

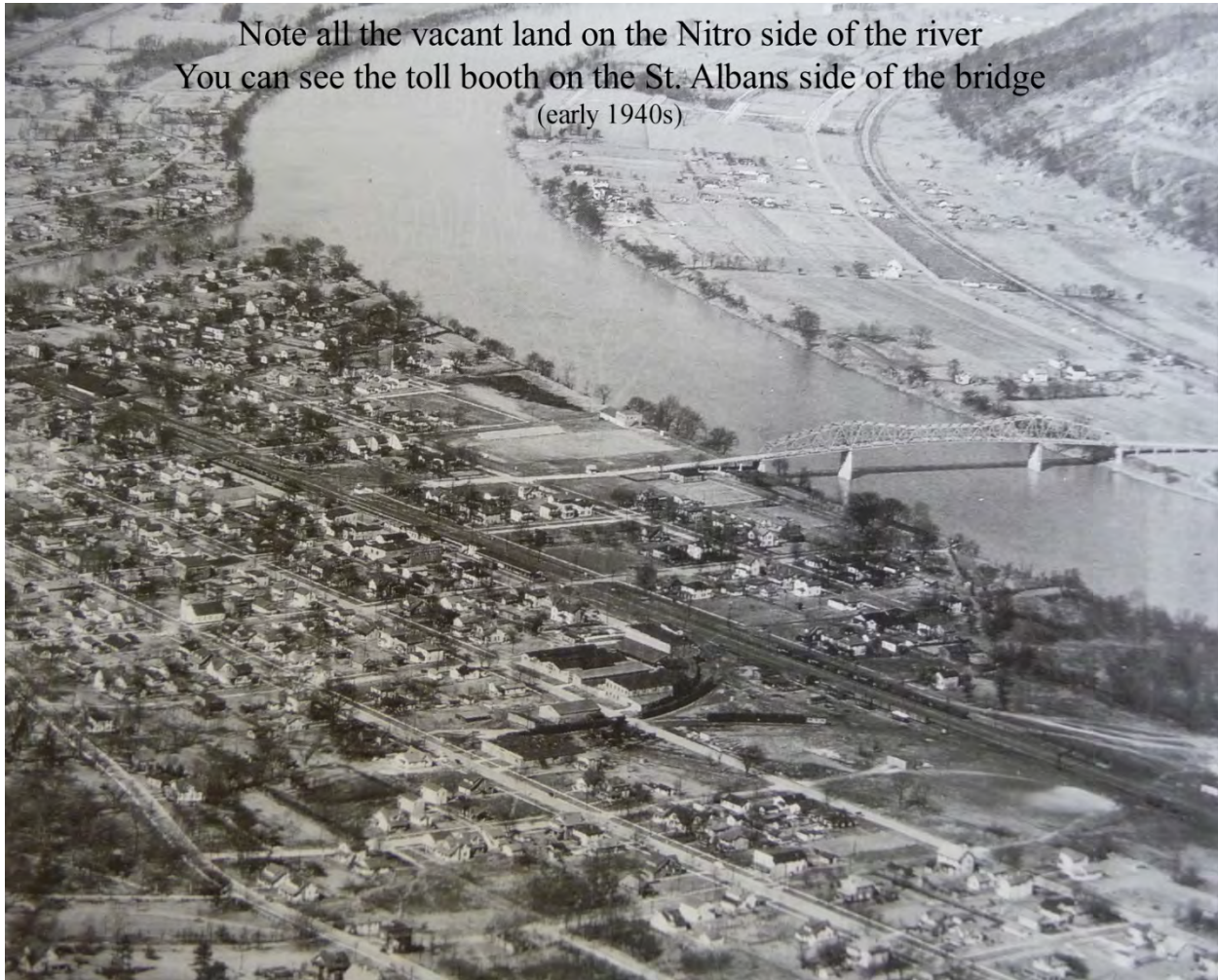


Figure 14: Ca. 1940s aerial photograph looking northwest over the town of St. Albans. The St. Albans-Nitro Bridge is shown in the middle-right of the image. Available from, Rich Hively, "St. Albans-Nitro Bridge," *Nitro, West Virginia* 25143, 2012.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 28 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

St. Albans - Nitro Municipal Bridge Project



The St. Albans-Nitro bridge was built in 1934 at a cost of approximately \$328,000, and was the first self liquidating government project to be constructed in West Virginia. It connects St. Albans with the North side of Kanawha river and with its sister cities of Nitro, Sattes, Institute and Dunbar. The Charleston airport and the State College for Colored are both within a five minutes drive of the North approach of this bridge. It affords the automobile traveler a direct connection from U. S. Route 60, which runs from the East to the West, to U. S.

Routes Nos. 21 and 119, which lead to the North and North East, and also to U. S. Route No. 35, which leads to the North West. The fact that in this automobile age, when very few people walk, 57,599 pedestrians paid to cross this bridge in a three year period is an indication of the important part it plays in the life of the community.

Mr. W. H. Miller was Mayor and J. W. Kiser, Troy D. Sutler, J. O. Murray, W. L. Lynch, C. A. McClung and H. H. Stollings were councilmen at the time it was erected.

\$85,000 C. & O. UNDERPASS



Third Street underpass main approach to the bridge erected by the city in conjunction with the C. and O. Railway at a cost of \$85,000.

Figure 15: Short history of the St. Albans-Nitro Bridge as shown in the Publication Historical Sketch of St. Albans, W. Va., "The Friendly Little City," 1938. Available from St. Albans Historical Society.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 29 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____

Photographs



PHOTO 1 OVERVIEW SHOWING SOUTHEAST ELEVATION OF TRUSS SPANS (SPAN NOS. 6, 7, 8), FACING NORTHWEST.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 30 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 2 OVERVIEW SHOWING SOUTHWEST VIADUCT SPANS (SPAN NOS. 1 THROUGH 5) AND PORTAL OF TRUSS SPAN (SPAN NO. 6), FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 31 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 3 OVERVIEW SHOWING NORTHEAST VIADUCT SPANS (SPAN NOS. 9 THROUGH 14) AND PORTAL OF TRUSS SPAN (SPAN NO. 8), FACING SOUTHWEST.

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET (Page 32 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 4 SOUTHEAST ELEVATION OF EARTHEN FILLED SOUTHWEST APPROACH AND SOUTHWEST ABUTMENT AND WINGWALL, FACING SOUTHWEST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 33 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 5 **SOUTHEAST ELEVATION OF SOUTHWEST VIADUCT SPAN NO. 1
SHOWING SOUTHWEST ABUTMENT AND WINGWALL AND VIADUCT
PEDESTAL NO.1, FACING NORTH.**

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 34 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 6 **SOUTHEAST ELEVATION OF SOUTHWEST VIADUCT SPAN NO. 2**
SHOWING VIADUCT PEDESTAL NOS. 1 AND 2, FACING NORTH.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 35 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 7 **SOUTHEAST ELEVATION OF SOUTHWEST VIADUCT SPAN NO. 3
SHOWING VIADUCT PEDESTAL NOS. 2 AND 3, FACING NORTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 36 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 8 **SOUTHEAST ELEVATION OF SOUTHWEST VIADUCT SPAN NO. 4
SHOWING VIADUCT PEDESTAL NOS. 3 AND 4, FACING NORTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 37 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 9 **SOUTHEAST ELEVATION OF SOUTHWEST VIADUCT SPAN NO. 5
SHOWING VIADUCT PEDESTAL NO. 4 AND BRIDGE PIER NO. 1,
FACING NORTH.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 38 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 10 **UNDERSIDE OF SOUTHWEST VIADUCT SPAN NOS. 5 THROUGH 1
SHOWING VIADUCT PEDESTALS, ROCKER SHOES, FLOOR BEAMS,
STRINGERS, AND INTERMEDIATE SIDEWALK AND RAIL POST
BRACKETS, FACING SOUTHWEST (NOTE NORTHWESTERN-MOST
(RIGHT) PEDESTALS WERE ADDED FOR A TURN LANE IN 1977).**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 39 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 11 **SOUTHWEST ELEVATION OF BRIDGE PIER NO. 1 SHOWING FLOORBEAMS, STRINGERS, AND ROCKER SHOES OF VIADUCT SPAN NO. 5 AND SHOES AND ANCHORAGE OF CANTILEVER TRUSS SPAN NO. 6, FACING NORTHEAST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 40 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 12 **SOUTHWEST AND SOUTHEAST ELEVATION OF BRIDGE PIER NO. 1
SHOWING BRIDGE SHOE AND ANCHORAGE ASSEMBLY OF
CANTILEVER TRUSS SPAN NO. 6, FACING NORTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 41 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE **SITE#** _____



PHOTO 13 **SOUTHEAST ELEVATION OF BRIDGE PIER NO. 2 SHOWING BRIDGE SHOE OF CANTILEVER TRUSS SPAN NOS. 6 AND 7, FACING NORTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 42 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 14 **NORTHEAST ELEVATION OF BRIDGE PIER NO. 3 SHOWING BRIDGE SHOE AND UNDERSIDE OF CANTILEVER TRUSS SPAN NOS. 7 AND 8, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 43 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 15 **UNDERSIDE OF CANTILEVER TRUSS SPAN NO.8 SHOWING BOTTOM CHORD AND FLOOR SYSTEM CONSISTING FLOOR BEAMS, STRINGERS, AND BOTTOM LATERAL BRACING WITH BRIDGE PIER NO. 3 IN BACKGROUND, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 44 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 16 **SOUTHEAST AND NORTHEAST ELEVATIONS OF BRIDGE PIER NO. 4,
FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 45 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 17 **NORTHEAST ELEVATION OF BRIDGE PIER NO. 4 SHOWING FLOORBEAMS, STRINGERS, AND ROCKER SHOES OF NORTHEAST VIADUCT SPAN NO. 9 AND SHOES AND ANCHORAGE OF CANTILEVER TRUSS SPAN NO. 8, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 46 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 18 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 9
SHOWING BRIDGE PIER NO. 4 AND VIADUCT PEDESTAL NO. 5,
FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 47 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 19 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 10
SHOWING VIADUCT PEDESTAL NOS. 5 AND 6, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 48 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 20 **UNDERSIDE OF NORTHEAST VIADUCT SPAN NOS. 10 THROUGH 14
SHOWING VIADUCT PEDESTALS, ROCKER SHOES, FLOOR BEAMS,
STRINGERS, AND INTERMEDIATE SIDEWALK AND RAIL POST
BRACKETS, FACING NORTHEAST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 49 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 21 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 11
SHOWING VIADUCT PEDESTAL NOS. 6 AND 7, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 50 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 22 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 12
SHOWING VIADUCT PEDESTAL NOS. 7 AND 8, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 51 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 23 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 13
SHOWING VIADUCT PEDESTAL NOS. 8 AND 9, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 52 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 24 **DETAIL OF VIADUCT PEDESTAL NO.9 AND ROCKER SHOE ALONG
NORTHEAST ELEVATION, FACING NORTH.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 53 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 25 **SOUTHEAST ELEVATION OF NORTHEAST VIADUCT SPAN NO. 14
SHOWING VIADUCT PEDESTAL NO. 9 AND NORTHEAST ABUTMENT,
FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 54 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 26 SOUTHEAST ELEVATION OF CANTILEVER TRUSS SPAN NO. 6
SHOWING BOTTOM CHORD, VERTICAL AND DIAGONAL MEMBERS,
SWAY FRAMES, TOP LATERAL BRACING, AND TOP CHORD, FACING
NORTHWEST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 55 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 27 NORTHWEST ELEVATION OF BRIDGE SHOWING BRIDGE SHOE AND ANCHORAGE ASSEMBLY OF CANTILEVER TRUSS SPAN NO. 6 ATOP BRIDGE PIER NO. 1, FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 56 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 28 SOUTHWEST PORTAL OF CANTILEVER TRUSS SPAN NO. 6 SHOWING PORTAL BRACING, RIVETED CONNECTIONS, VERTICAL AND DIAGONAL TRUSS MEMBERS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 57 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 29 **DETAIL OF RIVETED GUSSET PLATE ON INTERIOR OF NORTHWEST
ELEVATION OF CANTILEVER TRUSS SPAN NO. 6 AT SOUTHWEST
PORTAL.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 58 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 30 INTERIOR VIEW FROM DECK OF CANTILEVER TRUSS SPAN NOS. 6 AND 7 SHOWING BRIDGE DECK, VERTICAL AND DIAGONAL TRUSS MEMBERS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 59 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 31 INTERIOR VIEW OF JUNCTION OF CANTILEVER TRUSS SPAN NOS. 6 AND 7 ABOVE BRIDGE PIER NO. 2 SHOWING VERTICAL, HORIZONTAL, AND DIAGONAL TRUSS MEMBERS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 60 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 32 SOUTHEAST ELEVATION OF CANTILEVERED AND SUSPENDED TRUSS SPAN NO. 7 BETWEEN BRIDGE PIER NOS. 2 AND 3 SHOWING BOTTOM CHORD, VERTICAL AND DIAGONAL MEMBERS, SWAY FRAMES, TOP LATERAL BRACING, AND TOP CHORD, FACING NORTHWEST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 61 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 33 SOUTHEAST ELEVATION AND UNDERSIDE OF CANTILEVERED AND SUSPENDED TRUSS SPAN NO. 7 BETWEEN BRIDGE PIER NOS. 2 AND 3 SHOWING FLOOR SYSTEM, BOTTOM CHORD, VERTICAL AND DIAGONAL MEMBERS, SWAY FRAMES, TOP LATERAL BRACING, AND TOP CHORD, FACING NORTH.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 62 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 34 INTERIOR VIEW FROM DECK OF CENTER SUSPENDED PORTION OF TRUSS SPAN NO. 7 SHOWING BRIDGE DECK, VERTICAL AND DIAGONAL TRUSS MEMBERS, RIVETED CONNECTIONS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING NORTHEAST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 63 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 35 **DETAIL OF BUILT-UP, RIVETED VERTICAL MEMBER OF TRUSS SPAN NO.7 AT JUNCTION OF CANTILEVERED AND SUSPENDED PORTION OF SPAN, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 64 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 36 SOUTHEAST ELEVATION OF CANTILEVERED TRUSS SPAN NO. 8 BETWEEN BRIDGE PIER NOS. 3 AND 4 SHOWING BOTTOM CHORD, VERTICAL AND DIAGONAL MEMBERS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING NORTHWEST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 65 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 37 SOUTHEAST ELEVATION AND UNDERSIDE OF CANTILEVERED TRUSS SPAN NO. 8 BETWEEN BRIDGE PIER NOS. 3 AND 4 SHOWING FLOOR SYSTEM, BOTTOM CHORD, VERTICAL AND DIAGONAL MEMBERS, SWAY FRAMES, TOP CHORD, AND TOP LATERAL BRACING, FACING SOUTHWEST.

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 66 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 38 **NORTHEAST PORTAL OF CANTILEVER TRUSS SPAN NO. 8 SHOWING BRIDGE DECK, EXPANSION JOINT, PORTAL BRACING, RIVETED CONNECTIONS, VERTICAL AND DIAGONAL TRUSS MEMBERS, AND SWAY FRAMES, FACING SOUTH.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 67 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 39 **UNDERSIDE OF NORTHWEST APPROACH SPAN NO. 10 SHOWING
INTERMEDIATE SIDEWALK AND HANDRAIL SUPPORT BRACKETS
ALONG NORTHWEST ELEVATION, FACING NORTHEAST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 68 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 40 **DETAIL OF AN INTERMEDIATE HANDRAIL SUPPORT BRACKET
ALONG SOUTHEAST ELEVATION, FACING SOUTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 69 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 41 **DETAIL OF SIDEWALK HANDRAILING AND POST ASSEMBLY ALONG
NORTHWEST ELEVATION, FACING NORTH.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 70 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 42 **DETAIL OF HANDRAIL, POSTS, INTERMEDIATE HANDRAIL SUPPORTS,
AND CONNECTING BRACKETS ALONG SOUTHEAST ELEVATION OF
SPAN 14, FACING SOUTHWEST.**

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 71 of 75)

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 43 **DETAIL OF HANDRAILING SHOWING EMBOSSED MANUFACTURER'S MARK "BETHLEHEM USA" ALONG SOUTHEAST ELEVATION, FACING NORTHWEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 72 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 44 **DETAIL OF CONCRETE END POST WITH BRIDGE PLAQUE ALONG
NORTHWEST ELEVATION OF NORTHEAST APPROACH, FACING WEST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 73 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 45 **DETAIL OF HANDRAILING, POSTS, CONCRETE END POSTS, AND
HANDRAIL SUPPORT BRACKETS ALONG SOUTHEAST ELEVATION OF
SOUTHWEST APPROACH, FACING NORTH.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 74 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 46 **DETAIL OF HANDRAILING, POSTS, AND CONCRETE END POST ASSEMBLY ALONG SOUTHEAST ELEVATION OF NORTHWEST APPROACH, FACING SOUTHEAST.**

**WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET (Page 75 of 75)**

NAME RICHARD J. "DICK" HENDERSON MEMORIAL BRIDGE

SITE# _____



PHOTO 47 **DETAIL OF SIDEWALK AND CURVED HANDRAILING AND CONCRETE
END POST ASSEMBLY ALONG NORTHWEST ELEVATION OF
NORTHEAST APPROACH, FACING SOUTHWEST.**