A SURVEY AND PHOTOGRAPHIC INVENTORY OF METAL TRUSS BRIDGES IN VIRGINIA 1865-1932

IX. The Bristol Construction District

by

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Field Surveys conducted primarily by
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Virginia Highway & Transportation Research Council
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PREFACE

In 1974 the Research Council initiated a statewide survey of metal truss bridges to identify any with historic significance. This pioneering effort was financed with state research funds as it was intended to aid the Virginia Department of Highways and Transportation in meeting its obligations mandated by various requirements of the environmental review process.

As the work in Virginia proceeded, interest in the historic significance of bridges developed nationwide and warranted funding of the research under Highway Planning and Research funds administered by the Federal Highway Administration. A working plan was approved to develop criteria for the preservation or adaptive use of bridges and this work included surveys of metal truss bridges in the Lynchburg and Bristol districts and a statewide survey of concrete and masonry bridges. At that time surveys of metal truss bridges in the Staunton, Culpeper, Richmond, and Fredericksburg construction districts had been completed. The surveys of metal truss bridges for the remaining two districts, Salem and Suffolk, were funded with state research funds. An interim report entitled "Criteria For Preservation and Adaptive Use of Historic Highway Structures — A Trial Rating System for Truss Bridges" was issued in January 1978. This present report presents the results of the survey of the metal trusses in the Bristol District. The issuance of this report, which completes the statewide effort on metal truss bridges, has been delayed because of the resignation of the research analyst originally assigned to the project.

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INTRODUCTION

It is a notorious fact that there is no country of the world which is more in need of good and permanant Bridges than the United States of America.... Public spirit alone is wanting to make us the greatest nation on earth; and there is nothing more essential to the establishment of that greatness than the building of Bridges, the digging of canals, and the making of sound turnpike roads. Necessity has already produced some handsome and extensive specimens of bridge building in the United States.

Thomas Pope, as quoted above in his Treatise on Bridge Architecture of 1811, was pointing ahead to the importance of transportation development in our nation's history.(1)

The truss bridge was developed in direct response to the evolution and growth of America's transportation network. Its significance was recognized early. In 1916, prominent bridge engineer James Waddell wrote that the last form of bridge construction to be evolved but the one destined to promote the highest development of the art of bridge building was the truss.(2) Developments in technology are mirrored in its changing form. As materials changed from wood to combined wood and iron, to cast and wrought iron, and finally to steel, the truss bridge form reflected responses to needs for greater load and span capacity, mingled with manufacturing improvements in first irons, then steel. As current needs escalate load and traffic volume requirements, and highway safety standards are foremost in importance, the metal truss bridge is rapidly disappearing.

This report is a continuation of the Virginia Highway and Transportation Research Council's documentation of Virginia's remaining metal truss bridges,(3) a part of a research project delving into the technology of Virginia's historic transportation network. In particular, the results of the truss survey for the Bristol Construction District (Figure 1) are presented. In keeping with the previous reports of this series, the results are considered in light of historical trends.

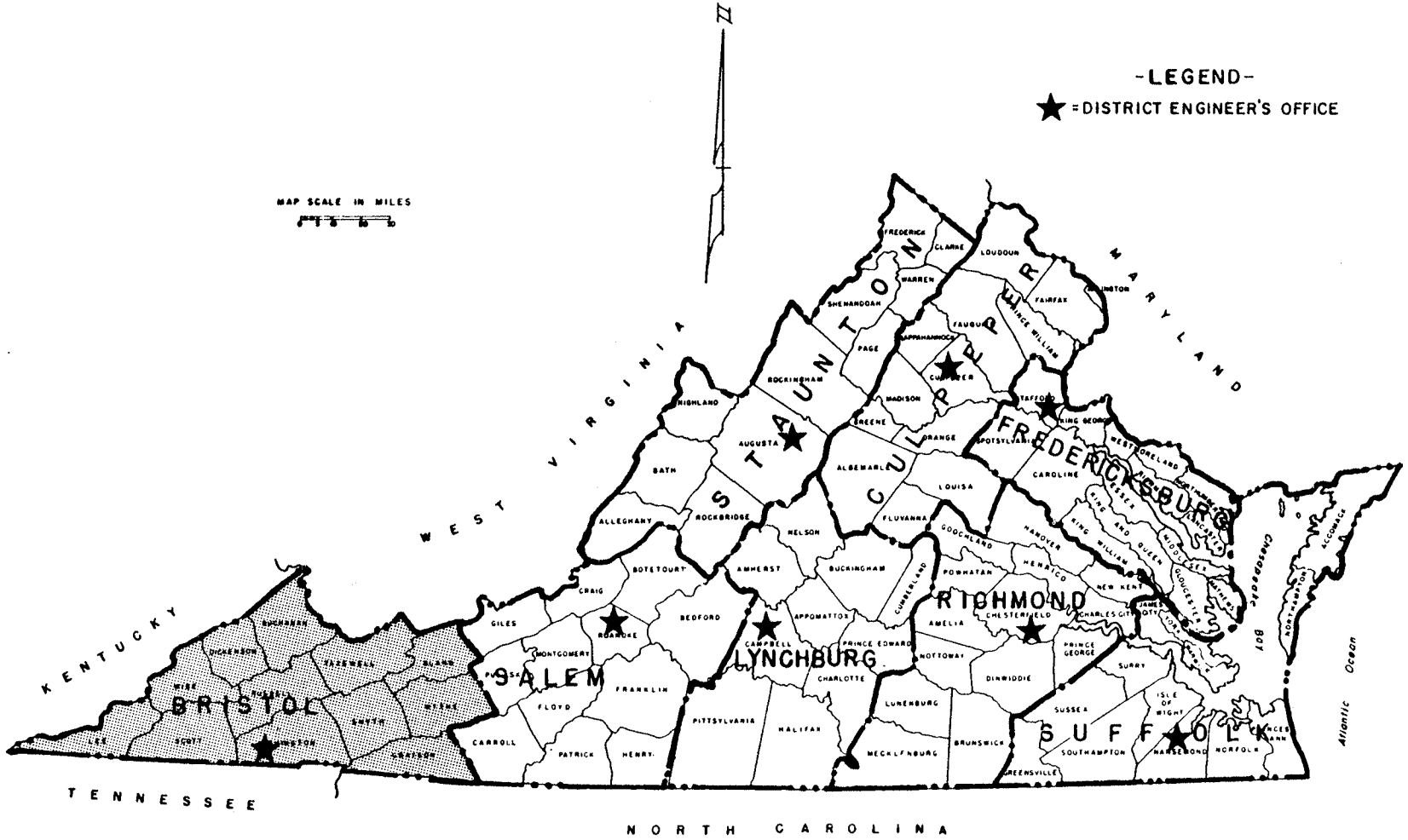

Figure 1. The Bristol Construction District.

The study was confined to pre-1932 bridges because after this time Virginia's bridge design for its secondary road system was no longer on a county-by-county basis and centralization meant a loss of regional diversity and an increased tendency to standardization.

THE BRISTOL CONSTRUCTION DISTRICT

The Bristol Construction District is Virginia's most remote geographical region. The twelve counties which make up this district form an isolated southwestern sector which borders West Virginia, Kentucky, Tennessee, and North Carolina. There are no urban centers in this vast, mountainous region. Traversing this rough terrain is difficult, although Interstate 81 carries traffic to the southeastern edge of the district. Other major routes in the district are east-west routes 460, 58 and 42, and north-south routes 23, 19 and 11.

TRUSS TYPES

The district's low urban demands and isolated geographic character have resulted in a large number of extant metal truss bridges built prior to 1932. The total number of metal trusses surveyed in the Bristol District is 143. Although this number is significant, it includes no unusual structural types. With the exception of one undocumented Parker truss, all the trusses fall into the commonly found categories of Pratt and triangular trusses. Thus, the diversity of truss types found within most of Virginia's construction districts is not found in the Bristol District.

There is, however, a great diversity in the bridge companies which manufactured these metal truss bridges. A few of these companies are historically significant and some are rare in that they are not recorded elsewhere in the state of Virginia. Also, many of the Bristol District metal trusses were manufactured by companies located in Roanoke, Virginia, the nearest urban area.

The most significant bridge company to erect bridges in the Bristol District is the Phoenix Bridge Company of Phoenixville, Pennsylvania. There are three metal truss bridges attributed to this technologically innovative company, one in Wythe County and two in Bland County. They are all single-span, pin-connected Pratt through trusses. The Wythe County Phoenix truss is illustrated in Figures 2 and 3. The portal bracing detail shown in Figure 3 closely matches that found on the National Register of Historic Places listed Phoenix truss in Botetourt County of the Salem Construction District.

Figure 2. A Wythe County Pratt through truss attributed to the Phoenix Bridge Company.

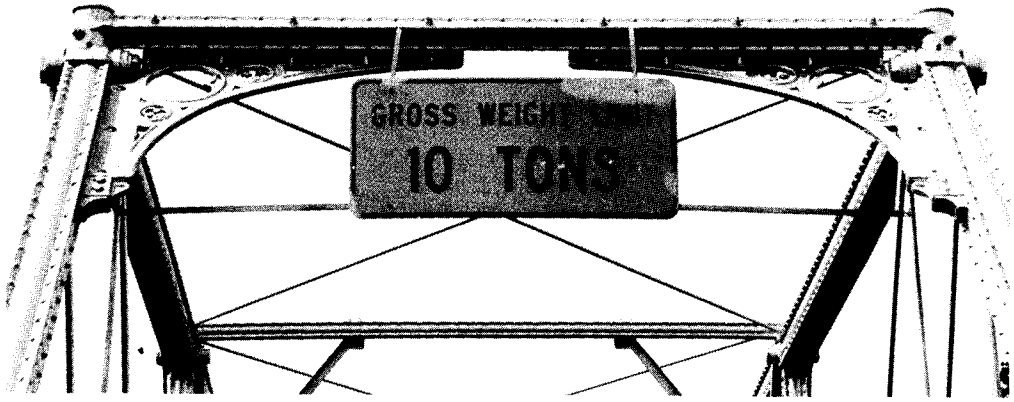

Figure 3. A detail of the portal bracing in Figure 2 showing the patented Phoenix columns and decorative strut bracing.

The bridge plates are missing on these Phoenix Company trusses but they are easily identified by their patented compression members, known as Phoenix columns. These wrought iron members are used for endposts, verticals, top chords, and lateral struts.

The Phoenix column was a technological innovation instrumental in shifting bridge-building materials from cast iron to wrought iron in the 1860's, according to bridge engineer J. A. L. Waddell's commentary in 1916.(4) A wrought iron composite column was patented by Samuel Reeves in 1862. It was made of three or more rolled flanged sections longitudinally oriented and bolted or riveted together. Several changes in this column design were patented in 1872 by Thomas Clarke and Adolphus Bonzano of Clarke, Reeves & Co., predecessors to the Phoenix Bridge Company. The standard column used in their bridges, however, was described in the "2nd Illustrated Album of Designs" produced by the Phoenixville Bridge Works and Clarke, Reeves & Co. in 1873 as 4 or 8 rolled sections riveted together at their flanges to form a column.

The structural advantage of the Phoenix column was that the increased area of this composite member made it stiffer and more capable of withstanding the buckling tendency of long slender columns. Variations in the diameter of the columns and the number of column sections were illustrated in the company's catalog. The three Bristol District Phoenix truss bridges verify these variations as they are built of 4-,6-, and 8-sectioned Phoenix columns. Figure 4 illustrates the entire portal view of one Bland County Phoenix truss, while Figure 5 illustrates an upper joint connection detail of the other Bland County Phoenix truss showing tie rods and Phoenix columns.

The King Iron Bridge Company of Cleveland, Ohio, is another technologically innovative and prolific bridge company represented in the Bristol District. The oddly proportioned Pratt truss illustrated in Figure 6 was built by this company. It is a relatively early bridge, erected in 1885, with its bridge plate intact on the portal strut identifying both date and manufacturer. This pin-connected through truss spans the Holston River in Smyth County. Its members are comprised of channels, lacing bars, and eye bars. There are four King Iron Bridge & Manufacturing Co. metal truss bridges remaining in Virginia, although the company listed many other bridges built in Virginia in an early catalog. In the 1884 company catalog, the King Iron Bridge Co. claimed to be the largest highway bridge works in the United States, with the capacity for wrought iron and steel bridges, high and low trusses, arch bridges, swing bridges, iron turntables, and combination bridges of all styles.

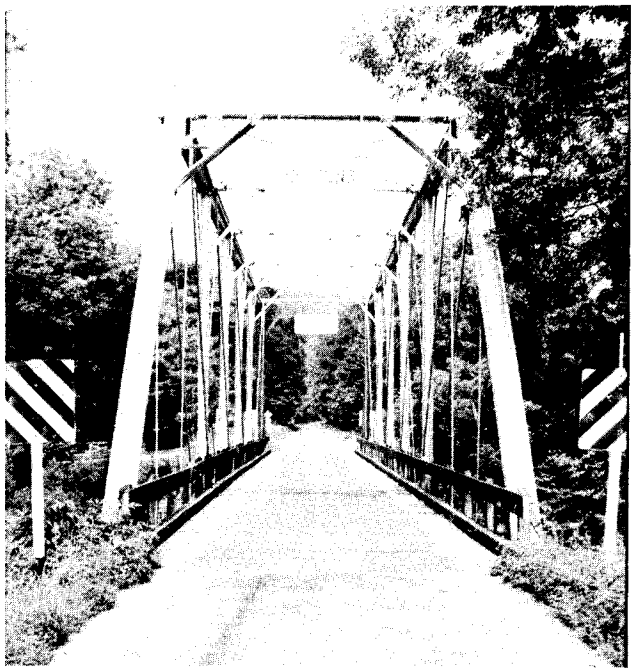

Figure 4. A Phoenix Company Pratt truss built in Bland County.

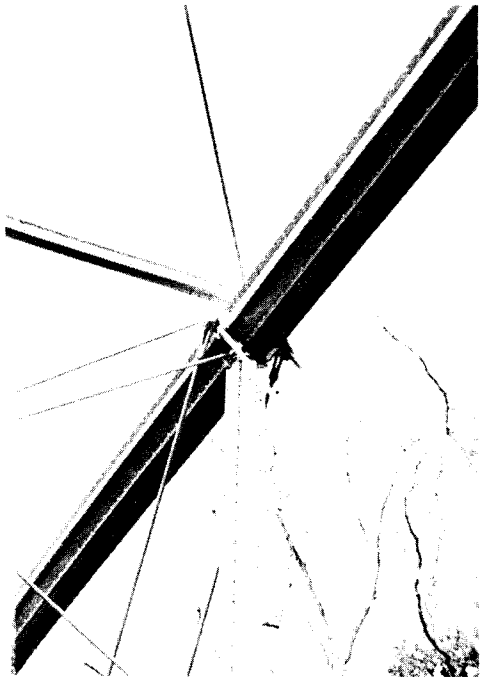

Figure 5. A detail of an upper joint on Bland County's second Phoenix Pratt truss.

The Groton Bridge & Manufacturing Company of Groton, New York, built a two-span Pratt truss over the Clinch River in Russell County. The extant bridge plate documents the date of this bridge's manufacture as 1889. The truss members are comprised of channels and laticing; eye bars are both die forged and loop welded. The Groton Company is noteworthy in Virginia for its design of an unusual truss bridge in the Staunton Construction District which is now listed on the National Register of Historic Places. Although the Russell County truss bridge is not innovative or unusual in its structure, it is significant as a representative of this sparsely represented bridge manufacturer. This two-span,pin-connected bridge is shown in Figure 7.

The Pittsburgh Bridge Company, manufacturer of two other metal trusses in Virginia, built the earliest extant spans in the Bristol District in Wythe County across Reed Creek. This two-span bridge was built in 1881 and consists of a very short span Pratt through truss and a Pratt pony truss. Both trusses are pin-connected. The posts on the pony span are "A" frame posts composed of angles and stay plates. These spans rest on handsome ashlar masonry piers (see Figure 8).

There are also three bridges in the Bristol District built by manufacturers not represented elsewhere in the state: the Chicago Bridge Company, Penn Bridge Company, and HIPCO Steel Bridges. The Chicago Bridge Company built a two-span Pratt through truss bridge in Russell County in 1891. It is pin-connected and is built on ashlar masonry piers. This bridge is illustrated in Figure 9. The Penn Bridge Company of Beaver Falls, Pennsylvania, built the single-span, pin-connected Pratt through truss in Grayson County shown in Figure 10. The third bridge is a late pony truss, triangular with verticals, built in 1925 and bearing a bridge plate marked HIPCO Steel Bridges. It is a typical riveted twentieth century pony truss (see Figure 11). The only unusual features of this bridge are the braced posts, probably a later modification to strengthen the truss.

In addition to interesting representatives from various bridge manufacturers, there are several metal trusses worth noting for their unusual configurations. The only Parker truss observed in the state survey is located in Lee County. The Parker truss is a variant of the Pratt truss whose upper chord is smoothly inclined, rather than abruptly changing in slope at the center as with the Camelback Pratt. This profile is illustrated in Figure 12. At 200 ft. (61 m), this pin-connected through truss is the longest span in the Bristol District.

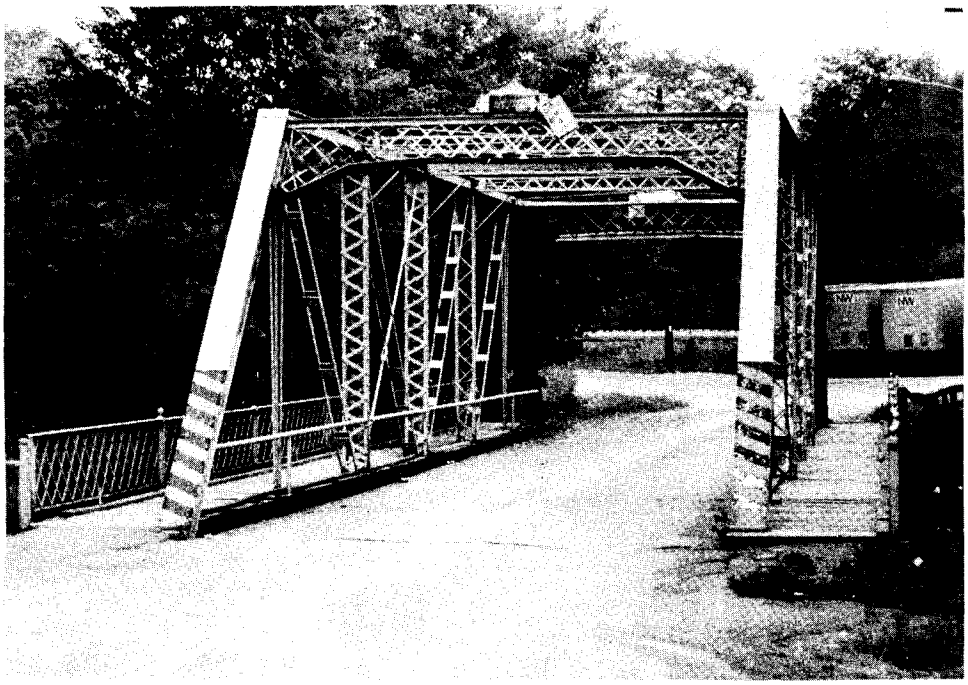

Figure 6. King Iron Bridge Company Pratt truss with bridge plate intact, built in 1885.

Figure 7. Groton Bridge & Manufacturing Company built this two-span Pratt truss in Russell County in 1889.

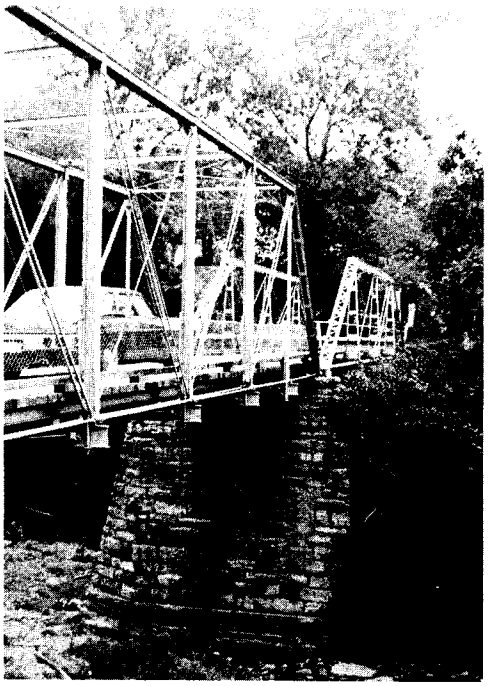

Figure 8. A two-span Pratt through and pony truss bridge built by the Pittsburgh Bridge Company in 1881. This is the district's earliest documented bridge.

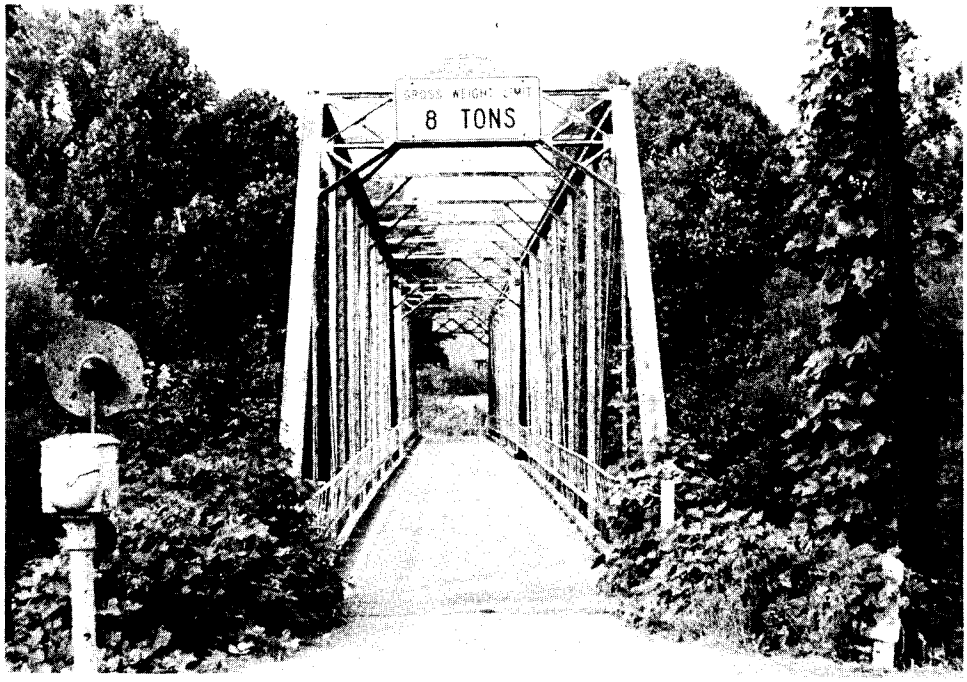

Figure 9. The Chicago Bridge Company built this two-span Pratt through truss in Russell County in 1891.

Figure 10. A single-span Pratt through truss built by the Penn Bridge Company of Beaver Falls, Pa.

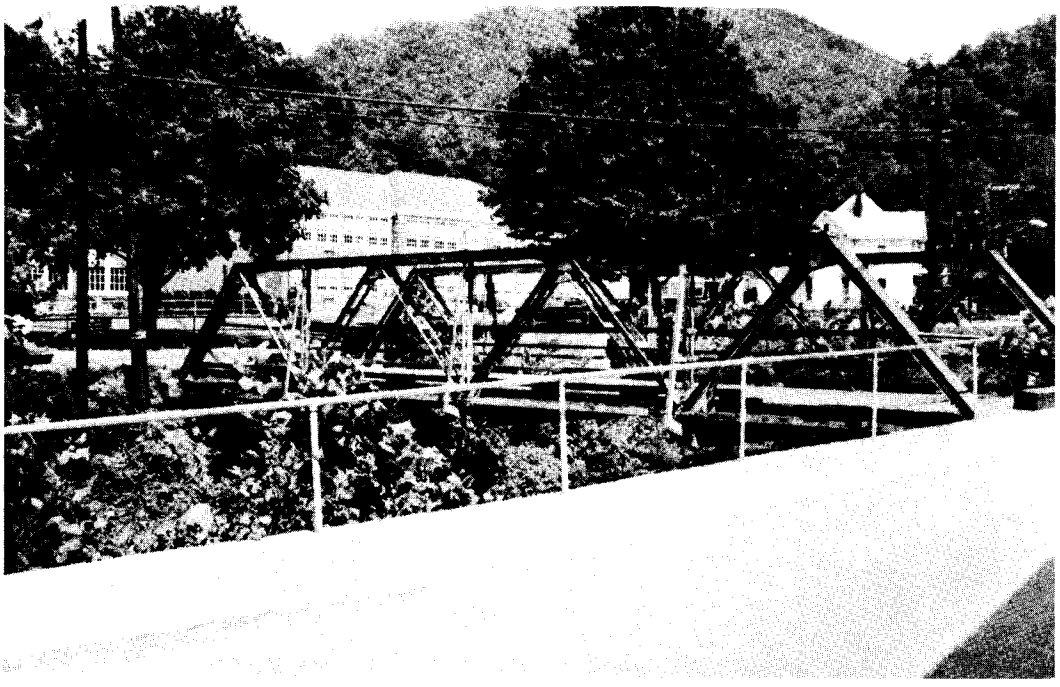

Figure 11. A typical twentieth century pony truss with riveted connections built by HIPCO Steel Bridges in 1925.

Figure 13 shows an unusual juxtaposition of metal truss and concrete spans. In between two concrete box beam spans is situated a 50 ft. (15 m) metal truss triangular with verticals pony span. Figure 14 shows a heavily structured triangular with verticals through truss whose unusual qualities are illustrated in the joint connection detail of Figure 15. Of particular interest in the joint connection photograph are the very heavy stringer beams and the eye bar and lateral bracing pin connection.

Many (39%) of the Bristol District trusses are undocumented with respect to date of manufacture, so a statistical basis for conclusions is limited. There are only 5 significantly early trusses built prior to 1890. In the time span from 1870 to 1910 there are only 13 metal trusses; all are Pratt types, 5 pony trusses and 8 through trusses. The figures confirm Waddell's observation in 1884 that 90% of all post-Civil War trusses were of the Pratt or Whipple type.(5) By 1916, according to Waddell, nearly all trusses "of ordinary span length are being designed of the Pratt or Petit type, but occasionally the triangular with secondary verticals is employed."(6) His later observations are also confirmed by the 1911-1932 group of trusses: 36 of the 74 are Pratt trusses, 35 are triangular with vertical trusses and 3 are Camelback Pratt trusses. Including trusses of undocumented dates the breakdown of types is 57% Pratt, 34% triangular with verticals, and 8% Pratt variations (Camelback and Parker). See Table 1*.

Fifty-nine percent of all truss bridges in the Bristol District are low/pony trusses, 40% are high/through, and 1% are deck trusses. The deck truss is a Pratt type. The pony truss spans range from a 42-ft. (12.8 m) pin-connected Pratt truss to a riveted 100-ft. (30.5 m) triangular truss. The through trusses range in length from an 80-ft. (24.4 m) pin-connected Pratt truss to a 200-ft. (61 m) Parker truss. The average span for the pony trusses is 71 ft. (21.6 m) and that for the through trusses is 131 ft. (39.9 m). These figures fit within the general confines of early twentieth century engineers Waddell's and Ketchum's requirements: shorter spans were satisfactory structurally if designed with parallel chords, but longer spans should have inclined chords.

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*Tables 1-15 appear on pages 16 through 45.

Figure 12. Parker truss, a variant of the Pratt truss, located in Lee County over the Powell River.

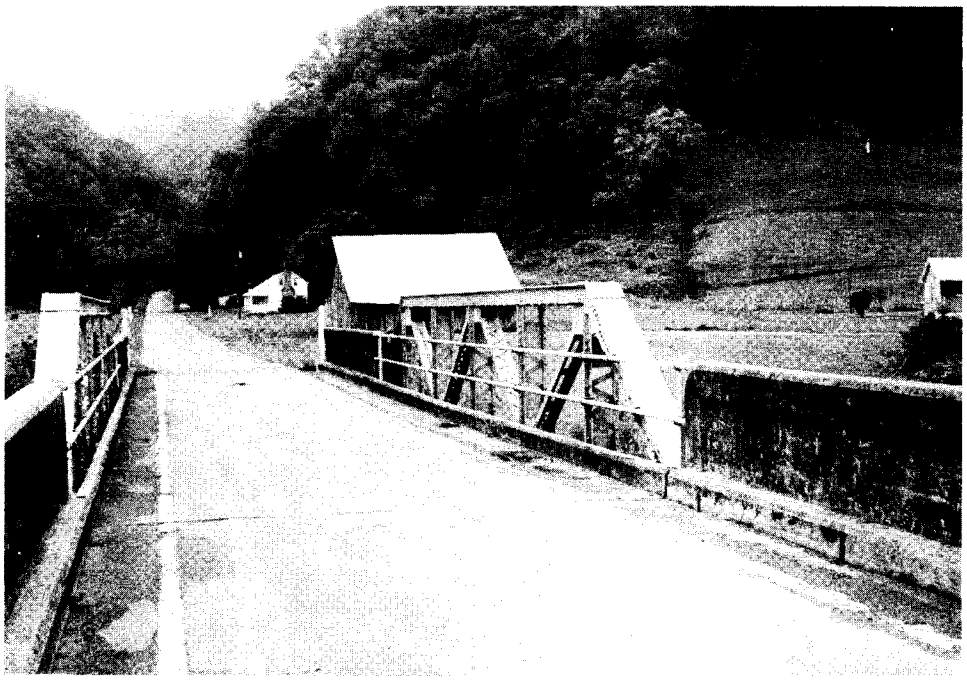


Figure 13. Pony truss span combined with two concrete spans in Scott County, over the Clinch River.

Figure 14. A heavily structured triangular with verticals through truss in Lee County.

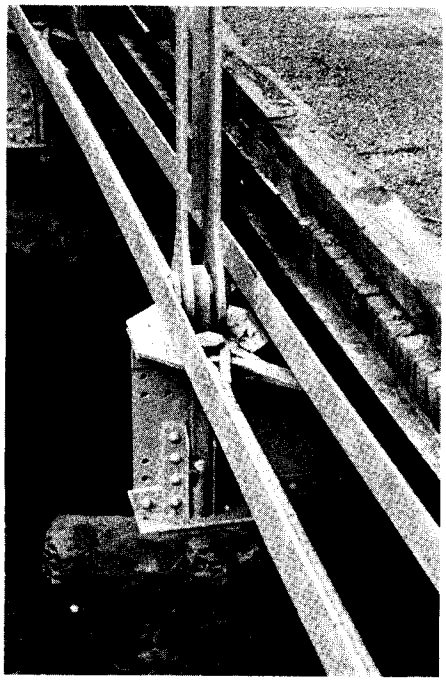


Figure 15. Lower joint connection detail of metal truss in Figure 14.

Considered by span length, the trusses in the 1890-1910 group again generally fit into Waddell's categories:

65-90 ft. (19.8-27.4 m)	pin-connected pony truss
90-200 ft. (27.4-61 m)	pin-connected through truss
200 plus ft. (61+ m)	pin-connected through truss with polygonal chords

The dated pin-connected through truss spans are 72 ft. (21.9 m), 82 ft. (30 m), 95 ft. (29 m), two at 110 ft. (33.5 m), 114 ft. (34.7 m), 120 ft. (36.6 m), and 140 ft. (42.7 m) long. The two dated pin-connected pony trusses of this era are 66 ft. (20.1 m) and 70 ft. (21.3 m) spans, respectively. Only 18% of all Bristol District pony trusses are pin-connected while 67% of the through trusses are pin-connected. This breakdown in joint connection types probably reflects later engineering design standards, like those proposed by Milo Ketchum,[7] whose principal objection to the pin-connected low truss was a lack of lateral stability due to insufficient bracing. He considered riveted trusses preferable for all low trusses and for high trusses up to 150 ft. (45.7 m). He also specified that spans longer than 150 ft. (45.7 m) should be pin-connected, but all high trusses could be pin-connected. Ketchum's 1908 breakdown of high trusses was:

80-170 ft. (24.4-51.8 m)	parallel chords, either pin or rivet
160-220 ft. (48.8-67.1 m)	Pratt with inclined upper chords, pin
220 plus ft. (67.1+ m)	Petit, pin

The Bristol survey results for high trusses in the 1911-1932 era generally confirm this breakdown, although spans tend to be more conservative with respect to the range of allowable span length. Pratt pinned spans range from 100 ft. (30.5 m) to 150 ft. (45.7 m); the pinned Camelback Pratt trusses are all 150 ft. (45.7 m) spans; the Parker truss is pinned and is 200 ft. (61 m) long. A listing of truss types in the Bristol District, with respective dates of manufacture and joint connection details, is given in Table 2.

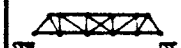
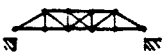
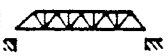
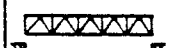
BRIDGE COMPANIES

The diversity of bridge companies represented in the Bristol District was discussed above. The companies are listed with respect

to the types of trusses built in the Bristol District in Table 3. Eighty-three of 143 trusses in the Bristol District have documented designer-fabricators. These 83 trusses are represented by 16 companies scattered throughout the 12 counties. The location of several iron and bridge manufacturing companies in the city of Roanoke, Virginia, shows the district's dependence on this nearby urban center. The Roanoke Iron Works, Inc., Roanoke Bridge Co., Inc., Virginia Bridge & Iron Co., Virginia Bridge Co., Camden Iron Works, Atlantic Bridge Co., and American Bridge Co. were all established in Roanoke or its sister city, Salem. The Virginia Bridge Co. was incorporated in 1895, having been previously the American Bridge Co.,[8] which seems to have been a popular name for bridge companies. The Virginia Bridge & Iron Company's principal product was heavy railroad bridge work. The Virginia Bridge Company was absorbed late this century by the American Bridge Co. The Roanoke Bridge Co., Inc., was organized in 1906 for the construction of county and municipal bridges. Until 1911 the Roanoke Bridge Co. worked together with the Virginia Bridge & Iron Co. The Roanoke Bridge Co. contracted for and erected the bridges in the field while the Virginia Bridge & Iron Co. fabricated the structural steel in its shops.[9] The Roanoke Iron Works, Inc., was established in 1907 as the consolidation of two large iron working enterprises in Roanoke.[10] The Camden Iron Works was established about 1887 and specialized in structural and ornamental iron.[11] In 1914, the Roanoke Bridge Co. of Roanoke and the Camden Iron Works of Salem merged to become the Roanoke Iron & Bridge Works.[12] Of the 143 truss bridges in the Bristol District, 56 were manufactured by Roanoke companies. This is a total of 67% of the known and documented trusses.

The types of trusses erected in the Bristol District and the bridge companies which manufactured them can be studied in more detail in Tables 1-15. Included in these tables is a county-by-county breakdown of the Bristol District metal truss bridges. This information is presented on pages 16 through 45, and the inventory forms for the trusses discussed in the text are presented in the Appendix.

Table 1. Truss types in the Bristol District.

TRUSS TYPE / COUNTY / CITY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
Bland			2-n.d.	2-1926 1-n.d.		
Buchanan				1-1925		1-1925
Dickenson			1-1916 1-n.d.	1-1923 1-1926 1-1927		1-n.d.
Grayson			1-1930 1-n.d.	1-1931 1-n.d.(modified)		3-n.d.
Lee			1-1916 5-n.d.	1-1922 1-1929 1-1930 4-n.d.		1-1912 1-n.d.
Russell			2-1912 1-1929	1-1913 1-1916(modified) 1-1925 1-1927 1 n.d. 2-1931		1-1927
Scott			3-1910 1-1911 1-1915 4-1922 4-n.d.	1-1915 1-1921 1-1926 1-1929 2-n.d.		2-n.d.
Smyth			1-1917 4-n.d.	1-n.d.		
Tazewell			2-1929 1-n.d.	1-1912 2-n.d.		
Washington			1-1908 1-1911 4-n.d.			1-n.d.
Wise		1-1911	1-1912 1-1920 1-1929 1-n.d.	1-n.d.		
Wythe	1-1931		1-1881 1-1931 1-n.d.	1-1929		
TOTAL	1	1	49	35		11

ND - no date
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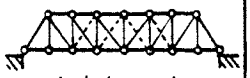
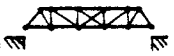
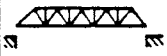
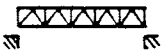
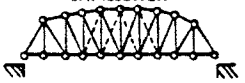
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
	2-n.d.	1-1928(modified)			8
		1-1922	1-1931		4
					6
	1-n.d.		8-1927		16
	1-1923	1-n.d.		1-Parker-n.d.	18
	2-1889 1-1891 2-1912				16
	2-1914 1-n.d.	1-1930			25
	1-1885 1-1926 1-1909 1-1928 1-1913 1-1930 1-1914 1-n.d.				14
	1-n.d.	1-1924			8
	2-1910 1-1914				10
	1-1914 1-1928 1-n.d.				9
	1-1881 1-1920 2-n.d.				9
	31	5	9	1	143

Table 2. Truss dates and connection details in the Bristol Construction District.

TRUSS TYPE	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
TRUSS DATES KNOWN 1870-1910: 13 1911-1932: 74	1-1931	1-1911	1-1881 2-1916 1-1908 1-1917 3-1910 1-1920 2-1911 4-1922 3-1912 4-1929 1-1915 1-1930 1-1931	1-1912 2-1925 1-1913 4-1926 1-1915 2-1927 1-1916 3-1929 1-1921 1-1930 1-1922 3-1931 1-1923		1-1912 1-1925 1-1927
UNKNOWN: 56			24	13		8
CONNECTION DETAILS AND SPAN LENGTHS						
PIN WITH LOOP-WELDED EYEBARS			1-1881 1-1908 1-1911 9-n.d.			1-1927 1-n.d.
PIN WITH DIE-FORGED EYEBARS			2-1912 1-n.d.			1-1912 7-n.d.
PIN WITH COMBINATION EYEBARS			1-n.d.			
RIGID CONNECTED	1-1931	1-1911	3-1910 4-1929 1-1911 1-1930 1-1912 1-1931 1-1915 13-n.d. 2-1916 1-1917 1-1920 4-1921	1-1912 2-1925 1-1913 4-1926 1-1915 2-1927 1-1916 3-1929 1-1921 1-1930 1-1922 3-1931 1-1923 13-n.d.		1-1925

ND - no date
* stylistic attribution

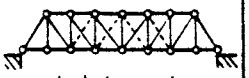
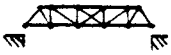
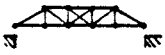
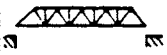
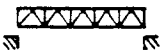
THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
	1-1881 1-1885 2-1889 1-1891 1-1909 2-1910 2-1912 1-1913 5-1914 1-1920 1-1923 1-1926 2-1928 1-1930	1-1922 1-1924 1-1928 1-1930	8-1927 1-1931		87
	9	1		1-Parker-n.d.	56
	1-1881 1-1909 2-1910 1-1913 1-1914 1-1920 1-1923 1-1926 1-1928 1-1931 3-n.d.				28
	1-1891 2-1912 1-1914 4-n.d.	1-n.d.			20
	1-1885 2-1889 1-n.d.			1-Parker-n.d.	6
	3-1914 1-1928 1-n.d.	1-1922 1-1924 1-1928 1-1930	8-1927 1-1931		89

Table 3. Bridge companies and truss types in the Bristol Construction District.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
ATLANTIC BRIDGE CO. CHARLOTTE,N.C.						
ATLANTIC BRIDGE CO. ROANOKE, VA.						
AUSTIN BROTHERS ATLANTA,GA.			1-1916			
CAROLINA STEEL & IRON CO. GREENSBORO, N.C.						
CHAMPION BRIDGE CO. WILMINGTON, OHIO			4-1921			
CHICAGO BRIDGE CO.						
GROTON BRIDGE & MFG. CO. GROTON, N.Y.						
HIPCO STEEL BRIDGES				1-1925		
KING IRON BRIDGE CO. CLEVELAND,OHIO						
PENN BRIDGE CO. BEAVER FALLS, PA.						
PHOENIX BRIDGE CO. PHOENIXVILLE, PA.						
PITTSBURGH BRIDGE CO. PITTSBURGH,PA.			1-1881			
ROANOKE BRIDGE CO. ROANOKE, VA.			1-1908 1-1912			1-1912
ROANOKE IRON & BRIDGE WORKS				1-1922 2-1929 1-1923 1-1930 4-1926 3-1931 2-1927		1-1925 1-1927
TWIN CITY BOILER WORKS BRISTOL, VA.				1-1929		
VIRGINIA BRIDGE & IRON CO. ROANOKE, VA.		1-1911	1-1911 1-1931 2-1912 1-1916 1-1917	1-1912 1-1913		1-n.d.
VIRGINIA DEPT. OF HIGHWAYS RICHMOND, VA.	1-1931		3-1929 1-1930			
VIRGINIA STATE HIGHWAY COMMISSION RICHMOND, VA.						
UNKNOWN			3-1910 1-1929 1-1911 24-n.d. 1-1915 1-1920	1-1915 13-n.d. 1-1916 1-1921 1-1925		7-n.d.
TOTAL	1	1	49	35		11

ND - no date
* stylistic attribution

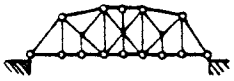
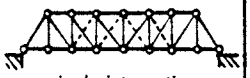
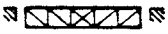
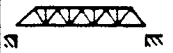
THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
	1-1920				1
		1-1924			1
					1
			3-1927		3
					4
	1-1891				1
	2-1889				2
					1
	1-1885				1
	1-n.d.				1
	*3-n.d.				3
	1-1881				2
	1-1909 2-1910				6
	1-1923 1-1926 2-1928 1-1931 1-n.d.	1-1922 1-1928 1-1930	5-1927 1-1931		31
					1
	2-1912 1-1913 4-1914 1-n.d.				18
					5
	1-1914				1
	3-n.d.	1-n.d.		1-Parker-n.d.	60
	31	5	9	1	143

Table 4. Truss types and bridge companies in Bland County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
PHOENIX BRIDGE COMPANY						
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.				2-1926		
UNKNOWN			2-n.d.	1-n.d.		
TOTAL			2	3		

ND - no date
* stylistic attribution

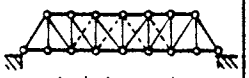
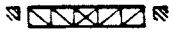
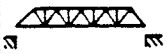
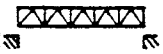
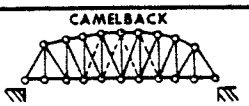
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
	*1-n.d. *1-n.d.				2
		1-1928 (mod.)			3
					3
	2	1			8

Table 5. Truss types and bridge companies in Buchanan County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
HIPCO STEEL BRIDGES				1-1925		
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.						1-1925
TOTAL				1		1

ND - no date
* stylistic attribution

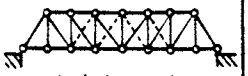
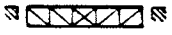
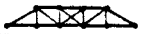
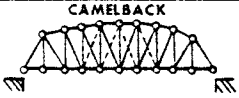
THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
					1
		1-1922	1-1931		3
		1	1		4

Table 6. Truss types and bridge companies in Dickenson County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
AUSTIN BROTHERS ATLANTA, GA.			1-1916			
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.				1-1923 1-1926 1-1927		
UNKNOWN			1-n.d.			1-n.d.
TOTAL			2	3		1

ND - no date
* stylistic attribution

THROUGH (HIGH)

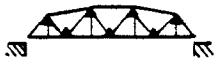
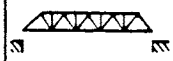
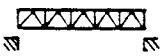
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
					1
					3
					2
					6

Table 7. Truss types and bridge companies in Grayson County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
CAROLINA STEEL & IRON CO. GREENSBORO, N.C.						
PENN BRIDGE COMPANY BEAVER FALLS, PA.						
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.				1-1931		
VIRGINIA DEPT. OF HIGHWAYS RICHMOND, VA.			1-1930			
UNKNOWN			1-n.d.	1-n.d. (mod.)		3-n.d.
TOTAL			2	2		3

ND - no date
* stylistic attribution

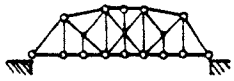
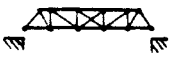
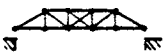
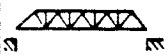
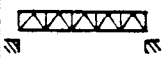
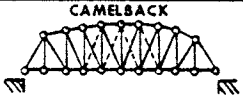
THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
			3-1927		3
	1-n.d.				1
			5-1927		6
					1
					5
	1		8		16

Table 8. Truss types and bridge companies in Lee County.

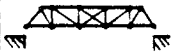
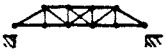
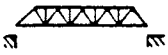
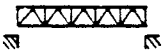
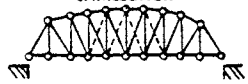
TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
ROANOKE BRIDGE CO. ROANOKE, VA.						1-1912
ROANOKE IRON & BRIDGE WORKS				1-1922 1-1929 1-1930		
VIRGINIA BRIDGE & IRON COMPANY ROANOKE, VA.			1-1916			
UNKNOWN			5-n.d.	4-n.d.		1-n.d.
TOTAL			6	7		2

ND - no date
* stylistic attribution

THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
					1
	1-1923				4
					1
		1-n.d.		1-Parker	12
	1	1		1	18

781

Table 9. Truss types and bridge companies in Russell County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
CHICAGO BRIDGE COMPANY						
GROTON BRIDGE & MANUFACTURING COMPANY GROTON, N.Y.						
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.				1-1927 2-1931		1-1927
VIRGINIA BRIDGE & IRON COMPANY ROANOKE, VA.			2-1912	1-1913		
UNKNOWN			1-1929	1-1916 (mod), 1-1925 1-n.d.		
TOTAL			3	7		1

ND - no date
* stylistic attribution

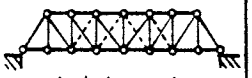
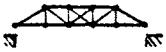
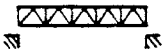
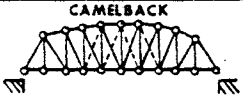
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
	1-1891				1
	2-1889				2
					4
	2-1912				5
					4
	5				16

Table 10. Truss types and bridge companies in Scott County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
CHAMPION BRIDGE COMPANY WILMINGTON, OHIO			4-1921			
ROANOKE IRON & BRIDGE WORKS ROANOKE, VA.				1-1926		
TWIN CITY BOILER WORKS BRISTOL, VA.				1-1929		
VIRGINIA BRIDGE & IRON COMPANY ROANOKE, VA.						
UNKNOWN			3-1910 1-1911 1-1915 4-n.d.	1-1915 1-1921 2-n.d.		2-n.d.
TOTAL			13	6		2

ND - no date
* stylistic attribution

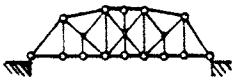
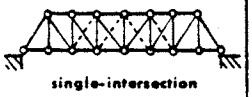
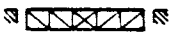
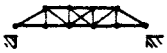
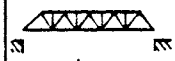
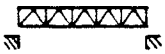
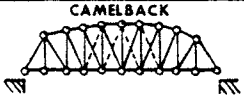
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
					4
		1-1930			2
					1
	2-1914				2
	1-n.d.				16
	3	1			25

Table 11. Truss types and bridge companies in Smyth County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
King Iron Bridge Co. Cleveland, Ohio						
Roanoke Bridge Company Roanoke, Va.						
Roanoke Iron & Bridge Works Roanoke, Va.						
Virginia Bridge & Iron Company			1-1917			
Unknown			4-n.d.	1-n.d.		
TOTAL			5	1		

ND - no date
* stylistic attribution

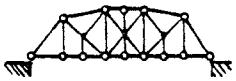
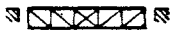
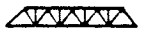
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
	1-1885				1
	1-1909				1
	1-1926 1-1928 1-1931				3
	1-1913 1-1914				3
	1-n.d.				6
	8				14

Table 12. Truss types and bridge companies in Tazewell County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
Atlantic Bridge Company Roanoke, Va.						
Virginia Bridge & Iron Company Roanoke, Va.				1-1912		
Virginia Dept. of Highways Richmond, Va.			2-1929			
Unknown			1-n.d.	2-n.d.		
TOTAL			3	3		

ND - no date
* stylistic attribution

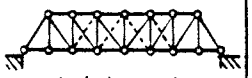
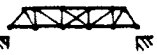
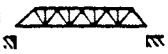
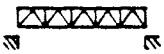
THROUGH (HIGH)					
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	TOTAL
		1-1924			1
					1
					2
	1-n.d.				4
	1	1			8

Table 13. Truss types and bridge companies in Washington County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
Roanoke Bridge Company Roanoke, Va.			1-1908			
Virginia Bridge & Iron Company Roanoke, Va.			1-1911			1-n.d.
Unknown			4-n.d.			
TOTAL			6			1

ND - no date
* stylistic attribution

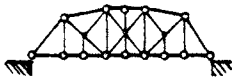
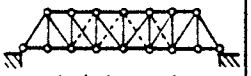
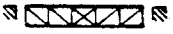
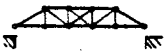
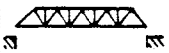
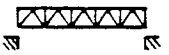
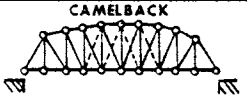
THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
	2-1910				3
	1-1914				3
					4
	3				10

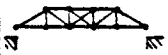
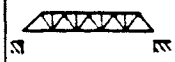
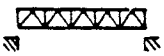
Table 14. Truss types and bridge companies in Wise County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
Roanoke Bridge Company Roanoke, Va.			1-1912			
Roanoke Iron & Bridge Works Roanoke, Va.						
Virginia Bridge & Iron Company Roanoke, Va.		1-1911				
Virginia Dept. of Highways Richmond, Va.			1-1929			
Virginia State Highway Comm. Richmond, Va.						
Unknown			1-1920 1-n.d.	1-n.d.		
TOTAL		1	4	1		

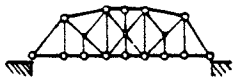
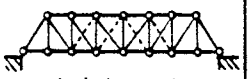
ND - no date
* stylistic attribution

THROUGH (HIGH)					TOTAL
PENNSYLVANIA Petit	PRATT single-intersection	TRIANGULAR single-intersection	TRIANGULAR inclined upper chord	OTHER	
					1
	1-1928 1-n.d.				2
					1
					1
	1-1914				1
					3
	3				9

Table 15. Truss types and bridge companies in Wythe County.

TRUSS TYPE / BRIDGE COMPANY	DECK	LOW (PONY)				
	PRATT 	PRATT  half-hip	PRATT  full-slope	TRIANGULAR 	TRIANGULAR  vertical endpost	CAMELBACK  Pratt
Atlantic Bridge Company Charlotte, N.C.						
Phoenix Bridge Company						
Pittsburgh Bridge Company Pittsburgh, Pa.			1-1881			
Roanoke Iron & Bridge Works Roanoke, Va.				1-1929		
Virginia Bridge & Iron Company Roanoke, Va.			1-1931			
Virginia Dept. of Highways Richmond, Va.	1-1931					
Unknown			1-n.d.			
TOTAL	1		3	1		

ND - no date
* stylistic attribution

THROUGH (HIGH)					TOTAL
PENNSYLVANIA  Petit	PRATT  single-intersection	TRIANGULAR  single-intersection	TRIANGULAR  inclined upper chord	OTHER	
	1-1920				1
	*1-n.d.				1
	1-1881				2
					1
	1-n.d.				2
					1
					1
	4				9

REFERENCES

1. Pope, Thomas, A Treatise on Bridge Architecture, New York, printed for the author, by A. Niven, 1811.

2. Waddell, J. A. L., Bridge Engineering, New York, John Wiley & Sons, Inc., 1916, p. 11.

3. Deibler, Dan Grove, "Metal Truss Bridges in Virginia: 1865-1932", numbers 1-5, Virginia Highway & Transportation Research Council, and Spero, Paula A. C., numbers 6-8, Virginia Highway & Transportation Research Council.

4. Waddell, op. cit., p. 471.

5. Waddell, J. A. L., The Designing of Ordinary Iron Highway Bridges, New York, John Wiley & Sons, Inc., 1891, (5th ed.), p. iv.

6. Waddell, J. A. L., Bridge Engineering, p. 25.

7. Ketchum, Milo S., The Design of Highway Bridges, New York, McGraw Hill Book Co., 1908, pp. 198-210.

8. Jacobs, E. B., History of Roanoke City and History of the Norfolk & Western Railway Company, Roanoke, Stone Printing, 1912, p. 112.

9. Ibid., p. 124

10. Ibid., p. 129.

11. Ibid., p. 49.

12. Federal Works Agency, Story of County and City, 1942, Roanoke City School Board, Stone Printing & Manufacturing Co., Roanoke, Va., p. 205.

R-358

A-1

Photo Numbers:

12601: R-5

Color: 11-15
B & W: 10-18

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: Bristol ; No. 01.
County: Bland ; No. 10.
City/Town: .
Street/Road: 61.
River/Stream/Railroad (crossing): Wolf Creek.
UTM/KGS Coordinates: .

Historical Information

Formal designation: .
Local designation: 1034.
Designer: Phoenix Bridge Company, Phoenix, Pa.
Builder: Phoenix Bridge Company, Phoenix, Pa.
Date: ; basis for: .
Original owner: Norfolk & Western RR ; use: railway.
Present owner: ; use: .

Historical or Technological Significance

_____ Unique/Unusual in its time: .

X Rare survivor though of standard design: .

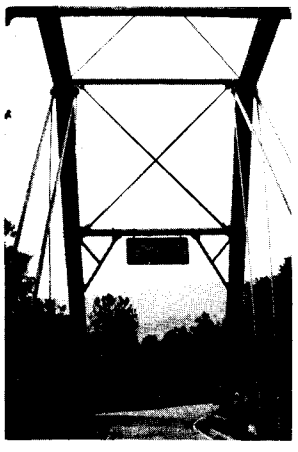
_____ Typical example of its time and a common survivor: .

_____ Other Remarks/Explanation: Has enormous floor beams and pin connections.

Nature/Degree of any destructive threats: .

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plans: CXI-11, 21 December 1950.



Recorder: DGD.
Date: 26 July 1976.
Affiliation: .

Design Information

Compass orientation of axis: _____.

No. of spans: 1 ; length; overall: 206' 5" .
206'
Span types:
(1) thru truss ; length: 200' 4" .
(2) _____ ; length: _____.
(3) _____ ; length: _____.
(4) _____ ; length: _____.
(5) _____ ; length: _____.
(6) _____ ; length: _____.

No. of lanes: 1 ; width: 16' c to c.

Architectural or decorative features:

lateral struts and sway struts are Phoeni. columns connected w/cylindrical tie rods

top chords and end posts are 15-1/2" in diameter

posts are 8" in diameter

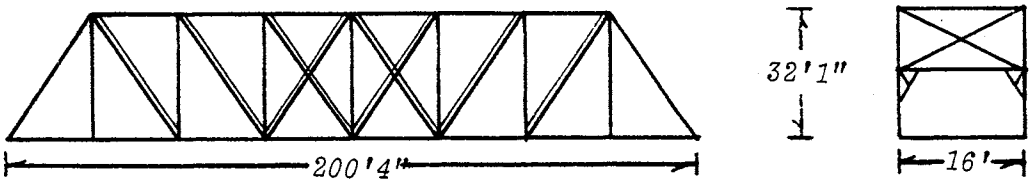
Structural Information

Substructure:
Material: Concrete .
Foundations: _____.
Piers: _____.
Abutments: Concrete .
Wings: Concrete .
Seats: Concrete .

Superstructure:
Material: wrought iron sources Phoenix Iron Company .
Characteristics, details and members:
Connections: X pin.
_____ rigid.
Top Chords Phoenix Column — 8 section .
End Posts: _____.
Bottom chords: Double and quadruple rectilinear eye bars, die forged .
Posts: Phoenix Column 4 section .
Diagonals: Paired rectilinear eye bars, die forged .
Counters: Paired cylindrical tie rods .

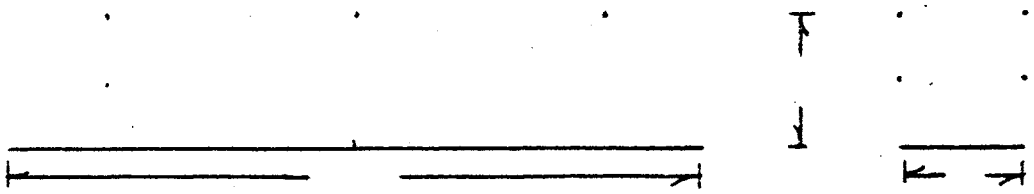
Truss Configuration

Main span type: Pratt Through/~~Pony/Deck, Skew~~



8 panels @ 25'1/2" each

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

A-3

Photo Numbers:

12601: R-5

Color: 25-36
B & W: 0-10

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol* ; No. *01* .
County: *Bland* ; No. *10* .
City/Town: *Round Botton* .
Street/Road: *61* .
~~River~~/Stream/~~Railroad~~ (crossing): *Wolf Creek* .
UTM/KGS Coordinates: _____ .

Historical Information

Formal designation: _____ .
Local designation: *1035* .
Designer: *Phoenix Bridge Company, Phoenixville, Pa.* .
Builder: *Phoenix Bridge Company, Phoenixville, Pa.* .
Date: [illegible] ; basis for: _____ .
Original owner: _____ ; use: *railroad bridge* .
Present owner: _____ ; use: _____ .

Historical or Technological Significance

_____ Unique/Unusual in its time: _____ .

X Rare survivor though of standard design: _____ .

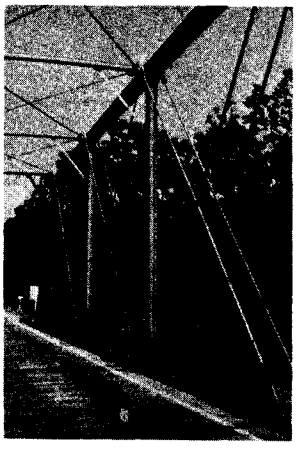
_____ Typical example of its time and a common survivor: _____ .

_____ Other Remarks/Explanation: *former RR bridge incorporated into highway system*

Nature/Degree of any destructive threats: *painted since 1973*

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plans: CXI-15, 5 January 1951 (for repairs)



Recorder: *DGD* .
Date: *26 July 1976* .
Affiliation: _____ .

Design Information

Compass orientation of axis: _____.

No. of spans: 1; length; overall: 145'3". 145'

Span types:
(1) Thru truss; length: 139'1-1/2".
(2) _____; length: _____.
(3) _____; length: _____.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

No. of lanes: 1; width: 15'9-1/2" c to c.

Architectural or decorative features:

has patented Phoenix columns, posts and top chords

lateral struts are Phoenix columns also w/angle sway braces

TC/EP's are 12-1/2" in diameter

Posts are 8" in diameter.

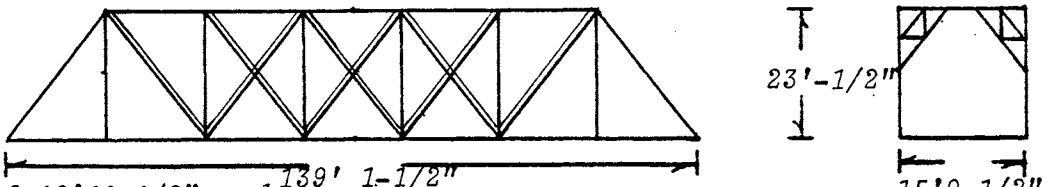
Structural Information

Substructure:
Material: Concrete.
Foundations: _____.
Piers: _____.
Abutments: Concrete.
Wings: Concrete.
Seats: Concrete.

Superstructure:
Material: wrought iron sources Phoenix Iron Company Philadelphia, Pa.
Characteristics, details and members:
Connections: X pin.
_____ rigid.
Top Chords: Phoenix columns - 6 section.
End Posts: Phoenix columns - 6 section.
Bottom chords: Paired and quadrupled rectilinear eye bars, die forged.
Posts: Phoenix columns - 4 section.
Diagonals: Double rectilinear eye bars, die forged.
Counters: Double cylindrical tie rods, screw on ends.

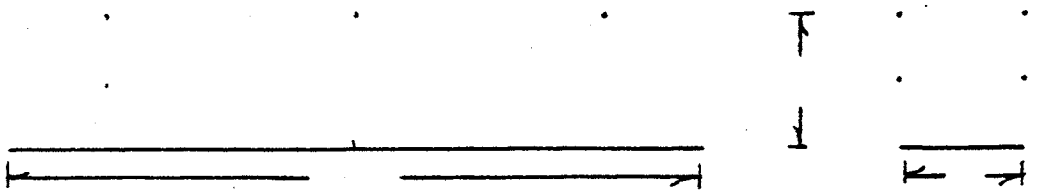
Truss Configuration

Main span type: Pratt Through/~~Pony/Deck, Skew~~



7 panels @ 19'10-1/2" each

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

Photo Numbers:

12601: R9

Color: 9-13
B & W: 14-17

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: Bristol ; No. 01 .
County: Buchanan ; No. 13 .
~~City~~/Town: Grundy .
Street/Road: Walnut Street .
River/Stream/Railroad (crossing): Slate Creek .
UTM/KGS Coordinates: .

Historical Information

Formal designation: .
Local designation: .
Designer: HIPCO Steel Bridges .
Builder: " " " .
Date: 1925 ; basis for: bridge plate .
Original owner: ; use: .
Present owner: ; use: .

Historical or Technological Significance

____ Unique/Unusual in its time: .

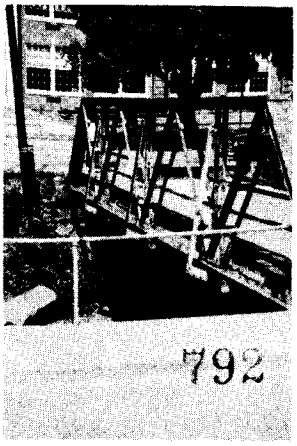
X Rare survivor though of standard design: unique bridge company .

____ Typical example of its time and a common survivor: .

X Other Remarks/Explanation: Not owned by Highway Department

Nature/Degree of any destructive threats: .

Reference materials and contemporary photos/illustrations with their respective locations:



Recorder: DGD .
Date: 10 August 1976 .
Affiliation: .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features:

Simple 2-angle railing

No. of spans: *1*; length; overall: _____.

Span types:

(1) *Low truss*; length: *75'*.
(2) _____; length: _____.
(3) _____; length: _____.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

No. of lanes: *1*; width: _____ c to c.

Structural Information

Substructure:

Material: *Concrete*.
Foundations: _____.
Piers: _____.
Abutments: *Concrete*.
Wings: *Concrete*.
Seats: *Concrete*.

Superstructure:

Material: *Steel* sources *B S C O, Cambria*.

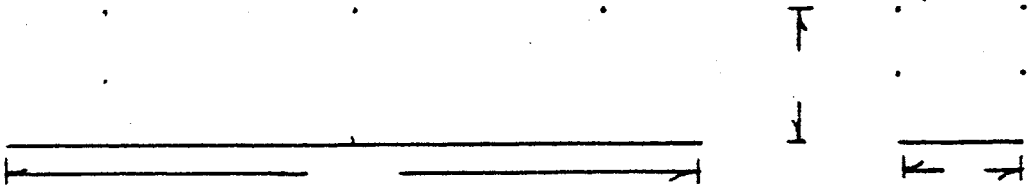
Characteristics, details and members:

Connections: _____ pin.
X rigid.
Top Chords *2 upright channels connected w/cover plates & stay plates*.
End Posts: *Same*.
Bottom chords: *2 angles connected w/stay plates*.
Posts: *2 angles connected w/stay plates — has external supports*.
Diagonals: *2 angles connected w/stay plates*.
Counters: _____.

Truss Configuration

Main span type: *triangular w/verticals* ~~Through~~/Pony/~~Deck, Skew~~

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

A-7

Photo Numbers:

12601: R28

Color: 17-19
B & W: 8-11

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: Bristol ; No. 01.
County: Grayson ; No. 38.
City/Town: Mouth of Wilson.
Street/Road: 767.
River/Stream/Railroad (crossing): Big Wilson Creek.
UTM/KGS Coordinates: .

Historical Information

Formal designation: .
Local designation: 6102.
Designer: .
Builder: Penn Bridge Company, Beaver Fall, Pa..
Date: ; basis for: bridge plate.
Original owner: ; use: .
Present owner: ; use: .

Historical or Technological Significance

_____ Unique/Unusual in its time: .

X Rare survivor though of standard design: No other bridges by this company in the state.

_____ Typical example of its time and a common survivor: bolted splice plates indicate that truss has been relocated.

_____ Other Remarks/Explanation: BRC-1 indicate that truss was built in 1909 and by state forces

Nature/Degree of any destructive threats: .

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plan: Std. 50-5

Recorder: DGD.
Date: 20 September 1976.
Affiliation: .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features:

No. of spans: 3 ; length; overall: 149' 4" .

Simple 2-pipe side railings

Span types:

(1) steel beam ; length: 24' 2" . 24'
(2) thru truss ; length: 101' 0" . 101'
(3) steel beam ; length: 24' 2" . 24'
(4) _____ ; length: _____.
(5) _____ ; length: _____.
(6) _____ ; length: _____.

No. of lanes: 1 ; width: 13' 3-1/2" to c.

Structural Information

Substructure:

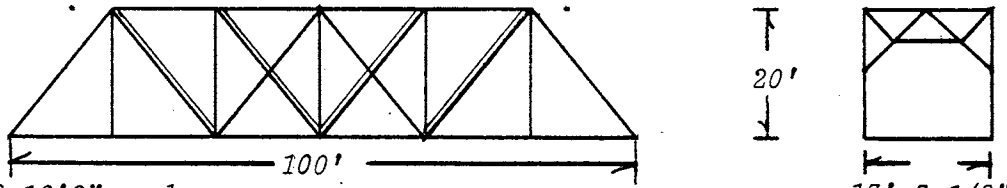
Material: Concrete.
Foundations: _____.
Piers: Concrete.
Abutments: Concrete.
Wings: Concrete.
Seats: Concrete.

Superstructure:

Material: Steel sources Cambria.
Characteristics, details and members:
Connections: X pin.
_____ rigid.
Top Chords 2 upright channels connected w/lacing bars.
End Posts: Same.
Bottom chords: Double rectilinear eye bars die forged.
Posts: 2 vertical channels connected w/lacing bars, paralleling roadway.
Diagonals: double rectilinear eye bars, die forged.
Counters: single rectilinear tie rods, die forged.

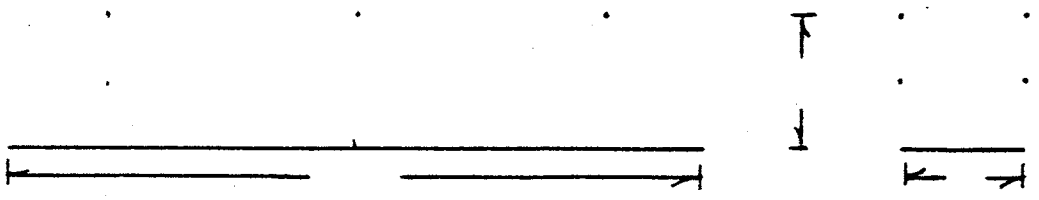
Truss Configuration

Main span type: Pratt Through/~~Pony/Deck, Skew~~



6 panels @ 16'8" each

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

Photo Numbers:

12601: R-10

Color: 20-23
B & W: 11-18

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: Bristol ; No. 01 .
County: Lee ; No. 52 .
City/Town: .
Street/Road: 616 .
River/Stream/Railroad (crossing): Wallen Creek Br. .
UTM/KGS Coordinates: .

Historical Information

Formal designation: .
Local designation: 6014 .
Designer: .
Builder: .
Date: ; basis for: .
Original owner: ; use: railroad bridge .
Present owner: ; use: .

Historical or Technological Significance

X Unique/Unusual in its time: Probably an abandoned RR bridge; has very heavy hanger beams.

___ Rare survivor though of standard design:

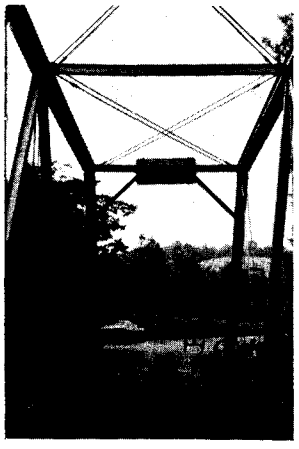
___ Typical example of its time and a common survivor:

___ Other Remarks/Explanation: Very unusual configuration assumed to be a railroad bridge based on floor beam size.

Nature/Degree of any destructive threats:

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File.



Recorder: DGD .
Date: 25 August 1976 .
Affiliation: .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features: *single-channel railing*

No. of spans: *1*; length; overall: *84' 9"*.
Span types:
(1) *thru truss*; length: *80' 6"*. *85'*
(2) _____; length: _____.
(3) _____; length: _____.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

No. of lanes: *1*; width: *16'3-1/2"* c to c.

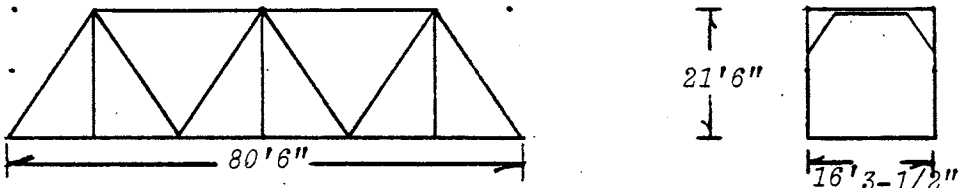
Structural Information

Substructure:
Material: *Limestone, concrete*.
Foundations: _____.
Piers: _____.
Abutments: *Concrete*.
Wings: *Coursed ashlar limestone masonry; broken surface*.
Seats: *Concrete*.

Superstructure:
Material: *Steel* sources _____.
Characteristics, details and members:
Connections: *X* pin.
_____ rigid.
Top Chords *2-upright channels riveted to a 3rd one*.
End Posts: *same*.
Bottom chords: *Double rectilinear eye bars, die forged*.
Posts: *None*.
Diagonals: *Double rectilinear eye bars, die forged*.
Counters: *Built-up I-beams*.

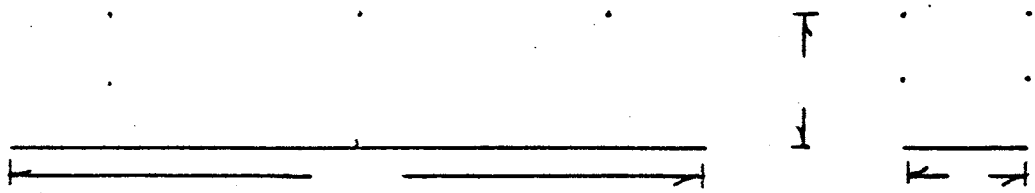
Truss Configuration

Main span type: *Triangular, w/verticals* Through/~~Pony/Deck~~, ~~Skew~~



6 panels @ 13'5"

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

Photo Numbers:

12601: R-21

Color: 8-10
B & W: 7A-12A

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol*; No. *01*.
County: *Lee*; No. *52*.
City/Town: _____.
Street/Road: *833*.
River/Stream/Railroad (crossing): *Powell River*.
UTM/KGS Coordinates: _____.

Historical Information

Formal designation: _____.
Local designation: *6498*.
Designer: _____.
Builder: _____.
Date: _____; basis for: *no bridge plate*.
Original owner: _____; use: _____.
Present owner: _____; use: _____.

Historical or Technological Significance

X Unique/Unusual in its time: *Appears to be a Parker — only one observed to date.*

_____ Rare survivor though of standard design: _____

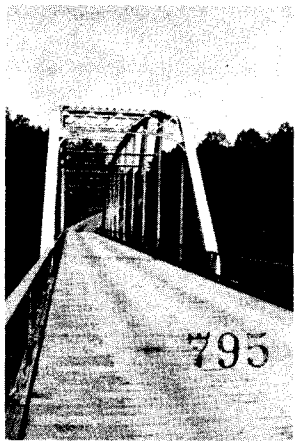
_____ Typical example of its time and a common survivor: _____

_____ Other Remarks/Explanation: *Bolts suggest that bridge was relocated; bridge was built by state forces on this site in 1966. Truss was stored at Jonesville residency but there is no indication as to its former location.*

Nature/Degree of any destructive threats: _____

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plan: CLXXXV-1, 4 August 1964



Recorder: *DGD*.
Date: *26 August 1976*.
Affiliation: _____.

Design Information

Compass orientation of axis: _____.

Architectural or decorative features:

Single "I" beam side railings

No. of spans: *4* ; length; overall: *353' 6"* .

Span types:

(1) *Steel beam* ; length: _____.
(2) *Steel beam* ; length: *50' 0"* . *50'*
(3) *Parker thru* ; length: *50' 11"* . *52'*
(4) *Steel beam* ; length: *200'* . *200'*
(5) _____ ; length: *51' 7"* . *52'*
(6) _____ ; length: _____.

No. of lanes: *1* ; width: *15' 1/2"* c to c.

Structural Information

Substructure:

Material: *Concrete*.
Foundations: _____.
Piers: *Concrete*.
Abutments: *Concrete*.
Wings: *Concrete*.
Seats: *Concrete*.

Superstructure:

Material: *Steel* sources *Jones & Laughlin*.

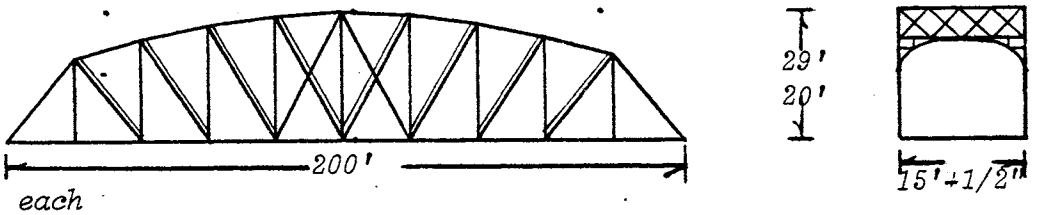
Characteristics, details and members:

Connections: *X* pin.
_____ rigid.

Top Chords *2 upright channels connected w/cover plates & stay plates*.
End Posts: *Same*.
Bottom chords: *Double rectilinear eye bars, die forged*.
Posts: *2 vertical channels connected w/lacing bars paralleling roadway*.
Diagonals: *2 angles connected w/stay plates & paved rectilinear eye bars, loop welded*.
Counters: *Single cylindrical tie rods, new*.

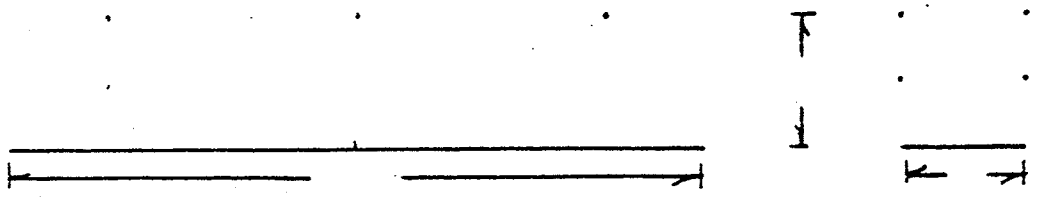
Truss Configuration

Main span type: *Parker, Pratt* Through/~~Pony~~/~~Deck~~, ~~Skew~~



10 @ 20' each

Secondary span type: *steel beam* ~~Through~~/Pony/~~Deck~~, ~~Skew~~



R-358

Photo Numbers:

12601: R-8

Color: 10-14
B & W: 4-16

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: Bristol ; No. 01 .
County: Russell ; No. 83 .
City/Town: Castlewood .
Street/Road: 615 .
River/Stream/Railroad (crossing): Clinch River .
UTM/KGS Coordinates: _____ .

Historical Information

Formal designation: _____ .
Local designation: 6025 .
Designer: Chicago Bridge Company .
Builder: _____ .
Date: 1891 ; basis for: Bridge plate .
Original owner: _____ ; use: _____ .
Present owner: _____ ; use: _____ .

Historical or Technological Significance

_____ Unique/Unusual in its time: _____ .

X Rare survivor though of standard design: Only bridge by this company in the state. .

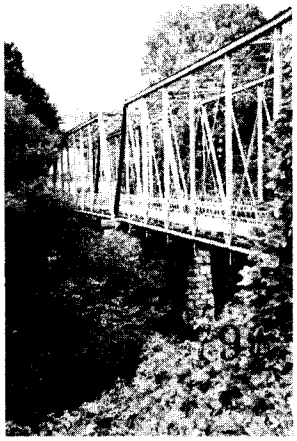
_____ Typical example of its time and a common survivor: _____ .

_____ Other Remarks/Explanation: _____ .

Nature/Degree of any destructive threats: Scheduled for replacement. .

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File



Recorder: DGD .
Date: 12 August 1976 .
Affiliation: _____ .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features: *Latticed side railings*

No. of spans: *3*; length; overall: *334' 2"*.

Span types:

(1) *Steel beam*; length: *17'6";17'1";17'1"*.
(2) *Thru truss*; length: *140'*.
(3) *Thru truss*; length: *140'*.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

No. of lanes: *1*; width: _____ c to c.

Structural Information

Substructure:

Material: *Stone masonry*.
Foundations: _____.
Piers: *Coursed ashlar masonry – broken surface*.
Abutments: *Coursed ashlar masonry – broken surface*.
Wings: _____.
Seats: *Limestone masonry*.

Superstructure:

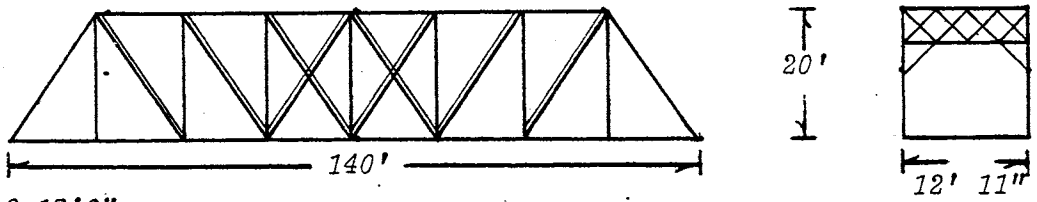
Material: *Steel* sources *CRM Co.*.

Characteristics, details and members:

Connections: *X* pin.
_____ rigid.
Top Chords *2 built-up channels connected w/cover plates & lacing bars.*.
End Posts: *Same*.
Bottom chords: *Double rectilinear bars, die forged*.
Posts: *2 angles connected w/lacing bars forming "T" shape*.
Diagonals: *Double rectilinear eye bars, die forged*.
Counters: *Double rectilinear tie rods, loop welded, some replacements*.

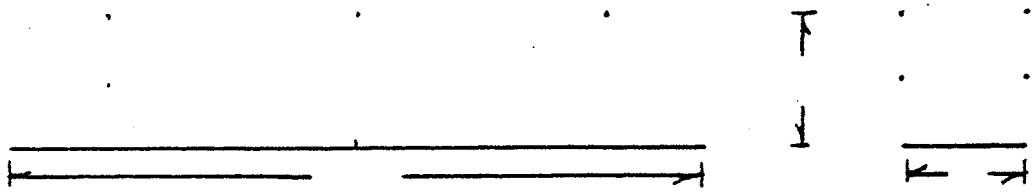
Truss Configuration

Main span type: *Pratt* ~~Through/Pony/Deck, Skew~~



8 panels @ 17'6"

Secondary span type: *Same* ~~Through/Pony/Deck, Skew~~



R-358

A-15

Photo Numbers:

12601: R-22

Color: 4-6
B & W: 14-17

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol* ; No. *01* .
County: *Scott* ; No. *84* .
City/Town: *Pattonsville* .
Street/Road: *638* .
River/~~Stream/Railroad~~ (crossing): *NF Clinch River* .
UTM/KGS Coordinates: _____ .

Historical Information

Formal designation: _____ .
Local designation: *6197* .
Designer: _____ .
Builder: _____ .
Date: *1921* ; basis for: *plans* .
Original owner: _____ ; use: _____ .
Present owner: _____ ; use: _____ .

Historical or Technological Significance

X Unique/Unusual in its time: *Has unusual concrete approach spans w/solid parapet railings; truss itself is a typical design.* .

_____ Rare survivor though of standard design: _____ .

_____ Typical example of its time and a common survivor: _____ .

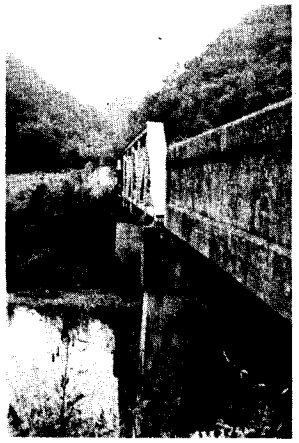
_____ Other Remarks/Explanation: _____

Old Rt. 10; the solid parapet walls on the concrete approach spans act structurally. .

Nature/Degree of any destructive threats: _____ .

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plans: XV-16, 6 August 1921.



Recorder: *DGD* .
Date: *27 August 1976* .
Affiliation: _____ .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features:

No. of spans: 3 ; length; overall: 106' 9" .

simple 2-pipe railing

Span types:

(1) *concrete beam* ; length: *27' 6"* . *28'*
(2) *low truss* ; length: *51' 9"* . *52'*
(3) *concrete beam* ; length: *27' 6"* . *28'*
(4) _____ ; length: _____.
(5) _____ ; length: _____.
(6) _____ ; length: _____.

No. of lanes: *1* ; width: *17' 6"* c to c.

Structural Information

Substructure:

Material: *Concrete*.
Foundations: _____.
Piers: *Concrete*.
Abutments: *Concrete*.
Wings: _____.
Seats: *Concrete*.

Superstructure:

Material: *Steel* sources *Bethlehem*.

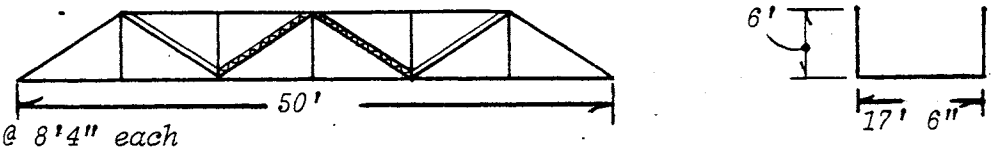
Characteristics, details and members:

Connections: _____ pin.
X rigid.

Top Chords *2 upright channels connected w/coverplates & lacing bars*.
End Posts: *Same*.
Bottom chords: *2 angles connected w/stay plates*.
Posts: *Paired b-to-b angles connected w/lacing bars*.
Diagonals: *2 angles connected w/stay plates*.
Counters: *2 angles connected w/lacing bars*.

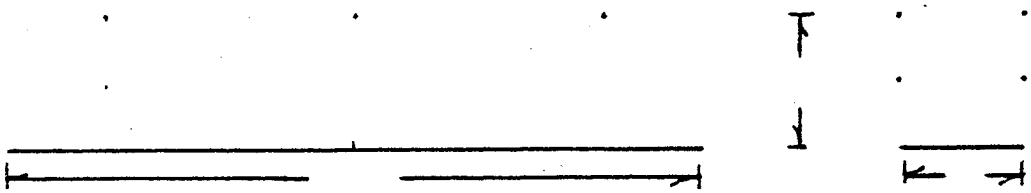
Truss Configuration

Main span type: *Triangular w/verticals* ~~Through~~/Pony~~/Deck, Skew~~



6 panels @ 8'4" each

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

Photo Numbers:

12601: R-26; R-29

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol*; No. *01*.
County: *Smyth*; No. *86*.
City/Town: *Manon*.
Street/Road: *Chilhowie Street*.
River/Stream/Railroad (crossing): *MF Holston River*.
UTM/KGS Coordinates: _____.

Historical Information

Formal designation: _____.
Local designation: _____.
Designer: _____.
Builder: *King Iron Bridge Co., Cleveland, Ohio*.
Date: *1885*; basis for: *bridge plate*.
Original owner: _____; use: _____.
Present owner: _____; use: _____.

Historical or Technological Significance

____ Unique/Unusual in its time: _____.

X Rare survivor though of standard design: *Designed by innovative King Co.*.

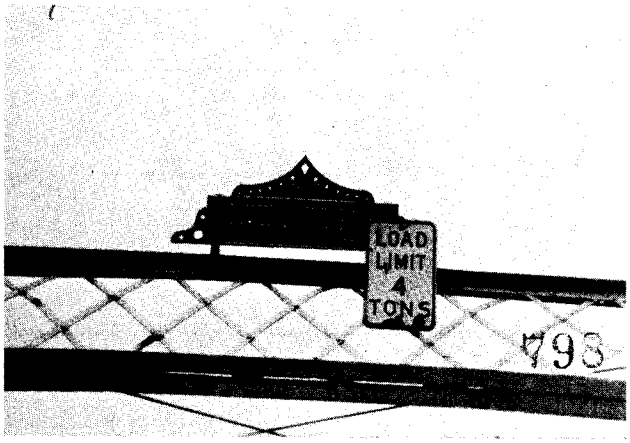
____ Typical example of its time and a common survivor: _____.

X Other Remarks/Explanation: *Many alterations have been made to posts, diagonals, portal struts.*
Not maintained by Highway Department.

Nature/Degree of any destructive threats: _____.

Reference materials and contemporary photos/illustrations with their respective locations:

Recorder: *DGD*.
Date: *21 September 1976*.
Affiliation: _____.



Design Information

Compass orientation of axis: _____.

No. of spans: 1; length; overall: _____.
Span types:
(1) Thru truss; length: 82'.
(2) _____; length: _____.
(3) _____; length: _____.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

No. of lanes: 2; width: 19'2" c to c.

Architectural or decorative features:

Single-pipe side railings
has 2 external sidewalks

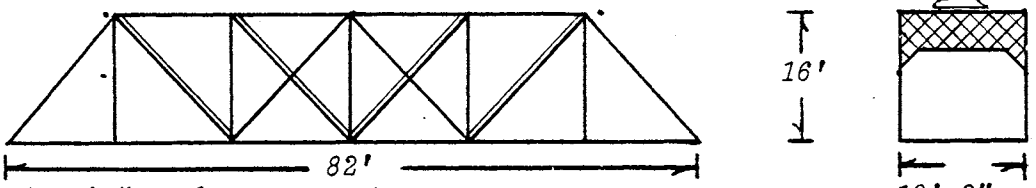
Structural Information

Substructure:
Material: *Concrete, stone*.
Foundations: _____.
Piers: _____.
Abutments: *Coursed, rusticated ashlar masonry*.
Wings: *Coursed, rusticated ashlar masonry*.
Seats: *Concrete*.

Superstructure:
Material: _____ sources *Phoenix Iron Co.*
Carnegie
Characteristics, details and members:
Connections: X pin.
_____ rigid.
Top Chords *2 upright channels connected w/cover plates and stay plates*.
End Posts: *Same*.
Bottom chords: *Double rectilinear eye bars, die forged*.
Posts: *2 vertical channels connected w/lacing bars (several are replacements)*.
Diagonals: *Double rectilinear eye bars, die forged; welded stay plates are addition*.
Counters: *Single cylindrical tie rods, w/welded loops (double)*.

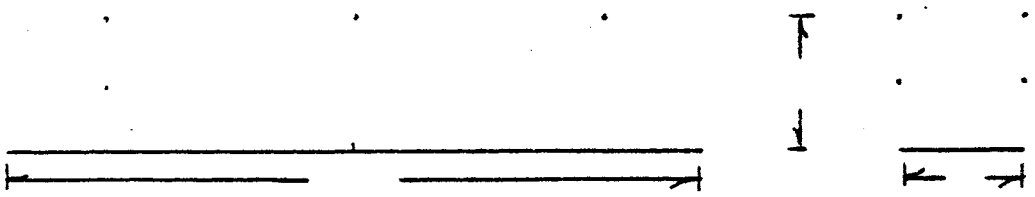
Truss Configuration

Main span type: *Pratt* ~~Through/Pony/Deck,~~ Skew



6 panels @ 13'8" each.

Secondary span type: _____ Through/Pony/Deck, Skew



R-358

Photo Numbers:

1260l: R-4, R13

Color: 14-16
B & W: 19-20,0-6

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol*; No. *01*.
County: *Wythe*; No. *98*.
~~City~~/Town: .
~~Street~~/Road: *619*.
~~River~~/Stream/~~Railroad~~ (crossing): *Cripple Creek*.
UTM/KGS Coordinates: .

Historical Information

Formal designation: .
Local designation: *6016*.
Designer: *Phoenix Bridge Company, Phoenixville, Pa.*.
Builder: *Phoenix Bridge Company, Phoenixville, Pa.*.
Date: ---; basis for: *stylistic attribution*.
Original owner: ; use: .
Present owner: ; use: .

Historical or Technological Significance

_____ Unique/Unusual in its time: .

X Rare survivor though of standard design: *another Phoenix RR bridge*.

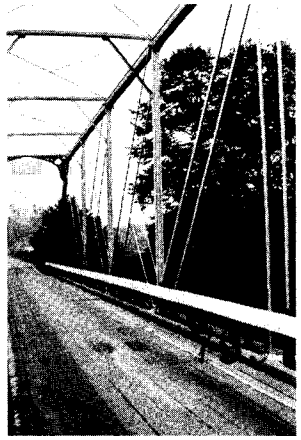
_____ Typical example of its time and a common survivor: .

_____ Other Remarks/Explanation: .

Nature/Degree of any destructive threats: .

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File



Recorder: *DGD*.
Date: *29 July 1976*.
Affiliation: .

Design Information

Compass orientation of axis: _____.

Architectural or decorative features:

No. of spans: 2; length; overall: 143'.

wooden side railings

Span types:

(1) *thru truss*; length: *124'*.
(2) *steel beam*; length: *14'5"*.
(3) _____; length: _____.
(4) _____; length: _____.
(5) _____; length: _____.
(6) _____; length: _____.

decorative portal braces

No. of lanes: *1*; width: *15'* c to c.

Structural Information

Substructure:

Material: *concrete, stone*.
Foundations: _____.
Piers: *concrete*.
Abutments: *concrete; west one is rubble masonry*.
Wings: _____.
Seats: *concrete*.

Superstructure:

Material: *wrought iron and steel* sources *Phoenix Iron Co.*.

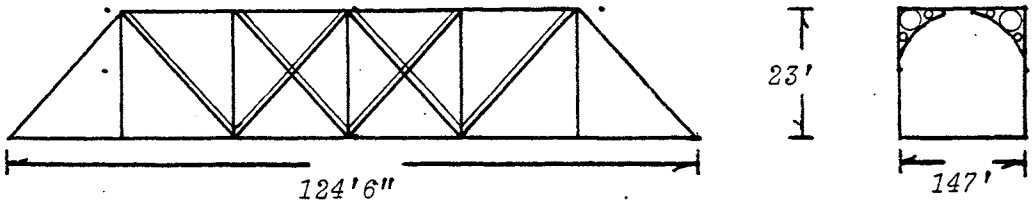
Characteristics, details and members:

Connections: *X* pin.
_____ rigid.

Top Chords *Phoenix columns 4 section*.
End Posts: *Phoenix columns 4 section*.
Bottom chords: *Double rectilinear eye bars, die forged*.
Posts: *Phoenix columns 4 section*.
Diagonals: *Double rectilinear eye bars, die forged*.
Counters: *Double cylindrical tie rods, w/adjustable ends*.

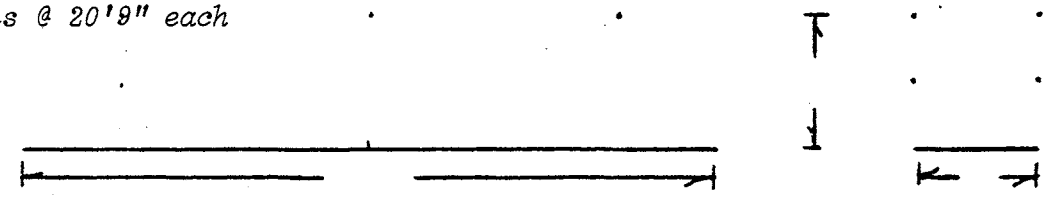
Truss Configuration

Main span type: *Pratt* Through/~~Pony/Deck,~~ Skew



Secondary span type: *Steel beam* ~~Through/Pony~~/Deck, ~~Skew~~

6 panels @ 20'9" each



R-358

Photo Numbers:

12601: R-4; R-31

Color: 8-12
B & W: 5-16

TRUSS BRIDGE SURVEY AND INVENTORY FORM

Geographic Information

State: Virginia
Va. Dept. of Highways District: *Bristol*; No. *01*.
County: *Wythe*; No. *98*.
City/Town: *Stones Mill*.
Street/Road: *640 (Church Street)*.
River/Stream/Railroad (crossing): *Reed Creek*.
UTM/KGS Coordinates: _____.

Historical Information

Formal designation: _____.
Local designation: *6027*.
Designer: _____.
Builder: *Pittsburgh Bridge Company, Pittsburgh, Pa.*.
Date: *1881*; basis for: _____.
Original owner: _____; use: _____.
Present owner: _____; use: _____.

Historical or Technological Significance

____ Unique/Unusual in its time: _____.

X Rare survivor though of standard design: *Earliest bridge in district by a company uncommon in Virginia.*.

____ Typical example of its time and a common survivor: _____.

____ Other Remarks/Explanation: *Bridge plate is covered by a load capacity sign. The thru/truss is a very tine truss, short and low; many members have been reinforced.*

Nature/Degree of any destructive threats: _____.

Reference materials and contemporary photos/illustrations with their respective locations:

Bridge Safety Inspection File
Plans: CI-11, CI-11A, 28 November 1951; 11 February 1948. (both for repairs)

Recorder: *DGD*.
Date: *29 July 1976*.
Affiliation: _____.

Design Information

Compass orientation of axis: _____.

No. of spans: 2 ; length; overall: 146' 8" .
Span types:
(1) low truss ; length: 70' .
(2) thru truss ; length: 72' .
(3) _____ ; length: _____.
(4) _____ ; length: _____.
(5) _____ ; length: _____.
(6) _____ ; length: _____.

No. of lanes: 1 ; width: 12'10-1/4" c to c.

Architectural or decorative features:

Wire side railings; & "I" beam and pipe one
Very handsome stonework

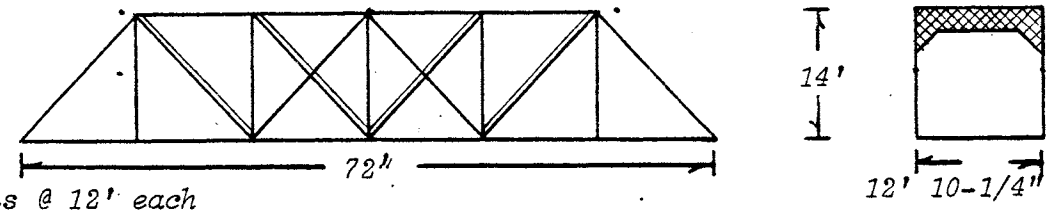
Structural Information

Substructure:
Material: Limestone .
Foundations: _____.
Piers: Coursed ashlar limestone masonry .
Abutments: Coursed ashlar limestone masonry .
Wings: Coursed ashlar masonry limestone .
Seats: Limestone; concrete .

Superstructure:
Material: steel/wrought iron sources _____.
Characteristics, details and members:
Connections: X pin.
_____ rigid.
Top Chords 2 upright channels connected w/cover plates and stay plates .
End Posts: Same .
Bottom chords: Double rectilinear eye bars, loop welded .
Posts: "I" beams w/reinforcing plates .
Diagonals: Double rectilinear eye bars, loop welded .
Counters: Single cylindrical tie rods, new .

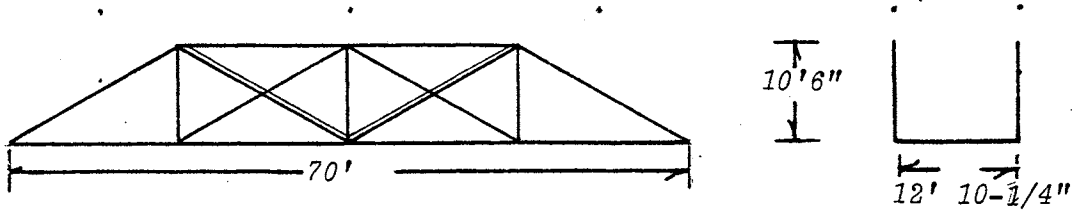
Truss Configuration

Main span type: Pratt Through/~~Pony/Deck;~~ ~~Skew~~



6 panels @ 12' each

Secondary span type: Pratt, full slope ~~Through~~/Pony/~~Deck,~~ ~~Skew~~



4 panels @ 17'6" each