NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

VLR 6/19/8
NRHP 9/12/8

NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name High Bridge

other names/site number #024-0056; High Bridge Trail State Park, #006-5007-0002

2. Location

street & number N/A not for publication N/A

city or town Farmville vicinity X

state Virginia code VA county Cumberland and Prince Edward code 049 and 147 zip code N/A

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant ___ nationally X statewide ___ locally. (___ See continuation sheet for additional comments.)

Signature of certifying official Date 7/28/08

Virginia Department of Historic Resources

State or Federal Agency or Tribal government

In my opinion, the property ___ meets ___ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

___ entered in the National Register
___ See continuation sheet.
___ determined eligible for the National Register
___ See continuation sheet.
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain): ___________

Signature of the Keeper ___________

Date of Action ___________

5. Classification

Ownership of Property (Check as many boxes as apply)

___ private
___ public-local
_X_ public-State
___ public-Federal

Category of Property (Check only one box)

___ building(s)
_X_ district
___ site
___ structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
0	0	buildings
0	0	sites
2	0	structures
0	0	objects
2	0	Total

Number of contributing resources previously listed in the National Register __0__

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) ____N/A____

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat:	Sub:
Transportation	Rail-Related
Defense	Battle Site

Current Functions (Enter categories from instructions)

Cat:	Sub:
Transportation	Pedestrian-Related
Landscape	Park

7. Description

Architectural Classification (Enter categories from instructions)

No Style

Materials (Enter categories from instructions)

foundation Brick, Granite, Sandstone, Concrete
roof N/A
walls N/A
other Steel, Wood

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

__X__ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

____ B Property is associated with the lives of persons significant in our past.

__X__ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations (Mark "X" in all the boxes that apply.)

____ A owned by a religious institution or used for religious purposes.
____ B removed from its original location.
____ C a birthplace or a grave.
____ D a cemetery.
____ E a reconstructed building, object, or structure.
____ F a commemorative property.
____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)

Engineering
Military
Transportation

Period of Significance 1854-1914

Significant Dates 1854; 1865; 1914

Significant Person (Complete if Criterion B is marked above) N/A

Cultural Affiliation N/A

Architect/Builder Virginia Bridge and Iron Company

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)

___ preliminary determination of individual listing (36 CFR 67) has been requested.
___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey # ________
___ recorded by Historic American Engineering Record # ________

Primary Location of Additional Data
_X_ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository: ___Virginia Department of Historic Resources___

==
10. Geographical Data
==
Acreage of Property __16 acres___

UTM References (Place additional UTM references on a continuation sheet)

Zone Easting Northing	Zone Easting Northing	Zone Easting Northing	Zone Easting Northing
1 17 737198 4133036	2 17 737295 4133138	3 17 737838 4132675	4 17 737777 4132599

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)
Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

==
11. Form Prepared By
==
name/title___Elizabeth Mary Andre____
organization___William and Mary Center for Archaeological Research___ date__April 9, 2008__
street & number__327 Richmond Road____________________________ telephone__(757)221-2584__
city or town____Williamsburg_________________________________ state_VA_ zip code __23185__
==
Additional Documentation
==
Submit the following items with the completed form:

Continuation Sheets
Maps A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.
Photographs Representative black and white photographs of the property.
Additional items (Check with the SHPO or FPO for any additional items)

==
Property Owner
==
(Complete this item at the request of the SHPO or FPO.)
name __Virginia Department of Conservation and Recreation__________________________
street & number__203 Governor Street____________________ telephone___(804)786-1712_____
city or town__Richmond___________________________________ state__VA__ zip code __23219__

==

Narrative Description

High Bridge encompasses sixteen acres along a roughly half-mile stretch of abandoned rail line. The small section of track is part of a larger 608-acre, 33.5-mile length of abandoned line that extends between Pamplin and Burkesville. The district lies in a relatively rural region, roughly three miles east of the town of Farmville and three miles west of the town of Rice. The 1854 and 1914 bridges cross the low-lying flood plain of the Appomattox River in a southeasterly-northwesterly direction. Conifers and deciduous trees forest the area to either side of the crossing, while small shrubs vegetate the cleared land around the bridge piers. The 1914 bridge is sited slightly northeast of the 1854 remains and extends between two steep, wooded bluffs.

1854 High Bridge **Contributing Structure**

The original 1854 High Bridge was constructed as a multiple-span, timber-framed, Burr-Arch, deck truss, which sprang from granite abutments and was supported upon brick piers. The structure originally consisted of twenty-one spans over twenty battered, brick piers that measured fourteen by twenty-seven feet at the base and eight by twenty-two feet at the top. The height of the bridge ranged from sixty feet at the abutments to 125 feet at its highest point, and the bridge spanned a total of 2,400 feet.

The abutments, both of which are still present, were constructed in two tiers: an upper tier, over which the track passed, and a lower tier, from which the truss system sprang. Both tiers of the northwesterly abutment are laid in hand-made, American-bond brick and topped with stone caps. The tiers are capped with one course of dressed, ashlar, sandstone blocks, measuring roughly eight inches in height and two feet in length; and one course of dressed, ashlar, quarry-face, granite blocks, measuring roughly two feet in height, two feet in width, and four feet in length. Both tiers of the southeasterly abutment are laid in regular courses of dressed, ashlar, quarry-face, granite blocks. Two courses of sandstone and a course of granite, in the same size and style as the caps of the northwesterly abutments, cap the southeasterly abutments. Channels, into which the wooden railroad ties were laid, were worked into the large, granite capstones on the upper tiers of the two abutments.

Thirteen of the original twenty piers are still standing. Each of the piers is laid in hand-made, American-bond brick; capped by five roughly square, ashlar, granite blocks; and resting on a foundation of regularly-coursed, ashlar granite that extends up to three feet above the ground and up to eight feet below ground level. The piers have all been retrofitted with iron angle-braces at each corner to secure horizontal support-rods. The granite blocks used in the construction of the pier foundations and the abutments exhibit evidence of the plug-and-feather quarrying process.

The now-demolished superstructure of the bridge consisted of twenty-one timber spans. The load of each individual span is carried by a timber arch that springs from the masonry piers and reinforced by a series of king-post trusses and diagonal braces. The diagonal braces were angled toward the center of the span. The truss system was bolted directly to the arches and supported by upper and lower chords. The lower chords extend between the two abutments, and the upper chords carry the bridge decking. Cross-bracing on the interior of the truss provided additional strength to the overall system. The historic photographs do not provide enough detail to determine the method of joinery applied to the original timber-framed superstructure. The entire superstructure of the bridge was secured to the brick piers with iron rods that extended through hollow shafts within the piers.

The iron rails were laid in a single track, which appears to have been a standard gauge, and bolted to the hand-hewn timber railroad ties down the center of the bridge deck. Wood planks measuring roughly three feet in width were laid on either side of the track to provide two walkways. An iron balustrade, consisting of battered balusters supporting an iron rail between large, battered, incised posts, ran the length of the two walkways.

The original 1854 High Bridge, due to the loss of its wooden superstructure and several brick piers, is lacking in integrity of design, materials, and workmanship, yet the remaining abutments and brick piers are in relatively stable condition and continue to convey the location, setting, feeling, and association.

===

1914 Bridge **Contributing Structure**

The 1914 Bridge is a multiple-span, steel, plate-girder, deck trestle. The span extends between two poured-concrete abutments and passes over twenty-one steel trestle towers. The towers stand 107 feet in height, and the entire bridge extends 2,418 feet in length. The primary spans, extending off each abutment, extend 90 feet in length; the intermediate spans, extending between towers, extend 72 feet in length; and the tower spans, passing over the top of each tower, extend 38 feet in length.

Each deck span is constructed of a steel frame of riveted, I-beam, plate-girders. Each girder consists of large plates that are riveted to both horizontal and vertical angles. The plates form the web of the I-beam, while the horizontal angles form the flanges. Additional, vertical angle bars are riveted at the joints of each connecting plate; the joints appear at the connecting point of each span.

The bottom flanges of the plate-girders are bolted to the top of each trestle tower. The trestle towers consist of a steel frame of riveted, plate-girder I-beams. The four larger, vertical beams, which provide the primary support of compression, are bolted through steel bearing plates to four large, poured-concrete pedestals. Each pedestal stands roughly eight feet in height and measures six-foot square and eight-foot, six-inches square at the top and base, respectively. The interior flanges of the vertical beams are constructed of steel lacing bars. Tensile, steel chords of simple, lacing-bar construction extend between the vertical members and strengthen the bottom and top of the trestle frame. Each open side of each trestle tower is further reinforced with diagonal cross-bracing. The cross-bracing consists of steel, riveted, plate-girder I-beams, the webs of which are constructed of lacing-bars. The members of the trestle towers are joined by riveted plates.

Circular-sawn wood railroad ties, measuring roughly one-foot square, are bolted to the top flange of the plate-girder frame. The ties are reinforced with S-shaped rods. The 1,955 railroad ties measure roughly one-foot square and are laid roughly three inches apart from one end of the bridge to the other. The original rails have been removed, but additional wood ties are bolted lengthwise atop each side of the deck.

With the exception of the loss of the rails, the 1914 bridge retains a high degree of integrity of materials, design, workmanship, location, setting, feeling, and association and is in very good condition.

Statement of Significance

Summary of Criteria

High Bridge, which comprises the masonry piers and abutments of the 1854 High Bridge and the extant 1914 steel bridge, is eligible for the National Register of Historic Places under Criterion A for its association with the broad patterns of railroad development in Virginia from the mid-nineteenth century through the early twentieth century and its role in major military events of the Civil War. Under Criterion A, High Bridge is eligible at the state level for the period between 1854 and 1914. High Bridge is also eligible for the National Register of Historic Places under Criterion C for its embodiment of both traditional and modern construction techniques and its embodiment of innovations and advances in bridge design and construction. Under Criterion C, High Bridge is eligible at the local level for the period between 1854 and 1914.

Railroads in Virginia

Virginians have long embraced the transportation challenges offered up by the state's diverse, often rugged and unforgiving, landscape. Early settlement along the coastal plain and navigable interior waterways provided only sufficient mobility and accessibility for the pioneering mindset of these early colonists. Crude roads soon linked the Tidewater to the hinterlands of the interior and permitted settlement within the Piedmont and Mountain regions farther west during the eighteenth century. Railroad development, too, answered the needs of improved transportation networks both within the state and further afield. The first track was laid in Virginia in 1831, at which time the small, horse-drawn Chesterfield Railroad opened to haul coal from the mines in Chesterfield County to Richmond. The first steam railroad commenced operations in 1837 between Petersburg and Richmond. Numerous small lines were established over the course of the 1830s, 1840s, and 1850s, connecting major points of commerce and industry, providing access into once-remote regions, and permitting the establishment of new, small communities. The true significance of the railroad came to light during the Civil War, when lines were vital for the transport of both men and supplies. Reconstruction and subsequent industrialization brought about a rapid expansion in the railroad system. Miles of new tracks were laid to connect towns and cities within the state and to tap into the markets of the industrialized North. The 1890s were characterized by the widespread consolidation of lines under large companies such as Norfolk and Western Railroad and Southern Railway. Consolidations led to large improvements in the quality and standardization of rail lines and their supporting structures during the early twentieth century, up until the eventual demise of the railroad as the primary mode of transportation.[1] The last three quarters of the twentieth century saw further consolidation of lines under large companies such as Norfolk Southern and the abandonment of under-utilized lines.

The South Side Railroad

The South Side Railroad was incorporated in 1846 to lay track between Lynchburg and Petersburg. The resulting line extended 132 miles, passed through a number of small towns including Farmville and Burkesville (where it intersected with the Richmond and Danville Railroad), and fueled the establishment of new communities, such as Pamplin, out of once-quiet crossroads. Both private and public funds financed the construction of the line. The railroad company initially sold stock to raise funds; but when private funding dried up, the state, after much discussion, supplied the remainder of the capital. Initially, the South Side Railroad was to bypass Farmville; however, the town raised $100,000 in capital for the line on the condition that it be rerouted through Farmville.[2]

One of the major obstacles confronted by the railroad engineers on the construction of this new line was the Appomattox River, whose steep-sided, broad-floored, flood plain lay directly along the proposed rerouting of the railroad. Traversing the river required either a bridge or a long series of grades down into the flood plain. The latter option was deemed prohibitively expensive by chief engineer C. O. Sanford. In a period when rail lines were often laid on bare ground, flooding created a constant derailment hazard. In order to avoid crossing the oft-sodden land surrounding the Appomattox River, railroad engineers undertook to design a bridge to span the entire width of the valley.[3]

The resulting bridge stood 126 feet high at its tallest point and 60 feet tall at its abutments. Twenty piers were rooted deep into the ground, topped with a wooden superstructure. When it was constructed, it was one of the largest bridges in the world, spanning a longer distance than any bridge of its height, and was regarded as a feat of modern engineering and the "outstanding feature" of the South Side Railroad.[4] The piers were laid in hand-made bricks of local clay that were fired in kiln pits dug near the base of the span, and the foundations of the piers and one of the abutments was constructed of locally quarried stone.[5] In 1859, in response for information regarding various building projects on the South Side Railroad, treasurer James Cuthbert sent Thomas Dewitt, secretary of the Board of Public Works, a table of costs, including some data concerning High Bridge, reproduced in Table 1.[6]

Masonry in piers	$\$7/yd^3$
Bricks laid	$8 per thousand
Dressed stone	$\$6/yd^3$
Undressed stone	$\$2.5/yd^3$
Superstructure	$16/ft
Rubble masonry	$\$4/ft^3$
Range work	$\$7/ft^3$

Table 1: Construction costs entailed during the construction of High Bridge.

The technical details of bridge construction are much more frequently discussed than are the labor arrangements made to bring the work to fruition. While no direct evidence has yet surfaced regarding who (other than the contractors) actually built the bridge, historians suspect that much of the bridge building in Virginia between 1850 and 1860 relied on the labor of enslaved African Americans. It is known that the piers were constructed by workers under the direction of Messrs. Flournoy, McDearmon, and later Silvanus Johnson, and that the superstructure was the province of Francis Carr; but the identities of the workers themselves, and their origins, are unknown. An enslaved worker could be used much more cheaply than could a professional mason or carpenter; and it was common practice for railroads to purchase and maintain substantial numbers of slaves during the late antebellum period, suggesting the High Bridge may have been erected by slave labor.[7]

Once completed, the High Bridge and the South Side Railroad helped connect markets in the interior of Virginia with the trade and social networks developing on the coast and its connecting waterways. The trains running over line carried tons of tobacco for export and brought in mail and news that heretofore had taken days, if not weeks, to come in by road or river. Trains headed to the coast carried cotton, wheat, tobacco, and flour and returned carrying guano (fertilizer), coffee, molasses, and liquor. By 1857, the rolling stock of the South Side Railroad consisted of 17 locomotives, 11 passenger cars, 188 freight cars, and 106 additional train cars. The establishment of the railroad directly impacted the regional communities. Those towns not located along the line, including Jamestown, a small port on the Appomattox River above High Bridge, experienced severe economic decline, while the towns served by the new railroad enjoyed the growth and economic prosperity brought about by the increased trade and emerging industrialism. Farmville grew as a regional commercial hub and eventually, after the Civil War, attracted a large number of manufacturing companies and financial institutions. The South Side Railroad intersected two other lines: at Burkesville, it connected with the Richmond and Danville Railroad, running north-south; and at its terminus in Lynchburg, it connected with the Virginia and Tennessee Railroad, which ran down to Knoxville. The broader rail network helped connect the coast with the interior, creating rail links that would be important to the development of towns throughout the South.[8]

Railroads During the Civil War

Throughout much of the Civil War, the South Side Railroad and the High Bridge remained an important component in the internal transportation network that moved both soldiers and civilians, as well as goods and supplies, between points within the Confederacy. Because outside commerce was being choked off by the Union blockade of southern ports, the need to move goods internally significantly increased. The railroad was also one of the mechanisms by which exports could be moved to one of the ports that served as a base for ships attempting to run the blockade. The large numbers of fully stocked tobacco warehouses burned during the campaigning around High Bridge in 1865 may have been filled in hopes of shipping the product to European or even Union markets.[9]

From mid-1864 until the collapse of Confederate defenses at Petersburg, the South Side Railroad was the main line of supply for Richmond and Petersburg and the Confederate soldiers entrenched around both cities. During this period, the railroad transported a significant amount of military supplies at the expense of cutting back on its regular passenger and freight service. The Army paid only 25% of the usual fare to move a soldier and 50% of the usual freight rate, virtually leading to the bankruptcy of the railroad in 1864 and 1865.[10] Shifting rail traffic away from carrying foodstuffs exacerbated the shortages in central Virginia that had led to massive bread riots in Richmond and other towns in the summer of 1863.[11]

Given its importance for military transport and supply, in 1864, the bridge was occupied and fortified by one section (two guns) of the Donaldsonville Artillery of Louisiana. Earthworks were built at both ends of the bridge, and a larger complex farther to the east, in which a number of cannons of varying types and calibers were mounted.[12] Reports from the Confederate War Department suggest that these works were built by enslaved African Americans impressed from the surrounding countryside. By September 1864, the rate of work had tapered off to the point that the government approved the conscription of local free blacks to complete the earthworks. Confederate troops manned these guns in cooperation with local home guard units.[13]

The Battle of High Bridge

The span over the Appomattox River did not achieve great tactical importance until late in the war. After the fall of Petersburg, General Robert E. Lee's Confederates began a precipitous withdrawal to the west, seeking an opportunity to regroup and re-supply. Following an April 6 disaster for the Confederates at Sailor's Creek, near High Bridge, it became clear to commanders from both sides that control of the bridge was of vital importance to the continued operation of the Confederate Army. The Appomattox River was running high and was "generally unfordable."[14] If the bridge could be destroyed before the Confederates crossed, they could be pinned against the Appomattox and forced to surrender. If, on the other hand, the Confederates escaped, they could burn the bridge in their wake and delay pursuers long enough for them to re-fit and re-supply from stockpiles at Farmville.

The Union made the first move, sending a force of 800 infantry and 80 cavalry to the bridge. They stopped short when they encountered the outer line of earthworks surrounding the southern end of the bridge, which mounted eight guns. The cavalry went forward in an attempt to push the home guard troops manning the guns from the area. While they were gone, a superior Confederate force of dismounted cavalry, under Generals Thomas Rosser and Fitzhugh Lee, attacked the infantry from the rear. The resulting fight ended with the capitulation of most of the Union infantry and the deaths of the Union commander, General Theodore Reed, and a number of other officers, and the mortal wounding of Confederate General James Dearing. The rank and file were not so riddled.[15]

During the night, the bulk of Lee's army tried to push its way across the bridge. Many were exhausted, having not eaten in three days while marching and fighting almost constantly since Petersburg. The column picked up civilians, government officials, and other hangers-on who slowed the movement of the troops and created even more of a logjam at the bridge. Confederates note the night of April 6 as one of the first times that it was clear that their army had come unstrung and was more focused on finding food and respite than anything else.[16] At one point, a minor panic broke out amongst the mass of men struggling across the bridge, and a number of soldiers were trampled in the darkness. At least one man was heard falling from the bridge.[17]

When the Union Army arrived in pursuit of the Confederates the next morning, a brigade of Confederate engineers attempted to burn both the railroad bridge and an adjacent, much lower wagon bridge of unknown date. When Union General Francis Barlow's division arrived, the bridge's first three spans were already ablaze. Union infantry and artillery chased off the Confederates, and men from Colonel Isaac Starbird's 19th Maine Infantry ran out onto the bridge to put out the fire. One New Hampshire officer recalled that the "superstructure was of wood which was tarred…the top was floored with boards and covered with tin." To prevent the fire from spreading across the entire wooden superstructure, some of the Maine soldiers tore the tin plating from the bridge's fourth span, cut through the boards, and cut the entire span away from the rest of the bridge; others poured water on the flames.[18] The Confederates' attempt to burn the wagon bridge also was unsuccessful.[19]

As the Confederates retreated from the south bank of the river, they detonated the redoubt there but left behind eight pieces of artillery; on the north bank they abandoned an additional ten pieces of artillery.[20] As a result of taking the bridge and preventing it from being burned completely by the retreating Confederates, the Union Army was able to keep on the heels of Lee's exhausted Confederates. The Southerners were not afforded sufficient time in Farmville to re-supply and had to burn many provisions that they desperately needed as they continued to retreat west. They were brought to bay two days later at Appomattox Court House, where Lee signed the capitulation that signaled the formal conclusion of the war.

The Reconstruction and Replacement of High Bridge

Immediately following the war, the Union Army planned to put the South Side Railroad back into service and probably began repairs to the burned sections of High Bridge late in April 1865.[21] Work orders were quickly countermanded when control over the line returned to the South Side Railroad Company. Reconstruction efforts began July 24, 1865. Nearly 450 feet of bridge needed replacement. During the reconstruction, the line remained in operation by running two trains simultaneously to each end of the bridge. The trains stopped at each end, and a collection of wagons and ferry boats on the Appomattox River portaged passengers and freight between the trains. This make-shift system continued until High Bridge officially re-opened in 1866.[22]

The line passed from the South Side Railroad to the Atlantic, Mississippi, and Ohio Railroad in 1870 and was sold again in 1881 to Norfolk and Western Railroad. The timber-framed superstructure was replaced with a new iron truss in 1886 to support the increased loads of the railroad. Heavy vibrations, however, caused cracks in the piers, and railroad engineers reinforced the original masonry supports with iron plates, angles, and rods by 1901.[23] Nonetheless, increased rail traffic revealed deficiencies within the structure and prompted plans for a new, steel, double-lane trestle in 1912. Upon the completion of the new bridge, the iron truss was removed from the old bridge, and several of the brick piers were dismantled during a brick shortage following World War I. The individual bricks of these piers may be found in Prospect Elementary School, in Prospect; the Craddock-Terry Shoe Factory, in Farmville; and the Edmund Garnett house, in Cumberland.[24]

The new steel structure was completed in 1914 by the Virginia Bridge and Iron Company, a large manufactory of structural iron and steel based in Roanoke. Founded in 1889, by P. K. Wentworth, I. E. Hunter, and C. L. Michael, as the American Bridge Company, the Virginia Bridge and Iron Company grew to be the largest steel fabricating company in the South.[25] The new trestle was constructed atop twenty-one steel towers alongside the original masonry piers of the 1854 bridge. The steel bridge served as an important route for the transshipment of war materials and soldiers to coastal ports during World War I. Passenger service was discontinued in 1979, leaving the line solely for freight transport. The line was officially abandoned in 2005.[26]

The Evolution of Bridge Technology in the United States

Initial colonial settlement concentrated around the coastal plains and along the navigable waterways. However, as settlement moved into the more rugged interior of the state and roadways became increasingly vital to transportation and communication, streams and other small waterways became obstacles to easy passage over the land. The bridges constructed during this period were make-shift structures born out of the practical, pragmatic resourcefulness of frontier life. Simple spans included felled trees laid side-by-side and often covered with a layer of earth to produce a flat roadbed. More elaborate structures for larger, more complex crossings often involved hewn timbers and cribbing. Rough stone was occasionally used for bridge abutments.[27]

The American population expanded rapidly in the period following the Revolutionary War, and transportation needs strove to keep apace with the growing nation. Turnpike construction eased the movement of Americans into the interior and broke ground on providing access over more rugged terrain, and a vast system of canals was constructed that would connect vital waterways and enhance trade. The construction of bridges during this period was an integral component to this dynamic period of internal expansion. The need for bridges increased significantly both on roads and over canals, and the canals themselves provided impetus for the analysis of structural bridge-building techniques. Canal spans struggled with an increase in length and height, as boats passing beneath the structures needed sufficient clearance. Whereas early bridge builders were simple craftsman and carpenters without any formal training in structural engineering, the builders confronting the obstacles of this new period in bridge construction were required to contemplate not just the physical production and assembly of the materials but, more importantly, the interaction of the bridge components under a variety of stresses. Although truss designs had been experimented with in Europe for years, the technology did not emerge in the United States until the end of the eighteenth century. King-post and queen-post trusses were widely used for small crossings in the late eighteenth and early nineteenth centuries; a single king-post truss could not generally span more than fifty feet, however, and a system of multiple king- or queen-posts was unable to span more than seventy feet. One of the first timber trusses to span a substantial waterway in the United States was constructed across the Connecticut River by Enoch Hale in 1785. The rigid triangular framework of a truss is more resistant to the forces of stress, as the three-sided form cannot change shape without distorting one of its members. Therefore, the system is more suitable for spanning larger crossings and sustaining heavier loads. However, the mechanics of the truss system are inherently more complex. A truss needs to carry more than its own weight and withstand a range of stresses, including compression, tension, and shear. Longer spans were heavier and, thus, subject to greater stress. Therefore, a small group of profession engineers began experimenting with timber frameworks that would withstand the large spans of the canal system in the early nineteenth century. A handful of these designs revolutionized bridge-building technology.[28]

One of the first successful timber truss systems was patented by Theodore Burr in 1806 and 1817. The Burr Arch Truss combined hewn timber arches with multiple king-post trusses. The springing points for the arches were placed directly atop the abutments, the arch was bolted to the truss members, and single, diagonal braces were placed between the vertical king posts. Burr's design successfully increased the size of the span that a timber truss or arch alone could achieve; his bridges could traverse spans from 150 to 200 feet with ease. Several more patented timber trusses followed on the heels of Burr's revolutionary design. The Town Lattice Truss, patented in 1820, introduced a cross-web of timber planks and became one of the most successful timber-frame bridge designs. The Long Truss, patented in 1830, implemented parallel chords, verticals, and diagonal crosses within each panel and demonstrated an advanced understanding of truss behavior. The Howe Truss, patented by a railroad engineer in 1840 and 1846, substituted iron for the verticals in Long's design.[29]

The railroads had tremendous impact on early truss development. As bridge historian Dan Grove Deibler suggests: "The single greatest impetus to truss technology was the expansion of the railroads, which required relatively flat, even roadbeds and economical solutions for crossing the natural topographic obstacles such as rivers and ravines that created much of the American landscape."[30] Railroad engineers were confronted with the increasing weight and speed of trains, wheel concentration intensity, and vibratory and lateral forces and were required to consider the effects of these new stresses on truss systems. Initially, Burr's design came closer to the needs of the railroad than any system previously developed. Eventually, however, the Burr Arch Truss was seen as deficient for the expanding railroads, as the combined arch and truss resulted in too many joints and too much pressure on the abutments. The Howe Truss, however, developed by a railroad engineer, was embraced as one of the most efficient truss systems by the railroads and is seen as one of the many innovations reflecting the evolution and increased influence of the railroad over the American landscape.[31]

Despite the experimentation with cast iron for railroad bridges in Europe, American engineers initially found the commodity to be too costly to transport and produce, and the merits of cast iron were dubious when considering the increased stresses induced by rail passage, as the material is brittle under the forces of tension. More importantly, the abundance of wood in the United States, along with the ability to employ unskilled labor, continued to make timber an attractive and wholly viable material for the construction of bridges. Therefore, prior to the Civil War, most railroad companies, particularly in Virginia, continued to build heavily with wood.[32]

Despite their early widespread use of timber, railroads quickly unveiled the inherent deficiencies of wood for bridge construction. An increase in rail traffic after the Civil War, coupled with the use of heavier, faster, and longer trains, took a toll on the timber trusses and trestles that `ere once relied upon. Wood was not as readily able to stand up to the increasing speed and weight, and the material was easily susceptible to weathering and fire. Although iron had previously been considered as a stronger structural material, few bridge engineers had experimented with it. The first iron truss in the United States was constructed in 1840 over the Erie Canal. The decades following that first all-iron truss bridge are characterized by a competitive search for the most efficient iron truss design. From the 1840s through the 1880s, a number of influential designs, several of which were developed directly by railroad companies, were patented, including the Pratt Truss (1844), the

Warren Truss (1848), the Whipple Truss (1841), the Parker Truss (1870), the Pennsylvania Truss (1871), the Baltimore Truss (1875), and the Lenticular Truss (1848 and 1878).[33]

However, not until the industrialization following the Civil War did the iron become widespread, particularly for use by the American railroad companies. An increase in population, due in part to the large influx of immigrants, a large westward migration, and the mounting transportation needs generated by the emerging industrialization, all formulated a landscape in which bridge engineering flourished. Cast iron proved insufficient, so engineers focused their attention on the merits of wrought iron. Able to withstand the forces of tension but weak in compression, wrought iron was initially used in conjunction with cast iron components. Eventually, engineers devised smaller, rolled units of wrought iron and assembled them into sizes that were able to withstand the forces of compression. The increased industrialization and ease of transport by the expanding rail network allowed bridge components to be standardized and prefabricated at mills and factories and shipped preassembled to construction sites. I-beams, H-beams, channels, angles, and plates could be riveted together into full-length girders that made up the structural components of the bridge.[34]

Large bridge companies began to develop after 1874 that specialized in bridge technology; many of these companies later expanded into the production of structural iron or steel for any large construction project. By the 1880s, wrought-iron was seen as the standard for bridge construction. In 1889, roughly one-quarter of the 1,600 miles of bridges in the United States were iron.[35]

During the 1890s, steel developed as the principal building material in the United States. As the material decreased in cost over the early twentieth century, it systematically replaced iron in bridge construction. Likewise, the merits of reinforced concrete were recognized and readily embraced during this period, particularly as the automobile began to impact the American landscape and require extensive highway construction. Steel or reinforced concrete beam-and-girder bridges dominated during the early twentieth century, particularly in the years following World War I. The new bridges achieved far greater lengths and load-bearing capacity than had been previously possible.[36]

The 1854 High Bridge

Constructed in 1854 during the initial stages of railroad development within Virginia, High Bridge reflects both the broad patterns of antebellum railroad development in Virginia and the innovative technologies that revolutionized bridge design and construction. Serving as an important link between the local communities and the greater regional and even national markets, High Bridge and the South Side Railroad fueled the growth and development of the towns through which the railroad passed and served as a major component in the larger transportation network that characterized the economic, social, and cultural landscape of antebellum Virginia.

The original High Bridge consisted of a timber-framed Burr Arch Truss atop twenty masonry piers. The piers were additionally supported on stone foundations, and the ends of the entire span rested on brick and stone piers. The original Burr Arch Truss design was an important innovation in bridge technology in the nineteenth century and part of a greater movement in inventive engineering that not only transformed the technology of spans but also significantly impacted the physical expansion of the railroad. Although the original truss superstructure has been removed and only thirteen of the original twenty piers still stand, the bridge remnants continue to illustrate the engineering challenges overcome by the railroad in the design and construction of High Bridge. The vertical height of the extant piers, and their continued lateral arrangement, echo the original, monumental massing and expanse of what was once one of the largest spans in the world and an engineering marvel of the South Side Railroad. The replacement of the wood truss with an iron truss and the eventual abandonment of the structure for the current steel span demonstrates the evolving technology of bridge and railroad engineering. The juxtaposition of the old remnants alongside the new bridge – the range of materials from stone, to brick, to concrete, to steel - is the physical manifestation of that evolution. As bridge historian Llewellyn Nathanial Edwards states: “The evolution of the bridge, from the first groping efforts of man through the stages of crude invention to the engineering achievements of modern times, tells the story of the progress of civilization on the American continent. The history of bridges exemplifies the restless, inventive creativeness of man as he improved his environment and advanced national frontiers.”[37]

It is that restless, inventive creativeness that Edwards describes that has compelled artists to capture in photograph, paint, or poem the monumental bridges like High Bridge, which was the frequent subject of such artistic endeavors. It emerged as a focal point of community identity for locales such as Farmville, symbolizing the era of progress and achievements of human ingenuity over the obstacles of nature. The bridge itself became inextricable linked with the landscape and has remained, despite its loss of integrity, an important component to the history of the region.

The historical significance of High Bridge and its association with regional identity is further emphasized by its role in major events of the Civil War. Likewise, its role reflects the larger impact that the railroad and, subsequently its bridges, had on the choreography of the battles within Virginia.

The 1914 Bridge

Constructed in 1914, during a period of growth within Virginia and the phase of railroad consolidation and structural improvements, the steel bridge is reflective of the broad patterns of railroad development in the early twentieth century, and its subsequent impact on local communities, and the technological advances that aided in both the expansion and improvement of transportation networks.

The continued operation of the South Side Railroad through the late nineteenth and early twentieth centuries stimulated industrial development within the communities which it served. Locations along the railroad, such as Farmville, reaped the benefits of a manufacturing economy and experienced significant population growth and physical expansion. Widespread improvements in existing lines during the early twentieth century assured the continued safety and efficiency of the railroad. The abandonment of the original bridge for the new structure directly reflects this era of railroad consolidation and reconfiguration.

Constructed as a steel, plate-girder trestle, the bridge takes advantage of the revolutionary technology of mass-produced, prefabricated, rolled units and the superior structural qualities of steel. The industrialization made possible within surrounding communities also impacted the design of new railroad structures during this period. Whereas the original High Bridge was constructed on the first rail line to pass through the corridor, the new steel bridge was constructed alongside an operating rail line, which could easily and cheaply transport the necessary bridge components directly from the factory. The Virginia Bridge and Iron Company, the builders of the new steel bridge, was one of a large number of iron and steel manufactories that specialized in bridge building and both benefited from and helped shape the new industrial landscape of the South.

In 2005, Norfolk Southern donated to the Commonwealth of Virginia a 33.5-mile segment of abandoned rail line that includes the remains of the 1854 bridge and the standing 1914 bridge. The bridge will be converted into a multi-use trail to accommodate pedestrian, bike, and horseback traffic, and will be a component of the High Bridge Trail State Park that will stretch along the abandoned rail line.

===

Endnotes

[1] Writers' Program (Virginia), *Virginia: A Guide to the Old Dominion* (New York: Oxford University Press, 1941).

[2] Wallace, *Speech of Thomas Wallace, of Petersburg, on the Bill Authorizing a Loan of State Bonds, to the South Side Railroad Company, Delivered in the House of Delegates, January 20 and 21, 1853* (Richmond, Va., 1853).

[3] South Side Railroad, "1849-1864 Southside Railroad, Correspondence, Reports, Etc." (papers, Board of Public Works Archive, Library of Virginia, Richmond).

[4] Jo D. Smith, *A History of High Bridge* (N.p.: Privately published, 1987), 5-6.

[5] Mark Naugle, *The History of Railroads in Virginia, 1850-1860* (unpublished paper, Archives, Earl Gregg Swem Library, College of William and Mary, Williamsburg, VA, 1932); Smith, 5-6.

[6] South Side Railroad.

[7] James M. Bisbee, "The History of the South Side Rail Road, 1846-1870" (Master's thesis, University of Richmond), 30; E. Pat Striplin, *The Norfolk & Western: A History* (Forest, Va.: Norfolk and Western Historical Society, 1997) 21.

[8] Bisbee, 56; Clarence H. Bradshaw, "History of Farmville, 1798-1948," *The Farmville Herald*, 37; Striplin, 14-5.

[9] Bisbee.

[10] Ibid, 81.

[11] South Side Railroad.

[12] William Marvel, *Lee's Last Retreat: The Flight to Appomattox* (Chapel Hill: University of North Carolina Press, 2002).

[13] J. F. Gilmer, "Report to the Engineer Bureau of the Confederate War Department," 1864. Reprinted by Robert N. Scott in *The Official Records of the War of the Rebellion,* Series IV, Volume III, Serial 129: Blockade Runners (Washington, D.C.: Government Printing Office, 1880).

[14] Christopher M. Calkins, *Thirty-Six Hours Before Appomattox* (N.p.: Privately published, 1980), 41.

[15] Marvel.

[16] Ibid, 120.

[17] Calkins, 41.

[18] Thomas L. Livermore, *Days and Events 1860-1866* (Boston: Houghton Mifflin Company, 1920), 499-451; Smith, 8.

[19] Marvel, 122.

[20] Calkins, 43.

[21] A photograph of High Bridge that shows repair work on the first four spans is dated April 1865, according to the caption on the negative sleeve in the Library of Congress collections ("Farmville, Virginia (vicinity). High bridge of the South Side Railroad across the Appomattox" by Timothy H. O'Sullivan [LOC Call Number: LC-B817-7179(P&P)]).

[22] Striplin, 22.

[23] Ibid, 52.

[24] Smith, 10.

[25] Virginia Bridge and Iron Company, *Virginia Bridge: Efficiency, Strength, Durability* (Roanoke, Va.: The Company, 1900); Ibid, *Virginia Bridge and Iron Company: Manufacturers of Bridges and Structural Steel for Every Purpose* (Roanoke, Va.: The Company, 1915).

[26] Smith, 10-1.

[27] Llewellyn Nathaniel Edwards, *A Record of History and Evolution of Early American Bridges* (Orono: University of Main Press, 1959), 19-34; Robert McCullough, *A History of Vermont Bridges* (Barre: Vermont Historical Society, 2005), 37.

[28] Dan Grove Deibler, *A Survey and Photographic Inventory of Metal Truss Bridges in Virginia, 1865-1932* (Charlottesville: Virginia Highway and Transportation Research Council, 1975), 8-9; Edwards, 37-9. David Jacobs and Anthony E. Neville, *Bridges, Canals, and Tunnels* (New York: American Heritage Publishing Company, 1968), 27-8; McCullough, 39-45.

[29] Edwards, 52; McCullough, 45-52.

[30] Deibler, 8.

[31] Jacobs, 27-8; McCullough, 45-52.

[32] Theodore Cooper, *American Railroad Bridges* (New York: Engineering News Publishing Company, 1889), 13-14; Deibler, 8-9; McCullough, 55, 101.

[33] Deibler, 9-18; Edwards, 93-5; McCullough, 55, 105-10.

[34] McCullough, 101-7.

[35] Cooper, 48; Deibler, 15.

[36] McCullough, 230.

[37] Edwards, xi.

==

Major Bibliographical References

Appomattox County. *Appomattox County: The Heart of Virginia*. Summersville, WV: Walsworth Publishing, 2001.

Bisbee, James M. “The History of the South Side Rail Road, 1846-1870.” Master’s thesis, University of Richmond, 1994.

Bradshaw, Clarence H. “History of Farmville, 1798-1948.” *The Farmville Herald*, 1994.

Calkins, Christopher M. *Thirty-Six Hours Before Appomattox*. N.p.: Privately published, 1980.

Cooper, Theodore. *American Railroad Bridges*. New York: Engineering News Publishing Company, 1889.

Davis, Burke. *To Appomattox: Nine April Days, 1865*. New York: Rhinehart and Company, 1959.

Deibler, Dan Grove. *A Survey and Photographic Inventory of Metal Truss Bridges in Virginia, 1865-1932*. Charlottesville: Virginia Highway and Transportation Research Council, 1975.

Edwards, Llewellyn Nathaniel. *A Record of History and Evolution of Early American Bridges*. Orono: University of Main Press, 1959.

Featherstone, Nathaniel R. *Appomattox County: History and Genealogy*. Baltimore: Clearfield, 1998.

Gilmer, J. F. *Report to the Engineer Bureau of the Confederate War Department.* 1864. Reprinted by Robert N. Scott in *The Official Records of the War of the Rebellion, Series IV, Volume III, Serial 129: Blockade Runners*. Washington, D.C.: Government Printing Office, 1880.

Hendrickson, Robert. *The Road to Appomattox*. New York: John Wiley and Sons, 1998.

Jacobs, David, and Anthony E. Neville. *Bridges, Canals, and Tunnels*. New York: American Heritage Publishing Company, 1968.

Johnson, Angus James, II. *Virginia Railroads in the Civil War*. Chapel Hill: University of North Carolina Press, 1961.

Livermore, Thomas L. *Days and Events 1860-1866.* Boston: Houghton Mifflin Co., 1920.

McCullough, Robert. *Crossings: A History of Vermont Bridges*. Barre: Vermont Historical Society, 2005.

Marvel, William. *Lee’s Last Retreat: The Flight to Appomattox*. Chapel Hill: University of North Carolina Press, 2002.

Naugle, Mark. *The History of Railroads in Virginia, 1850-1860*. (unpublished paper, Archives, Earl Gregg Swem Library, College of William and Mary, Williamsburg, VA, 1932).

Smith, Jo D. *A History of High Bridge*. Privately published, 1987.

South Side Railroad Papers. “1849-1864 Southside Railroad, Correspondence, Reports, Etc.” (papers, Board of Public Works Archive, Library of Virginia, Richmond).

Stanley, Vara S. “A History of Appomattox County” *Times-Virginia,* 1965.

Striplin, E. Pat. *The Norfolk & Western: A History*. Forest, VA: Norfolk and Western Historical Society, 1997.

Virginia Bridge and Iron Company. *Virginia Bridge and Iron Company: Manufacturers of Bridges and Structural Steel for Every Purpose*. Roanoke: The Company, 1915.

Virginia Bridge and Iron Company. *Virginia Bridge: Efficiency, Strength, Durability*. Roanoke: The Company, 1900.

Writers' Program (Virginia), *Virginia: A Guide to the Old Dominion*. New York: Oxford University Press, 1941.

Wallace, Thomas. *Speech of Thomas Wallace, of Petersburg, on the Bill Authorizing a Loan of State Bonds, to the South Side Railroad Company, Delivered in the House of Delegates, January 20 and 21, 1853*. Richmond, VA, 1853.

Weiland, Nancy J. *A History of Pamplin, Virginia*. 1985.

Verbal Boundary Description

The boundary of the nominated district is delineated by the general polygon whose vertices are marked by the following UTM reference points: A 17 737198 4133036; B 17 737295 4133138; C 17 737838 4132675; D 17 737777 4132599. The detailed boundaries are shown on the attached scaled GIS generated aerial map with a scale of 1" = 275'.

Boundary Justification

The northwesterly and southeasterly boundaries extend out past the abutments of the two bridges, thus encompassing both the architecturally and historically significant features and events that have conveyed significance to the High Bridge, and the northeasterly and southwesterly boundaries extend out to the property lines of the future High Bridge Trail State Park.

Attachments

ATTACHMENT 1
Timothy O'Sullivan
April 1865
Library of Congress Prints and Photographs Division, LC-DIG-cwpb-01299
High Bridge, Deck and Railings, NW View

ATTACHMENT 2
Timothy O'Sullivan
April 1865
Library of Congress Prints and Photographs Division, LC-DIG-cwpb-03952
High Bridge, Original Wood Truss, NE View

ATTACHMENT 3
Timothy O'Sullivan
April 1865
Library of Congress Prints and Photographs Division, LC-DIG-cwpb-03733
High Bridge, Post-Civil War Repairs, E View

ATTACHMENT 4
SKETCH MAP OF SITE, NOT TO SCALE

Photographs
The following is the same for all photographs.
High Bridge, Cumberland and Prince Edwards Counties, Virginia
Photos taken by Elizabeth Mary André on April 7, 2008
Digital images stored at the Virginia Department of Historic Resources

PHOTO 1 OF 15
1914 Steel Bridge, Abutment, NW View

PHOTO 2 OF 15
1914 Steel Bridge and High Bridge, NW View

PHOTO 3 OF 15
1914 Steel Bridge, Deck, SE View

PHOTO 4 OF 15
1914 Steel Bridge, Plate Girder Frame, SE View

PHOTO 5 OF 15
1914 Steel Bridge, Pedestals, SE View

PHOTO 6 OF 15
1914 Steel Bridge, Ties, SW View

PHOTO 7 OF 15
1914 Steel Bridge, Ties, View Looking Down

PHOTO 8 OF 15
1914 Steel Bridge, Plate-Girder Frame and Trestle Tower, NW View

PHOTO 9 OF 15
High Bridge, Abutment, SE View

PHOTO 10 OF 15
High Bridge, Abutment Cap, View Looking Down

PHOTO 11 OF 15
High Bridge, Abutment Cap, View Looking Down

PHOTO 12 OF 15
High Bridge, Abutment, SE View

PHOTO 13 OF 15
High Bridge, Abutment, SE View

PHOTO 14 OF 15
High Bridge, Abutment, NW View

PHOTO 15 OF 15
High Bridge, Brick Piers, NW View

024-0056

HIGH BRIDGE TRAIL
STATE PARK
HISTORIC DISTRICT

CUMBERLAND AND
PRINCE EDWARD
COUNTIES
VIRGINIA

UTM REFERENCES:

A. 17 737198 4133036
B. 17 737295 4133138
C. 17 737838 4132675
D. 17 737777 4132599