

PENNSYLVANIA RAILROAD, CONESTOGA CREEK VIADUCT
Pennsylvania Historic Railroad Bridges Recording Project
Spanning Conestoga River, south of City Water Works
Lancaster
Lancaster County
Pennsylvania

HAER No. PA-530

HAER
PA
36-LANC,
10-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
1849 C Street, NW
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Location: Spanning Conestoga River, south of City Water Works, Lancaster, Lancaster County, Pennsylvania.

USGS Quadrangle: Lancaster, Pennsylvania (7.5-minute series).

UTM Coordinates: 18/390950/4433865

Dates of Construction: 1887-88.

Basis for Dating: Secondary sources.

Date of Alteration: 1930.

Designer: William H. Brown (Chief Engineer, Pennsylvania Railroad).

Builder: John Keller and George F. Goll.

Present Owner: National Railroad Passenger Corp. (Amtrak).

Present Use: Railroad bridge.

Structure Type: Stone arch.

Significance: The Conestoga Creek Viaduct is unusual as a two-track bridge on a four-track line, and more so because of the projecting voussoirs on its south side, which would key in with a yet-unbuilt extension.

Historian: Justin M. Spivey, April 2000.

Project Information: The Historic American Engineering Record (HAER) conducted the Pennsylvania Historic Railroad Bridges Recording Project during 1999 and 2000, under the direction of Eric N. DeLony, Chief. The project was supported by the Consolidated Rail Corporation (Conrail) and a grant from the Pennsylvania Historical and Museum Commission (PHMC). Justin M. Spivey, HAER engineer, researched and wrote the final reports. Preston M. Thayer, historian, Fredericksburg, Virginia, conducted preliminary research under contract. Jet Lowe, HAER photographer, and

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Joseph E. B. Elliott, contract photographer, Sellersville,
Pennsylvania, produced large-format photographs.

Description and History

The railroad between Philadelphia and Harrisburg is the oldest in Pennsylvania. It became the backbone of the Pennsylvania Railroad (PRR) system, and remains a major route for east-west rail traffic today. Originally part of the Pennsylvania canal system, the state-owned Columbia & Philadelphia Railroad (C&P) opened between those two cities in 1834, and connected with a privately built line from Lancaster to Harrisburg in 1838.¹ The C&P's crossing of Conestoga Creek (now the Conestoga River) at Lancaster consisted of eleven wooden Town lattice trusses on stone piers, 1,412'-0" long overall, built by Amos Campbell in 1829.² The PRR acquired the C&P along with the troubled canal system in 1857. Six years later, perhaps to carry heavy Civil War supply trains, the railroad filled the approaches, reducing the viaduct's length to 349'-0", and replaced the spans with a series of iron Whipple trusses.³ This structure sufficed until the PRR began another round of main-line improvements in 1886, under the direction of Chief Engineer William H. Brown.

In many ways, construction of a stone bridge at Lancaster was linked to another stone bridge over the Conemaugh River at Johnstown.⁴ The two structures were often mentioned together in correspondence among PRR officials because they figured in plans for an eventual four-track main line across Pennsylvania. Both replaced iron truss bridges and were constructed in 1887 and 1888. In both cases, the old spans were shifted onto a temporary wooden trestle so that a new structure could be erected on the old alignment.⁵ According to one PRR history by Charles S. Roberts, Chief Engineer Brown had originally planned to replace the Johnstown bridge in iron. Only upon the suggestion of Pittsburgh Division Superintendent Robert Pitcairn did Brown — who later became known as the PRR's "stone man" because of his preference for the material — decide upon a stone bridge.⁶ This exchange may have influenced Brown's choice of stone for the Conestoga viaduct as well. Although the PRR solicited separate bids for the two structures, one unsuccessful bidder, Drake & Stratton, offered Brown a reduced price if allowed to construct both.⁷ Brown refused, however, and from there the two structures' paths diverged.

While the Johnstown bridge was constructed with four tracks, compromises between durability and cost determined that the Conestoga viaduct would have only two. John Keller and George F. Goll had based their low bid for the Conestoga viaduct on the cost of shipping materials for, and constructing, brick arches on limestone piers. Following discussion among PRR engineers about the durability of brick arches, Keller and Goll offered to substitute "Gallitzin stone," a sandstone from the Allegheny Mountains, at the same price if the PRR covered shipping costs.⁸ Brown conceded to the offer, but because of the additional expense of transporting materials, upper management scaled back plans for the bridge. In March 1887, the PRR's general manager wrote to Brown, "the President directs that the Conestoga bridge have foundations put in for four tracks and completed merely for two tracks leaving it in such condition that it can be extended whenever necessity requires, probably a few years hence."⁹ That necessity never arrived. The PRR completed its four-track main line from Philadelphia to

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Harrisburg in 1900, but left two stone bridges — over the Conestoga at Lancaster and over the Brandywine at Coatesville — only two tracks wide.¹⁰ Perhaps the PRR was then already planning a low-grade freight bypass, constructed from 1902 to 1905, which reduced traffic on the main line. Regardless, rail traffic has not subsequently reached a level that required widening of either bridge.

The decisions leading up to a two-track viaduct at Lancaster were codified into the construction contract. Detailed specifications included the two types of stone: "the sheeting of arches, skewbacks and coping to be of Mountain sandstone, the balance of masonry to be of first quality limestone equal to or of Leaman Place Stone."¹¹ The "Mountain sandstone," probably the same "Gallitzin stone" mentioned previously, would have come from Cambria County, while Leaman Place is in Lancaster County and therefore a local stone. Although the two types of stone have since weathered to a similar color, the line between them is distinct in an 1892 photograph of the bridge.¹² Although research did not uncover the original plan, PRR No. 2796, the major dimensions are repeated in the specifications. The four arches each span 54'-6", with a rise of 27'-3", thus semicircular, with spandrel walls rising 35'-3" above the springing line. The overall length is 329'-8", and the width 23'-0", with a coping projecting 2'-0". Keller and Goll, who were assisted by Samuel R. Slaymaker, left stones projecting on the south side to bond with the future extension, which has yet to be built.¹³ (Barring a dramatic increase in U.S. rail traffic, it probably never will.) The south spandrel wall was apparently not constructed to provide the same strength or durability as its northern counterpart, which may have necessitated the one major alteration to the bridge. In 1930, Belmont Iron Works supplied rails, plates, rods, and turnbuckles for external steel frames to tie the spandrel walls together.¹⁴ These frames only enhance the unfinished appearance of the Conestoga viaduct, which looks today much like Keller and Goll left it in 1888.

Notes

1. Albright Zimmerman, "The Columbia and Philadelphia Railroad: A Railroad with an Identity Problem," *Canal History and Technology Proceedings* 3 (1984): 53, 73.
2. Of the several sources describing this bridge, the most complete is Zimmerman, "The Columbia and Philadelphia," 62-63.
3. Negative No. 26250, Box 231, Photo Collection, Railroad Museum of Pennsylvania, Pennsylvania Historical and Museum Commission, Strasburg, Pa., shows one Whipple truss span.
4. See U.S. Department of the Interior, HAER No. PA-517, "Pennsylvania Railroad, Stone Bridge," 2000, Prints and Photographs Division, Library of Congress, Washington, D.C.
5. "Master Bridge-builder" William K. Beard supervised shifting of the spans at Lancaster, which weighed 450 tons; see "Replacing the Conestoga Bridge, Pennsylvania R. R., with Stone Arches," *Engineering News and American Contract Journal* 18 (22 Oct. 1887): 291. After the new bridge opened to traffic, the old iron spans were moved to another PRR line in Harismus Cove, New Jersey; see "The Penna. R. R. on Aug. 7 moved ...," *Engineering News and American Contract Journal* 18 (13 Aug. 1887): 105; "The Pennsylvania R. R. Co. is erecting ...," *ibid.* (10 Sep. 1887): 179.

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6. Charles S. Roberts, *Triumph I: Altoona to Pitcairn, 1846-1996* (Baltimore: Barnard, Roberts & Co., 1996), 239.
7. Drake & Stratton, to William H. Brown, 13 Apr. 1887, in file: Bridges - Philadelphia Division 1883-1903, Box 1454, Chief Engineer, Engineering Department, Pennsylvania Railroad Records, Acc. 1807, Hagley Museum and Library, Greenville, Del. [hereinafter cited as PRR Correspondence].
8. Keller and Goll, to William H. Brown, 23 Mar. 1887, in PRR Correspondence. See also William C. Bowles, Assistant Engineer, to Brown, 23 Mar. 1887, in *ibid*.
9. General Manager, to William H. Brown, 25 Mar. 1887, in PRR Correspondence.
10. Howard W. Schotter, *The Growth and Development of the Pennsylvania Railroad Company: A Review of the Charter and Annual Reports of the Pennsylvania Railroad Company 1846 to 1926* (Philadelphia: Press of Allen, Lane, and Scott, 1927), 265.
11. PRR contract with George F. Goll, dated 15 Apr. 1887, quoted in Lancaster County Planning Commission, *Lancaster County Historic Transportation Cultural Resource Study* (Lancaster: Lancaster County Planning Commission, 1995), 72.
12. The photograph appears in Edwin P. Alexander, *On the Main Line: the Pennsylvania Railroad in the 19th Century* (New York: Clarkson N. Potter, Inc., 1971), 44.
13. John W. W. Loose, *Heritage of Lancaster* (Woodland Hills, Calif.: Windsor Publications, 1978), and letter to author, 11 Jan. 2000. Slaymaker is mentioned in Lancaster County Planning Commission, *Transportation Cultural Resource Study*, 72.
14. National Railroad Passenger Corp. (Amtrak) archives, Philadelphia, Pa.

Acknowledgment

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Additional Sources

1. Richard J. Cook, *The Beauty of Railroad Bridges in North America — Then and Now* (San Marino, Calif.: Golden West Books, 1987), 37.
2. Interstate Commerce Commission, Bureau of Valuation, Engineering Field Notes, Pennsylvania Railroad, Jul. 1918, Box 6009, RG 134, National Archives, College Park, Md.
3. William F. Wornor, "Railroad Bridges over the Big and Little Conestoga," *Journal of the Lancaster County Historical Society* 35, No. 1 (Jan. 1931): 18-19.