

PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD, BRIDGE No. 1
(Pennsylvania Railroad, Grays Ferry Bridge)
Pennsylvania Historic Railroad Bridges Recording Project
Spanning Schuylkill River, south of Grays Ferry Ave.
Philadelphia
Philadelphia County
Pennsylvania

HAER No. PA-547

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HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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Location: Spanning Schuylkill River, south of Grays Ferry Ave., Philadelphia, Philadelphia County, Pennsylvania

USGS Quadrangle: Philadelphia, Pennsylvania-New Jersey (7.5-minute series).

UTM Coordinates: 18/482445/4420955

Date of Construction: 1902.

Basis for Dating: Construction contract.

Date of Alteration: 1987.

Designer: Unknown.

Fabricator / Builder: American Bridge Co.

Present Owner: Unknown.

Present Use: Railroad bridge (abandoned).

Structure Type: Through truss swing span; riveted deck girder.

Significance: Grays Ferry is the site of one of Philadelphia's oldest Schuylkill River bridges. The present swing span is typical of movable bridge construction at the turn of the twentieth century.

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

Description and History

According to historian Fred P. Powers, the first bridge across the Schuylkill River in the Grays Ferry section of Philadelphia was a pontoon bridge constructed around 1780, which would make it one of the earliest permanent crossings in the city. When the Philadelphia, Wilmington & Baltimore Railroad (PW&B) first entered South Philadelphia, it evidently did so on another floating bridge, which may have co-existed with the first.¹ Such a bridge could not have carried locomotives; the cars would have been pulled across by horses instead. In 1838, the PW&B completed a wooden covered bridge on stone piers to replace it. While its floating predecessor swung out of the way for boats, the new bridge had a horizontally retractable draw span. Although sturdier than a pontoon bridge, the wooden covered bridge did not improve the railroad's operations. As a traveler on his way from Louisville to New York noted in 1844,

... three miles from the terminus of the railroad in Philadelphia, the train came to Gray's [*sic*] Ferry on the Schuylkill River. From that point the cars were hauled by horses to the center of the city because the bridge across the river would not carry a locomotive and besides, the authorities did not encourage the operation of locomotives in the city streets.²

The 1838 bridge, No. 1 in PW&B records, had two roadways between three lines of Howe trusses, with the railroad on the south side and a highway on the north. Numbered from the east, spans 1 through 4 and 6 were through trusses on stone piers. The fifth span was a half-through Town lattice truss, which telescoped horizontally into the barrel of the sixth span.³

When the present swing bridge was constructed in 1901, PW&B records indicate that it replaced a "wooden draw" bridge. This quite possibly meant that the 1838 bridge was then still in use (albeit with a new retractable span installed in 1891).⁴ At any rate, the Grays Ferry Bridge was notoriously difficult to maintain during the 1890s. Even after replacing the movable span in 1891, the railroad had to repair the bridge each year until the decade's end, according to annual reports. In 1901, the city of Philadelphia constructed a new highway bridge and released the PW&B from its obligation to maintain the highway portion of its Grays Ferry Bridge.⁵ The railroad wasted little time in replacing the troublesome wooden drawbridge. In October of that year, the PW&B contracted with the American Bridge Company for a replacement.

The present structure, completed by October 1902, features a 226'-7" long swing span pivoting on a cylindrical stone pier roughly at mid-stream. Like many of its contemporaries, the swing span is a riveted steel through truss constructed of built-up members. A wooden pile fender, its long axis parallel to the current, protects the pivot pier from collisions with boats. The PW&B constructed the fender, which the American Bridge Company used as a platform for erecting the new span.⁶ The fender allowed the swing span to be erected in the open position,

without interrupting river traffic. When closed, the swing span aligns with the approach spans, which consist of riveted steel deck girders at either end (60'-11" on the east, 100'-0" on the west).

The mechanism, located on the swing span and driven by steam, is typical of movable bridge construction at the turn of the twentieth century. First, rail lifters raise the rails on the swing span. These rails have tapered ends extending slightly past either end of the swing span and meeting with similarly tapered rails on the approaches. The swing span rails must be lifted clear of the joints before the span can move. Wedges, which lock the bridge when closed, are then withdrawn from shoes on the approach piers. Finally, the engine drives a pinion, which engages a fixed circular rack on the pier to swing the span. This procedure is reversed when closing the bridge.

Shortly after the bridge's completion, in November 1902, the PW&B merged with the Baltimore & Potomac Railroad to form the Philadelphia, Baltimore & Washington Railroad (PB&W). The PB&W became a leased subsidiary of the Pennsylvania Railroad (PRR) in 1918.⁷ Conrail, which acquired former PRR lines in 1976, abandoned the Grays Ferry Bridge soon thereafter and left it permanently open. The bridge, sold to an unknown party in 1987, currently awaits an uncertain fate.

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Notes

1. Fred P. Powers, "Early Schuylkill Bridges," in *Philadelphia History, Consisting of Papers Read Before the City History Society of Philadelphia*, vol. 1 (Philadelphia: City History Society of Philadelphia, 1917), 286, in file: Schuylkill - Bridges, Fairmount Park Commission archives, Philadelphia, Pa. According to bridge historian Henry G. Tyrrell, the first bridge across the Schuylkill at Philadelphia was a pontoon bridge at Market Street in 1777; see *History of Bridge Engineering* (Chicago, 1911), 130.
2. William B. Wait, *River, Road and Rail: William Richardson's Journey from Louisville to New York in 1844* (New York: Valve Pilot Corp., 1942), 21, located in file: Philadelphia, Wilmington & Baltimore Railroad, Box 107, Research Files, Railroad Museum of Pennsylvania, Pennsylvania Historical and Museum Commission, Strasburg, Pa.
3. Several descriptions of this bridge exist. An inspection report describes a six-span bridge, corresponding to an engraving on the title page of Wait, *River, Road and Rail*; see Pennsylvania Railroad, "Chief Engineer's Office - Bridge Specifications," n.d., located in book stacks, Railroad Museum of Pennsylvania, Pennsylvania Historical and Museum Commission, Strasburg, Pa. Fred J. Moll's description has only five spans; see "Covered Railroad Bridges of Pennsylvania," 9, typescript in file: Bridges - Misc., Box 13, Research Files, Railroad Museum of Pennsylvania.
4. The strongest evidence for the 1838 bridge's survival are pre-1901 maps of Philadelphia showing what appears to be a wooden covered bridge at Grays Ferry; see, for example, Burk & McFetridge, "Philadelphia of To-day" (Philadelphia, 1888), Geography and Maps Division, Library of Congress, Washington, D.C. It should be noted, however, that while "drawbridge" presently serves as a generic term for any type of movable bridge, engineers have sometimes used "draw" to indicate a bridge with a horizontally retractable span; at other times, to indicate a swing bridge. See H. S. Prichard, et al., "Lift Bridges — A Discussion," *Proceedings of the Engineers' Society of Western Pennsylvania* 25, No. 1 (Feb. 1909): 12.
5. Philadelphia, Wilmington & Baltimore Railroad Co., *Fifty-third Annual Report of the Philadelphia, Wilmington & Baltimore Railroad Co., Year Ending October 31st, 1890* (Philadelphia, 1891), and *ibid.* for succeeding years.
6. American Bridge Company received \$0.0464 per pound of steel erected, but paid \$1,800 for the privilege of using the fender as falsework. See Agreement No. 3009, "American Bridge Co. with the P. W. & B. R. Co. for Grays Ferry Bridge, Oct. 7th. 1901," file: Philadelphia - Bridges 1899-1903, Box 751, Construction Contracts, Engineering Department, Pennsylvania Railroad Company records, Acc. 1807, Hagley Museum and Library, Greenville, Del.
7. 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), 279, 370.