

EASTON & NORTHERN RAILROAD, LEHIGH RIVER BRIDGE
(Lehigh Valley Railroad, Bridge No. EA77A)
Pennsylvania Historic Railroad Bridges Recording Project
Spanning Lehigh River
Easton
Northampton County
Pennsylvania

HAER No. PA-540

HAER
PA
48-EATO,
13-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
1849 C Street, NW
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Location: Spanning Lehigh River, Easton, Northampton County, Pennsylvania.

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

UTM Coordinates: I8/48I440/4503495

Dates of Construction: 1896-99.

Basis for Dating: Construction contracts and drawings.

Designers: F. E. Schall (Bridge Engineer, Lehigh Valley Railroad).

Fabricator: Union Bridge Co. (Athens, Pennsylvania).

Builder: Terry & Tench Construction Co.

Present Owner: Palmer Township, Pennsylvania.

Present Use: Railroad bridge (out of service).

Structure Types: Pin-connected Pratt deck trusses; pin-connected Pratt through trusses; riveted deck girders on pin-connected trestle bents.

Significance: This structure is significant for its highly complex geometry, with skew trusses carrying tracks on a reverse curve. It possesses a remarkable degree of integrity for a nineteenth-century steel truss bridge on a freight railroad.

Historian: Justin M. Spivey, April 2001.

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

The Easton & Northern Railroad (E&N), chartered in 1889, was one of several short lines serving the slate quarries and cement manufacturers of Northampton County, Pennsylvania. Its initial operating segment in 1890 ran from the north side of Easton about eight miles to Belfast Junction, where it connected with the Bangor & Portland Railway (B&P), another short-line slate hauler. B&P began leasing E&N in 1893.¹ Although E&N was well-connected to other railroads at its north end, the southern terminal remained somewhat isolated through the 1890s. The railroad's directors had envisioned a line through Easton to a junction with the Lehigh Valley Railroad (LVRR) as early as 1891. This plan evidently met with some opposition from Easton residents, who wanted a route around the city rather than through it. E&N eventually settled on a four-mile "belt line" route crossing the Lehigh River west of downtown. Contractors began grading the route in 1896 but work stalled on the bridge in mid-1897, leaving a series of unoccupied stone piers in the river.²

The *Easton Express*, a local newspaper, enticed residents with rumors of major railroad companies interested in the unfinished bridge. One article suggested that the Delaware, Lackawanna & Western Railroad (DL&W), a major anthracite coal carrier, might be trying to assemble a route to Philadelphia via the Lehigh River crossing. Another reported that LVRR officials had visited the site but ducked questions about completing the bridge.³ LVRR did become involved, providing engineering expertise and at least some funding for the work. Its ledgers record a total of \$130,000 paid to fabrication contractor Union Bridge Co. of New York.⁴ This level of investment certainly pointed toward LVRR acquisition of the line. As work resumed on the bridge in September 1898, the *Easton Express* reported that LVRR would take over E&N upon completion.⁵ When the bridge carried its first train seven months later, however, E&N remained a lessee of B&P. For a brief period in 1903 and 1904, DL&W even had control of the line. It was not until the latter date that E&N officially became LVRR property.

E&N's Lehigh River bridge was of national interest for its complex geometry, which carries a single track with reverse curvature and a 1-percent downhill grade from north to south. *Engineering Record* published a four-page description of the structure with dimensions of its spans, which are summarized in Table 1. All eight pin-connected Pratt truss spans are skewed relative to the piers, with only two (spans 3 and 4) exactly alike. Most of the trusses have stringers installed on 8-degree curves, except for spans 3 and 4, which have straight stringers in the transition between right and left curvature. The spans with curved stringers were designed for centrifugal loading from a freight train traveling at 50 miles per hour, and therefore have remarkably heavy lateral bracing. As a result of placing piers in the river parallel to the current,

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spans 2 and 7 have one line of trusses dramatically longer than the other. The difference is taken up in shorter panels at one end, equipped with heavy diagonals in the transverse plane. Two through trusses, over the Central Railroad of New Jersey on the north bank and LVRR on the south, were of particular interest. Their endmost "vertical" members were installed at an angle from the floor beam to the upper chord to compensate for the skew. Terry & Tench Construction Co. used a traveling gantry crane to erect the structure, completing the work between September 1898 and February 1899.⁶

Table 1. Lehigh River Bridge span table, numbered from north to south. All truss spans are pin-connected.

Span No.	Description	Centerline Length
1	Skew Pratt through truss over Central Railroad of New Jersey	207'-5"
2	Skew Pratt deck truss over local road (119'-10" west side, 141'-3" east)	128'-6"
3 to 5	Skew Pratt deck trusses over Lehigh River (167'-9" each)	503'-3"
6	Skew Pratt deck truss over Lehigh Canal (202'-11" west side, 197'-9" east)	200'-4"
7	Skew Pratt deck truss (215'-2" west side, 194'-3" east)	204'-8"
8	Skew Pratt through truss over Lehigh Valley Railroad	187'-0"
9 to 23 odd	Riveted deck plate girders (60'-0" each)	480'-0"
10 to 22 even	Pin-connected trestle bents (30'-0" each)	210'-0"
Total		2,121'-2"

Source: "The Lehigh Valley Railroad Bridge at Easton, Pa.," *Engineering Record* 41, No. 6 (10 Feb. 1900): 124.

The bridge has been little altered since it opened to traffic in May 1899, which is remarkable for a steel truss structure on a freight railroad. Following bankruptcy in 1970, former LVRR lines became part of the Conrail system.⁷ In the interest of eliminating unprofitable routes, Conrail gradually cut back service on the former E&N, totally abandoning the route in Easton by 1995. Palmer Township acquired sections of the E&N right-of-way in 1997, and is presently developing plans for a bike path.⁸

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Notes

1. Thomas T. Taber III, *The Delaware, Lackawanna & Western Railroad, The Route of Phoebe Snow, in the Twentieth Century, 1899-1960* (Muncy, Pa.: Thomas T. Taber III, 1980), 351.
2. "Where Danger Lurks," editorial in *Easton Express*, 6 Feb. 1891, and "Waiting for the Valley," *Easton Express*, 27 July 1897, included by David F. Drinkhouse in letter to author, 18 Feb. 2000.
3. "Railroad Rumors," *Easton Express*, 7 Oct. 1897, and "President Walter's Visit," *Easton Express*, 19 Oct. 1897, included by Drinkhouse in letter to author.
4. Construction & Work Ledger, in Carton 12, Lehigh Valley Railroad Records, Manuscript Group 174, Pennsylvania State Archives, Harrisburg, Pa.
5. "Valley Will Take Charge," *Easton Express*, 22 Sep. 1898, included by Drinkhouse in letter to author.
6. "The Lehigh Valley Railroad Bridge at Easton, Pa.," *Engineering Record* 41, No. 6 (10 Feb. 1900): 124-27.
7. Richard Saunders, "Conrail," in *Encyclopedia of American Business History and Biography: Railroads in the Age of Regulation, 1900-1980*, edited by Keith L. Bryant, Jr. (New York: Facts on File, 1988), 93.
8. Dennis Kelly, "W. Easton Bike Path in Brouhaha," *Morning Call*, 29 Oct. 1997, included by Drinkhouse in letter to author.

Acknowledgments

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Additional Sources

1. Construction drawings, milepost 77.62, region/division/branch 100501, aperture card files, Consolidated Rail Corp., Philadelphia, Pa. [transferred to Norfolk Southern Railroad Co., Atlanta, Ga.].
2. Robert F. Archer, *The History of the Lehigh Valley Railroad: "The Route of the Black Diamond"* (Forest Park, Ill.: Heimburger House Publishing Co., 1977).
3. Interstate Commerce Commission, Bureau of Valuation, Engineering Field Notes, Lehigh Valley Railroad, Notebook No. 10, pp. 1-7 (16 Oct. 1917), in Box 1711, Record Group 134, National Archives, College Park, Md.