MONASTERY ROAD BRIDGE
Pennsylvania Historic Bridges Recording Project III
Spanning Pennsylvania Railroad at Monastery Road
Lloydsville vicinity
Westmoreland County
Pennsylvania

HAER PA-628
PA-628

PHOTOGRAPHS

PAPER COPIES OF COLOR TRANSPARENCIES

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

Description[1]

Monastery Road Bridge is a pin-connected, double intersection Warren deck truss with a deck girder approach span at each end. Concrete-capped ashlar masonry piers and abutments support the bridge.

The main span is an eight-panel truss, 154'-4" long, 20'-9" deep and 20' wide. The upper chords are riveted, built-up members composed of back-to-back channels connected with lacing. The lower chords are paired eye bars, increasing in number from two eye bars in panels 1 and 8, to four in panels 2 and 7, to six in panels 3, 4, 5 and 6. The chords are connected by riveted, built-up vertical end posts (back-to-back channels with lacing), paired braces (back-to-back channels connected with lacing) angling up toward mid-span, and paired counterbraces (eye bars) angling down toward mid-span. The counterbraces pass through the lacing in the braces. The lower portions of the braces have cover plates. The panels are subdivided with vertical posts (four back-to-back channels with lacing) between the upper chords and the mid-panel points. The web members are pinned together at the panel points, suggesting a ca.1870s fabrication date. The bridge is laterally and transversely braced with turnbuckle rods crossing between panel points.

The deck system is composed of 4"x12" timber floor beams, laid on edge about 12" to 16" apart, seated transversely on the upper chords.[2] There appears to be two layers of timber plank decking, one laid longitudinally and one laid diagonally, on top of the floor beams. The wearing surface is asphalt. There are timber curbs and a cast iron pipe railing on both sides of the roadway. The north approach is 35' long, and the south approach is 34' long. Both approaches are composed of longitudinal, 3' deep, riveted steel girders. The girders support 4"x12" transverse timber floor beams.

History

In 1846, Rev. Boniface Wimmer (1809-1887) from Bavaria founded the first Benedictine monastery in North America at Saint Vincent parish (est. 1790) in Westmoreland County, Pennsylvania. Situated in the Allegheny foothills, "on one of the most beautiful and salubrious spots in America for a Benedictine monastery," the parish consisted of a church, parsonage, school house and ancient barn on 313 acres of prime agricultural land.[3] Within a short time, the small community of monks established a self-sufficient farm, complete with its own gristmill.[4] In addition to training monks for the priesthood, the monastery's mission was to build an

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[1] This is a very high, steep site that allows limited access to the superstructure. It was not possible to get measurements of the members. To date, plans and inspection reports have not been located.
[2] The 1998 Pennsylvania Department of Transportation Historic Bridge Inventory and Evaluation form states that these are railroad ties, but traditional railroad ties generally are square in cross-section.
[3] Rev. Boniface Wimmer, as quoted in Jerome Oetgen, *Mission to America: A History of Saint Vincent Archabbey, the First Benedictine Monastery in the United States* (Washington, DC: The Catholic University of America Press, 2000), 63; George Dallas Albert, ed., *History of the County of Westmoreland, Pennsylvania* (Philadelphia: L.H. Everts & Co., 1882), 273.
[4] St. Vincent Archabbey Gristmill (1854) was listed on the National Register of Historic Places in 1978.

educational institution for laymen. By 1855, over 200 students were enrolled at Saint Vincent College and Seminary.[5]

In 1847, the Pennsylvania Railroad was incorporated to build a rail line from Philadelphia to Pittsburgh. Construction of the Western Division from Altoona to Pittsburgh began in 1847 and by December of 1851, all that remained was a short section between Beatty's Station (just west of Monastery Road) and the Loyalhanna River. In order to bring the roadbed to the desired level, construction of that section of the line required a cut 2,600 feet long and 75 feet deep through rock ledge one mile north of Saint Vincent Monastery.[6]

Present-day Monastery Road was laid out at an unknown date prior to 1867, when the road appears in Beers' *Atlas of Westmoreland County*. A 1958 Pennsylvania Railroad track chart indicates that, at that date, this was a private road to Saint Vincent College.[7] Whether Monastery Road was constructed prior to or shortly after the railroad was established, the railroad company would have been required to provide a bridge at this location, as the 75-foot deep cut would have made access to a grade crossing nearly impossible.

No documentation has been found concerning construction of a bridge at this location, but presumably, the first bridge was a wooden structure, as many early bridges on the line were.[8] Within just a few years, however, President J. Edgar Thomason (1808-1874) noted that wooden bridges on the line were beginning to deteriorate and he began urging their replacement, stating, "economy, as well as safety, is in favor of iron structures."[9]

Pennsylvania Railroad Company *Annual Reports*, particularly from the 1880s through the 1890s, indicate that the company was building or replacing overhead highway bridges on the Western Division of the Main Line, but rarely specify the locations of those bridges.[10] One rare exception is a statement in the 1895 annual report that reads, "On the Western Pennsylvania Railroad Division ... the wooden overhead bridge at Sloan's Cut was replaced with an iron structure." No information has been found to definitively connect "Sloane's Cut" with this location, although local history research revealed that Samuel Sloan (1724-1791), an early Westmoreland County settler, lived in the vicinity of Latrobe. In 1774, Sloane helped establish Unity Meeting House

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[5] Pennsylvania Railroad Company, *Guide for the Pennsylvania Railroad* (Philadelphia: T.K. and P.G. Collins, Printers, 1855), 27.
[6] Pennsylvania Railroad Company, *Fourth Annual Report of the Chief Engineer, 15 January 1852*, 12.
[7] A 1958 Pennsylvania Railroad track chart published in Charles S. Roberts, *Triumph I: Altoona to Pitcairn 1846-1996* (Baltimore: Barnard Roberts & Co., 1997), 286. Research in Westmoreland County records or Saint Vincent Archabbey Archives might provide additional information regarding the history of Monastery Road. Inquiries were sent to Westmoreland County Clerk of Courts and Saint Vincent Archabbey in May 2006, with no response.
[8] The Pennsylvania Railroad Collection at the Pennsylvania State Archives contains a great deal of information on bridges, including an extensive collection of plans and blueprints. Further research in this collection might reveal additional clues as to the origins of the Monastery Road Bridge. Other potential sources of information are local newspapers and the Saint Vincent Archabbey Archives.
[9] Pennsylvania Railroad Company, *Tenth Annual Report of the Chief Engineer*, 1857, 46.
[10] The author examined Pennsylvania Railroad Company *Annual Reports* from 1847 to 1910 (missing years 1864-1878, 1886, 1888, 1889 and 1896) at the Pennsylvania State Archives. There does not appear to be enough information in these reports to clearly identify the Monastery Road Bridge.

and Cemetery at a site about a quarter-mile northwest of the intersection of Unity Cemetery Road and Monastery Road.[11]

Physical and documentary evidence suggests that the Monastery Road Bridge was a former railroad span rehabilitated for use as a roadway bridge. It is clearly over-built for a rural late-nineteenth century vehicular bridge and it appears to be similar in design to railroad bridges built on the Pennsylvania Railroad Main Line in the late 1870s.[12] The company is known to have re-used bridge trusses on occasion, so it is certainly within the realm of possibility that this bridge is a recycled span from an earlier structure.[13]

Design

In 1848, engineers Capt. James Warren and Theobald Monzani received a British patent for a bridge truss distinguished by diagonal web members alternately sloped in opposite directions to form a series of triangles. The design was an attempt to create the simplest rigid truss with uniform size members. American civil engineer Squire Whipple (1804-1888) reportedly introduced this type of truss in the United States in 1849-50 without knowing about Warren and Monzani's patent.[14]

While never common for wood bridges, the Warren truss gained popularity after the Civil War, when it was adapted to metal trusses. As patented, the form had no vertical members, which enabled the diagonals, under moving loads, to alternately function in tension and compression. Later modifications included vertical posts and an opposing set of diagonals. After the development of field riveting in the late nineteenth century, the Warren truss became one of the two dominant metal truss types in the United States and remained so well into the twentieth century.

In this particular example, the Warren trusses are configured so that traffic is carried on top of the structure. Known as a deck truss, this type of design is useful for sites with high approaches. It allows for significantly shorter—and less expensive—piers than would be required for a through truss bridge. Historic photos of the Pennsylvania Railroad Main Line suggest that overhead bridges at other locations were often standard pony or through trusses, but the deep cut at this particular location provided ample railway clearance for use of a deck truss.

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[11] See: http://www.pa-roots.com/~westmoreland/ffolder/sloan.html.
[12] The second (1877) Rockville Bridge over the Susquehanna River at Harrisburg had twenty-one 156-foot, pin-connected Warren deck truss spans. Coverdale & Colpitts, Consulting Engineers, *The Pennsylvania Railroad Company, Description and History of Important Bridges and Stations* (1945), Pennsylvania State Archives, MS 286, Box 3.
[13] Roberts, *Triumph I, Altoona to Pitcairn*, 240.
[14] Squire Whipple, *An Elementary and Practical Treatise on Bridge Building* (New York: D. Van Nostrand, 1883), 69 (footnote).

Builder

Like all major railroad companies, the Pennsylvania Railroad Company maintained a bridge department that designed, manufactured and erected bridges. Many of the standard metal bridges erected by the company were manufactured in its shops at Altoona, Pennsylvania; however, others were purchased from large bridge manufacturing firms in Pennsylvania and the Midwest. The company used a variety of metal truss types, including Haupt, Fink, Warren and Pratt trusses.[15] Historic photographs indicate that metal Warren deck truss bridges of the type seen at Monastery Road were used on the Pennsylvania Railroad Main Line in the late 1870s.[16]

[15] Railroad engineer Herman Haupt (1817-1905) patented the Haupt truss in 1839. Some of the first iron bridges on the Pennsylvania Railroad's main line were Haupt trusses (see HAER No. PA-207, Haupt Truss Bridge). Railroad engineer Albert Fink (1827-1897) patented the Fink truss in 1851. The Pennsylvania Railroad's 1870 Ohio River Bridge at Louisville had twenty-five Fink truss deck spans averaging 180' in length. In 1869, the Pennsylvania Railroad built one of the earliest all-metal Warren truss bridges over the Juniata River at Tyrone. In the 1870s, Pennsylvania Railroad engineers developed the Pennsylvania and Baltimore trusses, subdivided-panel variations of Thomas and Caleb Pratt's 1844 Pratt truss.

[16] *Traveling the Pennsylvania Railroad: the Photographs of William H. Rau* (Philadelphia: University of Pennsylvania Press, 2002).

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Jet Lowe, photographer, December 2002

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