

INWOOD IRON BRIDGE AT SWATARA GAP

HISTORICAL TRUSS INFORMATION

INWOOD IRON BRIDGE

A Pennsylvania (Petit) Thru Truss, Inwood bridge was fabricated by the Pittsburgh Bridge Company and was erected by their agents Nelson & Buchanan in 1899. The 160-foot-long, single-span, pin-connected steel bridge was determined eligible for listing in the National Register of Historic Places in 2007. A distinctive feature is its Z-shaped plate floor beam hangers. The bridge was closed due to structural deficiencies in 2006.

PENNSYLVANIA (PETIT) TRUSS BRIDGES

Pioneered by the Pennsylvania Railroad, the Pennsylvania (Petit) truss bridge is a variation on the more common Pratt truss, which includes braced diagonal members in all of its panels. The Pennsylvania truss adds to this design half-length struts or ties in the top, bottom or both parts of the panels. Its distinctive feature of an inclined top chord was necessary for the economy of material and panel sub-ties or sub-struts for greater strength of the truss. This was in response to the increasing live loads of railroad locomotives and rolling stock (HAER No. WI-5).

NELSON & BUCHANAN

Thomas McDowell Nelson (1849-1919), of Chambersburg, Pennsylvania along with New York native Andrew Buchanan (1851-1912) formed a bridge contracting partnership in 1883 at Chambersburg and became agents for the Pittsburgh Bridge Company. The company's success in Central and Eastern Pennsylvania largely depended on the engineering and business skills of their primary agents Nelson and Buchanan. Nelson also served as president of the Pittsburgh Bridge Company from 1896 until its merger with the American Bridge Company (HAER No. PA-591).



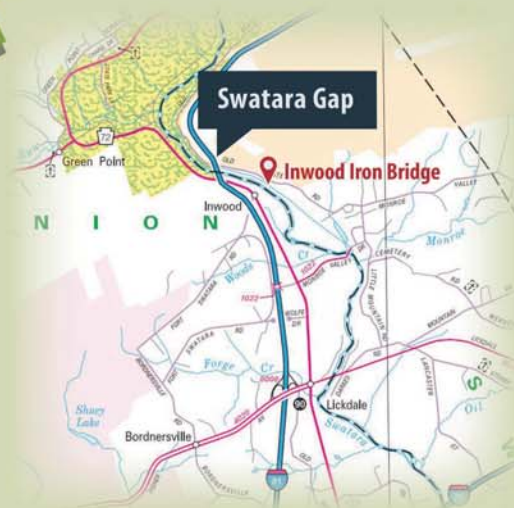
Inwood Iron Bridge cast builder's plate

PITTSBURGH BRIDGE COMPANY

By the early 1890s, steel was replacing wrought iron in American bridge construction. This was accelerated in 1900 by J. P. Morgan, who led a consolidation of 28 of the largest United States steel fabricators and constructors into the American Bridge Company. The merger included the Pittsburgh Bridge Company, the fabricator of the Inwood Bridge. The American Bridge Company advanced the use of steel as a construction material and promoted the standardization and mass production of stronger uniform shapes of angles, channels and I-beams of steel.



Looking west across the Swatara Creek through Inwood Iron Bridge at former location. The village of Inwood is in the background.

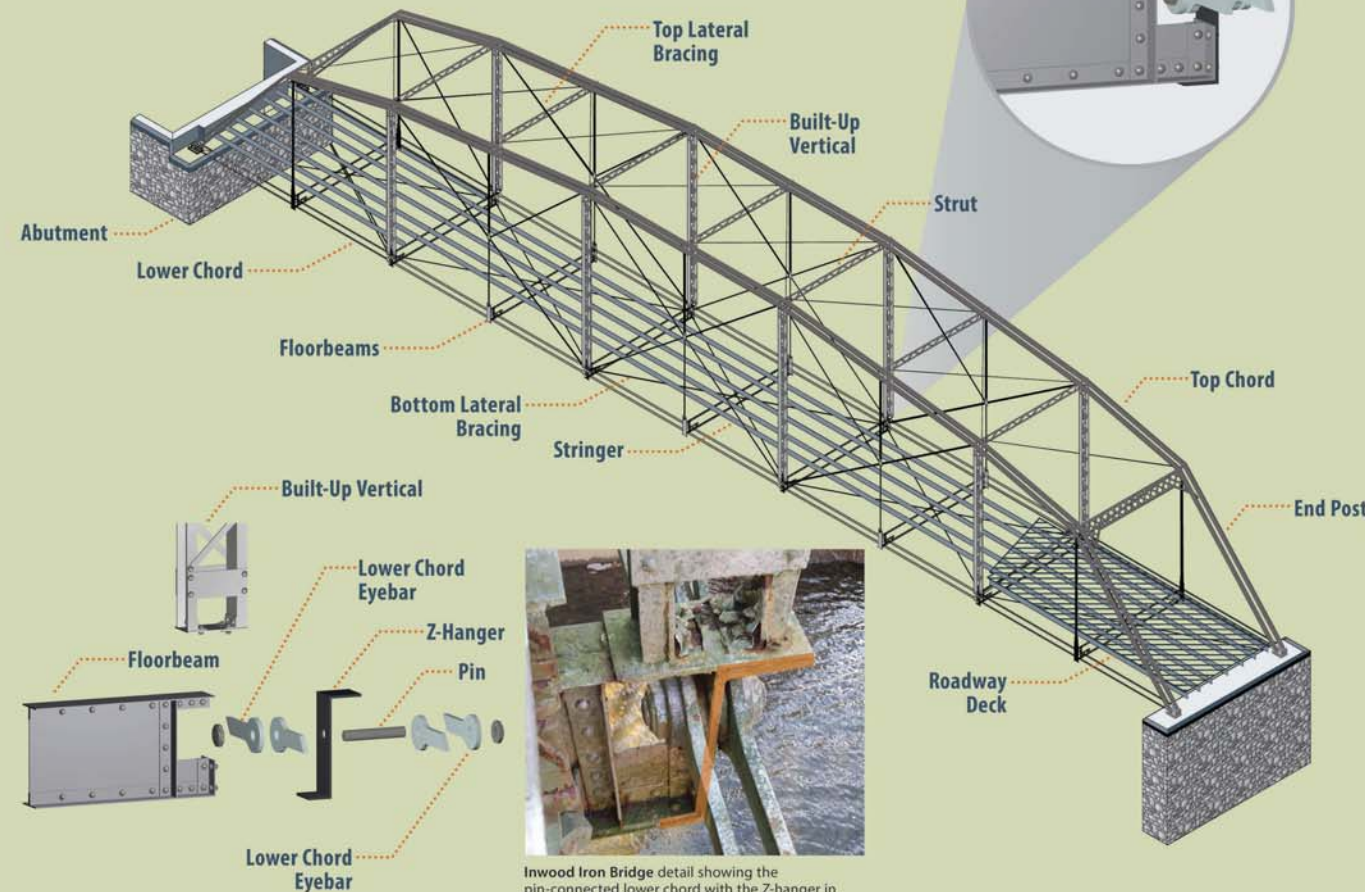


METAL TRUSS BRIDGES

Truss bridges are structures whose individual components are connected in a series of triangles or combinations of triangles. Through materials and engineering practice, by about 1875, metal truss bridge types in America had evolved into standardized forms, permitted through the development of built-up compression members.

During the post-Civil War era there were a variety of truss types, but all were fabricated out of pin-connected eye-bars and built-up members made from I-beams, standardized rolled sections and plates riveted together. The advantages of this production system included the low cost of shop fabrication, the shipping of preassembled parts and the speed with which a bridge could be erected using semi-skilled labor.

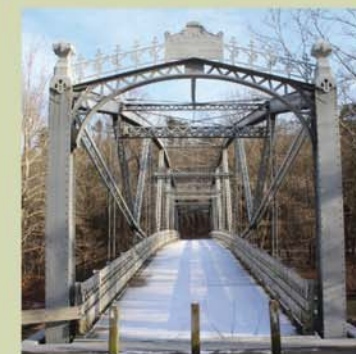
INWOOD IRON BRIDGE (T-575 OVER SWATARA CREEK) ISOMETRIC DIAGRAM



Inwood Iron Bridge detail showing the pin-connected lower chord with the Z-hanger in the center of the chord. (Highlighted)

WATERVILLE BRIDGE, LOCATED JUST NORTH OF THE INWOOD IRON BRIDGE

Built in 1890 by the Berlin Bridge Company of East Berlin, Connecticut, this lenticular truss bridge is a trademark design of this company. It was moved by PennDOT from Cummings Township, Lycoming County, to Swatara State Park in 1985 to be used by the Appalachian Trail over the Swatara Creek.



Looking east through the Waterville Bridge portal.

The Waterville Bridge was determined eligible by the Keeper of the National Register in 1980 who noted that it was "a rare instance of a lenticular truss bridge with a Warren configuration for the web members" (HAER No. PA-462, 1997).



Waterville Bridge cast plaque.

LENTICULAR TRUSS BRIDGES

The Lenticular truss pattern was patented in 1878 by the Corrugated Metal Company. The diagonals of the Lenticular truss are similar to those of a Pratt truss, but it differs in the lens-like shape of its curved top and bottom chords, whereby it derives its name. This distinctive design used less material than other truss types by combining the engineering of metal arch, suspension and truss systems.



View beneath Inwood Iron Bridge at former location showing the floor beams and support system. Every other floor beam (those with lattice built-up verticals) have the distinctive Z-hanger detail.

STONE FROM THE ORIGINAL TRUSS ABUTMENTS HAVE BEEN REFURBISHED AND USED ON THE RELOCATED/REHABILITATED TRUSS.