

Pine Creek Lenticular Truss Bridge

Lenticular truss bridges, named for their unique parabolic shape, are some of the most unique remnants of the once popular metal truss bridge construction method. One of only about 50 lenticular trusses still standing in the United States, the Pine Creek Lenticular Truss Bridge is one of PennDOT's most notable success stories.

Built in 1889 by the Berlin Iron Bridge Company of East Berlin, Connecticut, from a patented design by William O. Douglas and Charles M. Jarvis, this wrought and cast iron bridge is a Lenticular through truss with Warren pattern bracing on the sides. Standing at just under 288 feet long, the Pine Creek Bridge is one of the longest extant lenticular trusses. The Berlin Iron Bridge Company's wares were very popular with the Lycoming County Commissioners during the period of the Pine Creek Bridge's construction—it was one of at least six metal bridges commissioned at the time.



Lenticular Truss Before Rehabilitation

As with many other metal trusses, however, deterioration over time, inadvertent damage caused by poor structural repairs, and inadequate historical engineering all eventually required PennDOT to take action on the Pine Creek Lenticular Bridge. In the face of all of these issues, it would be reasonable to ask why PennDOT elected to repair the bridge at all. The answer is two-fold. On one hand, it is a truly significant and extremely rare historic resource that PennDOT understood should be retained in service if possible. In addition, the immediate area around the bridge was archaeologically sensitive. Archaeological investigations are often labor-intensive and costly.

Ultimately it was more cost-effective and efficient to repair the existing structure than to replace it.



After the rehab!

PennDOT made many repairs and improvements to the structure. As part of the project the bridge was improved to meet legal loads and the approaches were modified to improve safety. However, some of the most severe damage to the structure was caused by inappropriate repairs during the 1960s, when the bearings were encased in concrete. Since bearings allow the structure to expand and contract, encasing them in concrete prevented that movement and ultimately caused the bottom chord to buckle. Theoretically, to fix the problem it could have been possible to heat straighten the chord, and thereby retain the original material. Iron from the 1800s, however, is often of uncertain quality—no regulations existed, and strength, quality, and even chemical composition can vary widely—and heat straightening in that situation can have a detrimental effect. As a result, the Department elected to augment or replace damaged members with high-strength steel and the Pine Creek Lenticular Truss stands at its original location today, still serving Lycoming County as it has for 125 years.