Upper Bridge at Slate Run

(Hilborn Bridge/Pine Creek Lattice Truss Bridge)

Known variously as the Upper Bridge at Slate Run, the Hilborn Bridge, and the Pine Creek lattice truss bridge, by any name this bridge is certainly a unique example of metal truss engineering. Originally built in 1890 by the Berlin Iron Bridge Company, the Upper Bridge stands at just over 202 feet long, and is supported by a unique lattice truss system. Indeed, the term "lattice truss" is a bit of a misnomer—as the Historic American Engineering Record (HAER) report notes, it might be more accurately be described as a Warren quintangular truss. A Warren truss is a system of support that appears to make a "W" shape; in the case of the Upper Bridge, "…the diagonals [between upper and lower chords] intersect five panel points…The effect of this arrangement is like the superimposition of five separate Warren trusses on one another." This truss arrangement, with five overlapping diagonals, is highly unusual, particularly in a vehicular (rather than railroad) bridge. As with the Pine Creek lenticular truss bridge, the Upper Bridge was constructed after serious flooding destroyed many bridges around the Susquehanna River and its tributaries in 1889.

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By 1999, the bridge was in need of repair or replacement, due to a variety of problems. For the Lattice Truss Bridge, these issues fell into two categories. One category was basic improvements and repairs necessary to keep the structure safe and functional, while the other was the fact the structure did not meet modern bridge engineering standards. PennDOT was able to address the first category quite straightforwardly—the scope of work included repainting, repairing and replacing floor beams, increasing the vertical clearance for trucks by modifying the bridge's knee braces (which also reduced potential damage by trucks), and upgrading the guiderail to better project tension and compression members.

The second category, which for the Lattice Truss included problems like width and approach geometry, can often require significant changes to bridges and their surroundings, or even outright removal. In the case of the Pine Creek Lattice Truss, however, its isolated location worked in its favor. Because it is in a very rural area with limited development pressure and light traffic, it was possible to retain the bridge despite the fact it does not meet current engineering design specifications.

Due in part to that flexibility, the bridge was successfully rehabilitated, and still serves traffic over Pine Creek today, offering not only an important glimpse into bridge engineering history but also an example of successful bridge preservation by the Pennsylvania Department of Transportation.