THE WHEELING SUSPENSION BRIDGE-1849
WHEELING, WEST VIRGINIA

STATEMENT OF SIGNIFICANCE

In 1847 the Wheeling and Belmont Bridge Company commissioned Charles Ellet, Jr., to build a cable suspension bridge across the main channel of the Ohio River at Wheeling, West Virginia (then Virginia). The bridge was completed in October 1849. The 1020-foot main span of the bridge was, for many years, the longest bridge in the world. It surpassed the famous Suspension Bridge (now the Rhine) over the Rhine River in Switzerland by 80 feet between towers. It is one of the oldest suspension bridges in America still in use.

The commission to build the bridge was granted to Ellet insharp competition with John Roebling, the only other engineer in the U.S. at the time with experience in suspension bridge construction. Both engineers had made earlier proposals to the bridge company, and both responded with detailed designs to the company's invitation of May 1847 for bridge plans and cost estimates.

The drawing above of the Wheeling suspension bridge is a photostudy of Ellet's submital. At the bottom of the drawing are these credits, "Drawn by C. Ellet, Jr., Engineer Enlarged by J. Leese."

The bridge was built substantially as proposed and is described in excerpts from the proposal:

The span of the Wheeling Bridge is 1000 feet from center to center of the supports. The height of the foundations is 12 feet above the low water surface of the Ohio.

The summit of the eastern tower is 15'3.5 feet above the abutment from which it is supported, and 25 feet above the summit of the western tower. The flooring is 24 feet wide, with two 3'-1/2 feet wide, and an intermediate carriage way 5 feet wide. The flooring is supported by 12 cables of iron wire, each of which will be about four inches in diameter, and 3,800 feet long.

The cables are anchored into the masonry of the wingwalls, on the western shore and into other appropriate walls for the purpose. The masonry in the main street in the city.

The bridge operated profitably until 1854 when a high wind set up oscillations in the deck and the cables. They were literally twisted and bent. The bridge was rapidly repaired the bridge company immediately requested reconstruction plans from Ellet, and under the supervision of Captain McManus, a temporary single lane structure was in service in three months. In 1860, McManus completed a thoroughbridge using all but four of the original twelve cables salvaged from the original suspension. The suspenders and deck truss are probably from this period.

In 1872 a system of stay cables radiating from the tower tops was installed by Washington Roebling, son of John Roebling, to stiffen the structure. Further repairs and stiffening were accomplished in 1892 and in 1930. In 1964 the wooden deck was replaced with open steel grating on steel floor beams. Between 1978 and 1983 additional restoration was given to the main cables, deck trusses, and northeast anchorages.

The bridge was designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers (ASCE) in 1984, and a National Historic Landmark by the Secretary of the Interior in 1975. According to Emlen Kemp, one of the foremost authorities on the history of suspension bridges in North America, the Wheeling Suspension Bridge is "perhaps the most important extant ante-bellum civil engineering structure in America."

CREDITS

This project, conducted by the Historic American Engineering Record (HAER), is part of a long-range program to document historically significant industrial and engineering sites in the United States and include a group of historically significant engineering structures in the state of West Virginia. The project, sponsored by the West Virginia Department of Natural Resources and the Department of Civil Engineering, West Virginia University, was one of three recording projects in the state—this one being conducted during the summer of 1978. Field work, written data, measured drawings and photographs were prepared under the general direction of Douglas L. Griffin, chief, HAER, and Donald E. Sackheim, historian, HAER, with Kathleen Hoest (Columbia University) as project supervisor, and Emlen Kemp (Department of Civil Engineering, West Virginia University) as project advisor. The survey team consisted of David Van Tassel, historian (George Washington University); Lu Ann Sims, student, historian (Georgia Institute of Technology); Martin Greenberg, architect (Pratt Institute); Stephen Hanks, Architect (Kansas State University); and Robert Meden, architect (Kent State University). Formal photographs were taken by William Edmund Barrett.