

Carter Road Lift Bridge  
Spanning Cuyahoga River at Carter Road  
Cleveland  
Cuyahoga County  
Ohio

HAER No. OH-56

HAER  
OHIO,  
18-CLEV,  
37-

WRITTEN HISTORICAL & DESCRIPTIVE DATA  
PHOTOGRAPHS

Historic American Engineering Record  
National Park Service  
U. S. Department of the Interior  
P. O. Box 37127  
Washington, D.C. 20013-7127

ADDENDUM TO  
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HISTORIC AMERICAN ENGINEERING RECORD

Carter Road Lift Bridge

HAER No. OH-56

Location: Carter Road over Lime Street, B. & O. Railroad, and Cuyaboga River, Cleveland, Cuyaboga County, Ohio

UTM Coordinates: 17/441720/4593640

Date of Construction: 1940

Present Owner: City of Cleveland  
Lakeside Avenue  
Cleveland, Ohio

Present Use: Vehicular traffic

Significance: This bridge is significant as it reflects the work of famous Cleveland engineer, Wilbur J. Watson. The bridge is representative of the design for moveable bridges of the vertical lift type being built during the 1940's. It is similar to the Columbus Road Lift Bridge (HAER OH-55). Also of significance is the fact that this bridge was constructed as part of a Works Progress Administration (WPA) sponsored river improvement project, and thus provided work for a number of Cleveland building and engineering related businesses. The bridge has been selected as a historic bridge by the Ohio Department of Transportation.

Report prepared by: Randall S. Gooden  
Project Historian  
Ohio Historic Bridge Recording Project  
Summer 1986

reinforced concrete, full height abutment for the southern approach is also founded on concrete piles. The shore protection for the north and south piers consists of interlocking sheet piling bulkhead and "H" pile fenders with concrete beam walers.<sup>1</sup>

The Carter Road Lift Bridge consists of a vertical lift span, with six approach spans on the north side, and one approach span on the south. It provides for a 200 foot clear waterway. The lift span is a 220 foot long Pratt through truss, and the approach trusses are 46 feet 6 inches long with a 42 foot roadway and 6 foot cantilevered walkways on each side. Concrete-filled steel grid decks provide the roadway on the approach and tower spans, and an open-grid steel deck provides the roadway for the lift span. All of the sidewalks are concrete-filled steel grids. A network of steel stringers and built-up riveted floor beams support the roadway decks. Riveted, built-up steel and rolled sections make-up the towers, providing for a vertical lift of 74 feet 7 1/2 inches. The five north approach spans closest to the lift span have floor support framing of four lines of riveted plate girders and steel frame bents supporting a network of floor beams and stringers. Two girders and six lines of stringers comprise the floor framing on the northern-most approach. Four lines of girders and a network of floor beams and stringers support the roadway of the southern approach span.

Two massive concrete piers founded on concrete caissons with steel beam cores form the sub-structure. Steel bents on the north approach span are supported by six short concrete piers founded on concrete piles. A The bridge carries a four-lane road with sidewalks on each side. On the lift span, the open-grid steel deck limits the build-ups of snow, ice, and dirt and lightens the lift load. The vertical lift span allows river traffic to move under the bridge. It takes one and one-half minutes for the lift span to rise or lower. Two 100 horsepower electric motors perform that task. These are supplemented in emergencies by a 115 horsepower gasoline motor. Concealed cables carry electricity through the structure. Red lights and gongs warn road traffic of the impending rise of the lift span, and barrier gates and a cable net block traffic when the span is up. The bridge has a total length of 1,100 feet and 284 feet between the towers. The river is 210 feet wide between the abutments, and has a minimum clearance above water of 23 feet when the bridge is down and 97 feet when it is up.

This bridge, which cost \$874,000 to build, funneled money into the Cleveland economy as part of a Works Progress Administration sponsored river improvement project. Mt. Vernon Bridge Company of Mt. Vernon, Ohio constructed the steel work (See Scioto Pennsylvania Through Truss

Bridge, HAER OH-53). Western Foundation Company of Chicago performed the substructure work; Wellman Engineering Company of Cleveland built the machinery; Dingle-Clark Company of Cleveland did the electrical work; Glidden Company of Cleveland supplied the paint. George B. Sowers supervised the engineering work, and renowned engineer Wilbur J. Watson designed the bridge.<sup>2</sup>

Wilbur J. Watson had a successful engineering career. He was born in Berea, Ohio on April 5, 1871. Watson received a bachelor of science degree in civil engineering from Case School of Applied Science and was a member of Phi Delta Theta and Tau Beta Phi. Watson worked in the engineering department of Lake Shore & Michigan Southern Railway from 1889 to 1894. He was a designer and supervisor of construction for Osborn Engineering Company in Cleveland from 1898 to 1907.

In 1907, he founded an engineering consulting firm, Wilbur Watson and Associates, in Cleveland. The firm performed much noteworthy work in Cleveland and northern Ohio. Its work included the Cleveland Freight Terminal for the New York Central Railroad, the airship factory and dock in Akron for Goodyear, Northern Ohio Food Terminal in Cleveland, Lorain-Carnegie Bridge, Main Avenue Viaduct, Columbus Road Bridge, and Sidaway Bridge. All of these bridges were built in Cleveland. Watson

sat on a five-member board that formulated a construction code for the American Institute of Steel Construction. He was also a member of the American Society of Civil Engineers, American Railway Engineering Association, Cleveland Engineering Society, American Concrete Institute, Society of Terminal Engineers, Cleveland Planning Commission's subcommittee on bridges and was a trustee of Cleveland School of Architecture, Case Library Association, East Cleveland Public Library, and Baldwin Wallace College. Watson received an honorary doctorate of engineering from Case Western in 1930. He wrote the books Bridge Architecture, A Decade of Bridges, Bridges in History and Legend, General Specifications for Concrete Bridges and articles for The Ohio Motorist, American Architect and Architecture, Civil Engineering, and Concrete Engineering. Watson died in 1939.<sup>3</sup>

Carter Road Bridge is named for Lorenzo Carter, the first permanent settler in Cleveland. Carter, a native of Vermont, settled at the foot of present St. Clair Street in 1797. He provided the first formal transportation link across Cuyahoga River with the operation of a ferry at the foot of present Superior Street. Carter held many leadership and business positions in Cleveland and Cuyahoga County. He died in 1814 at age 47.<sup>4</sup>

By the 1980s, Carter Road Bridge suffered from much deterioration. The City of Cleveland undertook a city-wide bridge rehabilitation and replacement program with money from a Community Development Grant from the U. S. Department of Housing and Urban Development. A resulting study of Carter Road Bridge offered three possible solutions to the deterioration problem. Engineers wrote that the bridge could be rehabilitated, or the lift span replaced and the towers, approach spans, and substructure rehabilitated, or the entire bridge could be replaced.

The grant also provided for inspection of the bridge. American Bridge Division inspected the superstructure and electrical system; Earle Bridge Machinery Company of Florida inspected the mechanical system; Underwater Utilities inspected the substructure. The inspection showed that most repairs were needed in the floor systems, piers, shore protection, and electrical and mechanical systems and the trusses and towers required only minor repairs. Consultants recommended rehabilitation of the bridge at an estimated cost of \$6,930,000 as compared to \$7 million to \$8 million for replacing the bridge.<sup>5</sup>



NOTES

1 Dalton-Dalton-Newport, "City of Cleveland Report of Findings for Carter Lift Bridge over Lime Street, B. & O. R.R. and the Cuyahoga River: Bridge No. 1:002" (Cleveland, 1984), p. 4.

2 Ohio, Cleveland, Division of Engineering and Construction, Carter Bridge Built 1940, Bridge Files.

3 Who's Who in Engineering, 4th ed. (1937), s.v. "Watson, Wilbur Jay."

4 William Ganson Rose, Cleveland: The Making of a City (Cleveland: World Publishing, 1950), p. 35.

5 Dalton-Dalton-Newport, "City of Cleveland Report of Findings for Carter Lift Bridge," pp. 1, 6, 54, 66.

BIBLIOGRAPHY

Dalton-Dalton-Newport. "City of Cleveland Report of Findings for Carter Lift Bridge over Lime Street, B. & O. R.R. and the Cuyahoga River: Bridge No. 1:002." Cleveland, 1984.

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