

INTERNATIONAL RAILWAY BRIDGE  
Spanning the Niagara River  
Buffalo  
Erie County  
New York

HAER NY-549  
*HAER NY-549*

PHOTOGRAPHS  
COLOR TRANSPARENCIES  
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

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INTERNATIONAL RAILWAY BRIDGE  
HAER No. NY-549

Location: Approximately 650' northwest of the Tonawanda St. – Niagara St. intersection, Buffalo, Erie County, New York, thence spanning the Niagara River to Fort Erie, Canada.

UTM: 17/671262E/4755345N  
Quad.: Buffalo Northwest

Dates of Construction: 1870 – 1873

Engineers: Casimer S. Gzowski  
D. L. MacPherson

Contractor: C. S. Gzowski & Company

Present Owner: Canadian National Railway

Present Use: Railroad bridge

Significance: Opened in 1873, the International Railway Bridge was the fifth bridge built across the Niagara River and the first one built to cross the wide, relatively shallow portion of the river above Niagara Falls. Although bridges across the Niagara Gorge below the falls date from 1848, the rapid current in the river's upper region—as high as 12 mph—along with the large ice floes it carried each winter and spring as Lake Erie ice broke apart, had deterred attempts to build a bridge directly between Buffalo, New York, and Fort Erie, Ontario, Canada, even though the operational advantages of a railroad crossing there were apparent. The International Railway Bridge is unusual in that it was built with two swing spans to accommodate river traffic, one over the main river channel and another over the Black Rock Channel. During 1900-01, the bridge was modified with heavier truss members to increase its load limit.

Project Information: These large-format photographs are part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The Heritage Documentation Programs of the National Park Service, U.S. Department of the Interior, administers the HAER program. Jet Lowe (HAER Photographer) produced the photographs, and J. Lawrence Lee (HAER Engineer-Historian) prepared the brief history.

## History

Since the arrival of the earliest settlers in the area, the Niagara River has presented a formidable obstacle to communication between Western New York and Ontario, Canada. The approximately 170'-high falls over the Niagara Escarpment separate the wide, shallow upper river from the narrower, deeper channel through the gorge downstream. The gorge saw the first crossings, a steam ferry in 1846 followed by the first suspension bridge two years later. Railroads operated to both sides of the river by then, but international interchange of cars was possible only after the completion of John Roebling's suspension bridge across the gorge in 1855. Because of the location of their tracks and yards, most American and Canadian railroads preferred a connection south of the falls. Canada's Grand Trunk Railway proposed a bridge between Fort Erie, Ontario, and Buffalo, New York, as early as 1857, but the swift current and ice floes during the winter and spring deterred nineteenth-century bridge builders and financiers from tackling what they saw to be a risky project. Thus, train ferries that crossed upriver from the present bridge served as the only connection for many years, even though it was slow and frequently unavailable during icy conditions. The only alternative was the Roebling bridge some 20 miles north, which primarily conveyed competitors' traffic. Long delays were the norm using either route, and the need for an upper river crossing continued to grow.

In 1870, the engineering partnership of Casimer S. Gzowski and D. L. MacPherson proposed a design that employed multiple, iron, through-truss spans supported by stone piers. Their design called for caissons to be sunk into the river bed far enough to reach bedrock, which would provide a solid foundation for the piers. The railroads and financial backers accepted their proposal, and the International Bridge Company, a joint effort of the American and Dominion International Bridge companies, was organized to build and manage the International Bridge. Gzowski and MacPherson led the design team consisting of Edmund P. Hannaford, Joseph Hobson and George Hughs, while C. S. Gzowski & Company, a related enterprise, actually constructed the bridge. Construction began in 1870 and was completed in 1873. Although construction took more than a year longer than planned, primarily because up to 11' of rocky rubble had to be removed from the bottom to reach a stable foundation stratum, the company earned a rare distinction. No one died due to an accident during the bridge's construction, an unusual achievement for major projects of the era.

Measuring 3,651' in length, the International Bridge carries a single standard-gauge railroad track across the upper Niagara River between Buffalo, New York, and Fort Erie, Ontario, Canada. It is rare in having two swing spans. The bridge was built in two sections of iron trusses that initially were connected by a timber trestle across Squaw Island, New York. The longer (1,967') section crosses the main channel of the Niagara River between Fort Erie, Canada, and Squaw Island. The westernmost span also crosses the Niagara Parkway. This section consists of seven Pratt through-truss spans and a through-truss swing span. The international border passes through the swing span's center pier. The shorter (517') section between Squaw Island and the mainland, known as the Harbor Draw, is a single through-truss swing span, with its western half spanning the upriver channel to the Black Rock Lock. Its eastern half is now over the mainland, including the Niagara Thruway (I-190), but pre-1959 nautical charts show that both halves originally crossed Black Rock Harbor. The mainland side of the harbor was filled in for the

Niagara Thruway about 1955. This span was built wide enough to accommodate two tracks, but carries only one. Roadways for pedestrian and vehicular access to the Squaw Island Park from the mainland are cantilevered off its sides. The remaining 1,167' across Squaw Island were originally built on a low, curved, timber trestle, but it was soon buried with fill—a common procedure—and the track now appears to rest on a low embankment. The current bridge is the result of a 1900-01 rebuilding that installed heavier truss members to increase the bridge's load rating. (That project also removed a pedestrian walkway on the longer span.) Its abutments and piers are stone with wedges on the upstream (south) side to lift and break ice floes into pieces that could pass harmlessly under the bridge. The eight piers and two swing-span center piers rest on caissons sunk into the river bottom. (The center pier for the Harbor Draw swing span is now on the eastern bank of the Black Rock Channel.)

The Great Western, Canada Southern, Erie, New York Central & Hudson River, and New York, West Shore & Buffalo railroads, in addition to owner Grand Trunk, used the International Railway Bridge when it opened in 1873. Through a series of railroad mergers in the twentieth century, ownership of the bridge eventually passed to the Canadian National Railway, which continues to operate multiple freight trains across it daily. No through passenger trains have ever used this bridge, but a single-car local operation carried passengers between Buffalo and Fort Erie until 1934. Operation of the swing span in the river section became unnecessary after the enlarged Black Rock Lock opened to commercial shipping in 1913. It was permanently fixed in position during World War II, and its machinery removed sometime later. The Harbor Draw continues to open for vessels taller than about 15'. Notably, Gzowski and MacPherson's wedged piers endured massive ice floes in 1899 and 1938 without damage. (The latter ice floe destroyed a downstream bridge.) Except for the 1900-01 strengthening and the later swing span closure, the International Bridge has received few modifications since its opening, and it continues to provide a reliable rail crossing of the Niagara River.

## **Bibliography**

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