

Operation

Each year the bridge is swung to the “in-storage” position (open to boaters) on April 1st and to the “in-use” position (open to vehicular traffic) on December 1st.

This operation is carried out by the Monroe County D. O. T. bridge maintenance crew.

Swing bridge machinery was adapted to fit the seasonal nature of the structure, providing a simple, but effective operating system. A conventional pivot bearing and balance wheel ring system is used to swing the balanced structure.

The operating equipment consists of a single pinion mounted at the end of the back span, guided on a circular track. A portable electric drill drives the pinion through a pair of reducing gears. Standard portable hydraulic jacks (two 100 ton, for the west and south, two 50 ton for the east and north) are used to lift the structure in order to remove bearings at each end of the bridge. Two 300- ton hydraulic jacks, permanently mounted to the underside of the pivot beam, are used to lift the truss in order to remove the bearings at the pivot point.

For the spring operation, jacks are placed snugly at each abutment and raised slightly to relieve the load on the bearings. The east end is jacked up first, then the west end. In the next step, the bridge pivot beam is jacked up and the bearings removed. With bearings out of the way, the bridge is lowered on the main pivot bearing. Finally, the east and west bearings are removed respectively and now the bridge is free to swing. Total deflections are approximately four inches at the end of the long span and two inches at the end of the short span. At this point the bridge is turned, using the drill. Upon completion of the turning of the bridge, the sequence of actions is reversed to set the bridge back on the bearings.

The same process is followed in the fall.

Project Team

Owner:	Monroe County D. O. T. City Place, Suite 6100 50 W. Main Street Rochester, NY 14614-1231
Contact:	Bo Mansouri, P.E. County Bridge Engineer (585) 760-7720 bmansour@mcls.rochester.lib.ny.us
Telephone:	(585) 760-7720
e-mail:	bmansour@mcls.rochester.lib.ny.us
Design Team:	Erdman Anthony and Associates Inc., Lead Project Designer Joe Logan, P. E., Project Manager Hardesty and Hanover, Movable Bridge Consultant GZA Geoenvironmental - Subsurface Investigation and Design Om Popli, Survey and Sheet Piling Walls Design
Contractors:	Crane-Hogan (Bridge) Nory Construction (Park Improvements)
Truss Fabrication:	Harris Structural Steel, Inc.
Steel Erection:	Contractors Welders of Western New York, Inc.
Sheet Piling & Pile Footing :	Herbert F. Darling, Inc.
Bearing Wheels & Mechanical Equip.:	Franbuilt Inc.
Galvanized by:	Voigt & Schweitzer Cattie
Length of Project:	October 1985 to December 1998
Planning:	1985 to 1996
Design:	1996 to 1997
Construction:	Dec. 12, 1997 to Dec. 1, 1998
Cost of Bridge:	\$3.6 million
Cost of Park:	\$405,000

Designed and edited by: Bo Mansouri and Paul Bardotz
 Published by: Monroe County D. O. T.
 Date published: May 7, 2002
 Monroe County web site: <http://www.co.monroe.ny.us>

IB O B

Irondequoit Bay Outlet Bridge



Vital Link Between Irondequoit and Webster

Jack Doyle
County Executive
Terrence J. Rice, P.E.
Director of Transportation
Bo Mansouri, P.E.
County Bridge Engineer

History

In the early 1900's, the shallow channel was crossed by a narrow truss highway bridge and a single track railroad line. Around 1929 the bridge was replaced with a two-lane structure supported on timber piles. The timber bridge remained in service until August 14, 1985, when it was removed as part of an Army Corps of Engineers project that opened the Irondequoit Bay to marine traffic from Lake Ontario and created a state park at the bay outlet, to spark development in the bay.



The Irondequoit Bay Outlet Bridge came to be after several studies were carried out to determine the best way to traverse the bay outlet. The consultant determined that a low-level removable or "seasonal" bridge spanning the channel four months of the year was the only viable alternative that could be constructed with the remaining funds, after the allocated \$20 million for a high level bridge was diverted to the California earthquake relief in 1994. Monroe County Legislature approved the \$4.8 million project in 1997.

Included in the \$4.8 million was the renovation of the nearby Irondequoit Bay Marine Park and the building of a Bobtail Swing Truss Bridge, plus engineering fees.

The two-span swing structure has a main span of 132.5 feet and a counter-weighted span of 53 feet. The pivot point of the bridge is on the west bank of the channel.

The superstructure is a galvanized pony truss with bolted connections. The use of bolted connections and full galvanization results in a structure that will be virtually maintenance free over its designed life. The use of bolted connections eliminates the fatigue concerns common with modern welded truss bridge systems and allows full galvanization of the truss.

The deck is solid concrete on the counterweight span and galvanized open grating on the main span. The sidewalk is also concrete on the counterweight span and aluminum grating on the main span.

Features Snap Shot

Project Location:	In the Town of Irondequoit at the Irondequoit Bay Outlet.	
Project Objective:	To build a bridge that would meet the needs of the boating community, merchants in the area, and the motorists for at least four months of the year.	
Other Alternatives:	A high level lift bridge, a high level fixed bridge or a tunnel.	
Final Design:	A bobtail swing truss bridge.	
Structure Information:	Galvanized pony truss with bolted connections.	
Year Constructed:	<u>Old Bridge</u> 1929	<u>New Bridge</u> 1998
Material:	Concrete, steel and wood	Concrete and steel
Type of Bridge:	Fixed	Swing
Type of Truss:	n/a	Pony
Height of Truss:	n/a	Varies 13' - 12' 3"
Bridge Overall Length:	102'	185.5'
No. of Spans:	five	two
Span Length:	20' each	132.5' & 53'
Roadway Width:	34'	24'
Travel Lane Width:	17'	12'
Sidewalk Width:	7' 6" south	5' @ 2 sides
Vertical Clearance: (at high water mark)	2' 3"	4'
Horizontal Distance: (between sheet piling)	n/a	100'
Weight of Structure:	unknown	425 tons
Drill:	3/4" DeWalt, 120 volt, 10 amp., 375 RPM	
Gear Ratios:	2 gear ratio	
Reducers:	1) 14:1 2) 58:1	
Time to Set Up:	2 hours	
Time to Turn:	30 minutes	
Time to Set Down:	2 hours	



Awards

The Association for Bridge Construction and Design-Western New York Chapter gave the 1998 Bridge Award to the Irondequoit Bay Outlet Bridge and Marine Park.

The American Galvanizers Association awarded the bridge the 1999 Excellence in Hot Dip Galvanizing Award as the Most Distinguished Project.