



# Thomas J. O'Brien Lock & Dam

(Chicago, Illinois)  
Calumet River

**U.S. ARMY CORPS OF ENGINEERS**

**BUILDING STRONG®**

**Construction:** 1957-1960

**Congressional District:** IL-2

## Description

Thomas J. (T.J.) O'Brien Lock and Dam is 326.0 miles above the confluence of the Illinois River with the Mississippi river at Grafton, Illinois. It is approximately 35 miles upstream of the Lockport Lock and Dam, in the southeastern portion of Chicago.

O'Brien is located at the entrance to Lake Michigan in Chicago. The facility is a unit of the Inland Waterway Navigation System and is one of eight such facilities between Chicago and Versailles, Ill. It is composed of a navigational lock, fixed dam, and controlling works.



O'Brien is a low-lift sector gate lock. It provides a maximum lift of five feet for traffic passing from Lake Michigan to the Calumet River. The lock chamber is 1,000-feet long by 110-feet wide. The dam is 296.75 feet long. The controlling works consist of four large vertical slide gates (10 feet square) located near the center of the dam to regulate water flow. There are also two sets of sector gates weighing 216 tons each at both the river and lake ends. These are unique on the Illinois Waterway and; consequently, there is no need for tunnels in the lock walls.

T.J. O'Brien Lock and Dam controls the movement of water between Lake Michigan and the Calumet River while maintaining navigation. The lock and dam are used for flood control and waterway flushing, and also function as components of the diversion control system.

## History/Significance

The lock opened in 1960. The lock and dam elements of the complex were completed at a cost of \$6,954,700.

## Annual Tonnage (20-Year Historical)

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1992	7,759,545	1997	10,483,007	2002	7,618,898	2007	7,294,890
1993	8,690,366	1998	8,854,284	2003	6,975,080	2008	6,822,254
1994	13,291,318	1999	7,371,509	2004	9,674,528	2009	4,641,383
1995	11,997,055	2000	8,436,175	2005	9,048,078	2010	5,131,780
1996	12,837,902	2001	6,778,306	2006	9,482,367	2011	6,455,575

## U.S. ARMY CORPS OF ENGINEERS – ROCK ISLAND DISTRICT

CLOCK TOWER BUILDING, P.O. BOX 2004, ROCK ISLAND, IL 61204-2004  
Corporate Communications Office, (309) 794-5274, [www.mvr.usace.army.mil](http://www.mvr.usace.army.mil)

## Commodity Tonnage & Lockages (2011)

Coal	1,874,100	<u>Subtotals:</u>	Grain	96,000
Petroleum	738,300		Steel	1,150,700
Chemicals	370,398			
Crude Materials	1,700,235	<u>Lockages:</u>	Commercial Boats:	1,770
Manufactured Goods	1,451,450		Recreation Boats:	10,668
Farm Products	137,500		Light Boats:	197
Manufactured Machinery	170,231		Other Boats:	82
Waste Material	0		Total Boats:	12,717
Containers & Pallets	0		Total Cuts:	5,569
Unknown	13,361			

## Current Maintenance Issues – Thomas J. O'Brien

### Item (Critical Rank Order)

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Lock - Major Rehabilitation</li> <li>• Lock &amp; Dam - Major Maintenance</li> <li>• Install New High Mast Lighting</li> </ul> | <ul style="list-style-type: none"> <li>• Systemic Filling Valve Replacement</li> <li>• New Maintenance Building</li> <li>• Scour Repair</li> </ul> |
|---|--|

**TOTAL ESTIMATED COST: \$48,400,000**

After 50 years of service, reliability, and operation, problems are a recurring threat and have significant impacts to the navigation users. A plan to reduce the width of the Chicago River in the City of Chicago, near the Chicago Lock, has already rerouted the barge traffic using the Chicago Lock to the O'Brien Lock.

Although this will not cause a significant change in traffic flow, it does mean that O'Brien will be the only commercial access from the Illinois Waterway to Lake Michigan.

Frequent flooding and temperature extremes, combined with high usage, has resulted in significant deterioration of lock concrete and the decline of mechanical and electrical systems performance and reliability. The vertical concrete has deteriorated to the point that sections have had to be removed and/or threaten to fall into the lock chamber. Barges can become wedged under the armor, resulting in a dangerous situation for deck hands, lock personnel, and potential damage to the barges. Hazardous working conditions exist due to deteriorated horizontal concrete on the land and river walls of the lock chamber. The mechanical and electrical systems require constant patching and labor intensive repairs. Parts are difficult to obtain and have to be specially made in most cases. The probability of failure of the mechanical and electrical systems requiring extensive and expensive repairs in the next several years is very high. The potential at any time for an incident to occur due to deteriorated lock concrete, in which the lock had to be closed for more than a week, is very probable with the potential increasing every year the lock concrete is not rehabilitated.

A Rehabilitation Evaluation Report was approved in 2004, and we are awaiting a new construction start.

Significant features of the work include rehabilitation of the sector gate electric system, the lock electrical distribution system, and injection grouting of the lock land & river walls. The existing lock mechanical and electrical systems are original equipment installed in the 1960s. The electric power utility service was upgraded in 1998, but the other components have been in operation since the original construction of the lock. An electrical component failure of the lock electrical distribution system or the sector gate electrical system could result in lock failure, which could cause delays to navigation traffic. The sheet piling for the lock land wall and river walls have also been in service since the original construction of the lock. Should one of the sheet pile cells rupture, the lock would have an unscheduled closure to navigation for a minimum of 60 days. The repair costs are estimated at \$530,000 and the transportation impacts associated with a 60-day closure would approach \$18.3 million dollars. New lock dewatering bulkheads are needed to replace the old set of bulkheads that has been decommissioned due to age and deterioration.

UPDATE: October 2012