



Lock & Dam 21

(Quincy, Illinois)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG.

Construction: 1933-1938

General Contractors:

Lock: Joseph Meltzer, Inc., New York, N.Y.

Dam: McCarthy Improvement Co., Davenport, Iowa

Congressional District: MO-9; IL-17

Description

Lock and Dam 21 is 324.9 miles above the confluence of the Mississippi and Ohio Rivers. The complex stretches across the river at a point where the valley is wide with flat bottom land on either side of the river. The city of Quincy, Illinois, lies on the low bluffs along the river just upstream from the complex.

Lock dimensions are 110 feet wide by 600 feet long with additional provisions for an auxiliary lock.



The maximum lift is 10.5 feet with an average lift of 6.55 feet. It takes approximately seven minutes to fill or empty the lock chamber.

The movable dam has 10 submersible, elliptical Tainter gates (20 feet high by 64 feet long) and three submersible roller gates (20 feet high by 100 feet long). The dam system also includes two earth and sand-filled transitional dikes, and a submersible earth dike. It takes five hours for water to travel from Lock and Dam 20, in Canton, Missouri, to Lock and Dam 21.

History/Significance

Construction on Lock 21 began December 11, 1933 and was completed in August 1935. Construction on Dam 21 began in August 1936 and was completed in February 1938. The structure was placed in operation on July 23, 1938.

Because Lock and Dam 21 was located adjacent to Quincy, which had acute unemployment, the complex was built before some of the other, higher priority locks and dams. The lock, central control station, and esplanade were completed by August 1935. At that point, however, no money was available to begin the dam. As a result, representatives from Quincy vigorously, and successfully, lobbied for federal money to construct the dam as a work relief project.

A cofferdam failure on April 24, 1934, caused a one month delay in work on the Lock facility. River conditions were favorable for construction from December 1933 to January 1935. However, the presence of ice in January and February 1935, and the high river stages during spring 1935 delayed the cofferdam removal. The temperatures were unusually high between June 15 and Aug. 15, 1934, and the rainfall was heavy during the latter part of May and first part of June 1935. A total of 1,000,078 manhours were expended on the Lock project. The average number of men employed by the contractor was approximately 520, with a peak employment of more than 1,000 at

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the end of October 1934. The lowest river stage during construction occurred in 1934 at an elevation of 454.9 feet mean sea level.

The lock and dam elements of the complex were completed at a cost of \$4,155,000.

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	37,920,033	1997	31,931,164	2002	37,208,243	2007	28,546,672
1993	24,762,903	1998	33,312,353	2003	32,025,867	2008	21,939,658
1994	28,778,306	1999	37,863,139	2004	26,556,326	2009	25,623,076
1995	35,347,635	2000	36,449,116	2005	27,127,688	2010	23,431,362
1996	34,519,955	2001	32,874,457	2006	29,497,577	2011	22,220,636

Commodity Tonnage & Lockages (2011)

Coal	1,523,678	<u>Subtotals:</u>	Grain	11,784,146
Petroleum	239,280		Steel	88,200
Chemicals	3,567,737	<u>Lockages:</u>	Commercial Boats:	1,850
Crude Materials	2,373,689		Recreation Boats:	340
Manufactured Goods	1,200,617		Light Boats:	243
Farm Products	13,218,268		Other Boats:	52
Manufactured Machinery	76,586		Total Boats:	2,485
Waste Material	250		Total Cuts:	3,641
Containers & Pallets	1,600			
Unknown	18,931			

The 9-Foot Channel Project

Lock and Dam 21 is one of 29 locks and dams on the Upper Mississippi River that provide a water stairway of travel for commercial and recreational traffic from Minneapolis to the Gulf of Mexico.

The existing 9-foot Channel Navigation Project was largely constructed in the 1930s and extends down the Upper Mississippi River from Minneapolis-St. Paul to its confluence with the Ohio River and up the Illinois Waterway to the Thomas J. O'Brien Lock in Chicago. It includes 37 Locks and approximately 1,200 miles of navigable waterway in Illinois, Iowa, Minnesota, Missouri and Wisconsin.

The maintenance needs of the aging infrastructure are increasing at a rate much greater than the operations and maintenance funding provided for the system which adversely affects reliability of the system. Long-established programs for preventive maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Additionally, the system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at midpoint which triples lockage times and exposes deckhands to increased accident rates.

There are more than 580 manufacturing facilities, terminals, grain elevators, and docks that ship and receive tonnage in the Upper Mississippi River basin. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 1,050 large semi-trucks (26,250 cargo tons, 875,000 bushels, or 17,325,000 gallons). Annually, the 9-foot project generates an estimated \$1 billion of transportation cost savings compared with the operation and maintenance costs of approximately \$115 million.

UPDATE: October 2012