



Lock & Dam 16

(Illinois City, Illinois)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG.

Construction: 1933-1937

General Contractors:

Lock and Dam: Central Engineering Company,
Davenport, Iowa

Congressional District: IA-2; IL-17

Description

Lock and Dam 16 is about one mile upstream from Muscatine, Iowa, and 457.2 miles above the confluence of the Mississippi and Ohio rivers. The complex stretches across the river at a point where the valley is wide. The earthen embankment section of the dam straddles portions of Hog Island in the main channel.

The lock dimensions are 110 feet wide by 600 feet long with additional provisions for an auxiliary lock. The maximum lift is nine feet with an average lift of 6.5 feet. It takes approximately seven minutes to fill or empty the lock chamber.



The movable dam has 12 non-submersible Tainter gates (20 feet high and 40 feet long), three submersible Tainter gates of the same dimensions, and four non-submersible roller gates (20 feet high and 80 feet long). The dam system also includes a linear, concrete capped, ogee spillway; and a submersible earth and sand-filled dike. It takes eight hours for water to travel from Lock and Dam 15, in Davenport, Iowa, to Lock and Dam 16.

History/Significance

Construction on Lock 16 began on Nov. 17, 1933, and completed in February 1937. Construction on Dam 16 began in January 1935 and completed in February 1937. The structure was placed in operation on July 10, 1937.

Dam 16 was the last dam in the Rock Island District to employ non-submersible roller gates, as well as Tainter gates (submersible and non-submersible), which had steel sheeting on only one side. It was also the first dam in the District in which all the Tainter gates were operated by line shafts and motors housed in installations above each gate, rather than from locomotive hoist cars running on the dam's service bridge.

Funds for the design and construction of Lock 16 were provided by the National Industrial Recovery Act and the Public Works Act Appropriation. Four sites were investigated for the location of Lock and Dam No. 16: roughly 2,500 feet below the Muscatine High Bridge, at Muscatine, near Fairport and the selected site at Hog Island.

Below-normal river stages and mild winters for the entire construction period were advantageous to the contractor. The river stages ranged from a low of 531.2 to a high of 541.9 feet (mean seal level). During late 1933 and early 1934 the water surface elevations were at times lower than any previously recorded since 1864. Decisions by the contractor on the procedure to completely dewater cofferdams caused a 30-day delay in construction. Because of change orders and certain weather conditions, a total extension of 110 days was needed by the contractor for

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completion of the lock facility. The average daily number of employees on the lock facility was 335 with a peak of 735 employees on September 1, 1934.

The lock and dam elements of the complex were completed at a federal cost of \$3,682,000.

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>
2015	19,851,212	2010	18,453,809	2005	21,328,240	2000	30,583,395
2014	16,832,178	2009	19,417,486	2004	21,279,884	1999	33,139,184
2013	13,900,123	2008	16,494,518	2003	25,912,587	1998	28,790,247
2012	17,530,646	2007	21,598,027	2002	30,323,912	1997	27,405,115
2011	18,085,452	2006	22,708,972	2001	26,451,754	1996	30,359,583

Commodity Tonnage (2015)

All Units (Ferried Autos, Passengers, Railway Cars)	-
Coal, Lignite, and Coal Coke	2,391,100
Petroleum and Petroleum Products	197,300
Chemicals and Related Products	3,712,519
Crude Materials, Inedible, Except Fuels	2,254,390
Primary Manufactured Goods	1,363,632
Food and Farm Products	9,815,791
Manufactured Equipment & Machinery	113,280
Waste Material	-
Unknown or Not Elsewhere Classified	3,200

Vessel & Lockage Data (2015)

Average Delay - Tows (Hours)	1.31	Non-Commercial Vessels	40
Average Processing Time (Hours)	0.58	Non-Commercial Flotillas	37
Barges Empty	5,215	Non-Commercial Lockages/Cuts	37
Barges Loaded	12,715	Percent Vessels Delayed (%)	85
Commercial Vessels	2,696	Recreational Vessels	485
Commercial Flotillas	2,555	Recreational Lockages	320
Commercial Lockages/Cuts	3,529	Total Vessels	3,221
Non-Vessel Lockages	1	Total Lockages/Cuts	3,887

The 9-foot Channel Navigation Project

The 9-foot Channel Navigation Project includes 37 lock and dam sites (42 locks) on 1,200 river miles in Illinois, Iowa, Minnesota, Missouri and Wisconsin. Constructed largely in the 1930s, it extends from Minneapolis-St. Paul on the Upper Mississippi River to its confluence with the Ohio River and up the Illinois Waterway to the T.J. O'Brien Lock in Chicago.

The maintenance needs of this aging infrastructure have surpassed annual operations and maintenance funding. This limited funding has adversely affected reliability of the system and has primarily resulted in a fix-as-fail strategy, with repairs sometimes requiring days, weeks or months. Depending on the nature of a failure and extent of repairs, shippers, manufacturers, consumers and commodity investors can experience major financial consequences. Additionally, today's 1,200'-long tows must split and lock through in two operations within the Project's 600' chambers. This procedure doubles and triples lockage times, increases costs and wear to lock machinery, and exposes deckhands to higher accident rates.

More than 580 facilities ship and receive commodities within the Project. Grains (corn and soybeans) dominate traffic; cement and concrete products are the second largest group. A modern 15-barge tow transports the equivalent of 1,050 semi-trucks (26,250 tons, 937,387 bushels of corn, or 240 rail cars). Annually, the 9-foot project generates an estimated \$1 billion of transportation cost savings compared to its approximately \$115 million operation and maintenance cost.

UPDATE: May 2016