



Lock & Dam 20

(Canton, Missouri)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG®

Construction: 1932-1935

General Contractors:

Lock: Maxon Construction, Dayton, Ohio
Dam: S.A. Healy Co., Detroit, Mich., & Davenport, Iowa

Congressional District: MO-9; IL-17

Description

Lock and Dam 20 is 343.2 miles above the confluence of the Mississippi and Ohio rivers. The complex stretches across the river at a point where the valley is quite wide, about five-miles wide at the level of the lock and dam. A levee and the Gregory Diversion Ditch separate the complex from the town of Canton.

The 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 5.3 feet. It takes approximately seven minutes to fill or empty the lock chamber.

The movable dam has three non-submersible roller gates (20 feet high by 60 feet long), 34 non-submersible Tainter gates (20 feet high by 40 feet long), and six submersible Tainter gates (20 feet high by 40 feet long). The submersible Tainter gates submerge three feet. It takes six hours for water to travel from Lock and Dam 19, in Keokuk, Iowa, to Lock and Dam 20.

History/Significance

Lock construction began on Nov. 1, 1932 and was completed in November 1933. Dam construction began on Oct. 31, 1933 and was completed in November 1935. The structure was placed in operation on June 9, 1936.

Dam 20 was the first dam in the Rock Island District to include Tainter gates. The plans originally called for all of the Tainter gates to be operated by hoist cars traveling on the dam's service bridge. However, the District modified two Tainter gates so they were individually operated by line shafts and motors housed in installations above each gate. This operating machinery worked so well that all subsequent Tainter gates in the 9-Foot Channel Project, regardless of which district they were in, used line shafts and motors.

In November 1932, the lock contractor began construction of temporary buildings and assembly of equipment. Due to severe cold, approximately 33 working days were lost during the winter of 1932-33. Low water stages during the construction expedited the contractor's work. The average number of men employed by the contractor on the Lock was approximately 320, with a maximum of approximately 570. The dam contractor experienced generally favorable weather conditions throughout the contract period. Forty days of lost time on the dam construction can be attributed to periods of high water.



The lock and dam elements of the complex were completed at a cost of \$3,363,500. Lock and Dam 20 was the first complex in the Rock Island District on the Upper Mississippi River to undergo major rehabilitation. Major rehabilitation work began in the late 1980s and was completed in 1991.

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	36,596,710	1997	30,354,110	2002	35,902,022	2007	26,423,478
1993	23,345,464	1998	31,745,410	2003	30,811,633	2008	20,080,492
1994	27,441,221	1999	36,530,515	2004	25,228,357	2009	23,910,675
1995	34,309,031	2000	35,015,410	2005	25,564,051	2010	21,880,367
1996	33,111,679	2001	31,113,406	2006	27,584,821	2011	20,828,408

Commodity Tonnage & Lockages (2011)

Coal	1,487,468	<u>Subtotals:</u>	Grain	11,525,361
Petroleum	206,030		Steel	88,200
Chemicals	3,251,113	<u>Lockages:</u>	Commercial Boats:	1,737
Crude Materials	2,194,121		Recreation Boats:	482
Manufactured Goods	1,208,317		Light Boats:	217
Farm Products	12,399,243		Other Boats:	71
Manufactured Machinery	58,485		Total Boats:	2,507
Waste Material	3,100		Total Cuts:	3,582
Containers & Pallets	1,600			
Unknown	18,931			

The 9-Foot Channel Project

Lock and Dam 20 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