Lock & Dam 18

(Gladstone, Illinois)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG®**

Construction: 1934-1937

General Contractors:
Lock: Maxon Construction Company, Dayton, Ohio
Dam: S.A. Healy Company, Chicago, Ill.

Congressional District: IA-2; IL-17

Description

Lock and Dam 18 is 410.5 miles above the confluence of the Mississippi and Ohio rivers. The bottom lands on both shores are flat and punctuated by sloughs, marshes, and reefs. The river is dotted with low islands of various sizes. The Oquawka State Wildlife Refuge is adjacent to the lock and dam complex on the Illinois shore. The installation's esplanade interrupts a levee and functions as part of the Henderson River diversion that converted Turkey Island into an extension of the Illinois shore.

Lock dimensions are 110 feet wide by 600 feet long with additional provisions for an auxiliary lock. Maximum lift is 9.8 feet with an average lift of 6.9 feet. It takes approximately 10 minutes to fill or empty the lock.

The dam is composed of 14 submersible Tainter gates (20 feet high by 60 feet long) and three submersible roller gates (20 feet high by 100 feet long). All gates submerge to a depth of eight feet. The dam includes a submersible earth and sand-filled dike, a non-overflow earth and sand-filled dike, and two transition dikes. It takes eight hours for water to travel from Lock and Dam 17, in New Boston, Illinois, to Lock and Dam 18.

History/Significance

Construction on Lock 18 began on Jan. 26, 1934, and was completed in April 1935. Construction on Dam 18 began in September 1935 and was completed in May 1937. The structure was placed in operation on September 8, 1937.

Dams 11 and 18 were the first in the Rock Island District to employ submersible, elliptical Tainter gates. They were also the first two dams in the District to use submersible roller gates. Four sites were considered for Dam 18: just below the foot of Otter Island at mile 406.5, immediately above the old mouth of the Henderson River at mile 412.0, near Oquawka and at the present site. The final site selected also called for diversion of the Henderson River to a point below the dam. The final site was partially selected because the drainage pumps of the Iowa River Flint Creek Levee and Drainage District No. 16 discharged into the lower pool thus being unaffected by the raising of the water level for the upper pool.

Due to the heavy ice conditions, the contractor for the lock construction was delayed at the offset of the project by two months. The following winter of 1934-1935 was also so severe that little work was accomplished during the months of January and February. The draft of the barges engaged in the construction activities was limited during the summer of 1934 due to the low river stages. During the peak of construction in September 1934, the project employed 960 men as laborers and 74 men as supervisors. Average employment was 478 laborers and 44 supervisors.

The contractor completed the lock construction almost one month before the allotted contract time limit. Included in the contract for construction of the dam and associated appurtenances was the construction of the Henderson River cut-off Channel.

The lock and dam elements of the complex were completed at a cost of $4,122,400.

Annual Tonnage (20-Year Historical)

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1992	33,942,692	1997	28,791,241	2002	32,948,597	2007	24,193,022
1993	21,239,259	1998	31,228,140	2003	28,389,384	2008	18,661,036
1994	25,174,887	1999	35,707,505	2004	23,015,891	2009	21,812,990
1995	31,531,989	2000	32,864,097	2005	23,602,042	2010	20,493,468
1996	31,778,065	2001	28,570,073	2006	25,262,995	2011	19,850,238

Commodity Tonnage & Lockages (2011)

Coal	2,596,104
Petroleum	213,184
Chemicals	3,112,312
Crude Materials	2,174,347
Manufactured Goods	1,213,842
Farm Products	10,494,058
Manufactured Machinery	25,910
Waste Material	300
Containers & Pallets	1,600
Unknown	18,581

Subtotals:	Grain	9,682,589
	Steel	74,820
Lockages:	Commercial Boats:	1,730
	Recreation Boats:	607
	Light Boats:	138
	Other Boats:	72
	Total Boats:	2,547
	Total Cuts:	3,556

The 9-Foot Channel Project

Lock and Dam 18 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.