



**US Army Corps
of Engineers**
Rock Island District

LOCK & DAM 18 (GLADSTONE, ILLINOIS) MISSISSIPPI RIVER

General Contractors:

Lock: Maxon Construction Company, Dayton, Ohio

Dam: S.A. Healy Company, Chicago, Illinois

Construction: 1934-1937

Congressional Districts: 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.

The dam is composed of 14 submersible Tainter gates (20-feet high and 60-feet long) and three submersible roller gates (20-feet high and 100-feet long). All gates submerge to a depth of eight feet. The dam also includes a submersible earth and sand-filled dike, a non-overflow earth and sand-filled dike, and two transition dikes.

Lock dimensions are 110-feet wide by 600-feet long with additional provisions for an auxiliary lock. Normal upper pool elevation is 528.0, about 13 feet above the dam tail waters at low water. 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. It takes 8 hours for water to travel from Lock and Dam 17, in New Boston, Illinois, to Lock and Dam 18.

HISTORY/SIGNIFICANCE

The lock opened in 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. This complex also involved the diversion of Henderson River so that it entered the Upper Mississippi immediately below the lock and dam. 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 lock and dam elements of the complex were completed at a cost of \$4,122,400.

ANNUAL TONNAGE (10-YEAR HISTORICAL)

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1998	31,228,140	2003	28,389,384
1999	35,707,505	2004	23,015,891
2000	32,864,097	2005	23,602,042
2001	28,570,073	2006	25,262,995
2002	32,948,597	2007	24,193,022

(MORE INFORMATION ON THE REVERSE SIDE)

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COMMODITY TONNAGE & LOCKAGES (2007)

Coal	4,934,026	<u>Subtotals:</u>	
Petroleum	371,780		
Chemicals	2,741,040	Grain	12,362,325
Crude Materials	1,760,615	Steel	276,642
Manufactured Goods	730,397		
Farm Products	13,622,074	<u>Lockages:</u>	
Manufactured Machinery	19,170		
Waste Material	1,800	Boats:	3,257
Containers & Pallets	1,624	Cuts:	4,401
Unknown	10,496		

CURRENT MAINTENANCE ISSUES – LOCK & DAM 18

Item (Critical Rank Order)

Systemic Bulkhead Slots
 Dam Concrete Safety Repairs
 Repair Dam Concrete
 Dam Rehabilitation Evaluation Report
 Systemic Miter Gate Replacement
 Repair Roller End Shields & Seals - Dam
 Systemic - Crane Rail Adjustments - Dam
 Structural Repairs - Tainter and Roller Gates - Interior
 Systemic Repair Auxiliary Lock Gates, Including New
 Bulkhead Slots
 Systemic Structural Repairs Service Bridge Dam
 Systemic Structural Repairs - Tainter and Roller Gates
 - Exterior

Miter Gate Machinery/Gearbox Repair
 Systemic Tainter Valve Replacement
 Lock Rehabilitation Evaluation Report
 Replacing 70-Year Old Lock Pontoon Barge (Work Flats)
 Bridge Crane Repairs to Lattice Boom & Crane
 Undercarriage
 Repair Henderson River Bridge
 Systemic - Standby Generator and Compressor Enclosures
 Resurface Entrance Road (1,200')
 New Maintenance Building

TOTAL ESTIMATED COST: \$51,750,000

The existing 9-foot Channel Navigation Project was largely constructed in the 1930's 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 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.

More than 580 manufacturing facilities, terminals, and docks ship and receive tonnage in the Upper Mississippi River basin. In 2005, the system moved more than 160 million tons of commercial cargo worth roughly \$28.5 billion. 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 870 large semi-trucks (22,500 cargo tons, 787,500 bushels, or 6,804,000 gallons). Annually, the project generates an estimated \$1 billion of transportation cost savings compared with the operation and maintenance costs of approximately \$115 million.

In constant dollar terms, operations and maintenance funding for the system has been largely flat or declining for decades, while maintenance needs of the aging infrastructure increase. This is adversely affecting reliability of the system. Long-established programs for preventative 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 nature of a lock malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

POINT OF CONTACT

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