ILLINOIS WATERWAY, DRESDEN ISLAND LOCK AND DAM
7521 North Lock Road
Channahon vicinity
Will
Illinois

HAER IL-164-F
IL-164-F

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

ILLINOIS WATERWAY, DRESDEN ISLAND LOCK AND DAM

HAER NO. IL-164-F

Location:	7521 North Lock Road, Channahon vicinity, Will County, Illinois, on the Illinois River Latitude: 41.3259244, Longitude: -88.7082147
Present Owner:	U.S. Army Corps of Engineers, Rock Island District
Present Use:	Navigation of the Illinois Waterway
Significance:	The Dresden Island Lock and Dam site is significant as a component of the Illinois Waterway, which was developed to provide a navigable route from Lake Michigan to the Mississippi River and beyond.
Historian:	Justine Christianson, HAER Historian, 2008
Project Information:	The Illinois Waterway Recording Project (2007-2008) is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Heritage Documentation Programs, a division of the National Park Service, U.S. Department of the Interior, Richard O'Connor, Manager. The U.S. Army Corps of Engineers (USACE) funded the project. Ron Deiss, USACE, and Dana Lockett, HAER Architect, served as project managers. Dana Lockett and Anne Kidd produced the measured drawings. Large format photography was done by Brian Grogan. Justine Christianson wrote the historical reports. Research assistance was provided by John Fitzgerald, Archivist, USACE.

Part I. Historical Information

A. Physical History:

1. **Date of Construction:** (1929-33)
The lock, auxiliary lock, dam and dam boiler house were under construction from 1929-1933. The contract for the control station was not let until 1936.[1]

2. **Architect/Engineer:**
Walter Mickle Smith, Chief Design Engineer for the State of Illinois, is credited with designing the control station, lock, auxiliary lock, and dam.[2]

3. **Builder/Contractor/Supplier:**
The U.S. Army Corps of Engineers hired various companies to build components of the lock and dam site. These included the E.J. Biggs Construction Company, who built the control station.[3] Congress Construction Company was responsible for the masonry work at the lock and dam, while the Independent Bridge Company supplied and installed the miter gates, Tainter gates, and headgates as well as the gate and valve operating machinery.[4]

4. **Original Plans:**
A 1928 plan of the site by the State of Illinois' Division of Waterways shows a 642' dam stretching across the Illinois River with a power house proposed to the north. To the south of the dam was the lock with miter gates at both the upstream and downstream ends. Backfilling was proposed along the southern bank of the Illinois River.[5]

A 1932 Army Corps drawing reveals the layout of the main lock. A control house is centered on the landward side of the lock. Two sets of miter gates are located

---

[1] Mary Yeater Rathburn, American Resources Group, Ltd., "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange," Volume 1, prepared for U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois, October 1996, p. 77; Folder 821.1 (Dresden Island Lock) Control House, W-1088-Eng-880, 1936 in U.S. Army Corps of Engineers, Chicago District, Record Group 77, National Archives and Records Administration, Great Lakes Region, Chicago (hereafter cited as RG 77, NARA, Chicago).
[2] Mary Yeater Rathburn, "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange," Volume 2, prepared for U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois, October 1996, pp. 201-207; Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 87; Barbara J. Henning, "Dresden Island Lock and Dam Historic District," National Register of Historic Places Nomination Form, 2001, Section 7, Page 1.
[3] Folder 821.1 (Dresden Island Lock) Control House, W-1088-Eng-880, 1936.
[4] C.R. Andrew, Principal Engineer to District Engineer, Memo: Field Operations, Illinois Waterway, January 23, 1932, p. 3, in Folder 285/68b (Ill Wwy) State of Illinois, 1929, File #4, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[5] State of Illinois, Department of Purchases and Construction, Division of Waterways, "The Illinois Waterway, Dresden Island Lock and Dam, Finished Structures," Contract No. 3-F3, Submitted January 25, 1921 and Adopted May 8, 1928, available at U.S. Army Corps of Engineers, Rock Island District.

at the upstream end of the lock chamber. Between the main lock and the dam is a set of miter gates indicated as being "for future lock."[6]

A 1930 publication by the U.S. Army Corps of Engineers describes how Dresden Dam appeared at the time of the transfer of authority from the state. Piers measuring 8' thick and extending above the dam's crest divided the 642' long "discharge section" into nine 60' wide openings in which Tainter gates were located. A 4' thick buttress wall with foundation drains sat above the parabolic section of the dam. A cut-off wall with foundation drains and an apron extended 12'. North of the dam's Tainter gates was a 30' ice chute with a sector gate that was similar to that installed at Lockport. The dam also had a 518' long "power-house section" (built in anticipation of power being generated at the site) with thirty double sliding gates measuring 15' wide x 18' high and "closing on oak sills." The sliding gates would remain closed until a power house could be built and put into operation. This section of the dam connected to the north riverbank by an S-shaped earthen embankment with a 1:2 rip rapped slope. The embankment was located 8' above the pool's level.[7]

5. **Alterations and Additions:**
Various alterations and additions have been made to the site throughout its operational history. The first major work occurred in 1941 when the Great Lakes Dredge & Dock Company of Chicago reconstructed the upper approach wall.[8] The original valve operating machinery for the lock was replaced in 1969.[9] The first major rehabilitation of the entire lock took place from 1978-79 and involved rewiring the lock as well as resurfacing the lock walls and rebuilding the lower guide wall.[10] In 1981, the lower end of the lock was altered to better accommodate barges.[11] An extensive rehabilitation was undertaken from 1984-85 that involved filling the headgates of the dam with concrete since the anticipated development of hydroelectric power at the site had never occurred. In addition, the operating machinery for the lock gates was replaced.[12] Another major rehabilitation took place in 1995, which the Army Corps shut the waterway down for sixty days. At Dresden Island, work included resurfacing the lock walls and replacing gates.[13]

---

[6] U.S. Engineer Office, First District, Chicago, Illinois, "Illinois Waterway, Dresden Island Lock, Lock Electrical Equipment," February 2, 1932, available at U.S. Army Corps of Engineers, Rock Island District.
[7] U.S. Army Corps of Engineers, "The Illinois Waterway," (Washington: U.S. Government Printing Office, 1930), pp. 48-49.
[8] Folder 821.1 (Dresden Island—Upper Approach Wall), W-1088-Eng-1434 (1941), in U.S. Army Corps of Engineers, Chicago District, RG77, NARA, Chicago.
[9] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 201.
[10] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 201.
[11] Henning, "Dresden Island Lock and Dam Historic District," Section 7, Page 3.
[12] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 104; Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 201, 207.
[13] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 105 and Volume 2, p. 201; Henning, "Dresden Island Lock and Dam Historic District," Section 7, Page 3.

B. Historical Context:

The State of Illinois began construction at Dresden Island in 1929. As originally conceived, an auxiliary lock would be situated between the main lock and dam, much like the original plans had appeared for Starved Rock and Brandon Road. In addition, power would be generated at Dresden Island, Brandon Road, Marseilles and Starved Rock to help offset construction costs, so provisions were made in the site's layout to accommodate a power house. These plans did not come to fruition.[14] A lack of funding hampered construction progress at the site, so when the U.S. Army Corps assumed authority over the waterway in 1930, the $1.2 million contract for the lock and dam was only 49 percent complete while the $476,000 metalwork contract was 62 percent complete. The total estimated cost of the Dresden Island Lock and Dam site was $2,365,463, with half of that already having been spent by the state. In order to complete the project, the federal government expected to obtain funding from an emergency construction bill.[15]

The Army Corps continued the state's masonry and metalwork contracts and let new ones. In November 1931, there were reportedly 300 men working on the masonry while another thirty-five worked on the steel components. Progress was initially slow due to "considerable labor difficulties." In one incident, the local union sent 500 members to march on the site and keep workers from reporting to their jobs. The contractor, Congress Construction Company, restored its wage scale to that demanded by the union, thereby resolving the dispute.[16] Nevertheless, the problems at Dresden Island were cited as the reason for the lack of progress being made on construction of the waterway. President Hoover reportedly personally urged Chief of Army Engineers Maj. Gen. Lytle Brown to speed up construction. One advantage to speeding up construction touted in the press was that the project would ease unemployment by putting men to work, while others argued that increasing the pace of construction would simply raise costs. The fact remained, however, that even if substantial progress was made at Dresden Island and the waterway as a whole, navigation was still hampered by low bridges over the waterway in Joliet that required removal and replacement with higher bridges. The bridgework at Joliet had been delayed due to a conflict over wage rates.[17]

The mild winter of 1932 allowed substantial progress to be made.[18] That year, the Army Corps could report that the main lock at Dresden Island had been completed

---

[14] Staff Correspondent, "Illinois Gets Power Permits for 4 Projects," *Chicago Daily Tribune*, May 26, 1921, p. 8.
[15] Arthur Crawford, "Illinois Canal to Get Million of Relief Fund," *Chicago Daily Tribune*, December 22, 1930, p. 1; U.S. Army Corps of Engineers, *Annual Report of the Chief of Engineers, U.S. Army* (Washington, DC: Government Printing Office, 1931), p. 1275 (hereafter cited as USACE, *Annual Report*, date of publication).
[16] USACE, *Annual Report*, 1931; Arthur Evans, "Civic Leaders Urge Speed on Waterway Job," *Chicago Daily Tribune*, November 6, 1931, p. 13; Dan I. Sultan, Lt. Col., Corps of Engineers, District Engineer to The Division Engineer, UMVD, St. Louis, July 15, 1932, Subject: Progress Report, p. 4, in Folder 285/68b (Ill Wwy) State of Illinois, 1929, File #4, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[17] Arthur Evans, "Civic Leaders Urge Speed," p. 13.
[18] Arthur Evans, "Predict Illinois Waterway Will Be Open by Fall," *Chicago Daily Tribune*, February 24, 1932, p. 3.

(aside from 30 percent of the land wall), and the operating machinery for the lock gates had been installed. The auxiliary lock had also been finished except the arch dam. Progress was also being made on the dam, with 85 percent of the concrete for the head gate section poured while 50 percent of the ice chute pier and spillway had been completed. The Tainter gates were in the process of being installed, with three operating bridges and gate machinery in place. In addition, 925 acres of the Dresden Island pool had been cleared and dredging was underway.[19]

During 1933, the final projects were completed, including installing the lock's electrical equipment, erecting a temporary control house, and building access roads to the lock and dam site. The landwall of the main lock was completed, as were the headgate structure, ice chute pier and spillway, and the remaining Tainter gates. Completion of the temporary control house, installation of lock electrical equipment, and construction of the north and south approach roads cost $31,998.13. Clearing of Dresden Island pool continued at a total cost of $18,000.21 for 687 acres.[20]

After the waterway opened in 1933, alterations were made to the site. The dam boiler house was completed in 1934 at a cost of $11,470.38. Public Works funds were expended to build the lockkeepers' houses and the splashboards at the dam and to install the lighting and the fire protection/water distribution sewer system.[21] The final major addition to the site was the 1937 completion of the permanent control station.[22] Various auxiliary structures have been built and changes have been made to the operating machinery during the site's operational history.

Part II. Structural/Design Information

A. General Description:[23]

Located on the Illinois River, the district consists of a dam and boiler house with an auxiliary lock located between the dam and main lock. On the landward side of the lock are a number of structures associated with the operation of the lock and dam, including the control station, various storage buildings, power cabinets, control stands, tow haulage units, lifeboat crane and davit, and garages.[24]

---

[19] USACE, *Annual Report*, 1932, p. 1178.
[20] USACE, *Annual Report*, 1933, p. 728.
[21] USACE, *Annual Report*, 1934, pp. 857-858. The lockkeepers' houses cost $17,568.14; the splashboard installation cost $2,847.47; lighting for the lock and dam cost $3,706.62; and the fire protection, water distribution, and sewer system installation cost $9,395.97. Figures from 1934 *Annual Report*, p. 858.
[22] USACE, *Annual Report*, 1937, p. 977.
[23] Descriptions based on Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 201-258 and fieldwork done by the HAER recording team in 2007 and 2008.
[24] The lock, auxiliary lock, dam and control stand were determined to be contributing resources, while the comfort station, workshop, storage building, other minor buildings, operating machinery, and mooring piers were declared noncontributing, see Barbara J. Henning, "Dresden Island Lock and Dam Historic District," National Register of Historic Places Nomination Form, 2001, Section Number 7, Page 1.

The dam measures 1,505 ½' long and consists of (from north to south) a 500' fixed earthen embankment followed by a 300' concrete pier dam with fourteen single-leaf, vertical lift headgates that each measure 16' x 15'. Next is a 48' wide concrete ice chute with a boiler house on top that is identical to the one built at Starved Rock. The 540 square foot, concrete boiler house contains a boiler used to thaw the dam gates and keep them operable even in freezing conditions. A 620' concrete pier dam made up of nine Tainter gates measuring 50' wide x 16' tall and a 37.5' concrete spillway completes the dam.[25]

Between the dam and main lock is the unfinished auxiliary lock, consisting of the downstream walls and a concrete arch dam.[26] The Dresden Island Lock is the only one on the waterway that has an incomplete auxiliary lock adjacent to it, although the original plans for the waterway specified all sites would have them. A lack of funding certainly contributed to the abandonment of the idea.[27]

The Ohio River Standard Navigation main lock has a 110' x 600' chamber with reinforced concrete walls and a 21.75' lift. The lock has steel miter gates at both its upstream and downstream ends that are operated by electric motor assemblies. The chamber is watered by ten rectangular ports measuring 5' x 3'-6" that are located along the bottom of each lock wall. The ports extend from a 12' diameter culvert that runs through the interior of the chamber walls. The difference in size between the ports and the culvert diameter was planned in accordance with the Venturi principle, which states that the pressure of water is increased by movement through a constricted opening. Four valves operated by hydraulic machinery regulate the flow of water through the culverts.[28]

Centered on the landward side of the lock chamber is the 962 square foot control station that served as the "administrative and operation hub" of Dresden Island Lock and Dam. The control station is a one story, cross gabled brick building with concrete detailing and four belt courses. Metal industrial sash windows provide the crew with views of the lock chamber and waterway. The gable roof was originally tiled, but the tile has since been replaced by shingles. The control station is identical to those at Lockport, Brandon Road, Marseilles, and Starved Rock.[29]

---

[25] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 207-209.
[26] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 203-204; Henning, "Dresden Island Lock and Dam Historic District," Section 7, Page 2.
[27] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, p. 201.
[28] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 201-202.
[29] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 205-206; Henning, "Dresden Island Lock and Dam Historic District," Section 7, Page 2. A temporary steel control house was erected by the Joseph Pondelik Jr. Construction Company of Cicero, Illinois until the "newly filled area adjoining the lock walls may warrant the construction thereon of permanent buildings." See Dan I. Sultan, Lt. Col., Corps of Engineers, District Engineer to The Division Engineer, UMVD, in Folder 821.1 (Dresden Island Lock) Temp. Control House W-1088-Eng-430, 1932-34, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

To the west of the control station is a scooter building, erected in 1988. The one room, one story wood building houses the electric scooters used by workers for transportation around the site.[30] A comfort station opened in 1972. Located to the southeast of the control station, the 975 square foot, one story, concrete block building contains separate restrooms for men and women.[31] Behind the control station is an emergency generator and fuel containment shelter dating to 1973.[32]

Various structures used by the lock and dam staff were once located to the south of the control station and south of the access road to the site. The extant buildings include two one-car garages built by Louis J. Craney of Cicero, Illinois from 1934-35. The brick and block garages each measure 280 square feet, stand one story tall, and could house one car. Both garages feature a wooden vertical lift garage door on the front facades.[33] The other extant structure is the fire building, a 96 square foot, one room, one story brick and block building with a shingle hip roof that is located between the garages.[34] Originally, there were also two brick lockkeeper's houses dating to 1933-34 located in this area, but they were dismantled at some point. Peter E. Mozoleski of Chicago was awarded the building contract for the lockkeeper houses. Finally, building records indicate "two modest cottages" for the lock's Chief Electricians were also located in this area.[35]

At the eastern end of the lock chamber are a number of utilitarian buildings relating to the maintenance of the lock and dam. In the 1940s, an oil/paint shed was built. The 240 square foot, one room, one story building has a low pitched gable roof and is similar to those at Lockport and Starved Rock.[36] In 1973, a one room, one story metal building encompassing 1,800 square feet opened for use as a workshop.[37] Another one story, wood storage building was built in this area in 1992 to house an aboveground fuel tank.[38] A steel storage rack was added around 1990. The one story metal structure with a gable roof is located north of the 1992 storage building and was moved from another location on site.[39]

Alterations have been made to the lock itself and its operating equipment. In 1960, five weatherproof metal cabinets were placed on top of the lock walls at each corner of the chamber and at the halfway point of the lock's river wall. The cabinets contain

---

[30] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," pp. 217-218.
[31] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," pp. 241-242.
[32] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 249-250.
[33] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 253-256; Folder 821.1 (Dresden Island) Pump House & Garage, W-1088-Eng-686 1934-35, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago. Craney also built the pump house.
[34] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 211-212.
[35] Folder 624, Lockkeepers Buildings-General (1933-1941); Folder 624 (Dresden Island) Lockkeepers Houses W-1088-Eng-585, 1933-34, both in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[36] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 213-214.
[37] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 243-244.
[38] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 247-248.
[39] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 251-252.

the controls, fuses, circuit breakers, and other equipment that provide the electrical power for the lock. Similar cabinets were installed at Lockport, Brandon Road, Marseilles, Starved Rock, Peoria and La Grange.[40] In 1969, the original machinery operating the valves located within the lock's chamber walls was replaced by hydraulic machinery. Originally, the valve operating machinery had been housed in wells sunk within the lock walls, but the new hydraulic machinery was housed in metal cases located on top of the lock walls. Identical machinery was installed at Lockport, Brandon Road, Marseilles, and Starved Rock.[41] Replacement tow haulage units were installed in the 1970s. These motorized winch assemblies make it possible for "part of a fleet of barges to be locked through while not attached to their tow boat, thus making it possible to lock large modern units through without repeatedly detaching tow from the barges immediately in front of it." The same tow haulage units were installed at Lockport, Brandon Road, Marseilles, Starved Rock, Peoria and La Grange.[42] In 1985, the lock gate operating machinery, originally housed in pits in the lock walls, was replaced with four identical motor assemblies located at each corner of the lock chamber near the gates. The replacement machinery for the gates is the same as that installed at Lockport, Brandon Road, Marseilles, and Starved Rock.[43]

Four control stands (also known as "dog houses") were built in the 1970s at each corner of the lock chamber to house the switches operating the valves and gates. The 52 square foot, one room, one story, metal buildings have large windows on all four walls to provide operators with unobstructed views of the lock chamber.[44]

Two single-armed derricks were installed in the 1970s for use in loading and unloading material and launching life boats. Similar derricks were in use at Starved Rock, Marseilles Dam, and Peoria, as well as locks and dams on the Upper Mississippi River 9' Channel Project. A single-armed metal derrick was also put into operation in 1992 for the same use as those dating to the 1970s.[45]

In 1980, seven cylindrical reinforced concrete piers with mooring bits embedded in them were installed extending from the river's bottom to above the surface of the pool. All but three are 20'-4 ½" in diameter, with the remaining ones slightly larger at 31' in diameter. The piers help keep boats from running into the river wall of the lock and give crews a place to tie their boats while waiting to be locked through. Similar ones were built at other sites along the Illinois Waterway, as well as the Upper Mississippi lock and dam sites.[46]

---

[40] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 215-216.
[41] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 231-232.
[42] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 227-228.
[43] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 229-230.
[44] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 219-226.
[45] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 233-236.
[46] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 2, pp. 257-258.

B. Construction:

When the Army Corps assumed authority over the waterway, a great deal of work remained to be done at the Dresden Island site. The Congress Construction Company of Chicago won the contract to do all the masonry work for the gates, lock valves, and operating bridges with the lowest bid of $848,540, more than $300,000 below the estimate of the Army Corps and $600,000 below the high bid of $1,435,685 submitted by Drabo Contracting Company.[47] Powers-Thompson Construction Company won the contract to alter the lower miter sills (a modification by the Army Corps to the original plans developed by the State of Illinois), build the emergency dam masonry, and install gauges at Dresden Island, as well as Starved Rock, Marseilles, and Lockport that same year.[48] The Independent Bridge Company of Pittsburgh, Pennsylvania, was responsible for the metalwork, including the

> fabricating and erecting of three (3) lock miter gates of two (2) leaves each complete with anchorages and all fittings necessary for their complete installation, four (4) lock valves, eighteen (18) pairs of head gates, nine (9) Taintor gates, one (1) ice chute gate, nine (9) Taintor gate operating bridges, one (1) bridge over ice chute, and one (1) bridge over fixed dam, and the electrical wiring system at Dresden Island Lock and Dam, and one (1) lower lock miter gate of two (2) leaves complete with anchorages and all fittings necessary for its complete installation, six (6) pairs of head gates, twenty one (21) Taintor gates, twenty one (21) Taintor gate operating bridges, one (1) ice chute bridge, six (6) flood sluice gates.[49]

The company also fabricated, installed, and tested the four lock gate and four culvert valve operating machines.[50]

The Army Corps made some changes to the state's original design.[51] The lock specifications called for Monel metal pins, pin bushings, pintles and pintle bushings of the lock gates and Tainter gates, but the Army Corps changed it to a nickel steel/ phosphor bronze combination because testing had found that the Monel metal caused surfaces to seize. Originally, the state engineers had considered this combination but after seeing the problems the Sanitary District had with the bronze crystallizing and

---

[47] "$848,540 Is Low Bid on Illinois Waterway Lock," *Chicago Daily Tribune*, January 31, 1931, p. 10.

[48] Folder 821.1 (Marseilles-Starved Rock-Lockport-Dresden Island) Alterations W-1088-Eng-303, 1931-32, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

[49] Folder 821.1 (Brandon Road L&D) W-1088-Eng-238, Metal Works 1930-33; Folder 821.1 (Dresden Island L&D) W-1088-Eng-238, Shipping Notices 1931-32; and Folder 821.1 (Dresden Island Lock and Dam) W-1088-Eng-249, Lock Gates Etc., 1931-32, all in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

[50] Folder 821.1 (Brandon Road L&D) W-1088-Eng-249, Lock Gates 1931-33, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

[51] C.R. Andrew, Memorandum for the Files, Subject: Illinois Waterway—Some Items of Historical Interest which are Buried in the Files, June 15, 1949, p. 4 in Folder 285/68b (Ill Wwy) State of Illinois 1932-49, File #5, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

then failing (probably due to a chemical reaction with the water), they changed the specifications to Monel metal. What the state did not know (but was revealed with further investigation) was the Sanitary District had actually used a copper/zinc combination.[52] The Army Corps also decided that the state's design of the emergency dam was "inadequate" and designed a new one that required the alteration of the lower sills.[53]

Construction of the Dresden Island Dam had begun at the time of the transfer of authority from the state to the Army Corps. In the winter of 1932, the Army Corps removed the state's cofferdam and built a new one in anticipation of the construction of the last 600' of the dam.[54] With the completion of the cofferdam, excavation 16' into the rock for the dam's foundation could begin.[55]

In 1932-33, the Army Corps undertook a "Winter Program" in which alterations and repairs were made to the waterway's locks prior to the opening of the waterway. At Dresden Island, this included buying a steel arch emergency dam with all steel support bents, castings, plates, bolts and reinforcing bars, cutting stop log recesses into the lock walls, and buying rubber seals for the miter gates.[56] The electrical work was completed at the lock and dam during that time period as well. The Pierce Electric Company of Chicago, Illinois provided the electrical equipment while A.A. Electric Company of Cicero, Illinois installed the lights and electric power outlets at the dam.[57] A.B. Farquhar Company Limited of York, Pennsylvania had a contract with the Army Corps to provide two steam boilers and accessory pipe and fittings. A telegram was sent December 1932 to the Division Engineer of the Upper Mississippi Valley Division asking that the boilers be approved quickly because they were "urgently needed to prevent freezing of dams due to low temperatures."[58] Boiler houses were constructed on the downstream ends of the ice chute piers at Starved Rock and Dresden Island by E.J. Biggs Construction Company of Chicago. The contract called for: "constructing…steam and compressed air plants, comprising construction of two concrete boiler houses, and the furnishing (with the exception of the steam plants) and installing in each of the steam plant, a compressed air plant, a

[52] Andrew, Memorandum, Illinois Waterway, pp. 4-5.
[53] Andrew, Memorandum, Illinois Waterway, p. 5.
[54] Evans, "Predict Illinois Waterway Will Be Open By Fall," p. 3.
[55] Evans, "Civic Leaders Urge Speed," p. 13.
[56] Dan I. Sultan, Lt. Col., Corps of Engineers, District Engineer to Area Engineer, U.S. Engineer Area Office, Joliet, IL, Subject: Winter Program for Lock Maintenance and Repairs, July 20, 1933, in Folder 821.13 (Lock Gates & Machinery) Unwatering 1932-33, in Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[57] Folder 821.1 (Dresden Island) Electric Equipment W-1088-Eng-441, 1932-33 and Folder 821.15 (Dresden Island Starved Rock) Lighting, W-1088-Eng-586, 1933-34, both in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[58] Folder 821.1 (Dresden Island, Starved Rock) Boiler W-1088-Eng-463, 1932-33 in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

reciprocating water pump, piping, electrical equipment, a stove and appurtenant work."[59]

Tow haulage units manufactured by the American Heist & Derrick Company were installed in the late 1930s after the waterway had opened. After noticing at Starved Rock how a lack of power tow haulage units made "hand towing" necessary during double lockages, Capt. R.L. Dean recommended to the District Engineer of the Army Corps that tow haulage units be installed. Dean noted, "in view of the tremendous increase in Illinois River traffic in recent years, with a corresponding increase in number of lockages which must also include an increase in double lockages, inquiry is made as to whether installation of power tow-haulage units at such locks as are now without them is not now economically justified."[60] These were replaced in the 1970s with modern units.

Various auxiliary structures have been added and alterations made to the operating machinery throughout the site's operational history.

C. **Operation:**

The waterway had been designed for use by "towboats pushing eight jumbo hopper barges." The jumbo barges each measured 35' x 195'. The configuration of the eight barge tow with a towboat consisted of two rows of three barges tied together followed by a row of two barges tied together. The towboat pushed the three rows into position in the lock chamber, then moved alongside the first row (made up of two barges) during the lockage. The resulting configuration measured 105' x 600', which allowed all the barges to be locked through in one pass since the lock chamber conformed to the Ohio River Standard size of 110' x 600'. By the 1950s, the fourteen barge tow had become the standard. While the Thomas J. O'Brien lock with its 110' x 1000' chamber could handle this larger tow configuration, the earlier locks could not. The fourteen barge tow measured 105' x 985', requiring that the tow be broken into two, known as "cuts," on the other locks. The first cut was made up of two rows of three barges tied together. The second cut followed the standard configuration used in the eight barge tow. Rathburn describes the locking through process with the fourteen barge tow configuration.

> After breaking the two into these two cuts, the towboat pushed the first cut of barges through the lock, locked through with it, pushed the cut out of the lock, locked back through to get the second cut of barges, pushed it into the lock, moved over into the 'third barge slot' in the last row of the eight-barge configuration, locked through with the second cut, and then

[59] Folder 821.1 (Dresden Island, Starved Rock) Boiler House-W-1088-Eng-573, 1933-34, in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.
[60] R.L. Dean, Capt., Corps of Engineers, Assistant to Division Engineer to The District Engineer, Subject: Power tow-haulage units, September 11, 1937, in Folder 821.13 (Locks-Machinery), in U.S. Army Corps of Engineers, Chicago District, RG 77, NARA, Chicago.

reassembled the two cuts into one united configuration and moved back into its pushing position.[61]

This process was time consuming and caused congestion along the waterway, so the Army Corps installed replacement tow haulage units in the 1970s at all the locks except Thomas J. O'Brien. These units allowed the first cut to be pulled through the lock without the towboat, which remained in its position in the second cut. This minimized some of the time spent locking through. The installation of the new tow haulage units facilitated the use of the seventeen barge tow configuration, measuring 105' x 1118'. In this configuration, the first cut is made up of three rows of three barges. The second cut has two rows of three barges while the last row has two barges and an open slot for the towboat.[62]

From the 1930s to the 1970s, the amount and size of the vessels using the Illinois Waterway increased. In 1934, commercial traffic on the waterway amounted to 104,750, which had increased by 1953 to 20 million.[63] Traffic on the waterway leveled in the 1970s but congestion on both the Illinois Waterway and the Upper Mississippi River continues. According to a recently released study of the two systems dating to 2005, 51.6 million tons of commercial cargo worth $9.5 billion was transported on the Illinois Waterway. Together the two systems move 60 percent of

---

[61] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 99.
[62] Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, pp. 100-102.
[63] Department of Public Works & Buildings, "132 Years of Public Service: The History and Duties of the Division of Waterways," (State of Illinois, 1955), p. 15.
Illinois Waterway traffic statistics are provided in the U.S. Army Corps of Engineers' annual reports. The information is presented in various ways throughout the 1930s. In 1931, upbound traffic on the Illinois River (from La Salle to Grafton, IL) consisted of 128 steamers, 609 motor vessels, 21 sailing vessels, and 457 barges for a total of 1,215 vessels. The downbound traffic included 140 steamers, 515 motor vessels, 21 sailing vessels, and 400 barges for a total of 1,076 vessels. (USACE, *Annual Report*, Part II, 1932, p. 696.) By 1933 traffic had increased to a total of 2,140 upbound vessels at 341,760 tons, consisting of 50 steamers, 1,251 motor vessels, 772 barges, and 67 other types. Downbound traffic numbered 2,290 vessels at 344,249 tons, including 50 steamers, 1,282 motor vessels, 756 barges and 202 other types. In 1934 the total number of vessels had declined but tonnages increased, with upbound tonnage at 642,715 and downbound at 682,214. (USACE, *Annual Report*, Part II, 1934, p. 670 and Part II, 1935, p. 710.) In 1935, the statistics for the Illinois Waterway also included the Chicago Sanitary & Ship Canal and the Calumet-Sag Canal. The total tonnage was 1,361,280. On the South Branch of the Chicago River, 215,107 tons were carried. Total tonnage, including rafted traffic, was 1,584,428 tons worth $48,710,394. (USACE, *Annual Report*, Part II, 1936, p. 747.) In 1936, 1,537,759 tons were transported on the Illinois Waterway and 507,805 tons were moved on the South Branch of the Chicago River. The total tonnage was 2,048,057, including rafted traffic for a total value of $54,725,585. (Army Corps, *Annual Report*, Part II, 1937, p. 781.) In 1937, 2,874,864 tons were transported on the Illinois Waterway and 698,329 tons on the South Branch of the Chicago River. The total tonnage, plus rafted traffic, equaled 3,575,299 tons worth $65,604,398. (USACE, *Annual Report*, Part II, 1938, p. 803.) By 1938, the total tonnage on the Illinois Waterway (which included the Chicago Sanitary & Ship Canal, Calumet-Sag Canal, and South Branch of the Chicago River) was 4,446,493, including rafted traffic, at a total worth of $109,008,794. (USACE, *Annual Report*, Part II, 1939, p. 863.) From 1975-86, the amount of goods shipped on the waterway decreased from 48.5 million to 42.3 million. (Rathburn, "Architectural and Engineering Resources of the Illinois Waterway," Volume 1, p. 103.)

corn exports and 45 percent of soybean exports, in addition to coal, chemicals and petroleum.[64]

Dresden Island Lock and Dam remains a vital component of the Illinois Waterway and its lock and the dam's Tainter gates serve as examples of early twentieth century lock and dam technology.

[64] See Final Draft "Re-Evaluation of the Recommended Plan: UMR-IWW System Navigation Study, Interim Report," Issued March 2008, available at http://www2.mvr.usace.army.mil/UMRS/NESP/ (accessed March 2009).

Part III. Sources of Information

A. Primary Sources

"70 Chicagoans Inspect Locks in Illinois River." *Chicago Daily Tribune*, October 5, 1928, p. 3.

"$848,540 is Low Bid on Illinois Waterway Lock." *Chicago Daily Tribune*, January 31, 1931, p. 10.

"Emmerson and Good to Inspect Waterway Work." *Chicago Daily Tribune*, August 3, 1929, p. 12.

Evans, Arthur. "Civic Leaders Urge Speed on Waterway Job." *Chicago Daily Tribune*, November 6, 1931, p. 13.

_____. "Predict Illinois Waterway Will Be Open by Fall." *Chicago Daily Tribune*, February 24, 1932, p. 3.

"Illinois Canal to Get Million of Relief Fund." *Chicago Daily Tribune*, December 22, 1930, p. 1.

Staff Correspondent. "Illinois Gets Power Permits for 4 Projects." *Chicago Daily Tribune*, May 26, 1921, p. 8.

U.S. Army Corps of Engineers, Chicago District. Record Group 77, various files. Available at National Archives and Records Administration, Great Lakes Region-Chicago.

_____. *Annual Report of the Chief of Engineers, U.S. Army*. Washington, DC: U.S. Government Printing Office, 1931-1937.

_____. "The Illinois Waterway." Washington, DC: U.S. Government Printing Office, 1930.

B. Secondary Sources

Creager, William P., Joel D. Justin and Julian Hinds. "Earth, Rock-Fill, Steel and Timber Dams." Volume III, *Engineering for Dams*. New York: John Wiley & Sons, Inc., 1961.

Henning, Barbara J. "Dresden Island Lock and Dam Historic District." National Register of Historic Places Nomination Form, 2001.

O'Brien, William Patrick, Mary Yeater Rathburn, and Patrick O'Bannon. Edited by Christine Whitacre. *Gateways to Commerce*. Denver: National Park Service, Rocky Mountain Region, 1992.

Rathburn, Mary Yeater, American Resources Group, Ltd. "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange." Volume 1, prepared for the U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois, October 1996.

_____. "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange." Volume 2, prepared for the U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois, October 1996.

Tweet, Roald. *A History of the Rock Island District Corps of Engineers*. Rock Island, IL: U.S. Army Engineers District, Rock Island, June 1975.

C. Likely Sources Not Yet Investigated

Research was conducted in the Army Corps of Engineers records (Record Group 77) at the National Archives and Records Administration, Great Lakes Region, Chicago, but time constraints prevented thorough research into all available records. Additional information may be available in the records.

The State of Illinois' archives in Springfield, Illinois, contain the Annual Reports of the Division of Waterways, which could provide additional information on the state's construction activities. This archive was consulted by the American Resources Group with Mary Yeater Rathburn as Principal Investigator for the "Architectural and Engineering Resources of the Illinois Waterway between 130th Street in Chicago and La Grange" publication.