

Upper Mississippi River Nine-Foot Channel Project,
Lock and Dam Complex Number 14
Spanning the Upper Mississippi River between
Le Claire vicinity, Scott County, Iowa
and
Rock Island County, Illinois

HAER No. IA-25

HAER
IOWA,
82-LECLA.V,
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U. S. Department of the Interior
P. O. Box 25287
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD

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Upper Mississippi River Nine-Foot Channel Project,
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Location:

Located on the Upper Mississippi River, four miles downstream from LeClaire, Iowa, and 493.3 river miles upstream from the confluence of the Ohio and Mississippi rivers. The complex stretches across the river at a narrow point. Smith's Islands and a side chute lie beside the Iowa bluffs. The site is 3.6 miles below the head of the notorious, rock-bedded Rock Island Rapids. The 1921-24 LeClaire Lock and the remains of the first portion of the 1921-14 LeClaire Lateral Canal, built to bypass the treacherous LeClairs section of the Rock Island Rapids, are on the Iowa side of Smith's Island along the Iowa shore. The Rock Island District LeClaire Base Compound sites on a very small area of flat bottom land at the base of the bluffs on the Iowa shore. The 1935-39 esplanade and lock lie on the riverward side of Smith's Island at the southeast end of the island. The movable section of the dam ties to the riverwall of the main lock. There is no incomplete auxiliary lock adjacent to the main lock. The earthen embankment section of the dam extends from the movable section to the Illinois shore. Corps drawings numbers M-L 14 10/1; 10/2, 10/6; HAER photograph numbers IA-25-1 through IA-25-54.

Dates of Construction: 1921-1924; 1935-1940

Present Owner: U. S. Government
Rock Island District
Corps of Engineers

Present Use: River navigation/hydrology control

Significance: The U. S. Army Corps of Engineers Nine-Foot Channel Project (1927-1940) represents the culmination of a 100-year effort to improve the navigability of the Upper Mississippi River between the mouth of the Missouri River and Minneapolis, Minnesota. This specific project arose as a response to the farm crisis of the 1920s. Proponents of the New Deal adopted the project and gave speed to its construction as a means of providing public employment during the more general depression of the 1930s. By the 1940s, the completed project had converted over 650 miles of free-flowing

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 2)

river into a series of interconnected reservoirs which ensured enough water for fully loaded modern boats and barges to navigate the system. This constituted a significant alteration of the natural environment of the Upper Mississippi River. However, the project also brought economic benefits to the communities along and around the river corridor and lead to new recreational opportunities for the entire region.

The Upper Mississippi River Nine-Foot Channel Project inaugurated a new development in slack-water navigation system dam practice in the United States: the adoption of a non-navigable dam containing both roller and Tainter gates. Prior to the Corps' 1930 decision to build non-navigable dams on the Upper Mississippi River, United States Army engineering practice had, nearly universally, been to construct navigable dams, permitting open-river navigation at higher river stages. By 1930, European engineers had been using roller gates in dams extensively for over 25 years. However, only ten such structures had been built in the United States, and these were all located on reaches of rivers where ensuring navigability of any sort was not a design concern. It was not until 1925-1926 that civilian engineers pioneered the use, in the United States, of roller gates in combination with other types of gates. Most of the Corps' Upper Mississippi River project dam designs expanded upon this development, incorporating both roller and Tainter gates. The Corps' shift from navigable to non-navigable dams demonstrate the influence of shipping techniques on navigable waterway improvement technology. It also exemplifies the cautious nature of American Army engineers response to changes in shipping. The Corps' choice of this particular type of non-navigable movable dam illustrates the influence of the hydraulic characteristics of individual rivers on the selection of waterway improvement technologies. It also evidences the manner in which critical engineering design developments are disseminated and become accepted.

Ironically, the Upper Mississippi River Nine-Foot Channel Project also resulted in the obsolescence, by the project's end, of combination roller and Tainter gate dams. Technological advances resulting from the

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 3)

research and development incidental to the design and construction of the 26 lock and dam systems in this project enabled U. S. Army Corps of Engineers to develop both submersible and non-submersible Tainter gates which nearly matched the capabilities of the roller gates. Once these less expensive and easier operated and maintained gates had been developed, American engineers ceased designing or constructing combination roller and Tainter gate dams. The Corps' creation of a new dam type and its subsequent obsolescence during the course of a single project dramatically illustrates both the evolutionary nature of American engineering in general and the Nine-Foot Channel Project in particular (Text, pages 11 and 49-50. See HAER No. IA-23 for complete history, footnotes and bibliography).

Historian:

Mary Yeater Rathbun

August 1988

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Dates of Erection: 1921-1924; 1935-1940
2. Architect/Engineer: 1921-1924--U. S. Corps of Engineers, Cincinnati Division and Rock Island District; 1935-1940--U. S. Army Corps of Engineers, Rock Island District.
3. Original and Subsequent Owners: U. S. Government--Rock Island District, Army Corps of Engineers
4. Builders, Contractors, Suppliers (for 1935-1940 work only; those for 1921-1924 work are unknown):

General Contractor--Lock Construction: Central Engineering Company, Davenport, Iowa

Subcontractors:

Sammons-Robertson-Henry Co.	Rock excavation, common excavation, channeling, test and grout hole drilling, initial cleanup of foundation rock, and disposal of excavated material
Huntington, West Virginia	
Hunter Steel Company.....	Fabrication, erection, and placement of structural: miter gates, tainter valves, casings, operating machinery, wall armour, floor gratings, miscellaneous structural steel forgings, bronze, brass pipe, handrailing, rubber seals
(formerly Independent Bridge Co. Pittsburgh, Pennsylvania	
Inland Steel Company.....	Supplied reinforcing steel sheet piling
Chicago, Illinois	

General Contractor--Dam and Central Control Station Construction: Central Engineering Company, Davenport, Iowa.

Subcontractors:

Sammons-Roberts-Henry Company.....	Rock excavation
Huntington, West Virginia	
Bethlehem Steel Company.....	Fabrication, erection and placement of structural steel: tainter and roller gates, service bridge
Detroit, Michigan	

Upper Mississippi River Nine-Foot Channel
 Project, Lock and Dam Number 14
 HAER No. IA-25
 (Page 5)

H. Knudson Company.....Cleaning and painting all exposed
 Chicago, Illinois steel and machinery
 Luneclyff Construction Company.....Build central control station
 Commonwealth Edison.....Electrical installation

General Contractor--Power, Control, and Lighting System Construction:
 Sterling Electric Company, Minneapolis, Minnesota

Subcontractor: Superior Iron Works....Provided haulage units

General Contractor--Road Construction: L. A. Littig, d.b.a. Littig
 Construction, Davenport, Iowa

Subcontractors:

Perry Smith.....Graded, built forms, mixed and
 Davenport, Iowa placed concrete for curbs and
 gutters along the first 400 feet
 of the new roadway leading toward
 the lock site

General Contractor--Esplanade Construction and Alterations to 1921-22
 Lock: Edgar D. Otto, Downers Grove, Illinois

5. Original Plans and Construction:

1921-1924: Lock plan--U. S. Army Corps of Engineers, Rock Island
 District; miter gate plans--U. S. Army Corps of
 Engineers, Cincinnati Division; direct supervision of
 construction--U. S. Army Corps of Engineers, Rock
 Island District

1935-1940: U. S. Army Corps of Engineers, Rock Island District,
 plans submitted by senior engineer E. E. Abbott

6. Alterations and Additions:

<u>Item</u>	<u>Year</u>
Removed top of lower land wall gate block at 1921-1924 LeClaire Lock to depth of 2 feet; replaced with concrete	1930
Miter gates repaired at 1921-1924 LeClaire lock	1938

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 6)

Alterations to guide wall at 1921-1924 LeClaire Lock	1939
Construction-500-foot cell foundation concrete extension to upstream river wall of lock	ca. 1941
Land wall and lock gate handrails lowered by one rail and new handrails made from salvaged materials installed on both edges of each lock wall and on upstream side of walkways on top of lock gates	ca. 1945
Construction-handrail on upstream side of dam service bridge	ca. 1945
Construction-1,500-foot earthen mooring levee extension to upstream land wall of main lock	1951
Construction-Motor Shop Building No. 2 at LeClaire Base compound	1952
Construction-Warehouses No. 3 and 4 and Mississippi River Recreation Shop (Building 5) at LeClaire Base compound	1953
Construction-frame air-lock vestibule at upstream end door of central control station	ca. 1970
Addition-boat launches on lock walls	ca. 1970
Replacement - haulage units	ca. 1971 and 1973
Construction-metal and glass shelters around land wall control cabinets and at ends of the guidewalls of lock	ca. 1972
Removal-Lockmaster/Assistant Lockmaster residences from LeClaire Base compound	ca. 1975
Removal-standby generator for machinery room of central control station; installation of new generator, in addition put on back (riverward) side of central control station	ca. 1975

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 7)

Major rehabilitation of 1921-1924 LeClaire Lock including alteration so it could serve as a winter dry dock and construction of new operator's house on land wall of this lock	1979
Replacement--wooden plank hatches on dam service bridge with aluminum ones	ca. 1979
Installation--traveling mooring kevels extending length of guidewalls of lock	1980
Construction--new workshop building	1980-1981
Construction--concrete, metal, and fiberglass covers over machine pits on main lock	1982
Replacement--crane on dam	1983-1984
Replacement--light posts and light fixtures around lock	1984
Construction--new main lock house and consequent abandonment of Central Control Station except for access to electrical control panel for entire site	1984

B. Historical Context:

The oldest element of Upper Mississippi River Nine-Foot Channel Lock and Dam Complex Number 14 were not built as part of the Corps of Engineers' 1907-1930 Six-Foot Channel Project.

The Rock Island District developed specific plans for a LeClaire lateral canal and lift lock in 1913. When, by the summer of the Corps began re-examining and revising the designs for the canal and lock in light of recent developments in waterway improvement technology. District engineers also worked out the details for the more minor elements of the installation (things such as designing the lockmaster's and lockmen's residential complex). Construction did not begin until 1921 and was not completed until 1924.

The Corps built a longitudinal dam paralleling the Iowa shore from the head of the rapids of LeClaire to the head of Smith's Island. This dam, extending 6.5 feet above the average low water depth of the upper pool, and then Smith's Island itself formed the riverward wall of the canal. The Iowa shore formed the land wall of the canal. Most of the longitudinal

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 8)

dam, or river wall of this canal, was submerged when water pooled behind Dam 14. However, the portion of the canal between Smith's Island and the Iowa shore is part of the Nine-Foot Channel Project Lock and Dam Complex 14. It is used as a mooring and storage site for the Rock Island District's floating plant.

The depth of water needed in the LeClaire Canal was determined by the elevation of the surface of the water at LeClaire. The elevation of the water surface at Smith's Island was lower than at LeClaire. Therefore, an end, or stopper, was needed on the canal. The lift lock at Smith's Island, known as the LeClaire Lock, served this purpose as well as allowing boats using the canal to move from a higher elevation to a lower one, or vice versa. The corps opened the lock to navigation on November 29, 1922, but did not complete the structure until 1924. Commercial river traffic ceased using the LeClaire Lock in 1939 when the new lock and dam complex went on line. However, the LeClaire Lock was incorporated into the new complex, serving in the place of an auxiliary lock. Then, in 1969, the Rock Island District began operating the lock on weekends and holidays from May to October for the passage of pleasure craft. In 1979, the district conducted a major rehabilitation of the structure and its appurtenances. In this project, the miter gates and miter gate operating machinery were replaced, as were the wagon gate valves and operating machinery and the electrical service. The walls were resurfaced, a new operator's house built, and the downstream crib guidewall replaced in kind. A dewatering pump and bubbler system were also installed, so the facility could serve as a winter dry dock. The cost for this rehabilitation was over \$4.5 million.

The area first developed as an esplanade for the LeClaire Lock and Canal also continues to be a part of the Nine-Foot Channel Project complex. However, it is even more changed than the LeClaire Lock. This area is now the LeClaire Base compound. Only one warehouse building (built as an appurtenance to the 1921-1924 canal and lock and now known as the Mississippi River Recreation Office, Building 1) remains. The two 1921-24 lockmaster/assistant lockmaster residences were removed in the 1970s. Four large warehouse-type buildings were constructed on the site and the roadways were drastically altered in the 1950s. The area now served as a warehouse area and supply depot for the Rock Island District.

The special board of engineers which initially designed the Nine-Foot Channel Project in 1931 did not see the construction of the rest of the elements of Lock and Dam Complex Number 14 as a high priority and placed it in the third group of projects to be constructed.

The site for the new elements of Lock and Dam Number 14, on the far side of Smith's Island, was inaccessible from the nearest highway. L. A. Littig

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 9)

of Davenport, Iowa, rebuilt Wells Ferry Road, the existing roadway from U. S. Highway 67 to the 1921-1924 LeClaire Lock esplanade area, built a new section of road, and then built a temporary swing bridge across the upper end of that lock, in order for the contractors to be able to drive equipment out onto Smith's Island. This bridge rested on a 20 by 100 foot wooden barge. A similar (although not swinging) temporary bridge, resting on a smaller, modern barge still provides the only vehicular access to the 1935-1939 complex. This bridge is pulled out of the way when the 1921-1924 lock is used to pass pleasure craft between Pools 14 and 15.

Despite the fact that the 1921-1924 LeClaire Lock was already in place, Lock 14 was the first new element of complex 14 to be constructed. This was in keeping with the construction sequence used at all the project complexes built between 1931 and 1939. E. E. Abbott had completed the contract drawings for Lock 14 in January 1934, and it was scheduled to begin that year, along with Locks 11, 12, 18, and 12. However, Lock 14 was the last of the fourteen locks originally included in the Public Works Administration program for which an allotment of \$22 million was made to the Chief of Engineers on October 5, 1933. As of January 11, 1934, sufficient funds were not available from this allotment to build Lock 14, so the Corps indefinitely postponed its construction. However, the project was only stalled for a little over a year and a half. Charles H. Langman of Rock Island, Illinois, began construction of the temporary buildings on the site on August 2, 1935, in conjunction with and under the same contract as his similar work on complexes 13 and 17.

Most specific items of engineering at the 1930s' portions of this complex relate to its including examples of the most mature forms of elements to evolve in the Rock Island District. Dam 14 was one of the last three dams designed by the Rock Island District. E. E. Abbott signed the contract drawings for Dam 14 in August 1936. The dam was completed in December 1938.

At complex 14, the central control station was designed and built as part of the dam rather than the lock. However, because it is unique among central control stations in the district in that it is located on the river wall of the lock rather than in the esplanade, Central Control Station 14 is included in the following outline under "Other Elements" of the lock.

The dam system of Complex 13 consists of 13 2a-type Tainter gates, four submersible roller gates, and a non-overflow earth and sand-filled dikes. The 1921-1924 lock's dimensions are 80 feet by 320 feet with a low water depth of 8 feet at the upper sill and 7 feet at the lower. The design lock lift is 5.5 feet. The 1934-1936 lock's dimensions are the standard 100 feet by 600. Lock lift is 11 feet. Normal upper pool elevation is

572.0 feet; this is about 17 feet above the tail waters below the dam at low water. When both pools are at their normal elevation, the difference is reduced to 11 feet or less.

The 1920s' lock and dam elements of the complex took about three years to complete. The 1930s' lock and dam elements of the complex took over four and a half year (or about a year longer than average) to completed, at a cost of \$5,472,000. The complex was placed in operation as a unit of the Upper Mississippi River Nine-Foot navigation system on May 13, 1938, the same day as Lock and Dam Number 13 went on line.

PART II. TECHNOLOGICAL INFORMATION - LOCK

A. General Statement:

1. Design Character: 1921-1924 LeClaire Lock--Variant of Standardized Ohio-Mississippi Lock Design. Main Lock--Standardized Ohio-Mississippi Lock Design. Drawing Number M-L 14 20/1.
2. Condition of Fabric: 1921-1924 LeClaire Lock: Most historic fabric replaced; replacement fabric in excellent condition. Condition of Fabric Main Lock: Good.

B. Description of General Layout and Principal Elements:

1. Overall dimensions: 1921-1925 LeClaire Lock: Chamber--80 feet wide by 320 feet long with a low water depth of 8 feet at the upper sill and 7 feet at the lower. Design lift--5.5 feet. Currently providing 11 foot lift; Main Lock: Chamber 110 feet wide by 600 feet long by 40 feet high. Lift--11 feet. Drawing Number M-L 14 20/1, 10/2, 10/6.
2. Foundations: Bedrock
3. Walls: Reinforced monolithic concrete with steel rub bars embedded in their chamberward faces upstream and downstream from the lock gates. Land wall of 1921-1924 LeClaire Lock adjoins Iowa shore; river wall adjoins closing dam extending south to Smith's Island. Land wall of main lock adjoins southeast end of Smith's Island; river wall ties to dam on south. Drawing numbers M-L 14 20/4, 20/6A, 20/6AJ, 20/9, 20/19, 20/20A, 40/1.
4. Structural System: See above.
5. Bullnoses: Concrete configurations at each end of main lock river wall. Drawing number M-L 14 20/19.

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 11)

6. Guidewalls: 1021-1924 LeClaire Lock: Lower-400-foot timber crib extending the land wall out from the lock to assist guiding of barge traffic into the lock. Replaced in kind in 1979. Main Lock: Upper and Lower-extended monolithic concrete walls extending the land wall out from the lock chamber at either end to assist guiding of barge traffic into lock. Drawing number M-L 14 20/11.
7. Riverwall Extension: Main Lock--500-foot-long cell foundation extension to upstream of riverwall. Added in ca. 1941, to assist in counteracting outdraft which made navigation into and out of the upstream end of the lock difficult.
8. Mooring Levee: Main Lock--1,500-foot concrete extension to upstream guidewall. Added in 1951 to assist in counteracting outdraft which made navigation into and out of the upstream end of lock difficult.
9. Stage Recorder: Main Lock--Small concrete housing located at the end of the downstream guidewall. Equipment housed for the recording of river stages.

C. Mechanical Equipment:

1. Lock Valves: 1021-1924 LeClaire Lock--Wagon Gate Valves--lock valves of steel construction with electric motorized assembly. Valves are located in wells in lock walls. Replaced in 1979, they are now operated by switches in new lock operator's house. Main Lock--Tainter Valves--four cable driven lock valves of steel construction with electric motorized assembly. Valves are located in wells in lock walls. Operated by switches in weatherproof control cabinets on lock walls, with a cabinet beside each gate recess. Control cabinets on landwall surrounded by metal and glass shelters since mid-1970s. Drawing numbers M-L 14 25/1A; 28/1A, 20/12A.
2. Lock Gates: 1921-1924 LeClaire Lock--Two pairs of miter gates, Each leaf is operated by a remotely controlled electric motor in a machine pit in the lock wall; the gears are connected to the gate by a strut. Replaced in 1979. Main Lock--Two pairs of miter gates, both are balanced on stainless steel pintels and operated by arms, gears, and electric motor assemblies. Motor assemblies housed in machinery pits in lockwalls adjacent to each leaf. Machinery pits for main lock machinery covered by raised concrete, metal and fiberglass enclosures in 1983. Machinery is operated by switches in control cabinets. Bumper lines of chamber face of gates also of stainless steel. All other associated metal parts are of steel, stainless steel, or steel/nickel alloy. Drawing numbers M-L 14 21/1, 21/17, 22/1.

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 12)

3. Lighting: Various freestanding single and double head lighting standards, installed in 1984.
4. Plumbing: 1921-1924 LeClaire Lock--Lock is watered by wagon gate valves (see previous page) serving a tunnel in the land wall that enables the water level to be controlled on the interior of the lock. Main Lock--Lock is watered by the Tainter valves (see previous page) serving a system of cast-in-place tunnels that enable the water level to be controlled on the interior of the lock.
5. Haulage Unit: Motorized winch assembly to assist towing of barges through lockage. Replacement units were installed in the mid-1970s.
6. Traveling Mooring Kevels: Two large cleats on rails which extends the length of both the upstream and downstream guidewalls of the main lock. Installed in 1980, the kevels are used to assist towing of barges through lockage.

D. Other Elements:

1. Central Control Station--Standardized 2a construction. Exterior: Drawing Number M-L 14 70/1, 70/9.
 - a. First Floor: Contains machinery room where central control panel is located, abandoned main office, abandoned boiler room, transformer room, mezzanine stairway access, and access hatch to openings suitable for hydroelectric turbine, draft tubes, trash racks, scroll chamber, and vertical shaft connecting turbine to generator. Space available for turbine-driven hydroelectric generator which was never installed. Standby generator removed in mid 1970s. Drawing Number M-L 14 70/2.
 - b. Mezzanine: Contains bathroom and cooling water tank room. Drawing Number M-L 14 70/2.
 - c. Turbine Opnsngs: Where basement or sub-basement would be in a normal building. Openings suitable for (but never used for) hydroelectric turbine, draft tubes, trash racks, scroll chamber, and vertical shaft connecting the generator rotor to the turbine runners.
2. LeClairs Lock Operator's House--1979 structure located on land wall of LeClairs Lock. Does not have particular significance or contribute to the site.
4. Boat Launches: Built ca. 1970, the launches are single-armed derricks of metal construction.

PART III. TECHNOLOGICAL INFORMATION--MOVABLE SECTION OF DAM

A. General Statement:

1. Design Character: Combination roller/tainter low dam system design. Drawing Number M-L 14 40/1.
2. Architectural Character: 2b roller gate piers. Drawing Number M-L 14 40/2
3. Condition of Fabric: Excellent.

B. Description of Exterior

1. Overall Dimensions: 1,343 feet in length. Drawing Number M-L 14 40/1.
2. Foundation: Bedrock
3. Pier House Walls: Monolithic reinforced concrete. Drawing Numbers M-L 14 41/1 and 41/2.
4. Structural System: Monolithic concrete/structural steel.
5. Fenders: Concrete fenders located at the base of each pier.
6. Openings:
 - a. In Overall Structures: 17 water-channels and 2 archways; clustered in groups by sizes, north to south--4 water-channels ca. 60 feet wide; 4 water-channels ca. 100 feet wide; 9 water-channels ca. 60 feet wide; 2 archways ca. 60 feet wide. Drawing Number M-L 14 40/1.
 - b. In Pier Houses: 1 doorway, 1 floor hatch, and 11 three-pane windows for each of five pier houses. Drawing Number M-L 14 40/2, 41/4.
 - (1) Doorways and doors: 5
 - (2) Windows: 55
 - c. In steel diaphragm section of roller gate piers: 1 doorway and door in each of the four steel diaphragm sections. Five doorways and doors. Drawing Number M-L 14 40/2.

Upper Mississippi River Nine-Foot Channel
Project, Lock and Dam Number 14
HAER No. IA-25
(Page 14)

- d. In Access Tower: 2 doorways and doors. Drawing Number M-L 14 40/4.
7. Roofs:
 - a. Shape, covering: Pier houses have flat roofs covered in membrane/tar composition. Drawing Number M-L 14 41/3.
 - b. Towers, abutments, piers: 2 abutments; lockwall abutments includes access tower; 18 piers (11 tainter gate piers, 3 2b-style roller gate piers, 2 2b-style transition piers or combination tainter and roller gate piers, and 2 service bridge extension piers); 5 2b-style piers have pier house towers. Drawing Numbers M-L 14 40/1; 40/4; 40/18; 40/3; 40/2; 40/10; 40/12; 40/14; 40/26.
 8. Service Bridge:
 - a. Shape: Arched spans in a segmental series.
 - b. Materials: Structural steel. Drawing Number M-L 14 53/1.
- C. Description of General Layout and Principal Elements:
1. Access Plan: Simple stairway in the access tower which itself is part of the abutment resting on the riverwall of the auxiliary lock. This stairway leads to service bridge deck where walkway/rail tracks extend full length of dam. Access to all five pier houses directly off deck. Access to storage yard below southernmost 200 feet of dam by simple exposed stairway at the southern end of service bridge. Drawing Numbers M-L 14 40/1; 40/4; 40/9; 53/1; 53/9; 53/10.
 2. Stairways: In access tower--reinforced concrete with pipe railing; at end of service bridge extension--open metal with pipe railing.
 3. Flooring: In pier houses and access tower--reinforced concrete; on service bridge deck--wooden plank. Drawing Numbers M-L 14 40/4; 40/7; 53/10.
 4. Wall and Ceiling Finish: Reinforced concrete. Drawing Numbers M-L 14 40/4; 40/5.
 5. Hardware: Brass.

D. Mechanical Equipment:

1. Movable Gates: Eleven, 60-foot-wide by 20 feet high, 2a-type Tainter gates operated by line shafts and motors housed in installations above each gate; 4,100-foot-wide by 20 feet high, submersible roller gates operated on tooth track by chain driven hoist machinery located in pier house adjacent to each gate. Drawing Numbers M-L 14 48/1; 47/1; 55/1; 54/2.
2. Movable Crane: 30-ton vertical lift electric crane with 70-foot boom (replaced in ca. 1980) used for moving parts and equipment. Sits on original (ca. 1938) crane trolley which also supports additional bridge crane used for lifting emergency bulkheads, etc. Trolley rides on 15-gauge track system running entire length of service bridge deck. Drawing Numbers M-L 14 53/11; 53/13; 58/5, 58/8.
3. Lighting: Fixtures as of time of installation 1939-1940 -- Rewiring may have taken place over the years. Extent is unknown. Drawing Number M-L 14 56/1.

E. Other Elements:

1. Earth Dikes: 1,127-foot-long linear non-submersible rock-filled dike with rip-rap revetment topped with a clay and gravel road from the southern end of the movable section of the dam to the south side of the Davenport, Rock Island Railroad tracks on the Illinois shore. Drawing Numbers M-L 14 40/1, 52/1, 52/2.
2. Emergency Bulkheads: Temporary blocking units of riveted structural steel girder construction placed in gate openings in periods of emergency or repair. Drawing Numbers M-L 14 58/1, 58/4, 58/5.
3. Emergency Bulkhead Car/Tracks: Flat cars designed to store and access bulkheads. Located in storage yard. In the past, one of these cars was from time to time hoisted up to the service bridge deck and towed behind the movable crane. Repair materials were hauled on the car when used in this way. Drawing Numbers M-L 14 53/12, 40/25.
3. Storage Yard: 200-foot-long area extending from south abutment under service bridge extension, i.e., under last two archways in dam. The yard contains replacement parts for gates, bulkheads on track cars and related items. Drawing Number M-L 13 40/25.

PART IV: TECHNOLOGICAL INFORMATION-ESPLANADE AREA

A. Description of Esplanade--General Layout:

1. Design Character: 1921-1924 Esplanade--Service area and access road component. This esplanade area on the Iowa shore has an overall width of 175 feet to 300 feet and an overall length of 1,200 feet. It was originally designed to accommodate the Lockmaster's and two lockmen's residences, parking, a warehouse, and other service-related functions as well as the access road. Drawing Numbers M-L 14 110/1, 110/2. Major site alterations occurring since 1950 have converted it into a warehouse and supply depot for the entire district. The major changes to this area are noted in the following items. 1935-1940 Esplanade--This esplanade area on the artificially-enlarged southeast end of Smith's Island was initially mainly park area. Major site changes since 1980 have converted it into a service area component. The major changes to this area are also noted in the following items.
2. Architectural Character: 1921-1924 Esplanade--Craftsmen influenced residences and warehouse. See 1920 drawings of buildings. 1935-1940 Esplanade--utilitarian equipment garage on closing dam between 1921-1924 Lock and Smith's Island only structure.
3. Historic Landscape Design: Unique. See drawings of Lock and Dam No. 14, Auxiliary Lock Esplanade and main esplanade.

B. Condition of Site and Structures: Altered

1. Lockmaster's/Assistant Lockmaster's Residences: The structures has been moved off site. All related structures have been demolished.
2. LeClaire Base compound: Created since 1950 on 1921-1924 Esplanade area. Does not have have particular significance or contribute to the site. Includes Mississippi River Recreation Office Building No. 1 (built for 1921-1925 lock and canal--but has undergone major remodeling), Mississippi River Recreation Shop Building 5 (built 1953), Motor Shop Building No. 2 (built 1052), and Warehouses No. 3 and 4 (built 1953).

Lock and Dam Service Buildings: Built since 1980 on 1935-1940 Esplanade area. None have particular significance or contribute to the site. A metal machine shop was added in ca. 1980. New main lock house and work house added in 1984. It is a standardized element, the same as the new garage structures at other sites.

PART V: SOURCES OF INFORMATION

- A. Original Architectural/Engineering Drawings: Mississippi River Lock and Dam 14, lock operations folio, October 1937, file No. GP60-1; Mississippi River, Lock and Dam 14, operations folio, February 1940, file No. GP60-2; and Rock Island District Office-Construction drawings--Mississippi River Locks and Dams 1941-1986, (passim), Rock Island District Library, Clock Tower Building Annex, Rock Island, Illinois.
- B. Early Views: Approximate 1,200 high quality 8x10 black and white construction photographs: Lock and Dam Number 14-Photo Book groups 1410 (4 vols.), 121.3 and "Roadways. Locks 10, 11, 13, 14," Rock Island Arsenal, Rock Island, Illinois.
- C. Interviews: Present and past personnel--Lock and Dam Number 14, near LeClaire, Iowa.
- D. Bibliography:
 1. Primary and unpublished sources: National Archives Record Group 77, Entry 81, Chicago National Archives and Records Center; National Archives Record Group 77, Entries 111 and 112, Washington National Records Center, Suitland, Maryland; Chief of Engineers Annual Reports, 1927-1987; see also bibliography in HAER No. IA-23 narrative history.
 2. Secondary and published sources: See bibliography in HAER No. IA-23 narrative history.
- E. Likely Sources Not Yet Investigated: National Archives Record Group 77, Entry 107 (132 linear feet), Washington National Records Center, Suitland, Maryland; National Archives Record Group 77, Entry 1656, exact repository unknown; and National Archives Record Group 77, Entries 608, 609, and 610 (collective total 5 linear feet), National Archives, Washington, DC.
- F. Supplemental Material: 83 film canisters of 1931-1939 silent movies of the construction process taken by the Corps of Engineers, Rock Island District Office, Rock Island Arsenal, Rock Island, Illinois.
- G. Notes: The notes for this outline are contained in the notes section of HAER No. IA-23 narrative history.