Upper Mississippi River Nine-Foot Channel Project,
Lock and Dam Complex 15
Spanning the Upper Mississippi River
from the tip of Arsenal Island between
Rock Island, Rock Island County, Illinois
and
Davenport, Scott County, Iowa

HAER No. IL-27

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

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HISTORIC AMERICAN ENGINEERING RECORD

Upper Mississippi River Nine-Foot Channel Project, Lock and Dam Number 15

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Location: Located on the Upper Mississippi River in the heart of the Quad-Cities and 482.9 river miles upstream from the confluence of the Ohio and Mississippi rivers. The complex stretches across the river at one of its narrowest points, a point which is also at the foot of the Rock Island Rapids. The complex extends from the northwest tip of Arsenal Island on the Illinois side to a small area of flat bottom land on the Iowa side. The urbanized area of Davenport extends to the boundaries of the government-owned land on the Iowa side. The industrial sprawl of the U. S. Army's Rock Island Arsenal and the Rock Island District Corps of Engineers headquarters complex abut two sides of the facility on the Illinois side. The third Illinois end of the installation is bounded by the U. S. Army-operated Fort Armstrong historic site. The government-owned combined highway and railroad bridge joining Davenport, Iowa, and Rock Island, Illinois, spans the site. Although the bridge is not an official part of the complex, being independently operated as a part of the Rock Island Arsenal, its swing span pier is encased in the immediate wall of the lock. The lock, esplanade, boat harbor behind the upstream guidewall, and main complex access adjoin Arsenal Island with the movable section tying to the river wall of the locks and extending to the Iowa shore. Corps Drawing Numbers M-L 15 10/1; 10/2; 10/4; HAER Photograph Numbers IL-27-1 through IL-27-52.

Dates of Construction: 1931-1934

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 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 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: 1931-1934

2. Architect/Engineer: U. S. Corps of Engineers, Upper Mississippi Valley Division and Rock Island District

3. Original and Subsequent Owners: U. S. Government--Rock Island District, Army Corps of Engineers

4. Builders, Contractors, Suppliers:

General Contractor--Lock Construction: Merrit-Chapman-Whitney Corporation, Duluth, Minnesota (subsidiary of Merrit-Whitney-Scott Corporation, New York, New York)

Subcontractors:

Worden-Allen Company.....Fabrication, erection, and placement of miter
Chicago, Illinois gates, some castings, wall armor, floor gratings, miscellaneous structural steel forgings, bronze, brass pipe, handrailing, and rubber seals.
Chapman Valve Manufacturing Co. ...Tainter gates
Tri-Cities Mantle and Tile Co. ....Tile gauges
Davenport, Iowa
Zeidler Concrete Products Co. .....Concrete pipe
Bettendorf Company.....Classes "A" and "B" steel castings
Dewey Portland Cement Co. .....Cement and coarse aggregate
Davenport, Iowa
Rock Island Sand and Gravel Co. ...Sand
Rock Island, Illinois
Republic Electric Company.....Conduits
Beder Wood Sons Company.....Vitrified clay pipe

General Contractor--Dam and Power House Construction: S. A. Healy Company, Detroit, Michigan

Subcontractors:

S. Morgan Smith Company.....Fabrication, erection, and place-
York, Pennsylvania ment of roller gates and operating machinery
Westinghouse Electric and.....Fabricated the operating motors,
Manufacturing Company heaters for roller gates, control panels, hoist gears

American Bridge Company.....Fabrication and erection of service bridge
Link-Belt Manufacturing Co. .....Locomotive crane
Chicago, Illinois
Century Electric Company.....Motors for locomotive crane
Marnishfeger Corporation.....Fabrication and placement of bridge crane
Davenport Machine and Foundry Co. .Furnished and installed pickup
Davenport, Iowa device for emergency bulkheads, supports for pickup devices on emergency bulkheads, manhole covers and frames
E. D. Speer Company.....Electrical work
Illinois Steel Company.....Reinforcing steel
Builders Sand and Gravel Co. .....Sand
Davenport, Iowa
Dewey Portland Cement Company.....Cement and crushed stone
Davenport, Iowa
E. A. Alexoff.....Fill and tucking
d.b.a. Service Transfer Co.
Davenport, Iowa
Chicago Tube and Iron Company.....Handrailing
Chicago, Illinois
Robinson Little Clay Products Co. .Vitrified clay pipe
Barberton, Ohio
George Wagner.....Round wood piling
Tipton, Iowa
Tri-City Tile and Mantle Co. .....Tile gauges and tile and terrazzo
Davenport, Iowa floor-powerhouse
Merrit-Chapman-Whitney Corp. .....Construction of power house
Duluth, Minnesota
Ryan Plumbing and Heating Co. .....Plumbing and heating-power house
Andrew Anderson.....Plastering power house
C. A. Holmquist and Company.....Roofing and sheet metal-power house
Builders Service Company.....Structural steel-power house
McClelland Company.....Metal doors and steel-power house
Louis Hanssons Sons.....Mill work-power house
Davenport, Iowa
Rock Island Sand and Gravel.....Sand-power house
Rock Island, Illinois
Kaleman Steel Company.....Reinforcing steel-power house

General Contractor--Sewer and Seawall, Iowa side: Stephen A. Healy, Davenport, Iowa

Subcontractors:

Commanche Sand and Gravel Co. .....Washed gravel
Lalede-Christy Clay Products Co. ..Tile liners
Illinois Steel Company.....Reinforcing steel
Builders Sand and Gravel.....Sand
Davenport, Iowa
Dewey Portland Cement Company.....Cement and crushed stone
Davenport, Iowa
E. Alexoff.....Fill and trucking
d.b.a. Service Transfer Company
Davenport, Iowa

General Contractor--Arsenal Island Combination Storm and Sanitary Sewer: Woods Brothers Construction Company, Lincoln, Nebraska

General Contractor--Lock Operating Machinery, Electrical Power, and Control Construction: Collier Construction, Cleveland, Ohio

General Contractor--Main Lock Haulage Engines and Chocks: Silent Hoist Winch and Crane Company, Brooklyn, New York

Subcontractor:

Davenport Machine and Foundry Co. ..Installation

General Contractor--Storage House: McKeown Brothers Company, Chicago, Illinois

Subcontractors:

Detroit Steel Products Company.....Metal doors, window frames
Rock Island Sand & Gravel.....Sand
Rock Island, Illinois
Greenleaf Construction Company.....Concrete, tile, plastering,
Rock Island, Illinois electrical wiring, hardware installation
Chanon and Dufva.....Downspouts and floor drains
Rock Island, Illinois
E. E. Summers and Company.....Sheet metal work
Rock Island, Illinois
Brandle Roofing and Supply Co. ....Roofing
Rock Island, Illinois
O. J. Dean and Company.....Reinforcing steel
Chicago, Illinois
Blackhawk Electrical Company.....Electrical work
Rock Island, Illinois

General Contractor--Esplanade Sidewalks and Roadway Construction: Hoefle and Caleo, Rock Island, Illinois

General Contractor--Esplanade Concrete Driveway, Curb Drain, Catch Basin, and Lawn: W. D. Phelan and Company

General Contractor--Boat House on Boat Harbor Back of Upper Guidewall of Lock: Schadt Service Company, Silvis, Illinois

General Contractor--Esplanade Equipment Garage: John Goettsch, Davenport, Iowa

5. Original Plans and Construction:

Plans for locks, dam, power house, lock and dam operating machinery, and storage house--U. S. Army Corps of Engineers, Upper Mississippi Valley Division, contract signed by engineer Lenvik Ylvisaker; plans for sewer, seawall, and lock operator's house--U. S. Army Corps of Engineers, Rock Island District, Herbert G. McCormick; direct supervision of construction--U. S. Army Corps of Engineers, Rock Island District, resident engineer John H. Piel.

6. Alterations and Additions:

Item	Year
Addition-removable flashboards to roller gates no. 1 and 11	1940
Construction-mooring levee	1942
Land wall and lock gate handrails lowered by one rail and new handrail made from salvaged materials installed on both edges of each lock wall and on upstream sides of walkways on tops of lock gates	ca. 1945
Construction-handrail on upstream side of dam service bridge	ca. 1945
Construction-further mooring facilities	1951
Replacement-haulage units and construction haulage unit controller cabinet	1952
Construction-operations and utility building on land wall of locks	1963

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 end of the guidewall of lock	ca. 1972
Removal-Lockmaster/Assistant Lockmaster residences from esplanade	ca. 1975
Removal-wooden plank hatches on dam service bridge deck with aluminum ones	ca. 1979
Major remodeling-operations and utility building on land wall of locks	1979-1980
Installation-traveling mooring kevels extending length of guidewalls of lock	1980
Construction-new workshop building	1980-1981
Addition-rebar plates on lock walls inside main lock chamber	1982
Replacement-crane on dam	1983-1984
Replacement-light posts and fixtures around lock	1984

B. Historical Context:

The special board of engineers which initially designed the Nine-Foot Channel Project between 1929 and 1931 saw the construction of Lock and Dam Complex 15 as one of the highest priority items within the context of the overall project. The board placed complex 15 in the first group of projects to be constructed, those necessary, in the board's opinion, to care for existing commerce. However, the water level above the complex could not be raised too high because of the effect that it would have on industrials areas in and around the sewage systems of Davenport and Bettendorf, Iowa; the sewage system and low areas on Arsenal Island; and the water intake facilities for the city of Rock Island.

The potential for damage to these existing industrial areas, sewer systems and water intake influenced the Corps of Engineers in its selection of the type of movable gates to be used in the dam. The selection of cylindrical roller gates, with a clear span length between piers of 100 feet, was crucial to the development of the designs for all of the dams in the Upper

Mississippi River Nine-Foot Channel Project, for this was the first dam designed and built in the Rock Island District.

Despite setting the overall pattern for the project in terms of one of the types of movable gates used in the dams, Dam 15 is unusual among Nine-Foot Channel Projects structures built between 1931 and 1940. It is the only one that:

* have 1a roller gate piers
* employs only non-submersible roller gates
* is composed entirely of roller gates
* has roller gates of differing sizes
* contains non-standard length roller gates
* is not at right angles to the river
* includes no earthen embankment dike section
* incorporates a power plant which generates the electricity used to operate its gates, and the lock gates and valves, and
* utilizes an open truss service bridge with a bulkhead lifting crane on its lower cord.

The complex is also unusual in that the intermediate wall of the locks encases the swing span of the government bridge conneeting Arsenal Island and the Iowa shore. The locks at complex 15 are unique among those built in the Rock Island District between 1931 and 1940, in that the Corps completed both locks, the auxiliary lock as well as the main lock. The appurtenant structures at the complex are also unique. It is the only complex built in the district between 1931 and 1940 that includes a completed power house. This power house was built as part of the dam but because it sits on the riverwall of the locks, it is discussed in outline under "Other Elements" of the locks. There was no central control station at the complex. The Corps built a storage house on the intermediate wall of the locks to furnish the Ordinance Department with storage space for maintenance of the government bridge and to provide the lock staff with storage space for parts and supplies incidental to lock operations. Since there was sufficient space available, the Corps decided to locate the lock power and control substation in this building also. This, too, is discussed under "Other Elements" in this report. No office space was built, but the Corps did provide a small lock tender's shelter house on the intermediate wall, from which all parts of the locks and lock approaches are visible. This is also discussed under "Other Elements>" The only facilities located on the esplanade were the access road, and an equipment garage, and around the boat harbor in back of the upper guidewall is a boat house. The district also built a seawall with an intragel intercepting sewer, and an earthfill levee with the continuation of that sewer, as part of the project. Also built were a raised and strengthened

levee along a portion of Arsenal Island, an intercepting sewer for Arsenal Island, and an extension of the water supply intake pipe for the city of Rock Island. These remedial works are also discussed in the outline under "Other Elements" for the dam.

Unlike other complexes in the district, the plans for this complex (except for the seawalls and sewers and some of the less integral appurtenant structures, such as the boat house) were prepared in the Upper Mississippi Valley Division offices in St. Louis, Missouri. Engineer Ylvisaker was the key individual responsible for these plans. The Rock Island District was, however, responsible for coordinating and directly supervising construction.

The specific items of engineering significance at this complex relate to it being the first complex built in the Corps of Engineers' 1927-1940 Upper Mississippi River Nine-Foot Channel Project and its being the first complex in the Rock Island District to be designed. Everything here is either unique or a prototype from which the designs for the whole system flowed.

The main lock's dimensions are the standard 110 feet by 600 feet. The auxiliary lock is 110 feet by 360 feet. Lock lift on both locks is 16 feet. Normal upper pool elevation is 561.0, although the structures were designed for an ultimate elevation of 563.25--the elevation required to permit free access to possible terminal development along the Moline and East Moline waterfront of Pool 15.

The lock and dam elements of the complex took about three years (or about six months less than average) to complete at a cost of approximately $7,480,000. The complex was placed in operation as a unit of the Upper Mississippi River Nine-Foot navigation system on March 7, 1934. It was the first of the 1931-1940 Upper Mississippi River Nine-Foot Navigation Project complexes to go on line.

PART II. TECHNOLOGICAL INFORMATION - LOCK

A. General Statement:

1. Design Character: Standardized Ohio-Mississippi Lock Design. Drawing Number M-L 15 20/1.

2. Condition of Fabric: Good

B. Description of General Layout and Principal Elements:

1. Overall dimensions: Main lock chamber - 110 feet wide by 600 feet long by 40 feet high: adjoining incomplete auxiliary lock chamber 110 feet wide by 360 feet long by 40 feet high. Lift - 16 feet. Drawing Number M-L 15 20/1.

2. Foundations: Bedrock

3. Walls: Reinforced monolithic concrete with original steel rub bars on their chamberward faces upstream and downstream from the lock gates. Lock crew chiselled out channels and installed rub bars inside main chamber 1982. Land wall adjoins downstream tip of northern side of Arsenal Island. Intermediate wall is riverward wall of main lock and landward wall of auxiliary lock. Lower 350 feet of intermediate wall is pivot abutment for drawspan of government bridge connecting Arsenal Island, Illinois, and Davenport, Iowa. River wall of auxiliary lock ties to dam on north. Upstream 600 feet of this wall is river wall of auxiliary lock. Then to 300-foot long abutment for bridge. Dam ties to next 500 feet which incorporates the power house. Drawing Numbers M-L 15 20/41 20/2, 20/3, 20/4, 20/5, 20/6, 20/7, 20/8, 20/10, 20/11, 20/12, 20/17.

4. Structural System: See above.

5. Bullnoses: Concrete configurations at each end of intermediate wall. Drawing Number M-L 15 20/19.

6. Upper and Lower Guidewalls: Extended monolithic reinforced concrete walls extending the landwall out of the lock chamber at either end to assist guiding of barge traffic into the lock. Also on lower guidewall 500 feet of wall downstream from the lock is pre-existing approach to drawspan of government bridge connecting Arsenal Island, Illinois, and Davenport, Iowa. Drawing Numbers M-L 15 20/8, 20/9, 20/10.

7. Mooring Levee: Concrete extensions to upstream guidewall, added in 1942 to assist in counteracting outdraft which made navigation into and out of the upstream end of the lock difficult.

8. Stage Recorder: Small concrete housing located at the end of the downstream guidewall. Equipment housed for the recording of river stages.

C. Mechanical Equipment:

1. Tainter Valves: Eight cable drive lock valves of steel construction with electric motorized assembly. Valves are located in wells in lock walls. They are 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 15 25/1, 25/2, 25/15, 25/16.

2. Gates: Four pairs of 31.4-inch by 61.5-inch miter gates. All balanced on stainless steel pintels and operated by arms , gears, and electric motor assemblies. Motor assemblies are housed in machinery pits in lockwalls adjacent to each leaf. Electric motor assemblies operated by switches in control cabinets. Bumper lines on 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 15 21/1, 20/16.

3. Lighting: Various free standing single and double head lighting standards installed in 1984.

4. Plumbing: Lock is watered by the Tainter valves (see above) serving a system of cast-in-place tunnels that enable the water level to be controlled on the interior of the locks.

5. Haulage Unit: Motorized winch assembly to assist towing of barges through lockage. Replacement units were installed mid-1970s.

6. Traveling Mooring Kevels: Two large cleats on rails which extends the length of both the upstream and downstream guidewalls. Installed in 1980, the kevels are used to assist towing of barges through lockage.

D. Other Elements:

1. Power House: Conventional, rectangular plan, run-of-the-river hydroelectric power house. Develops all of the electricity needed to operate Lock and Dam Number 15 and half of the electricity used in the nearby Corps of Engineers district headquarters complex.

   a. Exterior--overall dimensions: 58 feet by 19 feet. Built on reinforced concrete riverwall of lock. Reinforced concrete walls and structural system. One chimney. Openings: three doorways and four doors (downstream doorway filled by double leaf door); six 30-pane windows with smaller arched window above, six 6-paned windows, four 8-paned windows (two over double leaf door and topped with arched window and one over lock side single door also topped with arched windows). Hipped roof with tile shingles. Drawing Numbers M-L 15 70/1, 70/2.

   b. Interior--First floor contains abandoned main office, heater room, and engine room, and mezzanine stairway access. Main hydroelectric generator and standby diesel generator in engine room. Mezzanine contains abandoned locker room and bathroom. Where basement or sub-basement would be, there's a 312 KVA hydroelectric turbine, trash racks, scroll chamber, vertical shaft connecting the generator rotor to the turbine runners and draft tube. Drawing Numbers M-L 15 70/1, 71/1.

2. Storage House:

   a. Exterior--overall dimensions: 62 feet by 36 feet. Sunken in reinforced concrete intermediate wall of lock. Reinforced concrete walls and structural system. Two steel chimneys. Openings: five doorways and seven doors (double sliding steel doors in three of the doorways); thirty-four 6-pane windows (four of which are in double sliding doors on downstream side end), four 4-pane windows (in upper panels of single swinging doors on upstream and downstream end and in upper panels of sliding double doors on upstream end). Flat roof covered in membrane/tar composition. Drawing Number M-L 15 72/1.

3. Locktender's shelter House

   a. Exterior--overall dimensions: 16 feet 8 inches by 12 feet 9-1/2 inches. Built on reinforced intermediate wall of lock. Reinforced concrete walls and structural system. Openings: one doorway and door, fourteen 9-pane windows (one of which is in the upper panel of entry door). Hipped roof with tile shingles.

   b. Interior--one floor, one room.

4. Boat Launches: Installed 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: Roller gate low dam system design. Drawing Number M-L 15 40/1.

2. Architectural Character: 1a roller gate piers. Drawing Number M-L 15 41/1

3. Condition of Fabric: Excellent.

B. Description of Exterior

1. Overall Dimensions: 1,203 feet in length. Drawing Number M-L 15 40/1.

2. Foundation: Bedrock

3. Pier House Walls: Monolithic reinforced concrete. Drawing Numbers M-L 15 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: 11 water-channels, each 109 feet wide. Drawing Number M-L 15 40/1.

   b. In Pier Houses: 2 doorways, four 8-pane window, four 6-pane windows, and two 4-pane windows for each of 11 pier houses. Drawing Number M-L 15 41/1.

(1) Doorways and doors: 22 doorways and 33 doors (each upstream doorway, the ones which open off the service bridge deck, has a double leaf door). Drawing Number M-L 15 41/1.

(2) Windows: 143 (including one each in the upper panel of each door). Drawing Number 15 41/1.

c. In Lock Wall Pier: Four archways. Drawing Number M-L 15 40/5.

7. Roofs:

a. Shape, covering: Pier houses have hipped roofs covered in shingle tile. Drawing Number M-L 15 41/3.

b. Towers, piers: 12 piers (one lock wall piers; ten 108-foot long, 62-foot-high 1a-style roller gate piers with a maximum width of 12 feet; one seawall pier); ten 1a-style piers and seawall pier have pier house towers; lock wall pier includes multi-landing stairway towers. Drawing Numbers M-L 15 40/1, 40/5, 40/7, 40/2.

8. Service Bridge:

a. Shape: Linear deck truss (modified "K" truss) spans (each span consisting of two modified "K" trusses) in segmental series.

b. Materials: Structural steel. Drawing Number M-L 15 53/1.

C. Description of General Layout and Principal Elements:

1. Access Plan: Lock wall pier consists of open multi-landing stairways. Upstream stairways leading to service bridge deck where walkway/rail track extends full length of dam. Access to all eleven pier houses directly off deck. Access to top of 370 linear foot outlet end of seawall and sewer on Iowa end of dam by simple exposed stairway at Iowa end of service bridge. Drawing Numbers M-L 15 40/1, 40/5, 53/8, 53/1, 53/9, 40/2.

2. Stairways: Reinforced concrete with pipe railing. Drawing Numbers M-L 15 40/5, 40/3.

3. Flooring: In pier houses--reinforced concrete; on service bridge deck--wooden plank. Drawing Numbers M-L 15 41/1, 41/20, 53/8, 53/9, 53/1.

4. Wall and Ceiling Finish: Reinforced concrete. Drawing Numbers M-L 15 41/1, 41/2.

5. Hardware: Brass.

D. Mechanical Equipment:

1. Movable Gates: Nine 109-foot long 19-foot, 4-inch diameter, non-submersible, non-overflow roller gates with a height when closed of 26 feet operated on tooth track by chain driven hoist machinery located in pier house adjacent to each gate; two 109-foot long, 16 foot, 2-inch diameter, non-submersible, overflow roller gates with a

   height when closed of 21 feet 9 inches operated on tooth track by chain driven hoist machinery located in pier house adjacent to each gate. Drawing Numbers M-L 15 47/1, 40/1.

2. Gate Heaters: Electrical heaters which warm the steel armature plates against which the timber seals of the end shields of the gates are pressed by the hydrostatic head effective when the gates are submerged. Heaters are also attached to inner surface of the ends of the roller gates.

3. Movable Crane: 30-ton vertical lift electric crane with 70-foot boom (replaced ca. 1980) used for moving parts and equipment. Sits on original (ca. 1934) crane trolley which rides on 13-foot 1-1/8-inch gauge track set on runway girders on the deck of the service bridge. The second bridge crane, a 15-ton capacity crane, for maneuvering emergency bulkheads, etc., is mounted on a similar trolly or carriage which rides on the lower chord of the service bridge. Drawing Numbers M-L 15 53/1, 56/3, 56/4.

4. Lighting: Fixtures as of times of installation - 1933-34. Rewiring may have taken place over the years--extent is unknown. Drawing Number M-L 15 56/1.

E. Other Elements:

1. Emergency Bulkheads: Temporary block units of riveted steel girder construction placed in gate openings in periods of emergency or repair. Stored on hangers suspended below service bridge deck level on the dam. Drawing Numbers M-L 15 58/1, 58/2, 58/3 40/10, 40/11.

2. Seawall and Intercepting Sewer: Intercepting sewer extends over 6.5 miles along Iowa shore from Bettendorf, Iowa, to about 136 feet downstream from Iowa end of Dam 15. First 4.5 miles downstream from Bettendorf is concrete box sewer of gradually increasing size covered by a riprapped earthen levee. Next two miles of sewer integral part of reinforced concrete seawall. The 370-linear-foot of outlet end of the seawall and sewer were built as an integral part of the north abutment of the dam. Five sluice gates allow the river to flush the sewer. Two of these sluice gates are automatic electrically-operated gates; the other three are hand-operated. A gate house for the electrically-controlled gates was built over the seawall and sewer. This building is reinforced concrete with a tile roof. Over sixty inlets on the Iowa shore allow outflow of Davenport and Bettendorf sanitary sewers into this sewer. This sewer and its enclosing earthen levee and seawall allow these sewer outlets, which otherwise would have been flooded by the water level rise effective

when water pooled behind Dam 15, to function and to prevent Iowa-side effluent from contaminating the Rock Island water supply. Drawing Number M-L 15 40/2.

PART IV: TECHNOLOGICAL INFORMATION - ESPLANADE

a. Description of Esplanade--General Layout:

1. Design Character: Park/service area and access road component. It wAs originally designed to accommodate an Lockmaster and Assistant Lockmaster residences, equipment garage, a boat house, parking, an access road, and other service related functions. Major site alterations have occurred since that time and are noted in the following items.

2. Architectural Character: Astylistic utilitarian equipment garage, and boat house only extant original structures.

3. Historic Landscape Design: Unique. Drawing number M-L 15 38/1.

B. Condition of Site and Structures: Altered

1. Lockmaster/Assistant Lockmaster Residences--(Standardized, Colonial Revival with side porch) The structures have been moved off site. All related structures have been demolished.

2. Outbuildings: Various shed and service buildings have been erected from time to time as demands required--none have particular significance or contribute to the site. A two-story, masonry operations and utility building (approximately 48 feet by 24 feet) was constructed on the land wall of the lock in 1963. Drawing Number M-L 15 78/2. This building was extensively remodeled and enlarged in 1979. A brick and steel garage was erected on the old site of the Lockmaster's residence ca. 1980. This element is standardized.

PART V: SOURCES OF INFORMATION

A. Original Architectural/Engineering Drawings: Mississippi River Lock and Dam 15, operations folio, February 1936, file No. GP61-1; Mississippi River, Lock and Dam 15, Dam, operations folio, April 1936, file No. GP51-2; and Rock Island District Office-Construction Drawings--Mississippi River Locks and DAms 1936-1986, (passim), Rock Island District Library, Clock Tower Building Annex, Rock Island, Illinois.

B. Early Views: Over 1,400 high quality 8x10 black and white construction photographs: Lock and Dam Number 15-Photo Book "Lock 15" and Photo Book Group 121.4 (6 vols), Rock Island Arsenal, Rock Island, Illinois.

C. Interviews: Present and past personnel--Lock and Dam Number 15

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.