OHIO RIVER SHORELINE, PADUCAH, KENTUCKY RECONSTRUCTION PROJECT

Presented To The Paducah City Commission

March 15, 2016

Presentation By:
Rick Murphy, P.E.
City Engineer &
Public Works Director

City of Paducah's Local Flood Protection Project (LFPP)

Commonly Referred To As

"The Floodwall"

The Floodwall:

- History
- Area of Protection
- Key Components & Function
- How it Works
- Partnership With the USACE
- Reconstruction Considerations
- Reconstruction Efforts to Date
- Current Project Status & Moving Forward

The Floodwall History

w of the Great Ohio River Flood at Paducah, Ky., February 22, 1884, showing Broadway at Highest Stage of Water—54 Feet 2 3/4 In

1884


Union
Store
193


1937 Flood
No 9

Floodwall Evolution:

- Authority: Flood Control Act of 22 January 1936
- Authorization: Flood Control Act Approved 28 August 1937
- Assurance of Local Cooperation: Adopted 2 May 1938
- Construction Period: August 1939 Through July 1949

Ohio River Flood Crest Elevations Based on Paducah Gage

February 1884: 54.2 feet

April 1913: 54.3 feet

February 1937: 60.6 feet

February 1950: 53.3 feet

May 2011: 55.0 feet

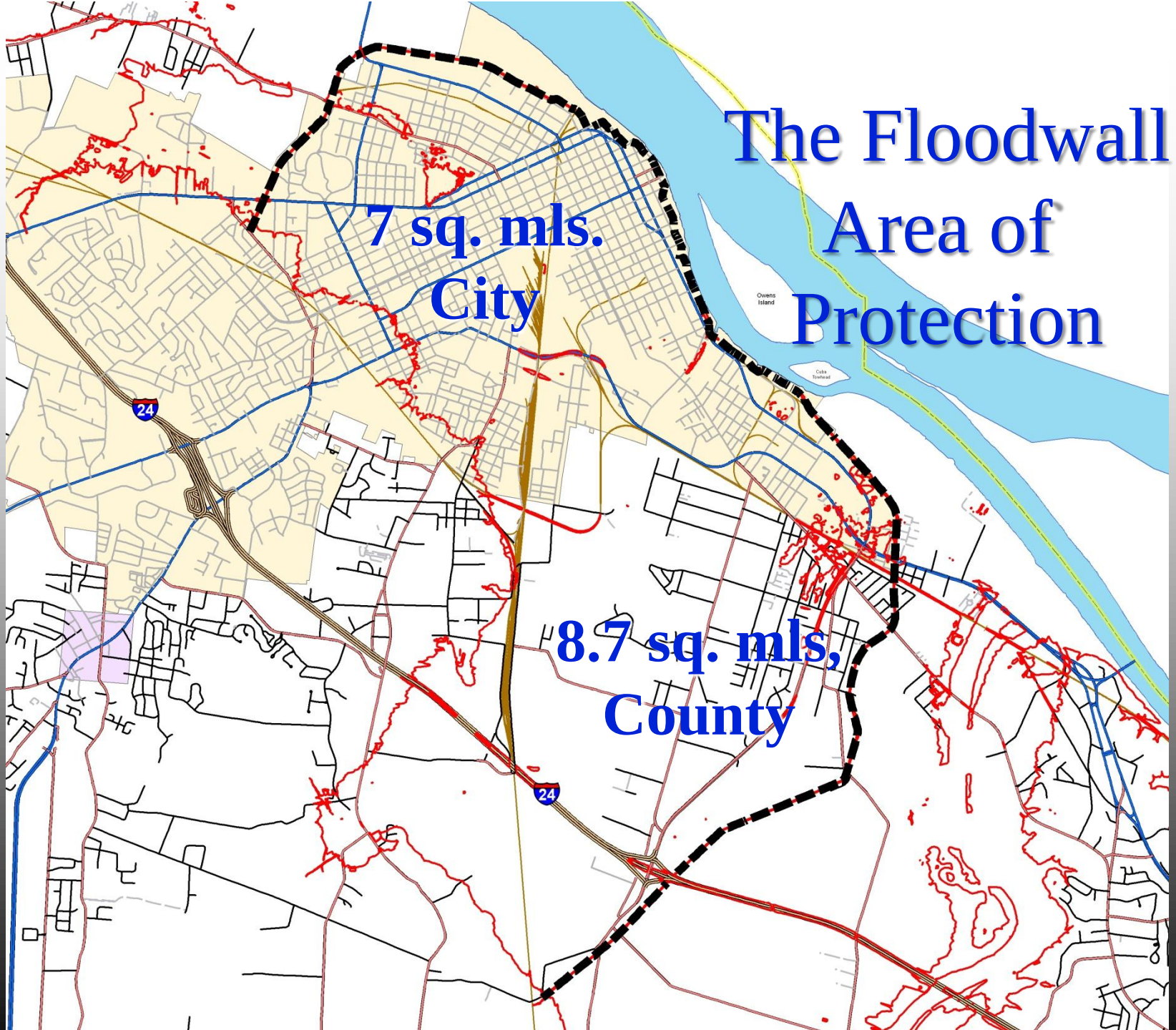
Since 1950, 10 major flood events have occurred leaving only minor damage when compared with the flood damage to Paducah prior to The Floodwall's completion July, 1949.

City of Paducah Assumed Its LFPP Sponsorship (O & M) Responsibilities July 1949

Budget Trivia:

1950	–	$27,700 +/-
1951	–	$36,600 +/-
1952	–	$33,800 +/-

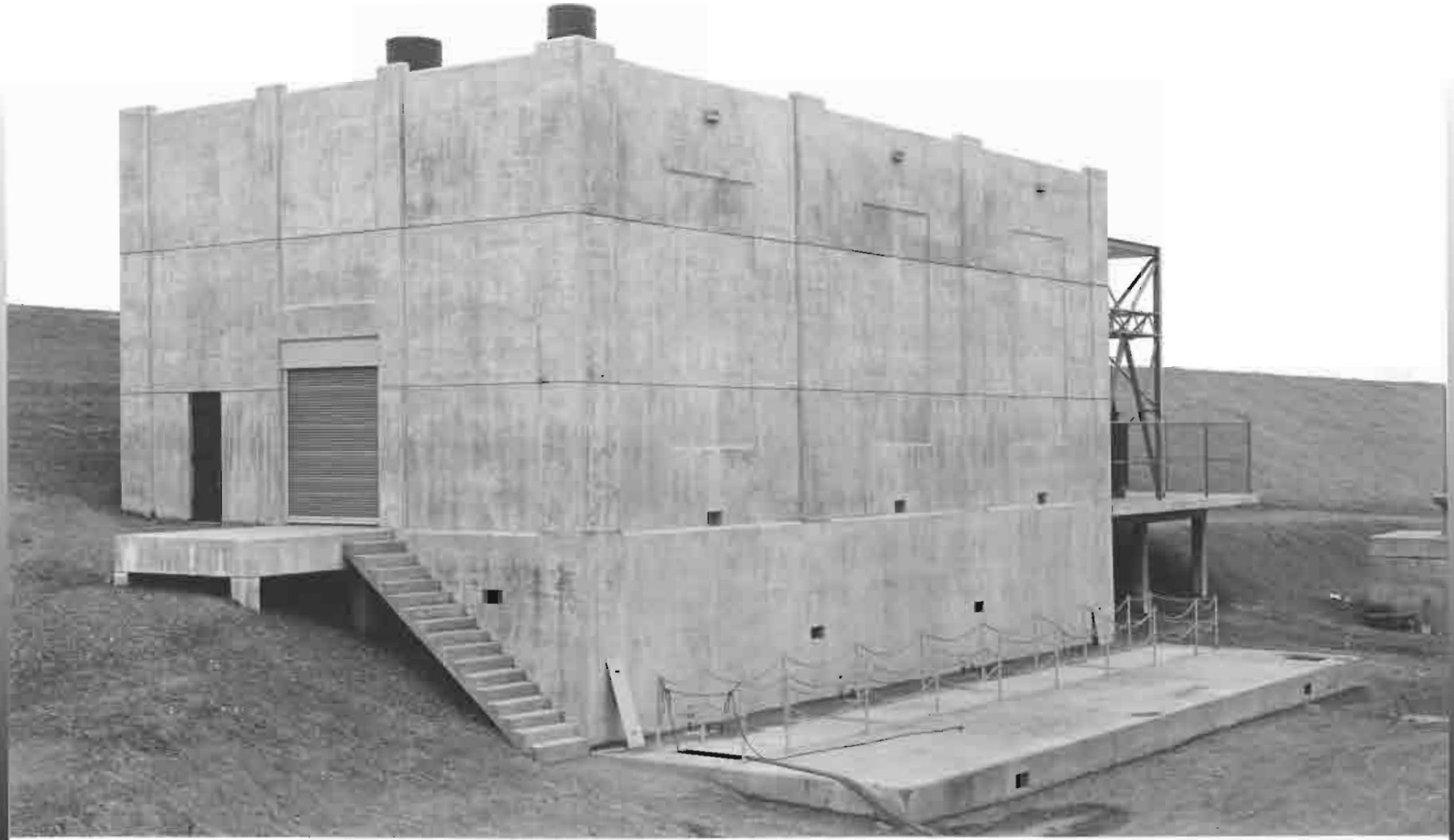
Presently 2016 – $590,000 +/-


The Floodwall Area of Protection
7 sq. mls. City
8.7 sq. mls. County
24
24
Owens Island
Cuba Towhead

The Floodwall
Key
Components & Function
O & M Responsibilities
Since 1949

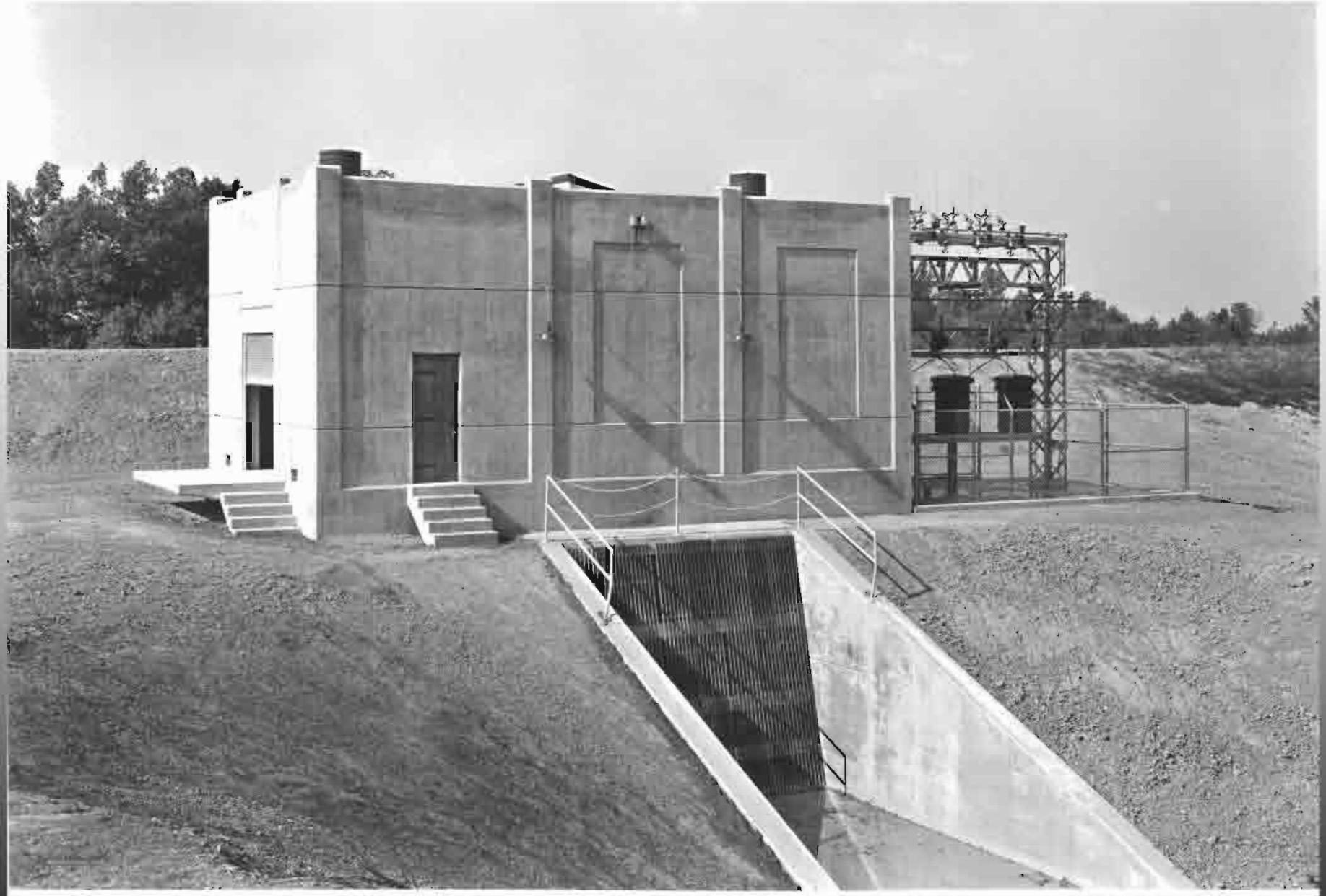
WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Ky. View showing backfilling operations of intercepting sewer looking from Broadway north on Second St. Contract No.W559eng-5785, Jan. 27, 1942. Midland Constructors, Inc., contractor.



WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

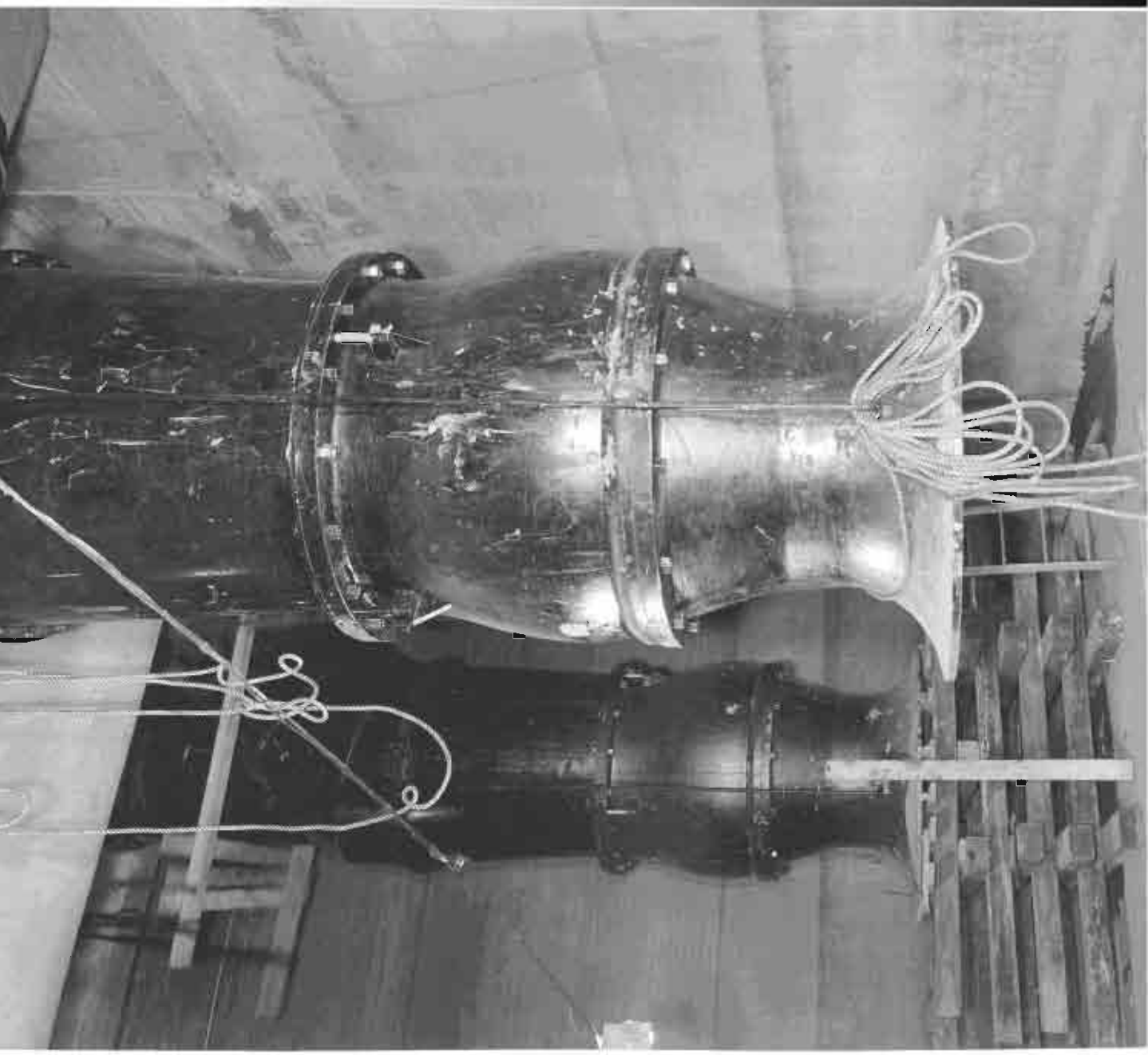
Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. Downstream landside view of completed Pump Plant No. 2. Contract No. W559eng-5785, 27 January 1942. Midland Constructors, Inc., contractor.



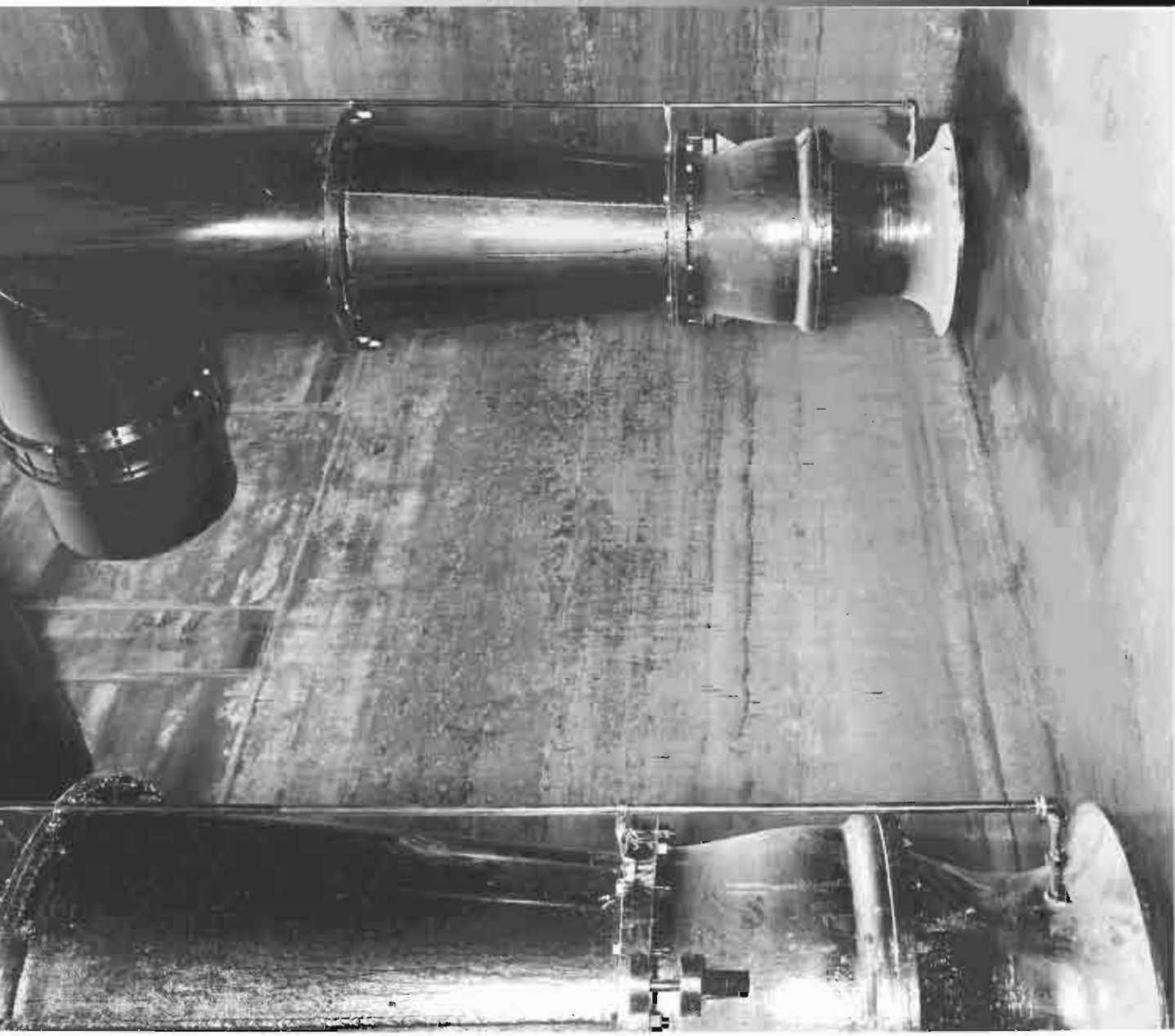
WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. Downstream landside view of completed Pumping Plant No. 1. Contract No. W559eng-5785, 27 Jan. 1942. Midland Constructors, Inc., contractor.

WAR DEPARTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 12 Sept. 1946 File No. 19174
Flood Control, Paducah, Ky., Ohio River. Contract W-15-029eng-912, C. E. Carson Company, Chicago, Ill., dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates for Pumping Plants 1, 2, 3, 5, 6, 7, 11 and 12
Pumps in storage yard at Sub-Office.



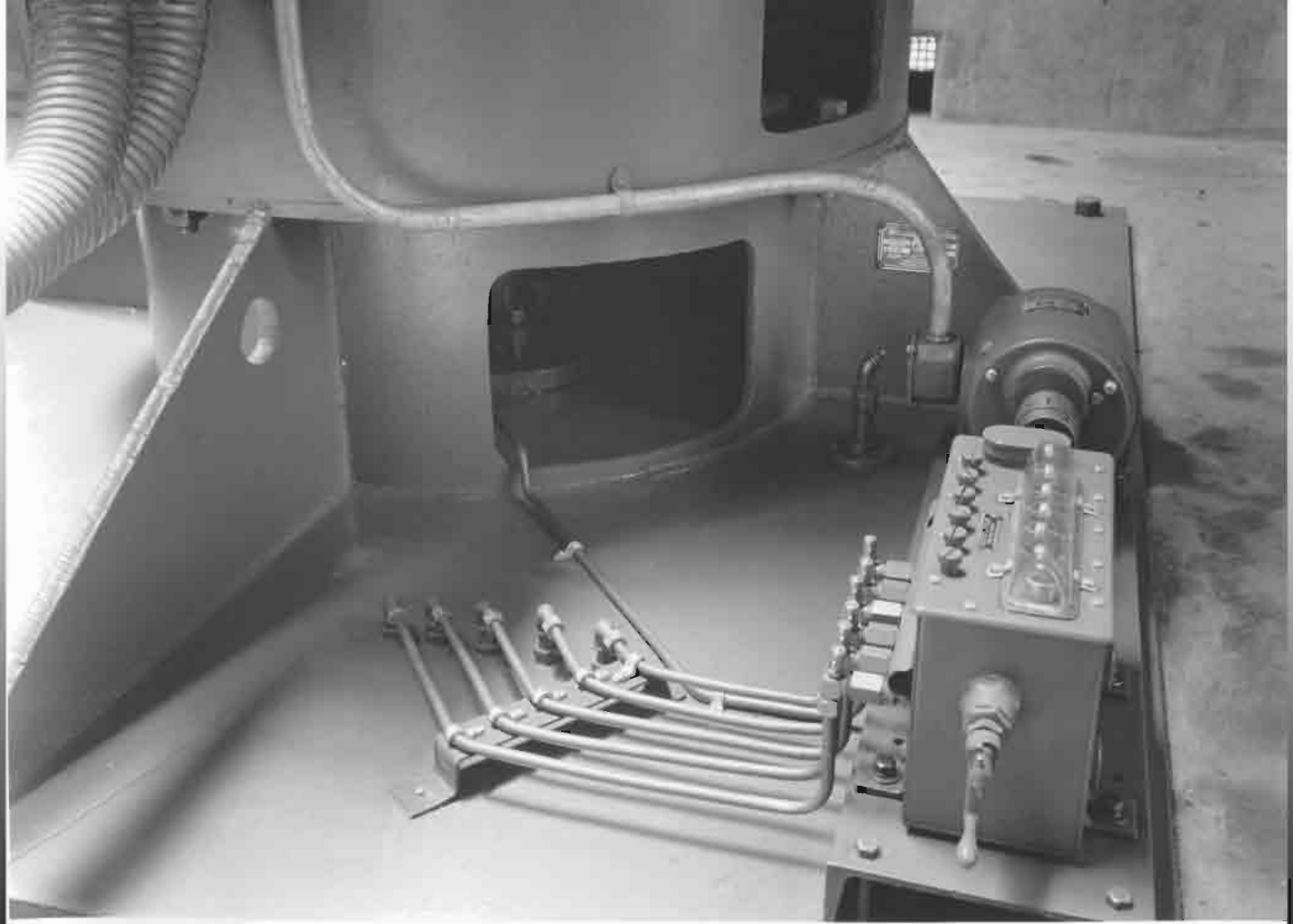
RTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 2 October 1946 File
od Control, Paducah, Ky., Ohio River. Contract W-15-029eng-912, C. E. Carson Company, Chi
ed 19 November 1945. Construction and Installation of Pumping Equipment and Gates for Pum
its 1, 2, 3, 5, 6, 7, 11 and 12.
tially completed installation of 2 - 90,000 gallon capacity pumps, Plant 2.



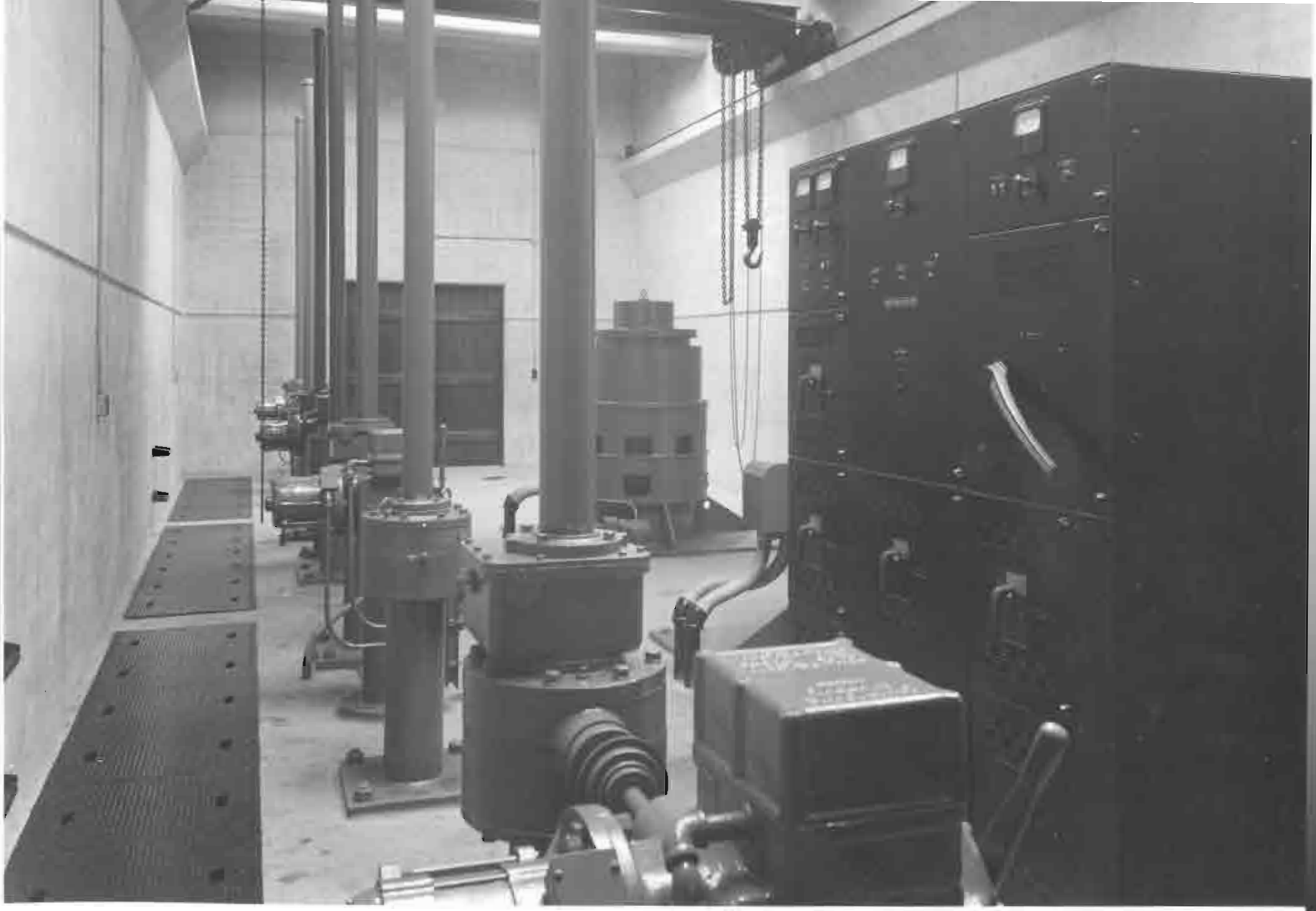
RTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 10 Dec. 1946 File
od Control, Paducah, Ky., Ohio River. Contract W-15-029eng-912, C. E. Carson Company, Chi
, dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates f
ping Plants 1, 2, 3, 5, 6, 7, 11 and 12.
in sump of Plant 5 showing 2 pumps installed.

LOUISVILLE DISTRICT, CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY. Date: 10 December 1947 File No. 20706
Flood Control--Paducah, Kentucky, Ohio River. Contract W-15-029eng-912 C. E. Carson Company, Chicago, Illinois, dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates for Pumping Plants 1, 2, 3, 5, 6, 7, 11 and 12.
Interior view of Pumping Plant Number 2 showing pumps 3, 4, 5 and 6.

LOUISVILLE DISTRICT, CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY. Date: 10 December 1947 File No. 20712
Flood control--Paducah, Kentucky, Ohio River. Contract W-15-029eng-912 C. E. Carson Company, Chicago, Illinois, dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates for Pumping Plants 1, 2, 3, 5, 6, 7, 11 and 12.
Interior view of Pumping Plant Number 6, showing pumps 1, 2 and 3.



LOUISVILLE DISTRICT, CORPS OF ENGINEERS, WAR DEPARTMENT. Date: 11 June 1947 File No. 20181
Flood Control- Paducah, Kentucky, Ohio River. Contract W-15-029eng-886, Economy Pump, Inc., Hamilton, Ohio, dated 18 September 1945, Pump Units. View showing Madison-Kipp oil line connections, installed on Unit #1 Plant #11.



LOUISVILLE DISTRICT, CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY. Date: 11 December 1947 File No. 20717
Flood Control--Paducah, Kentucky, Ohio River. Contract W-15-029eng-912 C. E. Carson Company, Chicago, Illinois, dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates for Pumping Plants 1, 2, 3, 5, 6, 7, 11 and 12.
Interior view of Pumping Plant #11 showing pumps 1 and 2.

LLE DISTRICT, CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY. Date: 11 March 1948 File No. 2
od Control-Paducah, Kentucky, Ohio River. Contract W-15-029eng-912. C. E. Carson Company
cago, Illinois, dated 19 November 1945. Construction and Installation of Pumping Equipmer
es for Pumping Plants 1, 2, 3, 5, 6, 7, 11 and 12.
w of electrical control panel, Plant Number 5.

WAR DEPAPTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. View on downstream riverside of Plant No. 2 showing installation of discharge pipes. Contract No. W559eng-5785, 27 Jan. 1942. Midland Constructors, Inc., contractor.

WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

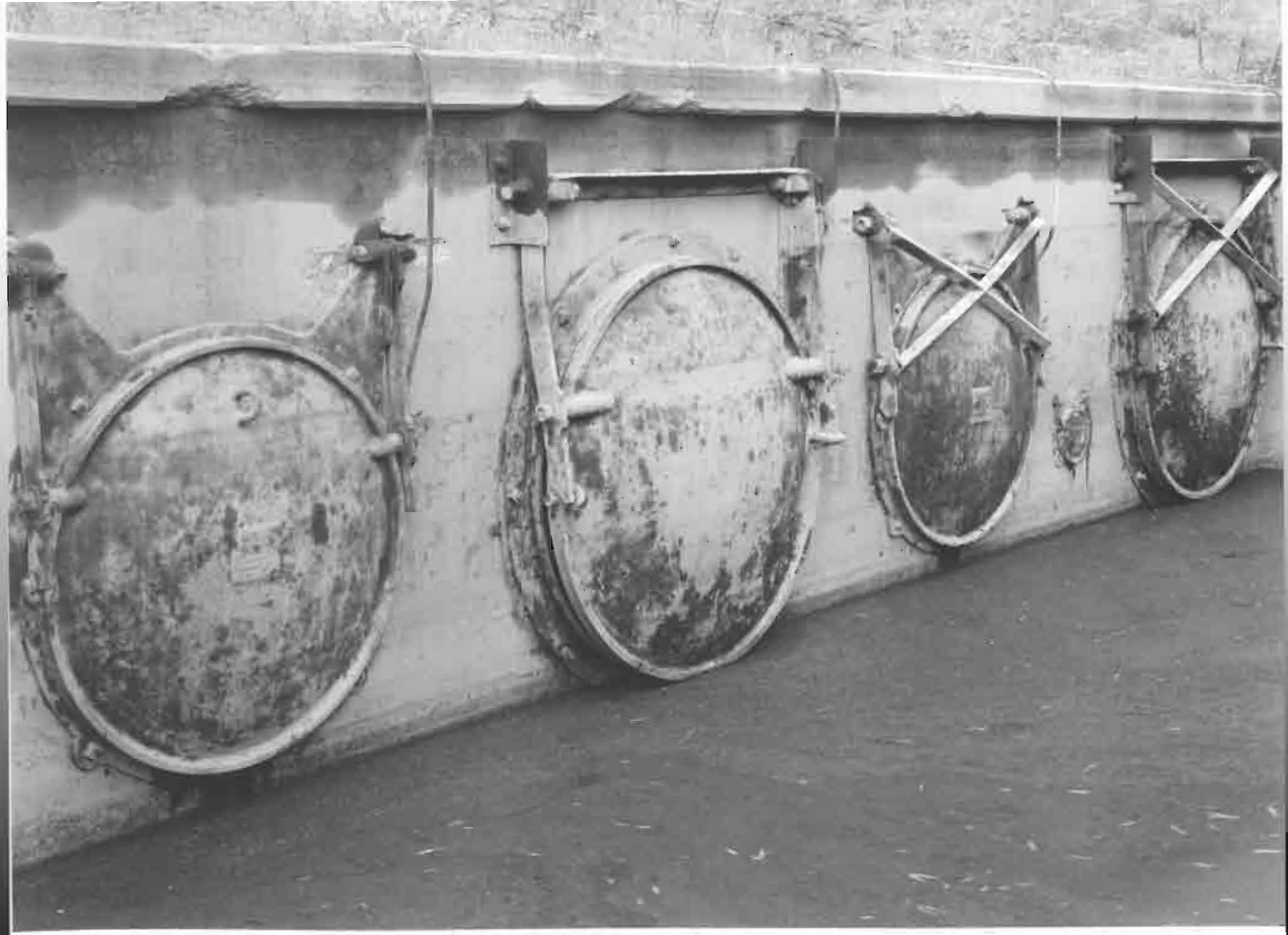
Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky.
Partially completed installation of discharge pipes on landside slope of levee at Plant No. 2.
Contract No. W559eng-5785, 27 Jan. 1942. Midland Constructors, Inc., contractor.

WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. Discharge pipes at Pumping Plant No. 2, before backfilling and placing of headwalls. Contract No. W559eng-5785, 27 Jan. 1942. Midland Constructors, Inc., contractor.

WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. Discharge Headwall and Riprap at Pump Plant No. 2, complete except for installation of two gates. Contract No. W559eng-5785, 27 January 1942. Midland Constructors, Inc., contractor.



LOUISVILLE DISTRICT, CORPS OF ENGINEERS, U. S. ARMY. Date: 8 June 1950. File No. 24517
Flood Control--Paducah, Kentucky, Ohio River, Paducah Flood Protection Project, Pumping Plant No. 2.
View showing damaged 48 inch and 60 inch flapgates on pump discharge pipes.

WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Pumping Plants) - Ohio River. For protection of Paducah, Kentucky. Completed portion of 72 inch semi-elliptical outfall sewer from Pumping Plant No. 6. Contract No. W559eng-5785, Jan. 27, 1942. Midland Constructors, Inc., contractor.

IMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 10 Dec. 1946 File
d Control, Paducah, Ky., Ohio River. Contract W-15-029eng-912, C. E. Carson Company, Chic
, dated 19 November 1945. Construction and Installation of Pumping Equipment and Gates fo
ing Plants 1, 2, 3, 5, 6, 7, 11 and 12.
alling sluice gate, Plant 5.


9.25 Miles – 48,700 Feet Earthen Levee

3.00 Miles – 15,870 Feet of Concrete Wall

WAR DEPARTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 6 Nov. 1946 File No. 19439
Flood Control, Paducah, Ky., Ohio River. Contract W-15-029eng-1031, C. E. Carson Company, Chicago, Ill., dated 15 October 1946. Trial erection and painting of movable closure works.
Trusses and purlins completely erected, riverside view. Closure Station 161+93.17 B-II.

WAR DEPARTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 6 Nov. 1946 File No. 19447

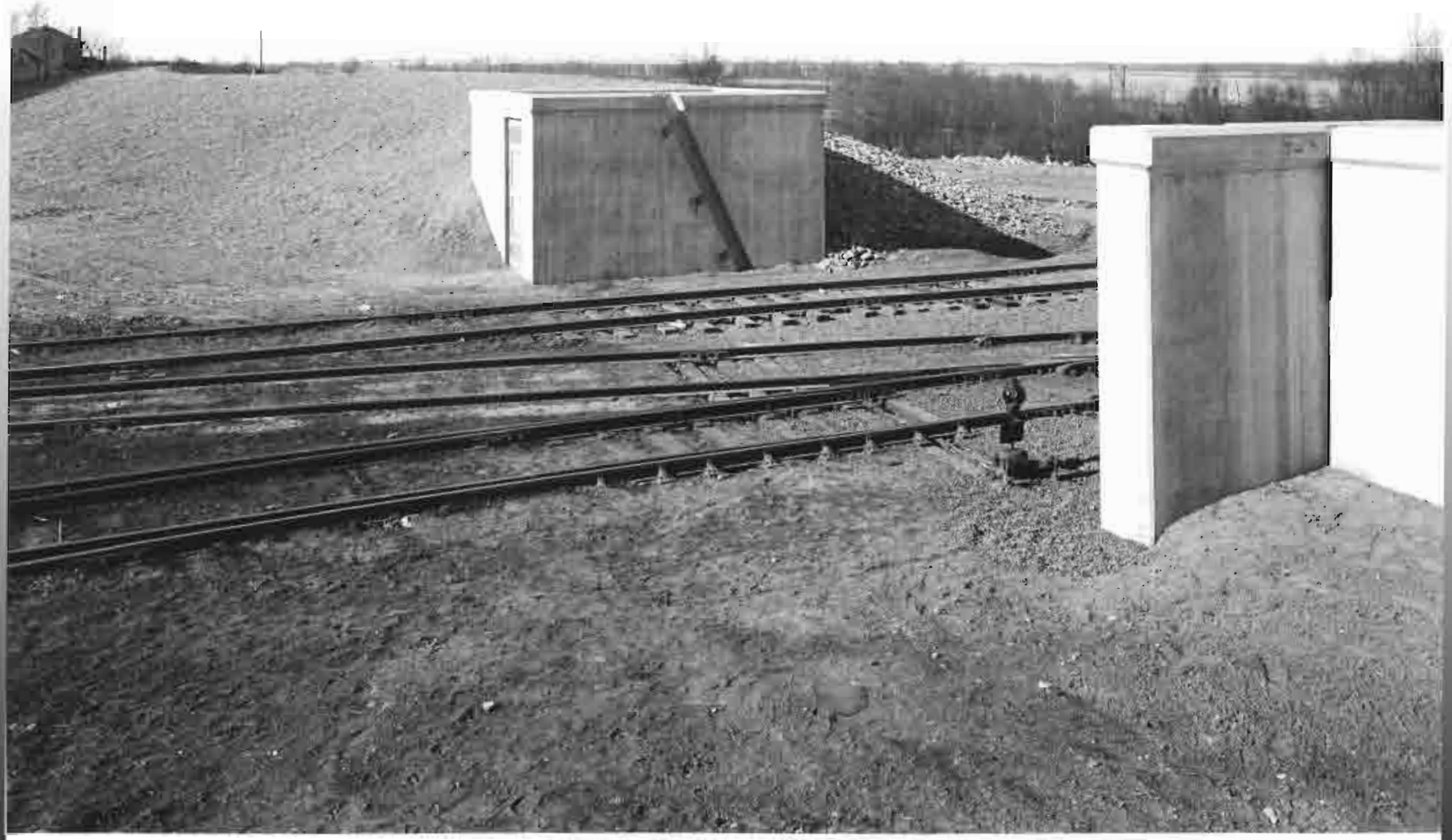
Flood Control, Paducah, Ky., Ohio River. Contract W-15-029eng-1031, C. E. Carson Company, Chicago, Ill., dated 15 October 1946. Trial erection and painting of movable closure works.

Completed trial set-up of closure at Station 161+93.17 B-II, looking downstream from top of upstream abutment.

WAR DEPARTMENT, U. S. ENGINEER OFFICE, LOUISVILLE DISTRICT. Date: 6 Nov. 1946 File No. 19448
Flood Control, Paducah, Ky., Ohio River. Contract W-15-029eng-1031, C. E. Carson Company, Chicago, Ill., dated 15 October 1946. Trial erection and painting of movable closure works.
Completed trial set-up of closure at Station 161+93.17 B-II, looking downstream on riverside.

WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Section B - Unit II) - Ohio River. For protection of Paducah, Ky.
Riverside view of completed closure at Station 132+40.50. Contract No. W559eng-5596, 18 June 1941.
Hoeffken Bros. Supply & Construction Co. and G. E. Tillman, contractor.



WAR DEPARTMENT U. S. ENGINEER OFFICE LOUISVILLE DISTRICT

Paducah Flood Protection Project (Section B - Unit II) - Ohio River. For protection of Paducah, Ky. Landside view of completed closure at Station 170+04.36 and tie-in to levee. Contract No. W559eng-5596, 18 June 1941. Hoeffken Bros. Supply & Construction Co. and G. E. Tillman, contractor.

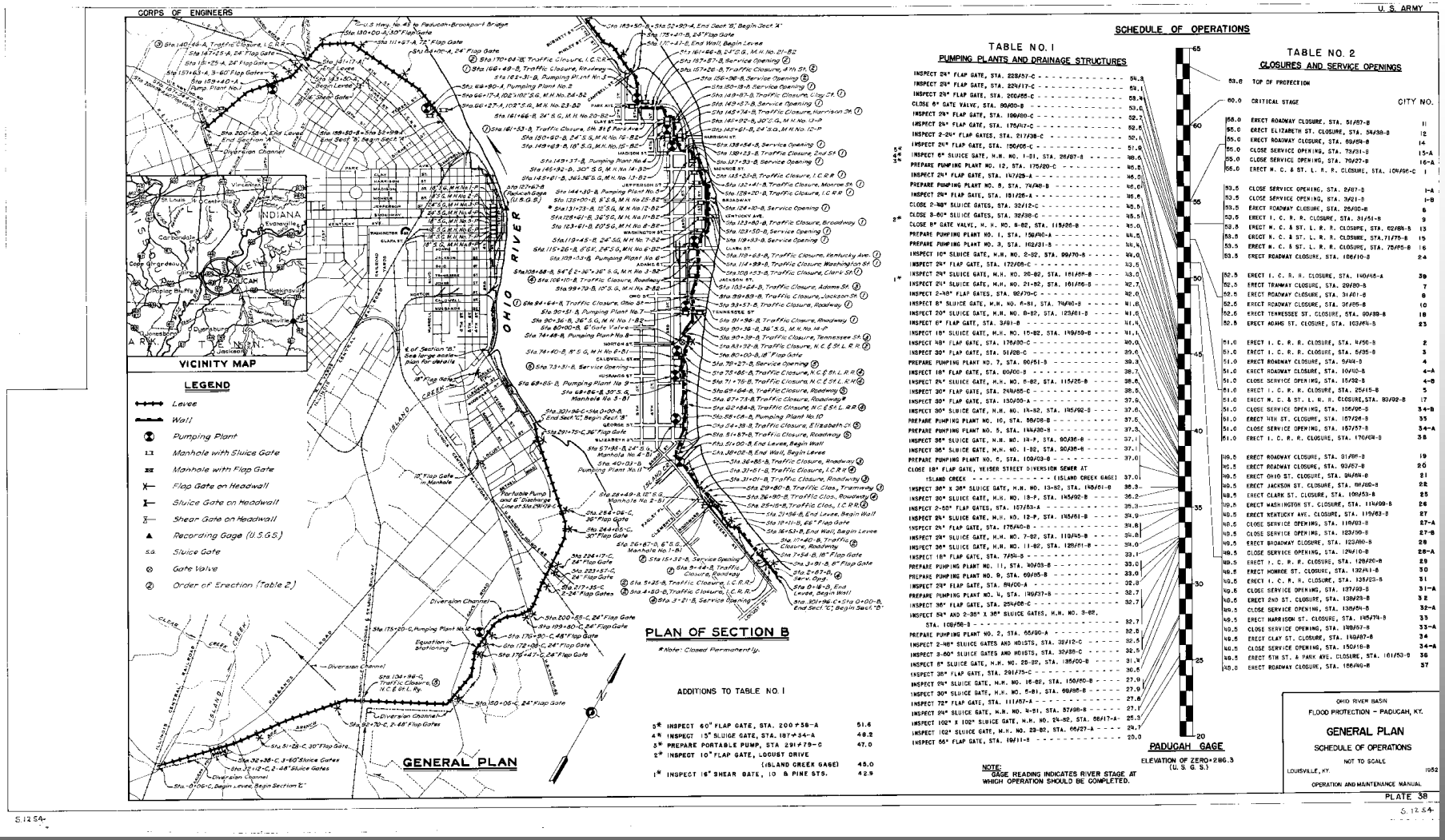
LOUISVILLE DISTRICT, CORPS OF ENGINEERS, WAR DEPARTMENT. Date: July 16, 1947. File No. 20252
Flood control - Paducah, Kentucky. Ohio River, Section B-II. View showing temporary gate at closure Sta. 106+10 B-II from river-side.

1944
(Midway - Floodwall Construction Project)
2016
(Present Condition)

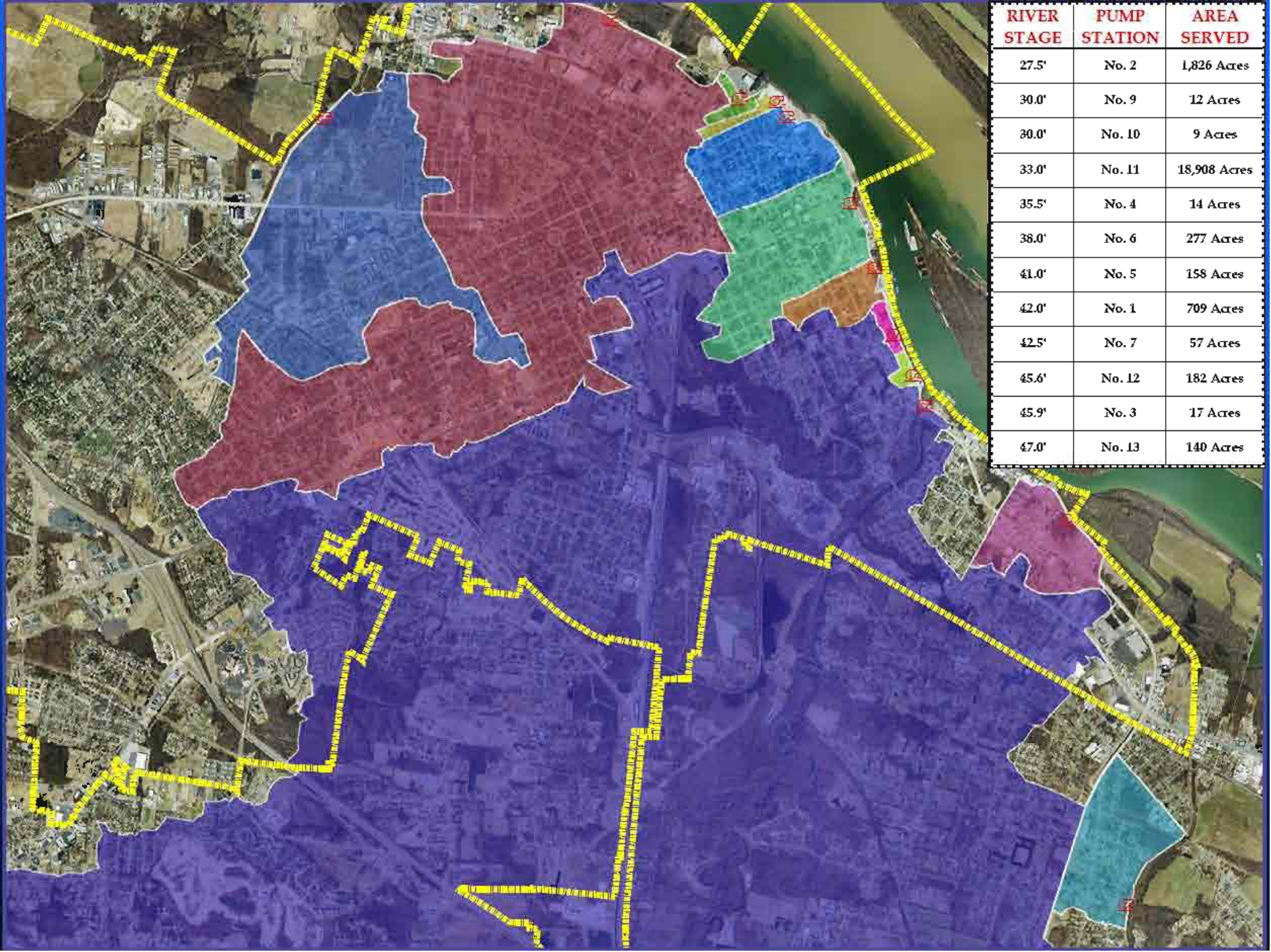
It should be noted, the Paducah Floodwall's components have been in service and/or exposed to the elements for 72 years!

Typical Floodwall Design Life: 50 Years

The Floodwall
How It Works

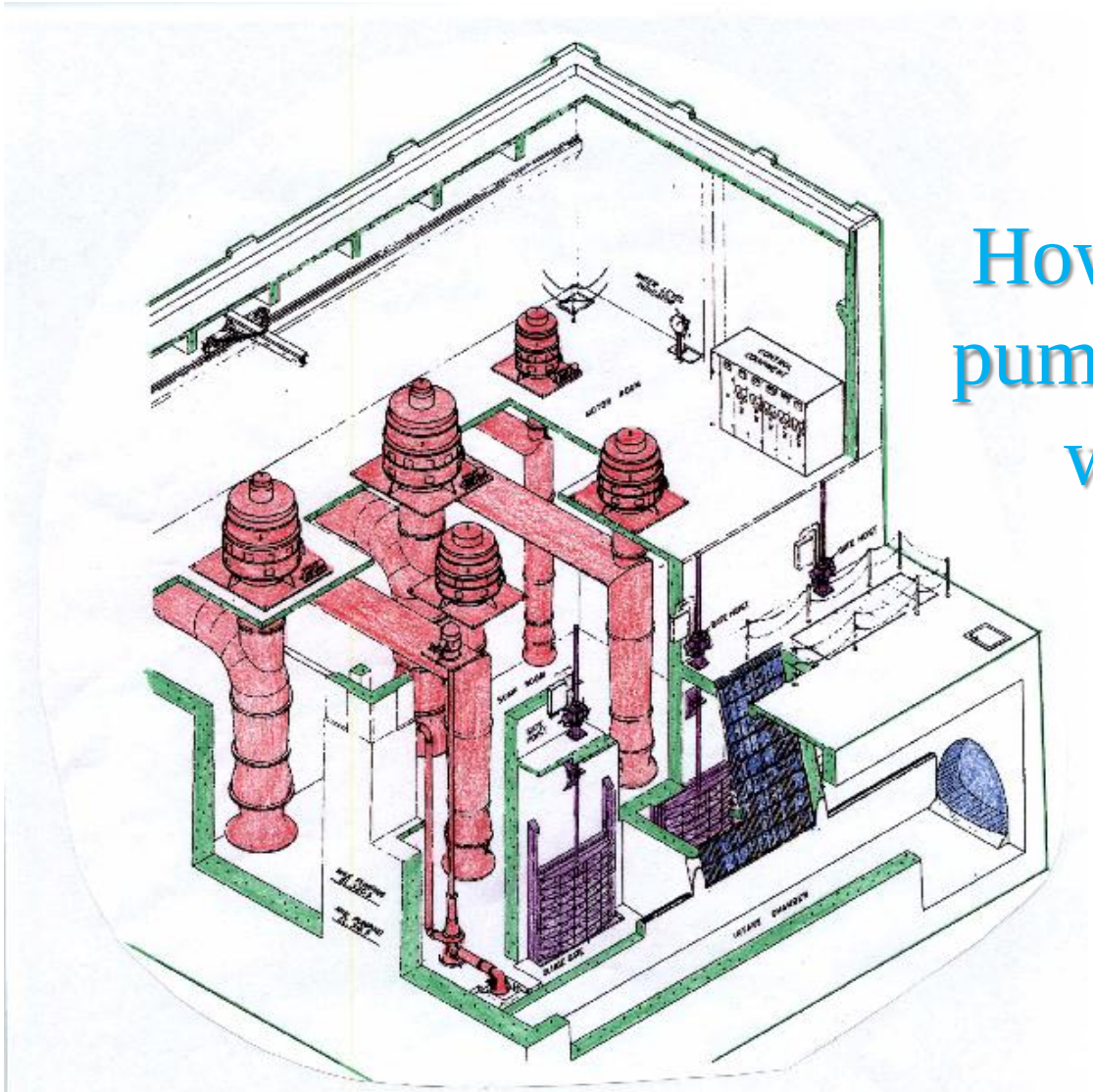


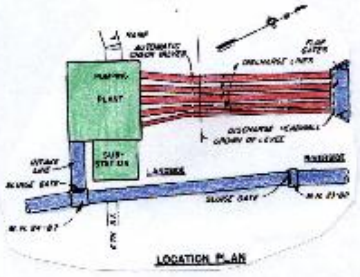
The rise and fall of the Ohio River initiates over 200 operational procedures that must be executed prior to any Floodwall element coming submerged.

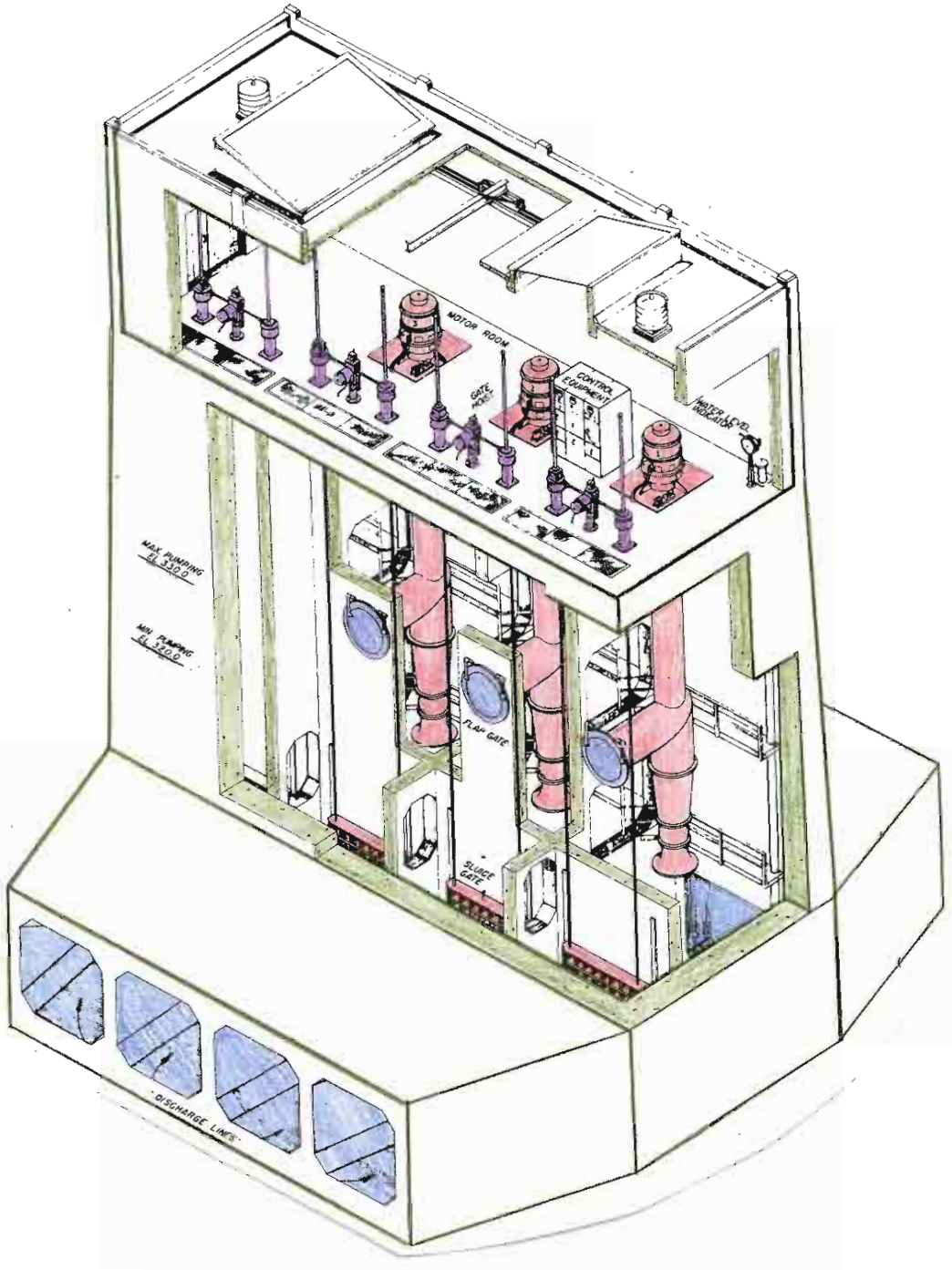


RIVER STAGE	PUMP STATION	AREA SERVED
27.5'	No. 2	1,826 Acres
30.0'	No. 9	12 Acres
30.0'	No. 10	9 Acres
33.0'	No. 11	18,908 Acres
35.5'	No. 4	14 Acres
38.0'	No. 6	277 Acres
41.0'	No. 5	158 Acres
42.0'	No. 1	709 Acres
42.5'	No. 7	57 Acres
45.6'	No. 12	182 Acres
45.9'	No. 3	17 Acres
47.0'	No. 13	140 Acres

How does a pump station work?






MOTOR ROOM
CONTROL EQUIPMENT
GATE
WATER LEVEL INDICATOR
MAX. PUMPING EL 320.0
MIN. PUMPING EL 320.0
FLAP GATE
SLUICE GATE
DISCHARGE LINES


3


05/03/2011

The Floodwall
City of Paducah's
Partnership
With The USACE

1995 – USACE Louisville District Annual Inspection Report

USCAE's notification to City of Paducah regarding their concern of our Corrugated Metal Pipes, (CMPs)

March 1998 - Congressman Whitfield requested $100,000 for USACE to conduct a Shoreline Study for the Paducah Flood Protection Project. The purpose for this study was to determine if a Federal Interest in the project met the requirement of the law.

May 2000 - USACE Louisville District completes Flood Damage Reduction Section 905(b) Analysis identifying general Floodwall elements in need of restoration. They were as follows:

- Restoration of Corrugated Metal Pipes
- Replacement of Existing Motor Control Systems
- Rebuild/Replace Existing Pump Motors
- Rebuild/Replace Existing Pumps
- Verify Structural Integrity of Levee and Floodwall

Total estimated cost in 2000 construction $'s was $5.2 Million.

2001 – Energy and Water Development Appropriations Bill contained (H.R. 4733, Report No. 106-963) that included $400,000 to initiate (PED) Preconstruction Engineering & Design for our project.

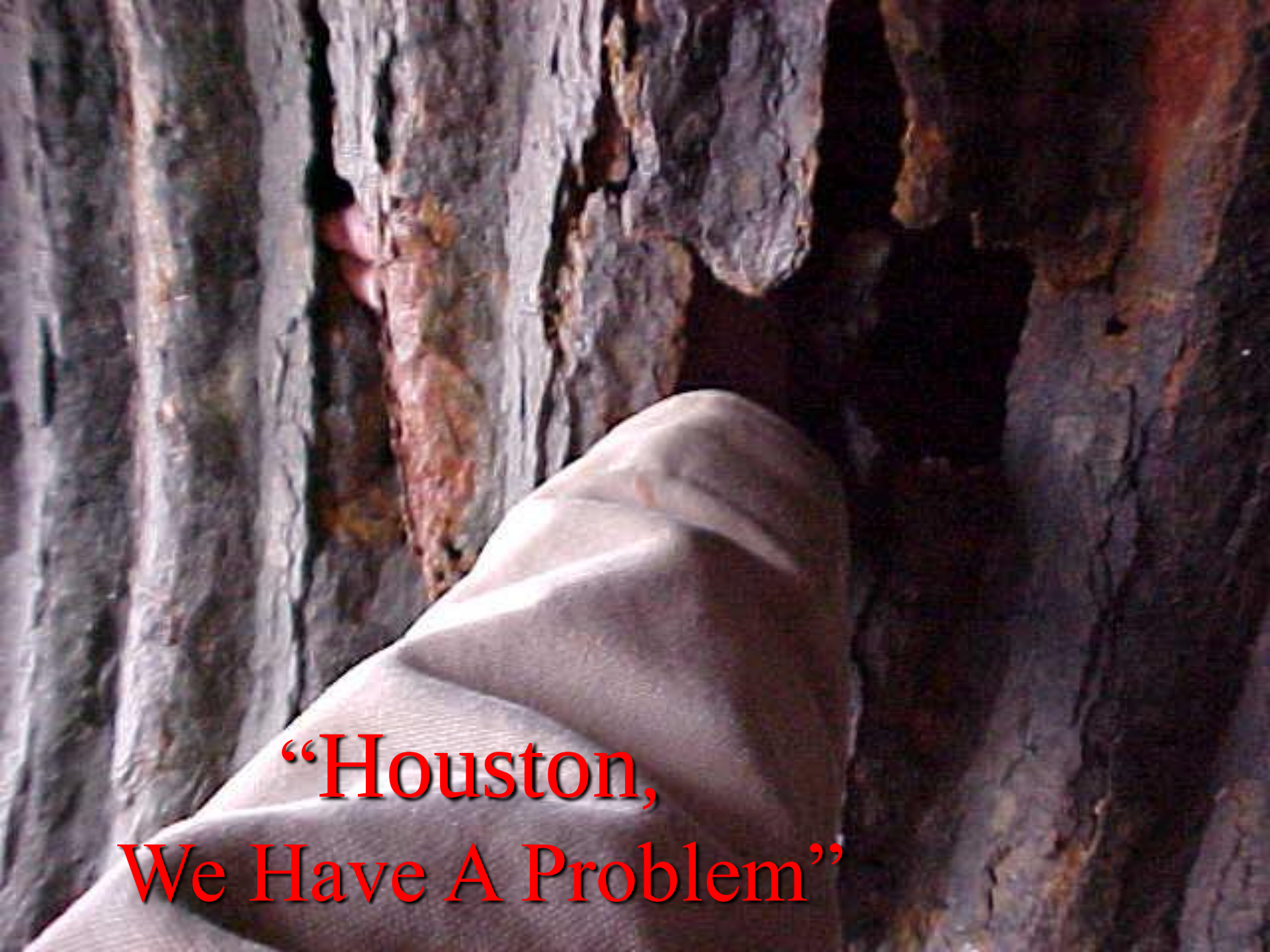
USACE Headquarters Council indicated the language of the bill could not authorize the USACE to initiate the work without Congress changing the language contained in the Bill.

Upon The City of Paducah discovering the “Language” of H.R. 4733 would not authorize the USACE Louisville District to proceed with the PED, we engaged our Federal elected officials to assist us with correcting the language that would be more appropriate for the USACE to initiate the restoration of our project.

*Notably at this time USACE Headquarters in Washington, D.C.'s Corporate Council entered into "Dialog/Debate" regarding whether or not there was a Federal interest in OUR Levee. WHY? ……..**they had given it to the Local Sponsor, City of Paducah, in 1949.***

Hence, The Question…."What is Maintenance and What is Restoration"? This legal debate would continue until 2005!


March
2004


“Houston,
We Have A Problem”

May 12, 2005

Paducah's Floodwall is given: A Minimally Acceptable Rating

By

USACE Louisville District

August 29, 2005

"Hurricane Katrina"

Hits the Gulf Coast

Paducah Notable Events - "Post Katrina"

May 16, 2006 – Paducah's Floodwall is given a Minimally Acceptable Rating with a condition, *"A Plan of Action for the repair of the corrugated metal pipes needs to be provided to this office within 60 days of the receipt of this letter. The plan should show that all necessary repairs will be completed within 12 months from the date of this letter. Failure to submit and then execute the plan may result in the removal of the Paducah Local Flood Protection Project from the Rehabilitation Assistance Program under Public Law 84-99."*

We were unable to meet this aggressive schedule.

Paducah Notable Events -"Post Katrina"

December 8, 2006 – Representatives from FEMA informed Paducah the Flood Insurance Rate Map (FIRM) are in need of updating for McCracken County, KY.

In order for FEMA to recognize the Floodwall as a viable Flood Protection Project, it must receive an acceptable rating from USACE.

FEMA has also established Minimum Levee Guidelines in order for FEMA to recognize levee systems as viable "Flood Protection Projects." in the NFIP. They are *1) Procedure Memorandum 34-Interim Guidance for Studies Including Levees and 2) Procedure Memorandum No. 43-Guidelines for Identifying Provisionally Accredited Levees (PAL).*

2007: Notice is given to Paducah-McCracken County that FEMA intends to Publish Preliminary FIRMs in December of 2009. Paducah would have 2 years from the FIRM Maps Preliminary publishing to gain its Provisionally Accredited Levee (PAL) status.

September 24, 2007 – Paducah receives its Annual Inspection Report from USACE Louisville District rating the Paducah Flood Protection Project as "Unacceptable" and is no longer eligible for benefits under Public Law 84-99.

November 2007

Public Law 110-114 Water Resources Development Act (WRDA) was passed identifying Paducah, Kentucky's Project. Under Section 5077 the Bill authorizes the Secretary of the Army to conduct a "Feasibility Study" for our project.

USACE Feasibility Study:

- **Require the execution of an "Agreement" between the Federal Government and Local Sponsor. Exec. January 2009**
- **Normally take 18-24 months once they have been initiated.**
- **Are cost shared between the Federal Government and the Local Sponsor 50/50.**
- ***Feasibility Report completed by USACE Louisville District (LRL) in April, 2011. Total Cost $797,000.***

February 2008 – August 2008

- **The Paducah Board of Commissioners authorizes the City of Paducah Engineering Department and Florence & Hutcheson to engage the USACE Louisville District regarding the repair of CMPs.**

Accomplishments:

- **USACE, Florence & Hutcheson, and Paducah's Engineering Staff successfully completed the following:**
  1. **Plans and Specifications to repair the CMPs with USACE approvals.**
  2. **Received and opened bids for the project September 29, 2008. *Sixty day window to award.***

October 2008

We had our project ready to execute. However, if we had awarded the project immediately following the bid opening we would have forfeited our opportunity to receive ANY Federal credit (In-Kind or Monetary) for our efforts. We are also in a position to forfeit any credit opportunities IF we spend money in advance of "The Feasibility Study's Completion" and/or the execution of any "Additional Agreements".

FEMA's required schedule to upgrade the FIRMs also created more complications for the City of Paducah to overcome in our attempts to satisfy all Federal requirements and schedules.

Hence, "The Paducah Dilemma."


Coke

September, 2008 Washington, D. C.

- Met with Rep. Ed Whitfield's staff member, Mr. Cory Hicks
- Mr. Hicks arranged meetings with Senator McConnell's staff and ASACW's (Assistant Secretary to Army Civil Works) staff.
- Subsequent to those meetings USACE Cincinnati Division and Louisville District personnel prepared documentation for ASACW's Office to *entertain/consider* an "*Exception to Policy – MOU." (EP)*

Without receiving an EP, Paducah would not have receive any Federal Credit of $2.1 million of expenses in association with its Mandatory CMP Slip Lining Project. All Federal monies require appropriate studies and/or agreements to be fully executed prior to any federal credits being recognized.

Exception to Policy From USACE

Given these circumstances it became necessary to engage the USACE at all levels from top to bottom whereas, the commanders of the Louisville District, Cincinnati Division and Headquarters would prove necessary if the City of Paducah was going to be allowed to receive any financial credit regarding any construction activity that would occur in advance of the appropriate federal documents being executed. Based on the justifications outlined by the Louisville District and Cincinnati Division, granting of an "Exception To Policy" would become the sole decision of ASACW's.

What Happened?

- **The ASACW authorized the "Exception to Policy" on 14 November, 2008 positioning the City of Paducah to become *more eligible to receive* a Federal Credit for its work in advance of the USACE's normal protocols.**

- **Authorizing the Exception allowed us to award our project on 20 November, 2008,……eight (8) days priorto our window of opportunity to award the project bid that expired Friday, 28 November, 2008.**

The Floodwall Reconstruction Efforts To Date

FLOOD CONTROL PROJECT COSTS FROM 1994 - 2008

FWPP #1 - Purchase of Electrical Equipment	Mar-94	$12,315.00		
			1994	**$12,315.00**
FWPP#2 Engineering Design - Mechanical and Electrical Upgrades	Jun-95	$21,901.20		
FWPP#2 Purchase of Medium Voltage Starter Group	Oct-95	$49,925.00		
FWPP#2 Purchase of Variable Frequency Drive	Oct-95	$14,336.75		
FWPP#2 Purchase of Vertical Turbine Pump	Oct-95	$23,055.00		
			1995	**$109,217.95**
FWPP#2 Installation of a Stormwater Pump	Jul-96	$113,496.00		
			1996	**$113,496.00**
Engineering Design - Mechanical and Electrical Upgrades	Aug-97	$73,545.50		
FWPP#2 30" Force Main Repair	Oct-97	$14,548.00		
			1997	**$88,093.50**
FWPP#11 Purchase of a Lubrication System	Feb-98	$13,871.00		
FWPP#11 Purchase of a Vertical Turbine Pump	Feb-98	$80,088.00		
FWPP#11 Purchase of a Vibration Detection Systgem	Feb-98	$3,043.00		
FWPP#11 Purchase of a Programmable Logic Control System	Feb-98	$5,603.47		
FWPP#11 Purchase of a Motor Control Center	Feb-98	$22,761.40		
FWPP#11 Stormwater Pump Installation	Aug-98	$121,191.00		
			1998	**$246,557.87**
FWPP#11 Main Beaker Replacement	Dec-99	$13,880.00		
			1999	**$13,880.00**
FWPP#5 & #6 Pump Upgrades	Jul-01	$192,509.00		
FWPP#5 & #6 Pump Upgrades	Aug-01	$2,494.56		
			2001	**$195,003.56**
FW 66" Corrugated Metal Pipe Emergency Repair	Mar-04	$68,146.90		
FWPP#2 30" Pipe Repair	Sep-04	$17,960.00		
FWPP#2 Pump Repair	Dec-04	$16,500.00		
			2004	**$102,606.90**
FWPP#4 Repair Electrical System Upgrade	Jun-06	$8,030.00		
FW Embankment work near Clarkline	Jul-06	$5,211.98		
			2006	**$13,241.98**
TOTAL COSTS 1994 - 2008				**$894,412.76**

- December, 2009: CMP restoration completed
- January 25, 2010: USACE reinstates the Paducah LFPP restoring our benefits afforded to us in regards to the Rehabilitation Assistance Program under Public Law 84-99
- April 6, 2010: USACE finalizes a “Levee System Evaluation” (LSE) yielding a POSITIVE result.
- Feasibility Report Completed April, 2011.
- Secured PED funding for the project’s restoration.
- Initiate PED Fall 2011 and Project Funding Request.

The Floodwall's Corrugated Metal Pipe (CMP) Restoration & Rehabilitation Project Overview


HOBAS

USACE Louisville District CMP Restoration & Rehabilitation Proof Test


10/14/2009


10/14/2009


10/14/2009


10/14/2009


10/14/2009


CAUTION
COLORADO
10/14/2009


10/27/2009


10/27/2009


10/27/2009


10/27/2009


10/27/2009
FLOW


10/27/2009

The Floodwall Reconstruction Considerations

- Determine Feasibility (Completed 2011)
- Determine Critical Components (Completed 2011)
- Determine Risk Based Reconstruction Priorities & Project Phasing (Completed 2013)
- Develop Reconstruction Specifications and Design Documents Based on Risk (In Progress)

Risk Based Reconstruction Priorities & Project Phasing

1. Pump Station: 12 Stations
2. Flap Gates: City In-Kind Effort, 39 Considered.
3. Seal Closures: City In-Kind Effort, 9 Unnecessary Openings To be Sealed
4. Gate Well Structures, USACE Regulations Require that 3 be Constructed.
5. Tee Wall, Toe Drains, Water Stops & Miscellaneous items.
6. New Pump Station 14 (For Consideration)
7. I-Wall Investigation Analysis & Remediation

The Floodwall Current Project Status & Moving Forward

OHIO RIVER SHORELINE, PADUCAH, KENTUCKY RECONSTRUCTION PROJECT

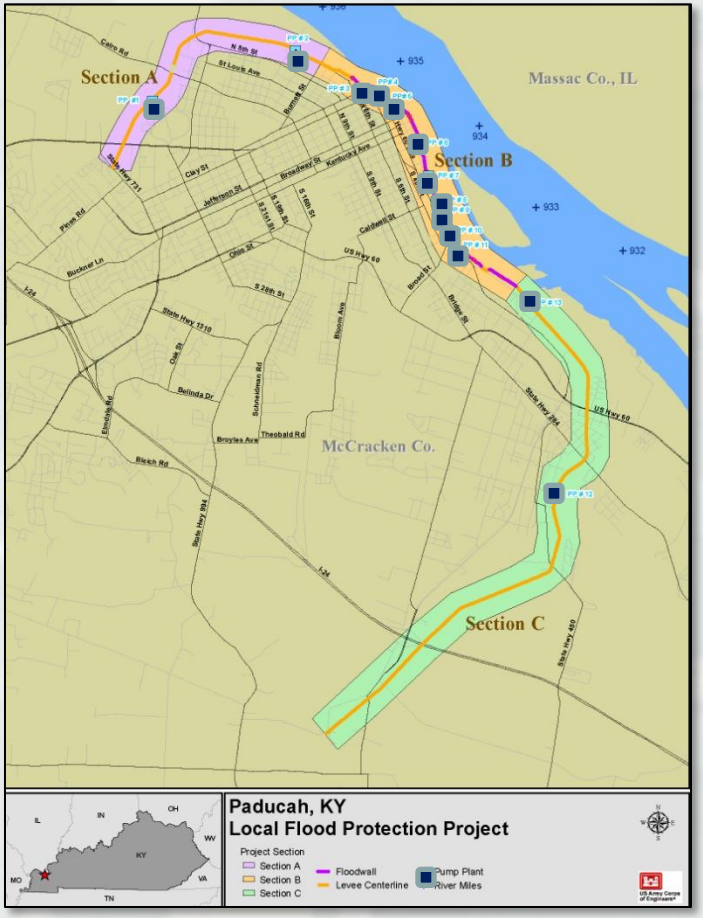
Congressional Visit

February 19, 2016

City of Paducah, KY
Gayle Kaler, Mayor
Jeff Pederson, City Manager
Rick Murphy, P.E. City Engineer & Public Works Director

Project Overview

- **Project Authorization (WRRDA 2014)**
  - Reconstruction Project
    - Rehabilitate 12 existing pump stations
    - Construct 1 new pump station
    - Slip-line 37 existing Corrugated Metal Pipes (CMP)
    - Replace water stops, plug toe drains
    - Construct new gate well structures
    - Permanently close several floodwall openings
    - Install scour erosion control
- **Project Objectives**
  - Improve system reliability
  - Restore system performance
- **Current Authorization Generated From USACE's Flawd Estimate.**
  - **$20.2M (FY14)**
- **BCR = 4.3 @ 4 3/4%**
  - **Annual Net Benefits = $5.3M**



Project Status

- **Current Project Status**
  - Slip-lining completed previously by the City of Paducah
  - Design work for Pump Stations 2, 7, 9 & 11 near or at completion.
  - Design Package 1 of 3 that included the reconstruction of Pump Stations 2, 7, 9, & 11 was scheduled to be advertise this summer.
  - USACE Louisville District errors cloud the projects current authorization and prevent any appropriations to be made or expended for the project's reconstruction at this time.
  - Pump Station #9, currently at 50% capacity, requires immediate reconstruction and must now be completed 100% by the City of Paducah ASAP.
  - Pump Station #2, subject to 33% pumping capacity loss that could cause several square miles of urban development to flood internally if the City of Paducah does not immediately reconstruction this station. The immediate reconstruction causes the City of Paducah to expend 100% the stations reconstruction without any government cost sharing as planned.
  - Government estimating errors of omission for Pump Stations 1, 2 and 12 discharge piping created a bust in the "Total Project Authorization" that creates an approximated 36 month delay. Such a delay has put the citizens of Paducah unnecessarily at risk of internal flooding should Pump Station #2 fail.

Project Status Continued

- **Current Project Cost Status**
  - Reconstruction of the project as recommended in the Chief's Report will exceed the Section 902(b) limit
    - $32.55M > $25.51M
  - Post Authorization Change Request (PACR) in review process
  - Drafting the necessary "2016 WRDA Bill Language" suitable for the appropriate Project Re-authorization for this Project is vitally important for the health, safety and well being for the citizens of Paducah-McCracken County.

Cost Increase

- The estimate included in the authorized project cost severely underestimated the cost for pump station discharge pipe replacements which were recommended in the Feasibility Report.

- Revised pump, motor, and controls replacement prices have increased since original estimate in 2010

Photo Circa 1949; PS#2
Discharge pipes – 60” dia, 48” dia, 30” dia

Photo November 2015, PS#2 Discharge Pipe
Severely eroded pipes with voids

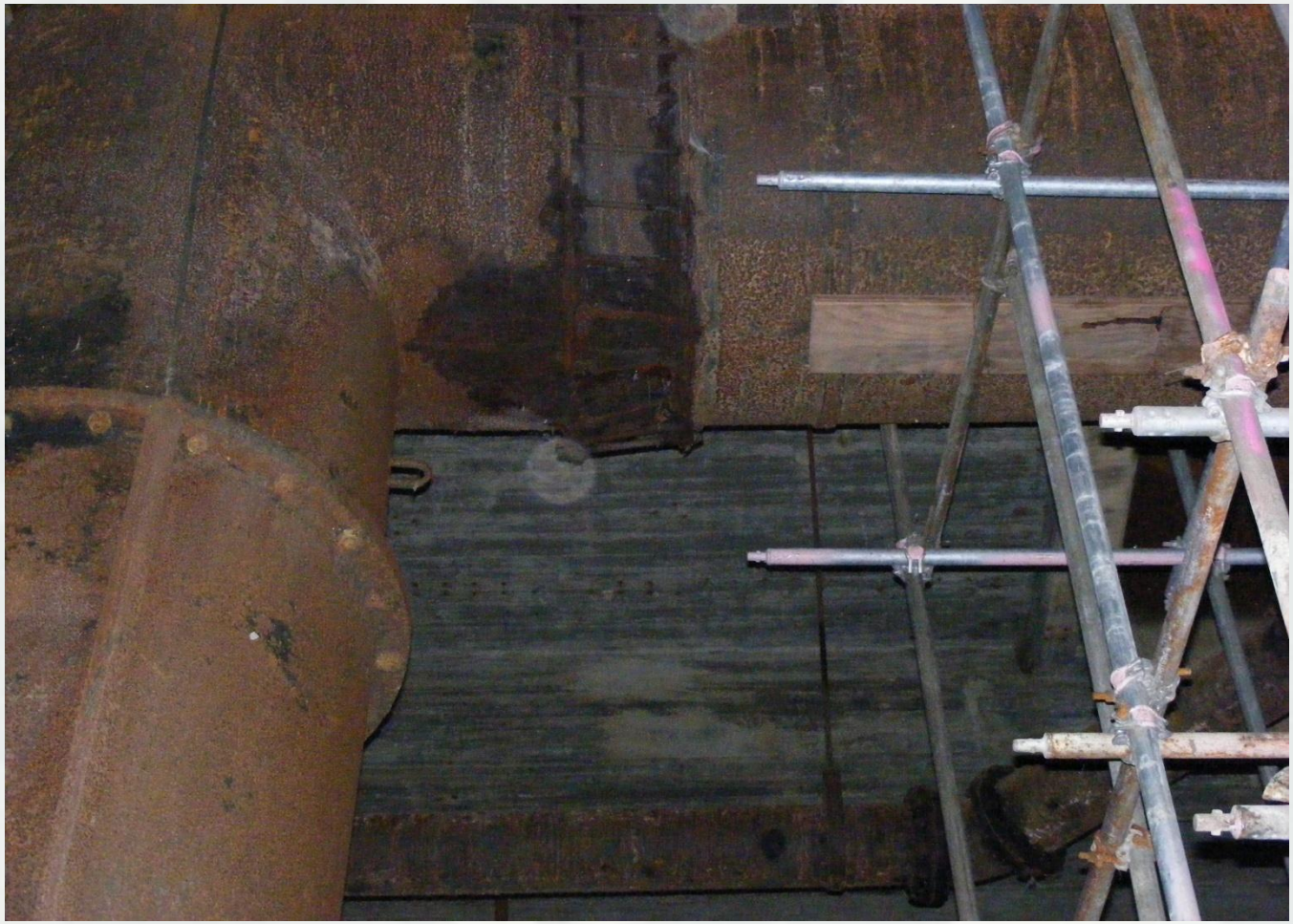
Current Situation Example

PS#2 discharge pipe
Supported by scaffolding

Current Situation Example Cont.

PS#2 discharge pipe
Supported by scaffolding

Current Situation Example Cont.



PS#2 discharge pipe
coupling failing! Pipe supported by scaffolding

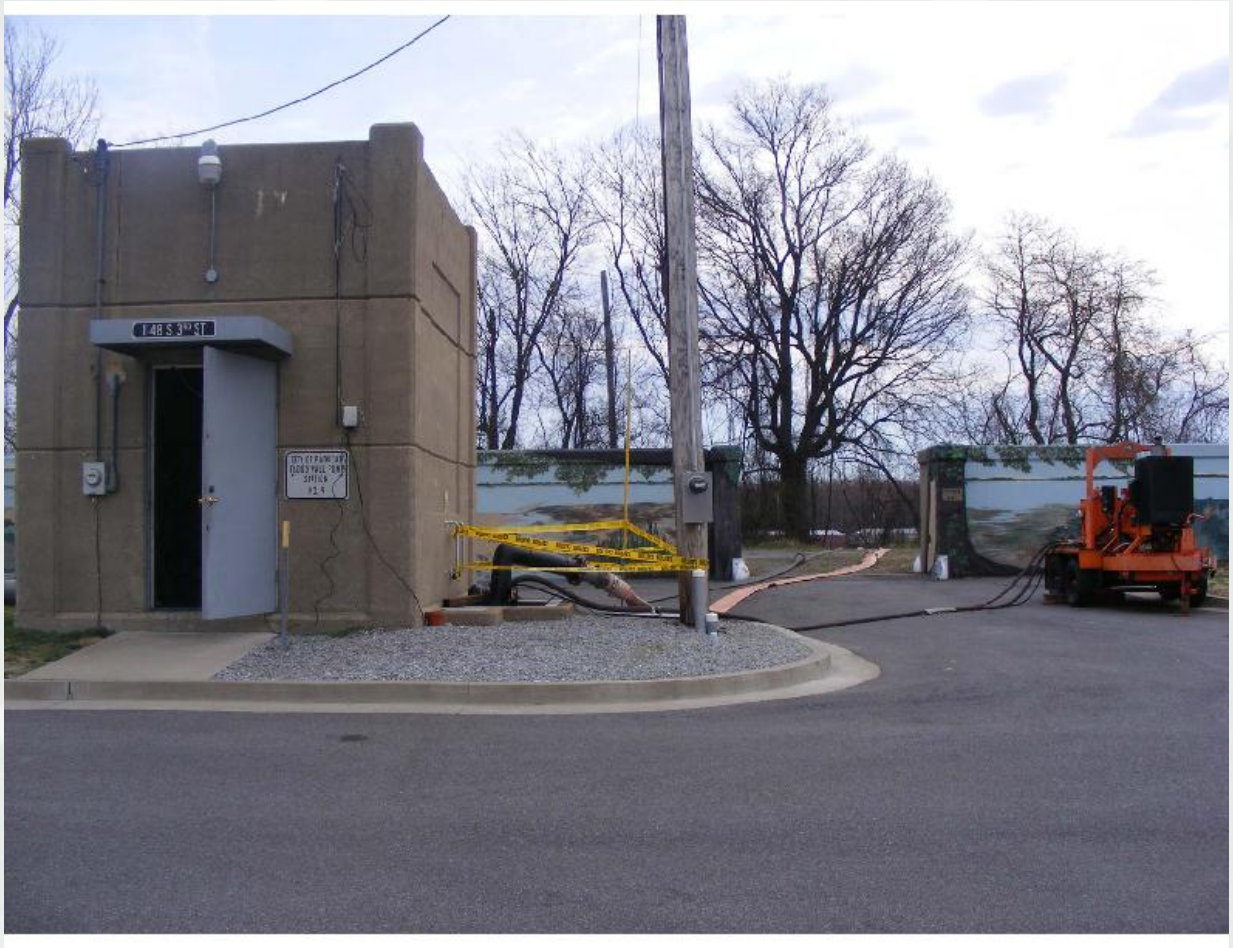
Current Situation Example Cont.

PS#2 discharge pipe coupling ruptured.
Discharge pipe supported by scaffolding

Current Situation Example Cont.

PS#9, Pump No. 2 has a broken drive shaft that causes this pump station's output to be reduced by 50%.

Current Situation Example Cont.



PS#9, Pump Temporary Pumps added to the station to offset lost pumping capacity at this station.

Current Situation Example Cont.

PS#9, Pump Temporary Pumps added to the station to offset lost pumping capacity at this station.

City of Paducah
Formal Request

- Post Authorization Change Request
- Sec 7001 of WRRDA 2016
  - **Modification of the Project's existing authority from $20.2M (FY14) to $32.55M**

Recommendations For Moving Forward

1. Considering the project key components are 72 years old and are indicating they’re at or near failure coupled with an additional 24 to 36 month federal government processing delay to gain federal funding,…. Portions of the project have shown they can no longer be delayed are in desperate need of immediate reconstruction!

2. Given the Project's reconstruction circumstances coupled with the complexities of expending federal government monies prior to the appropriate agreements in place, it will be necessary for the USACE to successfully "Justify" through "MOU" and an "Exception To Policy" before the ASACW. Gaining an Exception To Policy will position the City of Paducah to gain "Authorized In-Kind" project reconstruction expenses that will count as a portion of our required in-kind match for the overall project.

3. Given that Pump Stations 2 & 9 are of the greatest concern and risk for the health, safety and wellbeing of a large portion of our citizens, it is recommended the City to take immediate action to restore the full pumping capacities of both Pump Stations 2 & 9 as soon as reasonably possible!

4. Given that USACE Louisville District has nearly completed the design documents for both Pump Stations 2 & 9, it is recommended that the City of Paducah make an appropriate formal request to the USACE Louisville District that all Design Documents for both Pump Stations 2 & 9 be completed immediately by the USACE and delivered to the City in order that the City may advertise and administer this portion of the project's reconstruction.

5. Should the City be granted an appropriate MOU and an Exception to Policy by the office of ASACW, and is allowed to administer this portion of the project's reconstruction, it is recommended the USACE Louisville District have the responsibility for technical oversight during this portion of the project's reconstruction.

Questions?