

# **ENGINEERING DOCUMENTATION REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

## **MISSISSIPPI RIVER AT DAVENPORT, IOWA FLOOD DAMAGE REDUCTION PROJECT**

### **REACH 1 DAVENPORT WATER TREATMENT PLANT**



**NOVEMBER 2005**



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



**DEPARTMENT OF THE ARMY**  
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS  
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## ACKNOWLEDGMENT

Many members of the U.S. Army Corps of Engineers, Rock Island District (District) assisted with the preparation of this Engineering Documentation Report (EDR). Primary team members who are familiar with the technical aspects of this EDR are listed below:

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**US Army Corps  
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TO SIGN  
OUR WORK**



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**EXECUTIVE SUMMARY**

This Engineering Documentation Report (EDR) recommends the construction of a flood damage reduction project at Davenport, Iowa, to protect a portion of the riverfront (Reach 1), including the Davenport Water Treatment Plant (DWTP) owned by the Iowa-American Water Company (IAWC), from Mississippi River flooding. The recommended project is part of a larger project to protect the Davenport, Iowa riverfront, that the U.S. Congress authorized for construction on December 31, 1970 under Public Law 91-611, but which was never constructed.

The City of Davenport (City) requested, by a City Council resolution signed May 16, 2001, a U.S. Army Corps of Engineers (Corps) reconnaissance study and appropriation of Federal funds to investigate whether there would be a Federal interest in a flood damage reduction project for the City. A Limited Reevaluation Study (LRS) was initiated by the U.S. Army Corps of Engineers, Rock Island District (District) in September 2001. The LRS was completed in June 2002 and approved in August 2002. The approved LRS found likely economic justification for a flood damage reduction project and recommended development of an EDR. The city of Davenport is located in east-central Iowa, on the right descending bank of the Mississippi River, in Scott County.

The project would consist of two types of floodwalls, a portion of earth embankment, access closure structures, temporary and permanent access roads, interior flood control features, and an operation and maintenance (O&M) access road, which would provide flood damage protection for Reach 1 based on a 200-year design event, equivalent to the level of protection provided by the flood damage reduction systems of adjacent communities. The project is a cooperative effort between the Federal Government and the City.

A cost-shared design agreement (75% Federal and 25% non-Federal) was executed on March 24, 2003 for preparation of the EDR, including an Environmental Assessment (EA), and for the preparation of plans and specifications. This EDR establishes designs and cost estimates for the recommended project, includes appropriate National Environmental Policy Act (NEPA) documentation, and establishes a schedule for project implementation. The estimated cost to implement the project is \$7,021,050, which would be cost-shared 75% Federal and 25% non-Federal. The benefit-cost ratio is 2.2. A Project Cooperation Agreement (PCA) is required prior to initiating construction.



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C	Geotechnical Analysis
D	Structural Design Analysis
E	Real Estate Plan
F	Project Cost Estimate
G	Project Plates
H	Distribution List

## ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
AT&T	American Telephone and Telegraph
BCOE	Bidability, Constructability, Operational, and Environmental
CFR	Code of Federal Regulations
CEMVD	U.S. Army Corps of Engineers, Mississippi Valley Division
CFS	Cubic Feet per Second
District	U.S. Army Corps of Engineers, Rock Island District
DWTP	Davenport Water Treatment Plant
EA	Environmental Assessment
EDR	Engineering Documentation Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ER	Engineering Regulation
ESA	Environmental Site Assessment
FFE	Fully Funded Estimate
FT	Feet
FWS	Fish and Wildlife Service
GDM	General Design Memorandum
GIS	Geographic Information Systems
HTRW	Hazardous, Toxic, and Radioactive Waste
HTRWDR	Hazardous, Toxic, and Radioactive Waste Documentation Report
IHPA	Illinois Historic Preservation Agency
IAWC	Iowa-American Water Company
IC&E	Iowa, Chicago, & Eastern
IDNR	Iowa Department of Natural Resources
LER	Lands, Easements, and Rights-of-Way
LERRD	Lands, Easements, Rights-of-Way, Relocations, and Disposal Areas
LRR	Limited Reevaluation Report
LRS	Limited Reevaluation Study
MCACES	Micro Computer Aided Cost Estimated System
MSL	Mean Sea Level
NED	National Economic Development
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRI	National Rivers Inventory
O&M	Operation and Maintenance
PAC	Post-Authorization Change Report
PCA	Project Cooperation Agreement
PCC	Portland Cement Concrete
PED	Preconstruction Engineering and Design
PL	Public Law
RQD	Rock Quality Designation
RM	River Mile
SHSI	State Historical Society of Iowa
UMRBC	Upper Mississippi River Basin Commission
VE	Value Engineering
WRDA	Water Resources Development Act



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**Section 1 – Project Background**

**1.1 Introduction**

1.1.1 General. This Engineering Documentation Report (EDR) with an integrated Environmental Assessment (EA), produced by the U.S. Army Corps of Engineers, Rock Island District (District), provides engineering analysis and design along with updated cost estimates for a flood damage reduction project for the City of Davenport (City), Iowa as recommended in a Limited Reevaluation Study (LRS) dated June 2002.

The City of Davenport (City) requested, by a City Council resolution signed May 16, 2001, a U.S. Army Corps of Engineers (Corps) reconnaissance study and appropriation of Federal funds to investigate whether there would be a Federal interest in a flood damage reduction project for the City. A Limited Reevaluation Study (LRS) was initiated by the U.S. Army Corps of Engineers, Rock Island District (District) in September 2001. The LRS was completed in June 2002 and approved in August 2002. The approved LRS found likely economic justification for a flood damage reduction project and recommended the development of an EDR. A Design Agreement was executed between the District and the City on March 24, 2003 to allow for continuation of preconstruction engineering and design activities, including preparation of an EDR.

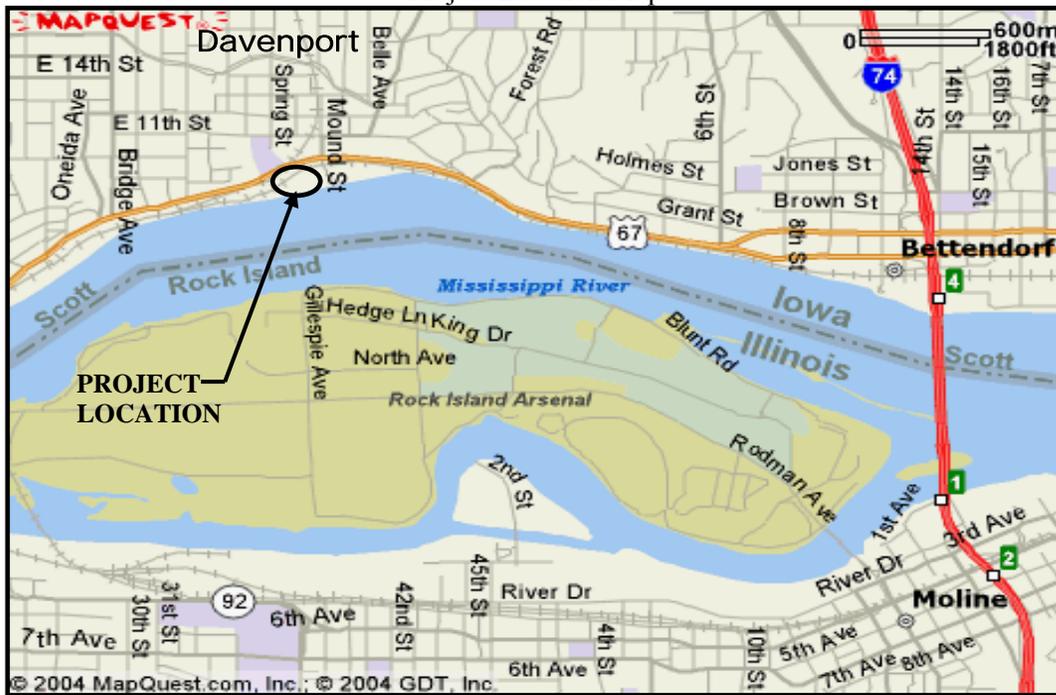
The purpose of this EDR with integrated EA is to meet Corps policy requirements and Federal law in determining a recommended course of action to provide a solution for flood damage reduction along Reach 1. The EA ensures that project construction complies with requirements contained in the National Environmental Policy Act (NEPA). The EDR is coordinated with public agencies, as well as the public, to solicit ideas and input to ensure an optimum solution is designed and constructed.

1.1.2 Project Location and Description of Project Area. The city of Davenport is located in east-central Iowa on the right descending bank of the Mississippi River, from approximate River Mile (RM) 477 to RM 485, in Scott County. There are about 88,500 square miles of Mississippi River drainage area upstream of the city. The city population is about 98,359 in an area of about 66 square miles. The city is one part of a group of cities forming the metropolitan area called the “Quad-Cities.” Davenport is the largest of the several cities and towns that extend for about 10 miles along both banks of the Mississippi River in Scott County, Iowa and Rock Island County, Illinois.

The DWTP is located near the upstream end of Davenport, Iowa, at RM 484. See Figure 1.1.1 below and Plate X2 in Appendix G. The Iowa-American Water Company (IAWC) owns and operates the DWTP. The DWTP provides the only source of potable tap water for approximately 131,000 people in Davenport, Bettendorf, and portions of Scott County in the State of Iowa. Several hundred businesses and governmental organizations rely on this water for their day-to-day activities, with the DWTP being the sole source of potable tap water for the area in the foreseeable planning horizon. The Reach 1 protected area would include the DWTP, a portion of the Iowa, Chicago & Eastern (IC&E) Railroad, two City-owned sanitary sewer lines, and several other water mains and utilities. See Figure 1.1.2.

The cities adjacent to Davenport, including Bettendorf, Iowa, and Rock Island and East Moline, Illinois, all have a high level of protection from Mississippi River flooding based on a 200-year design event as described in Section 2.1.2, Hydrologic and Hydraulic Considerations. The proposed project level of protection would be equivalent to the level of protection of these adjacent cities based on the project design criteria.

**Figure 1.1.1**  
Project Location Map



**Figure 1.1.2**  
Davenport Water Treatment Plant, Flood of 2001



## 1.2 Authorization

A Mississippi River Flood Damage Reduction Project at Davenport, Iowa, was authorized for construction on December 31, 1970, under Public Law (PL) 91-611, 91<sup>st</sup> Congress, in accordance with the recommendations of the Chief of Engineers in House Document No. 92-161, Ninety-Second Congress, 1<sup>st</sup> session. A Post-Authorization Change report (PAC) based on the Davenport, Iowa, Phase I General Design Memorandum (GDM), dated August 1976, was approved on November 29, 1977. The Phase I GDM, with the exception of the Nahant Marsh feature, was approved May 2, 1978. The availability of the final Environmental Impact Statement (EIS) was published in the *Federal Register* on March 3, 1978. A Phase II GDM recommending revisions to the proposed project was completed in February 1982 and approved on June 4, 1982. In May 1984, the City declined to participate in construction of the project. The project was classified as inactive and was scheduled to be de-authorized in April 2002.

Following a series of damaging floods in 1993, 1999, and 2001, the City of Davenport Council signed a May 16, 2001 resolution requesting a Corps reconnaissance study and appropriation of Federal funds. Federal funds were made available to initiate a LRS in September 2001. The LRS, which was completed in June 2002 and approved in August 2002, showed a continued Federal interest in a flood damage reduction project at Davenport, Iowa for Reach 1.

### **1.3 Items of Local Cooperation and the Project Cooperation Agreement (PCA)**

The project, as authorized in 1970, required the City of Davenport (City) to provide the lands necessary for construction of the project, but did not require any cash cost-share. As a result of the Water Resources Development Act (WRDA) of 1986, local sponsors are required to provide a cash contribution in addition to all lands, easements, rights-of-way, relocations, and necessary improvements for disposal areas (LERRD). Although the project was authorized prior to WRDA 1986, the cost sharing provisions of WRDA 1986 apply because project construction was not initiated prior to April 30, 1986.

In accordance with Section 103(a) of WRDA 1986, the local sponsor must pay 5 percent of the total project costs assigned to flood control and provide all necessary LERRD for construction and operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project. If the value of the above non-Federal contributions is less than 25 percent of total project costs assigned to flood control, the non-Federal sponsor must pay additional amounts as necessary to ensure the 25 percent minimum non-Federal cost share is met. However, in no event shall the non-Federal share exceed 50 percent of total project costs assigned to flood control. Following construction, the local sponsor is also responsible for all OMRR&R of the project.

### **1.4 Previous Investigations**

The Phase II GDM, dated February 1982 and approved on June 4, 1982, served as the basis for the LRS. The reevaluation process focused on updating the cost estimate and economic analysis for the entire project, Reaches 1 and 2, which were previously authorized for construction. The LRS showed that there is a strong Federal interest in constructing flood damage reduction features to protect Reach 1.

- A. U.S. Army Corps of Engineers, Rock Island District, General Design Memorandum (GDM), Phase I, Plan Formulation for Flood Control, Davenport, Iowa, dated August 1976.
- B. U.S. Army Corps of Engineers, Rock Island District, General Design Memorandum (GDM), Phase II, Local Flood Protection, Mississippi River, Davenport, Iowa, dated February 1982 and approved on June 4, 1982.
- C. U.S. Army Corps of Engineers, Rock Island District, Limited Reevaluation Report (LRR) for Flood Damage Reduction, Mississippi River at Davenport, Iowa, dated June 2002.

## 1.5 Project Description

1.5.1 General. The Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project), would consist of a primary floodwall, a portion of earth embankment, access closure structures, temporary and permanent access roads for the DWTP, and interior flood control features that include sewer work, gated storm pipe gravity outlets, and utility relocations, along with an operation and maintenance (O&M) access road. The project is a cooperative effort between the Federal Government and the City of Davenport (City). The Federal role consists mainly of planning and design, funding, and contracting for the construction of the various project features. The basic responsibility of the non-Federal sponsor, the City, is to provide planning input, provide rights-of-way, operate and maintain the completed project, and bear certain initial costs related to utility relocations. The IAWC and the IC&E Railroad are active participants in the project. The levee and floodwall system is approximately 2,285 feet (ft) long and protects an area approximately 9.5 acres in size. A permanent pump station is not proposed. Existing storm sewers collect runoff that enters an existing government box storm sewer along the existing river wall, or seawall. When the river exceeds the closure elevation of the proposed gatewells, the storm sewers gatewells would be closed, and temporary pumping would be required to remove the DWTP's interior storm water runoff. The level of protection for Reach 1 was based on a 200-year design event described in more detail under Section 2.1.2.

1.5.2 Floodwall. A proposed 2,160 ft floodwall would be the main feature of the project's flood damage reduction system. The west end of the proposed floodwall would tie into high ground west of the DWTP, while the east end would tie into the northeast corner of building "B" of the DWTP. The proposed floodwall consists of two types of construction. The first type of floodwall consists of an "I" wall configuration, where sheet piling is driven to bedrock and a small footing serves as a connection between the sheet piling and support for the floodwall. See Plate X3 in Appendix G for the locations of this type of floodwall and Plate C6 for the proposed floodwall cross-section. The second type is required to construct a portion of the floodwall directly on top of the existing government storm sewer, where the landside face of the floodwall would line up with the landside vertical face of the government sewer, as shown on Plate C6 in Appendix G. This portion of floodwall consists of a horizontal footing which lies over the top of the government sewer, along with a vertical wall, and is configured in an "L" shape. The appearance of both types of floodwalls would be the same above ground.

The proposed architectural treatment for the floodwall would include providing an additional 3 inches of portland cement concrete (PCC) to the proposed floodwall to develop a limestone block appearance. Formed liners with 3 inches of relief, and the use of colored PCC, would provide this proposed appearance to the floodwall. The proposed architectural pilasters, a wall cap, and lights placed on the floodwall would also enhance its appearance. The proposed lights would also provide lighting for operation and maintenance and security purposes.

1.5.3 Earth Embankment. An approximate 125 ft segment of earth embankment (levee) is proposed to tie the northwest corner of building "B" of the DWTP into high ground to the west, near the existing IC&E railroad abutment south of U.S. Highway 67 (River Drive). See Plate X3 in Appendix G. The proposed earth embankment would require existing vegetation to be stripped and the existing earth to be scarified and compacted. The new compacted earth embankment would be less than 3 ft in height.

1.5.4 Davenport Water Treatment Plant Building “B”. Building “B” of the DWTP will serve as a part of the flood damage reduction system. The use of building “B” of the DWTP as part of the flood damage reduction system has been coordinated with the IAWC. Both the IAWC and District engineers’ determined that building “B” of the DWTP is designed to withstand Mississippi River flood waters.

1.5.5 Gatewell Closures. This project includes combining existing storm sewers and developing new drainage patterns on the interior, or protected side of the levee and floodwall system. Two storm gatewells (B and D) are required along the Mississippi River, while the other gatewells (A, C, E, and F) are located throughout the rest of the project area. See Plates C2-C5 in Appendix G. An existing storm sewer would penetrate the northeast corner of the proposed floodwall. See Plate C5. This sewer is being used to provide interior drainage and requires two gatewells to prevent interior flooding during river stages above elevation 564 ft, MSL 1912. An interior sub-drain along the proposed floodwall would be connected to the storm sewer gatewells.

An existing 48 inch City-owned sanitary sewer pipe also would penetrate the proposed floodwall. See Plates C1-C3. The IAWC would have one or possibly two connections to this pipe within the protected area. Details of this design will be finalized during the development of plans and specifications. Gatewells are proposed at the floodwall so that this pipe can be closed if it experiences floodwater pressures that could damage the pipe and flood the interior.

1.5.6 Floodwall Closures. The IC&E Railroad track penetrates the proposed floodwall system at two locations. Two single leaf steel floodgates are proposed at these two locations to allow rapid closure prior to an impending flood. This portion of railroad track would be closed and unusable until flood waters recede and the closure structures are reopened. Also, the main access road to the DWTP, adjacent to the proposed upstream (eastern) IC&E Railroad closure, would require a single leaf steel floodgate for closure. This gate would also remain closed until flood waters recede and it could be reopened. All of the gates would be approximately 20 ft wide and would include a PC concrete sill, a foundation supported on H-piles, and a sheet pile cut-off wall driven to bedrock. See Plates C4 and S3.

A personnel floodgate is required to access the existing Mississippi River intake area of the DWTP. This gate would be designed with bars so that security could be maintained when the gate is open, allowing visual inspection of the intake area. This personnel floodgate would be designed so that closure of the gate could be made prior to an impending flood.

1.5.7 Operation and Maintenance Access Road. In order to properly operate, maintain, repair, and rehabilitate the project, and to allow the IAWC access to the river, an O&M access road on the unprotected side of the proposed floodwall is required. The proposed O&M access road would consist of a 12 ft wide section of PCC pavement between the proposed floodwall and the river. See Plates C1-C4 and C6. The proposed O&M access road would also serve a dual role as a recreational path. There is an existing path along the riverfront that provides an important recreational opportunity for the City’s residents and the general public. The proposed O&M access road would be connected to the existing riverfront path at each end and would accommodate recreational uses at those times when it would not conflict with required O&M activities.

Landscaping elements would be incorporated into the final O&M access road design to enhance the appearance of the project and to replace existing trees that are within the proposed floodwall alignment.

1.5.8 Plaza Relocation. The City constructed a plaza that contains a landscaped ground, gazebo, and a well known and popular sculpture by John Bloom (cast in the 1990's) entitled "Watching the Ferry", mostly with donated funds, to enhance the riverfront area. The existing plaza, located just southwest of the DWTP between stations 2+00 and 3+00, as presented on Plate C1 in Appendix G, would need to be relocated due to the proposed floodwall alignment. It is proposed that the plaza be relocated several hundred feet downstream to the west. The City would take on full responsibility for determining, funding, and performing the work necessary to relocate the plaza.

1.5.9 Utilities. The floodwall would be designed to accommodate existing utilities as necessary. Existing 15 kilovolt overhead power lines are located above the project area and along the proposed floodwall alignment. These existing overhead power lines would be relocated outside of the project area along the south side of River Drive, and would be placed underground to improve aesthetics.

Several abandoned sewer pipes would pass through the proposed floodwall and into the existing government storm sewer. Many of these existing sewer pipes have been plugged and sealed. During construction, the competence of these plugs would be verified. An existing 36 inch abandoned storm sewer would penetrate the proposed floodwall system along the northeast corner of the project. A portion of this existing storm sewer would be removed and sheet pile cut-off would be driven to bedrock at this location.

An active 16 inch high pressure water main would penetrate the proposed floodwall system north of the access road to the DWTP. This line is equipped with shut off valves located near the proposed floodwall. In order to provide adequate protection from possible line failure, this water main would be excavated and a split casing would be used to reinforce the pipe as it passes under the proposed floodwall system.

An existing American Telephone and Telegraph (AT&T) Company fiber optic cable would penetrate the proposed floodwall system in two locations. See Plates C1 and C5 in Appendix G. The AT&T Company completed a field location of their existing utilities and reviewed existing drawings. The upstream penetration would consist of a 2 inch steel conduit encased in PC concrete or a suitable fill material to prevent leakage. The downstream penetration would include fiber optic cables encased in a 1¼ or 2 inch plastic pipe. It is proposed that, during construction, the cable would be uncovered and sheet pile would be driven adjacent to the casing, taking care not to damage the cable.

If other unknown utilities are identified during construction, the status of those utilities would be investigated and the utilities would be removed or modified as required to ensure adequate flood protection. The final design for the utility modifications would be accomplished during the development of the project's plans and specifications.

1.5.10 Project Data Summary. Table 1.1 presents a summary of the project data.

**Table 1.1  
Project Data Summary**

<b>Item</b>	<b>Quantity/Measurement</b>	<b>Remarks</b>
<b>PROJECT PURPOSE:</b>		To provide a high level of flood damage reduction for Reach 1, including the Davenport Water Treatment Plant (DWTP), all located in Davenport, Scott County, Iowa. The DWTP serves over 131,000 customers.
<b>PROTECTED AREA:</b>	9.5 acres	Area of Reach 1.
<b>PROJECT FEATURES:</b>		
Floodwall	Top Elev. 573.9 ft Mean Sea Level (MSL) 1912, 2,160 LF	It would consist of “I” wall and “L” wall type configurations. The west end would tie into high ground. The northeast end would tie into building “B” of the DWTP. It would receive architectural treatment to enhance its aesthetics along the riverfront.
Sheet Pile Cut-Off Wall	1,460 LF	This would provide positive seepage cut-off and foundation support for the “I” wall.
Earth Embankment (Levee)	125 LF and 1 to 3 ft high	The east end would tie into the northwest corner of building “B” and the west end would tie into high ground.
Gatewell Closures:		
Gatewell A	48 inch sanitary sewer	To be closed if floodwaters back up in sewer.
Gatewell B	24 inch storm sewer	To be closed with interior waters pumped out during a flood event.
Gatewell C	48 inch sanitary sewer	To be closed if floodwaters back up in sewer.
Gatewell D	24 inch storm sewer	To be closed with interior waters pumped out during a flood event.
Gatewell E	24 inch storm sewer	To be closed with interior waters pumped out during a flood event.
Gatewell F	24 inch storm sewer	To be closed during a flood event. This gatewell isolates catch basins along River Drive, in Davenport, Iowa.
DWTP Access Road Closure	20 ft clear width	DWTP main access road floodwall closure.
IC&E Railroad Closure A	20 ft clear width	Downstream floodwall closure at railroad track.
IC&E Railroad Closure B	20 ft clear width	Upstream floodwall closure at railroad track.
Personnel Access Closure	4 ft wide	To be located near DWTP intake structure.
O&M Access Road	6 inch PCC surface, 6 inch granular base, 12 ft wide, 6 ft grass shoulders	Provides O&M access for floodwall and to DWTP intake structure. To be located along floodwall exterior.
Lighting		To be located on wall at pilasters to replace existing power pole mounted lighting.
Landscaping		Plans to be developed during plans and specifications to replace existing trees near alignment and enhance floodwall appearance.
Power Line Relocations		MidAmerican Energy Company to relocate section of overhead power cables and place underground.
Plaza Relocation		City to relocate prior to floodwall construction.
6 inch Water Main		Proposed to be located outside of floodwall.
16 inch Water Main		Penetration through floodwall foundation to be encased and sealed.
AT&T Fiber Optic Cable		Line penetration though floodwall foundation to be sealed.

Item	Quantity/Measurement	Remarks
<b>CONTROLLING ELEVATIONS:</b>		
Approximate Existing Ground Elevation	EL 564 ft MSL 1912 near upstream end to EL 566 ft MSL 1912 near the downstream end	The DWTP sits on a relatively flat piece of ground between the Mississippi River to the south and River Drive to the north.
Approximate Bedrock Elevation	EL 534.3 ft MSL 1912 to EL 554.0 ft MSL 1912	Generally, elevations vary from 544 ft MSL to 545 ft MSL along the riverfront portion of the alignment.
Proposed Top of Floodwall	EL 573.9 ft MSL 1912	Top of floodwall approximately 7 ft higher than the existing ground along the floodwall alignment.
Proposed Top of Levee Crown	EL 573.9 ft MSL 1912	Top of levee approximately 3 ft higher than the existing ground along levee.
DWTP Access Road Sill Elevation	EL 564.70 ft MSL 1912	See Appendix G, Plates S1-S5.
Railroad Closure A Sill Elevation (Downstream)	EL 569.50 ft MSL 1912	See Appendix G, Plates S1-S5.
Railroad Closure B Sill Elevation (Upstream)	EL 564.70 ft MSL 1912	See Appendix G, Plates S1-S5.

Item	Quantity/Measurement	Remarks
<b>REAL ESTATE AREA REQUIREMENTS:</b>		
Flood Protection Levee Easement	1.487 acres	See Appendix E.
Road Easement	1.236 acres	See Appendix E.
Temporary Work Area Easement	2.726 acres	See Appendix E.
<b>Total Real Estate Required</b>	<b>5.449 acres</b>	

Item	Cost
<b>CURRENT TOTAL PROJECT COST ESTIMATE SUMMARY:</b>	
Lands and Damages (Federal)	\$ 100,000
Lands and Damages (non-Federal)	\$ 650,000
Relocations	\$ 178,865
Levees and Floodwalls	\$ 4,361,075
Planning, Engineering, & Design	\$ 1,277,110
Construction Management	\$ 454,000
<b>Current Total Estimated Project Cost</b>	<b>\$ 7,021,050</b>
<b>ESTIMATED BENEFIT TO COST RATIO:</b>	
	<b>2.2</b>

## 1.6 Design Coordination

1.6.1 Floodwall Riverfront Alignment. The proposed floodwall alignment is one of the most important aspects of this project. The District developed several alternative alignments. The alignments were closely coordinated and analyzed with the District's Project Development Team (PDT), the City, the IAWC, and local interest groups. The recommended alignment allows for a secure line of protection that minimizes utility penetrations, provides space, security, and flood damage reduction for IAWC operations, and maintains recreational uses, while contributing to the appearance of the riverfront.

1.6.2 Davenport Water Treatment Plant Building "B". Coordination with the IAWC for the use of building "B" of the DWTP as part of the flood damage reduction system will need to continue during the plans and specifications phase of the project. Final design details to tie the east end of the proposed floodwall into the building will need to be coordinated during the development of the project's plans and specifications.

1.6.3 Aesthetics. The proposed floodwall concepts included alignment and appearance. The proposed floodwall color and texture, decorative lighting, and associated landscaping have been coordinated with land use planners within the City, the IAWC, and local interest groups and organizations. See the Landscape Architectural Considerations, Section 2.1.7, for additional explanation of the recommended architectural treatment alternatives and how they were developed.

1.6.4 Railroad Closures. Constructing the railroad closures requires close coordination with the IC&E Railroad. Rerouting the trains during construction would be a difficult task. Efforts have been made to minimize down time during construction. Railroad closure requirements have been used to develop the project plans and total project cost estimate. See Plates S1-S5 in Appendix G for IC&E Railroad closure details.

1.6.5 Operation and Maintenance Access Road Alignment. The District developed the proposed O&M access road design and geometric layout. The design was coordinated with the City and local interest groups. A proposed O&M access road, with a 12 ft wide PCC surface and 6 ft grass shoulders that would also serve as a recreational path, was presented and received positive comments.

1.6.6 Plaza Relocation. The City agreed to take on full responsibility for determining, funding, and performing the work necessary to relocate the landscaped plaza containing the gazebo and sculpture by John Bloom. The proposed location, several hundred feet downstream from its existing location, to the west of the project area, would be more visible and accessible than the existing location while still being located near the project area. See Plate C1 in Appendix G.

1.6.7 AT&T Fiber Optic Cable. The AT&T fiber optic cable consists of several cables within a 2 inch conduit. During construction of the proposed floodwall, care should be taken not to damage the cable. A sheet pile cut-off wall would be located as close as possible to the fiber optic cable and then sealed with a suitable fill material. Coordination with the AT&T Company would continue during the project's plans and specifications, and construction phases.

1.6.8 MidAmerican Energy Company Overhead Power Lines. There are existing overhead power lines in conflict with the proposed floodwall alignment. The City and IAWC desired to have the overhead power lines relocated and placed underground. The proposed underground power lines would be located outside the protected area and would not penetrate the proposed flood damage reduction system. Coordination with the MidAmerican Energy Company has resulted in a plan and an approximate cost which was used for planning purposes in this EDR.

### **1.7 Changes To Limited Reevaluation Study**

The LRS reevaluated the 1982 study that included a long line of protection for a significant part of the city of Davenport, Iowa (Reach 2). An in-depth engineering analysis was not developed for either Reach 1 or Reach 2 as part of the LRS. This EDR provides the design details required to accurately develop project costs and evaluate Reach 1. Changes to the LRS include modifications to the alignment to provide a better line of flood protection, to better accommodate O&M and security requirements, and to simplify construction by allowing land based construction operations.

The number and placement of gatewells for the project have been modified to accommodate for interior drainage, and to ease O&M. For more information, see Section 2.1.5, Design Alternatives and Recommendations.

Additional design details have been included to develop costs for the project, to stage construction, to estimate real estate requirements, and to coordinate with the project stakeholders.

## Section 2 – Project Investigations and Analyses

### 2.1 Current Engineering Studies, Investigations, And Design

Preparation of this EDR included a thorough utility search, ground survey, close coordination with the City and IAWC, site design to include floodwall alignment, access closure structures, and interior flood control features, along with site design for the O&M access road. Floodwall, gatewell, and closure features included geotechnical investigations, structural computations, landscape architecture, and a civil design layout. Hydrologic and hydraulic information was taken from the LRS and other hydraulic analysis of the Mississippi River. Preparation of the design and project drawings included the ground based survey as well as review of existing City and IAWC digital aerial topography, surveys, drawings, and reports. A Hazardous, Toxic, and Radioactive Waste (HTRW) Phase I environmental site assessment was prepared and is included in this EDR as Appendix B. A cost engineering study, to determine an estimated total project cost, was also prepared and is included in this EDR as Appendix F.

2.1.1 General Considerations. The main purpose of this project is to provide flood damage reduction (protection) for the DWTP that serves customers in Davenport, Bettendorf, and adjacent areas. The design flood elevation is 570.7 ft, Mean Sea Level (MSL) 1912. The proposed levee and floodwall would be constructed to elevation 573.9 ft MSL 1912, to provide a high level of protection based on the design presented in the 1982 GDM design documents, where the level of protection was based on a 200-year design event, equivalent to the level of protection of the Rock Island flood protection system. No new H&H analysis was included in the design of this project since the original design is still appropriate. Flood damage reduction for the project area in the past has consisted of installing temporary sand bag levees at great cost and risk to the City and public water supply. The structural design and analysis, included as Appendix D, provides this necessary level of protection.

In addition to the stated purpose of the project, the City and local interest groups were interested in beautifying the riverfront and increasing its appeal to path users. See Section 2.1.7, Landscape Architectural Considerations, which addresses these concerns.

The IAWC wanted to provide adequate space inside the proposed floodwall for its operations. Security issues were a concern that can be enhanced with construction of the floodwall. IAWC personnel were concerned about providing a positive influence on the community and how the aesthetic signature of the DWTP and proposed floodwall would accomplish this.

Local interest groups that expressed an interest in the design included the Lindsay Boat Harbor, the Lake Davenport Sailing Club, Davenport One, and local residents.

2.1.2 Hydrologic and Hydraulic Considerations. The upstream drainage area of the Mississippi River above Davenport, Iowa, is 88,500 square miles. The approved 1982 GDM design was based on discharge-frequency values and water surface profiles from the “Generalized, Regionalized Flow Frequency Study on the Mississippi River from Guttenberg, Iowa, to Hamburg Bay, Illinois,” dated March 1966. Table 2.1.1 compares those design flow-frequency values to the Corps, “Upper Mississippi River, Water-Surface Profiles, River Mile 0.0 to River Mile 847.5,” prepared for the Upper Mississippi River Basin Commission (UMRBC), dated November 1979. The UMRBCs 1979 Upper Mississippi River flood data is currently used for floodplain regulatory purposes.

The Upper Mississippi River System Flow Frequency Study, with a publication date of January 2004, updates the Upper Mississippi River flow frequency values and water surface profiles again; however, the flood information does not significantly change in the Davenport reach of the Mississippi River from that published in 1979. Table 2.1.1 also shows high water mark elevations for the summer 1993 and spring 2001 flood events, along with the 1966, 1979 and 2003 probabilistic values for the 200-year design flood elevation. In comparison, the 1979 flood profiles are approximately 2.2 ft lower than the 1966 design profiles for the 200-year flood event throughout the project area.

**Table 2.1.1  
200-Year Design Flow-Frequency and Water Surface Elevation Comparisons**

<b>LOCATION</b>	<b>1966 Profiles 200-Year</b>	<b>1979 Profiles 200-Year</b>	<b>2003 Profiles 200-Year</b>	<b>1993 Flood</b>	<b>2001 Flood</b>
	<b>DESIGN FLOW (in CFS, ft<sup>3</sup>/sec)</b>				
	389,000	330,000	314,000	260,000	280,000
	<b>ELEVATION (in ft MSL 1912)</b>				
RM 482.0 Centennial Bridge	568.5	566.3	566.5	565.0	564.5
RM 484.0 DWTP	570.7	568.5	568.7	567.0	566.5

The proposed top elevation for the proposed levee crown and floodwall is 573.9 ft, MSL 1912. This elevation would provide adequate protection for a design flood of 570.7 ft MSL 1912, plus an additional allowance for increased reliability. The proposed top elevation corresponds to the 1982 authorized project which was presented in the 2002 LRS and LRR. It is equivalent to the level of protection of the Rock Island levee downstream of the project area, and the Bettendorf and East Moline levees upstream of the project area. Reach 1 extends for approximately 1,500 linear feet along the existing river wall. Due to this relatively short distance, the top of the proposed floodwall would remain at a consistent elevation, rather than slope from upstream to downstream.

Based on available Federal Emergency Management Agency (FEMA) mapping, the project is not in the floodway. The floodway is that portion of the existing floodplain cross-section computed to be capable of conveying the regulatory flood with a water surface elevation increase of no more than the regulatory amount. Currently, existing structures and flood fighting operations during a flood effectively block all conveyance and storage in this area; therefore, with the proposed floodwall lying outside of the existing effective floodway according to FEMA mapping, no increase in flood height or induced flood damage would occur as a result of the project.

The layout of interior drainage patterns and the placement and size of the required gatewells after the floodwall is installed would be finalized during the project's plans and specifications phase. See Section 2.1.5.

2.1.3 Geotechnical Considerations. This paragraph includes pertinent summaries and application of findings for the geotechnical investigation. Subsurface exploration for this project included a review of existing soil borings, field locates for specific utilities, review of existing drawings and photographs, and the preparation and review of new soil borings. This information established existing conditions fairly well. The bedrock elevation and limits of existing fill are identified and applied to the proposed design and subsequent project cost estimate. In the 1930's, the District constructed a government sewer and the adjacent river wall, or seawall. Photographs from the construction are on file with the District and show the original storm sewer connections. The photographs and District drawings show the extent of fill landward of the river wall. The fill is not uniform in type of material, and it is doubtful that the material was compacted in place. In some areas, concrete debris and reinforcing bars were included in the fill.

In order to provide a structurally stable and cost effective floodwall, the proposed floodwall would be founded on sheet pile driven to bedrock. This would not only support the proposed floodwall and prevent differential settlement, but it would also provide added protection to effectively cut off potential under-seepage during a flood event. A portion of the proposed floodwall would be constructed directly on top of the existing government sewer. Existing soil would be excavated to allow for construction of a gravity wall with an "L" shaped configuration. Backfill would be compacted in horizontal layers to grade. It is anticipated that some of the existing material would contain debris or unsuitable backfill materials that would need to be hauled off site and replaced with hauled in material. The amount of project material to be disposed of and hauled in would be relatively minor and could be furnished by the contractor from commercial sources.

Groundwater is not expected to be a major concern during construction. The only exception to this would be if river flooding or heavy rainfall occurred. Open excavations should be kept to a minimum and storm water runoff would need to be pumped out if storm water is allowed to enter the project site. Some excavations would have to be braced, due to space limitations, to construct stable slopes. If an impending flood would occur during the construction period, the contractor could be utilized to assist in stabilizing or filling any vulnerable points around the DWTP and to help provide a protective berm.

The proposed floodwall would be constructed in sections to accommodate the temporary recreational path, onsite space limitations, and contractor capability. The order of work, to limit flood damage during construction, is not the most important factor for this project, but should be considered in developing contractor work plans.

A small earth embankment would tie the northwest corner of building "B" of the DWTP to high ground to the west. This area of ground is fairly wide and backed by building "B". See Plate C5 in Appendix G. An inspection trench would be excavated underneath the centerline of the proposed embankment and this area would be stripped to remove all organic material and loose soil. The sub-grade and new fill would be compacted in horizontal layers. The new earth embankment would be dressed with topsoil and seeded. For more information on the Geotechnical Considerations, see the Geotechnical Investigation included in this report as Appendix C.

2.1.4 Structural Considerations. Structural design was completed for the "I" floodwall configuration, the "L" floodwall configuration, the stability of the existing government sewer along with its ability to support the "L" floodwall, and for the access road and railroad closure structures. The District has several gatewell designs that are very similar and were used to complete the structural analysis.

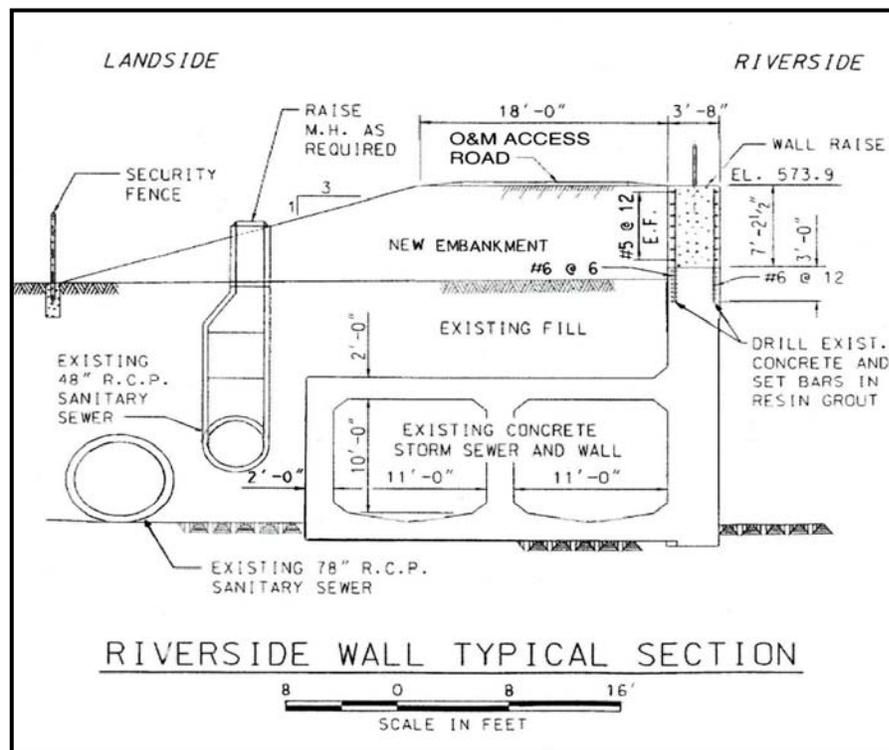
The railroad closure structures were initially designed to include a continuous footing below the sill. However, after coordination with the IC&E Railroad, constructing the closures quickly was very important. The design was modified so that pier foundations could be constructed while keeping the track operational. The pier foundations would support a pre-cast sill, greatly reducing down time. The Structural Analysis to support the project is included as Appendix D.

2.1.5 Design Alternatives and Recommendations.

2.1.5.1 Floodwall. The LRS, based on the 1982 GMD, recommended raising the river wall and constructing a tie-back floodwall to high ground. In preparation of this EDR, designers looked at alternative floodwall concepts and alignments.

One disadvantage to raising the existing river wall, as recommended in the LRS, is that the proposed floodwall would be built on the 1930's river wall. Also, the existing government sewer, a double box culvert with openings measuring 10 ft by 11 ft, would then become part of the line of protection. This is undesirable, because a break in the box culvert under flood conditions could result in a failure to the line of protection. There was also a concern about modifying the historical nature of the existing river wall. See Figure 2.1.1.

**Figure 2.1.1**  
River Wall Raise Alternative Floodwall



Another alternative included building a 7 ft high floodwall between the Mississippi River and the existing path. This would effectively cut off the recreational and aesthetic value that the riverfront provides to the area, which was a concern. Yet another alternative included setting the floodwall landside of the government sewer, so that the government sewer was outside of the line of protection. Designers also considered trying to locate the proposed floodwall landside of the sanitary sewer lines and the IC&E Railroad, but with that design, it would not be possible to build the floodwall landside of the railroad tracks and still protect all of the DWTP. See the site plan, Plate X3 in Appendix G. Similarly, constructing the proposed floodwall landside of the sanitary sewer lines would require crossing several large water mains. Minimizing the crossing of water mains was important. A water main rupture under or near a levee or floodwall could cause extensive damage. Containing the water mains and other DWTP structures within the proposed floodwall alignment allows for normal O&M of these structures, even during a flood.

Construction of a less costly levee consisting of compacted impermeable earth material is not feasible due to a lack of adequate space. The levee, or earth embankment, would have to be constructed over several existing utilities to include storm sewers, water mains, and sanitary sewers, which was a concern.

Therefore, the construction of both an “I” wall and “L” wall was recommended, along with an earth embankment tie-off to building “B” of the DWTP. See Figures 2.1.2 and 2.1.3. The space between the government sewer and the two City-owned sanitary sewers is insufficient in several areas to drive a sheet pile foundation (“I” wall configuration), without damaging the existing sewer lines. Relocating the sanitary sewers to make space for the “I” wall configuration was not an option, due to space limitations. Therefore, building a gravity floodwall in an “L” type of configuration above the government sewer was the most effective solution for this location. A preliminary cost analysis showed fairly equal costs between the three floodwall construction techniques.

The “I” wall configuration is a floodwall founded on a continuous sheet pile foundation. This “I” wall would provide a uniform line of protection down to bedrock and its configuration is proposed away from the top of the government sewer. The sheet pile ensures that under seepage is not a problem and that the type of soil or earth fill is not a significant factor in the stability of the proposed floodwall.



The advantage of the proposed floodwall alignment, shown on Plate X3, is that it presents a more uniform line of protection landside of the government sewer, keeps the public outside of the line of protection, provides better security for the DWTP, avoids multiple utility crossings where possible, and makes use of the value of the riverfront while minimizing the closure requirements during a flood.

2.1.5.2 Gatewells. There are two City-owned sanitary sewer lines that cross through the protected area of Reach 1. There is a 48 inch interceptor sewer that may have been constructed in the 1940's. This sewer has one or two connections within the DWTP protected area. This line has reduced capacity due to siltation within the line. The City estimated that it passes about 1 cubic foot per second (CFS) of sewage during dry periods and 28.2 CFS during peak flows. The City plans on using this line to full capacity in the future. Due to the age of the structure, the connections within the DWTP, and Corps design guidance, this line would require gatewells and sluice gates at the floodwall to allow closure during a flood event if flood waters were entering the DWTP interior, or protected area.

A second 78 inch sanitary sewer was constructed through this area in 1978. This sewer line passes an estimated 31.4 CFS during dry periods and 147.1 CFS during peak flows. This sewer line has no known connections within the DWTP protected area. The manholes are visible within the protected area and utilize bolted down lids. If gates were constructed on this sewer line, they would normally be open even during a flood event. If the gates were closed, sewage would back up in a large portion of Davenport, Bettendorf, and other smaller communities. Constructing gates on this sewer would be very expensive and very difficult due to the inability to stop the flow of sewage during construction. Pumping the sewage around the work area would also be very expensive due to the high flow rate and constructing a bypass sewer during gate construction would be very difficult due to the other existing utilities. Due to these considerations, the City and District determined that it would be better to allow this pipe to flow through the protected area without providing a mechanism for positive closure. The pipe would be maintained and manholes inspected to ensure they are capable of handling flood level internal pressures without rupture.

Storm sewer gatewells are located as shown on Plates C1-C5 in Appendix G. These gatewells must be closed before floodwaters reach their closure elevation around the DWTP. The interior manholes can be pumped into the gatewell covers to expel water that collects on the protected side of the floodwall. Sub-drains that are located inside the floodwall can be connected to these manholes. During normal river levels, these gatewells would be open and allow gravity drainage of storm water.

Two 36 inch low pressure water mains penetrate the floodwall near the IAWC intake structure. One of the two pipes can be isolated with an existing valve. The other line can be closed at the intake structure with an existing sluice gate mounted on the river wall. The design of all gatewells will be finalized during the development of the project's plans and specifications.

2.1.5.3 IC&E Railroad Closure Structures (Gates). Railroad closure gates are required to close off the two railroad access points through the Reach 1 protected area. See Plate X3 in Appendix G. Relocating the railroad around or over the line of protection did not appear to be feasible. The District has designed and constructed several railroad closures for flood damage reduction projects. The closure structures are usually constructed quickly to minimize railroad down time. Usually the railroad does the track work associated with the closure. Initial coordination with the IC&E Railroad revealed that down time is a problem. Diverting trains to another track is not a feasible option. This area is heavily used and there is only one track. There is not sufficient space to construct a temporary track or a permanent alternate route. Designers considered a continuous footing to support the gate sill. Down time for this type of gate installation was estimated to be 4 to 5 days per closure. It is proposed that both railroad closure gates would be installed at the same time, with a total estimated down time of 4 to 5 days. This amount of down time was not acceptable to the railroad.

Designers considered construction of a temporary bridge to support the tracks while construction continues under the bridge. This method would result in downtime while the bridge was installed, while driving sheet pile to support the footing, and while the bridge was removed and replaced with permanent track. Total time savings appeared to be minimal and high costs make this alternative less viable.

The recommended solution for installation of the closures includes the following:

During the first phase, the construction contractor would construct piers to support the sills. See Plates S1 and S2 in Appendix G. This first phase is estimated to take 2 days and would include the following steps:

- Drive sheet piles 7'-6" from center line of existing tracks to support excavation.
- Excavate for pier construction
- Drive H piles – use H12x63, six each for end piers and H12x74, six each for center pier
- Drive sheet piles
- Construct reinforced PC concrete piers – 3ft x 8ft x 20ft

The next sequence of activities, or second phase, would be accomplished within a proposed closure period, or down time, which would require the contractor to work 24 hours a day until construction of this phase is complete. First, the IC&E Railroad would remove the rail, ties, and ballast. The construction contractor would then:

- Excavate for sill
- Drive sheet pile cut-off
- Place type III PC concrete cap
- Place pre-cast PC concrete sill
- Compact backfill

The IC&E Railroad would finish the second phase by constructing new or replacing the existing ballast, ties, and rail.

After construction, the railroad sill elevation would be about 4 inches higher than the existing track. This would allow a heavier rail and positive drainage away from the floodwall.

Coordination with the IC&E Railroad will be critical throughout the two construction phases in order to complete the construction of the closures within the proposed closure period. To expedite the work, the contractor would prepare construction plans and coordinate the closures with the IC&E Railroad. Once construction began for this part of the project, it would continue without break until this part of the project was complete. During construction, work crews would be staggered, so that both closures would be constructed concurrently. If any conditions arise during the construction of the closures, the IC&E Railroad, the Corps, and the City should be notified immediately. Final coordination with the IC&E Railroad is required to further develop the final design and construction phases.

2.1.5.4 DWTP Access Road Closure Structure (Gate). Another closure gate is required at the vehicle access point into the DWTP. This access closure structure would be constructed adjacent to the railroad closure structure as shown on Plate X3 in Appendix G. The contractor would be required to construct a bypass during construction or to minimize downtime to less than 3 days. The access road would be re-aligned and raised to a higher sill elevation to match the railroad. This would provide longer access during the preliminary stages of a flood before the gates were closed and would also provide positive drainage away from the floodwall.

2.1.5.5 O&M Access Road. The proposed O&M access road would be located along the outside of the floodwall as shown on Plate X3. The proposed O&M access road would be constructed out of PCC to provide a smooth surface with good drainage. The PCC surface should hold up well during periods of inundation and when the sub-grade is saturated. The proposed O&M access road would be 12 ft wide with 6 ft shoulders and would also serve as a recreational path. Between the floodwall and the river railing, 6 ft grass shoulders would border the proposed O&M access road.

During construction, a temporary recreational path would be identified so that path users do not have to cross the railroad tracks and attempt to traverse along River Drive. Closures of the recreational path during construction are not expected.

2.1.5.6 Power Line Relocation. Overhead power lines would be relocated underground to accommodate the installation of the proposed floodwall. Due to a number of existing underground utilities, the proposed alignment of the floodwall, and operation and maintenance issues, there is not adequate space available to safely accommodate overhead power lines through the project area. There is also a strong desire from all stakeholders to bury the existing overhead power lines. MidAmerican Energy Company provided a cost estimate and proposed location near River Drive for this work. It is included in the total project cost estimate.

2.1.5.7 Other Utilities and Floodwall Penetrations. There are other utilities that cross the line of protection. Table 2.1.2 presents a listing of all utilities and proposed actions to ensure the floodwall system is not compromised.

2.1.6 Existing Utilities. This project involves several utilities, either abandoned or active, which affect the proposed flood damage reduction system. The floodwall alignment was developed to minimize crossing utilities as much as possible. For example, almost all of the IAWC's water mains are contained within the protected area. A detailed description of existing utilities and closures that cross the line of protection are contained herein.

**Table 2.1.2  
Existing Utilities that Cross Line of Protection**

<b>Station</b>	<b>Description</b>	<b>Activity</b>	<b>Remarks</b>
0+56	High ground	Begin floodwall.	West end of proposed floodwall to tie into high ground west of DWTP.
1+10	AT&T fiber optic cable	To be passed through the floodwall foundation.	Care would be taken not to damage existing fiber optic cable.
1+34	Downstream IC&E Railroad crossing	Construct single leaf floodgate.	Floodgate closure is approximately 20 feet wide.
1+67	Recreational Path	Construct new O&M access road outside of floodwall.	New O&M access road will also serve as a recreational path.
1+76	78 inch sanitary sewer	Verify that all manholes are securely fastened to contain flood water pressures.	This section of sewer line serves parts of Davenport, most of Bettendorf, and some other communities. The flow is estimated to be 32 CFS during dry periods.
1+94	48 inch sanitary sewer	Construct sluice gates to close as required during a flood event.	Normally gates would remain open unless pipe damage causes interior flooding. The flow is estimated to be 1 CFS during dry periods.
3+22	Overhead power lines	Relocate power lines underground and on the unprotected side of the proposed floodwall alignment.	MidAmerican Energy Company provided a rough cost estimate for this work.
4+33	16 inch storm drain	Remove at proposed floodwall and connect to new gatewell.	None.
4+51	14 inch storm drain	Remove at proposed floodwall and connect to new gatewell.	None.
5+97	14 inch abandoned sewer	Ensure line is adequately plugged at government sewer.	None.
6+76	6 inch abandoned sewer	Ensure line is adequately plugged at government box culvert.	None.
6+94	12 inch abandoned sewer	Ensure line is adequately plugged at government box culvert.	None.
7+33 to 7+75	DWTP Intake Structures	Construct floodwall around structure, relocate electrical panel to protected side, and remove unnecessary piping.	Incoming pipes shall not be modified. All through pipes to be sealed. Reference this table for outgoing pipes.
7+55 I	20 inch utility conduit	Utility conduit to be sealed around active pipes.	None.
7+62 I	30 inch abandoned intake pipe	Remove line at proposed floodwall.	None.
7+92 I	36 inch intake water main	Raise gate operator on 36 inch intake pipe.	None.
7+99 I	36 inch intake water main	No work recommended.	Isolation of line accomplished by closing gate near river prior to flood.
8+00	6 inch water main to hydrant	Construct gate valve at floodwall.	Hydrant used to perform O&M of DWTP intake structure.
9+18	12 inch abandoned sewer	Ensure line is adequately plugged at government box culvert.	None.
9+77	48 x 65 inch abandoned storm sewer	Ensure line is adequately plugged at government box culvert.	None.

Station	Description	Activity	Remarks
10+38	48 inch sanitary sewer	Construct sluice gates to close as required during a flood event.	Normally gates would remain open unless pipe damage causes interior flooding. The flow is estimated to be 1 CFS during dry periods.
10+49	78 inch sanitary sewer	Verify that all manholes are securely fastened to contain flood water pressures.	This section of sewer line serves parts of Davenport, most of Bettendorf and some other communities. The flow is estimated to be 32 CFS during dry periods.
10+77	24 inch storm sewer	Construct new gatewell at existing storm sewer.	None.
11+09	Underground electric feed	Relocate electric line or provide seal at proposed floodwall penetration.	None.
14+60	DWTP Access Road	Construct new DWTP access road outside of floodwall.	Main entrance and access road to the DWTP.
18+90 +/-	6 inch water main	Relocate to exterior of proposed floodwall.	6 inch main can be connected to existing main riverside of floodwall.
19+33	24 inch VCP storm sewer	Construct new gatewell.	Interior drainage to be collected in this manhole.
19+58	AT&T fiber optic cable	To be passed through floodwall foundation.	Care would be taken not to damage existing fiber optic cable.
19+71	Upstream IC&E Railroad crossing	Construct single leaf floodgate.	Floodgate closure is approximately 20 feet wide.
19+97	IAWC access road	Construct single leaf floodgate.	Floodgate closure is approximately 20 feet wide.
20+14	16 inch high pressure water main	Encase in split casing and seal ends of casing.	Existing valve locations to isolate water main located near floodwall. To be identified in O&M manual.
20+25	36 inch abandoned storm sewer	Remove section of storm sewer.	None.
21+18	24 inch storm sewer	Construct new gatewell.	Close gatewell during flood (Isolates City catch basins on River Drive).
22+10	Northeast corner of building "B" of DWTP	End floodwall.	Building "B" of the DWTP serves as a portion of the flood damage reduction system. East end of proposed floodwall to tie into northeast corner of building "B"
23+17	20 inch high pressure water main	N/A	Floodwall alignment developed to keep this line mostly outside of line of protection-in this vicinity ground level is high and abuts building "B".
22+98 to 24+33	Area between building "B" of DWTP and railroad bridge abutment	Build earth embankment.	Will tie the northwest corner of building "B" of the DWTP to high ground to the west.

The floodwall alignment was developed to minimize penetrations that may cause breaches in the flood protection system if the utility or structure is not properly operated or maintained.

### 2.1.7 Landscape Architectural Considerations.

2.1.7.1 General. Essentially, landscape architectural considerations have to do with human use and this project's impact on how people use and view the area within the project's influence. The project should not limit the area's capacity for human use, present or future, so part of the challenge is to anticipate the nature of future use. A project of this size would certainly be a noticeable new element in the city's landscape and it would be encountered by many people, both physically and visually; therefore, it is important that the proposed change to the existing local landscape be a positive one.

Viewed from the Mississippi River, or from either shore, the project area is a highly visible segment of the Quad-Cities riverfront, with considerable value for public use. It should be anticipated that this area's importance, as a part of the Quad-Cities riverfront greenway, will grow as adjacent riverfront is improved and new regional recreational trail connections bring increased use.

The project area is bounded by River Drive to the north and the Mississippi River to the south, and an existing recreational path runs through it. The Village of East Davenport, along with its many services and points of interest, is located just to the northeast of the project area. The water-taxi landing and Yacht Club are located immediately upstream, while the Lake Davenport Sailing Club and other points of interest, such as the Boat House Restaurant and Oneida Landing, are located immediately downstream.

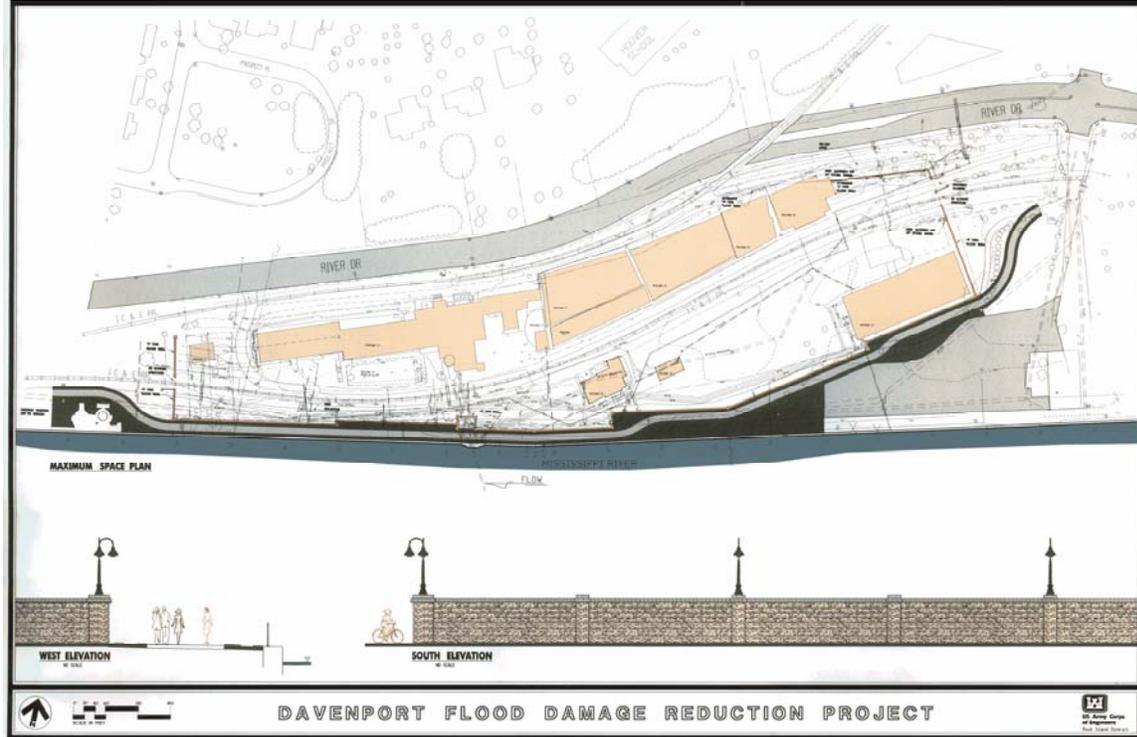
As a decades-old trend continues to strengthen, communities are placing ever increasing importance on re-establishing a positive visual and recreational connection with their waterways. This type of connection is becoming better understood as one of the most appropriate and beneficial uses of floodplains, and is increasingly seen as adding great value to local quality-of-life, with positive economic implications through recreation and tourism.

#### 2.1.7.2 Major Objectives.

2.1.7.2.1 Proposed Floodwall Alignment. There are two significant landscape architectural objectives with regard to the proposed floodwall alignment. The first objective is to preserve valuable riverfront green space for public use and the second is to achieve a relevant alignment in which the proposed floodwall has an appropriate and pleasing visual relationship to significant existing landscape elements, such as the river's edge, River Drive, and the DWTP's roads and buildings. The result would be a greener, more attractive riverfront, whether viewed from the land or from the river.

Though there are many constraints to achieving the ideal alignment, including a labyrinth of existing underground utilities and the fact that existing landscape elements share no common orientation, an optimum alignment is proposed. One characteristic of this alignment is that it is divided into a number of similar-length segments, making any necessary deviations more visually consistent with the overall alignment. The proposed floodwall alignment would provide a safe and comfortable riverfront corridor that emphasizes the best views and mitigates the worst views, while providing room for an O&M access road which will also serve as a recreational path, giving users the opportunity to be near the river. See Figure 2.1.4 below and Plates C1-C4 in Appendix G.

**Figure 2.1.4**  
Architectural Site Plan and Proposed Floodwall Elevation



2.1.7.2.2 Floodwall Architectural Treatment. Due to public use and high visibility of the project area, aesthetics are an important consideration; therefore, it is intended that the appearance of the proposed floodwall be enhanced through architectural treatment. The following paragraph provides a brief description of a proposed architectural treatment, which the City has approved.

The proposed floodwall would be made of reinforced, cast-in-place PCC, which is cost-effective and functionally appropriate, though not always attractive. The objective of the proposed architectural treatment is to make the floodwall attractive, like an estate wall. By casting pilasters at an appropriate spacing, using PCC form-liners, a PCC coloring system, and an architectural pre-cast PCC cap, the proposed floodwall would have the appearance of a cut limestone wall. Figures 2.1.4 and 2.1.5 show examples of this type of wall. Cut limestone has been used fairly extensively on large scale projects throughout the Mississippi River valley, including many buildings and appurtenances on the nearby Rock Island Arsenal island. The look of such a wall has universal appeal and is historically appropriate, elegant, and timeless. Such a wall would seem at home along the river and would complement its surroundings. Proposed vintage style ornamental light poles and fixtures would be mounted on top of the proposed floodwall, further enhancing its appearance. See Figure 2.1.4.

**Figure 2.1.5**

Example of Architectural Treatment of Cast-in-Place PC Concrete Walls



2.1.7.2.3 O&M Access Road. The proposed floodwall alignment provides an ample corridor for the proposed O&M access road, which would also serve as a recreational path, providing recreational users continued access along the river. The corridor's east end would be defined by an existing trail head, while the west end would be defined by the relocated plaza. See Figure 2.1.4. The proposed access road would be PCC, 12 ft wide and 6 inches thick. This would be suitable for operation and maintenance vehicles.

2.1.7.2.4 Lighting. Vintage style ornamental light poles and fixtures would be mounted on top of the proposed floodwall at every other pilaster, approximately 48 ft apart. This proposed lighting would facilitate nighttime use of the proposed O&M access road, improve safety and security, be attractive, enhance nighttime views of the proposed floodwall, and facilitate the elimination of existing, unsightly utility poles, overhead power lines, and utility lights. Mounting the proposed lights on top of the proposed floodwall would enhance the floodwall's appearance, while keeping the lights above flood levels.

2.1.7.2.5 Landscaping. The new riverfront green space, created between the proposed floodwall and the existing river wall, would be appropriately landscaped as a part of this project. In addition, trees would be planted behind the wall and, in time, would provide shade for the path users while giving the proposed floodwall and its environment a stately appearance.

2.1.7.2.6 Closure Structures (Gates). The proposed DWTP access road and IC&E Railroad closure gates at each end of the project would be open nearly all of the time; therefore, the design of the gates would include an appropriate architectural treatment so that the sides viewed by the public are attractive.

2.1.7.2.7 Relocate Existing Plaza. The location of the existing landscaped plaza, containing the gazebo and sculpture by John Bloom, is in conflict with the proposed floodwall alignment; therefore, it would be relocated. The proposed location is located approximately 200 feet downstream to the west. The need for this relocation would provide an opportunity to make some improvements in the area. Parking and access could be improved, as well as the plaza's setting and visibility, particularly as seen from River Drive.

#### 2.1.7.3 Landscape Architectural Considerations Summary.

- The project would improve riverfront connectivity and the quality of user experience.
- The proposed floodwall alignment obscures undesirable views while enhancing desirable views.
- The lighted, architecturally treated floodwall would be an attractive new riverfront element.
- The proposed O&M access road / path alignment is well defined and should be less confusing for users as compared to the present alignment, which currently meanders through the project area.
- There is virtually no net loss of usable riverfront green space.
- The project furthers desirable development of the Village of East Davenport's riverfront.
- By creating a safe and inviting public pedestrian space, both day and night, the project would illuminate and increase potential benefits gained by linking the following upstream to downstream points of interest to create a more significant Quad-Cities riverfront destination, including, the Village of East Davenport, the Yacht Club, the water-taxi landing, the existing recreational trail and its features, the plaza, the Lake Davenport Sailing Club, the Boat House Restaurant, and Oneida Landing.

2.1.8 Hazardous, Toxic, and Radioactive Waste (HTRW) Assessment. A HTRW investigation is required for Corps projects. The purpose of the investigation and analysis is to limit the amount of risk and liability that can be associated with contaminated areas. Elevated levels of some contaminants might require special handling and disposal. The cleanup or special handling can result in significantly higher costs. The investigation assesses potential for deep-seated contamination that could affect land values or future liability. If HTRW is encountered, it would affect project costs and would be a responsibility of the sponsor to mitigate prior to construction.

For this project, a Phase I HTRW investigation was completed in August 2002. It is included as Appendix B. A Phase I investigation is the first step in identifying potential contaminants. Depending on the outcome of the Phase I investigation, sometimes a Phase II investigation is required. A Phase II investigation usually requires analysis of soil and water samples. For the purposes of this project, a Phase II investigation was not recommended. The following paragraph summarizes the recommendation:

This assessment has revealed that there is slight risk identified due to the railroad, boat marina, and unknown fill material located in the project area. Otherwise, no other evidence of recognized environmental conditions associated with the project area were identified. No further HTRW assessment is recommended. If any recognized environmental conditions are identified during the construction of the project features, then work should cease and the District's Design Branch, Environmental Engineering Section should be notified to reassess the project area.

2.1.9 Value Engineering. A value engineering (VE) study for this EDR has been completed. Recommendations from that study will be appropriately coordinated with the project development team (PDT) and local sponsor. Incorporation of any approved recommendations will occur during preparation of the project's plans and specifications.

2.1.10 Permit Requirements. This project would require a floodplain construction permit from the Iowa Department of Natural Resources (IDNR). The permit should not be difficult to obtain since the project area is located outside of the floodway. Protecting Reach 1 from high river levels is not expected to have an impact on existing flood heights.

A Section 404(b)(1) Evaluation and a 401 Water Quality Certification are not required since this project does not impact the waters of the United States.

A storm water discharge or National Pollutant Discharge Elimination System (NPDES) permit for construction activities may be required. Effective March 10, 2003, the NPDES storm water discharge permit is required when a construction activity disturbs more than 1 acre. The construction of the floodwall may trigger the need to apply for this permit, depending on the amount of land the contractor disturbs. With or without the permit, the Corps, in all of its construction contracts, requires an environmental plan that addresses contaminants as well as erosion control measures. The contractor would be required to prepare an erosion control plan to ensure that unprotected soil is not allowed to leave the project site work limits. The work near the river wall and the river would require extra care and erosion control measures. Contract requirements should require the use of an erosion control mat to prevent erosion of soil prior to establishing a vegetative cover.

The contractor would be required to comply with all local codes and permit requirements.

## **2.2 Operation and Maintenance (O&M) Requirements**

An O&M manual would be developed before the end of project construction that details the sponsor's requirements. The non-Federal sponsor (City) will be responsible for the operation, maintenance, repair, replacement, and rehabilitation of the project and is required to perform O&M of the flood damage reduction project in accordance with Federal regulations. The annual O&M costs are estimated to be \$15,000.00. The following paragraphs give some general descriptions of O&M activities. The repair, replacement, and rehabilitation of the levee and floodwall system may be required due to damage to part of the system, which could occur after a significant flooding event.

The levee and floodwall system would be constructed to minimize operation and maintenance requirements. The floodwall should be inspected biannually: once by the City with the Corps, and once just by the City, with an inspection report prepared by the City and a copy provided to the Corps. Cracks, settlement, adjacent sinkholes, and misalignment of the system should be monitored and causes of distress determined and repaired. Sub-drains should be checked periodically to ensure they are not obstructed with debris.

Gatewells should be periodically inspected and exercised at least once per year. This ensures the gatewell is operational and operating equipment is readily available if needed during a flood. Vegetation should be mowed periodically near the levee and floodwall system. Trees and other "woody" vegetation should be removed to a distance of 15 ft from the levee and floodwall system.

The O&M access road, floodwall, lighting, and vegetation and grass along the shoulders of the access road would be operated and maintained by the City. This maintenance includes frequent inspections, cleaning trash, removing graffiti, etc. The City may seek the services of the IAWC to perform this work.

Operation of the system would occur during flood events. Before floodwaters back up through storm drains and manholes, the City would be responsible to close the necessary storm water gatewells and should install portable pumping equipment as necessary. A schedule of gatewell closures should be developed by the City with the assistance of the Corps, and coordinated with the IAWC. Railroad and access closure notifications should be made ahead of time by the City. Monitoring the flood damage reduction system and existing sanitary sewer lines by the City is required during a flood event. Pumps must be operated and maintained as well.

## 2.3 Construction Considerations

2.3.1 Temporary Recreational Path. The construction contractor would likely have to stage construction activities in order to maintain a temporary recreational path through the work area. A method to achieve this is to construct a temporary path near the railroad tracks while building the proposed floodwall along the river. After the river section of the proposed floodwall is constructed, the permanent path would be routed on the O&M access road along the outside of the floodwall. The temporary path would consist of an asphalt cement concrete (ACC) surface and security fencing as required. The temporary path width should be at least 8 ft wide. Security fencing should be kept at least 2 ft from the edge of the temporary path.

2.3.2 Floodwall Construction. The “L” floodwall, the utility work, and gateway construction would require open excavation. Due to project site limitations and to keep in compliance with Occupational Safety and Health Administration (OSHA) and Corps safety requirements, some of these excavations would require bracing to protect workers. Subsurface water is not expected to be a major factor during construction; however, some dewatering may be required due to rainfall or higher than normal river levels. Construction of the “I” floodwall would require less excavation, less formwork, and less PC concrete than the “L” floodwall, since it is founded on sheet piling.

2.3.3 Potential Flooding During Construction. If flooding occurs during construction of the project, contract modifications are often used to direct the contractor to assist with the flood fighting effort. For this project, it is probable that the Corps would direct the contractor to protect work in progress, fill in open excavations, and construct temporary levee systems.

2.3.4 DWTP Access Road Closure. The contractor shall maintain access to the DWTP. Both employees and deliveries must be able to get to the DWTP. The contractor could construct a temporary entrance around construction area at the main entrance gate. Another alternative is to construct an alternate entrance around building “A” of the DWTP to the parking lot north of building “A”. See Plate X3 in Appendix G. The contractor would be able to close the main entrance road for a couple of days with advance notification and coordination with the IAWC.

2.3.5 IC&E Railroad Closures. The IC&E Railroad closures would require an expedited construction plan. The goal is to construct the railroad closures within a proposed time-frame. Once this section of railroad track is closed, the contractor would work continuously until this part of the project is complete and this section of railroad track can be re-opened. The proposed construction sequence is listed in Section 2.1.5, Design Alternatives and Recommendations. Working in and around railroad property would require the contractor to coordinate with the IC&E Railroad to meet railroad requirements for liability insurance, flagmen, fencing, construction offsets, and other construction standards.

2.3.6 Staging Areas. Staging areas for the project have been identified in the Real Estate Plan, Appendix E. More precise locations will be identified during the development of the project’s plans and specifications. These areas would provide space for the contractor to store materials and equipment. Construction trailers would also be able to be located in the staging area. Additional areas may be delineated for temporary use for contractor parking and for the temporary recreational path.

## **2.4 Real Estate Considerations**

The real estate interests required for the project include a Flood Protection Levee Easement over approximately 1.487 acres to include the levee and floodwall, a Road Easement over approximately 1.236 acres, and a Temporary Work Area Easement over approximately 2.726 acres. Existing overhead power lines located above the project site and along the proposed floodwall alignment would need to be relocated prior to project construction. The estimated cost of Lands, Easements, and Rights-of-Way (LER) for the project is \$544,000 with an estimated Incidental Acquisition cost of \$106,000 for a total non-Federal Lands and Damages cost of \$650,000. The estimated cost for Federal Acquisition Administration is \$100,000.

The City will be required to execute a Project Cooperation Agreement (PCA) with the Corps. Upon execution of the PCA, the City must acquire all of the LERRD needed for the project making them available to the Corps for construction and, as necessary, to relocate or modify any utilities or facilities within the project boundaries. The project will be cost-shared on a 75% Federal and 25% non-Federal basis. Detailed information related to the real estate aspects of the project can be found in the Real Estate Plan, included as Appendix E.

## Section 3 – Environmental Analysis

### 3.1 Alternatives

3.1.1 No Action. This alternative would leave the flood damage reduction of Reach 1 vulnerable to the conditions at the time of this report. Community stability during flood times could be disrupted especially due to a high probability of an interrupted supply of potable tap water. Within the protected area, the IAWC could experience damage to property, deterioration of buildings, disruption of employment, and health hazards. In addition, large costs would be incurred to supply water to community residents and to repair damaged property within the DWTP protected area.

3.1.2 Levee and Floodwall. The proposed levee and floodwall project design has been developed and refined as described herein. The final alternative that identified the level of protection and the limits of the protected area were taken from previous investigations, including the June 2002 LRR.

Numerous study alternatives to address flood damage reduction in the Davenport, Iowa area have been identified in referenced documents. Some of these alternatives are relocations (railroads, highway, utilities), flood proofing, floodplain evacuation, floodplain regulation, earthen pervious levees, earthen impervious levees, folding floodwalls, permanent floodwalls, cap-walls (raising the existing river wall), flood damage reduction measures constructed at various reaches/locations in the city of Davenport, different levee or floodwall alignments and top elevations, different tie-offs to high ground, pumping facilities, etc. All these other alternatives have been evaluated in earlier documents and were eliminated for a variety of reasons, predominantly due to unfavorable benefit to cost ratios. These alternatives did not pass the planning evaluation criterion of efficiency.

These and other alternatives can be found in documents such as, *Final Environmental Impact Statement, Davenport, Iowa, Local Flood Protection, Mississippi River, Davenport, Iowa, Phase I*, August 1976; *Davenport, Iowa, Phase I, General Design Memorandum, Plan Formulation for Flood Control*, August 1976; *Mississippi River, Davenport, Iowa, Phase II General Design Memorandum, Local Flood Protection*, February 1982; and *Limited Reevaluation Report for Flood Damage Reduction, Mississippi River at Davenport, Iowa, Final*, June 2002.

### 3.2 Affected Environment

The environment affected by the scope of this EA is a non-wetland, urban and riparian area. The paved path and the maintained lawn with ornamental trees and shrubs that are in the floodwall alignment would be impacted. The vegetation that would be impacted if the floodwall alignment were implemented would be limited to mowed grass, approximately 20 ornamental deciduous trees, and a few shrubs. All of the trees and shrubs would either be transplanted or replaced to mitigate for lost habitat value to urban songbirds and small mammals.

### 3.3 Environmental Impacts of the Recommended Alternative

3.3.1 Historic Properties. The Corps consulted with the State of Iowa archeological site and survey Geographic Information Systems (GIS) databases (current as of August 2003) and determined that there are no previously recorded archeological sites in the Area of Potential Effect (APE). The Upper Mississippi River Locks and Dam No. 15 Historic District extends into a portion of the APE. Specifically, the City of Davenport Seawall with Integrated Sewer, which is a contributing element to the National Register of Historic Places (NRHP) Historic District determination, is located in the APE. The NRHP, Village of East Davenport Historic District boundary extends over a portion of the eastern edge of the APE. Also, the NRHP, Lindsay Park Historic District is contained within the Village of East Davenport Historic District and is located just east of the APE. Both the Village of East Davenport and the Lindsay Park Historic District boundaries extend into the Mississippi River, and the nomination forms identify the river view as a contributing element.

The District coordinated the APE and three proposed floodwall alignment alternatives with the State Historical Society of Iowa (SHSI) and the Illinois Historic Preservation Agency (IHPA) by letter dated August 29, 2003. See Appendix A. The District determined that the APE would not require further archeological evaluation because of the extensive ground disturbance associated with past construction activities and industrial development. The District determined that the three floodwall alignment alternatives had the potential to have an adverse physical and visual effect on the Upper Mississippi River Locks and Dam No. 15 Historic District and an adverse visual effect on the river's viewshed of the Village of East Davenport and Lindsay Park Historic Districts. The District recommended additional consultation regarding the potential adverse effects, once a preferred alternative had been selected. By letter dated September 10, 2003, the SHSI concurred with the District definition of the APE and its determinations, and provided names and addresses of three additional consulting parties (R&C#: 030982012, Appendix A). No other responses to the initial coordination letter were received.

The District provided the preferred floodwall alignment with determinations of its effect to consulting parties for review and comment by letter dated January 12, 2004. See Appendix A. The District determined that the preferred alignment would result in "No Adverse Effect" to the three historic districts. The District concluded that the preferred alignment would not have adverse visual or physical impacts on contributing elements to the Upper Mississippi River Locks and Dam No. 15 Historic District and that the river's viewshed, a contributing element to the Village of East Davenport and Lindsay Park Historic Districts, would not be obstructed by the project. No reply was received from the SHSI so, pursuant to 36 CFR Part 800.4.d.(1)(i), the District assumes full concurrence with the determination.

This project is in full compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 and the implementing Code of Federal Regulations (CFR) 36, Part 800, "Protection of Historic Properties." Although the District is assured that no significant historic properties would be affected by the recommended alternative, if any undocumented historic properties are identified or encountered during the undertaking, the District would discontinue all project activities in proximity to the discovery and resume coordination with the SHSI to identify the significance of the cultural resource and any potential effects under Section 106 of the NHPA of 1966 and CFR 36, Part 800, "Protection of Historic Properties."

3.3.2 Created Resources. The project exists within a created environment. Human activities are principally related to industrial, recreational, transportation, and municipal developments. One recreational feature associated with the existing recreational path would need to be relocated. This feature is the existing plaza, which contains a landscaped ground, gazebo, and sculpture by John Bloom. This existing plaza would be relocated immediately downstream to the west of the new floodwall alignment on City property and would continue to overlook the river. The City would take on full responsibility for relocation of the plaza.

3.3.3 Natural Resources. The project would occur in an urban setting with few remaining natural resource functions. The project area would consist of an O&M access road for operation and maintenance of the proposed floodwall, maintained lawns, and has been landscaped with ornamental trees and shrubs. This access road would also serve as a paved recreational path for biking, jogging, and walking. Proposed lighting along the floodwall would also be used for security purposes. The proposed floodwall alignment would require the removal or relocation of approximately 20 ornamental trees and a few shrubs. These currently function as a food source for birds and small mammals. This lost function would be mitigated by replanting or relocating these plants to areas in the project vicinity. No significant adverse impacts to natural resources would result from implementation of the project.

3.3.4 Threatened/Endangered Species. Coordination with Federal and State natural resource agencies has revealed three species that could be impacted by the project if the project area contains suitable habitat for any of them. The three species are bald eagle (*Haliaeetus leucocephalus*), Higgins' eye pearly mussel (*Lampsilis higginsii*), and Indiana bat (*Myotis sodalis*). No suitable habitat exists for any of these species. Therefore, the project would not impact any Federal or State threatened or endangered species.

### **3.4 Environmental Impacts of the Non-Recommended Alternative**

The non-recommended alternative for this project is No Action. Taking no action to reduce flood damages would have little impact on the environment. Pedestrian and bike traffic on the path would continue similar to current usage, the lawn adjacent to the DWTP and the path would continue to be maintained/mowed, and the ornamental trees and shrubs in the project area would continue to grow, providing pleasant visual impacts and minor habitat value to urban songbirds and small mammals.

The recreational plaza associated with the existing recreational path would not need to be relocated. The plaza, containing the gazebo and John Bloom sculpture on landscaped grounds, would remain in its current location.

### **3.5 Probable Adverse Environmental Impacts that Cannot be Avoided**

3.5.1 General. The proposed floodwall alignment would require the removal or relocation of some woody vegetation. Within the proposed floodwall alignment there are approximately 20 ornamental trees, all less than 20 ft tall. In addition, a few ornamental shrubs would require removal or relocation. This vegetation is attractive to path users and river users, and provides food for birds and small mammals. Loss of this vegetation would be fully compensated to restore the area's aesthetic and habitat value.

3.5.2 Cumulative Impacts from Flood Damage Reduction Projects. Flood damage reduction projects generally produce positive impacts to economic resources and social concerns. Potential losses of life and property damage risks are reduced while utility and transportation networks benefit from greater continuity and reliability. Social concerns such as water supply, wastewater disposal, and medical/emergency services experience improved delivery reliability. Due to the current nature of the project site, environmental impacts of the project are negligible.

### 3.6 Compliance with Environmental Quality Statutes

- A. **National Environmental Policy Act of 1969, as amended.** The compilation of this EA, describing flood damage reduction for the DWTP located in Davenport, Iowa along the Mississippi River in Pool 15, fulfills the NEPA obligation for this project. If implemented, the project would be in full compliance.
- B. **National Historic Preservation Act of 1966, as amended.** This project is in full compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 and the implementing regulations 36 CFR Part 800, "Protection of Historic Properties." Although the District is assured that no historic properties would be affected by the recommended alternative, if any undocumented historic properties are identified or encountered during the undertaking, the District would discontinue all project activities in proximity to the discovery and resume coordination with the SHSI to identify the significance of the cultural resource and any potential effects under Section 106 of the NHPA of 1966 and 36 CFR Part 800, "Protection of Historic Properties."
- C. **Clean Air Act of 1972, as amended.** It is not anticipated that the proposed flood damage reduction project would result in either short or long-term violations of air quality standards. It is not anticipated that the outdoor atmosphere would be exposed to contaminants or pollutants in such quantities and of such duration as may be or tend to be injurious to human, plant, or property, or which unreasonably interferes with the comfortable enjoyment of life, property, or the conduct of business. If implemented, the project would be in full compliance.
- D. **Clean Water Act of 1972 (Sections 401 and 404), as amended.** Since no dredged or fill material would be placed in the waters of the United States for this project, no Section 404(b)(1) Evaluation is required. A Section 401, State Water Quality Certification, is also not applicable to this project. If implemented, the project would be in full compliance.
- E. **Endangered Species Act of 1973, as amended.** Coordination with the U.S. Fish and Wildlife Service (FWS) lists three species that have the potential to be impacted if suitable habitat were present in the project area. Those species are bald eagle, Higgins' eye pearly mussel, and the Indiana bat. No suitable habitat for any of these species is present in the project area. If implemented, the project would be in full compliance.
- F. **Fish and Wildlife Coordination Act of 1958, as amended.** This project has been coordinated with the U.S. FWS, and the Iowa Department of Natural Resources (IDNR). The District coordination letter to the appropriate Federal and State agencies, and all responses, can be found in Appendix A of this report. If implemented, the project would be in full compliance.

- G. **Wild and Scenic Rivers Act of 1968, as amended.** The National Rivers Inventory (NRI) is used to identify rivers, or sections of rivers, that may be designated by Congress to be component rivers in the National Wild and Scenic Rivers System. There are no portions of the Mississippi River listed in the NRI for this project; therefore, the project would be in full compliance.
- H. **Executive Order 11988 (Flood Plain Management).** Because this project would reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and has considered alternatives to avoid adverse effects and incompatible development in the floodplains, it would be in full compliance, if implemented.
- I. **Executive Order 11990 (Protection of Wetlands).** No wetlands would be encountered for this project.

### **3.7 Relationship Between Short-Term Use and Long-Term Productivity**

Localized flood damage reduction protection is necessary to reduce the risk of catastrophic consequences of flooding to Reach 1 and the DWTP. Implementation of the project would provide improved flood damage reduction protection for the long-term.

### **3.8 Any Irreversible or Irretrievable Commitments of Resources if the Project is Implemented**

The machinery fuel, the construction materials, and the man-power expended on the project are considered irreversible or irretrievable. No irreversible or irretrievable commitment has occurred which would have the effect of foreclosing the formulation, or implementation of any reasonable and prudent alternative. No commitment of resources has occurred that would prejudice the selection of any alternative before making a final decision on this project.

### **3.9 Social and Economic Effects of the Recommended Action**

3.9.1 **Community and Regional Growth.** No adverse impacts to the growth of the community or region would be realized as a direct result of the project. The area could benefit from a reduced threat of flooding at this critical facility.

3.9.2 **Community Cohesion.** The project would be expected to enhance community cohesion by further reducing the threat of damages from flooding and securing a reliable source of potable tap water for the community served. No public opposition is anticipated.

3.9.3 **Displacement of People.** The project would not require any residential relocations.

3.9.4 **Property Values and Tax Revenues.** The value of the DWTP could increase following construction of the project.

3.9.5 **Public Facilities and Services.** Overall, the project would not significantly impact access to marinas, boat ramps, or public river-viewing points adjacent to the project area. The project would provide a high level of flood protection to the DWTP, ensuring a reliable source of water during high water events for over 131,000 people and several hundred businesses and governmental organizations in Davenport, Bettendorf, and portions of Scott County, Iowa.

The project would be designed to enhance the riverfront. A proposed O&M access road, which would also serve as a recreational path, would be located along the unprotected side of the proposed floodwall, providing O&M and recreational access along the riverfront. The proposed floodwall would be architecturally treated, portions of the project area would be landscaped, and lighting along the proposed floodwall would be installed. In addition, the existing landscaped plaza, containing the gazebo and John Bloom sculpture, would be relocated to the west of the project site, making it more visible and accessible for the public. During construction a temporary recreational path would be identified so that recreational path users do not have to cross the railroad tracks and attempt to traverse along River Drive. Closures to the recreational path system during construction are not expected.

The floodwall would be designed to accommodate existing utilities as necessary. Utilities include overhead power lines, several abandoned utility lines, an abandoned storm sewer, an active high-pressure water main, and an existing AT&T fiber optic cable.

**3.9.6 Businesses and Industrial Activity.** The project would positively impact the DWTP by reducing the potential for closure of the facility due to flooding. The project would require constructing two railroad closures and would involve close coordination with the IC&E Railroad. Rerouting trains during construction is a difficult task and efforts would be made to minimize down time. The project would not serve as a catalyst for expansion and would not further commercial or industrial activity in the project area. No business relocations would be required for the project.

**3.9.7 Employment and Labor Force.** The project would temporarily increase area employment during the construction phase. There would be no significant long-term effect on employment or labor force within the area.

**3.9.8 Farm Displacement.** The project would be located in an urban setting with no potential to displace farms.

**3.9.9 Life, Health, and Safety.** Upgrading the current level of flood protection would reduce life, health, and safety threats. In the past, flood damage reduction at the facility consisted of installing temporary sand bag levees at great risk to the public water supply. See Figure 1.1.2, which shows the DWTP during the flood of 2001. The project would increase the level of flood protection, thus providing a continued safe and healthy water supply for the area served.

A Phase I HTRW investigation was conducted and revealed that there is a slight risk identified due to the railroad, boat marina, and unknown fill material located in the project area. No other evidence of recognized environmental conditions associated with the flood damage reduction area were identified. No further HTRW assessment was recommended.

A temporary path through the work area would be available during construction of the floodwall along the river. For the safety of the users, the temporary path would be bordered by security fencing. No information has been obtained on which user groups utilize the path and for what purposes. Given the fact that a temporary path alignment would be undertaken during construction of the proposed floodwall, no user group should be negatively impacted.

3.9.10 Noise Levels. The project would temporarily increase noise levels during the construction phase; however, noise levels within the area are already elevated by the presence of the railroad and heavy trucks that travel in and out of the area on a daily basis. Following project completion, no significant or long-term noise impacts to residents, path users, or sensitive receptors are anticipated.

3.9.11 Aesthetics. The project area is a mix of industrial, commercial and residential properties. Construction activities would be within the view of neighboring properties and users of the existing path along the riverfront. Project plans include landscaping and new vegetation along the path and on both sides of the floodwall, which would highlight the riverfront appeal and be aesthetically pleasing. The project would have no long-term adverse impacts to the aesthetic resources of the area.

### **3.10 Relationship to Land Use Plans**

The project to reduce flood damages to Reach 1 and the DWTP, including measures to mitigate for lost natural resource functions of the impacted trees and shrubs, is consistent with current recreation plans along the riverfront adjacent to the DWTP, and with continued service of the DWTP itself.

### **3.11 Reference from Previous Studies**

3.11.1 Environmental Impact Statement (EIS). The previous authorized 1982 GDM included both Reach 1, the DWTP, and Reach 2, other major portions of the city of Davenport. At that time, the District prepared a final EIS dated August 1976, for Davenport, Iowa Local Flood Protection. It was filed with the U.S. Environmental Protection Agency (EPA) on March 3, 1978. To comply with the Clean Water Act, a Section 404(b)(1) Evaluation Report was filed with the EPA on April 2, 1979 as Supplemental Information to the Final EIS. Section 401 Certification was issued in an October 24, 1978, letter from the Iowa Department of Environmental Quality. To comply with the Fish and Wildlife Coordination Act, the U.S. EPA, and the FWS were contacted during the EIS process and during the formulation of the Phase II GDM.

Since the EIS was completed over 25 years ago and the project has been reduced in scope, this report includes a new EA.

3.11.2 National Historic Preservation Act Compliance. Archeological consultation and field investigations conducted in support of the original project were completed prior to the formal implementation of 36 CFR Part 800, the Federal regulations implementing Section 106 of the NHPA. Results of the archeological field surveys were submitted to Federal, State, and local interests for comment. Consultation did not include relevant Federally recognized Tribes as required by the current regulations (36 CFR 800.4). The National Park Service concurred with the field methods and negative results of the investigations by letter dated July 9, 1976 (H22-[RMR]PI). In addition, an archeological survey was conducted within Le Claire Park in 1997, and no historic properties were documented (R&C#: 970400057).

## Section 4 – Project Cost Estimate and Economic Analysis

### 4.1 Summary of Planning and Project Cost Estimates

4.1.1 Summary of pre-WRDA 1986 Advanced E&D Costs. As discussed in Section 1.2, Phase I and Phase II GDMs were prepared for Reaches 1 and 2 of the Davenport Project in the 1970's and early 1980's. Following approval of the 1982 Phase II GDM, preliminary Engineering & Design (E&D) work was conducted until the project was suspended in 1984.

Section 105 of the WRDA of 1986 requires that a water resources project be cost-shared with the local sponsor (75% Federal and 25% non-Federal). It is the Corps intent that only those pre-WRDA 1986 costs directly related to implementing the project be included in the total cost-share estimate. The District has reviewed all pre-WRDA 1986 Advanced E&D costs and has determined that \$120,110 of these costs are directly related to implementation of the project and are subject to cost-sharing. A summary of these costs is presented in Table 4.1.1 with a detailed analysis of these costs on file at the District. The non-Federal cost-share is 25% of the total costs allocated to development of the project.

**Table 4.1.1  
Summary of pre-WRDA 1986 Advanced E&D Costs**

Activity	Total Amount Expended	Amounts Allocated to Reach 1	Reach 1, non-Fed Cost-Share (25%)	Remarks
GDM Preparation FY 1973-1982	\$ 1,464,690	\$ 50,670	\$ 12,670	The Amount Allocated to Reach 1 was 3.46% of the Total Amount Expended
Engineering & Design FY 1983-1986	\$ 198,410	\$ 69,440	\$ 17,360	The Amount Allocated to Reach 1 was determined to be 35% of the Total Amount Expended.
<b>Total pre-WRDA 1986 Costs</b>	<b>\$ 1,663,100</b>	<b>\$ 120,110</b>	<b>\$ 30,030</b>	

4.1.2 Total Project Cost Estimate. The District prepared a project cost estimate using the Micro Computer Aided Cost Estimated System (MCACES). The summary and details from this estimate are shown in Table 4.1.2 and in Table F.1 located in Appendix F of this EDR.

**Table 4.1.2  
Total Project Cost Estimate (Current Working Estimate, December 2004)**

<b>Description</b>	<b>Unit of Measure</b>	<b>Unit Price</b>	<b>Total Project Cost Estimate (Dec 2004)</b>
<b>Lands and Damages</b>			
Lands and Damages (Federal Acquisition Administration)	Lump Sum (LS)		\$ 100,000
Lands and Damages (non-Federal)	5.449 acres		\$ 650,000
<b>Subtotal</b>			<b>\$ 750,000</b>
<b>Relocations</b>			
Overhead Power Lines	LS		\$ 178,862
<b>Subtotal</b>			<b>\$ 178,862</b>
<b>Levees and Floodwalls</b>			
Mobilization and Demobilization	LS		\$ 37,565
“I” wall	1,556 Lineal Feet (LF)	\$1,199 / LF	\$ 1,784,783
“L” wall	605 LF	\$1,020 / LF	\$ 590,617
RR/DWTP Access Road Closures	2 RR, 1 road		\$ 814,979
DWTP Access Road	LS		\$ 26,127
Earth Embankment (Levee)	LS		\$ 59,326
Gatewells	6 each	\$42,610 each	\$ 255,678
Electrical	LS		\$ 486,434
Topsoil/Seeding/Landscaping	LS...including around 20 shrubs, 30 medium trees, and 5 large trees		\$ 97,119
Misc Utility Work	LS		\$ 70,145
O&M Access Road	220 LF	\$ 680 / LF	\$ 138,301
<b>Subtotal</b>			<b>\$ 4,361,074</b>
<b>Planning, Engineering, and Design</b>			
pre-WRDA 1986	LS		\$ 120,110
Limited Reevaluation Report (LRR)	LS		\$ 100,000
Engineering Documentation Report (EDR)	LS		\$ 480,000
Project Plans and Specifications, including Project Management	LS		\$ 350,000
Engineering During Construction, O&M Manual, As-Built Drawings, including Project Management	LS		\$ 227,000
<b>Subtotal</b>			<b>\$ 1,277,110</b>
<b>Construction Management (S&amp;A)</b>	LS		<b>\$454,000</b>
<b>Total Project Cost Estimate</b>			<b>\$ 7,021,046</b>

## 4.2 Economic Analysis

The economic justification for this project was analyzed in the LRS and was reviewed and updated for this EDR. This section includes a summary of the analysis based on the current project cost estimate and price-level-updated benefits.

<b>Table 4.2</b>	
<b>Benefit-to-Cost Analysis</b>	
(50-year evaluation period, 5½% discount rate)	
<u>Item</u>	<u>Date/Estimate</u>
Price Level of Cost Estimate	December 2004
Davenport Water Treatment Plant, Reach 1 (recommended project)	
Current Total Project Cost Estimate	\$ 7,021,050
Annualized Costs (incl. Interest During Construction)	\$ 449,000
Annual Benefits	
Flood Damage Reduction	\$ 48,400
Protection of Municipal Water Supply	\$ 919,300
Total Annual Benefits	\$ 967,700
Benefit to Cost Ratio	2.2
Net Annual National Economic Development (NED) Benefits	\$ 518,700

## 4.3 Project Cost Distribution

This information was developed for the Mississippi River at Davenport, Iowa project. All other options were dropped due to economic infeasibility and will not be considered further. Based on current cost-sharing provisions, Federal and non-Federal costs would be distributed as shown in Table 4.3. These costs include all planning, engineering, and design costs, including those cost-shared under the existing Design Agreement between the District and the City.

**Table 4.3**  
**Project Cost Distribution**

**Total Cost-Share Estimate (Dec 2004)**

Total Project Cost Estimate (Dec 2004)	\$ 7,021,050
<b><u>Federal Cost Estimate (75%)</u></b>	<b>\$ 5,265,790</b>
<b><u>non-Federal Cost Estimate (25%)</u></b>	<b>\$ 1,755,260</b>
LERRD	\$ 828,865
Cash Contributions	\$ 926,395

**4.4 Summary of Project Cost Estimate and Schedule of Funding Requirements**

4.4.1 Summary of Project Cost Estimate. The Total Project Cost Estimate shown in Table 4.4 represents the Current Working Estimate (CWE) as of December 2004. The fully funded estimate represents the total project cost estimate plus an estimate of inflation during the construction period of the project. For more information, reference the Project Cost Estimate included in this EDR as Appendix F.

**Table 4.4  
Summary of Total Project Cost Estimate and Fully Funded Estimate**

	<b>Item</b>	<b>Total Project Cost Estimate (Dec 2004)</b>	<b>Fully Funded Estimate*</b>
01	Lands and Damages (Federal)	\$ 100,000	\$ 100,000
01	Lands and Damages (non-Federal)	\$ 650,000	\$ 650,000
02	Relocations	\$ 178,865	\$ 189,000
11	Levees and Floodwalls	\$ 4,361,075	\$ 4,608,285
30	Planning, Engineering, and Design	\$ 1,277,110	\$ 1,296,735
31	Construction Management (S&A)	\$ 454,000	\$ 479,730
	<b>Total Project Cost Estimate</b>	<b>\$ 7,021,050</b>	<b>\$ 7,323,750</b>

\* Includes the total project cost estimate plus an estimate of inflation costs during the construction period

4.4.2 Financial Capability and Financing Plan. The City of Davenport, Iowa, has the willingness and capability to finance its share of the cost of constructing the project. A Statement of Financial Capability and Financing Plan will be submitted with the draft PCA.

## Section 5 – Plan Implementation

### 5.1 Implementation Requirements

To implement the recommended project, a number of steps would be required, starting with report approval and going through O&M by the project sponsor. The estimated implementation schedule to proceed with the flood damage reduction project for Reach 1 is shown in Table 5.1.

**Table 5.1**  
**Implementation Schedule**

Date	Event
Aug 2005	Begin Plans & Specifications (P&S)
Feb 2006	Commitment of Federal Funds & Approval to Negotiate PCA
April 2006	Execute PCA
April 2006	Receive non-Federal Contribution
Sept 2006	Complete P&S
Oct 2006	Complete BCOE review of P&S
Oct 2006	Complete Real Estate Acquisition
Nov 2006	Advertise for Bids
Feb 2007	Award Construction Contract
Feb 2009	Complete Construction

### 5.2 Implementation Responsibilities

5.2.1 Federal Responsibilities. Project implementation will be cost-shared 75 percent Federal / 25 percent non-Federal. The Federal share is estimated to be \$5,265,790. The Corps will supervise and administer the construction contract in accordance with the PCA and available funding.

5.2.2 Non-Federal Responsibilities. The PCA is the formal assurance between the Federal and non-Federal partners. Within the PCA, the sponsor must agree to:

- Provide, without cost to the Federal Government, during the period of construction, all lands, easements, rights-of-way, and utility and facility alterations and relocations required for construction and maintenance of the project, regardless of their value.
- Make a cash payment of not less than 5 percent of the total project costs during the period of construction, regardless of the value of the items listed above. If the value of the items listed above is less than 20 percent of total project costs, the sponsor shall, during the period of construction, make such additional cash payments as are necessary to bring its total contribution in cash and the value of the Lands, Easements, Rights-of-Way, Relocations, and Disposal areas (LERRD), to an amount equal to 25 percent of the total project cost.

- Hold and save the Federal Government free from all damages arising from the construction, operation, maintenance, repair, replacement, and rehabilitation of the completed project, except for damages due to the fault or negligence of the Federal Government or its contractors.
- Operate, maintain, repair, replace, and rehabilitate the project upon completion in accordance with regulations or directions prescribed by the Secretary of the Army.
- Accomplish, without cost to the Federal Government, all alterations and relocations of buildings, transportation facilities, storm drains, utilities, and other structures and improvements made necessary due to project construction.
- Prevent encroachment on any of the flood protection structures, including ponding areas, and if ponding areas are impaired, provide substitute storage capacity or equivalent pump capacity promptly without cost to the United States.
- Prescribe and enforce regulations to prevent obstruction or encroachment on channels which will reduce their flood-carrying capacity or hinder maintenance and operation.
- Participate in and comply with applicable Federal floodplain management and flood insurance programs. Publicize floodplain information in the areas concerned and provide this information to zoning and other regulatory agencies for their guidance and leadership in preventing unwise future development in the floodplain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels, including ponding areas, provided by the project.
- Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, PL 91-646, approved January 2, 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the project and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.
- Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (PL 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, CFR, in connection with the construction, operation, and maintenance of the project.
- Prior to construction, grant the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon land which the sponsor owns or controls for access to the project, for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing and rehabilitating the project.

## **Section 6 – Summary of Coordination, Public Review, and Comments**

### **6.1 Coordination.**

Throughout project development, the Corps strives to inform, educate, and involve the many groups who may have an interest in the project. This coordination is paramount to assuring that all interested parties have the opportunity to be part of the project development process. Pertinent correspondence relative to NEPA is included in this EDR under Appendix A.

### **6.2 Public Review and Comments**

The main forum for receiving comments during the EDR development was through the District's Project Development Teams (PDT) coordination with the non-Federal sponsor, the City. Meetings were held between the PDT and City at critical stages throughout the EDR development.

As discussed in Sections 1.6 and 2.1, development of the project design was coordinated with the City and local stakeholders, including adjacent landowners, businesses, and residents. In addition to this coordination, a presentation to the Davenport City Council concerning the project was broadcast on the local access television station.

### **6.3 Draft EDR Released**

An announcement was mailed to a distribution list of nearly 70 addresses including congressional representatives; Federal, State, county, and city officials; businesses and the media; and members of the public. The mailing announced the completion of the draft EDR, which describes the recommended project, and offered the public the opportunity to comment on the EDR.

### **6.4 Summary**

The goals of the coordination process for the project were to inform, educate, and involve the active participants and all members of the public interested in and affected by the project along with soliciting feedback through open communication. These goals were met by providing City officials, IAWC personnel, and the public opportunities to become informed, educated about, and involved in the development of the EDR by providing feedback to the District's PDT. The feedback was used by the PDT to shape the EDR development and to develop the recommended project. The recommended project that is included in this EDR has been influenced and improved through the public involvement process.

## Section 7 – Recommendation and Conclusion

### 7.1 Recommendation

Flood damage reduction improvements to Mississippi River at Davenport, Iowa, Reach 1, as described in this EDR, are technically, economically and environmentally feasible, and are in the Federal interest. It is recommended that this report be approved and that a cost-shared project cooperation agreement be executed to implement the project.

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Date

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Duane P. Gapinski  
Colonel, U.S. Army  
District Engineer

7.2 Finding of No Significant Impact (FONSI)

**FINDING OF NO SIGNIFICANT IMPACT**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR**  
**MISSISSIPPI RIVER AT DAVENPORT, IOWA**  
**FLOOD DAMAGE REDUCTION PROJECT**  
**REACH 1**  
**DAVENPORT WATER TREATMENT PLANT**

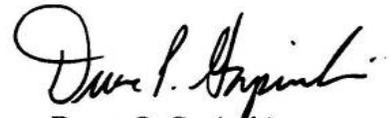
I have reviewed the information provided by the integrated Environmental Assessment and the Engineering Documentation Report, along with data obtained from cooperating Federal, State, and local agencies having jurisdiction by law or special expertise, and from the interested public. Based on this review, I find that the proposed flood damage reduction project would not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later developments.

Factors that were considered in making the determination that an Environmental Impact Statement is not required are as follows:

- a. No State or Federal threatened or endangered species would be impacted by the proposed project.
- b. No significant adverse environmental, social, economic, or cultural/historical impacts are anticipated as a result from implementation of the proposed project.
- c. The risk of flood damage to Reach 1 would be reduced, thereby reducing the potential of catastrophic disruption to the water supply for the City of Davenport, Bettendorf, and other parts of Scott County during periods of extreme high water.
- d. The proposed project is justified by a positive benefit-cost ratio of 2.2.

5-25-05

\_\_\_\_\_  
Date

  
Duane P. Gapinski  
Colonel, U.S. Army  
District Engineer

**APPENDIX A**

**PERTINENT CORRESPONDENCE  
& STATEMENT OF FINDINGS PACKAGE**

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX A  
PERTINENT CORRESPONDENCE  
& STATEMENT OF FINDINGS PACKAGE**

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**APPENDIX A  
PERTINENT CORRESPONDENCE**

**NEPA Correspondence Summary**

Coordination has been maintained throughout the planning process. The District's letter for natural resource coordination, dated July 25, 2003, along with the District's letters for cultural/historic coordination, dated August 29, 2003 and January 14, 2004, are included in this appendix. Following the District coordination letters are any/all responses received. The following Federal, State, County, municipal, and private organizations have been contacted:

Audubon Society, Iowa State Office  
City of Davenport  
Davenport Historic Preservation Commission  
Ho-Chunk Nation, Historic Preservation Department  
Illinois-American Water Company  
Illinois Department of Natural Resources, Office of Water Resources  
Illinois Historic Preservation Agency  
Iowa-American Water Company  
Iowa Department of Natural Resources, Division of Parks, Recreation & Preserves  
Iowa Department of Natural Resources, Water Resources Section  
Iowa Department of Public Defense, Emergency Management Division  
Iowa Tribe of Oklahoma, Cultural Preservationist  
Rock Island County Historical Society  
Sac and Fox Tribal Council, Meskwaki Tribal Historical Preservation Coordinator  
Scott County Board of Supervisors  
Scott County Conservation Board  
Scott County Historic Preservation Group  
Scott County Engineer  
State Historical Society of Iowa  
The Nature Conservancy, Iowa Field Office  
The Sierra Club, Iowa Chapter Office  
U.S. Fish and Wildlife Service  
U.S. Environmental Protection Agency, Region VII  
Village of East Davenport  
Winnebago Tribe of Nebraska, Cultural Preservation Officer

The IDNR, Conservation and Recreation Division, responded by letter dated August 11, 2003. They have no records of rare species or significant natural communities for this project. If listed species or rare communities are found, additional studies and/or mitigation may be required. Any construction activity that bares soil equal to or greater than 1 acre may require a storm water discharge permit from the IDNR.

The U.S. FWS, Rock Island Field Office, responded by letter dated August 27, 2003. They express potential concern for three species if suitable habitat for any of the species exists in the project area. No suitable habitat for bald eagles, Higgins' eye pearly mussel, or Indiana bat is present in the project area.

The U.S. EPA, Region VII, responded by letter dated August 28, 2003. They recommend that the EA include assessments of impacts to pedestrian traffic and to recreational facilities that could be impacted/obstructed during the construction phase. They recommend temporary pathways be constructed if heavy utilization or dependence exists on the pedestrian/bike paths. They also recommend the analysis should include the degree which the existing path is utilized by low income and/or minority populations within the project area. During the construction phase, appropriate erosion controls should be employed to prevent or retard sediment transport to the river. If 1 acre or more of soil disturbance is anticipated, a storm water NPDES permit would be required from the IDNR.

The SHSI responded by letter dated September 10, 2003, that they concurred with the District determination that archeological investigation would not be necessary due to the disturbed nature of the project area. The SHSI also concurred with the District determination that the undertaking has potential construction and visual impacts that may result in adverse effects to the Upper Mississippi River Locks and Dam No. 15 Historic District, the Village of East Davenport National Register of Historic Places Historic District, and the City of Davenport Register of Historic Places Lindsay Park Historic District. Lastly, the SHSI recommended additions to the consulting parties list and identified the need for additional consultation between the District and SHSI once project features had been refined.

The Winnebago Tribe of Nebraska notified the District by letter dated September 10, 2003 of their interest in the project and their wish to be notified in the event of inadvertent discoveries during project construction.

July 25, 2003

Planning, Programs, and  
Project Management Division

SEE DISTRIBUTION LIST

The Rock Island District of the U.S. Army Corps of Engineers has identified the need to provide flood protection for the Davenport Water Treatment Plant up to a flood elevation of 570.9 feet National Geodetic Vertical Datum plus freeboard. This flood height is equivalent to the Rock Island, Illinois, levee system located across the Mississippi River from Davenport, Iowa, and corresponds to a flood with a recurrence interval above the 200-year event. The Water Treatment Plant is located at approximate River Mile (RM) 484, right bank, in the City of Davenport, Scott County, Iowa, in Section 30, Township 78 North, Range 4 East.

A Limited Reevaluation Study was performed in 2001 and 2002 to evaluate the previously authorized Davenport flood control project, as described in the Phase II General Design Memorandum, dated February 1982. The Limited Reevaluation Report, completed in July 2002, determined that flood damage reduction improvements in Reach 1, the Water Treatment Plant, are technically, economically, and environmentally feasible and are in the Federal interest. This project would be cost-shared by the City of Davenport.

Three alternatives are currently being evaluated to provide flood protection for the Water Treatment Plant. The site location map and the three alternative details are enclosed (Enclosure 1). Each of the alternatives involves the construction of a floodwall that would tie into the levee embankment at the upland edge of the project site. The first alternative, the I-Wall, includes the placement of a floodwall over sheet piling to the landside of the existing concrete storm sewer and seawall, which runs parallel to the Mississippi River. The second alternative, the L-Wall, includes the placement of a floodwall over the landward edge of the existing concrete storm sewer and seawall. The third alternative, the Riverside Wall, includes the construction of a floodwall over the existing seawall. As the floodwall diverges from the seawall, the sheet pile and I-wall configuration would be constructed. The project would also include construction of gatewells and manholes to ensure positive closure of all storm drains. Other closure devices may be constructed to ensure reliability in closing other utilities as they cross the proposed line of protection.

The Rock Island District plans to prepare an Environmental Assessment for this proposal. At this time we would like to identify any existing significant resources or other environmental concerns associated with this proposal, such as wetlands, endangered species, land-use plans, flood plain issues, etc. Please inform us of any reports, studies, or other research concerning environmental resources in the project vicinity that may be of use in analyzing potential impacts of the project.

Please provide any comments you may have regarding this proposal within 30 days of receipt of this letter. Address your comments, concerns, or questions to Ms. Gail Clingerman of our Economic and Environmental Analysis Branch, telephone 309/794-5791. Written comments may be sent to our address above, ATTN: Planning, Programs, and Project Management Division (Gail Clingerman).

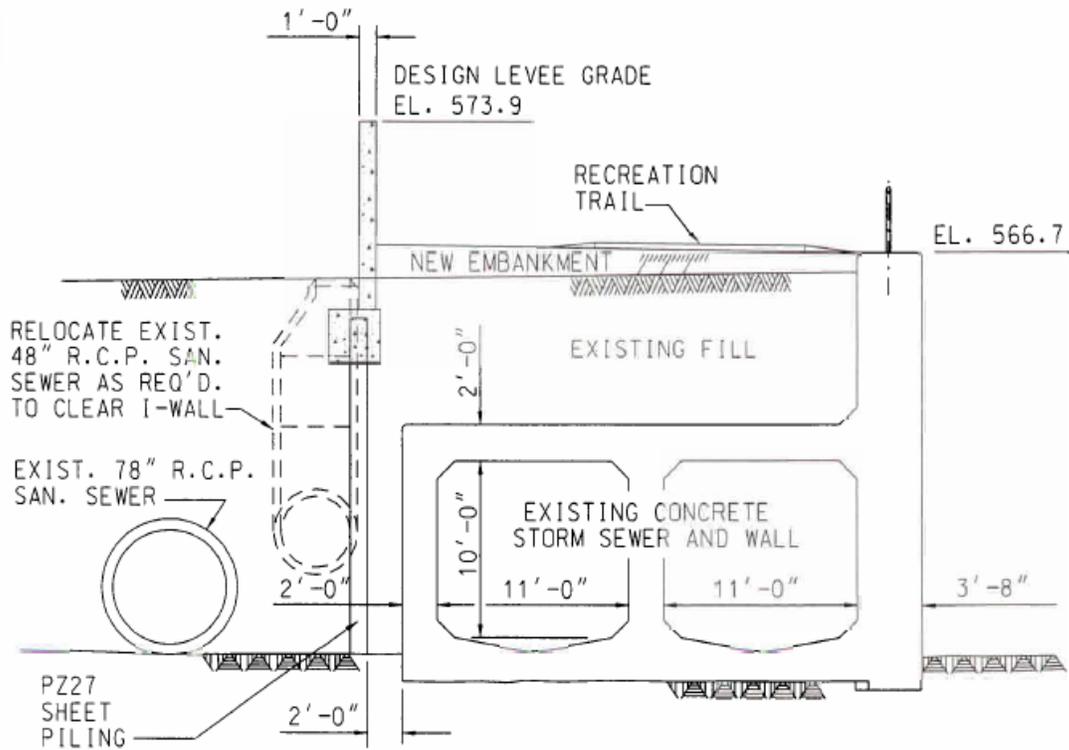
Sincerely,

**ORIGINAL SIGNED BY**

Kenneth A. Barr  
Chief, Economic and Environmental  
Analysis Branch

LANDSIDE

RIVERSIDE

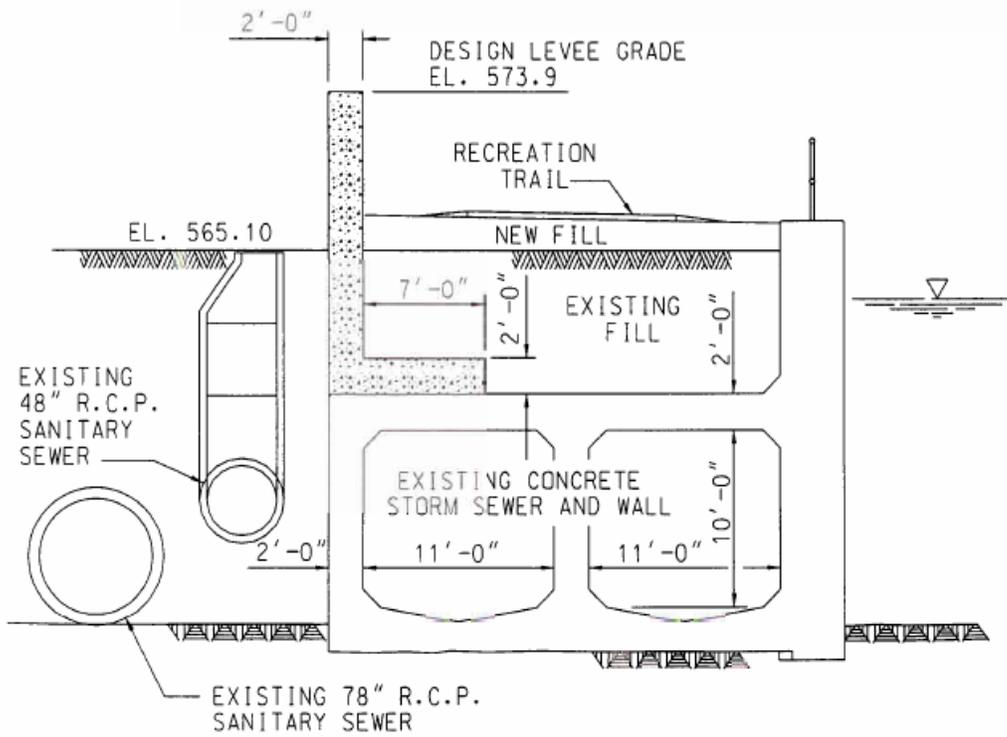


### I-WALL TYPICAL SECTION



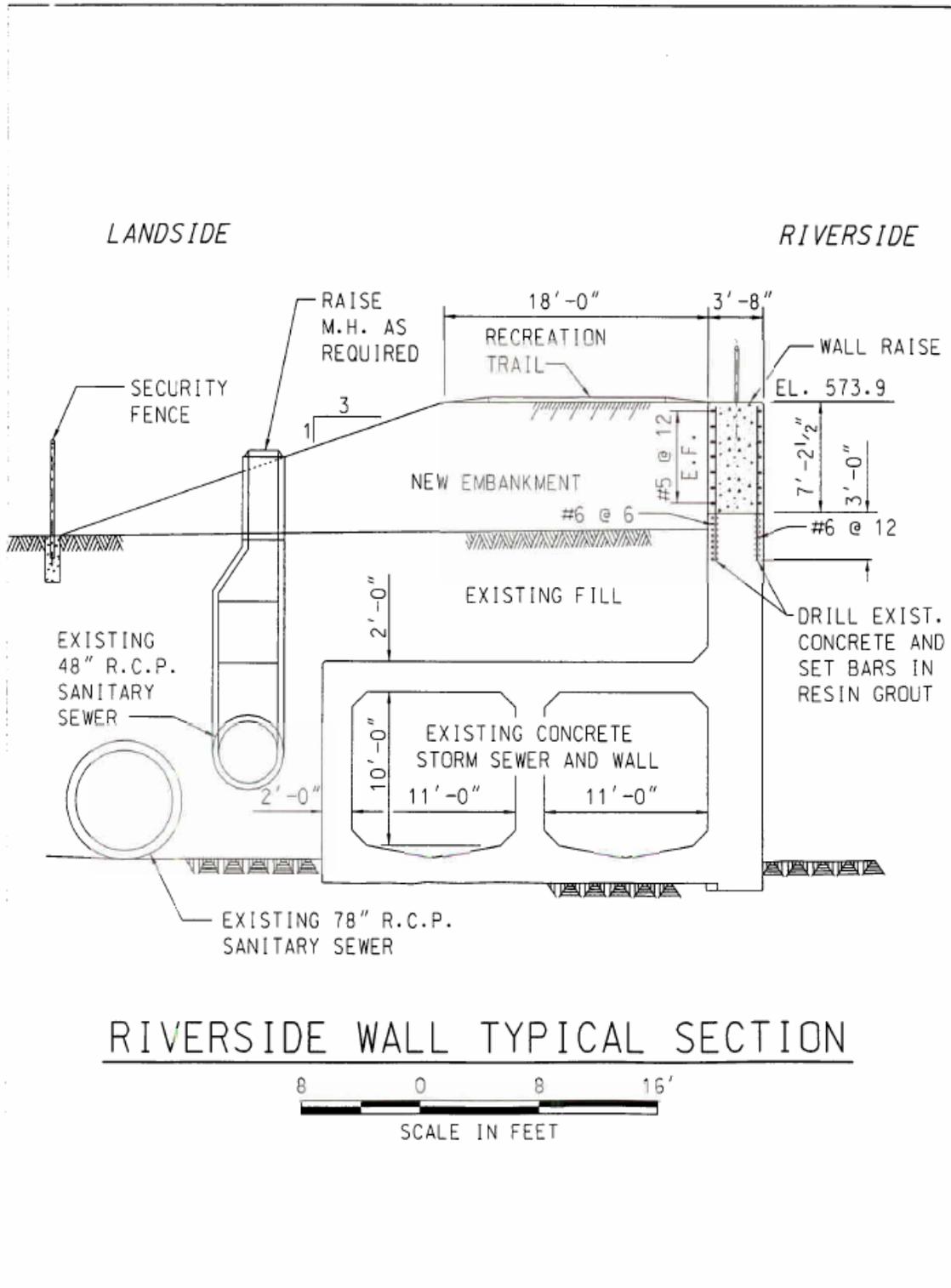
LANDSIDE

RIVERSIDE



### L-WALL TYPICAL SECTION





RIVERSIDE WALL TYPICAL SECTION



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Administrator, Region 7  
U.S. Environmental Protection Agency  
901 North 5th Street  
Kansas City, KS 66101

Scott County Board of Supervisors  
428 Western Avenue  
Davenport, IA 52801

Kelly M. Stone, P.E.  
Supervisor  
Water Resources Section  
Iowa Department of Natural Resources  
502 East 9th Street  
Wallace State Office Building  
Des Moines, IA 50319-0034

Keith Dohrmann  
Data Manager  
Division of Parks, Recreation & Preserves  
Iowa Department of Natural Resources  
Wallace State Office Building  
502 East 9th Street  
Des Moines, IA 50319-0034

Paul Zeph  
Executive Director  
Iowa State Office  
Audubon Society  
P.O. Box 71174  
Des Moines, IA 50325

The Sierra Club  
Iowa Chapter Office  
3500 Kingman Boulevard  
Des Moines, IA 50311

Jill Hood  
The Nature Conservancy  
Iowa Field Office  
108 Third Street, Suite 300  
Des Moines, IA 50309-4758

Brady A. Robbins  
Hazard Mitigation Bureau  
Emergency Management Division  
Iowa Department of Public Defense  
Hoover State Office Building  
Des Moines, IA 50319

Rock Island Field Office  
U.S. Fish and Wildlife Service  
4469 - 48th Avenue Court  
Rock Island, Illinois 61201

Scott County Engineer  
Scott County Courthouse  
416 West 4th Street  
Davenport, IA 52801

Honorable Charles Brooke  
Mayor of Davenport  
226 West 4th Street  
Davenport, IA 52801

Mr. Pat McGrath, P.E.  
City Engineer  
1200 East 46th Street  
Davenport, IA 52807

Scott County Conservation Board  
14910 - 110th Avenue  
Davenport, IA 52804

Mr. Mark L. Johnson, P.E.  
Vice President of Engineering  
Illinois-American Water Company  
P.O. Box 24040  
Belleville, IL 62223-9040

Mr. K. Brock Earnhardt  
Vice President and Manager  
Iowa-American Water Company  
P.O. Box 979  
Davenport, IA 52805

Dennis Kennedy  
Illinois Department of Natural Resources  
Office of Water Resources  
One Natural Resources Way  
Springfield, IL 62702-1271

August 29, 2003

Planning, Programs, and  
Project Management Division

#### SEE DISTRIBUTION LIST

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has identified the need to provide flood protection for the Davenport Water Treatment Plant up to a flood elevation of 570.9 feet National Geodetic Vertical Datum, plus freeboard. This flood height is equivalent to the Rock Island, Illinois, levee system located across the Mississippi River from Davenport, Iowa, and corresponds to a flood with a recurrence interval above the 200-year event. The Water Treatment Plant is located at approximate River Mile 484, along the right descending bank, in the City of Davenport, Scott County, Iowa, in Township 78 North, Range 4 East, Section 30 (Exhibits 1 and 2).

A Limited Reevaluation Study was performed in 2001 and 2002 to evaluate the previously authorized Davenport flood control project as described in the Phase II General Design Memorandum, dated February 1982. The Limited Reevaluation Report, completed in July 2002, determined that flood damage reduction improvements in Reach 1, the Water Treatment Plant, are technically, economically, and environmentally feasible and are in the Federal interest. This project will be cost shared by the City of Davenport.

Three alternatives are currently under evaluation (Exhibits 3-5). Each of the alternatives involves the construction of a floodwall that would tie into levee embankment at the upland edge of the project. The first alternative, the I-Wall, includes the placement of a floodwall over sheet piling to the landside of the existing concrete storm sewer and seawall, which runs parallel to the Mississippi River (Exhibit 3). The second alternative, the L-Wall, includes the placement of a floodwall over the landward edge of the existing concrete storm sewer and landward of the seawall (Exhibit 4). The third alternative, the Riverside Wall, includes the construction of a floodwall over the existing seawall (Exhibit 5). Where the floodwall diverges from the seawall, the sheet pile and I-Wall configuration would be constructed. The project will also include construction of gatewells and manholes to ensure positive closure of all storm drains. Other closure devices may be constructed to ensure reliability in closing other utilities as they cross the proposed line of protection.

### **Area of Potential Effect (APE)**

The APE for this undertaking includes the construction area, excavation areas, and all associated access, and staging areas as illustrated on Exhibits 1 and 2. The APE is not on tribal lands [reference 36 CFR 800.15(d); 36 CFR 800.4(a)(1); and 36 CFR 800.4(c)].

### **Consulting Parties**

The Corps finds the organizations identified in the attached Distribution List are entitled to be consulting parties as set out in 36 CFR 800.2 and invites them by copy of this letter to participate in the Section 106 process.

### **SHPO Invitation**

The Corps invites the SHPO to:

- Identify any other consulting parties as per 36 CFR 800.3(f);
- Comment as per 36 CFR 800.2(d)(3) on the Corps plan to involve the public by using the Corps' normal procedures for public involvement under the National Environmental Policy Act; and,
- Comment on or contribute to identification efforts including definition of the APE, all as per 36 CFR 800.4(a-b).

### **Identification of Historic Properties**

#### Review of Existing Information and Level of Future Identification Efforts:

The Corps has consulted with the State of Iowa archeological site and survey Geographic Information Systems (GIS) databases (current as of June 2003) and determined that there are no previously recorded archeological sites in the APE. The Upper Mississippi River Lock and Dam Number 15 Historic District (Historic District) extends into a portion of the APE and the boundaries have been reproduced in Exhibit 6. Specifically, the Davenport Seawall with Integrated Sewer, which are contributing elements to the National Register of Historic Places (NRHP) Historic District determination, are located in the APE. The Village of East Davenport NRHP Historic District boundaries extend over a portion of the eastern edge of the APE and have been reproduced in Exhibit 7. Finally, the City of Davenport NRHP Lindsay Park Historic District is contained within the Village of East Davenport District and is located just east of the APE. The Lindsay Park Historic District boundaries have been reproduced in Exhibit 8. It is critical to note that both the Village of East Davenport and Lindsay Park Historic District boundaries include approximately 100 feet of the riverbed and identify the river view as a contributing element to their significance.

The opinion of the Corps is that past construction activities have severely diminished the archeological potential of the APE (Exhibits 1, 3, 4, 5, and 9). In addition to seawall and sewer construction, past ground disturbances have resulted from building, road, railroad, and parking lot construction as well as from industrial development with the recent construction of the Water Treatment Plant and associated utilities. Consequently, the Corps has determined that none of the alternatives under consideration, with the possible exception of the potential levee feature, have potential to impact archeological resources and that archeological evaluation in that portion of the APE outside of the potential levee area is not warranted. Additional information and a Corps determination regarding the potential levee feature will be provided to the Distribution List within the next few months.

The Corps has determined that each of the three alternatives have the potential to adversely affect the Davenport seawall and sewer, both of which are contributing elements to the Upper Mississippi River Lock and Dam No. 15 Historic District. The alignment for I-Wall and L-Wall alternatives is offset from the seawall and involves working within existing fill (Exhibits 3 and 4). The I-Wall alternative does not result in physical impacts to the seawall or sewer while the L-Wall alternative may have a physical impact on the sewer (Exhibit 4). The Riverside Wall alternative will result in physical impacts to the seawall from drilling needed to attach the floodwall (Exhibit 5). Potential visual impacts to the seawall are associated with all three alternatives. Finally, all three alternatives have the potential to have adverse visual effects to the Village of East Davenport NRHP Historic District and the City of Davenport NRHP Lindsay Park Historic District. In both cases, the historic districts extend into the river and include the river view as a contributing element to their significance.

Request for Information from Consulting Parties:

The Corps is seeking information from all consulting parties regarding their concerns with issues relating to this undertaking's potential effects on historic properties and tribal concerns with identifying properties that may be of religious and cultural significance to them and may be eligible for the National Register [36 CFR 800.4(a)(3-4)]. Concerns about confidentiality [36 CFR 800.11(c)] regarding locations of properties can be addressed under Section 304 of the National Historic Preservation Act, which provides withholding from public disclosure the location of properties under several circumstances, including in cases where it would cause a significant invasion of privacy, impede the use of a traditional religious site by practitioners, endanger the site, etc.

We request your written comments on this project within 30 days pursuant to 36 CFR 800.3(c)(4). The Corps has identified the consulting parties for this undertaking as set out in 36 CFR 800.2 and invites them by copy of this letter to participate in the Section 106 process (see Distribution List). Results of this consultation and determination shall be included in an Environmental Assessment for additional public review later this year.

If you have any questions regarding this matter, please call Mr. Jim Ross of our Economic and Environmental Analysis Branch at 309/794-5540, or you may write to our address given above, ATTN: Planning, Programs, and Project Management Division (Jim Ross).

Sincerely,

ORIGINAL SIGNED BY

Kenneth A. Barr  
Chief, Economic and Environmental  
Analysis Branch

## DISTRIBUTION LIST

Ho-Chunk Nation  
Historic Preservation Department  
P.O. Box 667  
Highway 54 East  
Black River Falls, WI 54615

Marianne Long  
Cultural Preservationist  
Iowa Tribe of Oklahoma  
R.R. 1, Box 721  
Perkins, OK 74059

Chairman Johnathan Buffalo  
Meskwaki Tribal Historical  
Preservation Coordinator  
Sac and Fox Tribal Council  
349 Meskwaki Road  
Tama, IA 52339-9629

David Lee Smith  
Cultural Preservation Officer  
Winnebago Tribe of Nebraska  
P.O. Box 687  
Winnebago, NE 68071

Scott County Board of Supervisors  
428 Western Avenue  
Davenport, IA 52801

Scott County Engineer  
Scott County Courthouse  
416 West 4th Street  
Davenport, IA 52801

Mr. Pat McGrath, P.E.  
City Engineer  
1200 East 46th Street  
Davenport, IA 52807

Mr. K. Brock Earnhardt  
Vice President and Manager  
Iowa-American Water Company  
P.O. Box 979  
Davenport, IA 52805

Scott County Historic Preservation Group  
Attn: Ms. Karen Anderson  
1923 East 13th Street  
Davenport, Iowa 52803

Village of East Davenport  
2119 East 12th Street  
Davenport, Iowa 52803

Rock Island County Historical Society  
822 - 11th Avenue  
Moline, Illinois 61265

Lavon Grimes  
R&C Coordinator  
State Historical Society of Iowa  
600 East Locust  
Des Moines, IA 50319-0290

Anne E. Haaker  
Deputy State Historic Preservation Officer  
Illinois Historic Preservation Agency  
1 Old State Capitol Plaza  
Springfield, IL 62701-1507



STATE OF IOWA

THOMAS J. VILSACK, GOVERNOR  
SALLY J. PEDERSON, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES  
JEFFREY R. VONK, DIRECTOR

August 11, 2003

Gail Clingerman  
Planning, Programs and Project Management Division  
U.S. Army Corps of Engineers  
Clock Tower Building  
P.O. Box 2004  
Rock Island, IL 61204-2004

RE: Raise the floodwall along the Mississippi to the same height as on the Illinois side and to protect the Deavenport Water Treatment Plant from flooding, Scott County, Iowa

Dear Ms. Clingerman:

Thank you for inviting our comments on the impact of the above referenced project on protected species and rare natural communities.

We have searched our records of the project area and found no site-specific records of rare species or significant natural communities. However, our data are not the result of thorough field surveys. If listed species or rare communities are found during the planning or construction phases, additional studies and/or mitigation may be required.

This letter is a record of review for protected species, rare natural communities, state lands and waters in the project area, including review by personnel representing state parks, preserves, recreation areas, wetlands, fisheries and wildlife. It does not constitute a permit and before proceeding with the project, you may need to obtain permits from state and federal agencies.

Effective March 10, 2003, any construction activity that bares the soil of an area greater than or equal to 1 acre including clearing, grading or excavation may require a storm water discharge permit from the Department. Construction activities may include the temporary or permanent storage of dredge material. For more information regarding this matter, please contact Ruth Rosdail at 515/281-6782.

The Department administers regulations that pertain to fugitive dust IAW Iowa Administrative Code 567-23.3(2)"c". All persons shall take reasonable precautions to prevent the discharge of visible emissions of fugitive dusts beyond the lot line of property during construction, alteration, repairing or demolishing of buildings, bridges or other vertical structures or haul roads. All questions regarding fugitive dust regulations should be addressed to Jim McGraw at 515/242-5167.

If you have any questions about this letter or if you require further information, please contact me at (515) 281-8967.

Sincerely,

KEITH L. DOHRMANN, ENVIRONMENTAL SPECIALIST  
POLICY AND COORDINATION SECTION  
CONSERVATION AND RECREATION DIVISION

03-2076L

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319  
515-281-5918 TDD 515-242-5967 FAX 515-281-6794 WWW.STATE.IA.US/DNR



## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Rock Island Field Office  
4469 48<sup>th</sup> Avenue Court  
Rock Island, Illinois 61201  
Phone: (309) 793-5800 Fax: (309) 793-5804

IN REPLY REFER  
TO:  
FWS/RIFO

August 27, 2003

U.S. Army Corps of Engineers  
Rock Island District  
ATTN: PM-A (Gail Clingerman)  
Clock Tower Building, P.O. Box 2004  
Rock Island, Illinois 61204-2004

Dear Ms. Clingerman:

This letter responds to the coordination request letter for the Davenport Water Treatment Plant flood protection project in Pool 16 of the Mississippi River, Scott County, Iowa, which was dated July 25, 2003.

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain from the Fish and Wildlife Service information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing you the following list of species which may be present in the concerned area:

<u>Classification</u>	<u>Common Name (Scientific Name)</u>	<u>Habitat</u>
Threatened	Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Wintering (current distribution)
Endangered	Higgins' eye ( <i>Lampsilis higginsii</i> )	Mississippi River
Endangered	Indiana bat ( <i>Myotis sodalis</i> )	Caves, mines (hibernacula); small stream corridors with well developed riparian woods; upland forests (foraging)

The threatened bald eagle (*Haliaeetus leucocephalus*) is listed as breeding in Scott County, Iowa. During the winter, this species feeds on fish in the open water areas created by dam

tailwaters, the warm water effluents of power plants and municipal and industrial discharges, or in power plant cooling ponds. The more severe the winter, the greater the ice coverage and the more concentrated the eagles become. They roost at night in groups in large trees adjacent to the river in areas that are protected from the harsh winter elements. They perch in large shoreline trees to rest or feed on fish. There is no critical habitat designated for this species. The eagle may not be harassed, harmed, or disturbed when present nor may nest trees be cleared.

The endangered Higgins' eye pearly mussel (*Lampsilis higginsii*) is listed for the Mississippi River north of Lock and Dam 20 which includes Scott County, Iowa. This species prefers sand/gravel substrates with a swift current and is most often found in the main channel border or an open, flowing side channel.

While there is no designated critical habitat, the Higgins' eye Recovery Team has designated habitats essential to the recovery of the species. These areas do not include Scott County, Iowa.

The endangered Indiana bat (*Myotis sodalis*) is listed as potentially occurring in all counties south of Interstate 80 in Iowa. During the summer, the Indiana bat frequents the corridors of small streams with well developed riparian woods as well as mature upland forests. It forages for insects along the stream corridor, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fencerows, and over farm ponds and in pastures. It has been shown that the foraging range for the bats varies by season, age, and sex and ranges up to 81 acres (33ha). It roosts and rears its young beneath the loose bark of large dead or dying trees. It winters in caves and abandoned mines.

An Indiana bat maternity colony typically consists of a primary roost tree and several alternate roost trees. The use of a particular tree appears to be influenced by weather conditions (temperature and precipitation). For example, dead trees found in more open situations were utilized more often during cooler or drier days while interior live and dead trees were selected during periods of high temperature and/or precipitation. It has been shown that pregnant and neonatal bats do not thermoregulate well and the selection of the roost tree with the appropriate microclimate may be a matter of their survival. The primary roost tree, however, appears to be utilized on all days and during all weather conditions by at least some bats. Indiana bats tend to be philopatric, i.e., they return to the same roosting area year after year.

Suitable summer habitat in Iowa is considered to have the following characteristics within a ½ mile radius of the project site:

- 1) forest cover of 15% or greater;
- 2) permanent water;
- 3) one or more of the following tree species 9 inches diameter at breast height (dbh) or greater: shagbark and shellbark hickory that may be dead or alive, and dead bitternut

hickory, American elm, slippery elm, eastern cottonwood, silver maple, white oak, red oak, post oak, and shingle oak with slabs or plates of loose bark;

- 4) at least 1 potential roost tree per 2.5 acres;
- 5) potential roost trees must have greater than 10% coverage of loose bark (by visual estimation of peeling bark on trunks and main limbs).

If the project site contains any habitat that fits the above description, it may be necessary to conduct a survey to determine whether the bat is present. If Indiana bats are known to be present, they must not be harmed, harassed, or disturbed when present.

We recommend that you contact the Iowa Department of Natural Resources for information regarding state listed threatened and endangered species. Their address 110 Lake Darling Road, Brighton, IA 52540, or call them at (319) 694-2430.

This letter provides comment under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.) and the Endangered Species Act of 1973, as amended. Questions regarding this letter or our availability for review of the mitigation plan and/or the environmental assessment may be directed to Mr. Kraig McPeck at (309) 793-5800, ext. 210.

Sincerely,



Richard C. Nelson  
Supervisor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII  
901 NORTH 5TH STREET  
KANSAS CITY, KANSAS 66101

**AUG 28 2003**

Ms. Gail Clingerman  
Economic and Environmental Analysis Branch  
Rock Island District, Corps of Engineers  
Clock Tower Bank  
PO Box 2004  
Rock Island, Illinois 61204

Dear Ms. Clingerman:

RE: Flood Protection for the Davenport Water Treatment Plant in Davenport, Scott County, Iowa

This letter is to inform you that the Environmental Protection has received your request for environmental comment on the project mentioned above. The letter was received in our office on July 31, 2003.

The EPA recommends that your environmental assessment include assessment of impacts to pedestrian traffic and to recreational facilities that will be obstructed during the construction phase. Heavy utilization, or dependence on the pedestrian/bike trails may compel the provision of temporary pathways. This analysis should also include assessment of the degree which the existing path is utilized by low income and/or minority populations within the project area.

During the construction phase, appropriate erosion controls should be employed to prevent or retard sediment transport to the Mississippi River. Please also note; that if one (1) acre or more of soil disturbance is anticipated, then a stormwater NPDES permit will be needed from the Iowa Department of Natural Resources. Such a permit may contain more specific pollution control requirements.

If you have any questions or require further assistance, please contact me at (913) 551-7805.

Sincerely,

A handwritten signature in black ink that reads "NICHOLAS P. ROCHA".

Nicholas P. Rocha  
NEPA Reviewer  
Environmental Services Division



A Division of the Iowa Department of Cultural Affairs

September 10, 2003

In reply refer to:  
R&C#: 030982012

Mr. Jim Ross, Archaeologist  
Economic and Environmental Analysis Branch  
Corps of Engineers – Rock Island District  
Clock Tower Building P.O. Box 2004  
Rock Island, IL 61204-2004

RE: COE – SCOTT COUNTY – CITY OF DAVENPORT – PROPOSED CONSTRUCTION OF A  
FLOODWALL TO PROTECT THE DAVENPORT WATER TREATMENT PLANT – MISSISSIPPI RIVER  
LOCK AND DAM NO. 15 -- RM 484 -- SEC. 25, T78N-R3E AND SEC. 30, T78N-R4E

Dear Mr. Ross,

By this letter, the Iowa State Historic Preservation Office (heretofore SHPO) accepts the Corps' (Rock Island District) invitation to consult on this undertaking. The comments and recommendations presented below are in response to the Corps' notification under the heading SEE DISTRIBUTION LIST dated August 29, 2003.

Federal Undertaking

1. The SHPO agrees that the proposed action constitutes a Federal undertaking eliciting review under section 106 of the National Historic Preservation Act of 1966 and its implementing regulations, 36 CFR part 800.

Consulting Parties

1. We recommend that you include the following as potential consulting parties:

Mr. Gavin Schermer  
Office of Land Use Regulation  
City of Davenport  
226 W 4th Street  
Davenport, IA 52801

Mr. John Frueh, Chair  
Davenport Historic Preservation Commission  
625 Warren Street  
Davenport, IA 52802

Ms. Kerry McGrath, CLG Coordinator  
Iowa State Historic Preservation Office  
600 E. Locust  
Des Moines, Iowa 50319

If others come forward during the review process, the SHPO encourages the Corp to consider their interests and invite their consultation when deemed appropriate per 36 CFR part 800.3(f).

2. In accordance with section 101 (b) (3) the SHPO agrees to assist the Corp in carrying out their section 106 responsibilities for this undertaking.
3. In doing so, the SHPO will act in the best interests of the State of Iowa and its citizens in the preservation of their cultural heritage as mandated by 36 CFR 800.2 (c) (1).

Area of Potential Effects (APE)

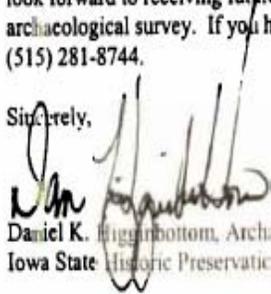
4. The SHPO agrees to comment on and contribute to identification efforts including definition of the project APE as per 36 CFR 800.4(a-b) and stipulates that the APEs defined for the various activities proposed by this undertaking must be defined in three-dimensional terms. The SHPO agrees that the area defined in Exhibits 1 and 2 represent the entire project APE based on the accompanying project description.

Identification of Historic Properties (Agency Evaluation of Historic Significance, etc.)

1. Upon reviewing the available project documentation, it is the opinion of this office that the project area has high potential to contain significant historic properties that may be eligible for listing on the National Register of Historic Places.
2. We agree that it is reasonable to assume that earthmoving associated with past construction and development activities within the project area of potential effects has profoundly disturbed any archaeological resources that may have existed there and that further archaeological investigation is not warranted. We also agree that the construction and visual intrusion of the proposed flood protection facility under the three alternatives are likely to result in adverse effects to the Upper Mississippi River Lock and Dam No. 15 Historic District, The Village of East Davenport Historic District, the Lindsay Park Historic District, and or contributing elements to those districts. We agree to consult with and assist the Corps of Engineers - Rock Island District to resolve the adverse effects as they are identified.

Thank you for inviting our consultation on this undertaking. At this time we have no further comments or recommendations. Please forward those stated above to the other consulting parties identified for this undertaking. I look forward to receiving future correspondences from you and await the opportunity to review the results of the archaeological survey. If you have any questions, or if I can be of further assistance please feel free to contact me at (515) 281-8744.

Sincerely,

  
Daniel K. Higginbottom, Archaeologist  
Iowa State Historic Preservation Office

# WINNEBAGO TRIBE of NEBRASKA

WINNEBAGO TRIBAL COUNCIL P.O. BOX 687 WINNEBAGO, NEBRASKA 68071



September 10, 2003

Department of the Army  
Rock Island District Corps of Engineers  
ATTN Planning, Programs, and Project Management Division, (Jim Ross)  
Clock Tower Building – PO Box 2004  
Rock Island, Illinois 61204-2004

RE: Davenport Water Treatment Plant

Mr. Ross,

Thank you for your letter of August 29, 2003. The Winnebago Tribe of Nebraska use to live in the area of your proposed project and construction, should any cultural properties be discovered or any human remains be unearthed please notify my office immediately. Thank you for your time in this matter.

*David Lee Smith*

David Lee Smith  
Cultural Preservation Officer  
Repatriation Program  
Box 270 – LPTC  
Winnebago, Nebraska 68071  
402-878-3313  
[dsmith@LPTC.BIA.edu](mailto:dsmith@LPTC.BIA.edu)

January 14, 2004

Planning, Programs, and  
Project Management Division

**SEE DISTRIBUTION LIST**

The Rock Island District of the U.S. Army Corps of Engineers (Corps) has identified the need to provide flood protection for the Davenport Water Treatment Plant up to a flood elevation of 570.9 feet National Geodetic Vertical Datum, plus freeboard. This flood height is equivalent to the Rock Island, Illinois, levee system located across the Mississippi River from Davenport, Iowa, and corresponds to a flood with a recurrence interval above the 200-year event. The Water Treatment Plant is located at approximate River Mile 484, along the right descending bank, in the City of Davenport, Scott County, Iowa, in Section 30, Township 78 North, Range 4 East (Exhibits 1 and 2, enclosed).

A Limited Reevaluation Study was performed in 2001 and 2002 to evaluate the previously authorized Davenport flood control project as described in the Phase II General Design Memorandum, dated February 1982. The Limited Reevaluation Report, completed in July 2002, determined that flood damage reduction improvements in Reach 1, the Water Treatment Plant, are technically, economically, and environmentally feasible and are in the Federal Interest. This project will be cost shared by the City of Davenport.

This project Area of Potential Effect (APE), encompassing three potential alternatives, was originally coordinated with those on the Distribution List by letter dated August 29, 2003. The State Historical Society of Iowa (SHSI) provided comment by letter dated September 10, 2003 (R&C#: 030982012). A preferred alternative has been selected that includes a floodwall design that combines L-wall features and I-wall features to the land side of the existing seawall. The L-wall floodwall will be placed on the landward edge of the existing concrete storm sewer and landward of the seawall (Exhibit 3). The I-wall floodwall will be placed over sheet piling to the landside of the existing concrete storm sewer and seawall (Exhibit 4). The relative locations of I-wall and L-wall placement are reproduced in Exhibit 2. The project will also include construction of gatewells and manholes to ensure positive closure of all storm drains.

**APE**

The APE for this undertaking remains unchanged from that previously coordinated with those on the Distribution List. The APE includes the construction area, excavation areas, and all associated access and staging areas, as illustrated on Exhibits 1 and 2. The APE is not on tribal lands [reference 36 CFR 800.15(d); 36 CFR 800.4(a)(1); and 36 CFR 800.4(c)].

### **Consulting Parties**

The Corps finds the organizations identified on the attached Distribution List are entitled to be consulting parties as set out in 36 CFR 800.2 and invites them by copy of this letter to participate in the Section 106 process. The Corps added three parties to the list based on recommendation made by the SHSI by letter dated September 10, 2003.

### **State Historic Preservation Officer (SHPO) Invitation**

The Corps invites the SHPO to:

- Identify any other consulting parties as per 36 CFR 800.3(f);
- Comment as per 36 CFR 800.2(d)(3) on the Corps plan to involve the public by using the Corps normal procedures for public involvement under the National Environmental Policy Act; and,
- Comment on or contribute to identification efforts, including definition of the APE, all as per 36 CFR 800.4(a-b).

### **Identification of Historic Properties**

#### Review of Existing Information and Level of Future Identification Efforts:

The Corps determined that this undertaking will not impact archeological resources due to past disturbance in the APE. The Corps further determined that the undertaking may adversely affect the Upper Mississippi River Lock and Dam Number 15 Historic District, the Village of East Davenport Historic District, and the Lindsay Park Historic District (Exhibits 5-7). The SHSI concurred with the Corps determinations by letter dated September 10, 2003 (R&C#: 030982012).

Potential adverse effects from the preferred alternative include physical effects to the Mississippi River Lock and Dam Number 15 Historic District and visual effects to all three Districts. Potential physical effects are those impacts associated with I-wall and L-wall construction and include excavation of existing fill, sheet piling excavation, and vibrations and stress associated with excavation, construction, and access and staging of machinery.

I-wall construction will occur along 1,900 feet of the proposed wall alignment, and the impact is limited to sheet piling excavation within existing fill (Exhibits 2 and 4). It is the opinion of the Corps that I-wall construction will have **No Adverse Effect** on the Upper Mississippi River Lock and Dam Number 15 Historic District because work will be limited to existing fill landward from the sewer and seawall. In addition, structural analysis has indicated that the sewer and seawall will not be affected by construction or associated access and staging of equipment.

L-wall construction will account for 250 feet of the proposed alignment and involve placing the wall atop the landward edge of the sewer and then placing fill up to the present grade (Exhibits 2 and 3). As with the I-wall, structural analysis has indicated that the sewer and seawall will not be affected by the additional weight or from vibrations associated with the construction effort. As a result, it is the opinion of the Corps that neither L-wall or I-wall construction will impact the structural integrity of the seawall or sewer. Therefore, it is the opinion of the Corps that L-wall and I-wall construction will have **No Adverse Effect** on the Mississippi River Lock and Dam Number 15 Historic District.

The APE for visual effects includes the river viewshed of the Village of East Davenport and Lindsay Park Historic Districts and the visual impact of the proposed floodwall on the existing seawall. Both the Village of East Davenport and Lindsay Park Historic District boundaries extend into the Mississippi River and identify the river view as a contributing element. The present APE is predominantly west of these two Districts. Photographs taken from the perspective of the two Districts looking back toward the project area document that the river view is already obstructed (Exhibits 8-11). The photographs were taken in December in order to take advantage of leaf fall and accentuate the river view. The proposed wall will not extend to the height of the existing obstructions and consequently will have a negligible impact on the river view of the two Districts. Therefore, it is the opinion of the Corps that the undertaking, as proposed, will not impact the river view of the two Districts and as a result the undertaking will have **No Adverse Effect** on the Village of East Davenport and Lindsay Park Historic District.

Visual effects of the undertaking on the seawall component of the Mississippi River Lock and Dam Number 15 Historic District are limited, as all but the metal railing of the seawall is hidden from view (Exhibit 12), with the exception of a limited amount of seawall visible from the perspective of boaters on the Mississippi River. The proposed floodwall will be constructed with both cast-in-place and pre-cast concrete using form liners to create architectural embellishment that mimics the color and style of limestone block construction used in the construction of the Clock Tower Building, a contributing structure to the Arsenal Island National Historic Landmark. The Clock Tower Building is located approximately one mile to the southwest of the APE and is visible both to the trail user and from the Mississippi River and Illinois shoreline.

A conceptual drawing of the wall is provided in Exhibit 13, along with an example of the type of material that will be used to construct the floodwall. It is the opinion of the Corps that the visual impacts of the undertaking, as proposed, will have **No Adverse Effect** on the Mississippi River Lock and Dam Number 15 Historic District and that the proposed style and color of wall material is consistent with the historic character of this section of the Mississippi River as demonstrated by the Arsenal Island National Historic Landmark.

Request for Information from Consulting Parties:

We request your written comments on this project within 30 days, pursuant to 36 CFR 800.3(c)(4). The Corps has identified the consulting parties for this undertaking as set out in 36 CFR 800.2 and invites them by copy of this letter to participate in the Section 106 process (see Distribution List). Results of this consultation and determination shall be included in an Environmental Assessment for additional public review later this year.

If you have any questions regarding this matter, please call Mr. Jim Ross of our Economic and Environmental Analysis Branch at 309/794-5540, or you may write to our address above, ATTN: Planning, Programs, and Project Management Division (Jim Ross).

Sincerely,

ORIGINAL SIGNED BY

Kenneth A. Barr  
Chief, Economic and Environmental  
Analysis Branch

Enclosures

CF (all wo/encls):  
Dist File (PM-M)  
✓ M-A (Ross, McGuire)  
ED-DM (Cerny)

MFR: Initial coordination letter for proposed  
flood damage reduction project at the Davenport  
Water Treatment Plant.

## DISTRIBUTION LIST

Ho-Chunk Nation  
Historic Preservation Department  
P.O. Box 667  
Highway 54 East  
Black River Falls, WI 54615

Marianne Long  
Cultural Preservationist  
Iowa Tribe of Oklahoma  
R.R. 1, Box 721  
Perkins, OK 74059

Chairman Johnathan Buffalo  
Meskwaki Tribal Historical  
Preservation Coordinator  
Sac and Fox Tribal Council  
349 Meskwaki Road  
Tama, IA 52339-9629

David Lee Smith  
Cultural Preservation Officer  
Winnebago Tribe of Nebraska  
P.O. Box 687  
Winnebago, NE 68071

Scott County Board of Supervisors  
428 Western Avenue  
Davenport, IA 52801

Scott County Engineer  
Scott County Courthouse  
416 West 4th Street  
Davenport, IA 52801

Mr. Pat McGrath, P.E.  
City Engineer  
1200 East 46th Street  
Davenport, IA 52807

Mr. K. Brock Earnhardt  
Vice President and Manager  
Iowa-American Water Company  
P.O. Box 979  
Davenport, IA 52805

Scott County Historic Preservation Group  
ATTN: Ms. Karen Anderson  
1923 East 13th Street  
Davenport, IA 52803

Village of East Davenport  
2119 East 12th Street  
Davenport, IA 52803

Rock Island County Historical Society  
822 - 11th Avenue  
Moline, IL 61265

Lavon Grimes  
R&C Coordinator  
State Historical Society of Iowa  
600 East Locust  
Des Moines, IA 50319-0290

Anne E. Haaker  
Deputy State Historic Preservation Officer  
Illinois Historic Preservation Agency  
1 Old State Capitol Plaza  
Springfield, IL 62701-1507

14 January 2003

MEMORANDUM THRU Commander, U.S. Army Engineer Division, Mississippi Valley,  
ATTN: CEMVD-MD-PP (Mr. Michael Harden), P.O. Box 80, 1400 Walnut Street, Vicksburg,  
Mississippi 39181-0080

FOR Commander, Headquarters, U.S. Army Corps of Engineers, ATTN: CECW-AG, 441  
G. Street, NW., Washington, DC 20314-1000

SUBJECT: Request for Waiver of Pre-WRDA 86 Advanced Engineering and Design (AE&D)  
Costs for Davenport, Iowa, Local Flood Protection, (PWI 074987)

1. Reference ER 1165-2-131, Water Resources Policies and Authorities, LOCAL COOPERATION AGREEMENTS FOR NEW START CONSTRUCTION PROJECTS.
2. The purpose of this memorandum is to request an exception to the policy, contained in ER 1165-2-131, regarding cost sharing of AE&D expended prior to enactment of the Water Resources Development Act of 1986 (WRDA 86). Current policy requires that all AE&D costs be included in the total project cost (TPC) estimate and cost shared with the non-Federal Sponsor (NFS). The NFS, City of Davenport, Iowa, has requested consideration for a waiver to current policy based on the discussion that follows.
3. Project History:
  - a. Section 201 of the Rivers and Harbors Act of 1970, Public Law 91-611, authorized the project for construction on 31 December 1970. The General Design Memorandum (GDM) was the approval document for the project, which was approved on 4 June 1982. The project consists of two distinct and independent Reaches, designated Reach 1 and Reach 2, with Reach 1 being significantly smaller in scope than Reach 2. Key GDM data follows:

1982 GDM FINDINGS		
	Reach 1	Reach 2
Cost Estimate	\$1,109,000	\$30,937,000
Benefit to Cost Ratio <b>with</b> Area Redevelopment Benefits due to depressed economy	1.67	1.16
Benefit to Cost Ratio <b>without</b> Area Redevelopment Benefits	1.17	0.82

SUBJECT: Request for Waiver of Pre-WRDA 86 Advanced Engineering and Design (AE&D) Costs for Davenport, Iowa, Local Flood Protection, (PWI 074987)

b. In May 1984, the City of Davenport decided not to proceed further with the project for a variety of reasons. The project was classified as inactive and was scheduled to be deauthorized in April 2002. In May 2001, after repeated severe flooding in 1993, 1997, and 2001, the City of Davenport requested that the project be reevaluated. General Investigation (GI) funds in the amount of \$100,000 were made available in September 2001 for a Limited Reevaluation Study (LRS). The LRS was approved by CEMVD on 20 June 2002. The LRS found that Reach 1 was economically feasible, but Reach 2 was not. The LRS recommended proceeding with Preconstruction Engineering and Design (PED) for Reach 1. Key LRS data follows:

2002 LRS FINDINGS		
	Reach 1	Reach 2
Cost Estimate	\$3,180,260	\$52,046,828
Benefit to Cost Ratio (Area Redevelopment benefits not applicable)	4.05	0.32

c. The Rock Island District began negotiating the design agreement with the NFS to continue PED work for Reach 1 to produce an Engineering Documentation Report (EDR) to be followed by plans & specifications. During the course of the design agreement negotiations, the requirement to cost share the project's sunk costs was raised. The NFS would like to have its cost sharing obligations clarified before proceeding with further PED work for Reach 1. The NFS understands its post-WRDA 86 cost-sharing requirements to cost share (75% Federal/25% Non-Federal) AE&D and PED costs, including 25% of the \$100,000 LRS costs expended mostly in FY 2002.

4. A funding summary follows, which shows information from FY 1972 through FY 2002.

Category	FY	Approp.	Amount Expended	Remarks
<b>PRE-WRDA 86 (Thru FY 86)</b>				
Unknown	72	See Remarks	\$19,725.00	Records management does not require maintenance of historical files. While we were able to find this expenditure information, we were not able to find category class or appropriation information for FY 72 through FY 79.
Unknown	73		\$106,975.00	
Unknown	74		\$75,045.00	
Unknown	75		\$298,972.51	
Unknown	76		\$307,846.00	
Unknown	77		\$157,036.00	
Unknown	78		\$121,327.00	
Unknown	79		\$79,548.20	
AE&D	80	CG	\$102,075.23	
AE&D	81	CG	\$126,706.77	
AE&D	82	CG	\$89,161.69	
AE&D	83	CG	\$100,458.35	
AE&D	84	CG	\$95,717.02	
AE&D	85	CG	\$2,240.11	
AE&D	86	CG	\$0.00	
			<b>\$1,682,833.88</b>	<b>Total Expended FY 72-FY 86</b>

CEMVR-PM-M

14 January 2003

SUBJECT: Request for Waiver of Pre-WRDA 86 Advanced Engineering and Design (AE&D) Costs for Davenport, Iowa, Local Flood Protection, (PWI 074987)

POST-WRDA 86 (From FY 87 on)				
AE&D	87	CG	\$1,538.64	
AE&D	88	CG	\$0.00	
AE&D	89	CG	\$344.99	
See Remarks	90-00	See Remarks	\$0.00	There were no dollars appropriated or expended from FY 90-00.
PED	01	GI	\$0.00	Received \$100,000.00 to do LRS
PED	02	GI	\$96,769.08	
PED	03	GI		

5. The total pre-WRDA 86 (from paragraph 3 above) costs were \$1,682,833.88. We request these be excluded from the TPC for cost sharing purposes for the following reasons:

a. The overwhelming majority of these costs were expended on Reach 2, which can no longer be pursued because it is not economically feasible. Using the 1982 GDM cost estimate figures, Reach 1 represents less than 5% of the total project that was studied in the 1982 GDM. The Reach 2 costs should be excluded from cost sharing because they are not relevant to the current project.

b. The GDM and design documents were all produced prior to WRDA 86. The information in these documents is nearly 20 years old and of very limited value in the current decision making process that began with the LRS that was funded in September 2001. Many changes have occurred in the project area that require new surveys, mapping, utility investigations, real estate investigations, cultural/historical coordination, and geotechnical explorations. Environmental assessments, economic analyses, cost estimates, and engineering and design must all be done with new information. A decision document (EDR) will be prepared, with all new information, after execution of the design agreement. The NFS would like to wait for approval of this policy exception before signing the design agreement.

6. In view of the above, we request that HQUSACE grant an exception to current policy for the Davenport, Iowa, Local Flood Protection project to allow the pre-WRDA 86 costs in the amount of \$1,682,833.88 to be excluded from the total project cost estimate for cost-sharing purposes.

7. The point of contact for this action is Mr. Perry Hubert, Project Manager, telephone 309/782-5366, or email: [Perry.A.Hubert@usace.army.mil](mailto:Perry.A.Hubert@usace.army.mil).

ORIGINAL SIGNED BY

GARY L. LOSS, P.E.  
Deputy for Programs and  
Project Management



DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

REPLY TO  
ATTENTION OF:

FEB 21 2003

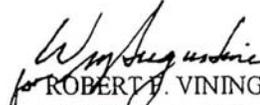
CECW-BC

MEMORANDUM FOR COMMANDER, MISSISSIPPI VALLEY DIVISION (CEMVD-MD-P)

SUBJECT: Request for Waiver of Pre-WRDA 86 Advanced Engineering and Design (AE&D) Costs for Davenport, Iowa, Local Flood Protection, (PWI 074987)

1. Reference is made to CEMVD-MD e-mail, dated 16 January 2003, endorsing CEMVR-PM-M memorandum of 14 January 2003, subject as above.
2. Section 105 of the Water Resources Development Act of 1986 (WRDA 86) requires that the costs of design of a water resources project be cost shared. As a matter of policy this requirement is applied to costs incurred prior to WRDA 86. However, it has always been the intent that only pre-WRDA 86 costs directly related to implementing the project be included in the total project costs to be costs shared with the non-Federal sponsor. The determination of whether specific costs are consistent with this intent is best made by the district office responsible for the project.
3. Accordingly, the district needs to thoroughly review the pre-WRDA 86 design related costs incurred for this project and determine which costs should or should not be subject to cost sharing with the non-Federal sponsor. Careful documentation of costs not subject to cost sharing is required. Any required adjustment in total project cost based on the district's review must be fully documented in the decision document serving as the basis for the project cooperation agreement (PCA) and excluded from the total project cost in the PCA.
4. Any questions should be directed to Mr. John Lucyshyn at 202-761-4537.

FOR THE COMMANDER:

  
ROBERT E. VINING  
Chief, Programs Management Division  
Directorate of Civil Works

## STATEMENT OF FINDINGS

### **I. Project Description.**

A. This Statement of Findings (SOF) concerns a proposal by the Rock Island District (District) of the U.S. Army Corps of Engineers to construct a flood damage reduction project at Davenport, Iowa, to protect a portion of the riverfront, specifically the Davenport Water Treatment Plant (Reach 1), owned by the Iowa-American Water Company, from Mississippi River flooding. The project consists of a floodwall, a portion of earthen embankment, railroad closure structures, temporary and permanent access roads, interior flood control features, and an operation and maintenance access road. The project is a cooperative effort between the Federal Government and the City of Davenport. The benefit-cost ratio is 2.2.

B. An Engineering Documentation Report (EDR) with integrated Environmental Assessment (EA) addressing the impacts of the proposed project has been prepared by the District, and was circulated for an approximate 30-day public review period that began on/about April 20, 2005 and expired on/about May 25, 2005. The EDR is entitled Engineering Documentation Report with Integrated Environmental Assessment, Mississippi River at Davenport, Iowa, Flood Damage Reduction Project, Reach 1, Davenport Water Treatment Plant, dated April 2005.

**II. Public Interest Review.** An open house was hosted by the City of Davenport on April 13, 2005 to present the draft EDR to the public and answer questions about the proposed project. Personnel from the District, the City of Davenport, and the Iowa-American Water Company were available for questions about the project. The open house included a running presentation, displays, and plans of the project, along with copies of the draft EDR and an informational handout/comment sheet. Approximately 15 people attended the open house, including a reporter with the Quad City Times, Village of East Davenport business owners, a Lake Davenport Sailing Club member, and interested residents. No negative comments were received.

**III. Public Review Comments.** The following is a list of responses (letters), summarizing the comments received during the approximate 30-day public review period for the EDR/EA. They appear in the order in which they were received, and each is followed by the Rock Island District response. A copy of each letter is attached to this package.

A. State of Iowa, Department of Natural Resources, Keith L. Dohrmann, Environmental Specialist, Policy and Coordination Section, Conservation and Recreation Division, dated April 22, 2005:

**COMMENTS/CONCERNS:** They have no additional comments to those they have already provided to the District during the early coordination process.

**RESPONSE:** None required.

**B.** MidAmerican Energy (MAE), Brian O. Williams, Sr. Environmental Coordinator, dated April 29, 2005:

**COMMENTS/CONCERNS:**

1. Mr. Williams points out an error in the report concerning the existing overhead power lines, when we say they would be relocated to the unprotected side of the new floodwall system.

2. The MAE requests the District confirm that the correct relocation plan by MAE of the overhead utility (to an underground facility located along the south side of U.S. Route 67) was included in any reviews or investigations concerning historic properties and/or the area of potential effect. Attachments to the letter include a letter from MidAmerican to the District dated October 21, 2003 with an enclosed map.

**RESPONSES:**

1. The MidAmerican letter is correct. The District was in error in Section 1.5.9 when it inadvertently stated the relocated power line would be on the unprotected side of the floodwall system. The correct reference to power line relocation will be made in the Final EDR.

2. The MAE by letter dated April 29, 2005 requested confirmation from the District that the corrected overhead utility line relocation was included as part of review and evaluation of the "Area of Potential Effect" (APE). The District (PM-A, Ross) contacted Brian Williams of MAE by telephone on May 6, 2005 and informed him that the APE as originally coordinated by the District encompassed the proposed relocation area and therefore this work could proceed in full compliance with the National Historic Preservation Act.

**C.** Bi-State Regional Commission, Gena McCullough, Planning Director, dated May 3, 2005:

**COMMENTS/CONCERNS:** They will not conduct additional review of the project. They do state their support for this type of improvement throughout the area to protect vulnerable facilities.

**RESPONSE:** None required.

**D.** State of Iowa, Department of Natural Resources, Bill Cappuccio, Staff Engineer Water Resources Section, dated May 3, 2005:

**COMMENTS/CONCERNS:**

1. They ask the District to refer to previously submitted IDNR (Dohrmann) comments expressed by letter dated August 11, 2003.
2. From a review of the information in the EDR, the floodwall would be located outside the floodway portion of the flood plain and would provide a level of protection in excess of 3 feet above the 500-year flood frequency flood. Based on this information, it appears the project would satisfy the requirements of Iowa Administrative Code 567-71.4(2).

**RESPONSES:**

1. The referenced letter will be consulted.
2. None required.

E. Iowa Tribe of Oklahoma, Erin C. Tipton, Historical Preservation, dated April 29, 2005:

**COMMENTS/CONCERNS:** They request to be kept informed if anything new is discovered during construction/excavation.

**RESPONSE:** It shall be done.

F. U.S. Fish and Wildlife Service, Rock Island Field Office, Richard C. Nelson, Field Supervisor, dated May 19, 2005:

**COMMENTS/CONCERNS:** They have no objections to the project and concur with the Finding of No Significant Impact. They also concur the project would have no effect on federally listed endangered species.

**RESPONSE:** None required.

**IV. Project Implementation Schedule.** The tentative schedule for the construction of this project, after signing of the appropriate portions of this Statement of Findings; acquisition of all required permits and certifications; signing of the Project Cooperative Agreement; and other procedural requirements; construction could begin by February 2007.

**V. Summary of Environmental Impact Review.**

A. An integrated EA within the EDR has been prepared for this project and circulated for review. This review has not identified any potentially significant adverse impacts direct, indirect, or cumulative, resulting from implementation of the project, as proposed. Thus, a Finding of No Significant Impact was prepared and included in the EDR.

B. Alternatives considered for this project are No Action; and Levee and Floodwall.

VI. **Summary of Findings.** I find that the implementation of the project, as proposed, and under conditions set forth, and as prescribed by all applicable laws and regulations, is not contrary to the public interest.

5-25-05

Date



Duane P. Gapinski  
Colonel, U.S. Army  
District Engineer



THOMAS J. VILSACK, GOVERNOR  
SALLY J. PEDERSON, LT. GOVERNOR

## STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES  
JEFFREY R. VONK, DIRECTOR

April 22, 2005

Mr. Lonn McGuire  
U.S. Army Corps of Engineers – Rock Island District  
Clock Tower Building  
P.O. Box 2004  
Rock Island, IL 61204-2004

RE: Engineering Documentation Report with Integrated Environmental Assessment and FONSI addressing the proposed flood damage reduction measures to protect the water treatment plant serving the City of Davenport, IA dated April, 2005 (draft)

Dear Mr. McGuire:

We have no additional comments to those already provided and included in the documentation.

If you have any questions about this letter or if you require further information, please contact me at (515) 281-8967.

Sincerely,

A handwritten signature in cursive script that reads "Keith L. Dohrmann".

KEITH L. DOHRMANN, ENVIRONMENTAL SPECIALIST  
POLICY AND COORDINATION SECTION  
CONSERVATION AND RECREATION DIVISION

FILE COPY: Keith L. Dohrmann

05-3660L.doc

WALLACE STATE OFFICE BUILDING / 502 EAST 9th STREET / DES MOINES, IOWA 50319

515-281-5918 TDD 515-242-5967 FAX 515-281-6794 [www.iowadnr.com](http://www.iowadnr.com)



MidAmerican Energy  
4299 NW Urbandale Drive  
Urbandale, Iowa 50322

4/29/2005

**CERTIFIED MAIL**

Mr. Lonn McGuire  
Rock Island District of the US Army Corps of Engineers  
Clock Tower Building  
PO Box 2004  
Rock Island, IL 61204-2004

**Re: Draft Engineering Documentation Report with Integrated Environmental Assessment  
– Davenport Water Treatment Plant**

Dear Mr. McGuire:

MidAmerican Energy Company (MidAmerican) appreciates the opportunity to work with the Corps of Engineers and the City of Davenport on this project. MidAmerican has completed the review of the draft Engineering Documentation Report with Integrated Environmental Assessment, Mississippi River at Davenport, Iowa, Flood Damage Reduction Project, Reach 1, Davenport Water Treatment Plant, dated April 2005 and has the following comments:

1. On Page 7, Paragraph 1.5.9, you state that, “the existing overhead power lines...would be located on the unprotected side of the floodwall system...” This is not the case. MidAmerican intends to relocate the overhead lines along the south side of U.S. Route 67 from the west edge of the Water Treatment Plant, east to Mound Street. MidAmerican would install the underground cable using normal boring methods, as long as bedrock or other obstructions are not encountered.
2. MidAmerican would like confirmation from the U.S. Army Corps of Engineers that the proposed relocation of the overhead utility line to a location adjacent to U.S. Route 67 was included in any reviews or investigations concerning historic properties and/or the area of potential effect.

To aid in your review and response, I have attached a copy of the cost proposal and the proposed design drawing sent to Mr. Dean Cerny of the United States Army Corps of Engineers on October 21, 2003. If you have questions concerning these comments, I may be contacted at (515) 281-2628 or via e-mail at [bowilliams@midamerican.com](mailto:bowilliams@midamerican.com).

Sincerely,

Brian O. Williams  
Sr. Environmental Coordinator

Attachments: October 21, 2003 Letter and Design Drawing



Serving local governments in Muscatine and Scott Counties, Iowa; Henry, Mercer and Rock Island Counties, Illinois.

May 3, 2005

OFFICERS:  
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VICE CHAIR  
Larry Minard

SECRETARY  
John Oberhaus

TREASURER  
Tom Harns

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City of Davenport  
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Jamie Howard, Alderperson  
Bob McGivern, Alderperson  
A. Francis Roederer, Citizen

City of Rock Island  
Mark W. Schwabert, Mayor  
Terry Brooks, Councilman

City of Moine  
Stan Leach, Mayor  
Bill Adams, Alderman

City of Bettendorf  
Mike Freeman, Mayor

City of East Moine  
Joe Moreno, Mayor

City of Muscatine  
Dick O'Brien, Mayor

City of Kewanee  
James Burns, Mayor

City of Silvis, villages of  
Andalusia, Carbon Cliff  
Coal Valley, Cordova, Hampton  
Hillsdale, Milan, Oak Grove  
Port Byron and Rapids City  
Ken Williams, Mayor, Carbon Cliff

Cities of -ledo, Colona  
Galva, Geneseo, villages of  
Alpha, Hindover, Irkinson  
Camondge, Orion, Sherrard  
Joa, Windsor and Woodhull  
Merle LeSage, Mayor, Geneseo

Cities of Blue Grass, Buffalo  
Elonge, Fruittano, LeClaire  
Long Grove, McCausland  
Princeton, Paverdale, Valcott  
West Liberty and Wilton  
Vernon Spring, Mayor, LeClaire

COUNTY REPRESENTATIVES:  
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Jo Anne Hillman, Member

Mercer County  
Tom Harns, Chairman

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John Oberhaus, Member

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Greg Adamson, Member  
Larry Minard, Member  
Celia Rangel, Citizen

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Ralph H. Heninger  
Nathaniel Lawrence  
Jim Tank  
Rory Wasburnum  
Tim Wilkinson  
Thomas A. Wilson

Executive Director  
Denise Bulat

Mr. Lonm McGuire  
Economic & Environmental Analysis Branch  
ATTN: Planning, Programs, and Project Management Div  
Department of the Army  
Rock Island Dist. Corp of Engineers  
Clock Tower Bldg., P.O. Box 2004  
Rock Island IL 61204-2004

Dear Mr. McGuire:

Thank you for the copy of the Integrated Environmental Assessment, Mississippi River at Davenport Iowa, Flood Damage Reduction Project, Reach 1, Davenport Water Treatment Plant, dated April 2005. The Environmental Assessment includes a Finding of No Significant Impact, addressing the proposed flood damage reduction measures necessary to protect the Davenport Water Treatment Plant, located in Davenport, Iowa.

Bi-State staff will not conduct additional review of this project. We do, however, continue to support this type of improvement throughout the area to protect vulnerable facilities, such as the water treatment plant.

Sincerely,

Gena McCullough  
Planning Director

GMsh  
Environment/Project Review Ltr



1504 Third Avenue, P.O. Box 3368, Rock Island, Illinois 61204-3368  
Phone (309) 793-6300, Fax (309) 793-6305  
Email: info@bistateonline.org - Website: www.bistateonline.org





THOMAS J. VILSACK, GOVERNOR  
SALLY J. PEDERSON, LT. GOVERNOR

## STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES  
JEFFREY R. VONK, DIRECTOR

May 3, 2005

Mr. Lonn McGuire  
Economic and environmental Analysis Branch  
Rock Island District Corps of Engineers  
Clock Tower Building  
P.O. Box 2004  
Rock Island, IL 61204-2004

Re: Davenport Water Treatment Plant Floodwall

Dear Mr. McGuire:

This is in reference to the April 15, 2005 letter from Kenneth Barr, Economic and Environmental Analysis Branch, requesting comments for the above referenced project.

I would start by referring you to comments regarding this project that were included in the letter dated August 11, 2003 from Keith Dohrmann of our Conservation and Recreation Division. In that letter, Mr. Dohrmann outlined several of the programs within the Department of Natural Resources (IDNR) that might have jurisdiction over various aspects of the proposed project.

In addition to those programs addressed in the earlier letter, the Department administers regulations pertaining to construction in flood plains. Iowa Administrative Code 567-71.4(2) requires a permit prior to the construction of any levee or dike in an urban area on the flood plain of a stream that drains greater than 2.0 sq. miles. A review of the information provided indicates the floodwall will be located outside the floodway portion of the flood plain as identified by the Davenport Flood Insurance Study. The floodwall will provide a level of protection in excess of 3 ft. above the 500-yr. flood frequency flood. Based on this information, it appears the project would satisfy the requirements of 567-72.4(2), Iowa Administrative Code.

WALLACE STATE OFFICE BUILDING / 502 EAST 9th STREET / DES MOINES, IOWA 50319  
515-281-5918 TDD 515-242-5967 FAX 515-281-6794 [www.iowadnr.com](http://www.iowadnr.com)

If you have any questions or comments regarding this matter, please feel free to contact me at (515) 281-8942.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Cappuccio". The signature is stylized with a large, looped "B" and a long horizontal stroke extending to the right.

Bill Cappuccio  
Staff Engineer  
Water Resources Section

cc: Lisa Ogle, Iowa DNR



## Iowa Tribe of Oklahoma

R.R. 1, Box 721  
Perkins, Oklahoma 74059  
(405) 547-2402  
Fax: (405) 547-5294

4/29/2005

US Army Corps of Engineers  
ATTN: Lonn McGuire  
P.O. Box 2005  
Rock Island, IL 61204-2004

RE: Reach 1

Dear Lonn McGuire:

We received the notification of your district's improvement program. I understand that some of the project is a previous improvement and you do not foresee any impact of Native American or Euro-American archaeological resources.

The Iowa people have an historic presence in Scott County. Please keep the Iowa Tribe of Oklahoma informed if anything new is discovered.

The historical preservation of the Iowa Tribe of Oklahoma is very important. Many religious and cultural artifacts have been discovered. During excavation if anything is unearthed please give me a call at 405-547-2402 ext. 323 or e-mail me at [etipton@iowanation.org](mailto:etipton@iowanation.org).

Thank you for your cooperation in this matter.

Sincerely,

Erin C. Tipton  
Historical Preservation

ECT/jr



United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Rock Island Field Office  
4469 48<sup>th</sup> Avenue Court  
Rock Island, Illinois 61201  
Phone: (309) 793-5800 Fax: (309) 793-5804

IN REPLY REFER  
TO: FWS/RIFO

May 19, 2005

Colonel Duane P. Gapinski  
District Engineer  
U.S. Army Engineer District  
Rock Island  
Attn: Mr. Lonn McGuire  
Economic and Environmental Analysis Branch  
Clock Tower Building, P.O. Box 2004  
Rock Island, Illinois 61204-2004

Dear Mr. McGuire:

This responds to the Engineering Documentation Report with Integrated Environmental Assessment, Mississippi River at Davenport, Iowa, Flood Damage Reduction Project, Reach 1, Davenport Water Treatment Plant, dated April 2005. The Fish and Wildlife Service has no objection to this project and concurs with the Finding of No Significant Impact.

We also concur with your findings that the proposed project will have no effect on federally listed endangered species. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. Should the project be modified or new information indicate endangered species may be affected, consultation should be initiated.

This letter provides comments under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); and the Endangered Species Act of 1973, as amended.

If you have any questions concerning our comments, please contact Kristen Lundh of my staff at (309) 793-5800 ext. 215.

Sincerely,

  
Richard C. Nelson  
Field Supervisor

S:\Office Users\Jody\GENERAL\DAV\Floodwall.doc

**FINDING OF NO SIGNIFICANT IMPACT**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR**  
**MISSISSIPPI RIVER AT DAVENPORT, IOWA**  
**FLOOD DAMAGE REDUCTION PROJECT**  
**REACH 1**  
**DAVENPORT WATER TREATMENT PLANT**

I have reviewed the information provided by the integrated Environmental Assessment and the Engineering Documentation Report, along with data obtained from cooperating Federal, State, and local agencies having jurisdiction by law or special expertise, and from the interested public. Based on this review, I find that the proposed flood damage reduction project would not significantly affect the quality of the human environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later developments.

Factors that were considered in making the determination that an Environmental Impact Statement is not required are as follows:

- a. No State or Federal threatened or endangered species would be impacted by the proposed project.
- b. No significant adverse environmental, social, economic, or cultural/historical impacts are anticipated as a result from implementation of the proposed project.
- c. The risk of flood damage to Reach 1 would be reduced, thereby reducing the potential of catastrophic disruption to the water supply for the City of Davenport, Bettendorf, and other parts of Scott County during periods of extreme high water.
- d. The proposed project is justified by a positive benefit-cost ratio of 2.2.

5-25-05

Date



Duane P. Gapinski  
Colonel, U.S. Army  
District Engineer

#  
#

## **APPENDIX B**

### **HTRW PHASE I ENVIRONMENTAL SITE ASSESSMENT**

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#

**PHASE I ENVIRONMENTAL SITE ASSESSMENT  
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE  
DOCUMENTATION REPORT**

**FOR THE**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**Prepared by: Troy N. Hythecker**

**Reviewed by: Alaena A. Ensey, P.E.**

**Rock Island District, U.S. Army Corps of Engineers  
Clock Tower Building  
P.O. Box 2004  
Rock Island, IL 61204-2004**

**AUGUST 2003**

**APPENDIX B**  
**HTRW PHASE I ENVIRONMENTAL SITE ASSESSMENT****EXECUTIVE SUMMARY****1. Background**

This Hazardous, Toxic, and Radio Active Waste Documentation Report (HTRWDR) documents the Phase I Environmental Site Assessment (ESA) for the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project) in accordance with Engineering Regulation (ER) 1165-2-132, HTRW Guidance for Civil Works Projects, and ER 405-1-12, Real Estate Handbook. The Phase I ESA was performed in conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Standards E 1527-00 and E 1528-00. The information was obtained through site reconnaissance, informal interviews, a review of maps and aerial photographs, District records, and a search of Federal and State environmental databases. These screening methods have been selected based on the particular nature of the flood protection project.

**2. Summary**

The project includes an investigation to determine the feasibility of constructing flood protection measures in the City of Davenport. This HTRWDR documents a Phase I ESA for the project. The DWTP is currently susceptible to inundation during flood events, and in past years has been protected by emergency flood fighting. The project consists of increasing the level of protection against flooding at the DWTP by constructing a levee or floodwall.

It is our opinion that there are no recognized environmental conditions associated with the sites identified through the environmental database searches and Environmental Data Resources, Inc. (EDR Inc).

The assessment identified that the existing and historical site conditions revealed a slight risk associated with the railroad corridor, boat marina, and the unknown fill material used for numerous construction activities on the project area. The title search results did not identify any recognized environmental conditions.

**3. Recommendation.**

This assessment has revealed that there is slight risk identified due to the railroad, boat marina, and unknown fill material located in the project area. Otherwise, no other evidence of recognized environmental conditions associated with the project area were identified. No further HTRW assessment is recommended. If any recognized environmental conditions become identified during the construction of the project features then work should cease and this office notified to reassess the project area.

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX B  
HTRW PHASE I ENVIRONMENTAL SITE ASSESSMENT**

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**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX B  
HTRW PHASE I ENVIRONMENTAL SITE ASSESSMENT**

**1. Introduction**

1.1 Purpose. The specific purpose of this Phase I ESA is to document an appropriate inquiry into Hazardous, Toxic, and Radioactive Waste (HTRW) activities on potential project lands associated with the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project). This Hazardous, Toxic, and Radio Active Waste Documentation Report (HTRWDR) documents the Phase I ESA. The entire HTRWDR with appendices is on file with the District's Design Branch, Environmental Engineering Section (CEMVR-ED-DN).

The primary goal of the project is to protect the DWTP, owned by the IAWC, from inundation during a flood event. The DWTP provides the only source of water for 131,000 people in Davenport, Bettendorf, and other portions of Scott County, Iowa. During past flood events, the DWTP was threatened by flooding, but remained in service due to emergency flood-fighting efforts.

1.2 Scope. The Corps, Engineering Regulation (ER), providing guidance for the conduct of Civil Works Planning Studies is contained in ER 1105-2-100. The policies and authorities outlined in ER 1165-2-132 and DIVR 1165-2-9, HTRW Guidance for Civil Works Projects, and ER 405-1-12, Real Estate Handbook, were developed to facilitate the early identification and appropriate consideration of HTRW issues in all of the various phases of a water resources study or project. The ASTM Standards E 1527-00 and E 1528-00 provide a comprehensive guide for conducting Phase I ESAs. These references provide information on what considerations are to be factored into project planning and implementation. The policy of the USACE is to avoid construction or secure real estate interests in lands where HTRW or other regulated materials is located within project boundaries or may affect or be affected by such projects.

This inquiry is required in order to minimize and prevent Federal liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), to reduce any threats to project workers, and avoid costly delays associated with environmental abatement activities.

The information was obtained through site reconnaissance, informal interviews, a review of maps and aerial photographs, Corps records, a search of Federal and State environmental databases, and a 50-year land title record review. These screening methods have been selected based on the particular nature of the project.

Appendix A of the HTRWDR contains a site plan and Appendix B contains a list of acronyms. References are provided in Appendix C. Appendix D contains the Environmental Data Resources Area Study Report, and Appendix E provides records review documentation. Appendix F contains a safety plan, while Appendix G contains photographs from site reconnaissance. Appendix H documents interviews and conversations that were conducted for this HTRWDR.

1.3 Authority. The flood damage reduction project for Davenport, Iowa is authorized by Section 201 of the Rivers and Harbors Act of 1970, under Public Law 91-611, 91<sup>st</sup> Congress.

1.4 Significant Assumptions. It is assumed that all information assessed and collected for this Phase I ESA is accurate. The validity of the obtained information was not verified.

1.5 Limitations and Exceptions. No ESA can wholly eliminate uncertainty regarding the existence of recognized environmental conditions concerning a property. This assessment is intended to reduce, but not eliminate, uncertainty regarding the existence of recognized environmental conditions in connection with a property with reasonable limits of time and cost. Professional judgment was used in collecting and evaluating data, and in formulating a recommendation.

Historical and regulatory record reviews are limited by the level of data collected by the recording agency, availability of record coverage, and by data transparency. If provided by the recording agency, statements regarding the limits of database were included with a copy of the findings. Record coverage research was limited to records on the District Intranet, Federal and State regulatory agency websites, EDR Inc search results, and popular mapping websites. Data was considered transparent only if it could easily be geospatially referenced to the property.

1.6 Site Safety. A Site-specific Safety and Health Plan (SSHP) was prepared for a site visit. The investigators followed all generic requirements of the USACE Safety and Health Requirements Manual (Engineering Manual (EM) 385-1-1). The SSHP is contained in Appendix F of the HTRWDR.

## **2. Site Description**

2.1 Location and Legal Description. The project is located on a parcel of land in Davenport, Iowa located near Mississippi River Mile 483.5 in Scott County, Iowa. The DWTP stretches from Lindsay Harbor at the upstream end to the intersection of River Drive and Mississippi Avenue at the downstream end of the property. The project area is located across the Mississippi River from the Rock Island Arsenal, a Federally owned military installation. A site plan of the project showing the project location is located in Appendix A of the HTRWDR.

2.2 Site and Vicinity Characteristics. The project site encompasses the DWTP located in the floodplain of the Mississippi River. Adjacent properties consist of residential, commercial, and industrial properties in an urban setting. The Mississippi River is the prominent feature and hub of activity in the area. Marinas, restaurants with a river view, and industrial facilities all depend on the river for their vitality. Several grand historic homes are located on the bluff of the Mississippi River, overlooking the river. The Village of East Davenport, a popular historic shopping district, is located east of the project area. A recreational path meanders along the river, and Lindsay Park, Prospect Park, and Indian Springs Park are all adjacent to the project area. Numerous fisherman, runners, walkers, and skaters appreciate the recreational features of the area.

2.3 Description of Structures/Roads/Improvements. The primary transportation feature near the project area is the IC&E Railroad, which forms the northern boundary of the DWTP. An additional IC&E Railroad link transects the site on the riverward side of the DWTP buildings. U.S. Route 67 (River Drive) runs near the river just north of the project area. A driveway from River Drive provides access to the site. A paved recreational bicycle/walking path is located between the DWTP and the river. Buried sanitary sewer pipes, storm water sewer pipes, and water lines pass through the project area. Overhead power lines and telephone lines service the DWTP. A seawall runs along the river through the project area.

2.4 Current Uses of Property. Property uses include lands owned by the IAWC, the City of Davenport, and the IC&E Railroad. The DWTP is the primary feature in the project area, and provides safe drinking water for approximately 131,000 residents and businesses to Davenport, Bettendorf, and other small towns in the surrounding area. DWTP facilities include water treatment processes, pumps, and storage areas. The City of Davenport owns a paved recreational path that follows the river that is used by bicyclists, runners, walkers, and fishermen. The railroad transports goods to industrial facilities in the area.

2.5 Current Uses of Adjoining Properties. Adjacent properties are primarily minimally developed areas along the Mississippi River. Several parks, recreational areas, and parking lots adjoin the project properties. These properties are susceptible to flooding; therefore, the recreational features and parking lots provide beneficial uses while minimizing the risk of economic damages resulting from floods. Lindsay Harbor is located to the east of the project area; the harbor secures boats and sells gasoline. Hoover School is located north of the project area.

Although separated from the project area by the Mississippi River, the Rock Island Arsenal is a Federal military installation. Thousands of personnel work on the island and provide assistance to the government in various capacities, both military and civic. Facilities on the island include offices, houses, an arsenal, and numerous other support facilities.

### **3. Records Review**

The purpose of a records review is to obtain and review records that will help identify recognized environmental conditions concerning the property. Some of the records reviewed pertain not just to the property, but also to properties within an approximate minimum search distance, in order to help assess the likelihood of problems from migrating hazardous substances or regulated contaminants. Factors considered in determining the approximate minimum search distance include ASTM Standards E 1527 and E 1528, the density of the setting, the distance hazardous substances or other regulated contaminants are likely to migrate, local geologic or hydrogeologic conditions, and other observable factors. This records review included querying several environmental databases. More specific information about the records and the results of the review is contained in Appendix E of the HTRWDR.

### 3.1 Standard Environmental Record Sources.

3.1.1 EnviroMapper and EnviroFacts Database Review. U.S. Environmental Protection Agency (EPA) records were searched within a one-mile search distance of the property. The search was performed using EnviroMapper in conjunction with EnviroFacts on June 6, 2003, by zooming into the project area on a map. Twelve sites were identified by the EnviroMapper search, and were identified using EnviroFacts. The sites that were identified are listed in Appendix E. Five of the sites had the potential for air emissions, nine sites were small quantity generators of hazardous waste, and one site was a superfund site. After numerous attempts to ascertain information about the superfund site, employees from EPA Region VII determined that the site is not a recognized environmental condition because they have no knowledge of the site and cannot find it in their databases. See Section 5: Interviews for additional information about this site.

3.1.2 Environmental Database Review. Environmental Data Resources, Inc. (EDR Inc) was used to provide a database review. Search areas were located within a one-mile search distance of the DWTP. Results indicated that one Corrective Activity (CORRACTS) site, seven Leaking Underground Storage Tanks (LUST), two Underground Storage Tanks (UST), one coal gasification plant, and two orphan sites were located within a one-mile search radius of target properties. The complete EDR Inc report is located in Appendix D of the HTRWDR.

The CORRACTS site is Brown Traffic Products, Inc. The site was classified as a low corrective action priority, and is located 1.125 miles away from the property. All of the LUST sites were classified as “No action required,” with the exception of Kwik Shop #578, which was given a “Low risk” classification. The UST sites and the coal gasification site were classified as “No action required.”

The Orphan sites were identified from the Emergency Response Notification System (ERNS) and the State Hazardous Waste (SHWS) databases. The Sylvan Slough oil release is on the opposite side of Arsenal Island, and potential contaminants would not likely be transported to the project area. The release at the Highway 67 plant near River Mile 489 is nearly four miles upstream, and contaminants do not likely exist in significant concentrations near the project area. The Sears Manufacturing Plant is located approximately 4.5 miles away from the project, and is therefore not within the minimum search distance.

A map showing the results of the EDR Inc study and the locations of the facilities is located in Appendix D of the HTRWDR as Figure D-1. There is no evidence of recognized environmental conditions from these properties.

3.1.3 National Response Center (NRC). The NRC database was queried on June 17, 2003, via <http://www.nrc.uscg.mil/foia.htm>. A search was conducted using Scott County, and the City of Davenport. Numerous results were obtained, however none were within a one-mile search radius of the project. The EDR Inc study incorporates the NRC database into its report, therefore adding redundancy to this search. Appendix E of the HTRWDR documents additional information about the NRC database search.

3.1.4 Iowa Department of Natural Resources. The Iowa Department of Natural Resources (IDNR), Land Quality and Waste Management Assistance Division, maintains a database of hazardous waste disposal sites. The database: (<http://www.state.ia.us/dnr/organiza/wmad/lqbureau/contam/disposalSites/siteSummaries/davenprt.pdf>) was queried on June 11, 2003, by searching for sites within Scott County. The search showed one site within one mile of the project area. The Davenport Coal Gas site operated at the site from 1855 to 1907, and subsequently was used by French and Hecht, a manufacturer of metals and wheels. In 1987, Lee Enterprises purchased the site for construction of the new Quad-City Times building. Soil, groundwater, and bedrock near the site were contaminated with coal tar. Environmental remediation was conducted in 1988 and 1990. The site is currently classified as “No action required.” Appendix E of the HTRWDR contains additional information about the database search.

3.2 Additional Environmental Record Sources. The IAWC provided the District with an un-dated Environmental Assessment Document for their East River Clearwell Addition Project. The document states that “the construction of the clearwell and transfer pumping facilities will not destroy historical or recreational areas, or wetlands habitat for endangered species.” This report states that the fill material near the water plant consists of soft and loose fill materials with wood and debris, reaching 15-20 feet below grade. The source of the fill materials are unknown although a sawmill was previously located on the site, which could be a potential source of the buried wood and debris. According to this report, the IAWC has owned the property since 1873.

3.3 Physical Setting Sources. United States Geological Survey (USGS) topographic maps showed that the immediate area is a floodplain on the right descending bank of the Mississippi River.

EDR Inc provided information about the local geology and hydrology. Rock stratigraphy is stratified and from the Paleozoic Era. The system is Devonian and the series is middle Devonian. Soil texture is silty clay loam. Soils are poorly drained, may have a saturated zone, a layer of low hydraulic conductivity, or seepage. Depth to the water table is less than one foot, and the depth to bedrock is greater than five feet. There is a high corrosion potential for uncoated steel. Measurements of pH range from a minimum of 5.6 to a maximum of 7.3. The permeability of the soil ranges from 0.6 to 2.0 inches per hour throughout the whole soil depth.

3.4 Historical Use Information. The property has been utilized as a water treatment facility since 1873. Over the years, additional treatment processes and structures have been constructed on the site to accommodate increasing population and changing technology. A sawmill had been operated that was located near the current location of Lindsay Harbor prior to 1873.

Like the project site, the project study area has experienced very few changes in use. Most of the commercial and residential development in the area was constructed prior to 1930. There is little information available about adjoining properties prior to the 1930s photograph.

Historic aerial photographs, fire insurance maps, and topographical maps were obtained from Corps resources and from EDR Inc. Photos from the 1930s, 1953, 1956, 1965, 1970, 1975, 1991, 1993, 1995, and 2000 were examined to discern historical use information. All of the photographs and maps are located in Appendix E of the HTRWDR.

The **1930s Brown's Photographs** (Figures E-7, E-8 in Appendix E of the HTRWDR) show that the project site is a water treatment facility. Many of the primary structures that exist at the current plant have been constructed. The surrounding community has been developed. Prospect Park is visible, along with residential, commercial, and industrial development in the area. The railroads are visible in their current locations. Locks and Dam No. 15 was not visible in the photograph; however, its construction was completed in May 1934.

The **1956 Sanborn Fire Insurance Maps** (Figures E-11, E-12) show the project site as the "Davenport Water Company." Settling basins, filter rooms, and pump houses are discernible from the maps. Hoover School appears to have been constructed, and there are numerous residences in the area. All of the residences are visible on current maps. The railroad lines pass through the site as shown in the current photos. Prospect Park and Indian Park are visible on the maps in the same locations that they are in today.

The series of **USGS 7.5-minute Topographical Maps** (Figures E-10, 14, 15, 16, 17) span from 1953 to 1993, including the years 1953, 1970, 1975, 1991, and 1993.

The 1953 map shows the DWTP site, the railroad, Prospect Park, and Lindsay Park. The railroad is labeled "Davenport, Rock Island, and Northwestern." A small water body with a surrounding levee is visible at the terminus of Mound Street. The 1970 map is nearly identical to the 1953 map. The water body seems to have receded, because the surface area is reduced on the map. There are no discernable differences between the 1970 map and the 1975 map. The 1991 map shows several changes from 1975. A fire station seems to have been constructed near Lindsay Park, and a marina is visible at the terminus of Mound Street. The marina is visible starting in 1970, but was not labeled until the 1991 map. Also, a seawall was constructed to reduce property damage during flooding events. A heliport was constructed on the Rock Island Arsenal. No discernible differences are visible from 1991 to 1993.

The **1965 Aerial Photograph** (Figure E-13) shows a significant change in the area from the 1930s Brown's Photographs, which is a result of construction of Locks and Dam No. 15 in the early 1930s. The 1965 photograph was taken in April, and documents a flooding event. The river overtopped its banks, submerged the marina, and encroached upon the project area. It appears that the DWTP was nearly inundated.

The **1995 and 2000 Aerial Photographs** (Figures E-18, 19, 20, 21) show no visible change from the 1965 photograph. These photographs were not taken during a flood event, because the marina is visible, and floodwaters have not encroached upon the water plant property.

3.5 Recorded Land Title Records. A 50-year title search was requested through the Real Estate-Partnership Programs and Support Branch of the District to investigate further historical information on the affected properties of this project. The search of the project area and immediate adjacent areas identified five landowners. The review of the landowners' legal records did not identify any environmental liens or disclosures that would indicate a recognized environmental condition. A copy of the memorandum provided by Real Estate is located in Appendix E of the HTRWDR.

## 4. Site Reconnaissance

4.1 Methodology and Limiting Conditions. Site reconnaissance consisted of a visit to the site by the District's Project Development Team (PDT) members. The site reconnaissance consisted of a visual inspection of target properties and adjoining properties. Assessment methods by the District did not involve intrusive techniques such as the taking and analyzing of soil samples.

### 4.2 Exterior Observations.

- Hazardous Substances in Connection with Identified Uses. None were identified.
- Storage Tanks. A rusty gasoline storage tank was observed on property across from the Quad-City Times property (Photo G06). Several underground storage tanks service gas stations in the project area (Photos G10, 11, 12, 13, 14, 19).
- Hazardous Substance Containers and Unidentified Substance Containers. A container containing unidentified substances was observed on the IAWC property (Photo G17). Several 55-gallon drums were also observed on the property (Photo G18).
- Indication of PCBs. None were identified.
- Pits, Ponds, and Lagoons. Numerous water treatment processes (below surface water tanks) exist on the target property; however, there is no evidence of a recognized environmental condition.
- Stained Soil and Pavement. No stained soil or pavement was identified.
- Solid Waste Disposal. No solid waste disposal sites were observed.
- Wells. No wells were observed.
- Septic Systems. No septic systems were observed.
- Any other Condition of Concern. The DWTP was constructed on unidentified fill material (Figure G-9). No signs of stressed vegetation or excessive settlement were noted. The grass around the water plant was mowed and well maintained. No herbicides are applied to the lawn around the water plant. There was minimal trash and river debris in the project area and on adjacent properties. The area was generally clean and well maintained. All buildings at the water plant appeared to be in excellent condition. Vehicular traffic is sometimes heavy on River Drive. Barge traffic is restricted to the main channel; many small boats are present in the area due to Lindsay Harbor. Many of the boats in the harbor are sailboats. The bike path along the seawall and through Lindsay Park is well maintained. The rail areas are also well maintained.

4.3 Interior Observations. No buildings or structures were visually investigated on the project sites. Since the water plant is a typical water treatment process, and is under strict regulation regarding hazardous substances, an interior investigation was not deemed necessary.

## 5. Interviews

Interviews were conducted with project team members and project sponsors, who have all visited the sites on previous occasions. These informal interviews were conducted with the following people regarding any potential recognized environmental conditions:

**Dean Cerny, District, Project Engineer** was interviewed on 30 June 2003. Dean said that the site has been used as a water treatment plant since 1873. The water plant acquired adjacent properties over the years to expand the plant in order to meet the water supply needs of the growing city. Dean was not aware of any HTRW issues on the site, and did not notice any chemical storage tanks or 55-gallon drums on the site. He is aware that the fill material is from an unknown source, but mentioned that the site has been excavated several times for construction of new structures and installation of sewer lines, and there have been no documented HTRW concerns during those excavations.

**Mark Neubauer, Operations Supervisor** from the IAWC was interviewed on 30 June 2003. Mark has been working for the IAWC for 28 years, and has an extensive knowledge of the project site. He stated that the water plant was constructed in 1872. Prior to the water plant, a sawmill (Cain Lumber Company) operated on the site near the current location of Lindsay Harbor. He said that with the exception of the sawmill, no other structures were acquired during expansion of the water plant. When the sewer lines and other structures were constructed, significant excavation occurred. "Veins of lumber" were exposed during construction, but there was no indication of an HTRW concern. To his knowledge, construction workers did not need to stop work because of HTRW issues. He said that the company stores anhydrous ammonia and up to 22,000 pounds of gaseous chlorine on site. Currently, polyaluminum sulfate is stored on site for use as a coagulant, and in the past alum was used. To the best of his knowledge, there have never been any reportable spills from chemical storage tanks. There is a Risk Management Plan in effect for the site that addresses safety issues for contractors entering the site. To the best of his knowledge, there were no train derailments or spills from the railroad. There is no indication of contaminated river sediment or poor intake water quality. Terracon has done soil borings on the site. Mark stressed the fact that the IAWC has always been concerned about environmental issues and has an excellent track record of environmental compliance. To the best of his knowledge, Mark is not aware of any recognized environmental conditions on the site.

**Robert Riebe, District, Design Branch**, was interviewed on 10 June 2003 about the sanitary sewer pipes that transect the site. He stated that sewer pipes were constructed in 1932, 1948, and 1974. He also provided a photo from 1932 that shows installation of the pipe, and also exposed fill material (Figure D-9). He is not aware of any HTRW concerns in the fill material or from the sanitary sewer.

**Rochelle Cardinale, Iowa Department of Natural Resources**, was interviewed on 11 June 2003 about the Leaking Underground Storage Tanks at Kwik Trip and Quad-City Marine. The tanks are classified as "Low Risk" and clarification of the term was requested. She stated that the tanks are classified as low risk because there is contamination at the site, but there is no direct threat to receptors. The Quad-City Marine site is classified as low risk but it's distance from the project site is more than a block away and typically plumes from a low-risk site do not extend more than one block away from a contamination site.

**Jim Ross, District, Cultural/Historic Resources**, was interviewed on 11 June 2003 about his knowledge of the Davenport Flood Protection Project. He does not have any archaeological or historic information about the project site or adjoining properties. He stated that there are no significant archaeological or historic areas on the site; however the floodwall could be a significant historic property. He is not aware of any HTRW issues on the site.

**Brian Burnett, Site Assessment Manager, EPA Region VII**, was contacted about the DC Franche and Co. “superfund site” that was identified in the EnviroMapper database search. After consulting several other employees and accessing EPA databases, Brian was not able to find the site. He stated that if the site were a superfund site, they would know about it and would have a significant amount of information about the history of environmental contamination. The site was also not visible on other databases, such as RCRA. To the best of his knowledge, Brian stated that the site is not a recognized environmental condition.

Conversation records documenting each of these interviews are located in Appendix H of the HTRWDR.

## **6. Findings**

The review of database results identified sites within one-mile of the project area. One CORRACTS site, seven LUST sites, two UST sites, one coal gasification plant, and two orphan sites were located within a one-mile search radius of target properties. Five sites had the potential for air emissions, nine sites were small quantity generators of hazardous waste, and one site was identified by the database search as a superfund site. The EPA Region VII was contacted to check for further information on the alleged superfund site. As shown in the interview above, the alleged superfund site does not appear on the EPA’s databases; therefore, based on this information this site is not a recognized environmental condition.

The evaluation of existing and historical site conditions revealed a slight risk associated with the railroad corridor, boat marina, and the unknown fill material used for numerous construction activities on the project area. The title search results did not identify any recognized environmental conditions.

## **7. Opinion**

The findings above have been evaluated using appropriate data and information associated with the Davenport Flood Protection Project. It is our opinion that there are no recognized environmental conditions associated with the sites identified through the environmental database searches and EDR Inc. The UST and coal gasification sites were classified as “No action required” so there is no evidence of a release. The LUST sites received a classification of “No action required” with the exception of one site that was classified as “Low risk.” There is no evidence to suggest that the site with “low risk” has generated recognized environmental conditions at the project site, so it is our opinion that no further assessment is required for this LUST. The alleged superfund site is not a recognized environmental condition, since the EPA Region VII had no record or knowledge of environmental contamination on the site.

In regard to the existing conditions associated with the unknown fill material, railroad corridor, and boat marina, it is our opinion that there is only a slight risk of recognized environmental conditions. If any evidence of recognized environmental conditions is discovered during construction activities, operations should cease until an assessment is performed.

## **8. Recommendations**

This assessment has revealed that there is slight risk identified due to the railroad, boat marina, and unknown fill material located in the project area. Otherwise no other evidence of recognized environmental conditions associated with the project area were identified. No further HTRW assessment is recommended. If any recognized environmental conditions become identified during the construction of the project features then work should cease and the Environmental Engineering Section of the District must be notified to reassess the project area.

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## **APPENDIX C**

### **GEOTECHNICAL ANALYSIS**

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX C  
GEOTECHNICAL ANALYSIS**

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**Plates (see Appendix G)**

<b>Plate</b>	<b>Title</b>
G1	Boring Locations
G2	Boring Log I
G3	Boring Log II

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**1. Purpose and Scope**

This appendix depicts the general geologic setting and geotechnical aspects for the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project) based on soil conditions encountered and using existing Corps criteria. The scope of study includes the review of Davenport, Iowa, General Design Memorandum Local Flood Protection, dated February 1982, East River Station Clearwell Building Subsurface Exploration Reports, dated September 1999 and February 2000, prepared by Terracon Consultants, Davenport, Iowa for the IAWC Water Treatment Facilities, Davenport, Iowa. It also includes the subsurface investigation program prepared by the District's Geotechnical Branch (CEMVR-ED-G) along with the investigation program prepared in September 2003 by Terracon Consultants located in Davenport, Iowa. Information and analysis presented herewith also include results of the interpretations of existing geotechnical investigations and discussions with both DWTP and in-house personnel.

**2. Location and Description**

The project is situated within the city of Davenport, Iowa, and lies along the Mississippi River between approximately river mile 483 and 484. The project site is located just south of the DWTP. The project consists of a primary floodwall system around three sides of the DWTP, two railroad closure structures, six gatewells, and a small length of earth embankment as shown on Plate X3 in Appendix G.

**3. Geology**

Davenport, Iowa lies at the downstream end of a reach of the Mississippi River with a relatively young geologic origin, known in previous times as the "Rock Island Rapids" (pre 9-foot navigation channel). This stretch of rapids existed between LeClaire, Iowa to the foot of Rock Island Arsenal, Illinois, with a distance of about 14 miles. The Mississippi flood plain in Davenport varies in width, from several hundred feet across upstream of the Government Bridge, to about a mile across near the Interstate Highway 280 Bridge. The soils of the floodplain are mainly lean clay alluvium, underlain by sand and gravelly-sand strata being thin or non-existent downstream from the project area and a bit thicker in the upstream project areas. The recent floodplain rises gradually to the toe of the bluff, several hundred feet distant.

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Throughout the reach of the project area, the riverbed is in a rock channel of mostly Devonian limestone, the Davenport Member of the Pinicon Ridge Formation, which presents an irregular erosion surface. Bedrock in the bluff which rises to a height of about 150 feet above the Mississippi River is covered with deposits of probably three glacial invasions, the Nebraskan, Kansan, and Illinoian with the most recent being Illinoian. The glacial till deposited by these three glacial invasions is covered by a thick but variable deposit of loess.

#### **4. Bedrock Stratigraphy**

The bedrock of the project area consists of moderately weathered, thinly bedded Devonian limestone, with close to very close jointing, and mainly vuggy. The bedrock was encountered at all boring locations. The depth of the bedrock encountered along the project area ranged from about 16 feet to 29 feet below the existing ground surface, or from elevation 554 to 534 feet above mean sea level (MSL 1912).

#### **5. Subsurface Explorations**

The District obtained 11 borings near the project area in the 1930's for the construction of the existing seawall. These borings were drilled upstream of the Locks and Dam No. 15 and south of the project alignment. Two more borings near the project area, D-52 and D-53, were obtained for the Davenport Local Flood Protection Project during 1977. Terracon Consultants of Davenport, Iowa, obtained an additional 8 borings in the vicinity of the project for the IAWC's Building "A" foundation. These borings were obtained in July 1999. All of these boring logs are on file at the District's Geotechnical Branch office. To further determine subsurface conditions for this project, the District's Geotechnical Branch obtained an additional eight borings, DP-03-1 through DP-03-8. The boring locations were determined by the District's Geotechnical Branch, marked in the field by Terracon Consultants for the utility locating services, and surveyed by Missman Stanley & Associates, Rock Island, Illinois. Boring DP-03-05 was not drilled to avoid encountering the possible sewer line at that location. The remaining borings were drilled by Terracon Consultants, Davenport, Iowa during September 2003. The boring locations are shown on Plate G1 and the boring logs are shown on Plates G2 and G3 in Appendix G.

The borings were drilled with a truck-mounted rotary drill rig equipped with a hydraulic head employed in drilling and sampling operations. The borings were advanced using hollow stemmed augers to their respective auger refusal depths. Samples were obtained using a split spoon barrel sampling procedure, where a standard 2-inch outside diameter split-barrel sampling spoon is driven into the ground with a 140-pound hammer falling a distance of 30 inches.

During drilling, the government sewer was encountered in boring, DP-03-6, at a depth of about 10 feet. This boring extended through the top PC concrete layer of the box culvert. A 6 inch rubber plug was placed into the top PC concrete layer, which was capped with PC concrete. The remainder of the borehole and other borings were backfilled using bentonite hole plug material mixed with the auger cuttings.

The soil and some rock samples recovered from the borings were tested in the laboratory to obtain their natural water contents. A pocket penetrometer also was used to help estimate the approximate unconfined compressive strength of some cohesive soil samples. Atterberg limits were performed on selected soil samples. The soil samples were classified in the laboratory based visual observation, texture, plasticity, and laboratory test results.

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The soil descriptions and estimated group symbols presented on the boring logs are in accordance with the Unified Soil Classification System.

Rock classifications and descriptions are based on visual and tactile observations. Both the percent recovery and the Rock Quality Designation (RQD) were determined for rock core samples and are provided on the boring logs. RQD is the percent of total length cored consisting of sound pieces at least 4 inches in length and is a measure of the in-situ rock mass integrity.

## **6. Proposed Earth Embankment**

The earth embankment (levee), approximately 125 feet long, would be constructed on the upstream end of the project. The embankment would tie the corner of building "B" of the DWTP to high ground to the west of building "B". See Plates X3 and C6 in Appendix G. The embankment would be approximately 3 feet high. The crown of the embankment would be 10 feet wide to provide access for normal maintenance and flood-fighting operations. The riverside and landside of the embankment would be constructed to a uniform slope of 3 horizontal to 1 vertical. The side slopes of the embankment would be grass seeded. The embankment would be constructed of impervious materials classified as CL, CL-CH, and CH with not less than 50 percent by weight passing the no. 200 sieve or SC with not less than 35 percent by weight passing the no. 200 sieve.

The plan and typical cross section of the embankment are shown on Plates C5 and C6. All impervious fill would require moisture and density control for the proposed embankment to ensure that through-seepage would be eliminated. For moisture control, a range of plus 2 to minus 2 percentage points deviation from the optimum moisture content would be used. The required density (95 percent of maximum dry density) would be achieved by controlling the uncompacted lift thickness using standard compaction equipment. The amount of project material to be disposed of and hauled in would be relatively minor and could be furnished by the contractor from commercial sources.

## **7. Foundation for Earth Embankment**

A subsurface investigation was made to ascertain the foundation conditions for the proposed earth embankment. According to the borings which were pertinent to the embankment, the foundation material consists of alluvial deposits. Atterberg limits, moisture contents, and shear strength tests indicate no exceptionally weak soils. The foundation materials consist of miscellaneous fill mixed with clay soils. The miscellaneous fill varies in thickness from 14 to 15 feet deep and consists of silty sand, sandy clay, and silty clay with traces of broken rocks, cinders, and wood fragments. The miscellaneous fill is underlain by alluvial deposits consisting of lean clay and fat clay, varying in thickness from 2 to 6 feet deep. The clay soil is underlain by moderately weathered limestone. A detailed description of the encountered soils is provided on the boring logs shown on Plates G2 and G3.

The entire foundation beneath the proposed embankment foundation would be cleared, grubbed, and stripped to remove unsuitable materials. All tap roots, lateral roots, or other projections over 1.5 inches in diameter within the proposed embankment foundation area would be removed to a depth of 3 feet below the existing ground surface.

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An inspection trench would also be excavated underneath the centerline of the proposed embankment. The inspection trench would have an 8 foot bottom width with side slopes of 1.0 horizontal to 1.0 vertical and a depth of 3 feet. The inspection trench would be excavated during construction to expose or intercept any undesirable underground features such as old drain tiles, water or sewer lines, buried logs, or other debris that could result in piping. When the inspection trench is open, it would be evaluated for undesirable materials by the District's Geotechnical Branch personnel. The excavated trench would be backfilled after a careful inspection to ensure that potential seepage channels or undesirable materials are not present. A detail of the inspection trench is shown on Plate C6 in Appendix G.

## **8. Foundations for Other Structures**

There are six gatewells, two railroad closure structures, one access road closure structure, a personal gate closure, and two types of PCC floodwall that would be built as a part of this proposed flood damage reduction project. The first type, an "L" wall configuration, would be constructed on top of the existing government storm sewer. The second type is an "I" wall configuration. Specific site borings were taken for these structures to determine the soil conditions, groundwater elevation, and engineering properties of the soil needed for the design of structural foundations. The locations of these structures are shown on Plates C1-C5 in Appendix G. Foundation design details of the proposed structures are given in Appendix D.

According to the borings which were pertinent to the foundation analyses for the proposed closure structures (railroad and access road closures), gatewells, and along the proposed floodwall, as shown on Plates C1-C5 in Appendix G, the foundation materials consist of miscellaneous fill mixed with clay. The thickness of the miscellaneous fill varies from 12 to 21 feet deep and consists of silty clay, silty sand, sandy clay, fine to medium sand with clay, and clayey sand, with broken bricks, rocks, broken concrete, wood fragments, and cinders. The miscellaneous fill is underlain by alluvial deposits (lean clay, fat clay, silty clay, sandy clay). In boring, DP-03-4, the miscellaneous fill is underlain by bedrock, moderately to slightly weathered limestone. The alluvial deposit stratum, varying from 2 to 6 feet thick, is underlain by bedrock, highly to moderately weathered limestone. In boring, DP-03-2, the alluvial deposit, 14 feet thick, is underlain by moderately weathered limestone. Any unsuitable material, which might not have been encountered by borings, would be replaced with impervious fill. The replacement material would be placed and compacted to obtain a density equal to the adjacent undisturbed foundation. If any structural foundation is determined to be below or near the water table, a dewatering system would be required to maintain the excavation area in dry condition. A detailed description of the encountered soils is provided on boring logs shown on Plates G2 and G3.

## **9. Groundwater**

Groundwater level observations were monitored during drilling operations and were noted on the boring logs as shown on Plates G2 and G3. Based on these observations, the groundwater levels encountered along the project ranged from elevation 559.5 to 550 feet MSL, 11 to 14 feet below the ground surface. No water level was found for boring DP-03-3. Water levels should be expected to fluctuate with changes in climatic conditions and river water surface elevations.

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## 10. Underseepage and Berm Analysis

**Floodwall:** The underseepage and berm analyses for the project along the DWTP are based on a study of thickness and permeability, and characteristics of the subsurface materials. Based on geotechnical investigations performed during the 1930's, 1977, 1999, and 2003, the foundation materials consist of miscellaneous fill mixed with clay. The thickness of miscellaneous fill varies from 12 to 21 feet and consists of silty clay, silty sand, sandy clay, fine to medium sand with clay, clayey sand, with broken bricks, rocks, broken concrete, wood fragments, and cinders. The miscellaneous fill is underlain by alluvial deposits (lean clay, fat clay, silty clay, sandy clay). In boring, DP-03-4, the miscellaneous fill is underlain by bedrock, moderately to slightly weathered limestone. The Davenport, Iowa, 1982 GDM and Mississippi River Locks and Dam No. 15, Davenport Seawall construction drawings, dated 1932, were also reviewed. The existing seawall is located along the south side of the project and is founded on bedrock. There are also some sewer lines built on bedrock; therefore, the underseepage has been reduced probably to a minimum quantity or none from the river side of the project. The design flood elevation along the proposed floodwall is approximately 571 feet and the top elevation of the existing seawall is 566 feet. The proposed floodwall would be subjected to only 5 feet of head, approximately. The "L" type floodwall would be constructed on top of the existing government storm sewer. The existing miscellaneous fill at the proposed "I" type floodwall foundation, and up to the ground surface, would be excavated and replaced with compacted impervious material. The floodwall would be founded on sheet piling driven through the compacted impervious fill to bedrock; therefore, the underseepage is not considered a problem and underseepage control features are not required along the proposed floodwall.

**Railroad Closure Structures:** The underseepage analyses are based on borings which were pertinent to the underseepage study. The foundation materials consist of miscellaneous fill. The existing miscellaneous fill at the proposed closure structure foundation and up to the ground surface would be excavated and replaced with compacted impervious material. The closure structures would be founded on sheet piling driven through the compacted impervious fill to bedrock. Therefore, the underseepage is not considered a problem and underseepage control features are not required along the proposed closure structures.

**Earth Embankment (Levee):** According to the borings which were pertinent to the underseepage and berm analysis for the approximately 3 foot high earth embankment, the foundation materials consist of miscellaneous fill mixed with clay. The thickness of the miscellaneous fill varies from 14 to 15 feet deep and consists of silty sand, sandy clay, and silty clay with traces of broken rocks, cinders, and wood fragments. The miscellaneous fill is underlain by alluvial deposits consist of lean clay and fat clay, varying in thickness from 2 to 6 feet deep. The clay soil is underlain by moderately weathered limestone. A detailed description of the encountered soils is provided on boring logs shown on Plates G2 and G3. Underseepage should not be a problem underneath the proposed 3 foot high earth embankment, because the foundation material consists of a significant amount of clay soils. When the inspection trench is open, it would be evaluated for undesirable materials by the District Geotechnical Branch personnel. The excavated trench would be backfilled after a careful inspection to ensure that potential seepage channels or undesirable materials are not present.

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## **11. Concrete Materials**

The project includes six gatewells, two railroad closures, an access road closure, a personnel gate closure, and two types of floodwall. The PC concrete in the structures and floodwalls would be subject to freezing/thawing. The PC concrete would be air-entrained and produced using locally available durable aggregates. The aggregates will be evaluated using test data furnished by the State of Iowa Department of Transportation and test data from Missouri River Division Laboratory. Aggregates from several of the sources have been used on other projects in the District.

Type I and Type II Portland cements, Class F fly ash, 1½ inch maximum size crushed limestone coarse aggregates, and natural sand fine aggregate are locally available. The cement and pozzolan would be accepted based on the manufacture's certification of compliance accompanied by the mill test report. The PC concrete mixtures would be proportioned by the contractor and submitted for approval. The maximum water cement ratio would be 0.48 by weight. Local ready mix plants are available to supply the PC concrete.

## **12. References**

1. U.S. Army Corps of Engineers, Rock Island District, Davenport Iowa, General Design Memorandum Local Flood Protection, February 1982, Davenport, Iowa.
2. East River Station Clearwell Building Subsurface Exploration Report, September 1999 and February 2000, prepared by Terracon Consultants, Davenport, Iowa for the Iowa American Water Company Davenport Water Treatment Facilities.

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## **APPENDIX D**

### **STRUCTURAL DESIGN ANALYSIS**

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
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STRUCTURAL DESIGN ANALYSIS**

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**APPENDIX D  
STRUCTURAL DESIGN ANALYSIS**

**1. Introduction**

1.1 General. This Structural Design Analysis describes the different methods used in designing the floodwall and gate structures required for the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project). The complete Structural Design Analysis report with supporting information is on file with the District's Design Branch, Structural Engineering Section (CEMVR-ED-DS), and contains information such as the design criteria, basic data and design assumptions, live and dead loads, different loading conditions, typical design computations, and stability analyses. In accordance with Engineering Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works projects, sufficient design computations have been performed to establish accurate cost information. Detailed design computations would be performed on individual structures during the preparation of the project plans and specifications.

**2. Design Criteria**

2.1 References. Design assumptions, different loading conditions, and allowable stresses, determined from specified safety factors and other criteria, are based on the applicable sections of the following Engineering Manual (EM), Engineering Technical Letter (ETL), and Engineering Circular (EC) references:

2.1.1	EM 1110-2-2105	"Design of Hydraulic Steel Structures"
2.1.2	EM 1110-2-2502	"Retaining and Flood Walls"
2.1.3	ETL 1110-2-256	"Sliding Stability for Concrete Structures"
2.1.4	EM 1110-2-2906	"Design of Pile Foundations"
2.1.5	EC 1110-2-6085	"Engineering and Design, Stability Analysis of Concrete Structures"
2.1.6	EM 1110-2-2000	"Standard Practice for Concrete for Civil Works Structures"
2.1.7	EM 1110-2-2104 (Change 1)	"Strength Design for Reinforced-Concrete Hydraulic Structures"

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2.2 Reinforced Concrete Structures. Reinforced concrete structures are designed using Ultimate Strength Design (USD) in accordance with Reference 2.1.7 and American Concrete Institute (ACI) 318-99. Structural concrete would have a minimum compressive strength of 4000 pounds per square inch (psi) at 28-days. All concrete for structures would be air-entrained in confirmation with “Building code requirements for reinforced concrete”, except as modified by the recommendations of the ACI committee 350 report on “Environmental Engineering Concrete Structures” for water bearing structures.

2.3 Concrete Reinforcement. Concrete reinforcement design is based on the use of deformed billet-steel bars conforming to the requirements of American Society for Testing Materials (ASTM) A615, Grade 60, with a minimum yield strength of 60,000 psi. Concrete cover and minimum reinforcement would comply with Reference 2.1.7 and ACI 318-99. The spacing, splicing, embedment and bending requirements of the bars would be in accordance with ACI-318 and the ACI Detailing Manual, ACI SP 66.

2.4 Steel Sheet Piling. Steel for sheet piling would conform to the requirements of ASTM A328. The top of the sheet pile would be staggered vertically by 1 foot in alternate placement. All piles will be PZ-27 unless otherwise indicated on drawings. The ends of sheet pile would be driven to rock level as all borings show top of rock elevations close to required penetration depth. Isolation pads would be installed at all expansion joints and at connections to gate structures.

2.5 Structural Steel. Structural steel would conform to the requirements of ASTM A-36. Allowable stresses for the design of structural steel would be in accordance with Reference 2.1.1. Minimum thickness of the stress carrying members will be 5/16 inch and skin plate would have minimum thickness of 5/16 inch. Splicing in skin plates would have full penetration weld and minimum weld size would be 3/16 inch.

### **3. Design of Structures**

3.1 “I” Wall Design using CWALSHT Program. The “I” wall configuration is a reinforced concrete floodwall founded on a continuous sheet pile foundation. This “I” wall is designed as a cantilever wall using the computer program CWALSHT (X0031), “Design / Analysis of Sheet Pile Walls by Classical Methods”. This program is used to design a cantilever sheet pile wall, which depends solely on its embedment for stability. The net water and soil pressures are assumed to vary linearly and reach equilibrium at the theoretical end of the piling. Coulomb earth pressure theory is used to evaluate the active and passive pressure coefficients. The program performs an iterative solution, where the wall penetration is varied, until conditions of equilibrium and other assumptions are satisfied. The output from the program includes the moment and shear ordinates at each 1 foot increment of depth. The equations of equilibrium used are those defined in “Substructure Analysis and Design” by Anderson.

For the program input and output of CWALSHT see Section 7 of the structural analysis report on file with the Structural Section of the District. For a typical cross-section of the “I” wall, see Plate D1a of the structural analysis report or Plate C6 in Appendix H.

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3.2 “I” Wall Design Conventional Method. The design of the “I” wall was also verified by hand computation using same soil parameters used in the program. Different penetrations are used to reach the condition of equilibrium. The maximum moment is calculated at point of zero-shear. The section is designed using the maximum moment and using working stress in accordance with Reference 2.1.1. See Section 8 of the structural analysis report for computations and layout.

3.3 “I” Wall above Grade Elevation. The “I” wall above grade is designed as a cantilever concrete wall constructed on pile cap supporting the architectural decorative concrete and withstanding a static flood water load at elevation 573.9 ft MSL 1912. The flexural reinforcement is designed to limit the theoretical flexural crack width to within 0.016 and 0.013 of an inch. The concrete section and reinforcement is also verified using CASTR, “User’s Guide for Concrete Strength Investigation and Design in accordance with ACI 318-89”. See Section 8.1 of the structural analysis report for the results and a spreadsheet prepared for the verification of the reinforcement requirements. See Section 8.2 for the result, interaction diagram and spread sheet for the verification of reinforcement.

3.4 “L” Wall. The “L” wall is a floodwall constructed over the existing government sewer in open excavation, which would result in a wall that is about 26 feet on the landward face of the seawall. This “L” wall shortens the vertical component of the line of protection by the length of the landward wall of the government sewer. This “L” wall section does not involve a sheet pile cut-off wall. The “L” wall would be designed to withstand floodwater loads, soil loads, and vehicle loads. The stability calculation of the wall was performed on a spreadsheet and the stem was designed as a cantilever wall. For the concrete design and stability computation see Section 9 of the structural report. For a typical cross-section of the “L” wall, see Plate D9 of the structural analysis report or Plate C6 in Appendix H.

3.5 Government Culvert Frame Analysis. Frame analysis of the existing government sewer was done in 1931. The moment, shear, and axial forces are shown on the Locks and Dam No. 15 drawing M-L15 62/26. The “L” wall would be constructed over the roof of the twin culvert. The additional load of the “L” wall over the culvert is assumed to be carried to the culvert’s rock foundation through its walls. RISA – 3D Version 4.5 computer program was used to analyze the frame model with the addition of the “L” wall. Three conditions, including construction loads, normal loads, and flood water loads, were analyzed to determine maximum moment and shear at joints and in members of the culvert. These maximum moments and shears were used to determine the capacity of each member with existing reinforcement. The results showed that the culvert will safely carry the additional load of the “L” wall through its walls and into its limestone rock foundation, with settlement of the culvert not a concern due to the rock foundation. The analysis with results is shown in Section 10 of the structural analysis report.

#### **4. Closure Structures**

4.1 Gate for Downstream Rail Crossing. The downstream gate is a steel structure designed as simply supported structures spanning horizontally to vertical supports. Hydrostatic pressure is computed with water at the top of the gate on the flood side and no water on the gate on protected side. Allowable stresses are in accordance with Reference 2.1.1. The gate height is controlled by the maximum flood, as defined under paragraph 4-2 of EM 1110-2-2705, and by the top of the rails. Since the top of the rails at this location is 4 inches higher than the existing elevation, of 569.04 ft MSL, the revised height of the gate is 4.527 feet. The design computations are based on a gate height of 4.86 feet.

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The design computations were not revised, as the cost difference would be minor. The design computation is shown in Section 11 and the gate drawing is on Plate D11 of the structural analysis report or on Plate S4 in Appendix H.

4.2 Gates for Upstream Rail Crossing and Access Road Crossing. The upstream gates would be two single leaf closure gates designed as simply supported structures spanning horizontally to vertical supports. Both upstream gates would be designed as equal spans with identical members so as to reduce the cost of fabrication. The rail-crossing gate would have a clear span of 20 feet perpendicular to the centerline of the track and the top of the sill would be 4 inches higher than the existing elevation of 564.36 ft MSL. The design computations are based on a gate height of 9.54 feet. The design computations were not revised, as the cost difference would be minor. The center pier would be identical to the end piers, withstanding a full gate load. The gate alignment would be  $81.42^\circ$  to the centerline of the track. The design computations are shown in Section 12 and the gate drawing is on Plate D12 of the structural analysis report.

4.3 Stability Analysis of Downstream Gate Foundation. The reinforced PCC gate monolith was designed in accordance with Reference 2.1.2. Stability Criteria shown in Table 4-2 of the Reference 2.1.2 was followed with a minimum of two load cases being considered for each monolith. Originally, one combined footing of a 28'x10' size was considered, but later on, due to optimization of the shutdown of rail, it was decided to design separate footings for each column and use the pre-cast sill blocks under the track as shown on the drawing on Plate D6.1 of the structural analysis report.

Originally, the footing was considered perpendicular to centerline track, but later on it was rotated by  $4.03^\circ$  towards unprotected side. The revised top of the rail is at elevation 569.37 ft MSL and the clear opening is 20 feet and 1 inch.

A detailed foundation analysis was performed for the gate at the downstream closure structure across the IC&E Railroad crossing. This structure spans a single track and was selected for analysis because of large design loads that it must support. Analysis was performed for the following load cases:

- Loading 1 Maximum Flood Condition
- Loading 2 Normal Flood Condition
- Loading 3 Normal Condition plus Train on Protected side
- Loading 4 Normal Condition plus Train on Un-Protected side

Initially, the footing was sized and designed to be a soil-supported foundation. The geotechnical information from Boring B2 shows 16 feet of fill material such as blocks, bricks, rubbles, cobbles, fat clay etc. After several trials of different sizes of footings and with consideration of construction time limitations, it was concluded that a soil-supported foundation would not meet the bearing capacity criteria required in Reference 2.1.2. Hence, a pile-supported foundation was considered. The design computations, not including pile foundation computations, are shown in Section 13 and the gate drawing is on Plate D13 of the structural report.

4.4 Stability Analysis of Upstream Gate Foundation. The reinforced PCC gate monolith for the twin gates was designed similar to downstream gate except it was analyzed for following loading conditions:

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- Loading 1 Maximum Flood Condition
- Loading 2 Normal Flood Condition
- Loading 3 Normal Condition Plus Train and HS20 - 44 Truck
- Loading 4 Normal Condition Plus Train and HS20 - 44 Truck on Protected side
- Loading 5 Normal Condition Plus Train and HS20 - 44 Truck on Un-Protected side

Originally the footing was considered perpendicular to centerline track but later on it was rotated by 8.58° towards protected side. The revised top of the rail is at elevation 564.70 ft MSL 1912, and the clear opening is 20 feet and 8 inches. Initial design was for a soil - supported foundation. The geotechnical information from Boring B7 shows a 20 foot depth of fill material such as blocks, bricks, rubbles, cobbles, fat clay etc. After several trials of different sizes of footings and with consideration of construction time limitations, it was concluded that a soil-supported foundation would not meet the bearing capacity criteria required in Table 4-2 of Reference 2.1.2. Hence, a pile supported foundation was analyzed.

Since, all piles are assumed to be driven to rock level, the allowable end bearing values were derived from Reference 2.1.4. Steel H-piles were selected because some piles were required to take tension loads under loading 1 and 2. A pile analysis will be performed with the computer program CPGA (X0080) during the project's plans and specifications phase. The number of piles and their length are assumed in accordance with bed rock elevation and considering bearing piles. The design computations are shown in Section 14 and the gate drawing is on Plate D14 of the structural analysis report.

4.5 Gatewells. The rectangular cast-in-place gatewells are designed using a foot wide section at the bottom of the gatewell. The computer program CFRAME (X0030), "Analysis of Plane Frame Structures", was used to design the reinforcing steel. Six gatewells were designed, as presented in the following table:

Item	Description	Location (Station)	Pipe Size in Gatewell	Height of the Gatewell	Size of the Gatewell (inside dimension)
1	Gatewell A	1+94.3	21" DIP storm sewer	25'-6"	6'-6"x4'-0"
2	Gatewell B	5+09.5	21" DIP storm sewer	21'-6"	4'-6"x4'-0"
3	Gatewell C	10+38.0	48" RCP sanitary sewer	25'-6"	6'-6"x4'-0"
4	Gatewell D	10+78.2	24" RCP storm sewer	26'-0"	4'-6"x4'-0"
5	Gatewell E	19+33.4	24" RCP storm sewer	23'-6"	4'-6"x4'-0"
6	Gatewell F	21+17.7	24" RCP storm sewer	22'-6"	4'-6"x4'-0"

The design computations are shown in Section 15 and the gate drawing is on Plate D15 of the structural analysis report.

4.6 Personnel Gate and Miscellaneous Items. The personnel gate is a steel structure designed as a simply supported structure spanning horizontally to vertical supports. The steel door is provided for the access opening required for IAWC personnel. The door is located near the Row Water Intake Well at Station 7+77.28. The steel door would be dogged along the "I" wall and a conventional fence gate would be provided for regular usage by the IAWC personnel. The design computations are shown in Section 16 and the gate drawing is on Plate D16 of the structural analysis report.

#

**APPENDIX E**

**REAL ESTATE PLAN**

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX E  
REAL ESTATE PLAN**

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**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**REAL ESTATE PLAN  
SPECIFICALLY AUTHORIZED**

**1. Purpose**

This Real Estate Plan supports the Engineering Documentation Report (EDR) with integrated Environmental Assessment (EA) for the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project). The flood protection project is authorized by Section 201 of the Rivers and Harbors Act of 1970, Public Law 91-611, 91st Congress. A City of Davenport Council resolution, signed May 16, 2001, requested a U.S. Army Corps of Engineers (Corps) reconnaissance study and appropriation of Federal funds. Federal funds were made available to initiate a Limited Reevaluation Study (LRS) in September 2001, with the LRS approved in June 2002. The project area is defined as the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa. The City of Davenport (City) is the proposed non-Federal sponsor for the project.

The main purpose of the project is to protect the Davenport Water Treatment Plant (DWTP) that services customers in Davenport, Bettendorf, and other communities in State of Iowa, which is owned by the Iowa-American Water Company (IAWC), from Mississippi River flooding. The project features would consist of a floodwall, a portion of earth embankment (levee), access closure structures, temporary and permanent access roads, and interior flood control features that include sewer work, gated storm pipe gravity outlets, and utility relocations, along with an operation and maintenance (O&M) access road.

The proposed floodwall construction would consist of two types of floodwall configurations; an "L" shape and an "I" shape. An existing storm sewer would be used to provide interior drainage, and would require two gatewell closures to prevent interior flooding during periods of high water. The gatewells would be connected to an interior sub-drain along the proposed floodwall. An existing 48 inch City-owned sanitary sewer pipe would penetrate the proposed floodwall. Gatewells are proposed at the floodwall so that this pipe can be closed if it ever experiences floodwater pressures that could damage the pipe and flood the interior, or protected side of the flood damage reduction system. The Iowa, Chicago, and Eastern (IC&E) Railroad would penetrate the proposed floodwall at two locations. Two single leaf steel floodgates are proposed for these two locations to allow rapid closure before an impending flood. The main access road closure, adjacent to the eastern railroad closure, would also consist of a single leaf steel floodgate. A segment of earth embankment is proposed to tie the northwest corner of building "B" of the DWTP into high ground to the west near the existing IC&E railroad abutment south of U.S. Route 67 (River Drive). The proposed earth embankment would have a height of less than 3 feet. There is also an existing recreational path that runs parallel along the riverfront and through the DWTP area.

#

The DWTP flood damage reduction project is designed to include a 12 foot wide paved permanent road easement for access, and for operation, maintenance, repair, replacement, rehabilitation, and security tasks. The paved permanent road easement would be connected on the east to a public street and on the west to the existing path. Lighting is proposed along the proposed floodwall and would provide security lighting for the DWTP. The road easement would be located outside of the floodwall and would be open to the river, simplifying construction by allowing land based construction operations. The floodwall would be designed to accommodate existing utilities.

## **2. Description of Lands, Easements, and Right-of-Way (LER) Required for Construction, Operation and Maintenance of the Project**

2.1 Project Description. The project area is located in the City of Davenport, Scott County, Iowa, in part of Section 25, Township 78N, Range 3 East, and part of Section 30, Township 78 North, Range 4 East of the 4th Principal Meridian, on the right (descending) bank of the Mississippi River. The project area includes the DWTP owned by the IAWC, a portion of the IC&E Railroad, a City recreational path, two City-owned sanitary sewer lines, a government-owned seawall and interceptor sewer, and several other water mains and utilities. The project description is identified in the EDR under Section 1, paragraph 1.5. The project area is outlined on the Project Area Map (Exhibit A).

2.2 Land Value and Acreage. The total estimated value of lands to be acquired for this project, to include severance damages and contingencies, is \$544,000.00. The number of owners/acres and type of estates required is as follows:

<u>No. of Owners</u>	<u>Acres</u>	<u>Type of Estate</u>
3	1.487	Flood Protection Levee Easement
2	1.236	Permanent Road Easement
2	2.726	Temporary Work Area Easement

2.3 Estates to be Acquired. The following standard estates are set forth in Engineering Regulation (ER) 405-1-12, Real Estate Handbook, and would be used for this project:

### 2.3.1 Flood Protection Levee Easement.

A Flood Protection Levee Easement would be required over approximately 1.487 acres. This easement area is shown outlined in yellow on Exhibit A. The estate language is as follows:

A perpetual and assignable right and easement in (the land described in Schedule A) (Tracts Nos. \_\_\_\_, \_\_\_\_ and \_\_\_\_ ) to construct, maintain, repair, operate, patrol and replace a flood protection levee and floodwall, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

### 2.3.2 Road Easement.

A Road Easement would be required over approximately 1.236 acres. This easement area is shown outlined in green on Exhibit A. The estate language is as follows:

A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. \_\_\_\_, \_\_\_\_ and \_\_\_\_ ) for the location, construction, operation, maintenance, alteration replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; (reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

### 2.3.3 Temporary Work Area Easement.

A temporary work area easement (three year period) would be required over approximately 2.726 acres. The temporary work areas are shown outlined in orange, red, and blue on Exhibit A. The estate language is as follows:

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A)(Tracts Nos. \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_) for a period not to exceed \_\_\_\_\_, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a (borrow area) (work area), including the right to (borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary structures on the land), and to perform any other work necessary and incident to the construction of the \_\_\_\_\_ Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

#

#### 2.3.4 Justification of Easement Estates.

Based on the project requirements, a Flood Protection Levee Easement is required for protection of the DWTP. A Temporary Work Area Easement is required for the staging, parking, and temporary access to the project. The temporary easement would be required for a three year period. A Permanent Road Easement would be required for access to the project site and to perform the operation and maintenance (O&M) tasks of the finished project. The easement estates are the real estate interests to be obtained and would meet the O&M requirements of the project.

2.4 Ownerships Affected. The project features affect three ownerships. The City (non-Federal sponsor) owns approximately 0.832 acre in fee. The IAWC owns approximately 4.136 acres in fee, and the IC&E Railroad currently owns approximately 0.481 acre in fee within the right-of-way (ROW) required for the project. The identified acreages would be required and utilized for all of the project features and are identified and outlined on Exhibit A.

2.5 Land Values. A gross appraisal with an effective date of December 3, 2004 was prepared by contract appraiser Mr. Douglas Nelson, Member of the American Institute of Appraisers. The appraisal was reviewed and approved by the District. A copy was forwarded to the Corps, Mississippi Valley Division, Programs Directorate, District Support Team (CEMVD-PD-SP) for post review in compliance with quality control guidelines. Land values are discussed in the Baseline Cost Estimate, paragraph 10, of this Real Estate Plan.

#### 2.6 Summary of LER Required for this Project.

(1)	Total ownerships affected:	3
(2)	Total Acres Required:	5.449 acres
	Floodwall and Levee Easement	1.487 acres
	Road Easement	1.236 acres
	Temporary Work Area Easement	2.726 acres

### **3. Lands Required, Owned By Sponsor**

The City currently owns approximately 0.832 acre of land in fee within the project area. The remaining lands required for the project are currently owned in fee by the IAWC and the IC&E Railroad Company. These lands are outlined on Exhibit A.

### **4. Non-Standard Estate Discussion**

There are no non-standard estates necessary for this project.

### **5. Federal Project within the LER Required for the Project**

There currently is no existing Federal project lying within the LER required for the project.

#

## **6. Federally Owned Land Required for Project**

There are no Federally-owned lands or real estate interests involved in this project. There currently is a government seawall and government storm sewer that runs along the Mississippi River. The proposed "L" type floodwall would be constructed directly on top of the existing government storm sewer, whereas the "I" type floodwall would be constructed adjacent to the storm sewer. The landside face of the floodwall would line up with the landside vertical face of the government storm sewer. At the time the government storm sewer was constructed, the lands utilized were lying below the ordinary high watermark. Use of the navigation servitude was exercised for the placement of the government-owned storm sewer, and therefore, no real property interests were acquired. Since then, additional fill has been added to the subject area, both landward and on top of the sewer, which has caused the current condition of said lands to now be lying above the ordinary high water mark. The seawall is lying within the navigation servitude and would not be affected by any of the project features.

Construction of the "L" type floodwall on top of the government-owned storm sewer would require a real estate interest. The construction of the "L" type floodwall would not have an adverse affect on the government-owned storm sewer, however, the City, as the non-Federal sponsor, would be granted a form of license from the government, in perpetuity, to allow the City to perform the O&M tasks to the finished project, as appropriate. In addition, there are several other existing sewers that attach to the government-owned storm sewer within the protected area. The abandoned sewers would be adequately plugged by constructing new plugs, whereas the sewers that would remain active would be outfitted with new gatewells, which would be attached to the active sewers that are attached to the government-owned storm sewer.

## **7. Navigational Servitude**

As stated in the previous section, the land required for the project is currently lying above the ordinary high water mark and therefore the navigational servitude does not apply and would not be exercised with this project.

## **8. Map Depicting the Area**

A project map is attached as Exhibit A.

## **9. Possibility of Induced Flooding Due to Project**

It is not anticipated that the project would induce flooding.

#

### 10. Baseline Cost Estimate

	Item	NON-FEDERAL	FEDERAL
01	Lands, Easements, & Rights-of-Way (LER)	\$ 544,000	-----
01	Relocation Assistance (PL 91-646)	-----	-----
01	Incidental Acquisition Costs:		
	a. Monitoring LS Acquisition (includes crediting)	-----	\$ 80,000
	b. Survey	\$ 20,000	-----
	c. Title Evidence	\$ 20,000	-----
	d. Negotiation/Closing	\$ 40,000	-----
	e. Appraisal	\$ 20,000	\$ 20,000
	f. Attorney's Opinion of Compensability	\$ 6,000	-----
	Total Incidental Acquisition Costs	\$ 106,000	\$ 100,000
<b>01</b>	<b>Total Lands and Damages Costs</b>	<b>\$ 650,000</b>	<b>\$ 100,000</b>

### 11. Relocation Assistance Benefits

There are no Public Law (PL) 91-646 Relocation Assistance Benefit payments anticipated for this project.

### 12. Mineral Activity/Timber Harvesting in Project Area

No mineral activity is known to exist in the area of the project. There is no known timber harvesting in the project area that may affect the project.

### 13. Sponsor Legal and Professional Capability to Acquire LER

A City of Davenport Council resolution was signed on May 16, 2001, requesting a Corps reconnaissance study and appropriation of Federal funds. After completion of the reconnaissance study, the City entered into a Design Agreement on March 24, 2003, allowing for the implementation of the planning, engineering and design of the project. The City has agreed to be responsible for the O&M of the completed project.

The City has the legal capability and experience to perform the required construction and O&M of the project. The assessment of the non-Federal sponsor's capability is included as Exhibit B.

The sponsor has been advised of the PL 91-646 responsibilities in acquiring the ROW for the project and has been advised of their responsibilities for documenting expenses for credit on the project. A Project Cooperation Agreement (PCA) would be executed after approval of this EDR is received from Corps Headquarters.

#

#### **14. Zoning Ordnances Proposed**

No known zoning ordnances are proposed.

#### **15. Schedule of Land Acquisition Milestones**

A detailed schedule for land acquisition would be developed when the final ROW limits have been determined. The sponsor would need a minimum of one year to acquire the necessary ROW. Additional time may be required if condemnation is necessary. The following schedule would be completed after project approval:

ROW Drawings Completed	12 Weeks
Initiate Acquisition	8 Weeks
Acquisition Complete	52 Weeks
ROW Certificate	4 Weeks

#### **16. Facility or Utility Relocations**

The only utility relocation for the project consists of the existing overhead power lines, owned by the MidAmerican Energy Company. The overhead power lines are located directly above the project site and along the proposed floodwall alignment. The overhead power lines conflict with the proposed floodwall construction area. A Preliminary Attorney's Opinion of Compensability was prepared in support of the relocation of these overhead power lines. The Preliminary Opinion specifies that the IAWC has conveyed an easement for the power lines to MidAmerican Energy Company (formerly known as the Iowa-Illinois Gas and Electric Company), who therefore possess a compensable interest in the real estate and facilities (poles, anchors, wires) attached thereto. The easement begins just off the public right-of-way for River Drive and continues south to the government seawall, then east parallel to the government seawall to City-owned property near Mound Street. This easement is within the ROW required for the proposed floodwall; therefore, the electrical transmission lines and poles would need to be relocated. The transmission lines and poles would be relocated to nearby public ROW, and at this time, it does not appear that additional lands would be acquired for this relocation. The relocation of these overhead power lines would need to be done prior to construction of the proposed floodwall. The City, as the non-Federal sponsor, is responsible for this relocation. As part of the construction, conduit would be run along the proposed floodwall and wire would then be run through the conduit to replace the overhead lines that feed the transformers for the IAWC.

A final Attorney's Opinion of Compensability would be prepared based upon official public records and final plans and specifications for the project, prior to execution of a relocation agreement.

There are other utilities within the proposed project footprint; however, relocation of these utilities is not required. The utilities include abandoned and existing sewer pipes and a fiber optic cable. During construction, the integrity of the plugs in the abandoned pipes would be confirmed, the fiber optic cable would remain in place and the contractor directed not to damage it, and new interior drainage patterns would be created using existing storm sewers.

#

**17. Impacts of Suspected or Known Contaminants**

The District conducted a Phase I Environmental Site Assessment (ESA) in accordance with the appropriate standards. The ESA concluded that there was a slight risk of environmental conditions identified due to the railroad, boat marina, and unknown fill material located in the project area. However, due to the slight risk, no further Hazardous, Toxic, and Radioactive Waste (HTRW) assessment is recommended at this time. The ESA also specifies that if any recognized environmental conditions were identified during construction, then work should cease and the Environmental Engineering Branch of the District would reassess the project area. For additional information relating to the ESA, please consult the Phase I ESA for the property, which is included as Appendix B to this EDR.

**18. Landowners' Support or Opposition to the Project**

At this time, a public meeting has not been held; therefore, it is unknown whether or not there is support or opposition to the project from surrounding landowners. Prior to commencement of the project's land acquisition, a public meeting would be scheduled and held as required by regulation.

**19. Risk of Acquiring Lands before Execution of the PCA**

In accordance with ER 405-1-12, Chapter 12, a letter has been sent to the Sponsor regarding the risks associated with acquiring land before execution of the PCA. The sponsor has not indicated any intent to initiate early acquisition on this project.

**20. Other Real Estate Issues Relevant to the Project**

In accordance with current laws and regulations, the local sponsor shall receive credit toward its share of project costs for the value of the LERRD provided for project purposes.

2 ENCLS  
as

DATE: \_\_\_\_\_

\_\_\_\_\_  
JOANNE M. LIEVING  
Realty Specialist  
Partnership Programs and Support Branch  
Real Estate Division  
Rock Island District Corps of Engineers

DAVENPORT FLOOD DAMAGE REDUCTION PROJECT  
IOWA-AMERICAN WATER TREATMENT PLANT  
REACH 1

LEGEND

- ROW FOR FLOOD PROTECTION LEVEE EASEMENT = 1.487 acres
- ROW FOR PERMANENT ROAD EASEMENT (ACCESS/O&M) = 1.236 acres
- ROW FOR TEMPORARY WORK AREA EASEMENT (Construction/Staging/Access) = 2.726 acres

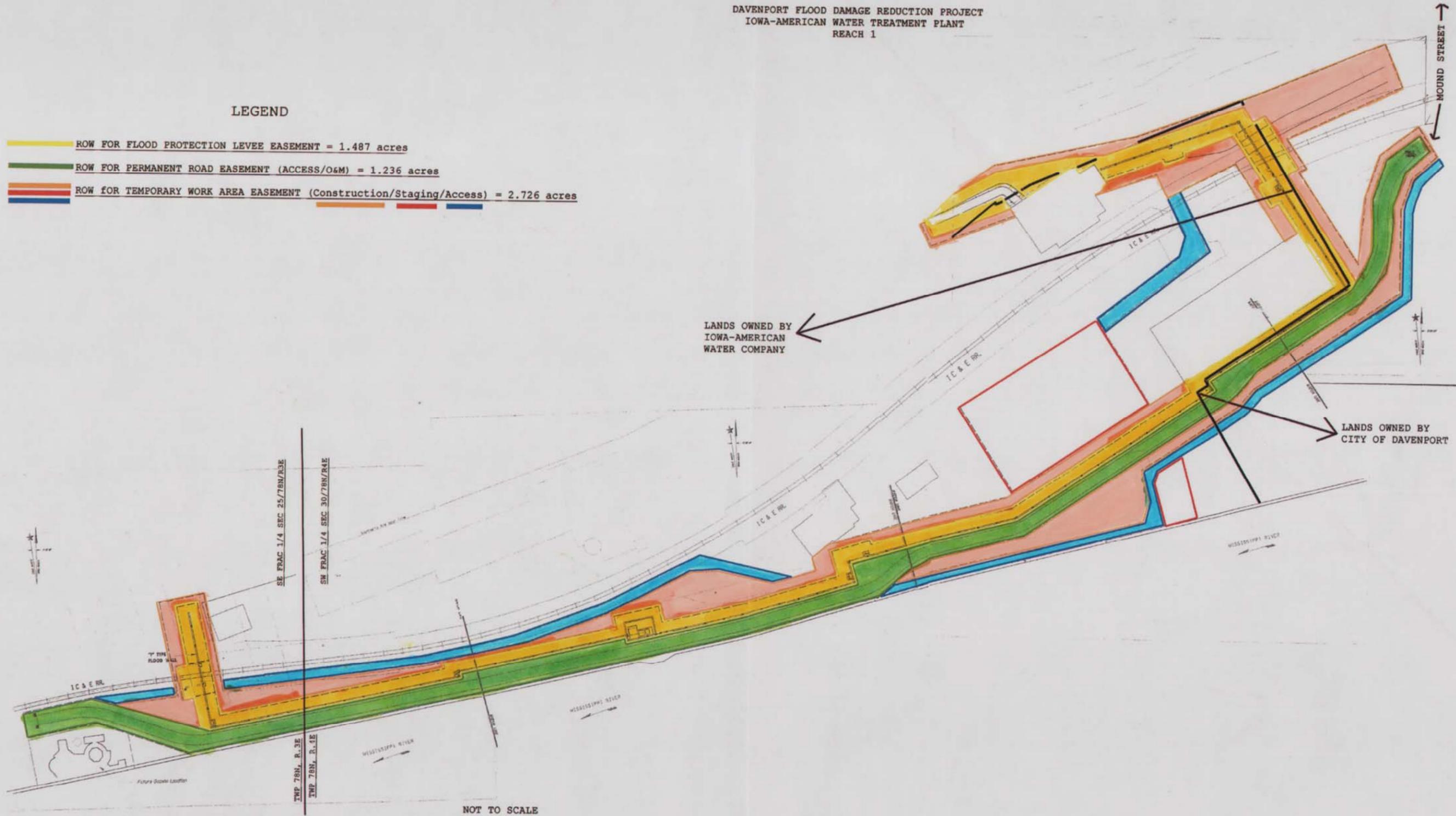


EXHIBIT A

**EXHIBIT B**  
**ASSESSMENT OF NON-FEDERAL SPONSOR'S**  
**REAL ESTATE ACQUISITION CAPABILITY**  
**MISSISSIPPI RIVER FLOOD DAMAGE REDUCTION, REACH 1**  
**DAVENPORT WATER TREATMENT PLANT**  
**DAVENPORT, SCOTT COUNTY, IOWA**  
(per Appendix 12E, ER 405-1-12)

**I. Legal Authority**

- a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? (Yes/No)  Yes  No
- b. Does the sponsor have the power of eminent domain for this project? (Yes/No)  Yes  No
- c. Does the sponsor have "quick take" authority for this project? (Yes/No)  Yes  No
- d. Are any of the land/interests in land required for the project located outside the sponsor's political boundary? (Yes/No)  Yes  No
- e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? (Yes/No)  Yes  No

**II. Human Resource Requirements**

- a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of federal projects including P.L. 91-646, as amended? (Yes/No)  Yes  No
- b. If the answer to IIa is "yes", has a reasonable plan been developed to provide such training? (Yes/No) N/A
- c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? (Yes/No)  Yes  No
- d. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule? (Yes/No)  Yes  No
- e. Can the sponsor obtain contractor support, if required in a timely fashion? (Yes/No)  Yes  No
- f. Will the sponsor likely request Corps assistance in acquiring real estate? (If "yes", provide description). (Yes/No)  Yes  No

**III. Other Project Variables**

- a. Will the sponsor's staff be located within reasonable proximity to the project site?  
(Yes/No)
- b. Has the sponsor approved the project/real estate schedule/milestones? (Yes/No)

**IV. Overall Assessment**

- a. Has the sponsor performed satisfactory on other Corps projects? (Yes/No)
  - a. With regard to this project, the sponsor is anticipated to be: highly capable (fully capable) moderately capable/marginally capable/insufficiently capable. (If sponsor is believed to be "insufficiently capable", provide explanation.)

**V. Coordination**

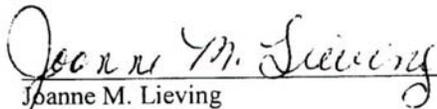
- a. Has this assessment been coordinated with the sponsor? (Yes/No)
- b. Does the sponsor concur with this assessment? (If "no", provide explanation).  
(Yes/No)




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Patrick McGrath **P.E.**  
 Public Works Department  
 City Engineer  
 City of Davenport, Iowa

Prepared By:




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Joanne M. Lieving  
 Realty Specialist  
 Partnership Programs and Support Branch

#

Reviewed By:



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Chief, Partnership Programs and  
Support Branch



Ralph J. Werthmann  
Chief, Real Estate Division  
Rock Island District Corps of Engineers

6 January 2005

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## **APPENDIX F**

### **PROJECT COST ESTIMATE**

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX F  
PROJECT COST ESTIMATE**

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**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX F  
PROJECT COST ESTIMATE**

**1. General**

This appendix contains a detailed project cost estimate prepared for the Mississippi River Reach 1 Flood Damage Reduction Project at Davenport, Iowa (project). The project is located near Mississippi River Mile 484. The flood damage reduction project area includes the DWTP, a portion of the IC&E Railroad, an existing City recreational path and adjacent features, two City-owned sanitary sewer lines, and several other water mains and utilities. The scope of work associated with the construction of this project includes the construction of 1556 ft of "I" wall, 605 ft of "L" wall, approximately 125 ft of earth embankment (levee), gateway closures, floodwall closures, an operation and maintenance access road, utility work and landscaping. The estimate reflects the total project cost, which includes Federal and non-Federal construction, real estate, planning, engineering and design, and construction management costs. The estimate was developed after review of the drawings contained in this EDR, discussion with members of the design team concerning site specific conditions, and review of similar construction projects. A detailed estimate was prepared using the Micro Computer Aided Cost Estimate System (MCACES).

**2. Price Level**

The project cost estimate is based on December 2004 price levels. These costs are considered to be fair and reasonable to a well-equipped and capable contractor and include overhead and profit. Calculation of the Fully Funded Estimate (FFE) was done in accordance with guidance from Engineering Manual (EM) 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS), updated September 2004. The mid-point of construction is anticipated to be February 2008 and was used to determine the FFE.

**3. Contingencies and Assumptions**

After review of project documents and discussion with engineering and construction personnel involved in the project, cost contingencies were developed which reflect the uncertainty associated with the work features. A contingency factor for each feature was assigned based on qualified cost engineering judgment of the available design data, the type of work involved, and uncertainties associated with the work and schedule. The basis for the selection of the contingency factor is primarily due to the level of design, unknown haul distances, unknown site conditions, unknown site access, unknown material costs, and unknown quantities.

#

Contingency factors vary from 5% to 25%, with an overall construction contingency factor of about 15%. Contingency amounts and justification are as indicated on the MCACES sheets. Generally, the project features can be constructed using conventional methods and are similar to previous District projects.

#### **4. Current Working Estimate and Fully Funded Estimate**

The MCACES sheets are shown on pages F-5 through F-16. The MCACES estimate incorporated local wage and equipment rates, incorporating local wage and equipment rates. Costs are consistent with guidance in Engineering Regulation (ER) 1110-2-1302, Civil Works Cost Engineering and ER 1110-2-538, Civil Works Project Cost Estimating – Code of Accounts. Table F.1 summarizes the results of the MCACES estimate. The table summarizes the total project costs for the current working estimate and fully funded estimate by project feature.

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**Table F.1  
Current Working Estimate (CWE) and Fully Funded Estimate Summary**

<b>Flood Damage Reduction, Reach 1, Davenport Water Treatment Plant, Davenport, Iowa - (1 of 2)</b>										
<b>Code of Account</b>	<b>Item Description</b>	<b>Qty</b>	<b>UOM</b>	<b>Unit Cost</b>	<b>Total</b>	<b>Cont (%)</b>	<b>Contingency Amount</b>	<b>CWE</b>	<b>Escalation Amount</b>	<b>Fully Funded Estimate</b>
01	Lands and Damages									
	Federal	1	JOB	SUM	\$100,000	0%	\$0	\$100,000	\$0	\$100,000
	non-Federal	1	JOB	SUM	\$650,000	0%	\$0	\$650,000	\$0	\$650,000
	<b>SUBTOTAL LANDS AND DAMAGES</b>				<b>\$750,000</b>			<b>\$750,000</b>		<b>\$750,000</b>
02	Relocations									
	Overhead Power Lines	1	JOB	SUM	\$170,345	5%	\$8,517	\$178,862	\$10,139	\$189,001
	<b>SUBTOTAL RELOCATIONS</b>				<b>\$170,345</b>			<b>\$178,862</b>		<b>\$189,001</b>
11	Levees and Floodwalls									
	Mobilization/Demobilization	1	JOB	SUM	\$32,665	15%	\$4,900	\$37,565	\$2,130	\$39,695
	I-Wall	1556	LF	\$996.65	\$1,550,786	15%	\$233,997	\$1,784,783	\$101,183	\$1,885,966
	L-Wall	605	LF	\$847.15	\$512,523	15%	\$78,094	\$590,617	\$33,476	\$624,093
	Fiber Optic Line Penetrations	2	EA	\$865.00	\$1,730	25%	\$432	\$2,162	\$123	\$2,285
	Sanitary Sewer Work	2	EA	\$1,411.00	\$2,822	25%	\$706	\$3,528	\$200	\$3,728
	Storm Sewer Work	1	JOB	SUM	\$34,490	20%	\$6,878	\$41,368	\$2,345	\$43,713
	Water Main Work	1	JOB	SUM	\$18,470	25%	\$4,617	\$23,087	\$1,309	\$24,396
	RR/Access Road Closures	1	JOB	SUM	\$704,848	16%	\$110,131	\$814,979	\$46,193	\$861,172
	Iowa American Access Road				\$22,719	15%	\$3,408	\$26,127	\$1,481	\$27,608
	Earth Embankment				\$49,438	20%	\$9,888	\$59,326	\$3,363	\$62,689
	Gatewells	1	JOB	SUM	\$222,329	15%	\$33,349	\$255,678	\$14,492	\$270,170
	Project Electrical	1	JOB	SUM	\$422,986	15%	\$63,448	\$486,434	\$27,571	\$514,005
	O&M Access Road	1	JOB	SUM	\$112,767	23%	\$25,534	\$138,301	\$7,839	\$146,140
	Landscaping	1	JOB	SUM	\$81,165	20%	\$15,954	\$97,119	\$5,505	\$102,624
	<b>SUBTOTAL LEVEES AND FLOODWALLS</b>				<b>\$3,769,738</b>			<b>\$4,361,074</b>		<b>\$4,608,284</b>
	<b>TOTAL ESTIMATED CONSTRUCTION COST</b>				<b>\$3,940,083</b>			<b>\$4,539,936</b>		<b>\$4,797,285</b>





#

#

Wed#16#Mar#2005#####Tri-Service#Automated#Cost#Engineering#System# (TRACES)#####TIME#14:15:46#  
Eff\_#Date#12/22/04#####PROJECT#DAVLF6:####Davenport#Local#Flood#Protection# #Scott#County,#IA#  
PROJECT#NOTES#####Rock#Island#District#####TITLE#PAGE##2#

-----#

#

#####The#Scope#of#Work#for#this#project#includes:#

#

#####Construction#of#a#primary#floodwall--Includes#two#types#of#construction.#  
#####Portions#of#the#wall#will#be#constructed#on#top#of#the#existing#government#  
#####sewer#and#vertical#floodwall.##These#portions#are#configured#in#an#"L"#shape.#  
#####Other#portions#will#be#configured#in#an#"I"#shape.##The#wall#types#will#have#  
#####the#identical#appearance#above#ground.##Form#liners#will#be#used#to#produce#a#  
#####stone#masonry#appearance#and#the#top#of#the#wall#will#have#a#precast#concrete#  
#####cap#along#the#entire#length.##There#will#be#a#sprayed-on#coating#  
#####on#the#above-ground#concrete#of#the#wall#to#enhance#the#appearance.#

#

#####Construction#of#levee#embankment--A#125#foot#segment#of#earth#embankment#will#  
#####tie#the#levee#to#high#ground#west#of#Building#"B."##Work#includes#stripping,#  
#####scarifying,#compacting#and#new#fill.##Gated#closure#structures--#1.Two#  
#####existing#storm#sewers#(16-inch#and#14-inch)#will#be#combined#and#two#new#  
#####gatewells#will#be#provided#to#prevent#interior#flooding.##Subdrains#within#  
#####the#floodwall#will#connect#to#these#gatewells.##2.A#gatewell#will#be#provided#  
#####at#the#location#of#a#48-inch#city-owned#sanitary#sewer#pipe#that#would#be#at#  
#####risk#of#damage#in#a#flood#event.##3.A#36-inch#water#main#requires#a#new#gate#  
#####to#allow#positive#closure#at#the#new#floodwall.#

#

#####Railroad#Closures--Two#single#leaf#floodgates#will#be#constructed#to#allow#  
#####for#closure#of#the#railroad#in#the#event#of#a#flood.##Construction#will#  
#####require#close#coordination#with#the#ICE#railroad.#

#

#####O&M#Access#Road--A#proposed#O&M#access#road#will#be#installed#along#the#  
#####riverfront.#The#new#access#road#will#be#12#feet#wide#and#constructed#of#  
#####concrete.##Lighting#will#be#provided#on#top#of#the#floodwall#to#illuminate#the#  
#####road.##A#temporary#road#during#construction#  
#####will#allow#for#uninterrupted#usage#of#this#stretch#of#the#road.#

#

#####Landscaping--Landscaping#is#an#important#part#of#this#project#and#will#be#  
#####provided#along#the#O&M#access#road,#as#well#as#on#both#sides#of#the#wall.#

#

#####Utility#modifications--Existing#overhead#powerlines#owned#by#MidAmerican#  
#####Energy#will#be#relocated#and#buried#to#allow#for#construction#of#the#  
#####floodwall#and#to#improve#aesthetics.##Several#abandoned#sewer#lines#will#be#  
#####verified#for#proper#plugging#and#sealing.##A#portion#of#a#36-inch#abandoned#  
#####storm#sewer#will#be#removed.##A#16-inch#high#pressure#water#main#will#be#  
#####excavated#and#reinforced#with#split#casing#for#the#portion#passing#under#the#  
#####floodwall.##An#existing#fiber#optic#cable#will#require#encasing#or#relocation.#

#

#####The#project#is#located#in#Scott#County,#Iowa#along#the#Mississippi#River#at#  
#####the#Iowa#American#water#company.#

#

#####The#wage#rates#used#for#this#estimate#are#Department#of#Labor#Decision#Number#  
#####IA030031,#Heavy#River#Work#rates#and#IA030004#Building#rates#for#Scott#  
#####County,#Iowa.#

#

#####This#estimate#was#completed#at#a#December#2003#price#level.##The#estimate#is#  
#####based#on#information#that#was#available#at#the#time#of#the#feasibility#study.#  
#####A#subsequent#cost#update#was#done#in#December#2004#to#reflect#wage#rate#  
#####changes#and#to#account#for#changes#in#the#scope#of#work.##An#additional#cost#

#

LABOR#ID:#DAVLF3#####EQUIP#ID:#RG0599#####Currency#in#DOLLARS#####CREW#ID:#NAT00A###UPB#ID:#UP00EA#















#

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#####Rock#Island#District#####SUMMARY#PAGE##6#
#####*#PROJECT#OWNER#SUMMARY#-#Feature*##
#
-----#
#####QUANTITY#UOM###CONTRACT#CONTINGN#ESCALATN##TOTAL#COST#UNIT##NOTES#
-----#
#
#####11_#35.5##Upstream#-#RR#Access#Road#####1.00#EA#####335,566##67,113##22,824####425,503##425503###4,5,6#
#####11_#35.10##Railwork#####1.00#EA#####205,588##10,279##12,235####228,103#####6#
#####11_#35.15##Downstream#-#RR#####1.00#EA#####163,693##32,739##11,134####207,566##207566###4,5,6#
#####TOTAL#RR#Access#Road#Closures#####704,848##110,131##46,193####861,173#
#
#
#####11_#40#Iowa#American#Access#Road#
#
#####11_#40.5##Remove#Existing#Road#####440.00#SY#####2,156####323####141#####2,620####5.95#####5#
#####11_#40.10##Construct#New#Road#####440.00#SY#####20,563##3,084##1,340####24,988##56.79####5,6#
#####TOTAL#Iowa#American#Access#Road#####440.00#SY#####22,719####3,408##1,481####27,608##62.75#
#
#
#####11_#50#Earth#Embankment#
#
#####11_#50.5##Impervious#Embankment#####1804.00#CY#####49,438####9,888###3,363####62,689##34.75##1,4,5#
#####TOTAL#Earth#Embankment#####1804.00#CY#####49,438####9,888###3,363####62,689##34.75#
#
#
#####11_#55#Gatewells#
#
#####11_#55.5##A#####54,415####8,162###3,547####66,124#####5,6#
#####11_#55.10##B#####34,615####5,192###2,256####42,063#####5,6#
#####11_#55.15##C#####53,755####8,063###3,504####65,322#####5,6#
#####11_#55.20##D#####29,075####4,361###1,895####35,331#####5,6#
#####11_#55.25##E#####25,380####3,807###1,654####30,841#####5,6#
#####11_#55.30##F#####25,090####3,763###1,635####30,489#####5,6#
#####TOTAL#Gatewells#####222,329##33,349##14,492####270,170#
#
#
#####11_#60#Project#Electrical#
#
#####11_#60.5##Lighting#####422,986##63,448##27,571####514,005#####5,6#
#####TOTAL#Project#Electrical#####422,986##63,448##27,571####514,005#
#
#
#####11_#65#Landscaping#
#
#####11_#65.5##Seeding#for#LFP#####1.62#AC#####6,226####934####406####7,566#4670.18#
#####11_#65.6##Topsoil#for#Seeding#####1310.00#CY#####33,978####5,097##2,215####41,289##31.52#
#####11_#65.10##Plants#####37,792####9,448##2,678####49,918#
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#
#
#
LABOR#ID:#DAVLF3#####EQUIP#ID:#RG0599#####Currency#in#DOLLARS#####CREW#ID:#NAT00A##UPB#ID:#UP00EA#

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#

**APPENDIX G**

**PROJECT PLATES**

#

**ENGINEERING DOCUMENTATION REPORT  
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT**

**MISSISSIPPI RIVER AT DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT**

**REACH 1  
DAVENPORT WATER TREATMENT PLANT**

**APPENDIX G  
PROJECT PLATES**

**INDEX**

<b>Sheet</b>	<b>Page</b>	<b>Title</b>
X1	1	Cover Sheet
X2	2	Vicinity Map, Location Map, & Index
X3	3	Project Site Plan
G1	4	Boring Locations Site Plan
G2	5	Boring Logs I
G3	6	Boring Logs II
C1	7	Plan & Profile 0+00 to 5+00
C2	8	Plan & Profile 5+00 to 10+00
C3	9	Plan & Profile 10+00 to 15+00
C4	10	Plan & Profile 15+00 to 20+20
C5	11	Plan & Profile 20+20 to 24+50
C6	12	Typical Project Cross-Sections
C7	13	Gatewells Plans & Sections
S1	14	Railroad Closures Construction Sequence
S2	15	Upstream Closures Plan, Elevation, & Sections
S3	16	Upstream Railroad & Road Closures (Double Gate)
S4	17	Upstream Closures Sections & Details (Double Gate)
S5	18	Downstream Railroad Closure (Single Gate)

# MISSISSIPPI RIVER DAVENPORT, IOWA

# FLOOD DAMAGE REDUCTION PROJECT

# REACH 1

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US Army Corps  
of Engineers  
Rock Island  
District

THIS PROJECT WAS DESIGNED BY THE ROCK ISLAND DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE DESIGN IS SUBJECT TO THE REVISIONS AND APPROVALS OF THE DISTRICT ENGINEER. THE DESIGN IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN APPROVAL OF THE DISTRICT ENGINEER. THE DESIGN IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN APPROVAL OF THE DISTRICT ENGINEER. THE DESIGN IS NOT TO BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN APPROVAL OF THE DISTRICT ENGINEER.

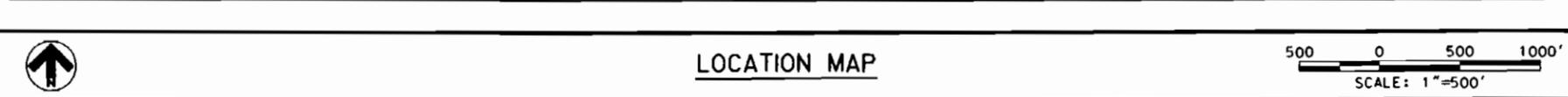
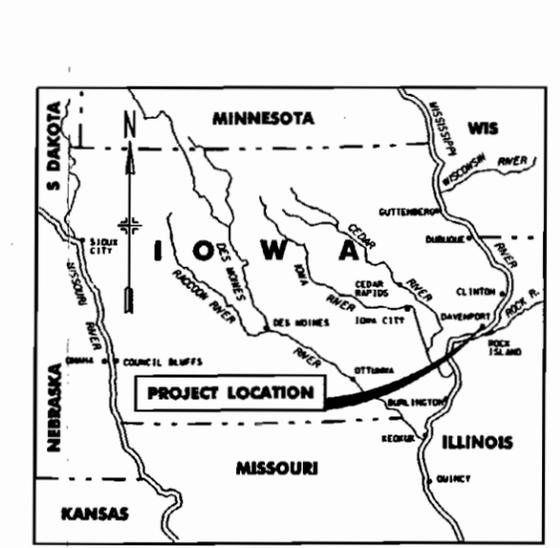
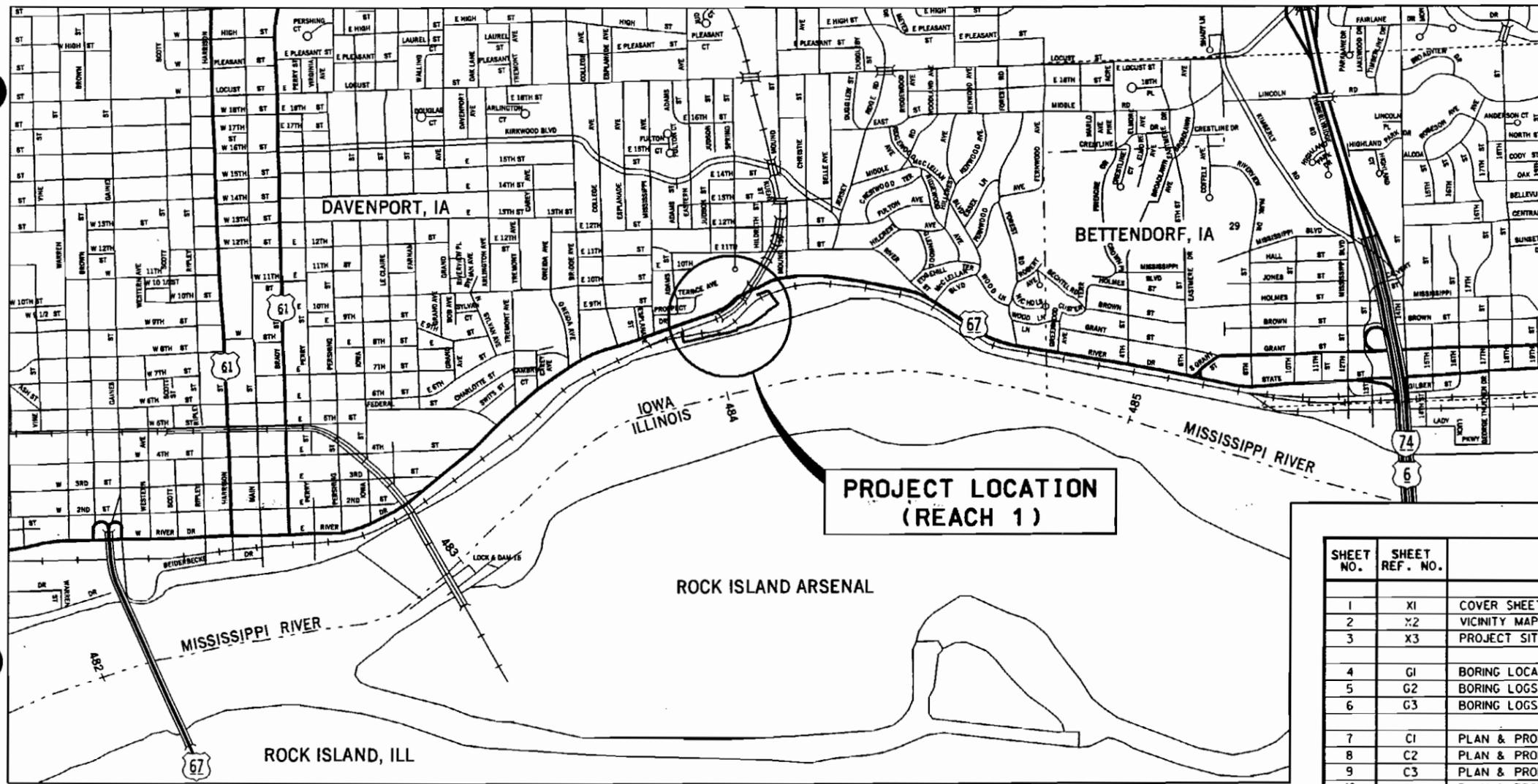
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	Revisions		
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	Chief, Hydraulic Branch		
	Chief, Geotechnical Branch		

Designed By:	DRC	Date:	4 APR 05
Drawn By:	RTR	Scale:	AS SHOWN
Created By:	XXX	Project Code:	FP29
Reviewed By:	XXX	Specification Number:	W912EK-XX-B-XXXX

U.S. ARMY ENGINEER DISTRICT  
CORPS OF ENGINEERS  
ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1  
**COVER SHEET**

Sheet  
Reference  
Number:  
**X1**  
Sheet 1 of 18



SHEET NO.	SHEET REF. NO.	TITLE OF DRAWING
1	X1	COVER SHEET
2	X2	VICINITY MAP, LOCATION MAP, & INDEX
3	X3	PROJECT SITE PLAN
4	G1	BORING LOCATIONS SITE PLAN
5	G2	BORING LOGS I
6	G3	BORING LOGS II
7	C1	PLAN & PROFILE 0+00 TO 5+00
8	C2	PLAN & PROFILE 5+00 TO 10+00
9	C3	PLAN & PROFILE 10+00 TO 15+00
10	C4	PLAN & PROFILE 15+00 TO 20+20
11	C5	PLAN & PROFILE 20+20 TO 24+30
12	C6	TYPICAL PROJECT CROSS-SECTIONS
13	C7	GATEWELLS PLANS & SECTIONS
14	S1	RAILROAD CLOSURES CONSTRUCTION SEQUENCE
15	S2	UPSTREAM CLOSURES PLAN, ELEVATION, & SECTIONS
16	S3	UPSTREAM RAILROAD & ROAD CLOSURES (DOUBLE GATE)
17	S4	UPSTREAM CLOSURES SECTIONS & DETAILS (DOUBLE GATE)
18	S5	DOWNSTREAM RAILROAD CLOSURE (SINGLE GATE)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:
DRC	RTR	XXX	4 APR 05

**INDEX OF DRAWINGS**

THE PROJECT WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING: CONSTRUCTION OF TWO TYPES OF FLOODWALL (1' WALL & 7' WALL), CONSTRUCTION OF AN EARTHEN TIE-BACK LEVEE, CONSTRUCTION OF FOUR GATED CLOSURE STRUCTURES, INCLUDING TWO FOR THE RAILROAD, ONE FOR THE TREATMENT PLANT ACCESS ROAD, AND ONE FOR THE PERSONNEL ACCESS GATE, CONSTRUCTION OF GATED STORM AND SANITARY SEWER GRAVITY OUTLETS (GATEWELLS), STORM SEWER WORK, AND CONSTRUCTION OF AN O&M ACCESS ROAD ALONG WITH UTILITY RELOCATIONS, ARCHITECTURAL TREATMENT FOR THE FLOODWALL, INSTALLATION OF LIGHTING, SITE RESTORATION, AND SEEDING.

**SCOPE OF WORK**



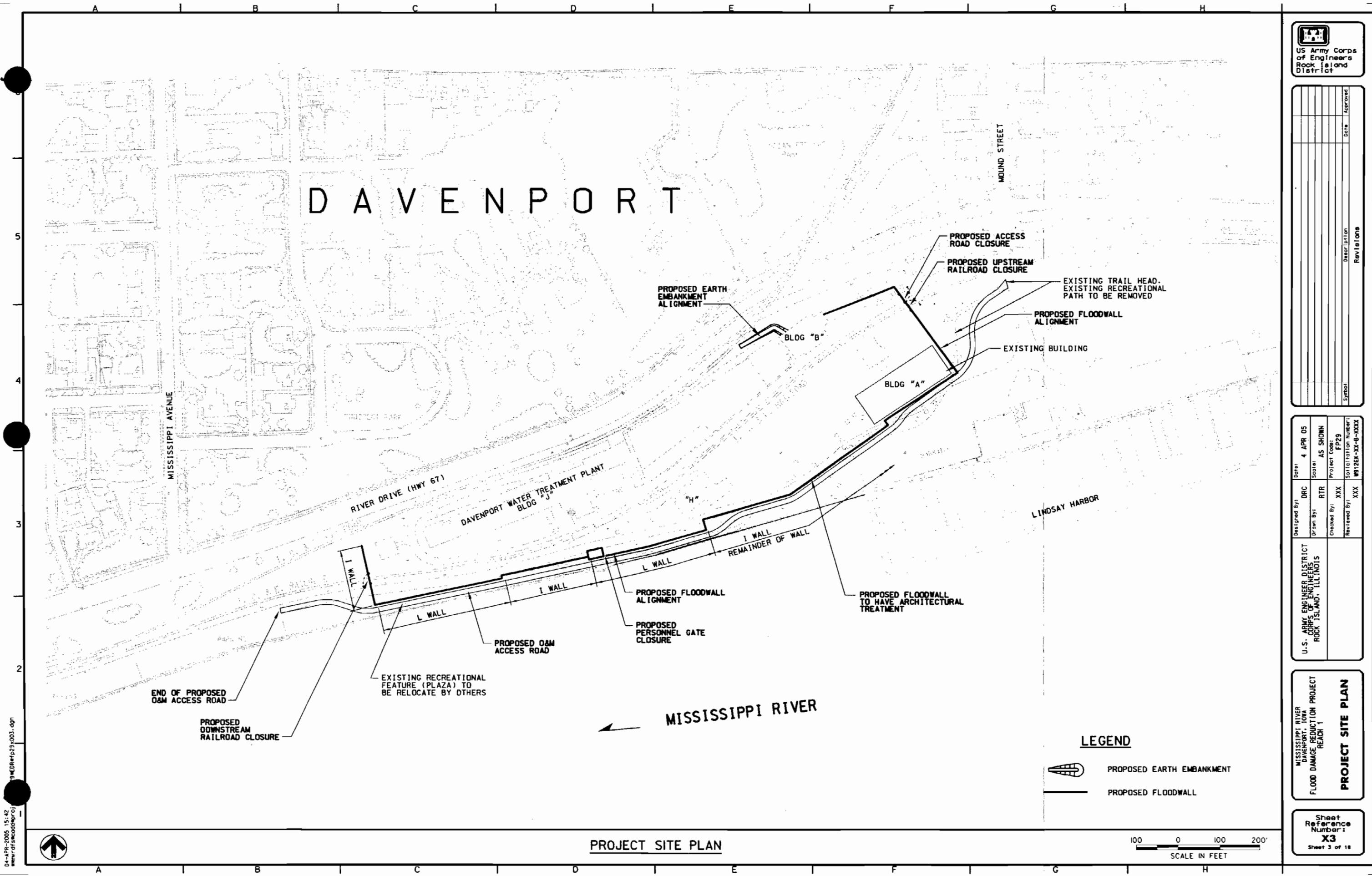
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U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS	Scale: AS SHOWN	Project Code: FP29	Soil Station Number: W912EK-XX-B-XXXX
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MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1

**VICINITY MAP,  
LOCATION MAP,  
& INDEX**

Sheet Reference Number:  
**X2**  
Sheet 2 of 18



# DAVENPORT

## PROJECT SITE PLAN

### LEGEND

- PROPOSED EARTH EMBANKMENT
- PROPOSED FLOODWALL



Symbol	Description	Date	Approved

Designed By: DRC	Date: 4 APR 05
Drawn By: RTR	Scale: AS SHOWN
Checked By: XXX	Project Code: FP29
Reviewed By: XXX	Solicitation Number: W12EK-XI-0-XXX

U.S. ARMY ENGINEER DISTRICT  
ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1

### PROJECT SITE PLAN

Sheet Reference Number:  
**X3**  
Sheet 3 of 18

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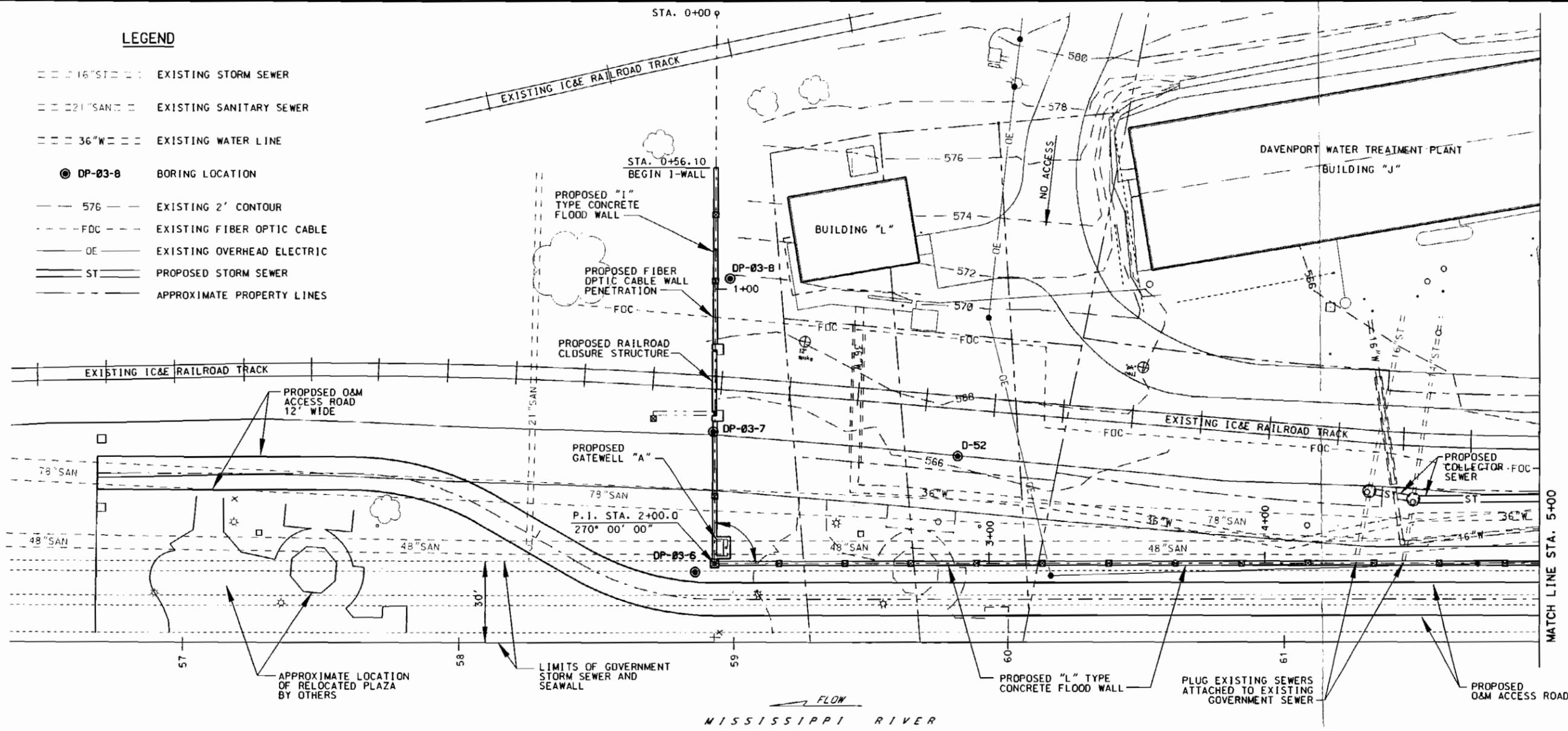




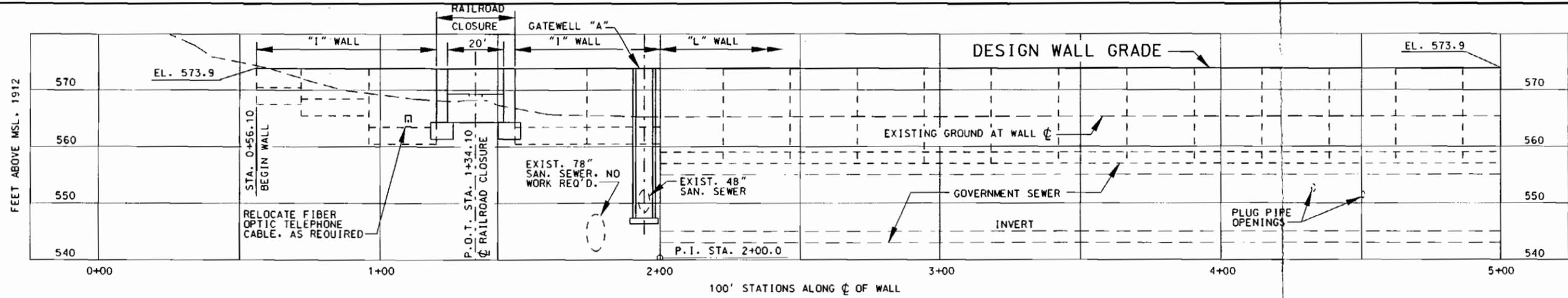


**LEGEND**

- 16" ST --- EXISTING STORM SEWER
- 21" SAN --- EXISTING SANITARY SEWER
- 36" W --- EXISTING WATER LINE
- DP-03-8 BORING LOCATION
- 576 --- EXISTING 2' CONTOUR
- FOC --- EXISTING FIBER OPTIC CABLE
- OE --- EXISTING OVERHEAD ELECTRIC
- ST --- PROPOSED STORM SEWER
- --- APPROXIMATE PROPERTY LINES



**PLAN 0+00 TO 5+00**



**PROFILE 0+00 TO 5+00**



Symbol	Description	Date	Approved

Designed By: DRC	Date: 4 APR 05
Drawn By: RTR	Scale: AS SHOWN
Checked By: XXX	Project Code: FP29
Reviewed By: XXX	Specification Number: WS12EN-XX-B-XXXX

U.S. ARMY ENGINEER DISTRICT  
DAVENPORT, IOWA  
CORPS OF ENGINEERS  
ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1

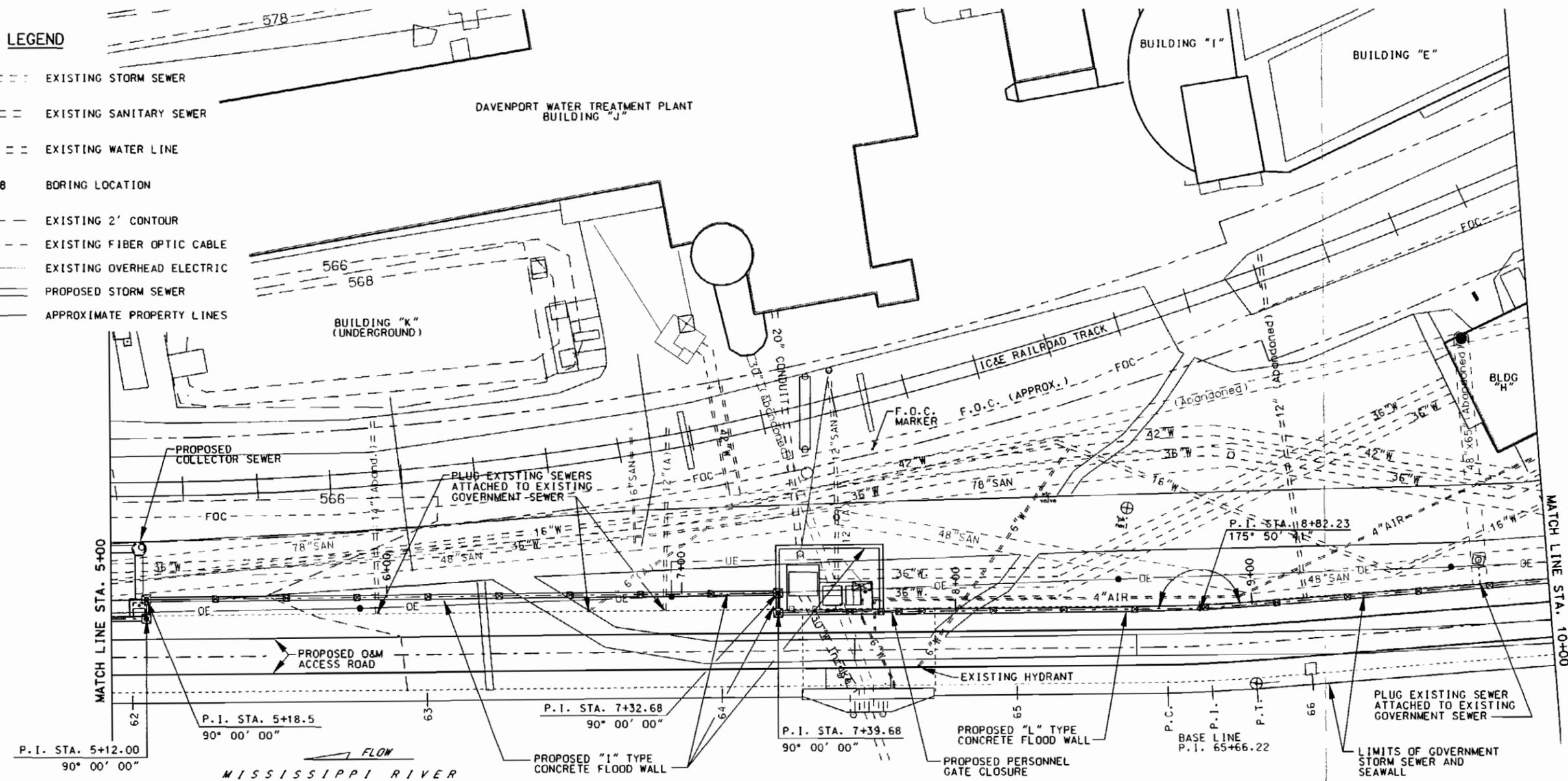
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0+00 TO 5+00**

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Sheet 7 of 16

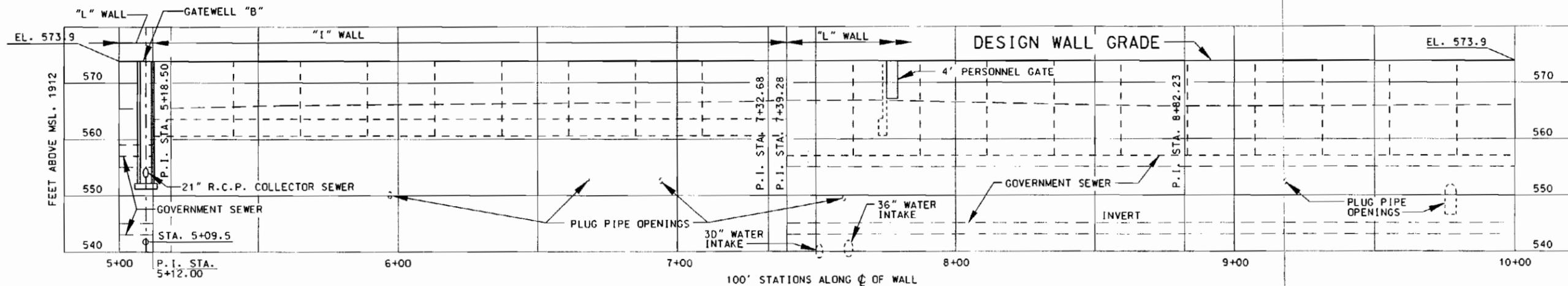
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**LEGEND**

- 16" ST --- EXISTING STORM SEWER
- 21" SAN --- EXISTING SANITARY SEWER
- 36" W --- EXISTING WATER LINE
- DP-03-8 BORING LOCATION
- 576 --- EXISTING 2' CONTOUR
- FOC --- EXISTING FIBER OPTIC CABLE
- OE --- EXISTING OVERHEAD ELECTRIC
- ST --- PROPOSED STORM SEWER
- --- APPROXIMATE PROPERTY LINES



**PLAN 5+00 TO 10+00**



**PROFILE 5+00 TO 10+00**



Symbol	Description	Date	Approved

Designed By: DRC	Date: 4 APR 05
Drawn By: RTR	Scale: AS SHOWN
Checked By: XXX	Project Code: FP29
Reviewed By: XXX	Solicitation Number: W912EY-XX-B-XXXX

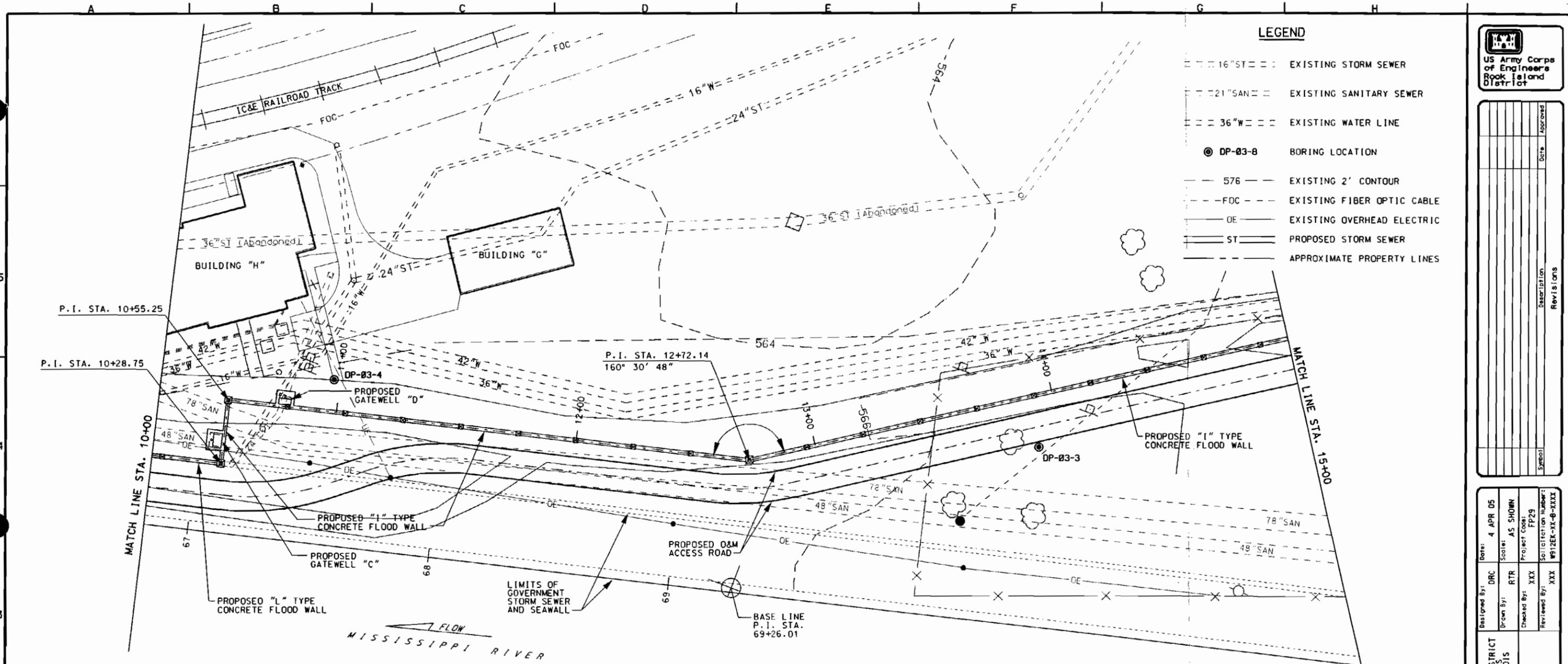
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 CORPS OF ENGINEERS  
 ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
 DAMBURY, IOWA  
 FLOOD DAMAGE REDUCTION PROJECT  
 REACH 1

**PLAN & PROFILE  
 5+00 TO 10+00**

Sheet Reference Number:  
**C2**  
 Sheet 8 of 18

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**LEGEND**

- 16" ST --- EXISTING STORM SEWER
- 21" SAN --- EXISTING SANITARY SEWER
- 36" W --- EXISTING WATER LINE
- DP-03-8 BORING LOCATION
- - - 576 - - - EXISTING 2' CONTOUR
- - - FOC - - - EXISTING FIBER OPTIC CABLE
- - - OE - - - EXISTING OVERHEAD ELECTRIC
- ST --- PROPOSED STORM SEWER
- - - - - APPROXIMATE PROPERTY LINES



Symbol	Description	Date	Approved

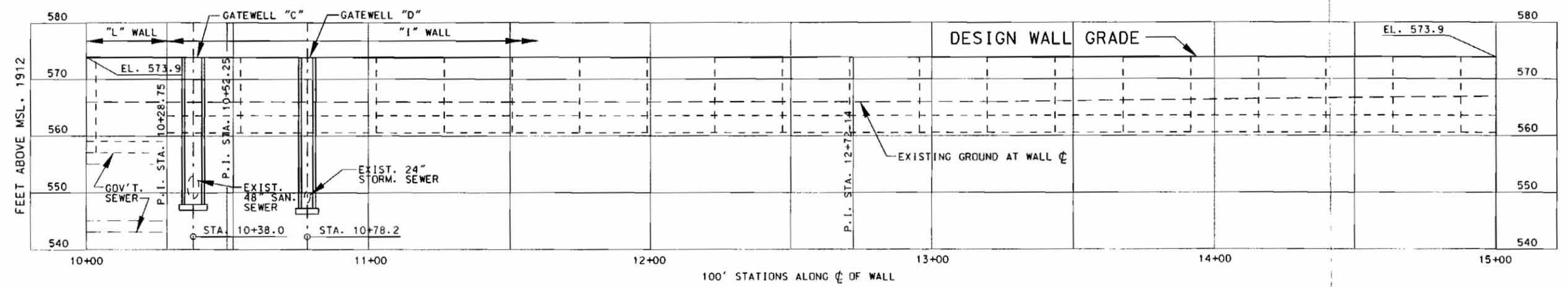
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Reviewed By: XXX	Specification Number: W912EK-XX-B-XXXX

U.S. ARMY CORPS OF ENGINEERS  
 ROCK ISLAND DISTRICT  
 MISSISSIPPI RIVER  
 DAMAGE REDUCTION PROJECT  
 REACH 1

**PLAN & PROFILE  
 10+00 TO 15+00**

Sheet Reference Number:  
**C3**  
 Sheet 9 of 18

**PLAN 10+00 TO 15+00**



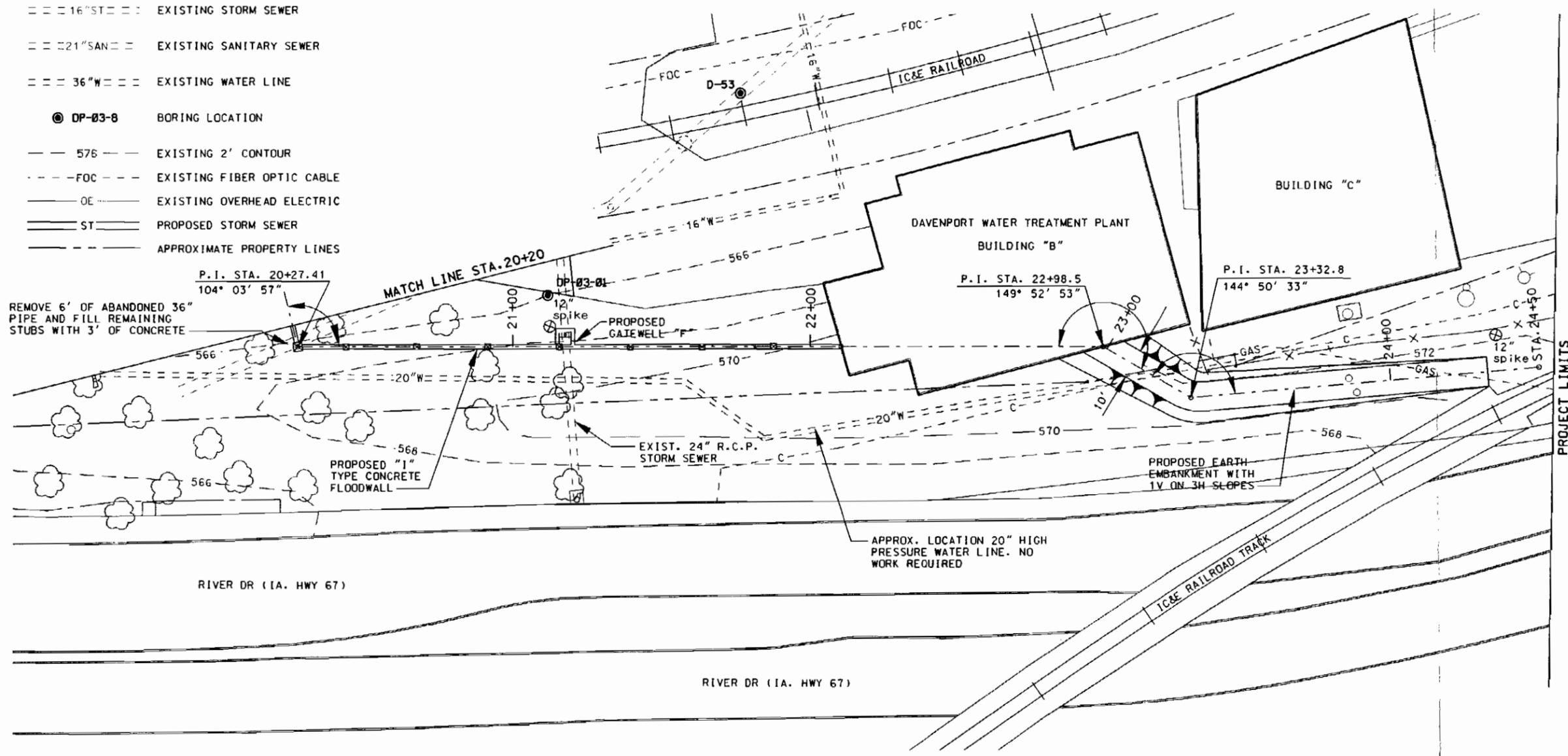
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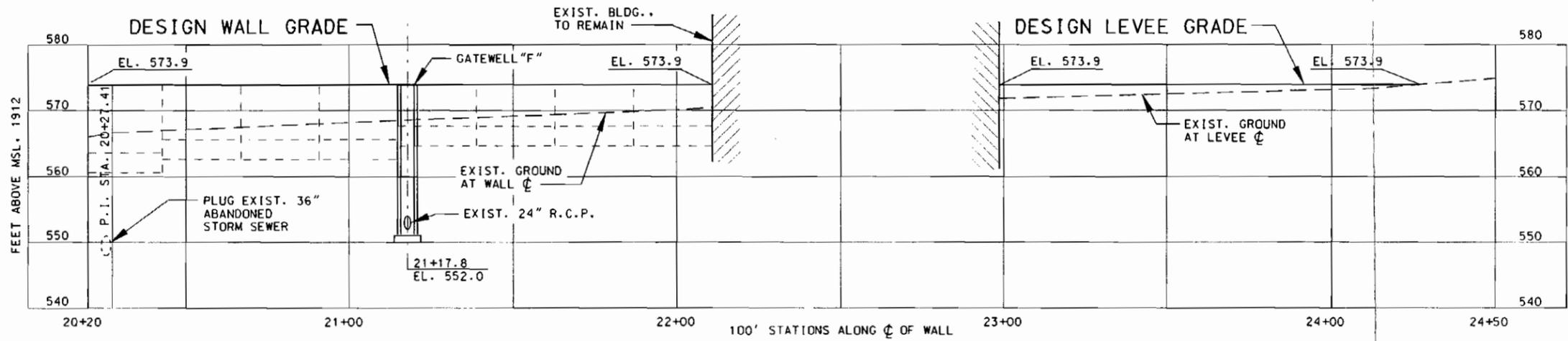


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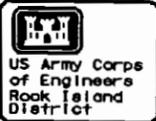
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- == 21"SAN == EXISTING SANITARY SEWER
- == 36"W == EXISTING WATER LINE
- DP-03-8 BORING LOCATION
- 576 --- EXISTING 2' CONTOUR
- - - FOC - - - EXISTING FIBER OPTIC CABLE
- OE --- EXISTING OVERHEAD ELECTRIC
- == ST == PROPOSED STORM SEWER
- - - - - APPROXIMATE PROPERTY LINES



**PLAN 20+20 TO 24+50**



**PROFILE 20+20 TO 24+50**



Symbol	Description	Date	Approved

Designed By:	DRC	Date:	4 APR 05
Drawn By:	RTR	Scale:	AS SHOWN
Checked By:	XXX	Project Code:	FP29
Reviewed By:	XXX	Solicitation Number:	W912EK-XX-8-XXX

U.S. ARMY ENGINEER DISTRICT  
 ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
 DAVENPORT, IOWA  
 FLOOD DAMAGE REDUCTION PROJECT  
 REACH 1  
**PLAN & PROFILE  
 20+20 TO 24+50**

Sheet Reference Number:  
**C5**  
 Sheet 11 of 18

05-JUL-2005 10:17  
 \*\*\*rjdf\*\*\*

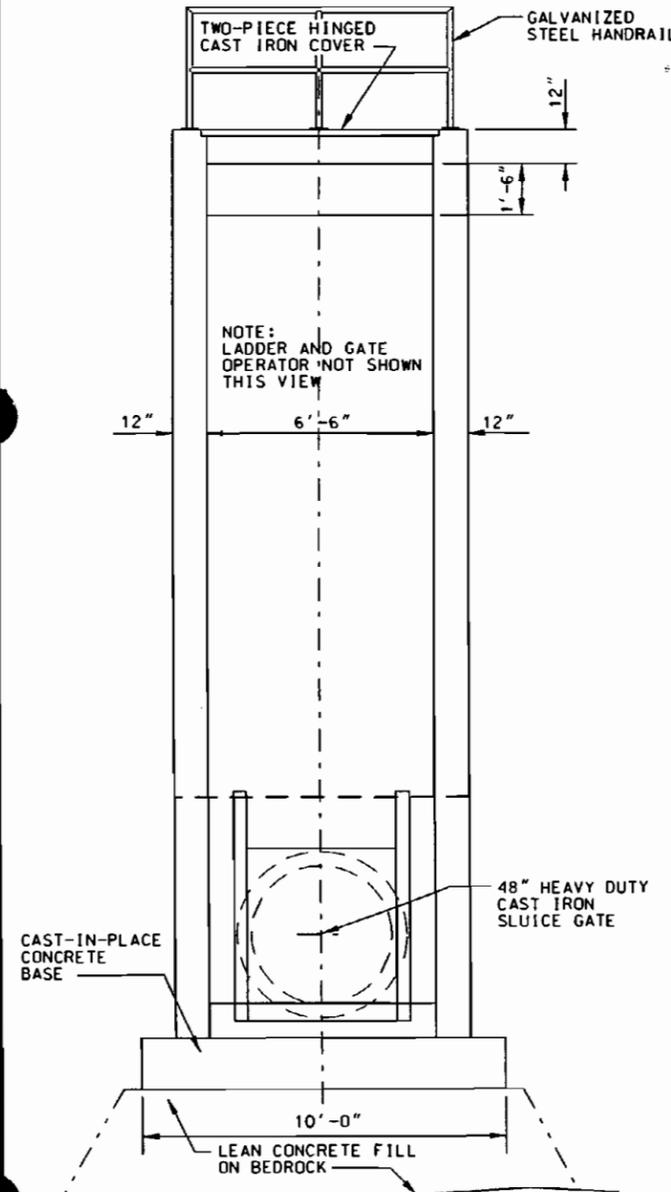


DIMENSIONAL DATA					
GATEWELL	STA.	TOP	INV.	PIPE	ANGLE
A	1+94.3	573.9	548.4	48" R.C.P.	-
B	5+09.5	573.9	553.2	21" D.I.P.	-
C	10+38.0	573.9	549.0	48" R.C.P.	-
D	10+78.2	573.9	548.3	24" R.C.P.	13°
E	19+33.4	573.9	550.9	24" R.C.P.	15°
F	21+17.7	573.9	552.0	24" R.C.P.	-5°

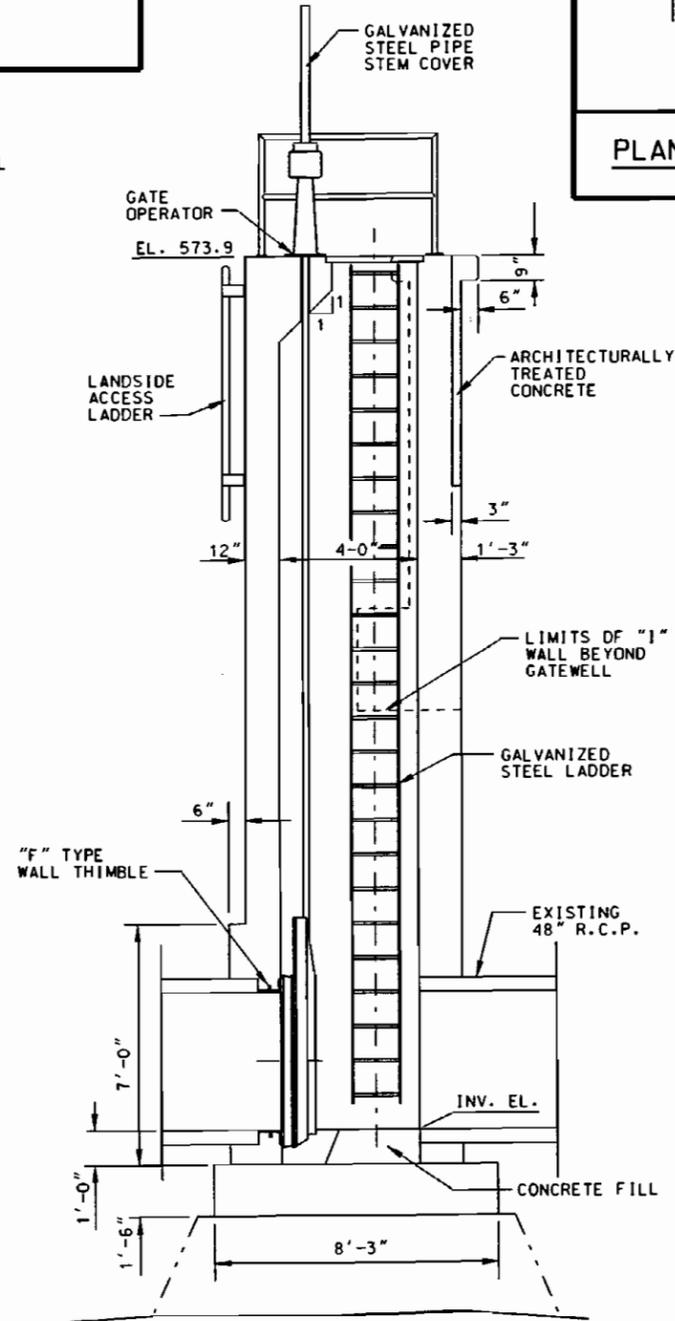
DIMENSIONAL DATA TABLE

PLAN OF GATEWELLS A & C

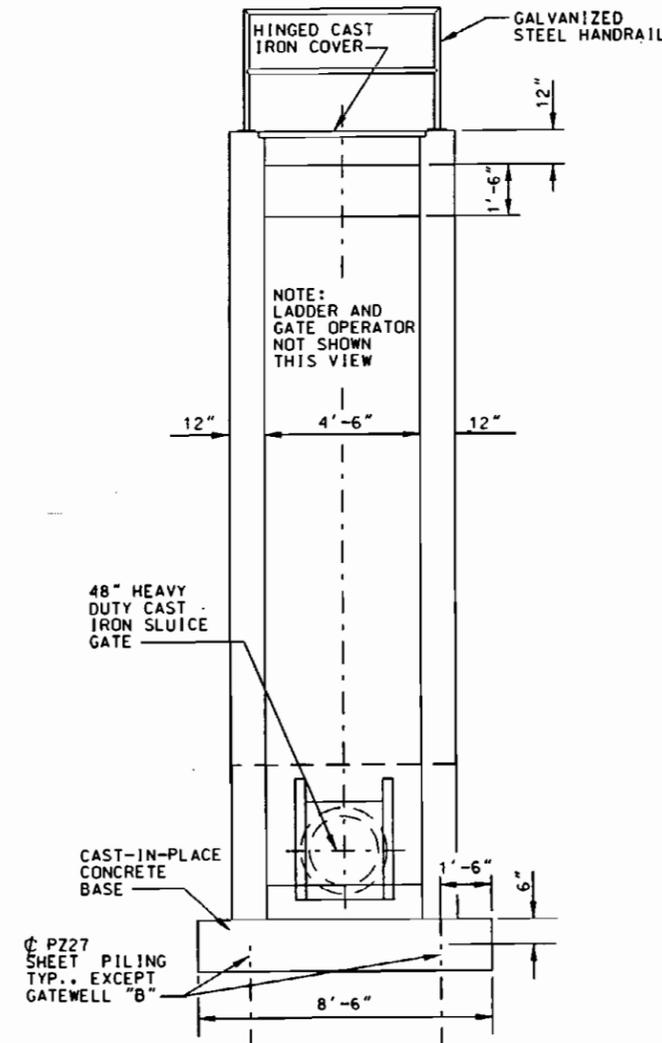
PLAN OF GATEWELLS B, D, E, & F



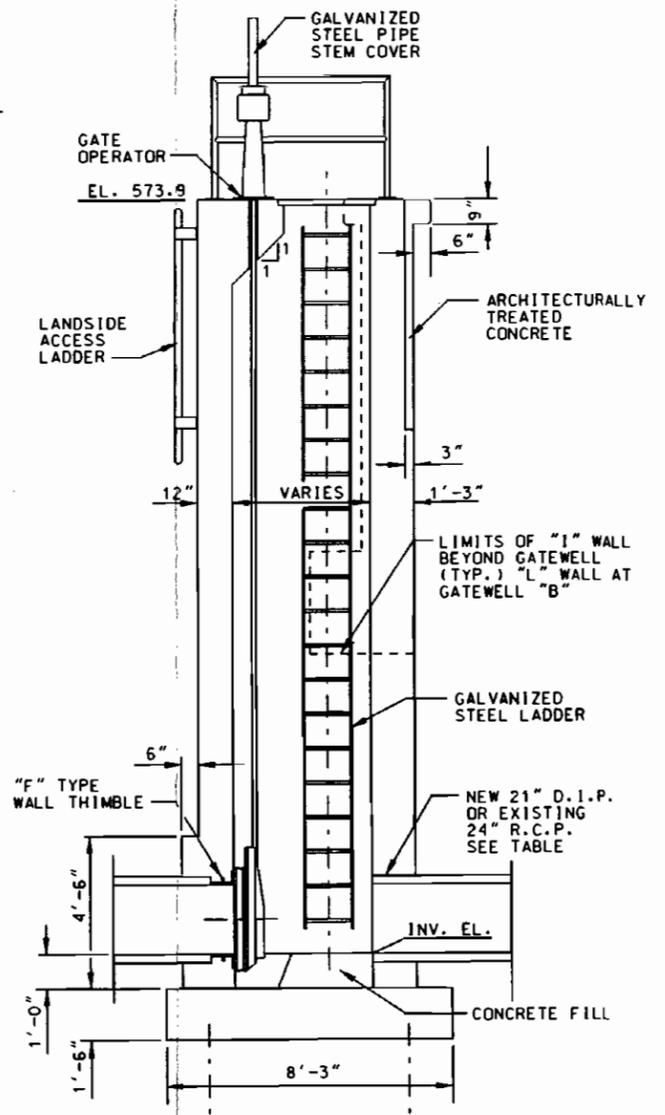
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

SECTIONS OF GATEWELLS A & C

SECTIONS OF GATEWELLS B, D, E, & F



Symbol	Description	Date	Approved

Date:	4 APR 05
Designed By:	DRC
Drawn By:	RTR
Checked By:	XXX
Reviewed By:	XXX
Scale:	AS SHOWN
Project Code:	FP29
Solicitation Number:	W812EK-XX-B-XXX

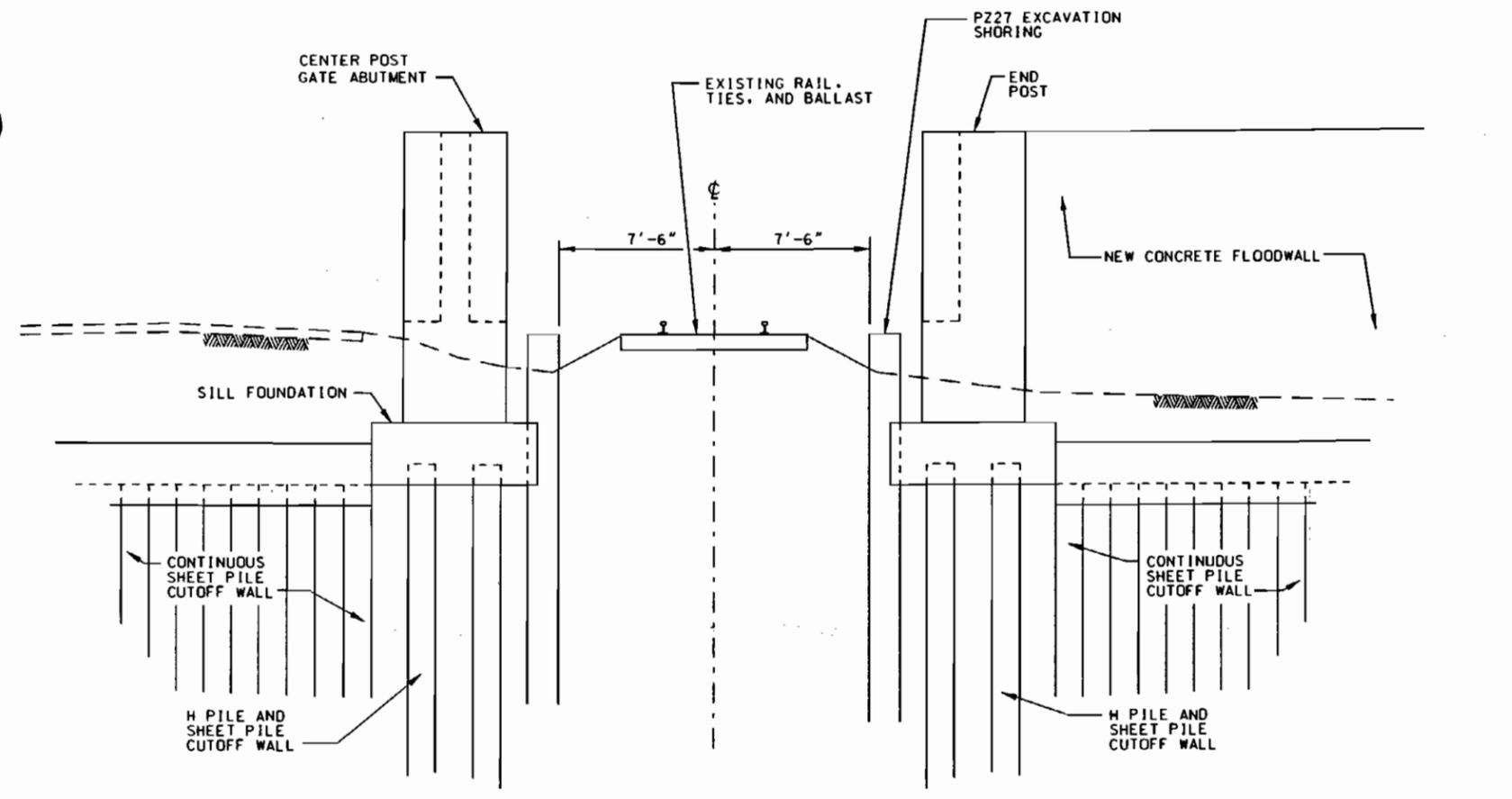
U.S. ARMY ENGINEER DISTRICT  
 ROCK ISLAND, ILLINOIS

MISSISSIPPI RIVER  
 DAYTON, IOWA  
 FLOOD DAMAGE REDUCTION PROJECT  
 REACH 1

**GATEWELLS  
 PLANS & SECTIONS**

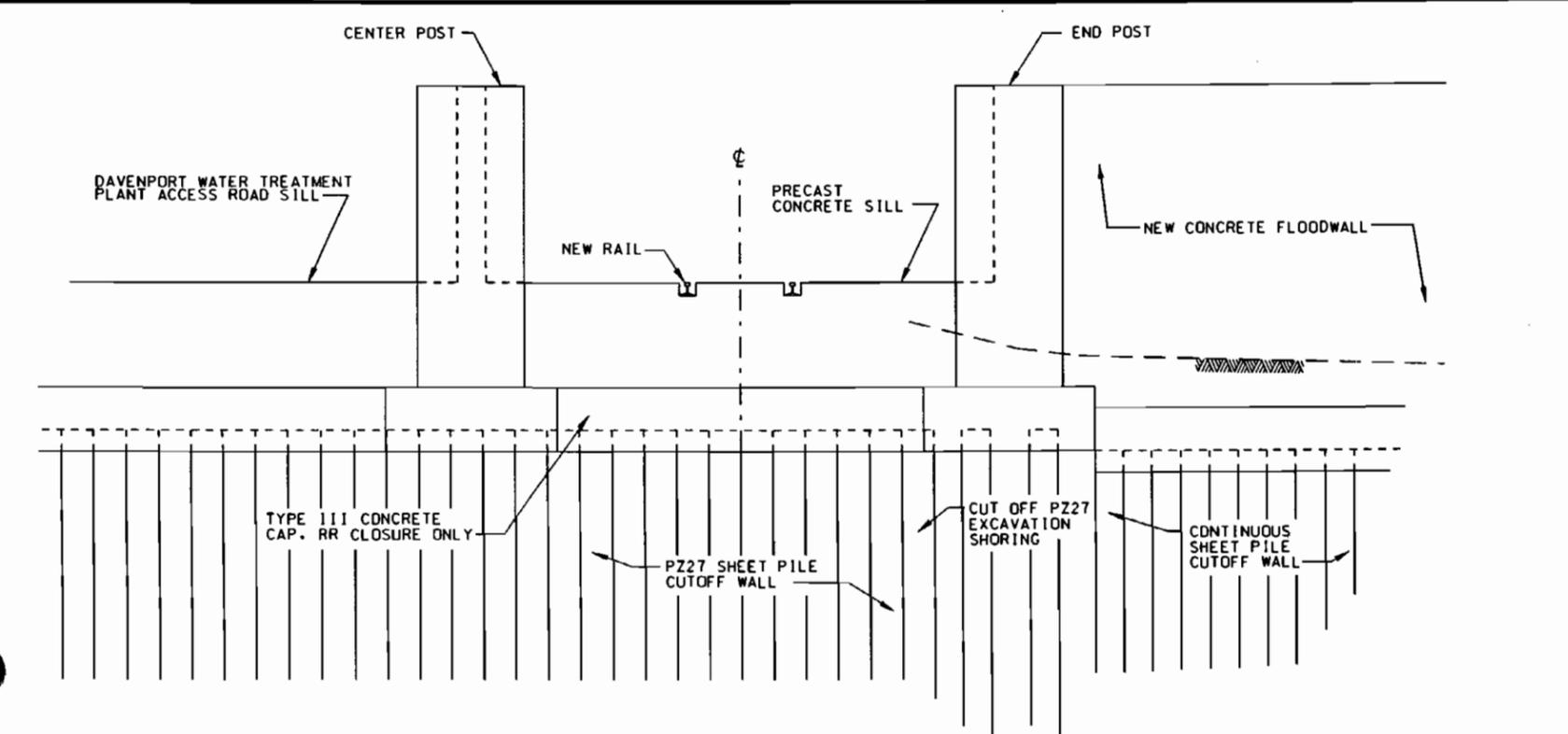
Sheet Reference Number:  
**C7**  
 Sheet 13 of 16

04-APR-2005 09:25  
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PHASE I ELEVATION

SCALE IN FEET



PHASE II ELEVATION

SCALE IN FEET

**PHASE I - RAILROAD REMAINS OPEN**

1. DRIVE SEET PILE 7'-6" FROM CENTER LINE OF EXISING TRACKS TO SUPPORT EXCAVATION.
2. EXCAVATE FOR PIER CONSTRUCTION.
3. DRIVE H PILE - USE H12X63. 6 EA. FOR END PIERS AND H12X74. 6 EA. FOR CENTER PIER.
4. DRIVE SHEET PILE.
5. CONSTRUCT REINFORCED CONCRETE PIERS - 3 FT. X 8 FT. X 20 FT.

**PHASE II - RAILROAD CLOSURE (24 HRS/DAY - WORK NON-STOP UNTIL RAILROAD IS OPEN)**

1. THE RAILROAD WOULD REMOVE THE RAIL. TIES, AND BALLAST.
2. EXCAVATE FOR SILL.
3. DRIVE SHEET PILE CUT-OFF.
4. PLACE TYPE III CONCRETE CAP.
5. PLACE PRECAST CONCRETE SILL.
6. COMPACT BACKFILL.
7. THE RAILROAD WOULD REPLACE THE RAIL. TIES, AND BALLAST.

**NOTE**

WORK APPLIES TO BOTH RAILROAD CLOSURE STRUCTURES (DOWNSTREAM & UPSTREAM). WORK CREWS WILL WORK SIMULTANEOUSLY ON BOTH RAILROAD CLOSURES.

**RAILROAD CLOSURES CONSTRUCTION SEQUENCE**

Symbol	Description	Date	Approved

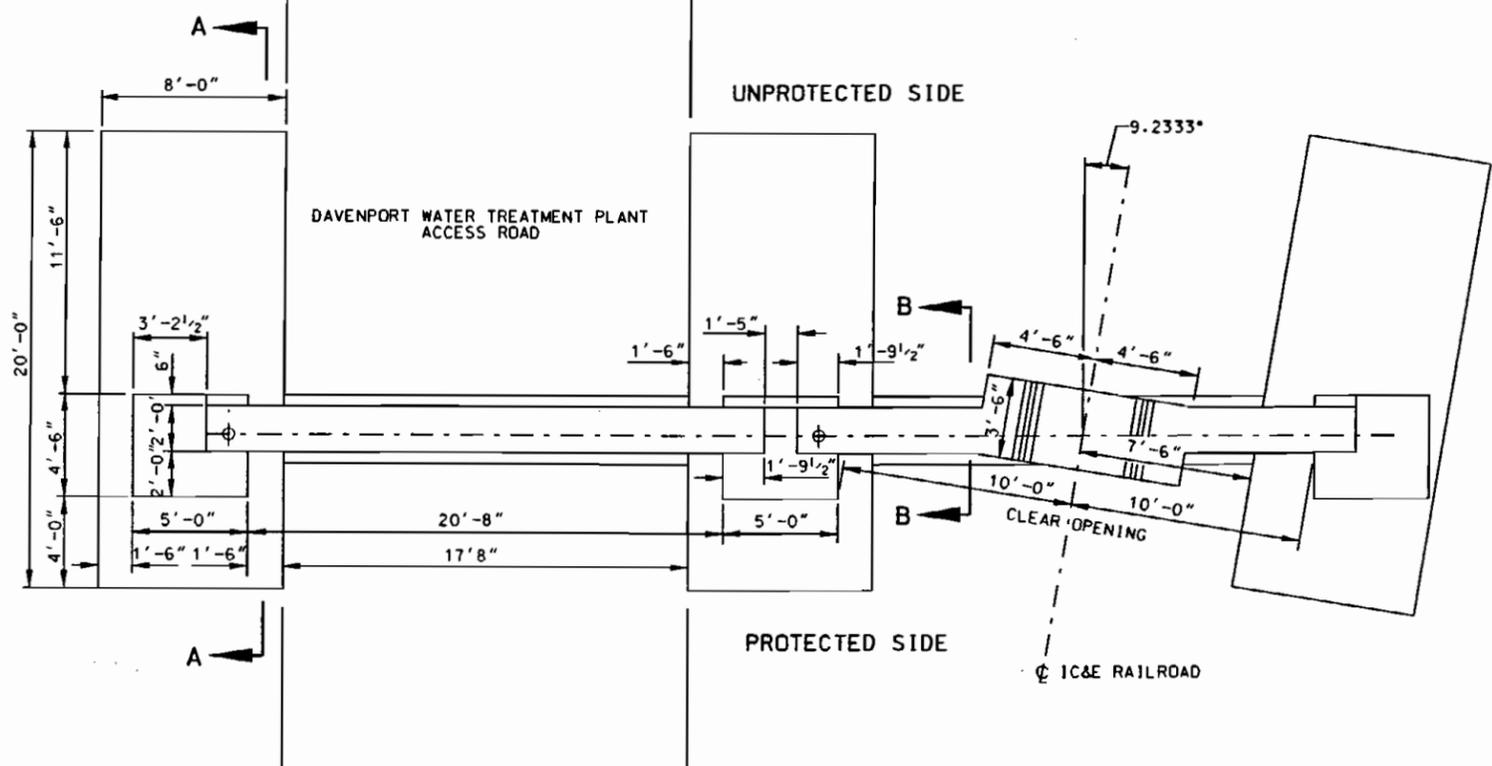
Designed By:	DRC	Date:	4 APR 05
Drawn By:	RTR	Scale:	AS SHOWN
Checked By:	XXX	Project Code:	FP29
Reviewed By:	XXX	Specification Number:	W122EK-XI-B-XXXX

U.S. ARMY ENGINEER DISTRICT  
CORPS OF ENGINEERS  
ROCK ISLAND, ILLINOIS

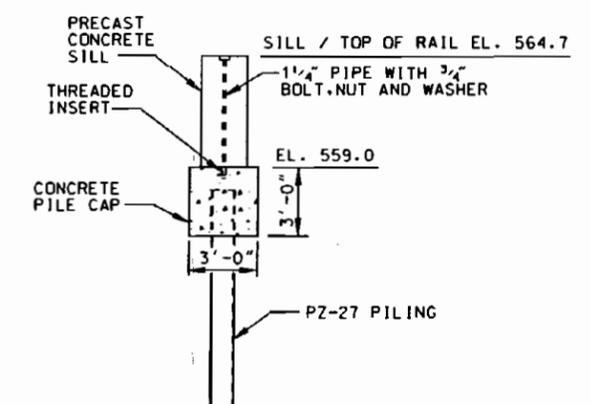
MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1  
**RAILROAD CLOSURES  
CONSTRUCTION  
SEQUENCE**

Sheet Reference Number:  
**S1**  
Sheet 14 of 18

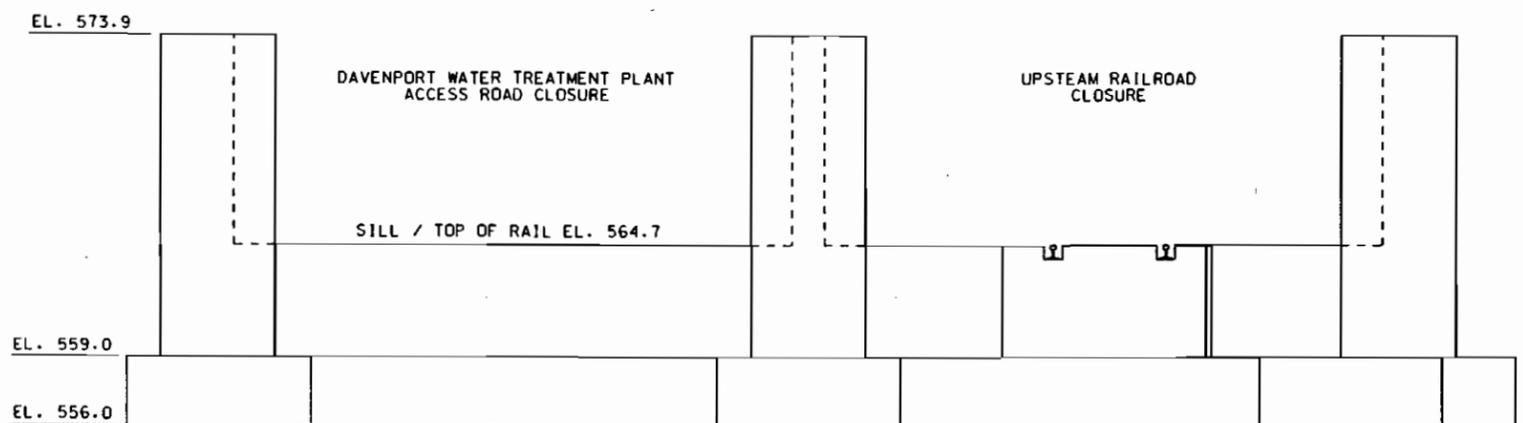
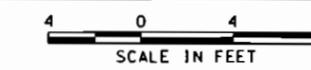
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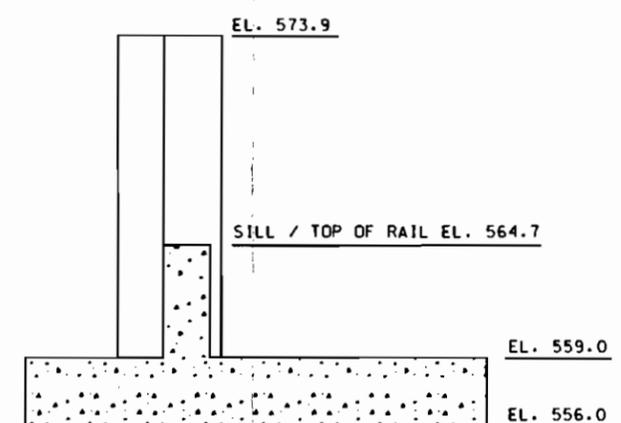
PLAN



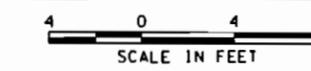
SECTION B-B



ELEVATION



SECTION A-A



NOTE: PILING NOT SHOWN. THIS VIEW

NOTE: PILING NOT SHOWN. THIS VIEW

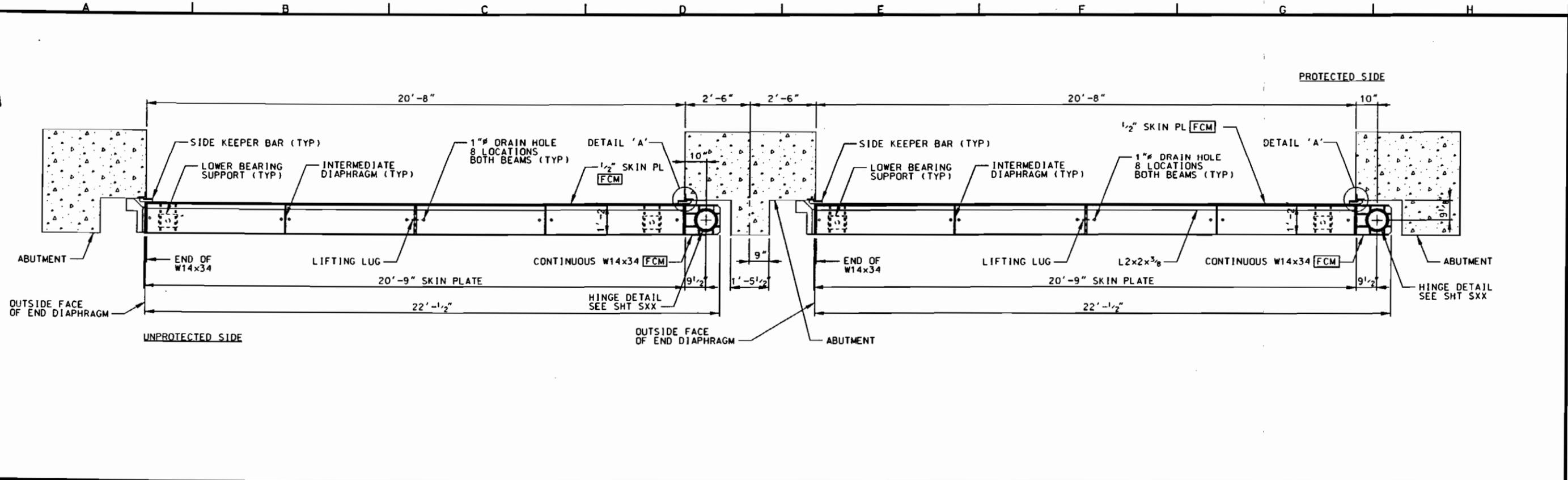
Symbol	Description	Revisions	Date	Approved

Designed By: DRC	Drawn By: RTR	Checked By: XXX	Reviewed By: XXX	Date: 4 APR 05	Scale: AS SHOWN	Project Code: PP29	Solicitation Number: W912EK-XK-B-XXXX
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS							

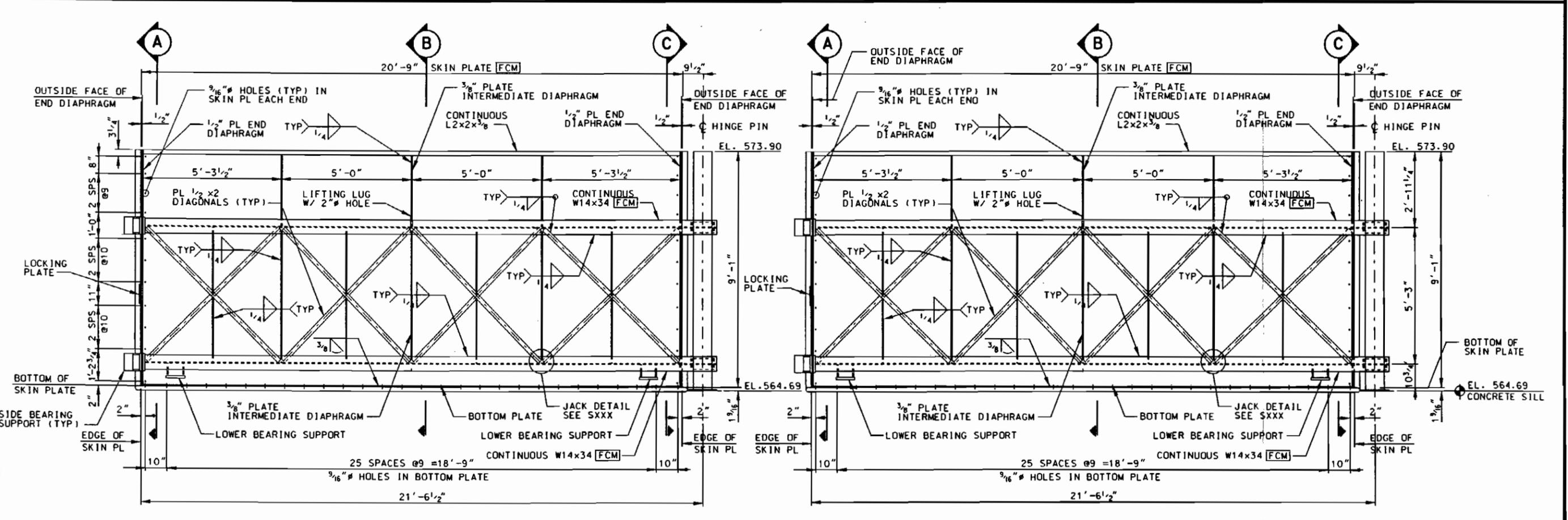
MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1  
**UPSTREAM CLOSURES,  
PLAN, ELEVATION,  
& SECTIONS**

Sheet Reference Number:  
**S2**  
Sheet 15 of 18

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PLAN



ELEVATION



Symbol	Description	Date	Approved

Designed By:	KCP	Date:	4 APR 05
Drawn By:	DGP	Scale:	AS SHOWN
Checked By:	KEW	Project Code:	FP29
Reviewed By:	FRJ	Specification Number:	#912EK-KK-B-XXXX

MISSISSIPPI RIVER  
DAVENPORT, IOWA  
FLOOD DAMAGE REDUCTION PROJECT  
REACH 1  
**UPSTREAM RAILROAD  
& ROAD CLOSURES  
& (DOUBLE GATE)**

Sheet Reference Number:  
**53**  
Sheet 16 of 18

04-APR-2005 09:32  
c:\p04\ref\p04s003.dgn





#

**APPENDIX H**

**DISTRIBUTION LIST**

#

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UNITED STATES SENATOR  
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DAVENPORT IA 52803

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REPRESENTATIVE IN CONGRESS-1ST DIST  
US HOUSE OF REPRESENTATIVES  
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WATERLOO IA 50702

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ENVIRONMENTAL AFFAIRS  
US DEPT OF COMMERCE  
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WASHINGTON DC 20230

REGIONAL DIRECTOR  
REGION 7  
US DEPT OF HOUSING AND URBAN DEVELOPMENT  
GATEWAY TOWERS II 400 STATE AVE  
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US DEPT OF HOUSING AND URBAN DEVELOPMENT  
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ROCK ISLAND IL 61201

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US DEPT OF INTERIOR  
US FISH AND WILDLIFE SERVICE - REG 3  
1 FEDERAL DR BHW FEDERAL BLDG  
FORT SNELLING MN 55111-4056

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NATURAL RESOURCES CONSERVATION SVC  
US DEPT OF AGRICULTURE  
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PRESIDENT - MISSISSIPPI RVR COMM  
US ARMY ENGR DIV - MISSISSIPPI VALLEY  
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R&C COORDINATOR  
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SCOTT COUNTY COURT HOUSE 416 W 4TH ST  
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MARLENE NELSON  
COUNTY CLERK  
SCOTT CO COURT HOUSE 416 W 4TH ST  
DAVENPORT IA 52801

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90E

14 MAR 05

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DAVENPORT IA 52801

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14 MAR 05

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311 EASTLAWN BLDG  
IOWA CITY IA 52242

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90E

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SERIALS DEPT  
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DAVENPORT IA 52801-1490

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DAVENPORT IA 52804

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THE CITIZENS COMMITTEE  
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CLINTON IA 52732

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THE SIERRA CLUB  
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THE NATURE CONSERVANCY  
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SCOTT COUNTY HIST PRESERVATION SOC INC  
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MICHAEL PHELPS  
PUBLISHER  
QUAD CITY TIMES  
PO BOX 3828  
DAVENPORT IA 52808

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DAVENPORT EDR

90E

14 MAR 05

INTERNAL:

COMMANDER, US ARMY ENGINEER DISTRICT, ROCK ISLAND  
CLOCK TOWER BLDG, PO BOX 2004, ROCK ISLAND, IL 61204-2004

ATTN: CEMVR-PM-M (DIST FILE)(2 COPIES)  
CEMVR-PM-M (HAMILTON)  
CEMVR-PM-A (MCGUIRE)(5 COPIES)  
CEMVR-PM-A (ROSS)  
CEMVR-PM-A (JACKSON)  
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CEMVR-ED-DG (FLEISCHMAN)(20 COPIES)  
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CEMVR-ED-DS (PATEL)  
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CEMVR-ED-C (KIRKEENG)  
CEMVR-ED-C (TRAICOFF)  
CEMVR-ED-C (CUMMINGS)  
CEMVR-ED-DF (HOLDEN)  
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CEMVR-OC  
CEMVR-RE  
CEMVR-RE-F (LIEVING)  
CEMVR-IM-CL