Protection of Water and Wastewater Treatment Plants with FEMA Funding Assistance

Session D4

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HDR

June 2016
2011 Flood Costs

- Total FEMA claim for 2011 flooding $6.5 million
- Flood fight costs
- Reconstruction of park parking lot
- Reconstruction of Fairview Drive (Access to Park and Treatment Plants)
- Debris cleanup and disposal
- Temporary emergency measures
Flood Mitigation

- City Applied through NEMA for FEMA Mitigation Funding
- FEMA Approved Funding at 75%/25%
- Project result from 2011 Missouri River Flooding
- Project Funding is Federal Funds with Federal Rules
- Wetlands Mitigation
Proposed Mitigation

- Raise Fairview Drive
- Construct earthen berm around both plants
- Construction storm water collection system, detention pond, pump station, and discharge
- Install backup generators
Work Included

- 2900 LF of earthen berm
- New flood gate for Fairview Drive
- New pump station for plant effluent and storm water for use during flooding events
- New generators for treatment plants and intake
- Storm water detention pond
- New outfall sewer pipes to river
- Wetlands mitigation
Design Issues

- Existing site conditions
- Utility relocations
- Berm elevation and connections
- Maintaining water supply to Cargill
- Automation
- Access for plants and public
- Contractor coordination
Existing Site Conditions

- Soft, alluvium soils
- Known utilities
- Known utilities – unknown locations
- Abandoned anhydrous ammonia plant
- UPRR embankment
Original UP Embankment Construction
Environmental Issues

- Abandoned anhydrous ammonia plant
- Wetlands
- Floodplain
- Air permit
Utility Relocations

- Raw and finished water mains
- Chemical feed lines
- Discharge lines
- Sanitary sewers
- Electrical
- Gas
- Communications
Encasement detail

STEEL CASING PIPE - STRUCTURAL GRADE STEEL; MINIMUM YIELD STRENGTH OF 35,000 PSI

GROUT ANNULAR SPACE BETWEEN INSIDE OF CASING AND OUTSIDE CARRIER PIPE WITH CEMENT BENTONITE GROUT:
- 94 LBS TYPE I CEMENT
- 5 LBS POWDERED BENTONITE
- 8.5 GAL. WATER

REPAIR SLEEVE
PLUG END WITH BRICK AND MORTAR OR RUBBER BOOTS
CASING SPACER OR CHOCK

AS REQUIRED BY CASING SPACING MANUFACTURER

NOTE:
GIVEN DIMENSIONS AND THICKNESSES ARE MINIMUMS AND DO NOT CONSIDER CONTRACTOR’S METHODS OR INSTALLATION LOADINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CASING OF ADEQUATE DIAMETER AND THICKNESS FOR WATER MAIN CONSTRUCTION TO ACCOMMODATE CONSTRUCTION METHODS. ENCASEMENT BEDDING SHALL BE FLOWABLE FILL, SEE DETAIL THIS SHEET.

CASING PIPE

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SMOOTH STEEL CASING DIRECT BURY

NOT TO SCALE
Berm and Fairview Drive Elevations

- 500 year flood event plus 3 feet
- Allowance for settlement
- Wave action
- Rip rap protection
NOTE: TOP OF BERM INCLUDES ONE FOOT OF OVERBUILD FOR FUTURE SETTLEMENT.

TYPICAL SECTION – EAR THEN BERM

NOT TO SCALE
Automation

- Sluice gates
- Pump station
- Flood gate
Contractor Coordination

- Six construction contracts: grading, paving, pump station and utilities, generators, trail and OPPD
- Laid out construction sequence and timing
- Milestone dates in construction contracts
- Weekly, combined construction meetings
- Single construction manager
UPRR & OPPD Coordination

UPRR
- Move all utilities off of ROW
- Redesign of the outfall during construction

OPPD
- Reroute main service to plant, feeds within plant
- Extensive coordination for connections
Funding

- Total Cost = $8 million
- City Share = $2 million
- PMRN RD Assisted for $500,000 towards city share
Questions?
Berm Construction