Red River of the North at East Grand Forks, MN & Grand Forks, ND

Flood Control Project – Armada of Pump Stations Protect Both Cities

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GF & EGF
Flood Control Project
Pumping Stations

Presentation Summary

- Project location
- 1997 flood
- Project background
- Pump station design
- Pumps
- Generators
- Controls
- Questions
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Project Location

Canada

Grand Forks/East
Grand Forks

North Dakota

Minnesota

Mpls./St. Paul

Wisconsin

Lake Superior

Lake Michigan
1997 Flood

- Greatest flood on record for this area
- 50,000 people evacuated
- Both Grand Forks and East GF under water
- Ice storm knocked out power to each City
- Major blizzard
- Several buildings in Grand Forks burned
- Over $1 Billion in damages
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Downtown Grand Forks 1997 Flood
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Project Background

- Project started after 1997 flood
- Multiple construction contracts
- One project: Grand Forks & East Grand Forks
- $400 Million cost
- Completion in 2007 – 10 year anniversary of 1997 Flood
- 23 Pump Stations (12 GF and 11 EGF)
- Ring levees around each City
- 40 miles of levee total
- 3 miles of floodwall
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Pump Station Design

- 23 Stations – Optimization and Cost Analysis
- Size from 6000 GPM to 112,000 GPM
- English Coulee largest station (GF side)
- Balance number of stations versus capability of each City to operate and maintain them
- Pump, control & generator supply contracts
- Heating and maintaining buildings
- Maintenance and consistency between stations critical – spare parts
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Downtown East Grand Forks Station
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Grand Forks Elmwood Drive Station
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Grand Forks English Coulee PS (-40F)
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- Purchased under supply contract
- KSB submersible storm water pumps
- Pumps installed on guide rails
- Hoist system provided for pump removal
- Interior Flood Control Analysis Optimization
- Settled on 3 Pump Sizes
- English Coulee Station utilizes vertical pumps
- Farval automatic lubrication system
- Use compressed air system for filling Farval lubricators
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KSB Submersible Pumps
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Vertical Pumps at English Coulee PS
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Generators

- Purchased under supply contract with Onan
- Automatic transfer switches
- Skid mounted fuel tanks and 24 hr operation
- Fuel tanks double wall construction
- Alarm system tied into SCADA. Limit data sent back to master station.
- Need to be operated monthly
- Load banks built into exhaust ductwork and sized at 50% of generator capacity
- Winter operation
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500 KW Generator English Coulee
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100 KW Generator, Fuel Pipe, & Exhaust
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Detail of Exhaust Duct and Load Bank
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Controls

- Supply contract with SCIPAR
- Individual Motor Starters
- Incorporates SCADA and Telemetry
- Radio system
- Central computer at each City
- Transducers for measuring water levels
- No Remote Operation – We want operators at each station
- Data overload – Limit what is sent
- Programming issues – Training for each City
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Starter Panels 6000 GPM Pumps
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SCIPAR Control Panel
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SCIPAR Control Panel at English Coulee
Questions or Comments?

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