THE RED RIVER FLOODWAY EXPANSION PROJECT

Presentation to APEGM
September 21, 2005
OUTLINE

• Reason for the Project
• Design Update
• Contribution of Engineers and Scientists
• Environmental Approval Process
• Construction Status
• Project Budget
REASON FOR THE PROJECT
Benefits of the Floodway Expansion Project

- Provide protection against a 1 in 700 year flood
- Protect 450,000 residents (140,000 homes) in Winnipeg, East St. Paul and West St. Paul
- Protect over 8,000 businesses
- Protect against in excess of $12 billion in damages from a 700 year flood
- Protect against significant environmental devastation
- Provide construction employment
- Improve infrastructure
- Provide economic and recreational opportunities
2D Simulation

CITY OF WINNIPEG
WITH EXISTING FLOODWAY
SIMULATED FLOOD INUNDATION
SURFACE AND BASEMENT
(700 YEAR EVENT)

CITY OF WINNIPEG
WITH EXPANDED FLOODWAY
SIMULATED FLOOD INUNDATION
SURFACE ONLY
(700 YEAR EVENT)
Real Life Reminder

- New Orleans is currently experiencing the impact of overland flooding resulting from Hurricane Katrina
DESIGN UPDATE
Expansion Design

- Pre-design data collection started Spring 2003
- Actual pre-design started December 2003
- Pre-design completed July 2004
- Detailed design started Fall 2004 (on-going)
Expansion Components

1. Floodway Channel Expansion: Widening channel to handle larger floods than 1997 flood.
2. Inlet Control Structure: Improvements; enhanced safety features.
3. Outlet Structure: Expansion and design improvements, erosion control.
5. West Dyke: Extension and enhancement of existing West Dyke system.

Main Components of Floodway Expansion Proposal
**Channel Enlargement**

- Increase flow capacity from 1,700 to 4,000 cms (60,000 to 140,000 cfs)
- Widening – No deepening
- 21,000,000 m³ (27,500,000 yd³)
- No additional land to spoil excavated material
Improvements to the Inlet Structure

- Enhances to fire protection system
- Enhances to security
- Upgrades to hydraulic systems
- Erosion control measures to protect the embankments
Enlarged Outlet Structure

- Widen outlet structure
- Widen outlet channel
- Energy Dissipation measures
- Erosion Protection on the West Bank of Red River
Upgrade of Highway and Railway Bridges

- 12 Bridges replaced and upgraded (6 Highway / 6 Railway Bridges)
- Bridges Widened and Lengthened
- Enhanced Safety Measures
- 60,000 people use highway bridges per day
Other Expansion Components

- Overhead Hydro Lines
- Telecommunication Cables
- Gas and Oil Pipelines
- Water mains
- City Aqueducts
- Seine River Siphon
- Drainage Structures
Expansion of the West Dyke

- Raising and extending
- Increasing freeboard up to 2 metres for 100 year wind
CONTRIBUTION OF ENGINEERS AND SCIENTISTS
Contributions of Engineers and Scientists

- Over 250 People Have Contributed Technically To Date
  - 3 Levels of Government
  - Consulting Community
  - Academia
  - The Public
Involvement as:

- Project Proponents and Financial Sponsors
- Technical Directors, Advisors, Project Managers
- Regulators
Federal Government Departments

- Infrastructure Canada
- Transport Canada
- Fisheries and Oceans Canada
- Canadian Environmental Assessment Agency
Provincial Government

- MFA (a Crown Corporation)
- Province of Manitoba
  - Conservation
  - Water Stewardship
  - Transportation & Government Services
Municipal Government

- City of Winnipeg
  - Water & Waste Department
  - Public Works Department

- Rural Municipalities
  - Morris
  - Macdonald
  - Ritchot
  - Tache
  - Springfield
  - East St. Paul
  - West St. Paul
  - St. Andrews
  - St. Clements
  - Selkirk
Consulting Community

- Consultant firms
  - ACRES
  - Barnes & Duncan
  - Dillon Consulting
  - First Canadian Engineers
  - Earth Tech
  - InterGroup
  - KGS Group
  - LEA Engineers & Planners Inc
  - SNC-Lavalin
  - Stantec
  - Teshmont
  - TetrES Consultants Inc
  - UMA
  - Wardrop Engineering Inc

- Others
  - University of Manitoba
  - Bombardier Transportation
  - CHC
  - National Research Council Canada
  - NRC-CARC
Engineering Disciplines Involved

- Hydraulics/Fluid Mechanics
- Hydrology
- Geotechnical and Hydrogeology
- Structural
- Transportation
- Electrical
- Mechanical
- Municipal/Utilities
- Biology/Environmental Sciences
Hydraulics/Fluid Mechanics, Hydrology

- Hydraulic Analysis,
  Hydrodynamic Modeling,
  Channel Design,
  Ice Processes

- River Analysis & Rating Curves
Hydraulics/Fluid Mechanics, Hydrology

- Inlet Control Structure -
  Dam Safety Analysis
Hydraulics/Fluid Mechanics, Hydrology

- Outlet Control Structure – Energy Dissipation Improvements
Geotechnical and Hydrogeology

Groundwater Modelling

Slope Stability Analyses
Structural

- Structures/Gates
- Bridges

-- Replacement
- Retrofit/Rehabilitation
Transportation

- Road and Railway Code and Safety Improvements
Electrical & Mechanical

- Controls & Power Supply
- Gate Trunions
- Operator Servo Motors & Hydraulic Systems
Municipal and Utilities

500 kV Transmission Line near the Floodway
Biology and Environmental Sciences

- Physical Environment
- Terrestrial and Aquatic Environment
- Socio-Economic Environment
- Public Consultation
Contributions of the U of M

- Outlet Model
  - Physical Construction
  - Analysis
  - Recommendations for Design Modification

Civil Engineering
Hydraulics Research and Testing Facility
Contributions of the U of M

- Slope Stability Research Proposal
  - Data collection
  - Analysis
  - Recommendations for Design Modification

Civil Engineering
Geotechnical Department
Contributions of the CHC (NRC)

- TELEMAC 2D Numerical Model
  - Analysis
  - Recommendations for Design Modification
ENVIRONMENTAL APPROVAL PROCESS
Before construction could begin, the project required environmental approvals from Manitoba and Canada.

Under the *Canada-Manitoba Agreement on Environmental Assessment Co-operation*, Canada and Manitoba agreed that both governments will participate in a co-operative review of the project.
Environmental Review Process

- Public Consultation
  - Since January 2004, MFA has been listening to Manitobans about the project.
  - 4 Rounds of consultation – 3 of which were held prior to the filing of the EIS
  - More than 300 hours of stakeholder meetings
  - Approximately 20 community meetings and information sessions
  - Distribution of approximately 100,000 newsletters
  - Over 100,000 hits to MFA website
Environmental Review Process

- Submitted EIS in August 2004
- Submitted EIS Supplementary Filing in November 2004
- Submitted response to CEC Information Requests in December 2004
- Manitoba Clean Environment Commission hearings mid-February to mid-March 2005
- Submitted additional information to Federal agencies in April 2005
- July 8, 2005, MFA received
  - Federal approval
  - Provincial license
CONSTRUCTION STATUS
5 - YEAR CONSTRUCTION TENDER SCHEDULE
Awarded Contracts

- First excavation contract awarded to Strilkiwski Contracting and Nelson House Forest Industries (Joint Venture) – Grande Pointe Embankment Gap - $1.4 million
Awarded Contracts

- Highway bridge girders contract awarded to Lafarge Canada Inc. - $20.9 million
Awarded Contracts

- Highway detour barriers contract awarded to Barkman Concrete Ltd. - $400,000
Awarded Contracts

- Manitoba Hydro gas main awarded to Crown Utilities (sub: Unger) - $1.1 million
- PTH59 South Detour Construction awarded to Strilkiwski Contracting and Nelson House Forest Industries (Joint Venture) - $600,000
Pending Contract Awards

- PTH 59 South Bridge (closed September 13, 2005)
- Trans-Canada Highway East Bridge (Closing October 4, 2005)
- Second excavation contract – first channel widening (Closing October 6, 2005)
- Other utility crossings
Near Future Tenders

- CNR Sprague Bridge
- Railway bridge temporary detour steel girders
PROJECT BUDGET
Project Budget Update

- Project budget ($665 million)

- To date, $240 million committed to project by Canada and Manitoba

- Canada and Manitoba currently in discussions to formally conclude full funding agreement
Cost Uncertainties

- Funding delays and uncertain fuel, concrete & steel prices and potential labour shortages could impact final budget.