

FLOODWAY EXPANSION PROJECT PDEA 2 PRELIMINARY CHANNEL EXPANSION DESIGN

Manitoba Conservation / Manitoba Floodway
Expansion Authority

Winnipeg, Manitoba



Project Description

KGS Group had the lead role in an association of three engineering consultants (KGSAcresUMA) that completed the recent PDEA2 preliminary design on the Floodway Channel as part of the Floodway Expansion Project. The primary objective was to determine the optimum channel geometry for the expanded Floodway to pass the design flood of a 1 in 700 year event vs. the existing design of approximately 1 in 100 year. The design incorporated hydraulic and geotechnical considerations of the Channel, in combination with affected structures such as the bridges, the City of Winnipeg water supply Branch 1 and 2 Aqueducts, the facilities around Spring Hill, groundwater impacts, environmental considerations, the Outlet Structure, utilities, and Manitoba Hydro use of the Floodway right-of-way. The primary design components that were completed in-house include the following:

- Optimization of the expanded Channel geometry to determine the most hydraulically efficient and cost effective design of widening vs. deepening, with consideration of all facets of the design that affect performance and cost.
- Hydraulic analysis of the Channel to ensure the required flow performance is achieved.
- Geotechnical design to determine the acceptable side slopes, disposal embankment geometry, and the disposal offset distance from the edge of the excavated channel.
- Geotechnical stability analysis of the bridge abutment approaches on the Channel side slopes where up to 7 m of fill is required to achieve the design grades.
- Evaluation of the erosion protection requirements during both construction and over the long term. An erosion control plan for the construction period was developed, and the potential impacts of a spring flood during the construction were also determined.
- Revegetation of the Channel side slopes was evaluated, with consideration of short and long term erosion protection, spring and summer flood passage, agricultural land use, and cost.
- Estimation of the overall construction cost, and development of the design and construction schedule.