

2019 Team Achievement Award Winner



*Taché Promenade
Active Transportation
Upgrades and the
Belvédère Saint-
Boniface; Trek
Geotechnical Inc.,
Morrison Hershfield,
and HTFC Planning and
Design*

The Taché Promenade Active Transportation Upgrades and Belvédère Saint-Boniface is one of the first cornerstone projects of the City of Winnipeg's twenty-year plan for riverfront economic development. The vision is to combine trails, parkways, drives, and open spaces to form a "green ribbon" connecting both sides of the Red River at The Forks with other cultural and historic destinations. Trek Geotechnical Inc., Morrison Hershfield and HTFC Planning and Design collaboratively provided the geotechnical and structural engineering, architectural and landscape design, and public engagement.

The Taché Promenade project featured a widened promenade-style walkway and pedestrian belvedere, or lookout, elevated above the riverbank. The project incorporated riverbank stabilization to protect the promenade, roadway and important municipal infrastructure, and to increase the reliability of the city's primary dike. Community input was sought in a public engagement forum and on-line survey. The project included public art in the form of the "Guiding Light" sculpture and viewing area.

Innovative engineering and architectural design were brought to the fore in numerous project details. The curved elevated walkway immerses pedestrians in a "wandering" effect. Each curved structure component, in turn, required precise dimensions and angles, and specialized erection techniques. Three-dimensional geometry checks, along with girder fabrication using machine-guided bolt-hole laser cutting, ensured each piece fit within critical tolerances.

The curving structure built upon a riverbank presented a range of potential soil movement modes and behaviours. Time-dependent slope movement and the geometrically complicated structure were analysed using an iteration of sophisticated geotechnical and structural finite-element models. Output from the geotechnical model of lateral loads on piles produced a non-linear load-deformation response for each element of soil along each pile. This information was incorporated into another finite-element model of the complete bridge structure. This collaborative use of geotechnical and structural models identified the range of loading and boundary conditions that met desired performance outcomes. Loading on the riverbank, as well as on the sheet pile wall along Taché Promenade, was reduced using cellular concrete as lightweight backfill.

A wire mesh pedestrian railing gave a transparent appearance providing users a closer connection to nature. Design of the curved tensioned stainless-steel wire mesh

railing, a Manitoba first, was complex, and required mesh elongation and tension forces to be analysed to ensure adequate fall protection.

The new structure was designed to blend with the natural landscape by purposeful selection of materials, colours, textures, and lighting. Weathered steel skirting, oak timbers, and glare-free illumination (LED puck lights were another Manitoba first) complemented the riverbank colours providing a rustic feel. Photovoltaic modeling was performed to specify safe light spacing and wattage. Material selection achieved desired aesthetics, durability, and ease of maintenance, while keeping within limits of superstructure weight restrictions.

The project team integrated six engineering disciplines as well as bridge and landscape architecture to create a complex and creative city landmark. The Taché Promenade Active Transportation Upgrades and Belvédère Saint-Boniface project, along a core city waterfront, improves connections to St. Boniface destinations and enhances pedestrian and cycling opportunities. This signature elevated walkway with a tree-top view of the Red River and the Forks National Historic site provides one of the city's most striking vistas.

In recognition of the engineering excellence demonstrated in their innovative design and implementation of the Taché Promenade Active Transportation Upgrades and the Belvédère Saint-Boniface Project, Engineers Geoscientists Manitoba is pleased to present the 2019 Team Achievement Award to Trek Geotechnical Inc., Morrison Hershfield, and HTFC Planning and Design.