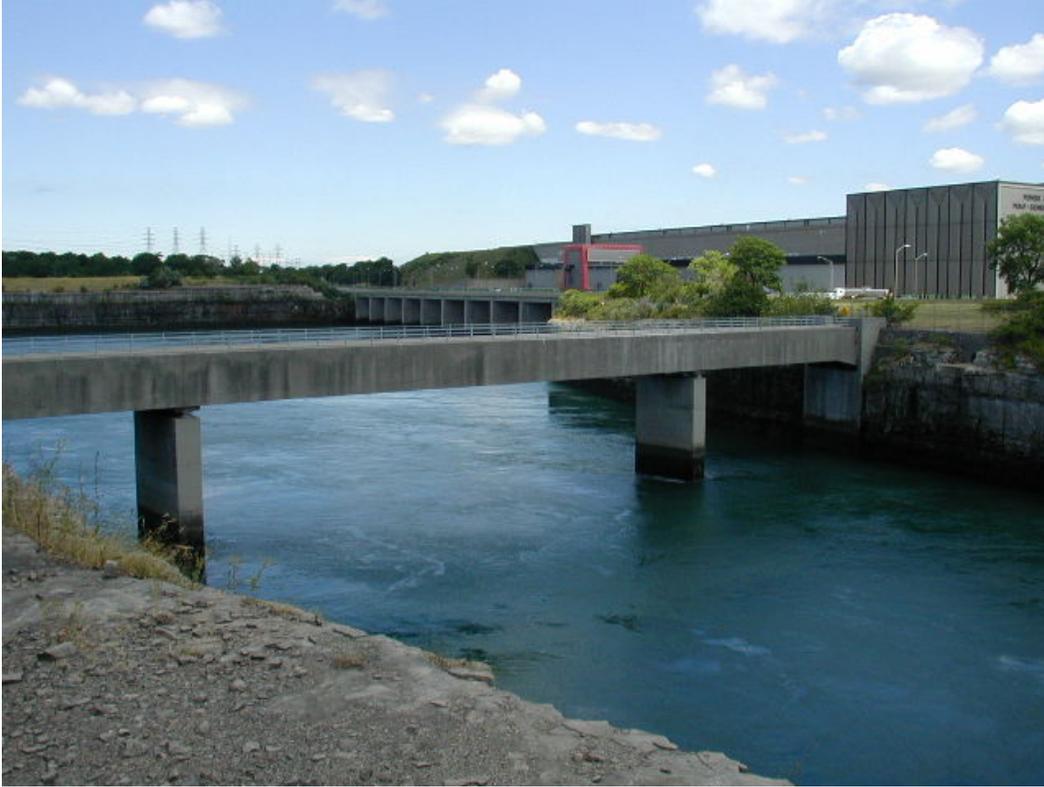


PROJECT DESCRIPTION

Power and Control Tunnel Bridge Evaluation



Location:
Niagara Falls,
New York

Client:
TVGA Consultants
for the
New York Power
Authority

Contact:

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***View of the Power and Control Tunnel Bridge at the Niagara Power Project
Looking Northeast***

The Power and Control Tunnel Bridge spans the forebay canal at the Niagara Power Project in Lewiston, NY. The NYSPA contracted with a team that included McMahon & Mann Consulting Engineers, P.C. to assess the condition of this bridge that carries power conduits from the Lewiston-Pump Generating Plant. Cracking of the superstructure is observed over each of the two piers constructed within the forebay canal, and a survey of the bridge profile reveals that the top of the west pier has heaved approximately 5 inches. The expansion joint at the west end of the bridge is closed and frozen in place, and the measured distance between expansion joints is approximately six inches less compared to the original construction. MMCE completed a geotechnical analysis of the rock conditions surrounding the bridge to assess the potential for rock squeeze between the walls of the forebay and heave of the shale foundation beneath the piers. A protocol for evaluating movements of the rock and correlating the movements with respect to time was developed. Rock squeeze is a regional problem and data from other nearby facilities was collected to validate a model for describing the time dependant rock movements. It was concluded that the rate of rock deformation had decayed, and the anticipated future movements of the rock would not have a significant impact on the performance of the structure. A monitoring program was implemented to validate the conclusions and verify the safety of the structure.