

Saint-Pierre Collector Reconstruction, Québec



• Technical training on instrument installations to qualified confined-space workers



• Typical 3D crackmeters and geophone installation in tunnel



• Heavy-duty protection cover to avoid crackmeters damage from effluent debris



• Seismographs and datalogger system for remote monitoring of vibrations and crack openings



• Project site

The Saint-Pierre collector is a major wastewater tunnel that runs along the Saint-Jacques Escarpment, south-west of Mount Royal. As part of the Turcot Interchange reconstruction project, the Saint-Jacques overpass, located at the junction of the interchange and the Décarie Expressway, was demolished and is scheduled to be rebuilt. Preliminary inspections revealed large cracks running along the inside of the tunnel, showing a state of degradation. It was decided that a deviation should be built before work even began on the Saint-Jacques overpass.

GKM Consultants was thus mandated in the spring of 2015 to provide a vibration and crack opening monitoring system that would allow the client to view in real time any impacts of the deviation's construction.

GKM Consultants provided geophones, which were installed directly in the tunnel by the client's team, and vibration monitoring devices (seismographs), installed above ground. In addition, seven crackmeters, which measure variations in crack openings, and seven z-crackmeters, which measure the height difference between the two sides of a crack, were installed. Each instrument had to be protected by heavy-duty steel coverings, since the current of water and debris that regularly fills the tunnel could have struck and damaged them. GKM Consultants trained the client's employees on how to install the instruments and provided assistance during the installation of each one. GKM Consultants also designed, built and configured the above-ground real-time

monitoring system. A visual-audible alarm connected to the automated data acquisition system was designed to go off if vibration levels were significantly high or if any variations in the crack openings occurred. This tool allowed engineers to know immediately if ongoing operations were having an effect on the collector. Finally, to provide continuous monitoring, data was automatically relayed to a remote data management system, which allowed the client to access their data at any time and which also sent out automatic email alarm messages if certain thresholds were exceeded.

GKM Consultants is proud to have been part of such a major infrastructure project.