

# Normandie Pedestrian Bridge, Québec



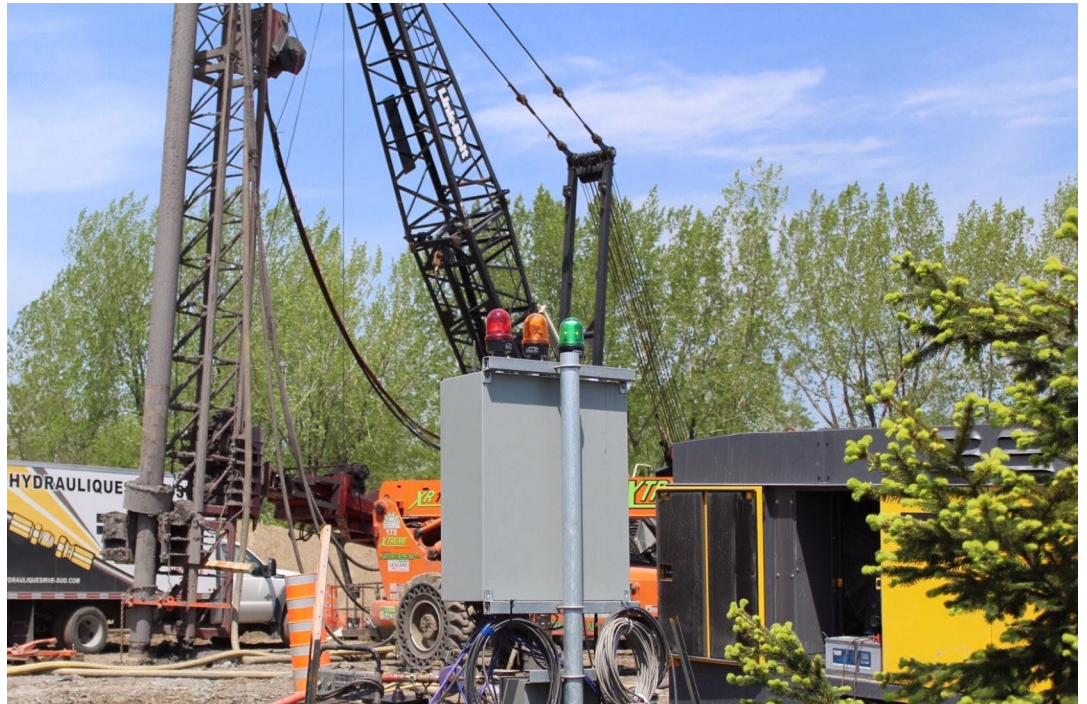
Visual warning system



Preparation of grout



General view of construction site



Normandie pedestrian bridge, Longueuil Québec | Vibration monitoring during pile driving

On February 10<sup>th</sup>, 2015, a dump truck with its box raised slammed into a pedestrian bridge over the 132 highway in Longueuil, causing the overpass to partially collapse. The footbridge linked the Marie-Victorin Park and the Lemoyne Park giving access to pedestrians and cyclists.

As part of the rebuilding of the bridge in February 2017, one of the major points for the city of Longueuil was to protect the structural integrity of a wastewater interceptor that crosses the Normandy bridge in the park perpendicularly to Marie-Victorin. Knowing that the work will produce vibrations and overloads that may affect the interceptor, GKM Consultants has been mandated to develop a geotechnical instrumentation plan that is easy to implement and that would warn the contractor in real time of an activity which could affect the interceptor.

To measure the different vibrations generated by the reconstruction, GKM Consultants installed four borehole geophones above and near the pipe that measure the vibrations in the three axes: longitudinal, transverse and vertical. In addition to the geophones, four push-in pressure cells with integrated piezometers have been installed. The objective was to measure an increase in soil pressure in the driving direction during reconstruction of the bridge. These sensors provide fast installation and

reliable data through vibrating wire technology.

The installed systems continuously measure and transfer data via cellular modems to GKM Consultant's secure servers that generate real-time email alerts when the thresholds are exceeded. So workers on the job site can also be aware, a three-color visual alarm has also been installed. It allows you to know in real time whether the work in progress has an impact on the interceptor. A yellow indicator light will illuminate if the vibrations or pressure on the pipe approaches considerably the permitted threshold. In the event of an overrun, a red light comes on and an alarm is sent by e-mail to the concerned parties. All data collected is available on the GKM Consultants online viewing site.

By providing a turnkey service covering the drafting of an instrumentation plan, drilling management, sensor installation and the implementation of a real-time data tracking platform, GKM Consultants facilitated the work of the TNT Group with rapid intervention, with minimal impact on the other works as well as the overall timetable.

GKM Consultants is proud to have contributed to this project which will give access to the St. Laurent River to the citizens of Longueuil.