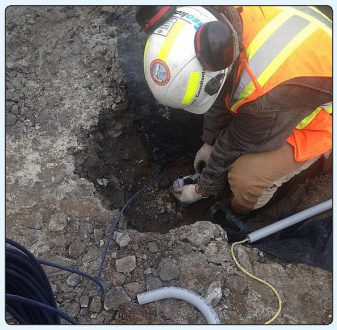
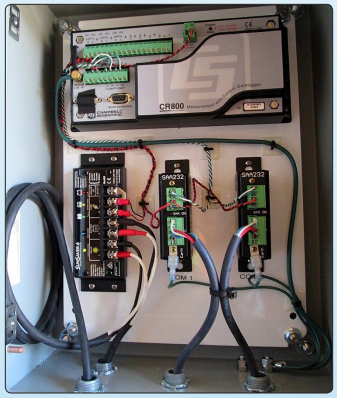
Highway 11/17 Embankment Monitoring, Ontario



- *Shape Accel Array (SAA) installation in vertical orientation*

- *Shape Accel Array (SAA) installation in horizontal orientation*



- *Solar powered data acquisition system for SAA*

- *Battery powered data acquisition system for vibrating wire instruments*

- *Piezometer installation in geotechnical boreholes*

Red Rock (EXP Hamilton) – GKM Consultants was involved in the supply and installation of portions of an instrumentation and monitoring program employed to monitor settlements, lateral displacement and pore water pressures in the foundation soils during construction of the Highway 11/17 embankments between Nipigon and Red Rock as part of a contract for the Ministry of Transportation of Ontario (MTO). The rate of fill placement, the wait period between stages of fill, the timing for the removal of surcharge and the construction of structures will be controlled by the instrumentation readings.

We used Geokon Vibrating Wire Piezometers (Model 4500S) to monitor the pressure changes in the native clay due to placement of the roadway embankment and dissipation over time through the installed wick drains system. We also employed Geokon Vibrating Wire Settlement Sensors (Model 4600), Inclinometer Casing (Model 6400) and Measurand Shape Accel Arrays (SAA) to measure global settlement as well as vertical and horizontal deformation profiles at multiple locations. The various instruments are connected to a combination of GKM Micro-800 and Geokon LC-2 Dataloggers, which record readings at hourly intervals. Data is collected manually and evaluated on a regular basis to determine the sequencing of construction events.

We provided on-site specialized training to the client's engineers and the construction group. Our training focused on the properties of the various sensors and the proper installation procedures, with special attention paid to cable handling during the construction stage.

GKM Consultants and Geokon are proud to have worked with EXP, Teranorth and the MTO on such a complex and challenging monitoring project, which contributes to the further understanding of infrastructure construction in the physiographic region of the Canadian Shield.