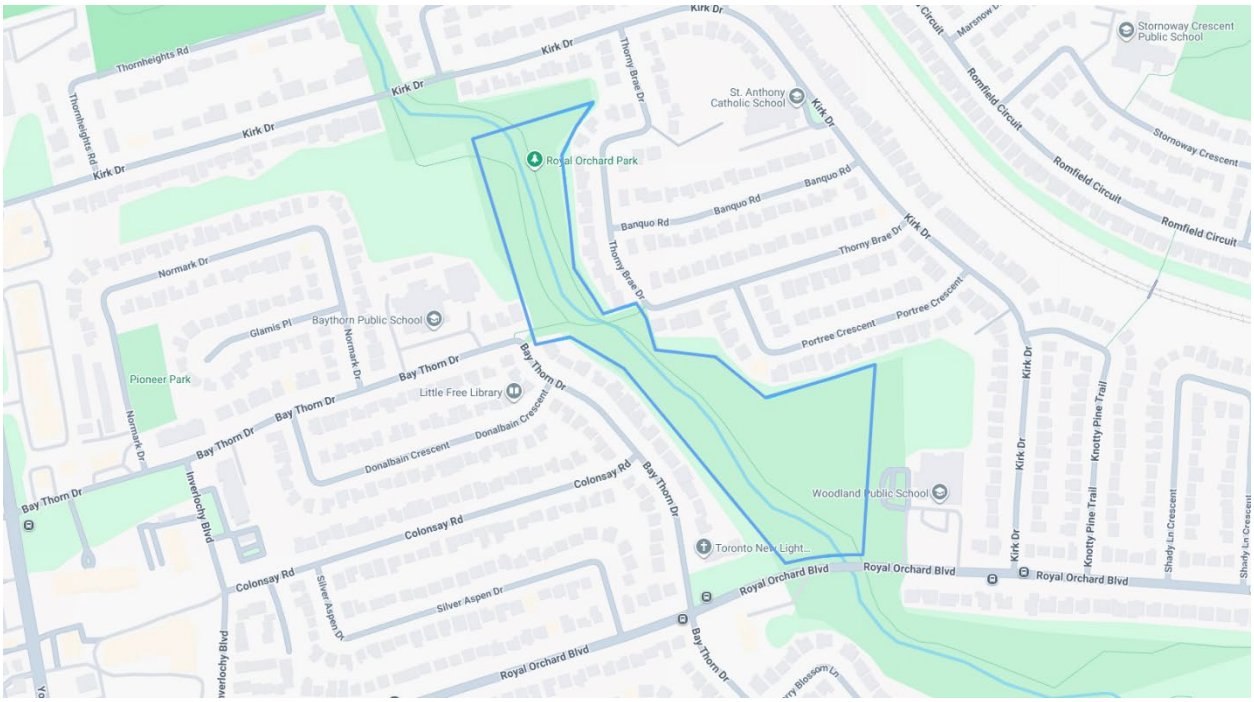
GIMP – Royal Orchard Park

Site Location: PIN - 030260211

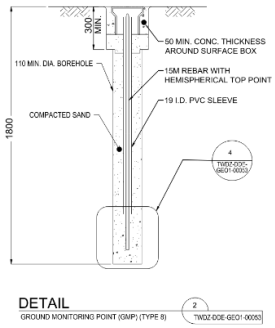


Schedule:

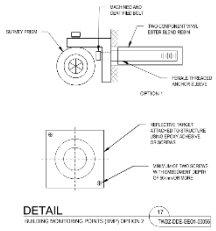
Instrumentation installation: Dec 1, 2026 – Jan 31, 2027

Reading access: Feb 1, 2027 – Sept 30, 2027

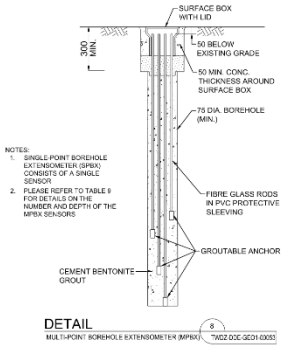
1. **Ground Monitoring Points (GMP)** shall be used for measuring the localized ground settlement around Shafts. GMP shall consist of a 15 mm diameter rebar embedded in a concrete toe, installed at the bottom of a drilled borehole. A 19 mm PVC friction reducing sleeve shall be installed around the rod to allow for unrestricted movement. The annular space shall be backfilled with clean sand. A flushmount protective cover shall be installed for each GMP instrument. The settlement shall be measured by surveying the top of the rod with topographical survey equipment. Readings from GMP shall be accurate to +/- 1 mm.



2. **Building Monitoring Points (BMP)** shall be used for measuring the horizontal and GIMP vertical movements of specified structures upon which the construction activity may affect. BMP shall consist of a survey prism which is attached to a machined and certified bolt which is inserted into a drilled hole in the building exterior in which a female threaded anchor sleeve has been inserted, and the bolt is further reinforced using a two (2) component vinyl ester blend resin. The movement shall be measured by using a total station. Readings from BMP shall be accurate to +/- 1 mm.



3. **Multi-Point Borehole Extensometers (MPBX)** will be used for monitoring vertical deformation at selected depths below ground surface. MPBX will consist of multiple anchors at various lengths which will be installed vertically into drilled boreholes and grouted in place. The range of each anchor will cover 50 mm of heave measurements and 150 mm of settlement measurements. MPBX will be equipped with electrical sensors which can be connected to a remote monitoring system. MPBX will be installed at the tunnel centerline with the lowest anchor at 1.0 m above the tunnel crown, and at three shallower depths distributed equally between the lowest anchor and 4.0 m below the ground surface. The monitoring data may be collected manually with a readout unit or automatically with a datalogger. Settlement of the instrument reference head will be measured by topographical survey equipment. Readings from the reference head of MPBX will be accurate to +/- 1 mm and the electrical sensors will be accurate to +/-0.25% Full Scale (FS)



4. **Utility Monitoring Points (UMP)** will be used to measure localized settlement of the Utilities located within the PZOI. The UMP will be offset laterally between 300 mm and 600 mm from the outer boundary of the Utilities. UMP will consist of a 16 mm diameter rebar embedded at least 200 mm in a concrete toe, installed at the bottom of a drilled borehole to the invert depth of the Utilities. A 19 mm PVC friction reducing sleeve resting 50mm above the concrete piling will be installed around the rod to allow for unrestricted movement. The annular space will be backfilled with clean sand. A flushmount protective cover will be installed for each UMP instrument. The settlement will be measured by surveying the top of the rod with topographical survey equipment. Readings from UMP will be accurate to +/- 1 mm.

