City of Sarnia

Sarnia Sewer Upgrade Project
Phase 3-Trunk Sanitary Sewer Microtunnelling

Contractor: CRS Tunnelling, 734 Nebo Road, Hannon, Ontario

www.crstunnelling.com

Consulting Engineering: AECOM 410-250 York St. London, Ontario

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Project: Installing 1,756m of 1350mm diameter concrete pipe through Microtunnelling https://www.youtube.com/watch?v=w4RoeKO5XsA

Construction of 2 maintenance chambers

Construction of 4 shafts

Instrumentation and Monitoring

Timelines: March 2020 to January 2021

Project Map

Contract Phases

Phase 1 Construction of Shaft 2 – completed May 6, 2020

Phase 2 Construction of Shaft 1 – on-going

Microtunnelling between Shaft 2 to Shaft 1 – delayed

Due to Covid-19, the equipment and some of the operators are being imported from USA. Microtunnelling requires highly qualified operators to operate the machine from the surface control room using satellite technology to direct the tunneling machine. Once the equipment begins to excavate, the tunneling machine is required to continually progress until it reaches the next shaft. A crew of operators are required to ensure around the clock staffing is available.

Phase 3 Construction of Shaft 3 – upcoming (approximately June 1, 2020)

Phase 4 Microtunnelling between Shaft 2 to Shaft 3

Construction of Shaft 4

Phase 5 Microtunnelling between Shaft 3 to Shaft 4

Phase 6 Construction of maintenance chambers Shafts 1 & 4

Backfill Shafts 2 & 3

Impact on Neighbouring Residents

Construction of Shaft 3 & 4

Equipment: Excavator, crane, mini-excavator, generator, dump trucks, loader

Labour: Crew of 5 – 6 working 5-6 days a week from 7:00am until 7:00 pm (unless ongoing operation requires extended day)

Noise: Running equipment, back-up beeping

Dust: Minimum

Lighting: Day time activity unless required to work extended day then lighting will be required

Microtunnelling – between Shaft 3 and 4

The sending shaft will be Shaft 3 (Howard Watson Nature Trail at Confederation Road)

Equipment: Crane, loader, delivery trucks, Microtunnelling Machine (underground)

Labour: 5-6 labourers on each shift – 24 hours

Noise: Running equipment, back-up beeping, the contractor will be installing a power supply from Bluewater Power to avoid running a generator

Dust: Minimum

Construction of Maintenance Chambers

Equipment: Excavator, crane, dump trucks, concrete trucks, loader

Noise: Equipment running, generator, saws, back-up beeping

Dust: Minimum

Lighting: Mostly day-time work, late afternoon and early evening with late fall construction

Protection of Private Property

Critical areas for this project have been identified as the displacement and the ground movements adjacent to deep excavations, temporary retaining structures, tunnel (microtunnel/proposed sewer) and tunnel portals. Below is a list of precautions that will be taken before, during and after the installation of the shafts, tunneling, structure installation and backfill. The monitoring points are being installed to detect any ground variances during the project to allow for recording and modification to the process for the installation.

Pre-construction Survey

The contractor has completed a pre-construction survey through a 3rd party consultant along the property lines abutting this project.

Field Inspections

The Contractor's Engineer shall conduct visual field inspections not less than once per week for the duration of this project.

Inclinometers

The Inclinometers have been installed near the installed and proposed shaft installations to monitor the tunneling operations.

http://www.geo-observations.com/inclinometers

Surface Monitoring Points

The Surface/ground settlement points are meant for monitoring the settlement of the Ground/Surface using optical means (Total station/Theodolite). The majority of these points are installed directly in-line with the proposed microtunnelling operation. This will provide the tunnel operator information on the tunneling operation at the level of the installation.

Reflective Target Monitoring

Reflective Target Monitoring (RTM) can provide information regarding movement of structures adjacent to the excavation. The effect of construction on adjacent buildings can be monitoring through reflective targets installed.

As backyard fences are within the excavation zone, the RTM will be installed in various location on this project.

Vibration Monitoring

Ground-borne vibration monitoring can help construction and mining companies reduce damage risks, comply with environmental regulations and limit community annoyance while operating efficiently.

This monitoring will be installed at the shafts where the microtunnelling equipment will be placed for this installation process. During the operation of the equipment, this unit will be continuously recording information and relaying this information to the tunneling operator.

Sign up for our email list to receive emails from the City of Sarnia that will update you of the Microtunnelling project. You may withdraw your consent at any time. Email sewerproject@sarnia.ca to sign up for the emails or to ask any questions or concerns.