



Basement Flooding Protection Program Sewer Upgrades on Old Mill Drive and Catherine Street

June 08, 2023

Agenda

1. Review of Action Items from Virtual Trailer #3 on May 25, 2023
2. Project Timeline
3. Project Overview
4. MTBM Rescue and Ground Stabilization Details
5. Equipment on Site

Action Items from May 25, 2023 Virtual Trailer #3

1. City staff to follow-up about testing the noise output from the generators

- The site team has verified that noise control measures have been implemented on the critically silenced generators.
- The generator specification cut sheets have been checked and the noise level of the generator and pumps are within the allowable City Noise Bylaw thresholds.
- Testing of the noise output from the generators is being arranged.

2. City staff will provide a more detailed presentation of the work being performed at the site, including a graphic of the location of the forthcoming open cut works at the next trailer

- As requested, today's presentation will include a more detailed description of the work being performed on-site and the forthcoming open cut works.

Action Items from May 25, 2023 Virtual Trailer #3

3. City staff will follow-up on any water damage in Traymore Park.

- In the last trailer, a concern was raised regarding possible issues with grading and exposed tree roots behind 24 and 26 Old Mill Drive.
- An arborist visit is being arranged to investigate this issue.

4. City staff will follow-up on providing additional access to Old Mill Drive for emergency vehicles

- Project subcontractor is estimated to demobilize from site next week, which will increase accessibility.
- Based on onsite observations, there is suitable access for emergency vehicles.
- The large vehicles (heavy machine equipment, dump trucks, vacuum trucks) access the site daily from Old Mill Drive.

Action Items from May 25, 2023 Virtual Trailer #3

5. **City staff to follow-up on the timeline for the installation of the mirror for traffic sightlines at 2 Old Mill Drive**
 - This was discussed with the Contractor, who is currently sourcing a convex mirror.
 - Traffic management plan around 2 Old Mill Drive have been reviewed and are in accordance with Book 7

6. **City staff will follow-up on sod restoration timelines at Riverside Drive**
 - We have confirmed that the sod restoration in the area near 520 Riverside Drive will occur in September following the sewer connection work at Riverside Drive and Old Mill Drive.
 - A site visit will be arranged with the building management at 520 Riverside Drive to discuss the re-sodding requirements at this location.

Action Items from May 25, 2023 Virtual Trailer #3

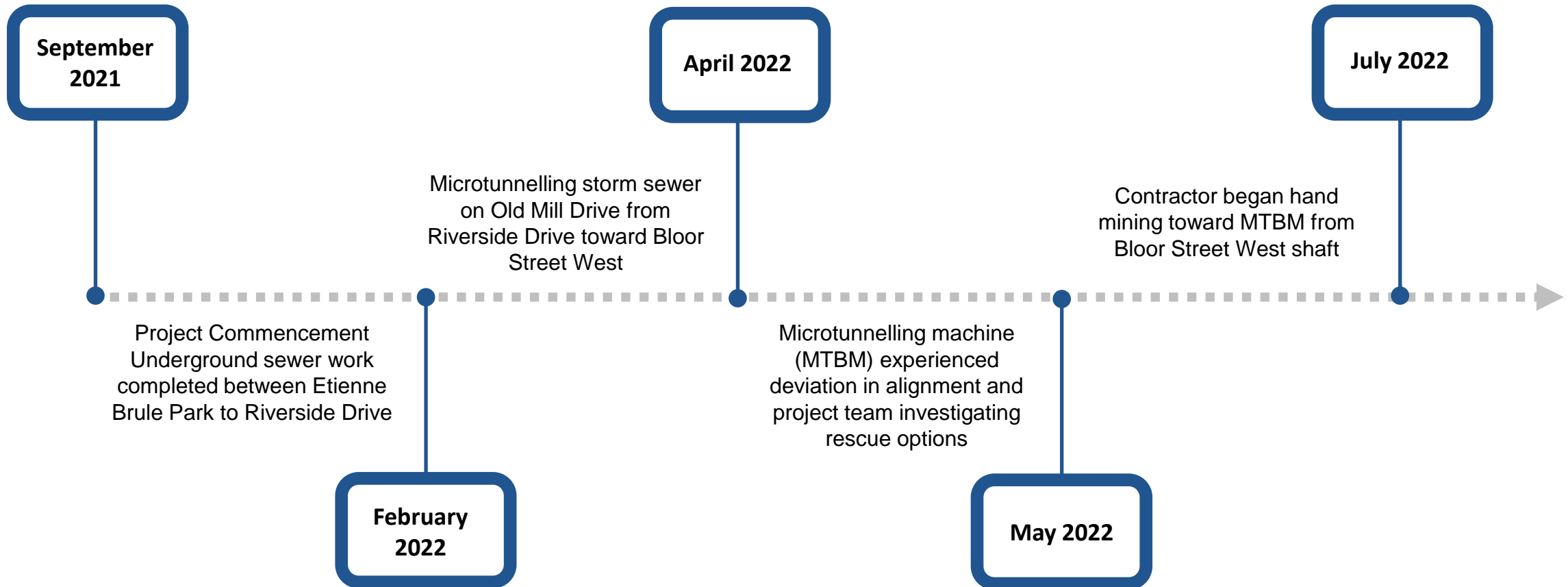
7. City staff will follow-up to see if site staff can attend an upcoming Virtual Trailer session

- The Consultant Contract Administrator and the Program Construction Manager are in attendance at today's Virtual Trailer.

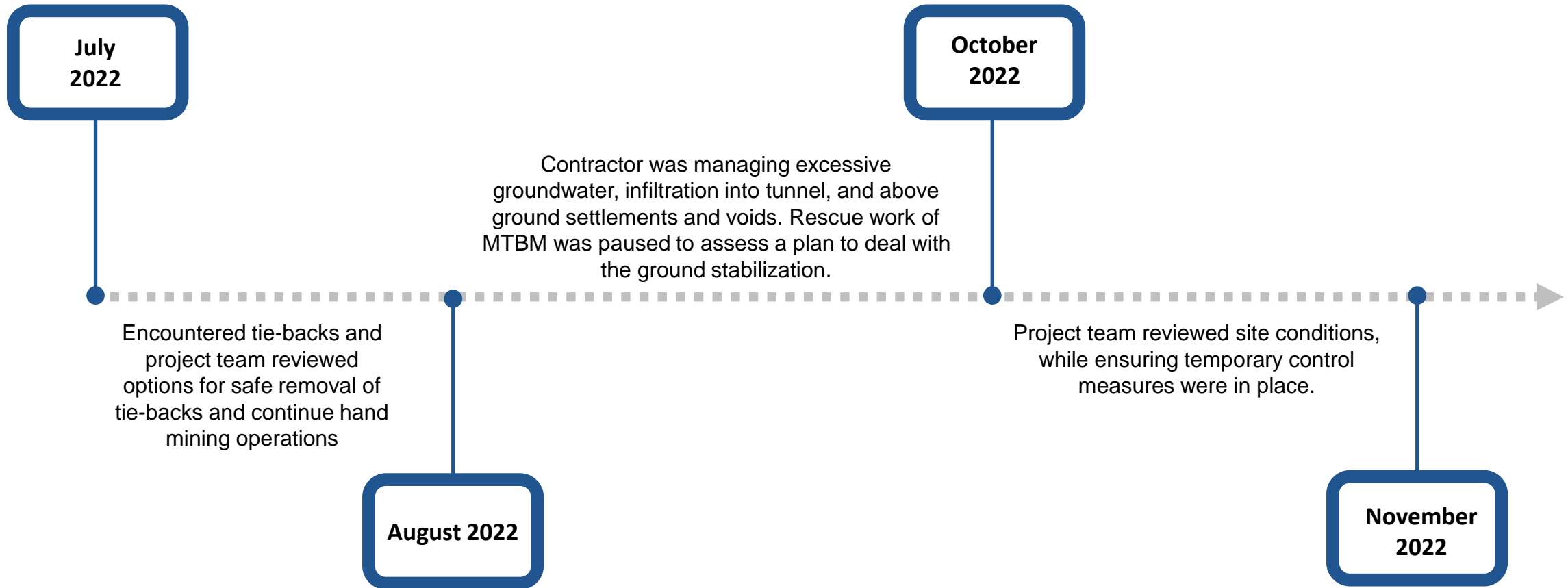
8. City staff to consult Legal division on Public Document sharing

- We are currently in discussions with our Legal Services Department regarding the sharing of project documents with the public.

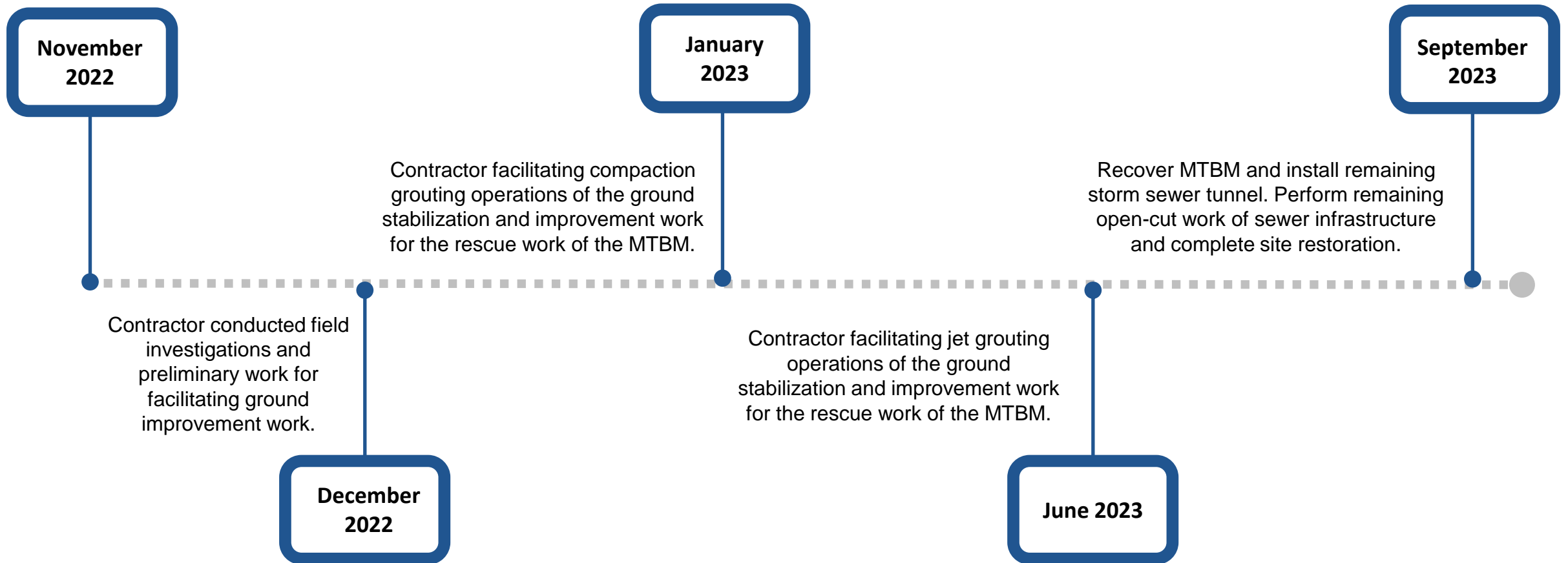
Project Timeline



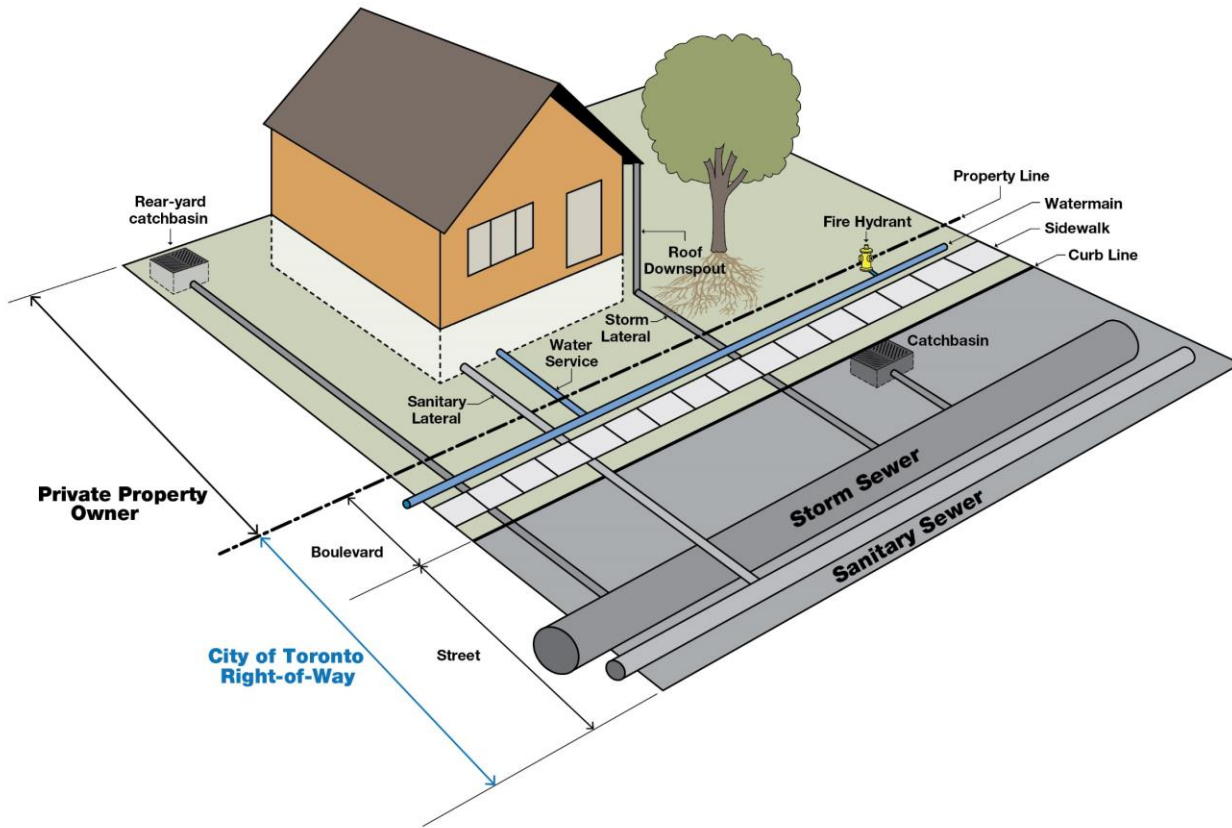
Project Timeline



Project Timeline



Terminology Overview



Storm Sewer	Pipe that captures rainwater or snowmelt. Storm sewer system also connects to catch basins, the square grates on the side of the road.
Sanitary Sewer	Pipe transporting wastewater released from a drain, toilet, sink or appliances to a wastewater treatment plant.
Watermain	Distribution system designed to deliver potable water for domestic consumption and firefighting purposes.
Sewer Laterals/Services	Pipe connections from City sewers to residences.
Water Services	Connections from City watermain to residences.

Etienne Brule Park

- The contractor is using a parts of Etienne Brule and Traymore Parks for a site offices as well as for a laydown area for construction materials and equipment.
- ✓ A new outfall and headwall structure in the Humber River
- ✓ 750mm storm sewer installation (open-cut)
- Overall restoration of park, including sod and the pathway and any areas affected by construction, will be completed following underground construction work.



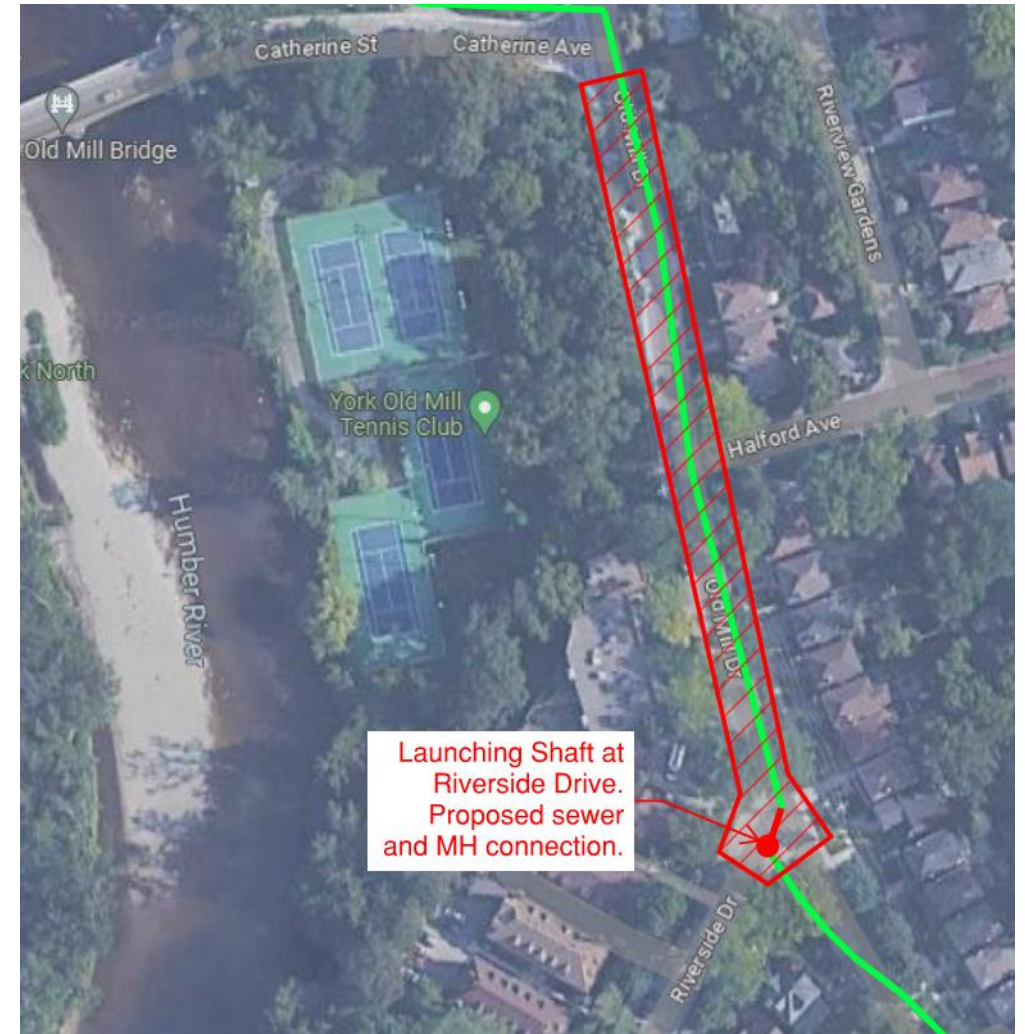
Catherine Street

- ✓ 750mm storm sewer installation (open-cut)
- Road resurfacing from Old Mill bridge to Old Mill Drive
- Boulevard and sod restoration



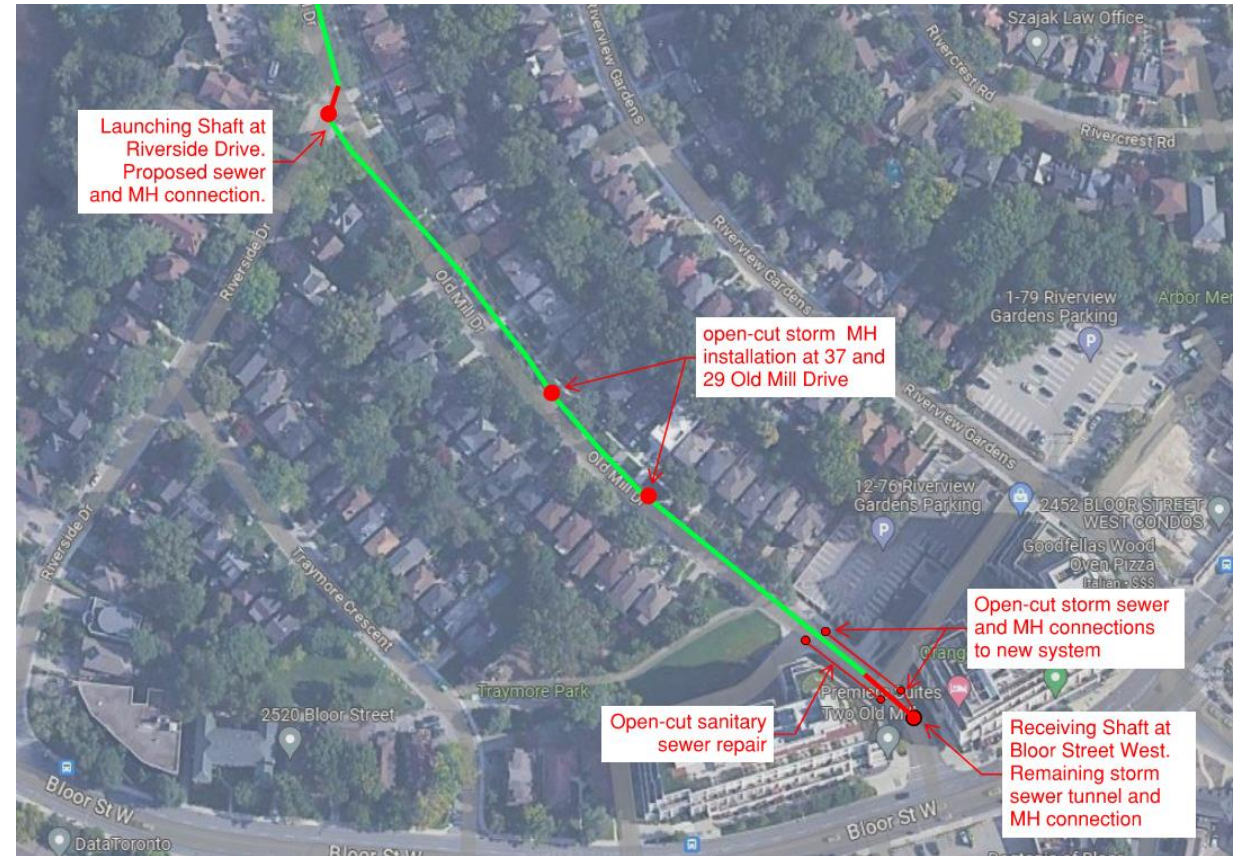
Old Mill Drive from Catherine Street to Riverside Drive

- ✓ 600mm storm sewer installation (open-cut) from Catherine Street to Riverside Drive
- ✓ Substandard water service replacements
- Storm sewer pipe and maintenance hole connection at Riverside Drive (open-cut)
- Road restoration from Catherine St. to Halford Ave, and at Old Mill Dr. and Riverside Dr.
- Boulevard and sod restoration



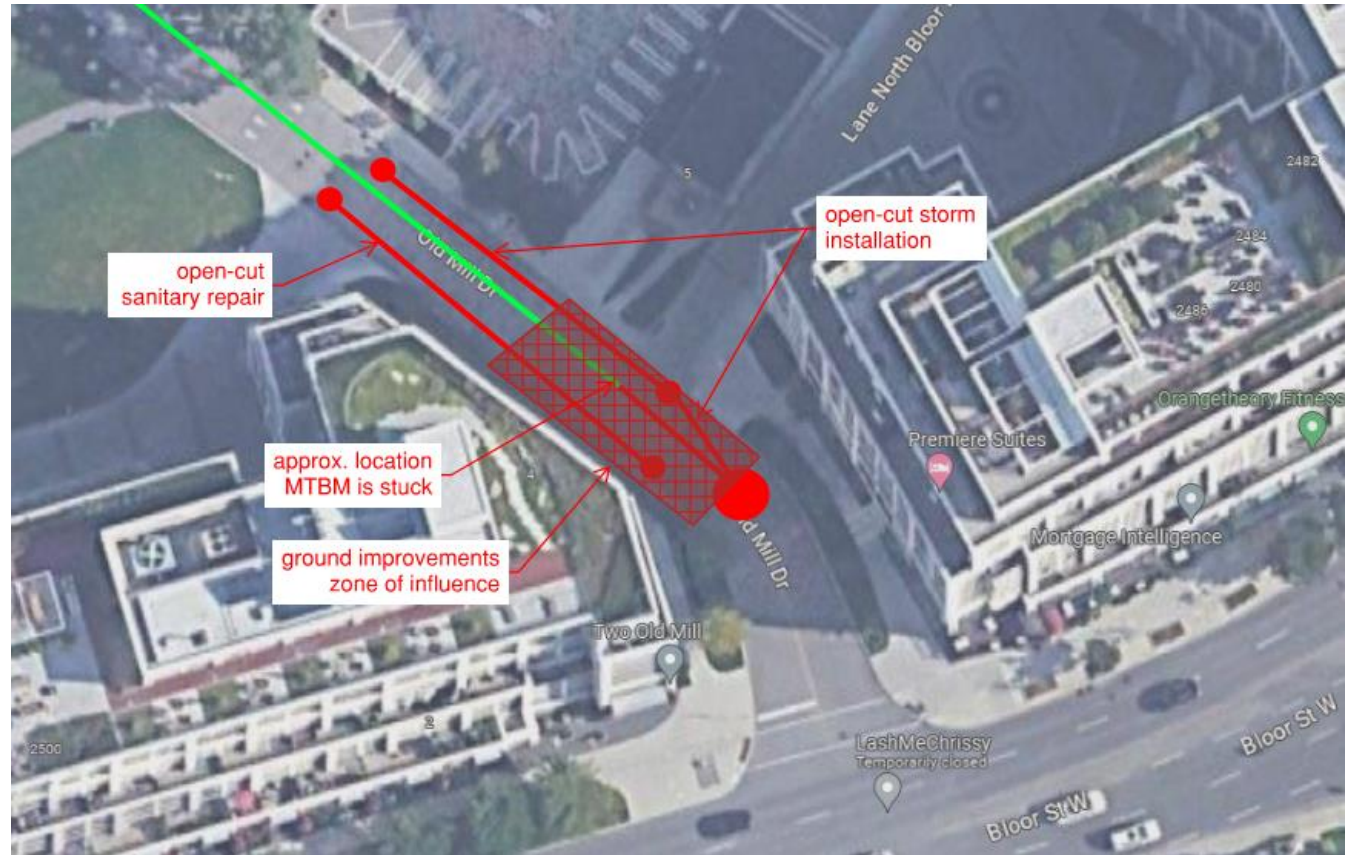
Old Mill Drive from Riverside Drive to Bloor Street West

- ✓ 900mm storm sewer installation (microtunnel) from Riverside Drive to Bloor Street West. Approx. 275m of storm sewer was tunneled.
- Remaining 7m section of hand mined 900mm storm sewer pipe and maintenance hole connection (open-cut) at Bloor Street West.
- Maintenance Holes and 300mm and 400mm RCP Storm Sewer (open cut).
- Storm sewer installation (open-cut) on Old Mill north of Bloor to collect upstream flows, direct them to the new deeper storm sewer.
- Sanitary sewer pipe repair (open-cut).



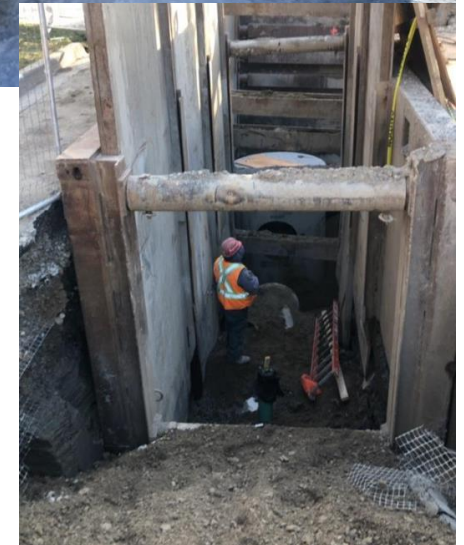
Old Mill Drive from Riverside Drive to Bloor Street West

- Hand mining operation to rescue the MTBM is mostly completed.
- Ground stabilization, including compaction and jet grouting operations, are completed.
- Recover MTBM



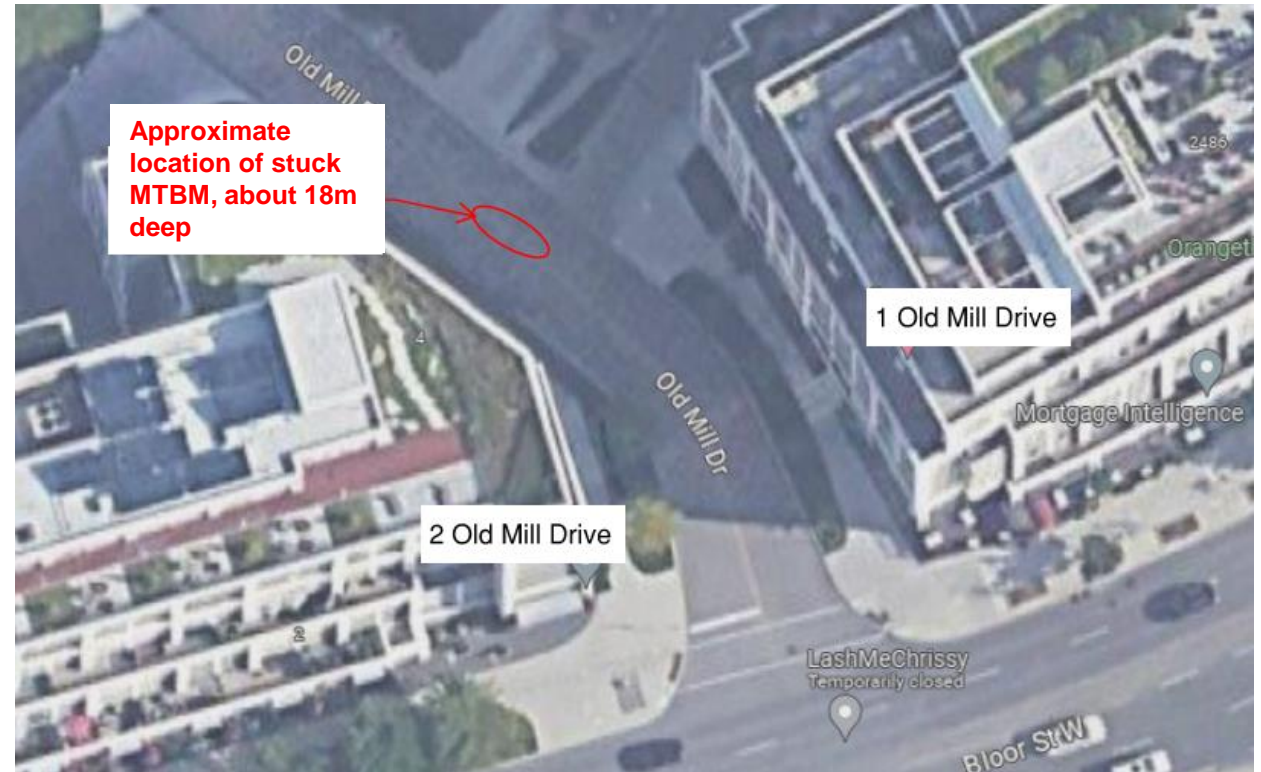
Terminology Overview

Open-cut	Open trench excavation using an excavator and shoring.
Tunnelling	Tunnelling is an underground drilling excavation using specialized technology.
MTBM	Micro-tunnelling boring machine. The device used for drilling underground.
Hand mining	Conventional tunnelling method done using shovels and hand tools to excavate the soil and a jacking mechanism to push pipe into the excavation.



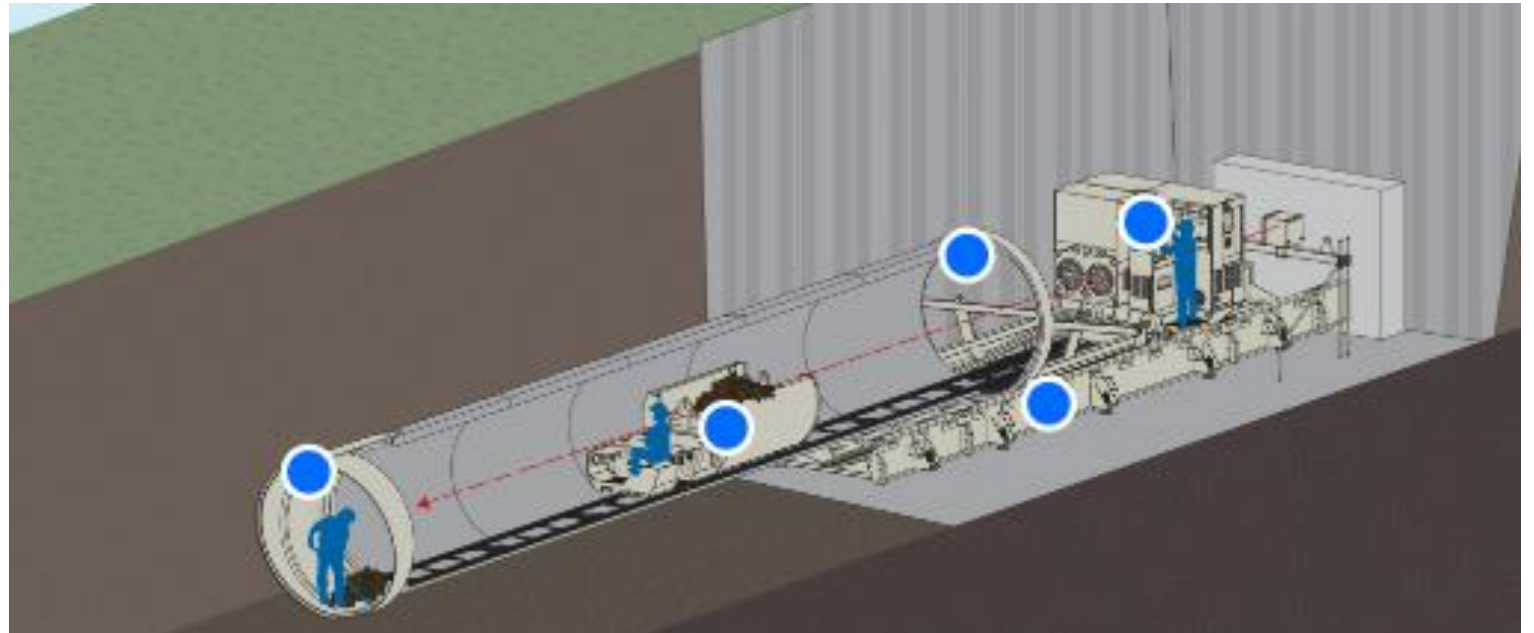
MTBM Rescue

- During the microtunnelling operations of the new storm sewer, from Riverside Drive to Bloor Street West, the machine encountered a vertical alignment issue.
- At first it was not clear what the issue was, as this is an underground operation.
- It was then found that the MTBM had encountered a tieback in the alignment of the tunnel, which impeded its journey to the receiving shaft and necessitated a plan to rescue and retrieve the machine.



MTBM Rescue

- The Contractor began hand mining towards from the receiving shaft to the machine head where it was stuck in the ground.
- The Contractor is essentially hand digging the earth and moving it out of the excavation to allow a steel casing to be pushed horizontally through the hand-mined tunnel excavation using a hydraulic jacking machine.
- Soil is removed as the casing progresses.
- The contractor managed to hand mine back to the face of the MTBM machine, when additional issues were encountered.



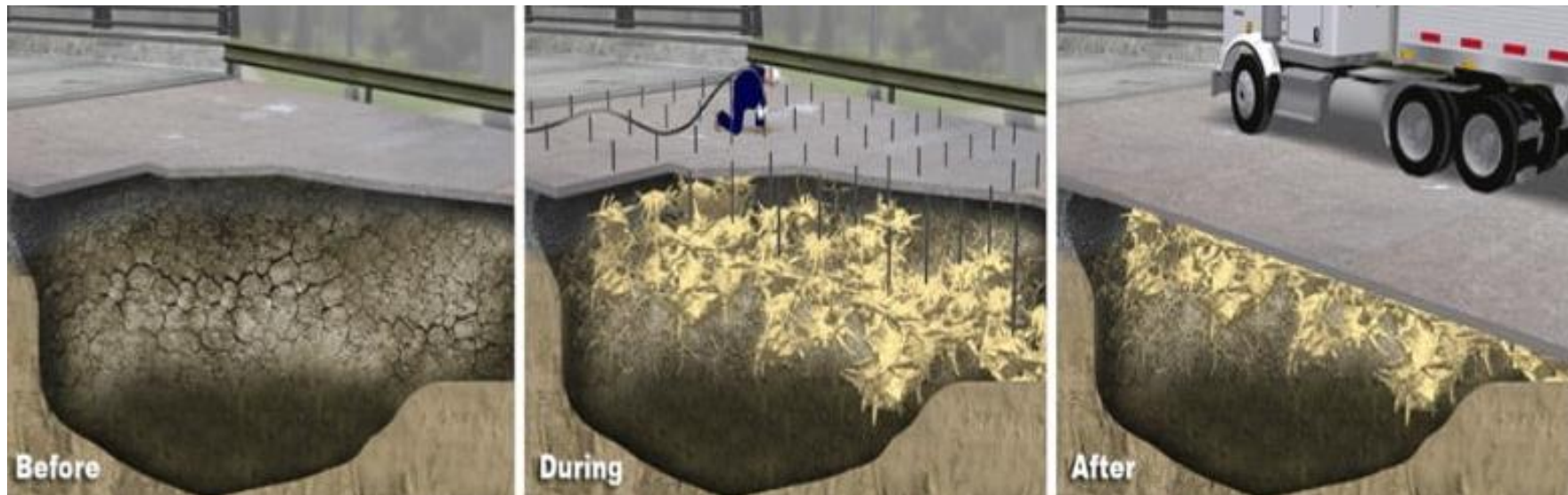
Ground Stabilization

- Once the contractor reached the MTBM, water infiltrated into the tunnel, creating poor ground conditions, which resulted in unsafe conditions for the workers to perform the rescue operation underground.
- Sink holes were remediated at grade and were contained to the construction area around the MTBM machine.
- The ground above and around the MTBM needed stabilization for the hand mining rescue to continue safety.
- The ground stabilizing operations on Old Mill Drive is ongoing using a two-phased procedure of compaction and jet grouting.
- Site staff are continuously monitoring the ground conditions.

Grout	A substance specifically designed to fill crevices, gaps or voids.
Jet Grouting	A trenchless method that utilizes grout to stabilize ground conditions by injecting grout under high pressure and velocity to mix with and modify the soil.
Compaction Grouting	A ground improvement technique that uses high pressure injection of grout to displace and compact soil.

Grouting for Ground Stabilization

- Grouting is a highly technical procedure of injecting a pumpable fluid mixture into a soil to improve the physical soil characteristics by strengthening. It is used to decrease permeability, reduces settlements, and provide excavation support.
- The grout mixture and pumping parameters have been designed and calculated by engineers specialized in these procedures. The mixture consists of, but is not limited to, silty sand, cement, and water. There is no detrimental effect to the surrounding building foundations.

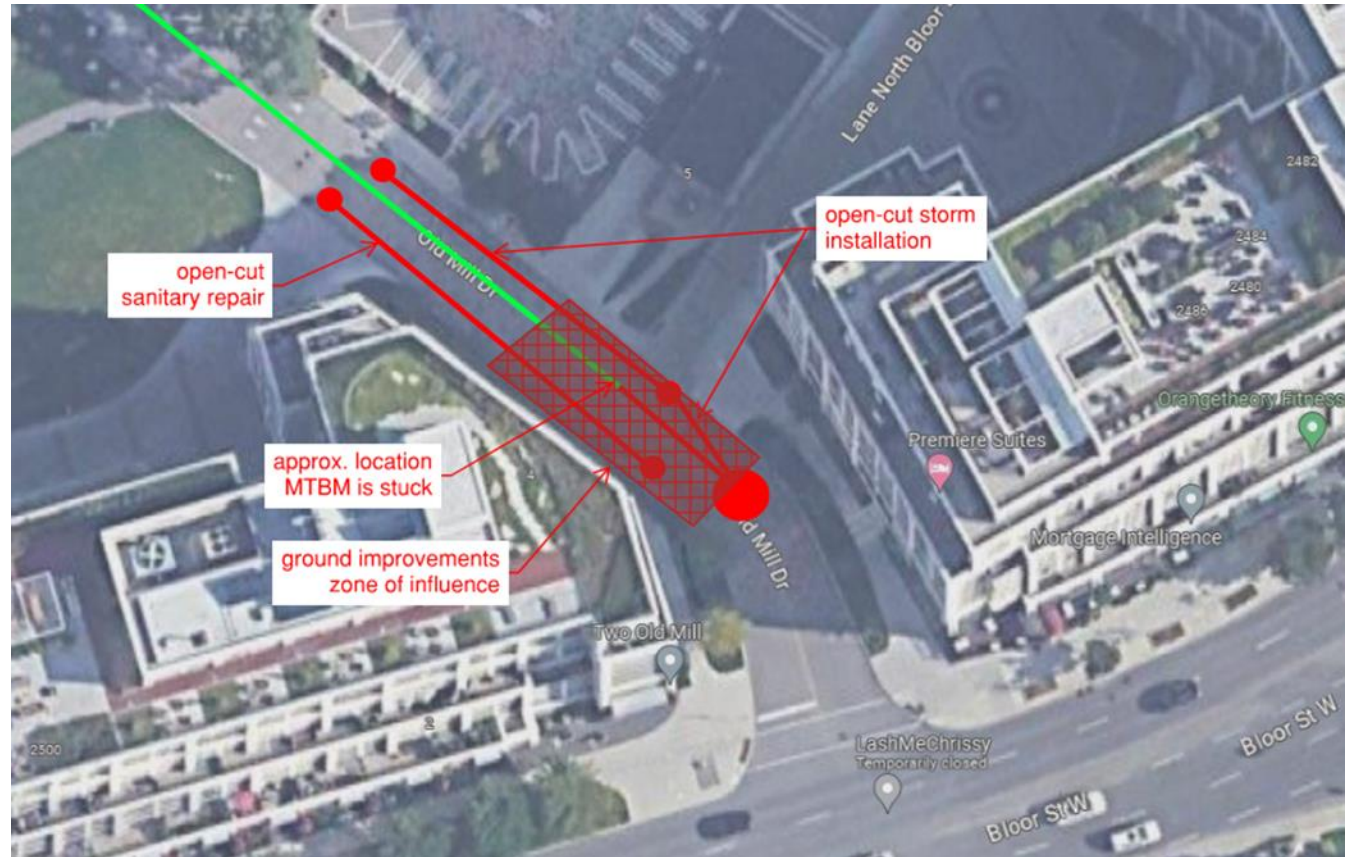


Ground Stabilization Approach

The Contractor is performing a 2-phase approach to improve the ground conditions using:

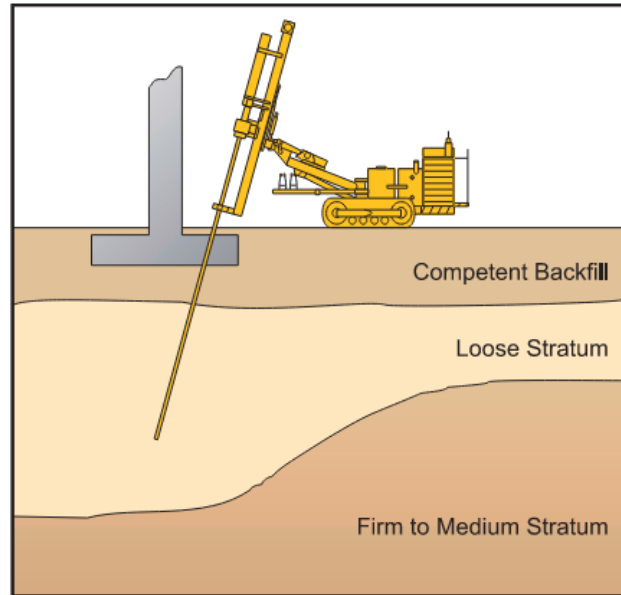
1. Compaction Grouting
2. Jet Grouting

The ground stabilization is located in the construction area around the MTBM only.



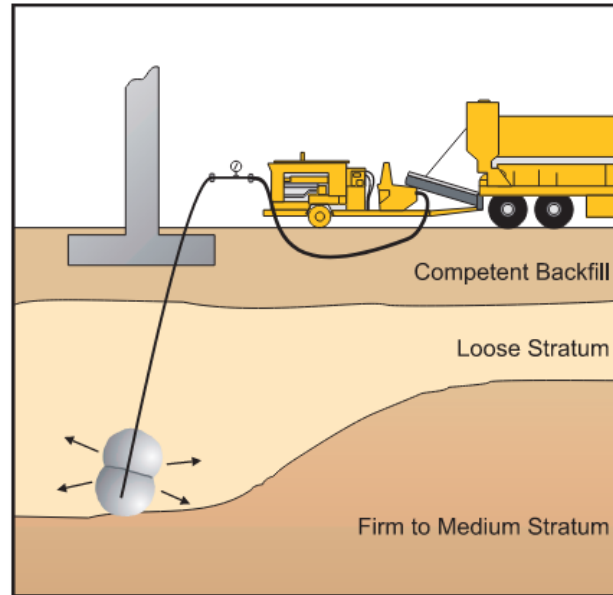
Compaction Grouting

- A ground improvement technique that uses high pressure injection of grout to displace and compact soil.



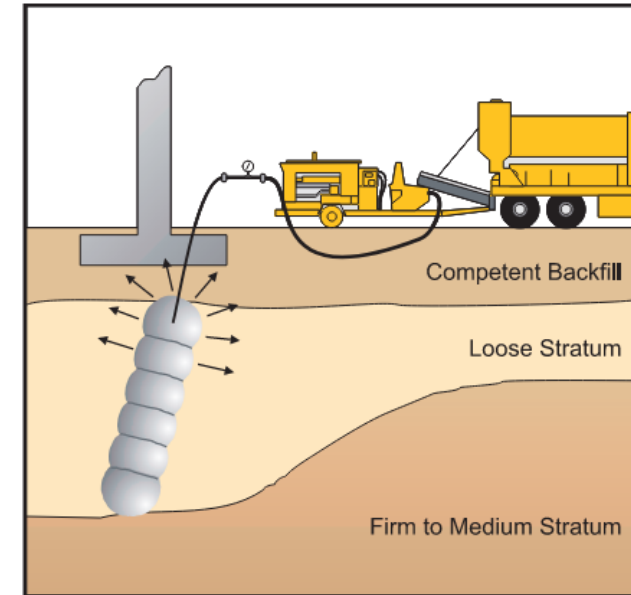
Installation of grout pipe

- Drill casing



Initiation of grouting

- Begin slow grout injection
- Pressure/volume check
- Check grout quality

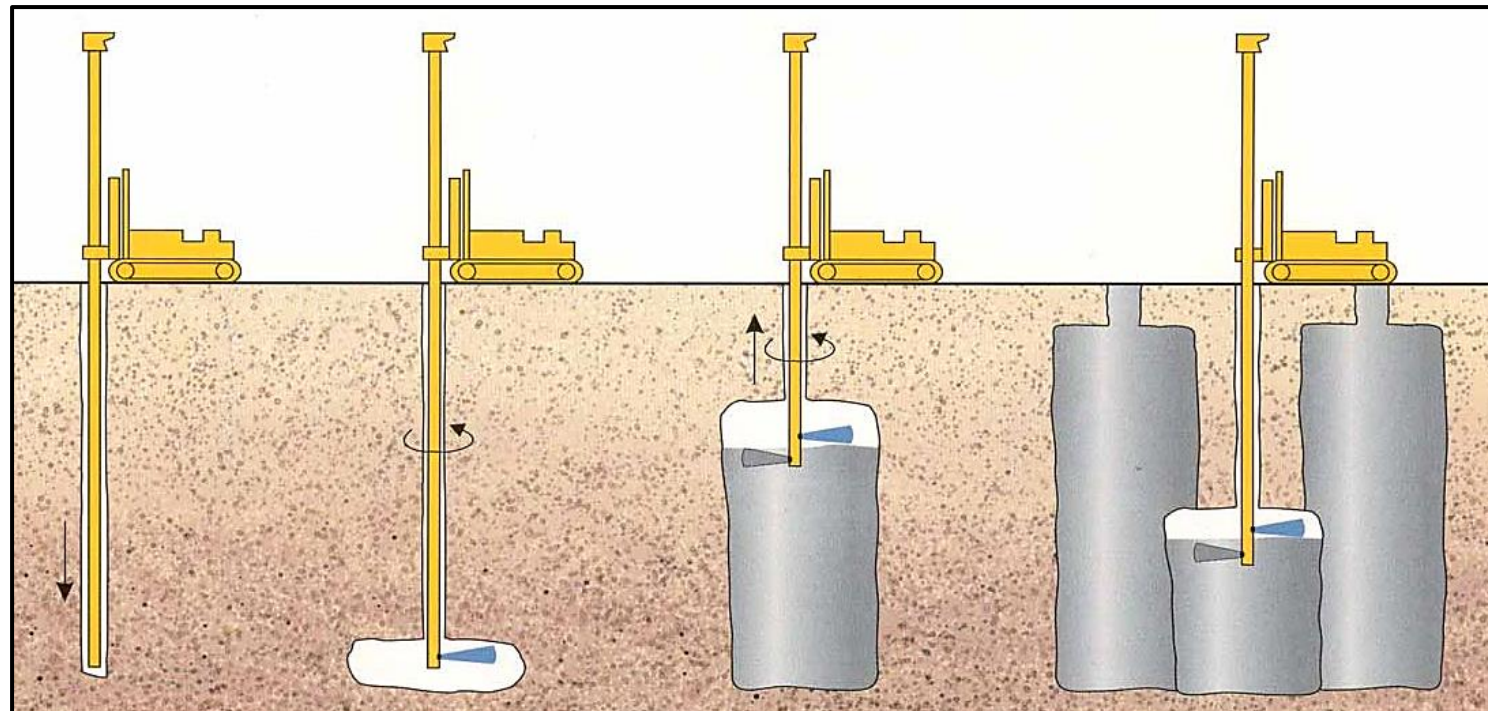


Continuation of grouting

- Continue injection of grout
- Control pressure and grout quantity

Jet Grouting

- A trenchless method that utilizes grout to stabilize ground conditions by injecting grout under high pressure and velocity to mix with and modify the soil.
- Jet grouting requires drilling or jetting a small diameter hole to the required depth and lifting the pipe while injecting grout.



➤ Drilling

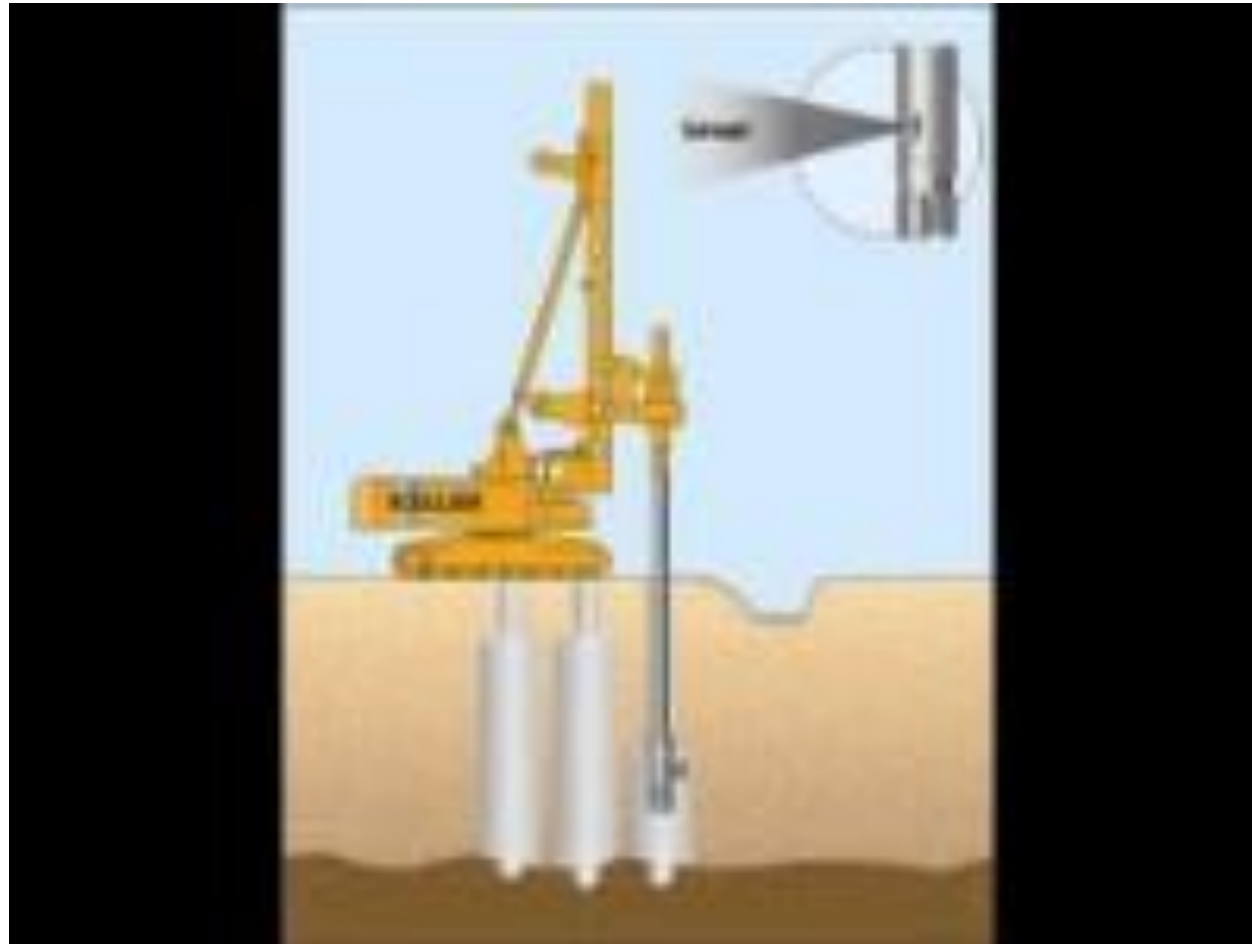
➤ High pressure grouting

➤ Jet grouting column, rotating and withdrawal

➤ Repeat every column sequence

Jet Grouting Video

- Single Jet Grouting Video



[Single Jet - Jet Grouting - YouTube](#)

Trucks on Site

Vacuum Trucks

Vacuum trucks are used to suck up saturated material that is removed from the ground during the jet grouting operation and move it to a containment bin prior to disposal.

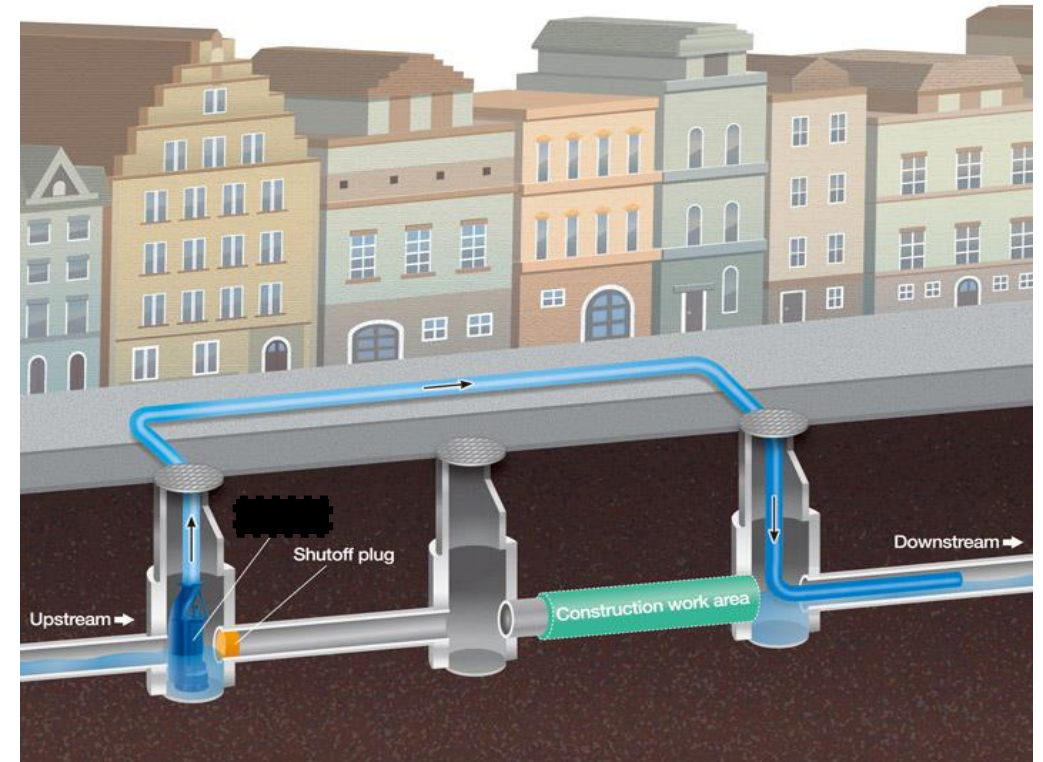


Concrete Trucks

Used to transport concrete material to the site for use during the ground improvement operations and overall construction activities.

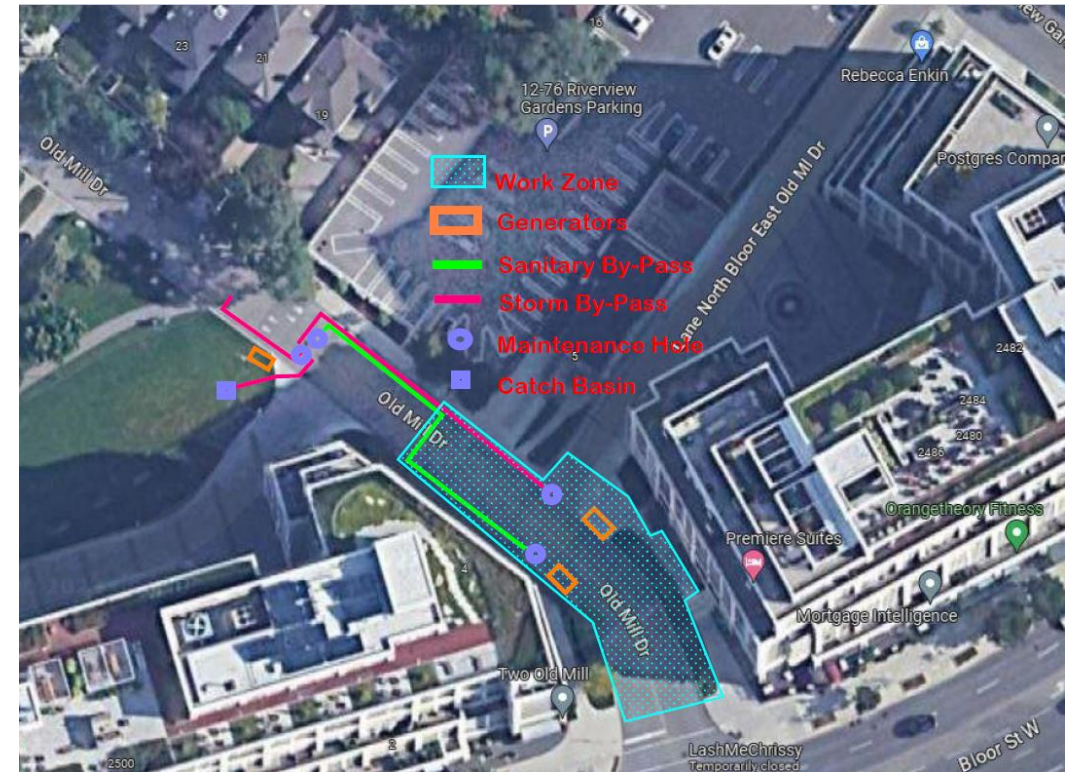
Bypass Systems located at Traymore Park

- Bypass systems allow for continuous flow of the sewers while work is being completed between maintenance holes. Flow from the sewers is pumped from the upstream Maintenance Hole through hosing to the downstream Maintenance Hole.
- A 375mm diameter storm sewer and a 250mm diameter sanitary sewer are currently being bypassed due to obstructions in the sewers.
- Both sewers will be repaired/replaced as part of this contract.



Bypass Systems located at Traymore Park

- The shallow 375mm storm sewer is currently being bypassed during heavy rainfall events to avoid additional overland flooding at Traymore Park. This sewer will be decommissioned and upgraded as part of the contract scope, however the rescue procedures for the MTBM must be completed first.



- A short section of the 250mm sanitary sewer is also being bypassed on Old Mill drive. This bypass will remain in place until the ground stabilization operations have been completed and the contractor can make repairs to the sewer.

Sewer Bypass Generators

Generators currently being used to power the storm and sanitary bypass systems will be removed in stages as the base scope work is completed.

- Automatically turn on and off based on the volume of flow in the storm and sanitary sewers
- Cannot be turned off



At Traymore Park



Adjacent to 2 Old Mill Drive



Adjacent to 1 Old Mill Drive

Keller Operation Generators

Generators currently being used to power the ground improvement operations and site workers' trailer will be removed upon completion of the ground improvement operation.

- Turned on for construction activities throughout the working day
- Turned off at the end of the day

