# 1056 and 1060 Brant Street, Burlington, Ontario

## Hydrogeological Investigation

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# 1 Introduction

## 1.1 Project Description

EXP Services Inc. (EXP) was retained by 2735842 Ontario Inc; 2060188 Ontario Inc.; 2735841 Ontario Inc.; 2059977 Ontario Inc.. to prepare a Hydrogeological Investigation Report associated with the proposed development located at 1056 and 1060 Brant Street, Burlington, Ontario (hereinafter referred to as the 'Site').

The Site is situated at 1056 & 1060 Brant Street and is currently occupied by a two-storey residential building with an associated asphalt parking lot. Low to mid-rise residential/commercial properties bound the Site to the north and south, and a Ryckman Common bound the site to the South. The Site is rectangular in shape and the topography at the Site is relatively flat-lying.

Based on the conceptual site plan, it is understood that the proposed development will consist of a 12-storey residential condominium structure with one (1) level of underground parking. The underground parking garage structure will occupy the entire site area. The Site location plan is shown on Figure 1.

EXP conducted a Preliminary Geotechnical Investigation and Environmental Site Assessment in conjunction with this investigation. The pertinent information gathered from the noted investigations is utilized for this report.

## 1.2 Project Objectives

The main objectives of the Hydrogeological Investigation are as follows:

- Establish the local hydrogeological settings within the Site;
- Assess construction dewatering flow rates and potential impacts;
- Ass long-term foundation sub-drain discharge volumes;
- Assess groundwater quality; and,
- Prepare a Hydrogeological Investigation Report.

## 1.3 Scope of Work

To achieve the investigation objectives, EXP has completed the following scope of work:

- Reviewed available geological and hydrogeological information for the Site;
- Develop and conducted Single Well Response Tests (SWRT) on four (4) monitoring wells (combined with geotechnical investigation) to evaluate hydraulic properties of the saturated soils at the Site. The actual depth of the BH/MWs will depend on soil conditions;
- Collected one (1) groundwater samples for laboratory testing of the City of Burlington Sanitary and Storm Sewer Use By-Law parameters, and additional metals filtered;
- Evaluate the information collected during the field investigation program, including borehole geological information, SWRT results, groundwater level measurements and groundwater water quality;
- Preparation of site plans, cross-sections, geological mapping, and groundwater contour mapping for the Site;
- Estimate construction dewatering flow rates (Short Term);
- Provide preliminary estimates of sub-drain discharge volumes (Long Term);

- Assess potential impacts and recommend mitigation measures;
- Prepared a Hydrogeological Investigation Report; and

The Hydrogeological Investigation was prepared in accordance with the Ontario Water Resources Act, Ontario Regulation 387/04. The scope of work outlined above was made to assess dewatering and did not include a review of Environmental Site Assessments (ESA).

## 1.4 Review of Previous Reports

The following reports were reviewed as part of this Hydrogeological Investigation:

- EXP Services Inc. (March 13, 2025) Preliminary Geotechnical Investigation, 1056 and 1060 Brant Street, Burlington, ON, prepared for 2735842 Ontario Inc, 2060188 Ontario Inc, and 2059977 Ontario Inc.

Any past and/or future geotechnical, hydrogeological, environmental and risk assessments, and updated development/architectural plans should be provided to update this hydrogeological report prior to submission of permits and approvals by the municipalities and agencies.

# 2 Hydrogeological Setting

## 2.1 Regional Setting

### 2.1.1 Regional Physiography

The Site is within a physiographic region known as the Iroquois Plain. The physiographic landform is named Shale Plains (Chapman & Putnam, 2007).

The Iroquois Plain was created along the shores of former Lake Iroquois, an ancient glacial lake. The noted Plain primarily consists of shallow water sandy deposits.

The topography of the Iroquois Plain is relatively flat with a gradual slope to the south, toward Lake Ontario.

### 2.1.2 Regional Geology and Hydrogeology

The surficial geology can be described as Paleozoic bedrock with coarse textured (foreshore-basinal) glaciolacustrine deposits to the south consisting of sand, gravel, minor silt and clay (Ministry of Northern Development and Mines, 2012). The surficial geology of the Site and surrounding areas is shown on Figure 2.

Based on the available regional geology maps, the subsurface stratigraphy of the Site from top to bottom is summarized in Table 2-1 (TRCA, 2008 and Oak Ridge Moraine Groundwater Program, 2018). The overburden thickness is approximately 4.3 m.

**Table 2-1: Summary of Subsurface Stratigraphy**

| Stratigraphic Unit | General Description | Top Elevation of Stratigraphic Unit |
|---|---|---|
| Halton Till or Equivalent (Aquitard) | This lithologic unit typically consists of sandy silt to clayey silt till interbedded with silt, clay, sand and gravel. | 101.6 |
| Oak Ridges Moraine or Equivalent (Aquifer) | This geology unit mainly consists of interbedded fine-grained sand and silt deposits where coarse-grained sand and gravel along with clay laminae are locally reported. | 97.6 |
| Georgian Bay Formation | Bedrock primarily consists of interbedded shale, limestone, dolostone and siltstone. It belongs to the Upper Ordovician, (Ministry of Northern Development and Mines, 2012). | 97.3 |

Regional groundwater across the area flows southeast, towards Lake Ontario (Oak Ridge Moraine Groundwater Program, 2018). Local deviation from the regional groundwater flow pattern may occur in response to changes in topography and/or soils, as well as the presence of surface water features and/or existing subsurface infrastructure. The available regional data suggests that groundwater table is located within bedrock at approximate elevation 100 m.

### 2.1.3 Existing Water Well Survey

Water Well Records (WWRs) were compiled from the database maintained by the Ministry of the Environment, Conservation and Parks (MECP) and reviewed to determine the number of water wells documented within a 500-m radius of the Site

boundaries. The locations of the MECP WWRs within 500 m of the Site are shown on Figure 3. A summary of the WWR is included in Appendix A.

The MECP WWR database indicates that fifty (50) records within a 500 m radius from the Site where no well record is identified onsite (Figure 3 and Appendix A). Well distances are calculated relative to the Site centroid, therefore some distances in Appendix A exceed 500 m.

The database indicates that the offsite wells are at an approximate distance of two hundred and fifteen (215) m or greater from the Site centroid. All offsite wells were reportedly identified as monitoring and observation wells and test holes (19), water supply well (1), abandoned (21) and/or listed with unknown use (9).

The Well Identification Number (Well ID No.) of the only offsite water supply well is 2800006 where it is reportedly located 383 m from the Site centroid.

The reported water levels ranged from depths of 3.0 m to 27 meters below ground surface (mbgs).

Based on the date of installation of the water supply well (1952) and since the area is municipally serviced, it is unlikely that the noted water supply well is still active.

## 2.2 Site Setting

### 2.2.1 Site Topography

The Site is in a commercial and residential land use setting. The topography is considered relatively flat with a regional gradual southeasterly slope towards Lake Ontario.

As indicated on the borehole logs included in Appendix B, the ground surface elevation of the Site ranges between approximately 101.81 to 101.16 meters above sea level (masl).

### 2.2.2 Local Surface Water Features

The Site is predominantly on a watershed divide between two watershed areas, with most southern portions of the site located in the Upper Hager Creek watershed and northern parts of the Site within Upper Rambo Creek watershed. No surface water features exist onsite. The nearest surface water features are Rambo Creek located approximately 180 m east of the Site and Lake Ontario located approximately 2.5 km southeast from the Site boundary (Conservation Halton Online Basemap - camaps.maps.arcgis.com).

### 2.2.3 Local Geology and Hydrogeology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the geotechnical investigation report (EXP, 2025). They are summarized for the hydrogeological interpretations. As such, the information provided in this section shall not be used for construction design purposes.

The detailed soil profiles encountered in each borehole and the results of moisture content determinations are presented on the attached borehole logs (Appendix B). The logs include textural descriptions of the subsoil and groundwater conditions and indicate the soil boundaries inferred from non-continuous sampling and observations during drilling. These boundaries reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change.

The "Notes on Sample Description" preceding the borehole logs form an integral part of and should be read in conjunction with this report. The following is a brief description of the soil conditions encountered during the investigation.

Briefly, the general stratigraphy at the site comprises the pavement structure followed by fill material over native deposits of silty clay till and, sandy silt till extending to shale bedrock. A summary of the various soil layers is presented below.

**Pavement Structure/Topsoil**

Pavement structure, comprising 15 to 150 mm asphaltic concrete over a 125 to 180 mm thick granular base, was encountered from surface in all boreholes with an exception to BH-3.

**Fill**

Fill material was encountered below the pavement structure in all boreholes extending to approximately 1.5 to 4.5 m below the existing grades. The fill generally comprised of silty clay with some sand and trace gravel, was brown in colour and in moist to wet condition. Trace rootlets, dark brown to black organic staining were typically encountered in the fill and trace brick fragments and concrete fragments were encountered at Borehole BH-2. Moisture contents in the fill were measured between approximately 12 and 20 percent.

**Silty Clay Till**

A glacial deposit of silty clay till was encountered in all boreholes except at Borehole BH-2, below the granular fill and/or fill and extended to depths of approximately 2.2 to 9.8 m. The silty clay till included trace sand, gravel, and shale fragments; was generally brown or reddish brown in colour and in a moist state with moisture contents of the stratum ranging from 8 to 16 %. SPT N values ranged from 32 to greater than 100 per 305 mm of spoon penetration. Based on the undrained shear strengths greater than 225 kPa as determined by pocket penetrometer measurements, the stratum is classified as hard in consistency.

**Sandy Silt Till**

A sandy silt till deposit was encountered below the fill in Borehole BH-2 and below the silty clay till in boreholes BH-3 and BH-4. The sandy silt till deposit contained trace clay and some gravel. The sandy silt till stratum was noted to become clayey below 4.6 to 6.1 m. The sandy silt till was brown or greyish brown or reddish brown in colour. Moisture contents recorded in the sandy silt till deposit range from approximately 8 to 18 percent, indicating moist conditions. Based on SPT N values of 45 to greater than 100 blows per 305 mm of penetration, the stratum is classified as dense to very dense.

**Shale**

Red shale bedrock of the Queenston Formation was encountered in all boreholes, except BH-5, underlying the till deposit at depths ranging from 3.2 to 3.8 m below grade. The bedrock was proven by coring at Boreholes BH-1 and inferred from drilling observations at the remaining locations. It should be noted that the contact elevations should not be interpreted as exact planes of bedrock since the auger will frequently penetrate some distance into the weathered rock before noticeable resistance is encountered. Further, the distinction between highly weathered shale and the overlying stratum, particularly if the latter contains abundant shale fragments, is not always clear and consequently, some of the soil resting on the surface of the bedrock might be very weak and highly weathered shale.

In general, the Queenston Shale bedrock is highly weathered in the upper portion (becoming more sound with depth), and it exhibits characteristics more commonly encountered with soil than with rock (slake durability index less than 80%, higher moisture content, etc.). Hard limestone interbeds are also possible within the shale; these hard layers can result in contractual problems for excavations and drilling.

The borehole and monitoring well locations are shown on Figure 4. Geological cross-sections were generated based on the available borehole logs completed as part of the previous and current investigations and shown on Figure 5 (Cross section A-A'). The cross section shows a simplified representation of soil conditions and soil deposits may be interconnected differently than represented. Borehole logs used to generate both cross-sections are provided in Appendix B.

# 3 Results

## 3.1 Monitoring Well Details

The monitoring well network was installed as part of the Geotechnical and Environmental Investigations at the Site. It consists of the following:

- Three (3) shallow overburden monitoring wells (BH/MW 3, BH/MW 4S and BH/MW 4D) were installed;
- One (1) deep bedrock monitoring well (BH/MW 1) was installed.

The diameter of all monitoring wells is 50 mm. All wells were installed with a flush mount protective casing. Borehole logs and monitoring well installation details are provided in Appendix B. The monitoring well locations are shown on Figure 4.

## 3.2 Water Level Monitoring

As part of the Hydrogeological Investigation, static water levels in the monitoring wells installed outside of the existing building were recorded in three (3) monitoring events, including March 13, 21 and 24 of 2023. A summary of all static water level data as it relates to the elevation survey is given in Table 3-1 below.

The groundwater elevation recorded in the shallow wells ranged from 99.16 masl (2.0 mbgs at BH/MW 3 on March 21, 2023) to 99.46 masl (2.32 mbgs at BH/MW 4S on March 13, 2023). The groundwater elevation recorded for the deep wells ranged from 99.45 masl (2.36 mbgs at BH/MW 1 on March 24, 2023) to 99.55 masl (2.26 mbgs at BH/MW 1 on March 13, 2023).

**Table 3-1: Summary of Measured Groundwater Elevations**

| Monitoring Well ID | Ground Surface Elevation (masl) | Approximate Full Well Depth (mbgs) | Minimum GW Elevation (masl) | Maximum GW Elevation (masl) | Depth | 13-Mar-23 | 21-Mar-23 | 24-Mar-23 |
|---|---|---|---|---|---|---|---|---|
| BH/MW 1 | 101.81 | 10.77 | 99.45 | 99.55 | mbgs | 2.26 | 2.32 | 2.36 |
| | | | | | masl | 99.55 | 99.49 | 99.45 |
| BH/MW 3 | 101.16 | 7.56 | 99.16 | 99.23 | mbgs | 1.93 | 2.00 | 1.95 |
| | | | | | masl | 99.23 | 99.16 | 99.21 |
| BH/MW 4S | 101.79 | 5.45 | 99.27 | 99.46 | mbgs | 2.32 | 2.51 | 2.52 |
| | | | | | masl | 99.46 | 99.28 | 99.27 |
| BH/MW 4D | 101.80 | 7.64 | 99.23 | 99.43 | mbgs | 2.37 | 2.57 | 2.53 |
| | | | | | masl | 99.43 | 99.23 | 99.27 |

Notes:
mbgs - meters below ground surface
masl - meters above mean sea level
NA-not available / well destroyed or not accessible

One (1) map was created for the Site to show groundwater contours of the water-bearing zone, as measured on March 24 of 2023 monitoring event (Figure 6). Accordingly, the groundwater flow directions in the water-bearing zone is interpreted to be in southeast direction of the Site, towards Lake Ontario, as expected.

Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions. This may also affect the direction and rate of flow. The on-going seasonal groundwater level monitoring will further refine and provide more information on seasonal groundwater level fluctuations on Site.

## 3.3 Hydraulic Conductivity Testing

Four (4) Single Well Response Tests (SWRT's) were completed on monitoring wells BH/MW 1, BH/MW 3, BH/MW 4S, BH/MW 4D on March 24, 2023. The tests were completed to estimate the saturated hydraulic conductivity (K) of the soils at the well screen depths utilizing data loggers, preprogramed to take measurement on (time in sec/ half sec/minutes) intervals.

The static water level within each monitoring well was measured prior to the start of testing. In advance of performing SWRTs, each monitoring well underwent development to remove fines introduced into the screens following construction. The development process involved purging of the monitoring wells to induce the flow of fresh formation water through the screen. Each monitoring well was permitted to fully recover prior to performing SWRTs.

Hydraulic conductivity values were calculated from the SWRT and constant rate test data as per Hvorslev's solution included in the Aqtesolv Pro. V.4.5 software package. The semi-log plots for normalized drawdown versus time are included in Appendix C.

A summary of the hydraulic conductivities (K-values) estimated from the SWRTs are provided in Table 3-2.

**Table 3-2: Summary of Hydraulic Conductivity Testing**

| Monitoring Well | Approximate Well Depth (mbgs) | Screen Interval (mbgs) | | Soil Formation Screened | Estimated Hydraulic Conductivity (m/s) |
|---|---|---|---|---|---|
| | | from | to | | |
| BH 1 | 10.77 | 7.77 | 10.77 | Silty Clay Till | 1.8E-06 |
| BH 3 | 8.72 | 5.72 | 8.72 | Sandy Silt Till/Shale Bedrock | 9.7E-06 |
| BH 4S | 5.45 | 2.45 | 5.45 | Silty Clay Till/Sandy Silt Till | 5.5E-06 |
| BH 4D | 7.64 | 4.64 | 7.64 | Sandy Silt Till/Shale Bedrock | 1.6E-06 |
| | | | | Highest Estimated K Value | 9.7E-06 |
| | | | | Geometric Mean of Estimated K Values for bedrock | 1.1E-06 |
| | | | | Arithmetic Mean of Estimated K Values for bedrock | 3.3E-06 |

SWRTs provide K-estimates of the geological formation surrounding the well screens and may not be representative of bulk formation hydraulic conductivity. As shown in Table 3-2, the highest K-value of the tested water-bearing zone is 9.7E-6 m/s, and the arithmetic mean of the K-values is 3.3E-6 m/s

One (1) map was created for the Site to show groundwater contours of the shallow water-bearing zone, as measured on March 23 of 2023 monitoring event (Figure 6). Accordingly, the groundwater flow directions in the shallow zone is interpreted to be in southeast direction of the Site, towards Lake Ontario, as expected.

For the design of foundations without perimeter and foundation drainage systems, shallower wells need to be considered to evaluate the shallow groundwater table. The hydrogeologist needs to be consulted during the design process.

Groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions. This may also affect the direction and rate of flow. It is recommended to conduct seasonal groundwater level measurements to provide more information on seasonal groundwater level fluctuations.

## 3.4 Groundwater Quality

To assess the suitability for discharging pumped groundwater into the sewers during dewatering activities, one (1) groundwater sample was collected from monitoring well BH/MW 4D on March 24 of 2023 using a peristaltic pump. Prior to collecting the noted water sample, approximately three (3) standing well volumes of groundwater were purged from the referred well. The

samples were collected unfiltered and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The groundwater samples were submitted for analysis to Bureau Veritas Laboratory, a CALA certified independent laboratory in Mississauga, Ontario. Analytical results are provided in Appendix D.

Table 3-3 summarizes exceedance(s) of the Sanitary (Halton Region) and Storm (City of Burlington) Sewer Use By-Law parameters.

When comparing the chemistry of the collected groundwater samples to Halton Region Sanitary Sewer Discharge Criteria, there were no parameter exceedances to be reported.

When comparing the chemistry of the collected groundwater samples to the City of Burlington Storm Sewer Discharge Criteria (Table 2) the following parameters reported an exceedance: Total Suspended Solids (TSS) and Total Manganese (Mn)

Reporting detection limits (RDLs) were below the Sewer Use By-Law parameter.

**Table 3-3: Summary of Analytical Results**

| Parameter | Units | Region of Halton Sanitary Sewer Discharge Limit | City of Burlington / Halton Region Storm Sewer Discharge Limit | Concentration BH/MW 4D 24-Mar-23 |
|---|---|---|---|---|
| Total Suspended Solids (TSS) | mg/L | 350 | 15 | **29** |
| Total Manganese (Mn) | mg/L | 5 | 0.05 | **0.088** |

**Bold –** Exceeds City of Burlington / Halton Region Storm Sewer Discharge Limit (Table 2).
**Bold & underlined** – Exceeds City of Burlington / Halton Region Sanitary and Combined Sewer Discharge Limit (Table 1).

For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

For the long-term dewatering discharge to the sanitary sewer system (post-development phase) and based on the water quality test results, the water is suitable to be discharged without a treatment system.

For the long-term dewatering discharge to the storm sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment, as required.

The water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase, as required by the City.

An agreement to discharge into the sewers owned by the City of Burlington / Halton Region will be required prior to releasing dewatering effluent.

A review of the phase two ESA dated May 4, 2023 indicates that groundwater samples analyzed were non detect. The Environmental Site Assessment Report(s) shall be reviewed for more information on the groundwater quality conditions at the Site.

# 4 Dewatering Assessment

The dimensions of the proposed structure (see architectural drawings in Appendix F) to support the dewatering assessment are summarized in Table 4-1 below.

**Table 4-1 Building Dimensions for Dewatering Assessment**

| Input Parameter | Assumption | Units | Notes |
|---|---|---|---|
| Number of Subgrade Levels | 1 Level | - | Underground parking garage structure occupy the entire site area |
| Ground Elevations | 101.64 | masl | Average ground surface elevation based on BHs |
| Top of Slab Elevation | 97.64 | masl | Based on Architectural Drawings (4.0 m below ground elevation) (WZMH Architects, 2024) |
| Lowest Footing Elevation | 96.14 | masl | Assumed to be approximately 1.5 m below the top of slab elevation |
| Excavation Area (Length x Width) | 1,528.6 (43.6 x 35.1) | $m^2$ (m x m) | Approximate area (length x width) of Site for the proposed development (WZMH Architects, 2024) |

## 4.1 Dewatering Flow Rate Estimate and Zone of Influence

The Dupuit-Forcheimer equation for radial flow to both sides of an excavation through an unconfined aquifer resting on a horizontal impervious surface was used to obtain a flow rate estimate. Dewatering flow rate is expressed as follows:

$$Q_w = \frac{\pi K(H^2 - h^2)}{Ln\left[\frac{R_o}{r_e}\right]}$$

$$r_e = \frac{a+b}{\pi} \qquad R_o = R_{cj} + r_e$$

Where:

Qw = Rate of pumping ($m^3/s$)
X = Length of excavation (m)
K = Hydraulic conductivity (m/s)
H = Hydraulic head beyond the influence of pumping (static groundwater elevation) (m)
h = Hydraulic head above the base of aquifer in an excavation (m)
$R_0$ = Radius of influence (m)
$R_{cj}$ = Cooper-Jacob's radius of influence (m)
$r_e$ = Equivalent perimeter (m)
$a$ = Length of the excavation area (m)

$b$ = Width of the excavation area (m)

It is expected that the initial dewatering rate will be higher to remove groundwater from within the overburden formation. The dewatering rates are expected to decrease once the target water level is achieved in the excavation footprint as groundwater will have been removed, primarily from storage, resulting in lower seepage rates into the excavation.

## 4.2 Cooper-Jacob's Radius of Influence

The radius of influence (Rcj) for the construction dewatering was calculated based on Cooper-Jacob's equation. This equation is used to predict the distance at which the drawdown resulting from pumping is negligible.

The estimated radius of influence due to pumping is based on Cooper-Jacob's formula as follows:

$$\mathrm{R}_{cj} = \sqrt{2.25KDt/s}$$

Where:

Ro = Estimated radius of influence (m)
D = Aquifer thickness (original saturated thickness) (m)
K = Hydraulic conductivity (m/s)
S = Storage coefficient
t = Duration of pumping (s)

The calculated radius of influence is provided in Appendix E.

## 4.3 Stormwater

Additional pumping capacity may be required to maintain dry conditions within the excavation during and following significant precipitation events. Therefore, the dewatering rates at the Site should also include removing stormwater from the excavation.

A 25 mm precipitation event was utilized for estimating the stormwater volume. The calculation of the stormwater volume is included in Appendix E.

The estimate of the stormwater volume only accounts for direct precipitation into the excavation. The dimensions of the excavation are considered in the dewatering calculations. Runoff which originated outside of the excavation's footprint is excluded and it should be directed away from the excavation.

During precipitation events greater than 25 mm (ex: 100-year storm), measures should be taken by the contractor to retain stormwater onsite in a safe manner to not exceed the allowable water taking and discharge limits, as necessary. A two (2) and a one hundred (100) year storm event over a 24-hour period are 57.3 and 124.7 mm (refer to Appendix E).

## 4.4 Results of Dewatering Rate Estimates

### 4.4.1 Construction Dewatering Rate Estimate

For this assessment, it was assumed that the proposed construction plans include an excavation with shoring extending to the Site boundaries. EXP should be retained to review the assumptions outlined in this section, should the assumed shoring design change.

Short-term (construction) dewatering calculations are presented in Appendix E.

Pits (elevator, sump pits) are assumed to have the same excavation depth and dewatering target as the main excavation; deeper pits may require localized dewatering and revised dewatering estimates.

Based on the assumptions provided in this report, the results of the dewatering rate estimate can be summarized as follows:

**Table 4-2 Summary of Construction Dewatering Rate**

| Peak Dewatering Flow Rate Including Rain Collection Volume and Zone of Influence | |
|---|---|
| **Description** | **With 1 Level of Underground Parking (L/day)** |
| Total Volume (L/day) Short Term Discharge of Groundwater (Construction dewatering) with Safety Factor (including precipitation) | 141,000 |
| Total Volume (L/day) Short Term Discharge of Groundwater (Construction dewatering) without Safety Factor (including precipitation | 90,000 |
| Total Volume (L/day) Short Term Discharge of Groundwater (construction dewatering) with Safety Factor (excluding Precipitation) for EASR and PTTW | 103,000 |

The peak dewatering flow rates does not account for flow from utility beddings and variations in hydrogeological properties beyond those encountered during this investigation.

Local dewatering may be required for pits (elevator pits, sump pits), if these extend deeper than the dewatering target. Local dewatering is not considered to be part of this assessment. Dewatering estimates should be reviewed once the pit dimensions are available.

Local dewatering may be required for pits (elevator pits, sump pits, raft) and for localized areas with permeable, soft, or wet soil conditions. Local dewatering is not considered to be part of this assessment, but contractor should be ready to install additional system to manage such conditions. Dewatering estimates should be reviewed once the pit dimensions are available.

All grading around the perimeter of the excavation should be graded away from the shoring the systems and ramp/site access to redirect runoff away from excavation.

The dewatering assumptions are based on using shoring system without open cuts and sloped excavations.

If groundwater cutoff systems (ex: caisson walls, sheet piles) are installed, these should be designed for maximal hydrostatic pressure for shallow and deep water levels, without dewatering on the outer side of the groundwater cutoff. Soldier pile and lagging and caisson wall systems should be designed to account for shallow groundwater conditions and take into consideration that dewatering systems may not provide fully dewatered soil conditions.

If groundwater cutoff systems are used for decreasing long-term dewatering rates, these should be designed as permanent structures to cutoff groundwater inflow in the long-term. All perforations should be sealed permanently (ex: tiebacks, breaches, and cold joints) with no leakages and inspected. Fillers should extend into low permeability deposits (ex: sound bedrock or till)

to cutoff groundwater from water bearing zones. Inspections should be conducted to confirm the depth of low permeability deposits along shoring system and that fillers are keyed into low permeability soil deposits.

All grading around the perimeter of the construction Site should be graded away from the shoring the system.

The contractor is responsible for the design of the dewatering systems (depth of wells, screen length, number of wells, spacing sand pack around screens, prevent soil loss etc.) to ensure that dry conditions are always maintained within the excavation at all costs.

Dewatering should be monitored using dedicated monitoring wells within and around the perimeter of the excavation, and these wells should be monitored using manual measurements and with electronic data loggers; records should be maintained on site to track dewatering progress. Discharge rates should be monitored using calibrated flow meters and records of dewatering progress, and daily precipitation as per MECP requirements should be maintained.

### 4.4.2 Post-Construction Dewatering Rate Estimate

It is our understanding that the development plan includes a permanent foundation sub-drain system that will ultimately discharge to the municipal sewer system if conventional footings are installed.

The long-term dewatering was based on the same equations as construction dewatering shown in Section 4.1.

The calculation for the estimated flow to the future sub-drain system (with no cutoff walls) is provided in Appendix E. The dewatering target for the foundation drainage system is taken at 0.5 m below the lowest slab elevation.

The foundation drain analysis provides a flow rate estimate. Once the foundation drain is built, actual flow rate measurements of the sump discharge will be required to confirm the estimated flow rate.

Based on the assumptions provided in this report, the estimated sub-drain discharge volumes are summarized in Appendix E. Seasonal and daily fluctuations are expected. These estimates may be affected by hydrogeological conditions beyond those encountered at this time, fluctuations in groundwater regimes, surrounding Site alterations, and existing and future infrastructures.

**Table 4-3: Summary of Long-Term Dewatering Rate**

| Long-Term Dewatering Flow Rate | With 1 Level of Underground Parking (L/day) |
|---|---|
| Total Volume (L/day) Long-Term Drainage of groundwater (from foundation drainage, weeping tiles, sub slab drainage) with Safety Factor Included | 25,000 |
| Long-Term Dewatering Rate without Safety Factor | 17,000 |

Intermittent cycling of sump pumps and seasonal fluctuation in groundwater regimes should be considered for pump specifications. A safety factor was applied to the flow rate to account for water level fluctuations due to seasonal changes.

These estimates assume that pits (elevator and/or sump pits) are made as watertight structures (without drainage), if their depths extend below the dewatering target, as previously stated. The dewatering assumptions are based on using shoring system without open cuts. Open cuts can act as preferential groundwater pathways in the long-term and cause foundation drainage volumes to increase.

The sub-drain rate estimate is based on the assumptions outlined in this report. Any variations in hydrogeological conditions beyond those encountered as part of this investigation may significantly influence the sub-drain discharge volumes.

## 4.5 MECP Water Taking Permits

### 4.5.1 Short-Term Discharge Rate (Construction Phase)

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering is more than 50,000 L/day but less than 400,000 L/day, then an online registration in the Environmental Activity and Sector Registry (EASR) with the MECP will be required. If groundwater dewatering rates onsite exceed 400,000 L/day, a Category 3 Permit to Take Water (PTTW) will be required from the MECP.

As of July 1, 2021, an amendment of O. Reg. 63/16 has come into effect and replaced the former subsection 7 (5) such that the EASR water taking limit of 400,000 L/day would apply to groundwater takings of each dewatered work area only, excluding stormwater.

The dewatering estimate including a safety factor is greater than 50,000 L/day and less than 400, 000 L/day as shown in Table 4-2. The MECP construction dewatering rate excludes the precipitation amount and is the rate used for the permit application. Based on the MECP construction dewatering an EASR will be required to facilitate the construction dewatering program of the Site.

A Discharge Plan (dewatering sketch, sewer discharge agreement) must be developed and applied for any discharges from the Site. Monitoring of both water quantity and water quality must be carried out for the entire duration of the construction dewatering phase. During this phase, the Discharge Plan and the daily water taking records must be available onsite.

The EASR, Water Taking and Discharge Reports, hydrogeological investigation report, and geotechnical assessment of settlements must also be available at the construction Site during the entire construction dewatering. EXP should be notified immediately about any changes to the construction dewatering schedule or design, since the EASR will need to be updated to reflect these modifications.

### 4.5.2 Long-Term Discharge Rate (Post Construction Phase)

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering is more than 50,000 L/day, then an application for a Category 3 Permit to Take Water (PTTW) will be required from the MECP.

Based on the dewatering estimate shown in Table 4-3 less than 50,000 L/day, a Category 3 Permit to Take Water (PTTW) will not be required to facilitate the post-development phase.

The safety factor for construction (short-term) dewatering is selected larger than for long-term to account for anticipated greater groundwater volumes during initial dewatering. The applied analytical formula is adequate for long-term (steady state) conditions as it omits specific yield and time dependency. When the formula is used for short-term conditions a larger safety factor is recommended to cover a larger initial dewatering rate, which is required to remove stored groundwater. Moreover, a large initial construction dewatering rate is favorable, as it supports reducing the time to reach the dewatering target elevation.

# 5 Environmental Impact

## 5.1 Surface Water Features

The Site is predominantly on a watershed divide between two watershed areas, with most southern portions of the site located in the Upper Hager Creek watershed and northern parts of the Site within Upper Rambo Creek watershed. No surface water features exist onsite. The nearest surface water feature is Rambo Creek, approximately located 180 meters east of the Site boundary. Lake Ontario is approximately 2.5 km from the Site boundary to the southeast Conservation Halton Online Basemap).

Due to the limited extent of zone of influence and the wide distance to the nearest surface water feature, no detrimental impacts on surface water features are expected during construction activities.

## 5.2 Groundwater Sources

Well Records from the MECP Water Well Record (WWR) Database were reviewed to determine the presence and number of water supply wells within a 500 m radius of the Site boundaries. Given that no active water supply wells exist within the 500 m buffer, no dewatering related impact on water supply wells is expected in the area.

## 5.3 Geotechnical Considerations

As per the MECP technical requirement for PTTW and EASRs, the geotechnical assessment of the stability of the soils due to water taking (ex: settlement, soil loss, subsidence, etc.) is required. The water taking should not have unacceptable interference on soils and underground structures (foundations, utilities, etc.).

A letter related to geotechnical issues as it pertains to the Site is required to be completed under a separate cover.

## 5.4 Groundwater Quality

It is our understanding that the potential effluent from the dewatering system during the construction will be released to the municipal sewer system. As such, the quality of groundwater discharge is required to conform the City of Burlington / Halton Region Sewer Use By-Law.

Dewatering (short and long-term) may induce migration of contaminants within the zone of influence and beyond due to changing hydraulic gradients, hydrogeological conditions beyond Site boundaries and preferential pathways in utility beddings etc. The water quality sampling conducted as part of this assessment was performed under static conditions. As a result, monitoring may be required during dewatering activities (short and long-term) to monitor potential migration, and this should be performed more frequently during early dewatering stages.

For the Short-term (construction) discharge to the Sanitary/Storm sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment, as required.

For the long-term (post construction) dewatering discharge to the storm sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment, as required.

The water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase as required by the City.

An agreement to discharge into the sewers owned by the City of Burlington / Halton Region will be required prior to releasing dewatering effluent.

The Environmental Site Assessment Report(s) shall be reviewed for more information on the groundwater quality conditions at the Site.

## 5.5 Well Decommissioning

In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

# 6 Conclusions and Recommendations

Based on the findings of the Hydrogeological Investigation, the following conclusions and recommendations are provided:

- The Site is located predominantly on a watershed divide between two watershed areas: the Upper Hager Creek watershed to the west and south and Upper Rambo Creek watershed to the north and east. The Site is located in the physiographic region known as Iroquois Plain and physiographic landform known as sand plain.
- The main overburden soil types encountered during on-site drilling program include silty clay till and sandy silt till.
- Thickness of overburden sediments in the area has been mapped to vary between approximately 4.3 m
- There are no surface water features present onsite. The nearest surface water features are Rambo Creek located approximately 180 m east of the Site and Lake Ontario located approximately 2.5 km southeast from the Site boundary.
- The groundwater elevation recorded in the shallow overburden wells ranged from 99.16 masl (2.00 mbgs) to 99.46 masl (2.32 mbgs) while the groundwater elevation recorded for the deep bedrock wells ranged from 99.45 masl (2.36 mbgs) to 99.55 masl (2.26 mbgs).
- The direction of groundwater flow is interpreted to be directed to southeast, towards Lake Ontario, as expected.
- The highest estimated bulk hydraulic conductivity for bedrock is approximately 9.7 x $10^{-6}$ m/s with geometric mean k-values estimated as 1.1 x $10^{-6}$ m/s and an arithmetic mean of the estimated K-values of 3.3 x $10^{-6}$ m/sec.
- When comparing the chemistry of the collected groundwater samples to Halton Region Sanitary Sewer Discharge Criteria, there were no parameter exceedances to be reported.
- When comparing the chemistry of the collected groundwater samples to the City of Burlington Storm Sewer Discharge Criteria (Table 2) the following parameters reported an exceedance: Total Suspended Solids (TSS) and Total Manganese (Mn).
- The construction dewatering and groundwater control will be required for building construction with two (2) levels of underground parking.
- Based on the assumptions outlined in this report, the estimated peak dewatering rate for proposed construction activities is approximately 141,000 L/day. This is the rate which will be required to be discharged to the municipal sewer system. If the municipal sewer system is not available at the time of construction, the discharge point will be the nearest environment.
- The estimated MECP dewatering rate for proposed construction activities is approximately 103,000 L/day. As the dewatering flow rate estimate is between 50,000 L/day and 400,000 L/day, an EASR will be required to facilitate the construction dewatering program for the Site.
- The long-term flow rate of the foundation sub-drain is estimated to be approximately 25,000 L/day. It is recommended that once the sub-drain system is in place, a flow meter be installed at the sump(s) to record daily discharge volumes during the commissioning stage of the system. Regular maintenance/cleaning of the sub-drain system is recommended to ensure its proper operation. A PTTW will not be required for long-term discharge.
- The construction dewatering and long-term estimate of sub-drain discharge volumes is based on the assumptions outlined in this report. Any variations in hydrogeological conditions beyond those encountered as part of this preliminary investigation may significantly influence the discharge volumes.
- For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

- As per the MECP technical requirement for PTTW and EASRs, the geotechnical assessment of the stability of the soils due to water taking (ex: settlement, soil loss, subsidence etc.) is required. The water taking should not have unacceptable interference on soils and underground structures (foundations, utilities etc.). A letter related to geotechnical issues as it pertains to the Site is required to be completed under a separate cover.
- The potential discharge from the dewatering system during the construction will be directed to the municipal sewer system. As such, the quality of groundwater discharge will have to conform to the applicable City of Burlington / Halton Region Sewer Use By-Law standards and discharge permit(s) will be required from the City of Burlington / Halton Region prior any dewatering effluent discharges.
- The EASR registration allows construction dewatering discharge of up to 400,000 L/day. A Discharge Plan (dewatering sketch, sewer discharge agreement) must be developed and applied for any discharges from the Site. The Discharge Plan and monitoring for both water quantity and water quality must be carried at the Site during the entire construction dewatering phase. The daily water taking records must be maintained onsite for the entire construction dewatering phase.
- The EASR, Water Taking and Discharge Reports, hydrogeological investigation report, and geotechnical assessment of settlements must always also be available at the construction Site for the entire construction dewatering. EXP should be notified immediately about any changes to the construction dewatering schedule or design, since EASR will need to be updated to reflect these modifications.
- In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

The conclusions and recommendations provided above should be reviewed in conjunction with the entirety of the report. They assume that the present design concept described throughout the report will proceed to construction. This report is solely intended for the construction and long-term dewatering assessments. Any changes to the design concept may result in a modification to the recommendations provided in this report.

# 7 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current hydrogeological conditions within the study area. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment. EXP must be contacted immediately, if any unforeseen Site conditions are experienced during construction activities. This will allow EXP to review the new findings and provide appropriate recommendations to allow the construction to proceed in a timely and cost-effective manner.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

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We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

EXP Services Inc.



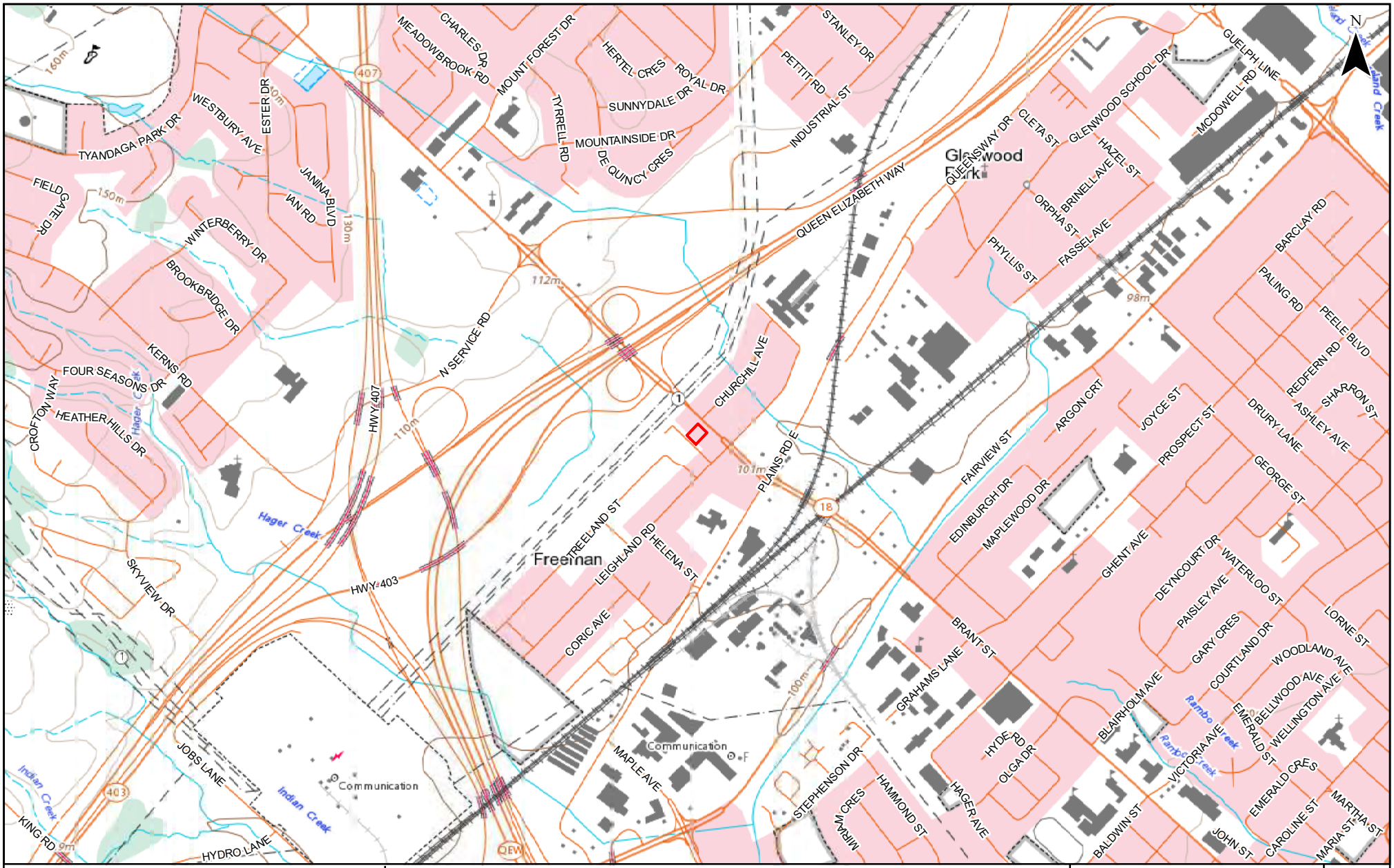

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Environmental Services

# 8 References


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# Figures




SCALE:

0 150 300 450 600 750 m

LEGEND:

APPROXIMATE SITE BOUNDARY

SITE LOCATION PLAN

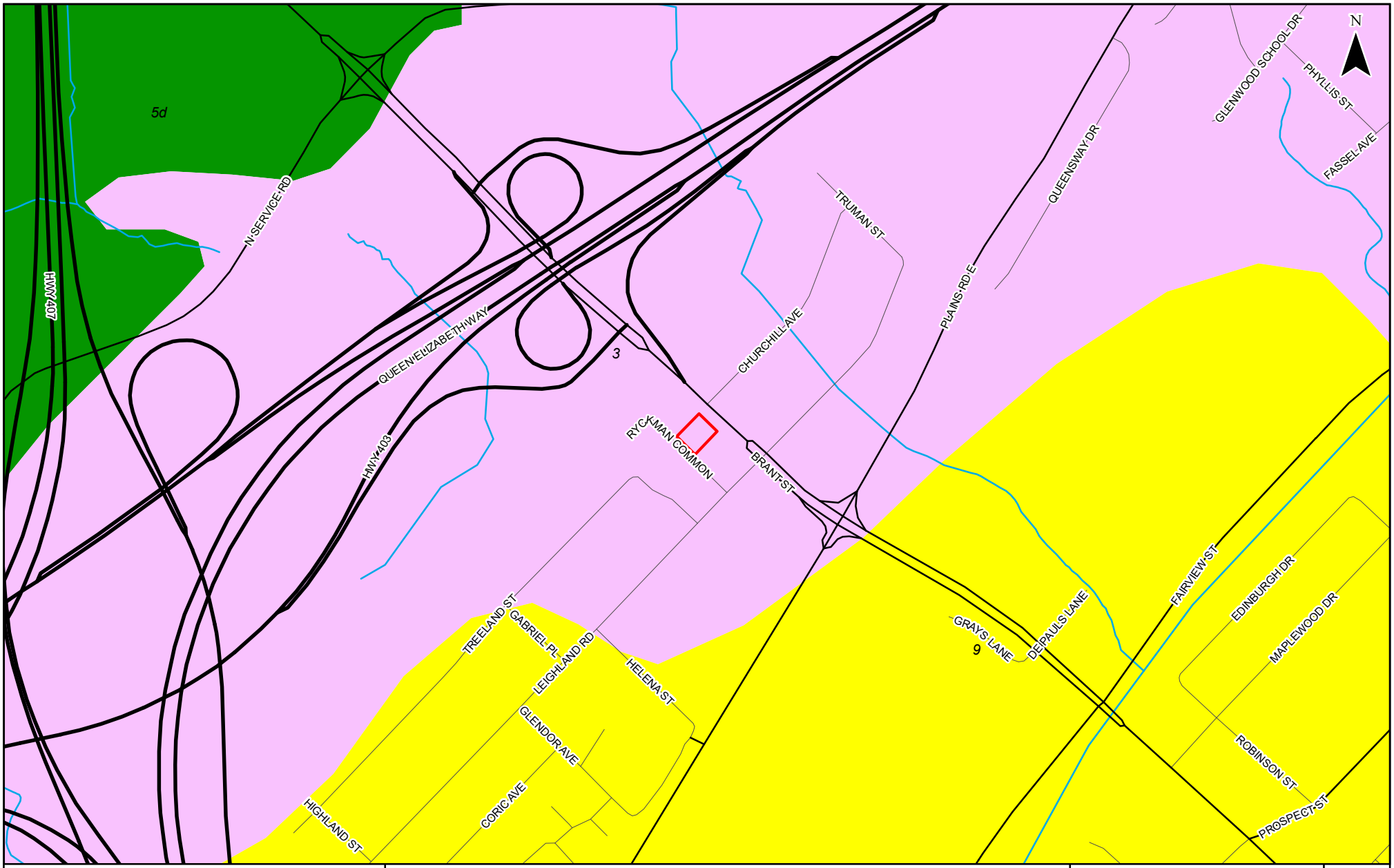
FIGURE: 1

HYDROGEOLOGICAL INVESTIGATION
1056 & 1060 BRANT STREET
BURLINGTON, ONTARIO

| DRAWN BY: | CHECKED BY: |
|---|---|
| AC | HL |

PROJECT NUMBER: GTR-22029875-A0

DATE: APRIL 2023




SCALE:

0 100 200 300 400 500 m

SOURCE:

BASED ON ONTARIO GEOLOGICAL SURVEY DATA PUBLISHED IN 2010

LEGEND:

- APPROXIMATE SITE BOUNDARY
- 9: COARSE-TEXTURED GLACIOLACUSTRINE DEPOSITS
- 5D: GLACIOLACUSTRINE-DERIVED SILTY TO CLAYEY TILL
- 3: PALEOZOIC BEDROCK

| DRAWN BY: | CHECKED BY: |
|---|---|
| AC | HL |

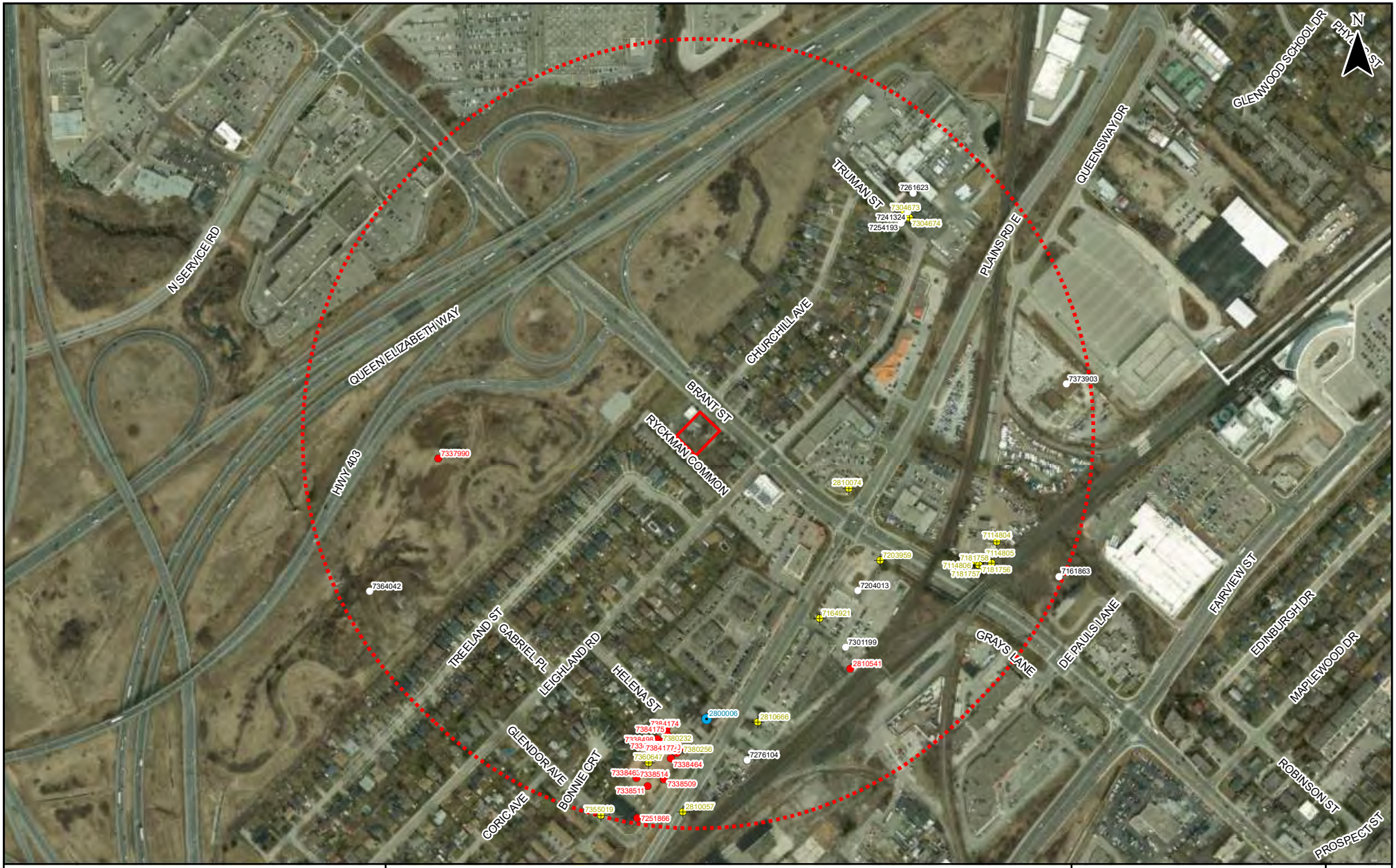
# SURFICIAL GEOLOGY

FIGURE: 2

HYDROGEOLOGICAL INVESTIGATION
1056 & 1060 BRANT STREET
BURLINGTON, ONTARIO

PROJECT NUMBER: GTR-22029875-A0

DATE: APRIL 2023




SCALE:

0 80 160 240 320 400 m

SOURCE:

BASED ON GOOGLE EARTH IMAGERY DATED 2021,
AVAILABLE WELL RECORD INFORMATION AS OF MARCH 2021

exp.

| DRAWN BY: | CHECKED BY: |
|---|---|
| AC | HL |

LEGEND:

- MONITORING WELL / TEST HOLE
- WATER SUPPLY WELL
- ABANDONED WELL
- UNCLASSIFIED / UNFINISHED WELL
- APPROXIMATE SITE BOUNDARY
- 500 m ZONE

# MECP WATER WELL RECORDS MAP

FIGURE: 3

HYDROGEOLOGICAL INVESTIGATION
1056 & 1060 BRANT STREET
BURLINGTON, ONTARIO

PROJECT NUMBER: GTR-22029875-A0

DATE: APRIL 2023




SCALE:

0 5 10 15 20 25 m

LEGEND:

- BOREHOLE (EXP, 2023)
- BOREHOLE / MONITORING WELL (EXP, 2023)
- CROSS SECTION AXIS
- APPROXIMATE SITE BOUNDARY

| DRAWN BY: | CHECKED BY: |
|---|---|
| AC | HL |

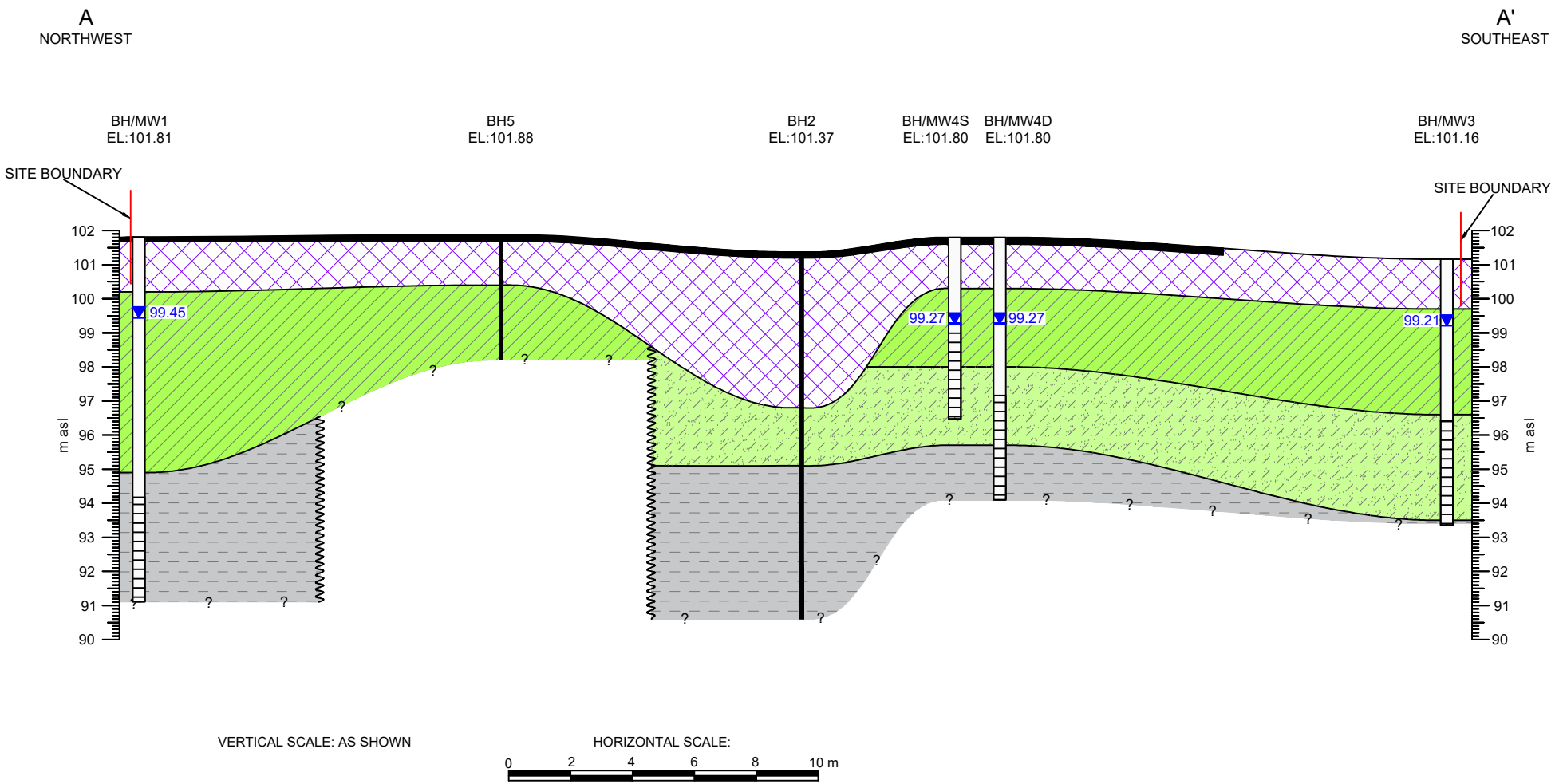
# BOREHOLE / MONITORING WELL LOCATION PLAN

FIGURE: 4

HYDROGEOLOGICAL INVESTIGATION
1056 & 1060 BRANT STREET
BURLINGTON, ONTARIO

PROJECT NUMBER: GTR-22029875-A0

DATE: APRIL 2023




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LEGEND:

- ASPHALT / GRANULAR MATERIAL
- FILL
- SILTY CLAY TILL
- SANDY SILT TILL
- SHALE BEDROCK
- GROUNDWATER ELEVATION (masl) AS MEASURED ON MARCH 24, 2023

TITLE AND LOCATION:

CROSS SECTION A-A'
HYDROGEOLOGICAL INVESTIGATION
1056 AND 1060 BRANT STREET
BURLINGTON, ONTARIO

| PROJECT NO.: | DWN.: |
|---|---|
| GTR-22029875-A0 | HY |
| SCALE: | CK: |
| AS NOTED | HL |
| DATE: | FIG. NO.: |
| APRIL 2023 | 5 |

\\exp\data\BRM\GTR-22029875-A0\60 Execution\65 Drawings\CAD - HG\GTR-22029875-A0.dwg




SCALE:

0 5 10 15 20 25 m

LEGEND:

- BOREHOLE / MONITORING WELL (EXP, 2023)
- APPROXIMATE SITE BOUNDARY
- XX.XX GROUNDWATER ELEVATION (m asl) AS MEASURED ON MARCH 24, 2023
- GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION

| DRAWN BY: | CHECKED BY: |
|---|---|
| AC | HL |

GROUNDWATER CONTOUR PLAN

FIGURE: 6

HYDROGEOLOGICAL INVESTIGATION
1056 & 1060 BRANT STREET
BURLINGTON, ONTARIO

PROJECT NUMBER: GTR-22029875-A0

DATE: APRIL 2023

# Appendix A – MECP WWR Summary Table

| Off-Site | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BORE_HOLE_ID | WELL_ID | DATE | EAST83 | NORTH83 | ELEVATION (m ASL) | LOCATION ACCURACY | STREET | CITY | DISTANCE FROM SITE CENTROID (m) | CONSTRUCTION METHOD | WELL DEPTH (m bgs) | WATER FOUND (m bgs) | CASING DIAMETER (cm) | 1st USE | 2nd USE | FINAL STATUS |
| 10146563 | 2800006 | 11/20/1952 | 595682 | 4798804 | 99.1 | margin of error : 100 m - 300 m | | | 383 | Cable Tool | 27.4 | 27.4 | 15.2 | Domestic | | Water Supply |
| 11174674 | 2810057 | 4/29/2004 | 595650 | 4798680 | 95.7 | margin of error : 10 - 30 m | 2201 PLAINS RD E | BURLINGTON | 507 | Boring | 6.0 | 3.0 | 5.0 | | | Observation Wells |
| 11174691 | 2810074 | 9/8/2004 | 595872 | 4799113 | 100.4 | margin of error : 10 - 30 m | 2011 PLAINS RD E | BURLINGTON | 215 | Boring | 8.0 | 6.0 | 5.0 | | | Observation Wells |
| 11692871 | 2810666 | 10/27/2006 | 595750 | 4798800 | 98.5 | margin of error : 10 - 30 m | 1382 PLAINS RD EAST | BURLIGNTON | 395 | Boring | 3.0 | 1.0 | 5.1 | | | Observation Wells |
| 1001880127 | 7114804 | 10/27/2008 | 596070 | 4799042 | 98.7 | margin of error : 10 - 30 m | 2070 QUEENSWAY BLVD. | BURLINGTON | 425 | DIRECT PUSH | 4.3 | | 5.2 | Monitoring and Test Hole | | Monitoring and Test Hole |
| 1001880130 | 7114805 | 10/27/2008 | 596052 | 4799019 | 99.1 | margin of error : 10 - 30 m | 2070 QUEENSWAY BLVD. | BURLINGTON | 417 | DIRECT PUSH | 4.3 | | 5.2 | Monitoring and Test Hole | | Monitoring and Test Hole |
| 1001880133 | 7114806 | 10/27/2008 | 596040 | 4799016 | 99.1 | margin of error : 10 - 30 m | 2070 QUEEENSWAY BLVD. | BURLINGTON | 407 | DIRECT PUSH | 4.0 | | 5.2 | Monitoring and Test Hole | | Monitoring and Test Hole |
| 1003529350 | 7164921 | 1/31/2011 | 595833 | 4798939 | 99.4 | Approximate location: margin of error : 300 m - 1 km | | | 296 | Rotary (Convent.) | 4.6 | | 4.6 | Monitoring | | Observation Wells |
| 1003809847 | 7181756 | 5/14/2012 | 596046 | 4799010 | 99.1 | margin of error : 100 m - 300 m | 2070 QUEENSWAY DR | Burlington | 415 | Driving | 3.0 | | 3.8 | Monitoring | | Observation Wells |
| 1003809850 | 7181757 | 5/14/2012 | 596051 | 4799006 | 99.1 | margin of error : 30 m - 100 m | 2070 QUEENSWAY DR | Burlington | 421 | Driving | 3.0 | | 3.8 | Monitoring | | |
| 1003809863 | 7181758 | 5/14/2012 | 596063 | 4799013 | 98.5 | margin of error : 100 m - 300 m | 2070 QUEENSWAY DR | Burlington | 429 | Driving | 3.0 | | 3.8 | Monitoring | | Observation Wells |
| 1004381696 | 7203959 | 6/14/2013 | 595914 | 4799017 | 97.0 | margin of error : 30 m - 100 m | 1446 PLAINS RD E | Burlington | 297 | Rotary (Convent.) | 4.6 | | 5.1 | Test Hole | | Test Hole |
| 11552451 | 2810541 | 4/25/2006 | 595874 | 4798871 | 99.4 | margin of error : 10 - 30 m | 1390-1400 PLAINS RD. | BIRLINGTON | 376 | Other Method | 3.7 | | 5.1 | | | Abandoned-Other |
| 1005793606 | 7251866 | 5/26/2015 | 595589 | 4798671 | 98.5 | margin of error : 30 m - 100 m | 1325 PLAINS RD. E | BURLINGTON | 522 | | | | | Monitoring | | Abandoned-Other |
| 1006978433 | 7304673 | 11/22/2017 | 595946 | 4799482 | 102.3 | margin of error : 30 m - 100 m | 1055 TRUMAN STREET | BURLINGTON | 404 | Boring | 4.2 | 2.0 | | Test Hole | Monitoring | Observation Wells |
| 1006978436 | 7304674 | 11/22/2017 | 595953 | 4799476 | 102.3 | margin of error : 30 m - 100 m | 1055 TRUMAN STREET | Burlington | 405 | Boring | 4.2 | 2.0 | | Test Hole | Monitoring | Observation Wells |
| 1008307492 | 7360647 | 5/14/2020 | 595604 | 4798745 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 446 | Auger | 4.6 | 3.1 | | Monitoring | | Observation Wells |
| 1008568338 | 7380232 | 1/28/2021 | 595620 | 4798771 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 418 | Auger | 8.5 | 2.4 | | Monitoring | | Observation Wells |
| 1008568591 | 7380254 | 1/28/2021 | 595630 | 4798775 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 413 | Direct Push | 4.0 | 1.8 | | Monitoring | | Observation Wells |
| 1008568594 | 7380255 | 1/28/2021 | 595640 | 4798776 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 411 | Direct Push | 4.0 | 1.8 | | Monitoring | | Observation Wells |
| 1008568597 | 7380256 | 1/28/2021 | 595646 | 4798764 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 423 | Direct Push | 4.0 | 1.8 | | Monitoring | | Observation Wells |
| 1007557338 | 7338455 | 5/17/2019 | 595637 | 4798762 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 426 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557362 | 7338463 | 5/17/2019 | 595598 | 4798732 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 460 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557365 | 7338464 | 5/17/2019 | 595634 | 4798751 | 98.7 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 437 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557467 | 7338498 | 5/17/2019 | 595616 | 4798777 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 413 | | | 0.8 | | Not Used | | Abandoned-Other |
| 1007557488 | 7338505 | 5/17/2019 | 595622 | 4798773 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 416 | | | 0.8 | | Not Used | | Abandoned-Other |
| 1007557491 | 7338506 | 5/17/2019 | 595626 | 4798771 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 418 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557494 | 7338507 | 5/17/2019 | 595631 | 4798767 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 421 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557497 | 7338508 | 5/17/2019 | 595623 | 4798763 | 98.8 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 426 | | | 0.9 | | Not Used | | Abandoned-Other |
| 1007557500 | 7338509 | 5/17/2019 | 595625 | 4798723 | 98.2 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 466 | | | 1.8 | | Not Used | | Abandoned-Other |
| 1007557506 | 7338511 | 5/17/2019 | 595603 | 4798714 | 99.0 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 477 | | | 1.2 | | Not Used | | Abandoned-Other |
| 1007557515 | 7338514 | 5/17/2019 | 595588 | 4798725 | 98.5 | margin of error : 30 m - 100 m | 1335 Plains Road East | Burlington | 469 | | | 1.2 | | Not Used | | Abandoned-Other |
| 1008583691 | 7382220 | 2/18/2021 | 595630 | 4798775 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 413 | | | 1.8 | | | | Abandoned-Other |
| 1008583694 | 7382221 | 2/18/2021 | 595640 | 4798776 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 411 | | | 1.8 | | | | Abandoned-Other |
| 1008583697 | 7382222 | 2/18/2021 | 595646 | 4798764 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 423 | | | 1.8 | | | | Abandoned-Other |
| 1008598775 | 7384174 | 3/11/2021 | 595628 | 4798790 | 98.4 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 399 | | | 0.9 | | | | Abandoned-Other |
| 1008598778 | 7384175 | 3/11/2021 | 595629 | 4798783 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 405 | | | 1.4 | | | | Abandoned-Other |
| 1008598781 | 7384176 | 3/11/2021 | 595645 | 4798775 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 412 | | | 1.6 | | | | Abandoned-Other |
| 1008598784 | 7384177 | 3/11/2021 | 595642 | 4798758 | 98.8 | margin of error : 30 m - 100 m | 1355 Plains Road East | Burlington | 429 | | | 0.9 | | | | Abandoned-Other |
| 1008204469 | 7355019 | 1/14/2020 | 595540 | 4798675 | 98.5 | margin of error : 30 m - 100 m | Glendor Ave | Burlington | 528 | Rotary (Convent.) | 6.1 | | | Monitoring and Test Hole | | Monitoring and Test Hole |
| 1003496138 | 7161863 | 3/10/2011 | 596153 | 4798995 | 95.8 | margin of error : 10 - 30 m | | | 519 | | | | | | | |
| 1004383798 | 7204013 | 6/13/2013 | 595884 | 4798976 | 99.6 | margin of error : 30 m - 100 m | | | 300 | | | | | | | |
| 1005355427 | 7241324 | 4/15/2015 | 595951 | 4799484 | 102.3 | margin of error : 30 m - 100 m | | | 409 | | | | | | | |
| 1005835461 | 7254193 | 11/20/2015 | 595942 | 4799469 | 102.3 | margin of error : 30 m - 100 m | | | 392 | | | | | | | |
| 1005934111 | 7261623 | 3/23/2016 | 595958 | 4799509 | 102.4 | margin of error : 30 m - 100 m | | | 432 | | | | | | | |
| 1006298681 | 7276104 | 4/25/2016 | 595736 | 4798749 | 98.8 | margin of error : 30 m - 100 m | | | 442 | | | | | | | |
| 1006870681 | 7301199 | 11/21/2017 | 595868 | 4798900 | 99.1 | margin of error : 30 m - 100 m | | | 348 | | | | | | | |
| 1007541027 | 7337990 | | 595323 | 4799153 | 100.5 | margin of error : 30 m - 100 m | 480 GUELPH LINE | | 349 | | | | | | | Abandoned-Other |
| 1008415053 | 7364042 | 2/11/2020 | 595231 | 4798975 | 105.2 | margin of error : 30 m - 100 m | | | 487 | | | | | | | |
| 1008519240 | 7373903 | 9/25/2020 | 596163 | 4799253 | 99.6 | margin of error : 30 m - 100 m | | | 497 | | | | | | | |

| | COUNT |
|---|---|
| Monitoring Well / Test Hole | 19 |
| Dewatering Well | 0 |
| Water Supply Well | 1 |
| Abandoned Well | 21 |
| Unclassified / Unfinished Well | 9 |
| TOTAL | 50 |

# Appendix B – Borehole Logs

# Log of Borehole BH-1

Project No. GTR-22029875-A0 Drawing No. 3

Project: Proposed Mid-Rise Residential Development Sheet No. 1 of 1

Location: 1056 & 1060 Brant Street, Burlington, Ontario

Date Drilled: March 7, 2023

Drill Type: D-120 Truck Mount. Hollow Stem

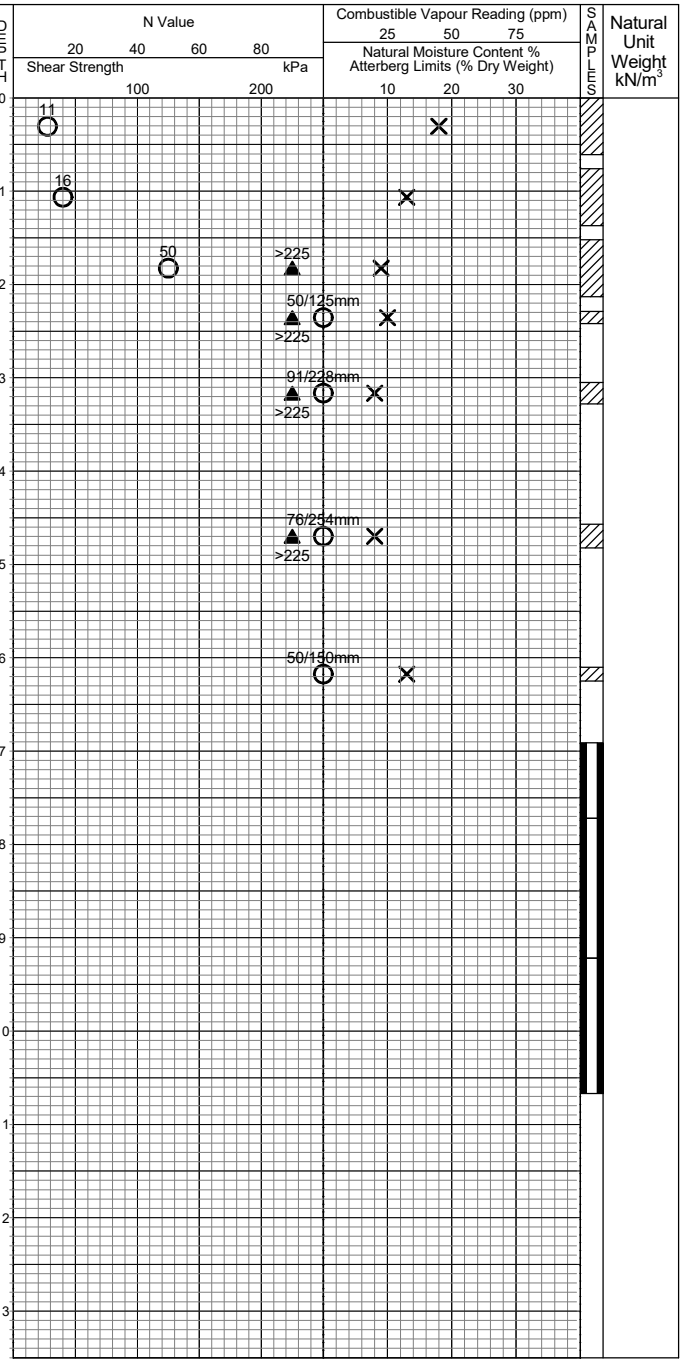
Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

| GWL | SYMBOL | Soil Description | ELEV. m |
|---|---|---|---|
| | | | 101.81 |
| | | **ASPHALT:** (~15 mm thick) | ~101.8 |
| | | **GRANULAR:** (~125 mm thick) | ~101.7 |
| | | **FILL:** silty clay, some sand, trace gravel, brown, moist, dark brown organic staining in upper 600 mm | |
| | | **SILTY CLAY TILL:** trace sand and gravel, brown, moist, hard, trace shale inclusions | ~100.2 |
| | | some gravel below 3.1 m | ~99.4 |
| | | 50 mm thick sandy silt layer at 4.6 m | |
| | | 100 mm thick wet gravel layer at 6.1 m | |
| | | **SHALE BEDROCK:** highly weathered to slightly weathered, red, damp | ~94.9 |
| | | RUN 1 (6.90 - 7.72 m): Recovery 86%, RQD 28% (Poor) | |
| | | RUN 2 (7.72 - 9.22 m): Recovery 96%, RQD 72% (Fair) | |
| | | RUN 3 (9.22 - 10.67 m): Recovery 100%, RQD 85% (Good) | |
| | | **Borehole terminated at 10.7 m depth below existing grade in shale bedrock.** | ~91.1 |

NOTES:
1. This drawing is to be read with the subject report and project number as presented above.
2. Interpretation assistance by EXP is required before use by others.




LAGWGLJFHAM-EXP BH LOGS-22029875.GPJ NEW.GDT 5/5/23


EXP Services Inc.
Hamilton, Ontario
Telephone: 905.573.4000
Facsimile: 905.573.9693


| Time | Water Level (m) | Depth to Cave (m) |
|---|---|---|
| on completion | dry | open |
| March 24, 2023 | 2.4 | -- |

# Log of Borehole BH-2

Project No. GTR-22029875-A0 Drawing No. 4

Project: Proposed Mid-Rise Residential Development Sheet No. 1 of 1

Location: 1056 & 1060 Brant Street, Burlington, Ontario

Date Drilled: March 6, 2023

Drill Type: D-120 Truck Mount. Hollow Stem

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

| GWL | SYMBOL | Soil Description | ELEV. m | DEPTH |
|---|---|---|---|---|
| | | **GRANULAR:** (~150 mm thick) | 101.37 | 0 |
| | | **FILL:** silty clay, some sand, trace gravel, brown, moist, trace organics, trace concrete | ~101.2 | |
| | | wet below 4.6 m | | |
| | | **SANDY SILT TILL:** some gravel, trace to some clay, some gravel, brown, moist, very dense | ~96.8 | |
| | | clayey below 5.3 m | | |
| | | **SHALE BEDROCK:** highly to slightly weathered, some silty clay till layers, reddish brown | ~95.1 | |
| | | **Borehole terminated at 10.8 m depth below existing grade due to spoon refusal in shale bedrock.** | ~90.6 | 11 |

NOTES:
1. This drawing is to be read with the subject report and project number as presented above.
2. Interpretation assistance by EXP is required before use by others.

N Value: 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

SAMPLES

Natural Unit Weight kN/m³

| Depth | N Value |
|---|---|
| 0 | 11 |
| 1 | 10 |
| 2 | 39 |
| 3 | 62 |
| 4 | 38 |
| 5 | 50/125mm |
| 6 | 98 |
| 7 | 50/150mm |
| 8 | 87/200mm |
| 9 | 50/150mm |
| 10 | 50/125mm |
| 11 | 50/100mm |
| 12 | |
| 13 | |

LAGWGLJFHAM-EXP BH LOGS-22029875.GPJ NEW.GDT 5/12/23

EXP Services Inc.
Hamilton, Ontario
Telephone: 905.573.4000
Facsimile: 905.573.9693

| Time | Water Level (m) | Depth to Cave (m) |
|---|---|---|
| on completion | dry | open |

# Log of Borehole BH-3

Project No. GTR-22029875-A0 Drawing No. 5

Project: Proposed Mid-Rise Residential Development Sheet No. 1 of 1

Location: 1056 & 1060 Brant Street, Burlington, Ontario

Date Drilled: March 2, 2023

Drill Type: D-120 Truck Mount. Hollow Stem

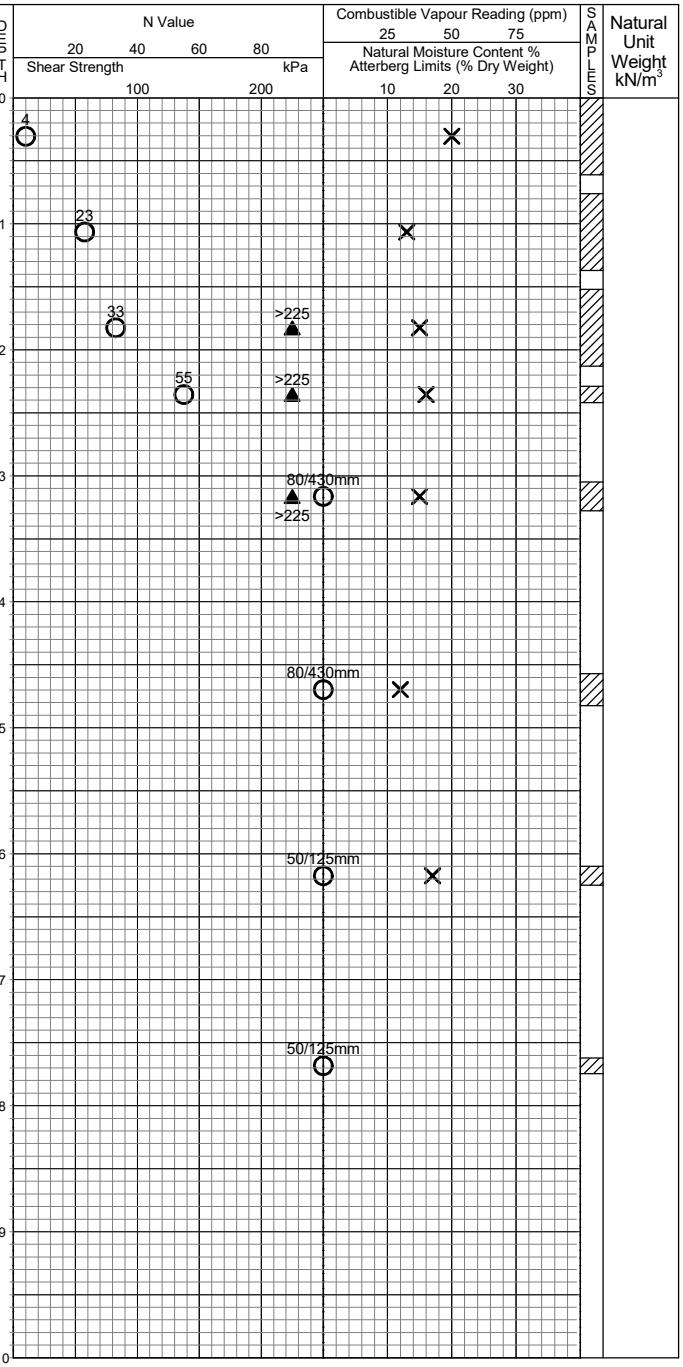
Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test S

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

| GWL | SYMBOL | Soil Description | ELEV. m |
|---|---|---|---|
| | | | 101.16 |
| | | **TOPSOIL:**> (~150 mm thick) | ~101.0 |
| | | **FILL:** silty clay, some sand, trace gravel, brown, moist, trace rootlets, trace dark brown organic staining, trace shale fragments | |
| | | | ~99.7 |
| | | **SILTY CLAY TILL:** trace sand and gravel, brown, moist, hard, trace shale inclusions | ~99.2 |
| | | reddish brown below 3.1 m | |
| | | | ~96.6 |
| | | **SANDY SILT TILL:** some gravel, trace clay, reddish brown, moist, very dense | |
| | | clayey below 6.1 m | |
| | | | ~93.5 |
| | | **SHALE BEDROCK:** highly weathered, reddish brown | ~93.4 |
| | | **Borehole terminated at 7.8 m depth below existing grade due to spoon refusal in shale bedrock.** | |

NOTES:
1. This drawing is to be read with the subject report and project number as presented above.
2. Interpretation assistance by EXP is required before use by others.




LAGWGLJFHAM-EXP BH LOGS-22029875.GPJ NEW.GDT 5/5/23


EXP Services Inc.
Hamilton, Ontario
Telephone: 905.573.4000
Facsimile: 905.573.9693


| Time | Water Level (m) | Depth to Cave (m) |
|---|---|---|
| on completion | dry | open |
| March 24, 2023 | 2.0 | -- |

# Log of Borehole BH-4

Project No. GTR-22029875-A0 Drawing No. 6

Project: Proposed Mid-Rise Residential Development Sheet No. 1 of 1

Location: 1056 & 1060 Brant Street, Burlington, Ontario

Date Drilled: March 3, 2023

Drill Type: D-120 Truck Mount. Hollow Stem

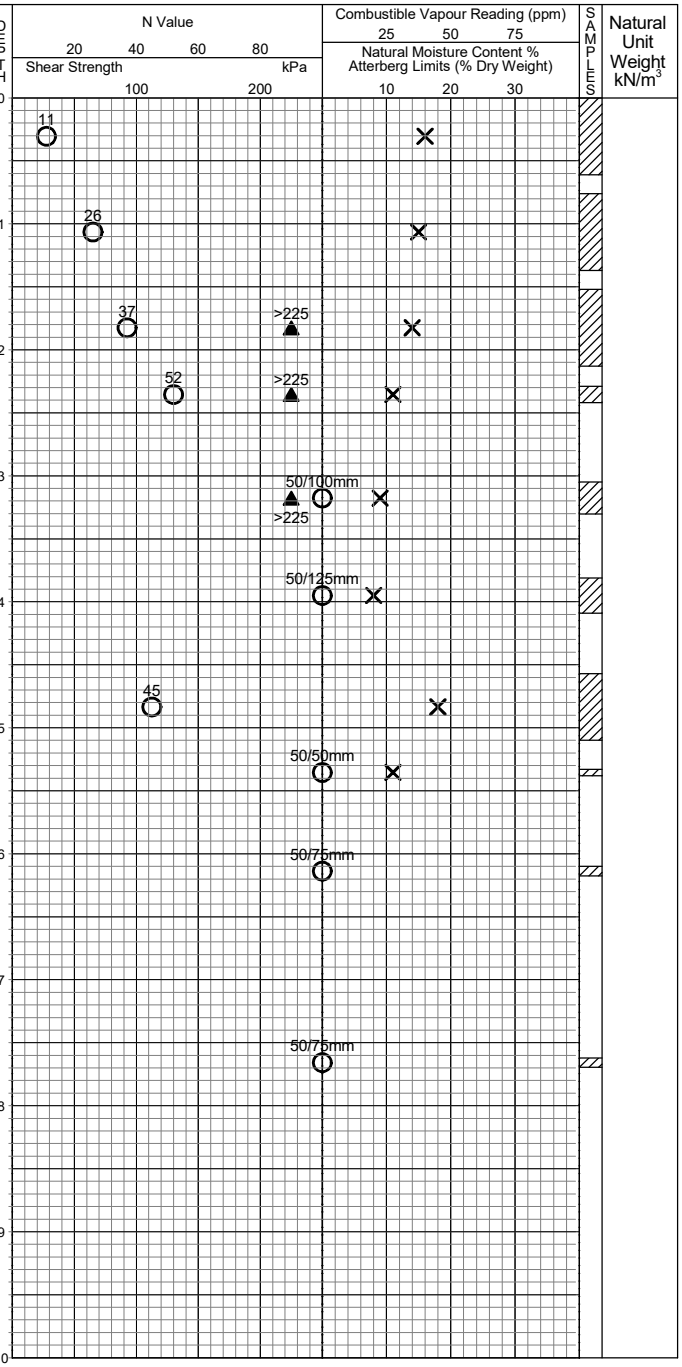
Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

| GWL | SYMBOL | Soil Description | ELEV. m |
|---|---|---|---|
| | | | 101.80 |
| | | **ASPHALT:** (~20 mm thick) | ~101.8 |
| | | **GRANULAR:** (~180 mm thick) | ~101.6 |
| | | **FILL:** silty clay, trace to some sand, trace gravel, brown, moist, trace black organic staining | |
| | | | ~100.3 |
| | | **SILTY CLAY TILL:** trace sand and gravel, brown, moist, hard, trace shale inclusions | |
| ▼ | | | ~99.3 |
| | | **SANDY SILT TILL:** some gravel, trace clay, reddish brown, moist, very dense | ~98.0 |
| | | clayey below 4.6 m | |
| | | trace shale fragments below 5.3 | |
| | | | ~95.7 |
| | | **SHALE BEDROCK:** highly weathered, reddish brown | |
| | | | ~94.1 |
| | | **Borehole terminated at 7.7 m depth below existing grade due to spoon refusal in shale bedrock.** | |

NOTES:
1. This drawing is to be read with the subject report and project number as presented above.
2. Interpretation assistance by EXP is required before use by others.




LAGWGLJFHAM-EXP BH LOGS-22029875.GPJ NEW.GDT 5/5/23


EXP Services Inc.
Hamilton, Ontario
Telephone: 905.573.4000
Facsimile: 905.573.9693


| Time | Water Level (m) | Depth to Cave (m) |
|---|---|---|
| on completion | dry | open |
| March 24, 2023 | 2.5 | -- |

# Log of Borehole BH-5

Project No. GTR-22029875-A0 Drawing No. 7

Project: Proposed Mid-Rise Residential Development Sheet No. 1 of 1

Location: 1056 & 1060 Brant Street, Burlington, Ontario

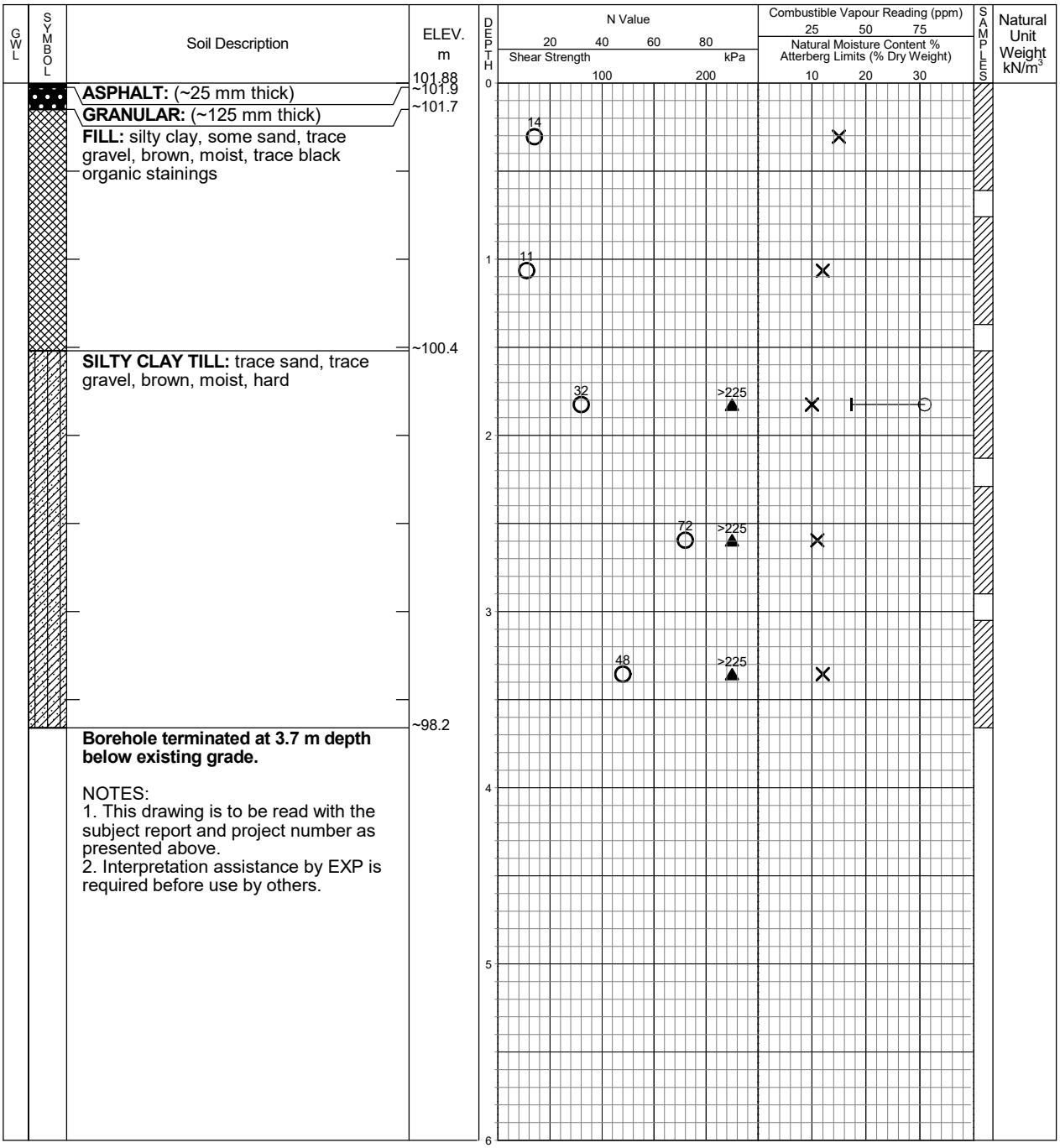
Date Drilled: March 7, 2023

Drill Type: D-120 Truck Mount. Hollow Stem

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

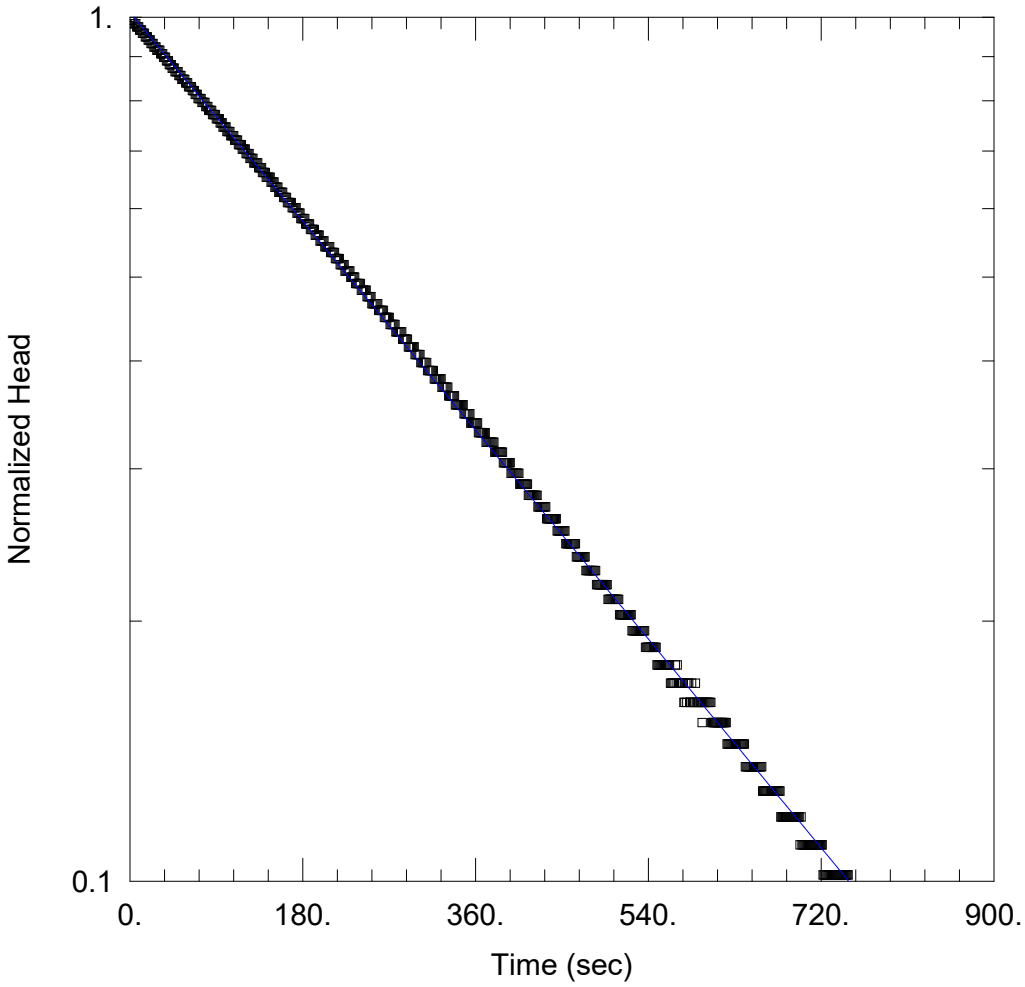



LAGWGLJFHAM-EXP BH LOGS-22029875.GPJ NEW.GDT 5/5/23


EXP Services Inc.
Hamilton, Ontario
Telephone: 905.573.4000
Facsimile: 905.573.9693


| Time | Water Level (m) | Depth to Cave (m) |
|---|---|---|
| on completion | dry | open |

# Appendix C – SWRT Procedures and Results




## BH/MW 1 FALLING HEAD

Data Set: C:\...\BH 1 FH.aqt
Date: 03/24/23 Time: 18:44:47

## PROJECT INFORMATION

Company: EXP Services Inc
Client: 2735842 Ontario Inc.,
Project: GTR_22029875-A0
Location: 1056 & 1060 Brant St, Burlingt
Test Well: BH/MW 1 Falling Head
Test Date: 24 March 2023

## AQUIFER DATA

Saturated Thickness: 8.4 m Anisotropy Ratio (Kz/Kr): 1.

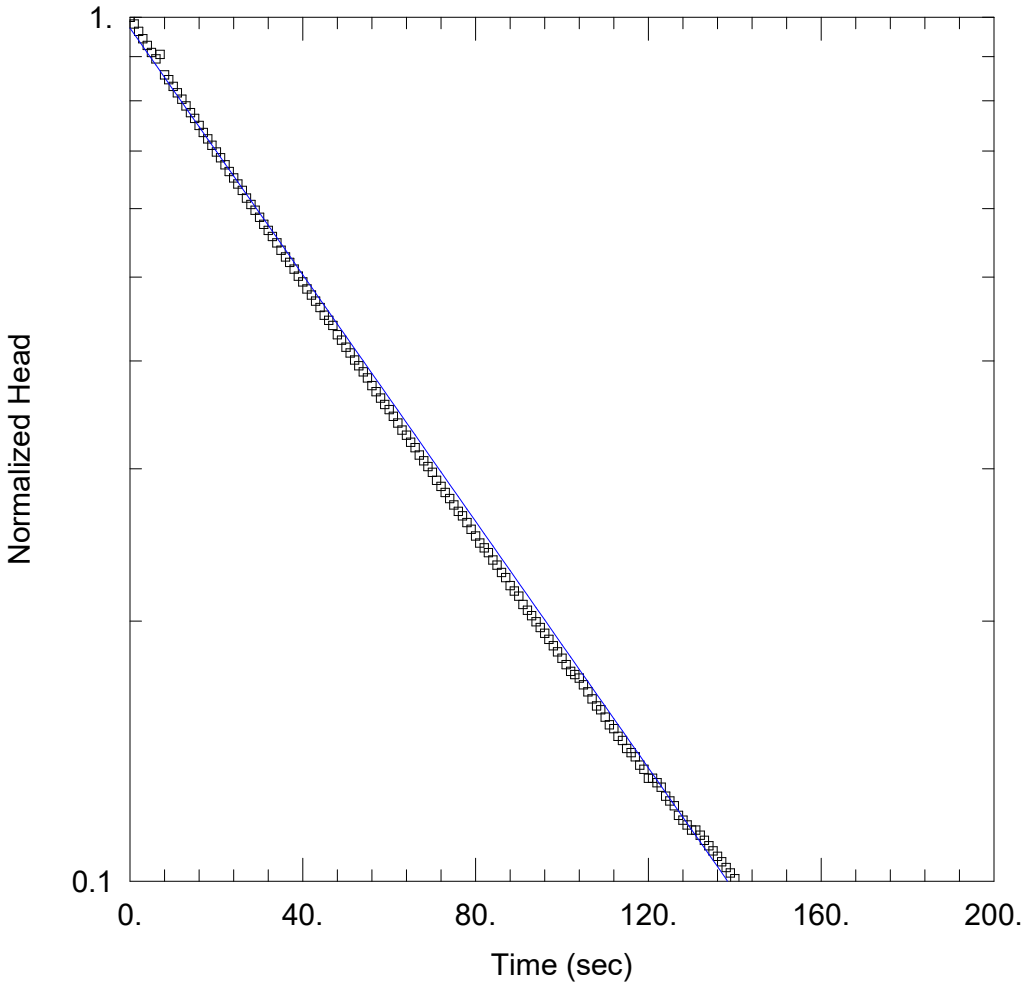
## WELL DATA (BH/MW 1 Falling Head)

Initial Displacement: 0.354 m
Total Well Penetration Depth: 8.4 m
Casing Radius: 0.0254 m
Static Water Column Height: 8.4 m
Screen Length: 3. m
Well Radius: 0.0254 m

## SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.816E-6 m/sec y0 = 0.3581 m




## BH/MW 3 FALLING HEAD

Data Set: C:\...\BH 3 FH.aqt
Date: 03/24/23 Time: 18:48:11

## PROJECT INFORMATION

Company: EXP Services Inc
Client: 2735842 Ontario Inc.,
Project: GTR_22029875-A0
Location: 1056 & 1060 Brant St, Burlingt
Test Well: BH/MW 3 Falling Head
Test Date: 24 March 2023

## AQUIFER DATA

Saturated Thickness: 5.59 m Anisotropy Ratio (Kz/Kr): 1.

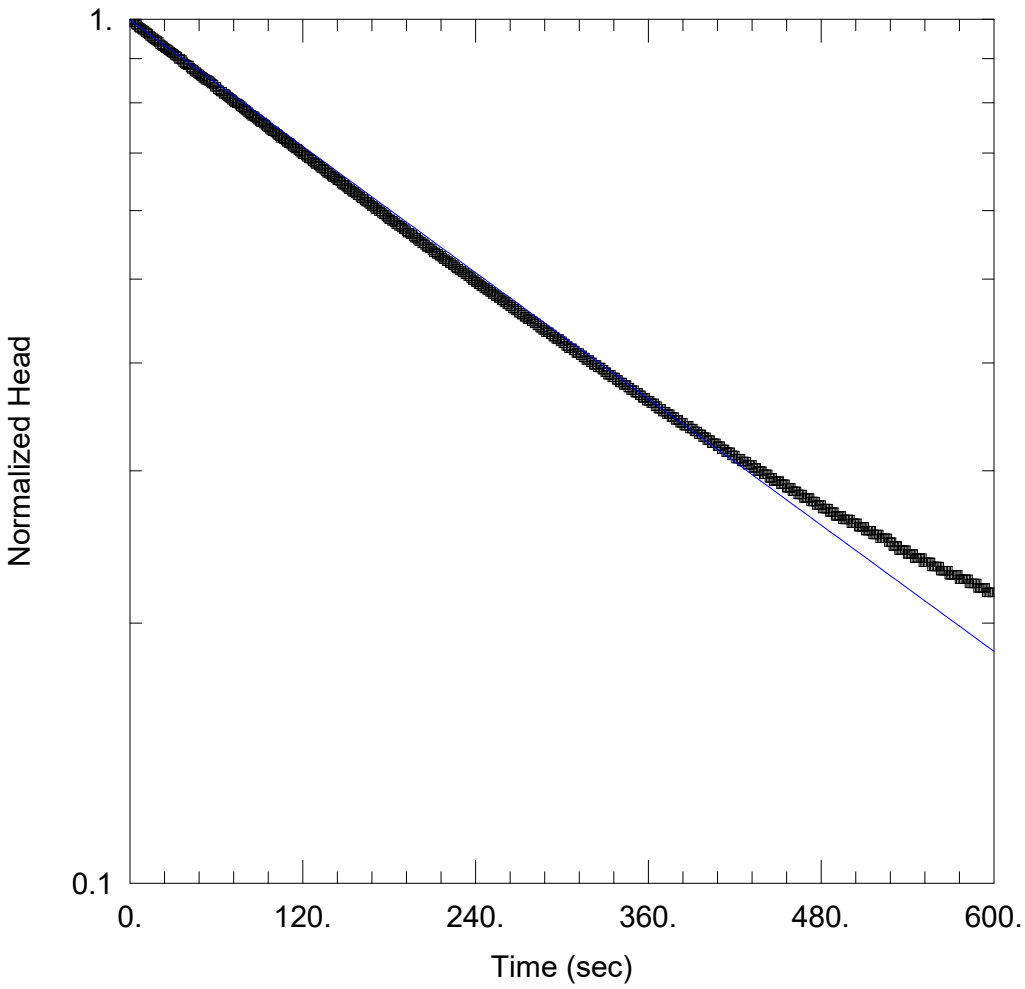
## WELL DATA (BH/MW 3 Falling Head)

Initial Displacement: 1.938 m
Total Well Penetration Depth: 5.59 m
Casing Radius: 0.0254 m
Static Water Column Height: 5.59 m
Screen Length: 3. m
Well Radius: 0.0254 m

## SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 9.655E-6 m/sec y0 = 1.882 m




BH/MW 4D RISING HEAD

Data Set: C:\...\BH 4D RH.aqt
Date: 03/24/23 Time: 18:56:02

PROJECT INFORMATION

Company: EXP Services Inc
Client: 2735842 Ontario Inc.,
Project: GTR_22029875-A0
Location: 1056 & 1060 Brant St, Burlingt
Test Well: BH/MW 4D Rising Head
Test Date: 24 March 2023

AQUIFER DATA

Saturated Thickness: 5.12 m Anisotropy Ratio (Kz/Kr): 1.

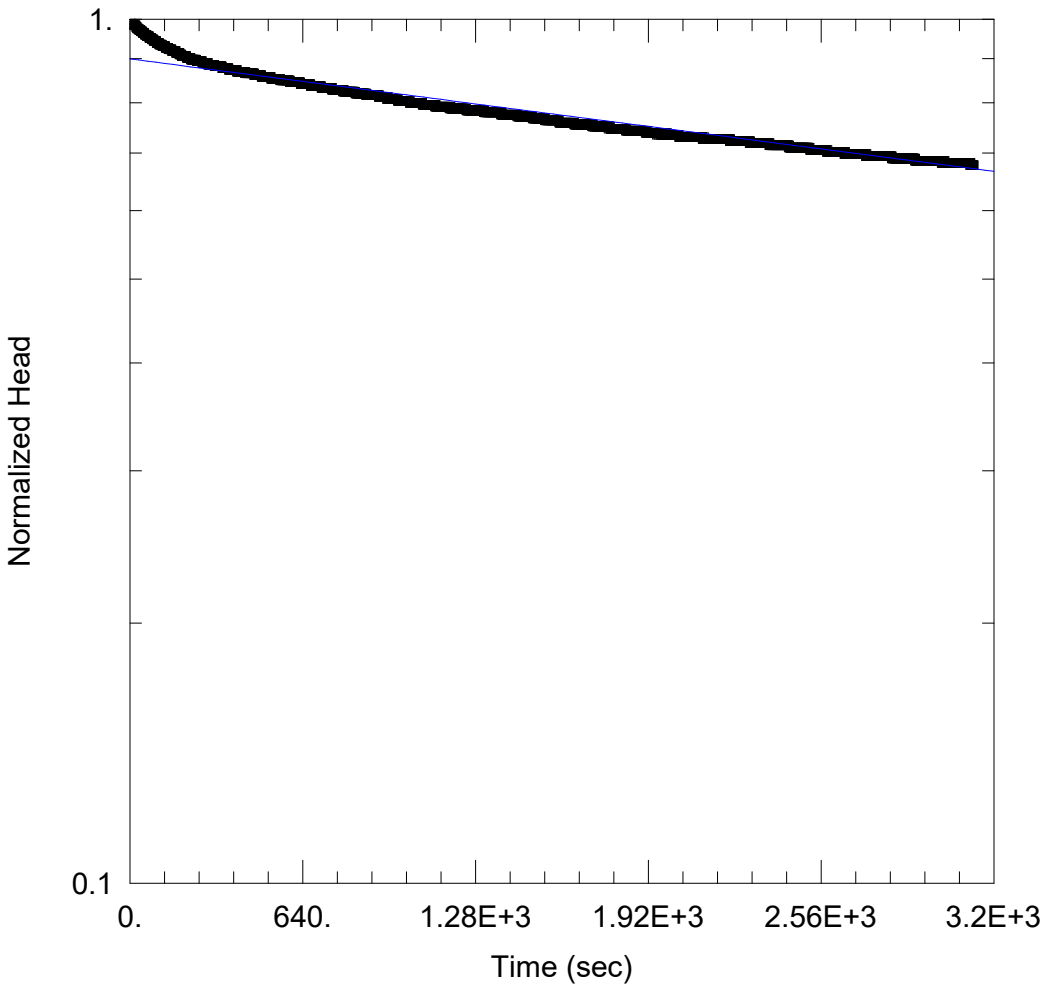
WELL DATA (BH/MW 4D Rising Head)

Initial Displacement: 1.161 m
Total Well Penetration Depth: 5.12 m
Casing Radius: 0.0254 m
Static Water Column Height: 5.12 m
Screen Length: 3. m
Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.648E-6 m/sec y0 = 1.158 m




BH/MW 4S RISING HEAD

Data Set: C:\...\BH 4S RH.aqt
Date: 03/24/23 Time: 18:52:05

PROJECT INFORMATION

Company: EXP Services Inc
Client: 2735842 Ontario Inc.,
Project: GTR_22029875-A0
Location: 1056 & 1060 Brant St, Burlingt
Test Well: BH/MW 4S Rising Head
Test Date: 24 March 2023

AQUIFER DATA

Saturated Thickness: 2.93 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH/MW 4S Rising Head)

Initial Displacement: 0.735 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.0254 m
Static Water Column Height: 2.93 m
Screen Length: 3. m
Well Radius: 0.0254 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

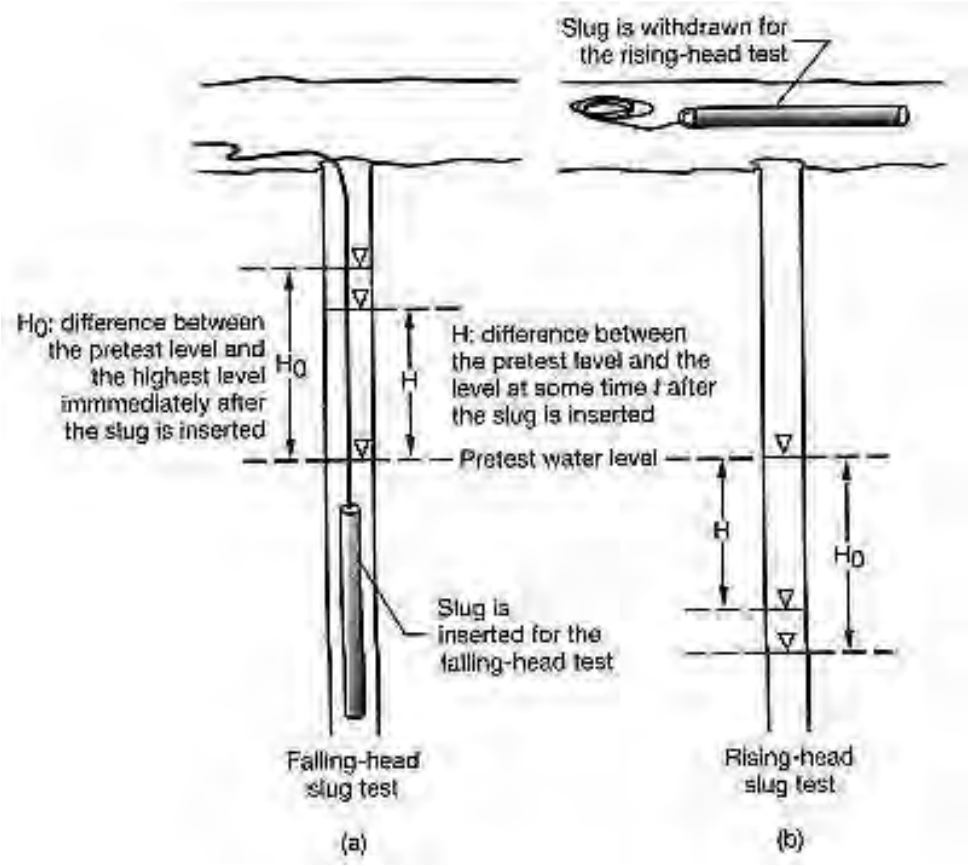
K = 5.465E-8 m/sec y0 = 0.661 m

# Single Well Response Test Procedure

A Single Well Response Test (SWRT), also known as a bail test or a slug test, is conducted in order to determine the saturated hydraulic conductivity (K) of an aquifer. The method of the SWRT is to characterize the change of groundwater level in a well or borehole over time.

In order to ensure consistency and repeatability, all **exp** employees are to follow the procedure outlined in this document when conducting SWRTs.

The figure below depicts a schematic of a slug and bail test and the respective water level changes.





Initials ___

# Slug Test Procedure

## Equipment Required

- Copy of a signed health and safety plan
- Copy of the work program
- PPE as required by Site-Specific HASP
- Copy of the monitoring well location plan/site plan
- Waterproof pen and bound field note book
- SWRT field data Entry form
- Disposable gloves
- Duct tape
- Deionized water
- Alconox (phosphate free detergent)
- Spray bottles
- Electronic water level meter and spare batteries
- Solid PVC or stainless steel slug of known volume or clean water
- String (nylon)
- Water pressure transducer (data logger) and baro-logger
- Watch or stop watch with second hand
- Plastic sheeting

## Testing Procedure

1. Remove cap from well and collect static water level
2. Remove waterra tubing/bailer and place in garbage bag. Record static water level measurement again.
3. Lower the slug into the well and record the dynamic water level.
4. Record the drawdown (for the slug test) at set five (5) second intervals for the first five (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown until 95% recovery is reached. To calculate this value: Find the difference between the dynamic water level and the static water level, then multiply by 95% (.95). Add the resulting value to the dynamic water level.

   (Static Water Level – Dynamic Water Level).95 + Static Water Level = 95% Recovery Value
6. Once complete, replace the waterra tubing/bailer and re-secure the well cap.

**Note:** If the well is deep, more than one slug may be inserted by attaching the slugs to a series.

Slugs must be washed with methanol, then lab grade soap, and then rinsed with de-ionized water after each use.

Based on the recorded observations, the hydraulic conductivity (in m/s) of the aquifer will be determined. In order to determine the hydraulic conductivity; the well diameter, radius of the borehole and length of the screen will also be required.

# Bail Test Procedure

## Equipment Required

- 20 L (5 gal) Graduated pail
- Stop watch or watch with seconds
- Garbage bags
- Water level meter
- Field sheets/log book
- Latex Gloves
- Bailer and Rope

## Procedure

1. Remove cap from well and collect static water level.
2. If using a **bailer**:
    a. Affix the rope to the bailer.
    b. Remove the waterra tubing and place in garbage bag
    c. Record static water level measurement again.
    d. Record how much water was removed by either counting the number of full bailers or emptying removed water into a container.
    e. Quickly lower the bailer into the well and remove.
    f. Continue this process until the water level will reduce no further.
    g. Record the dynamic water level.
3. If using **waterra** to bail the water:
    a. Pump the water into graduated bucket until the water level will reduce no further.
    b. Record how much water has been removed.
    c. Record the dynamic water level.
4. Record the recovery at set five (5) second intervals for the first (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown/recovery until 95% recovery is reached.
6. Once complete, replace any waterra tubing that may have been removed from the well and re-secure the well cap.

# Appendix D – Laboratory's Certificates of Analysis

Your P.O. #: ENV-BRM
Your Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your C.O.C. #: 926372-02-01

**Attention: Francois Chartier**

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

**Report Date: 2023/03/31**
Report #: R7570106
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BUREAU VERITAS JOB #: C383871**
**Received: 2023/03/24, 15:00**

Sample Matrix: Water
# Samples Received: 1

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Sewer Use By-Law Semivolatile Organics | 1 | 2023/03/26 | 2023/03/27 | CAM SOP 00301 | EPA 8270 m |
| Biochemical Oxygen Demand (BOD) | 1 | 2023/03/24 | 2023/03/29 | CAM SOP-00427 | SM 23 5210B m |
| Chromium (VI) in Water | 1 | N/A | 2023/03/27 | CAM SOP-00436 | EPA 7199 m |
| Total Cyanide | 1 | 2023/03/27 | 2023/03/27 | CAM SOP-00457 | OMOE E3015 5 m |
| Mercury in Water by CVAA | 1 | 2023/03/28 | 2023/03/28 | CAM SOP-00453 | EPA 7470A m |
| Total Metals Analysis by ICPMS | 1 | 2023/03/29 | 2023/03/29 | CAM SOP-00447 | EPA 6020B m |
| E.coli, (CFU/100mL) | 1 | N/A | 2023/03/24 | CAM SOP-00552 | |
| Total Nonylphenol in Liquids by HPLC | 1 | 2023/03/27 | 2023/03/29 | CAM SOP-00313 | In-house Method |
| Nonylphenol Ethoxylates in Liquids: HPLC | 1 | 2023/03/27 | 2023/03/29 | CAM SOP-00313 | In-house Method |
| Polychlorinated Biphenyl in Water | 1 | 2023/03/28 | 2023/03/30 | CAM SOP-00309 | EPA 8082A m |
| pH | 1 | 2023/03/27 | 2023/03/27 | CAM SOP-00413 | SM 4500H+ B m |
| Phenols (4AAP) | 1 | N/A | 2023/03/27 | CAM SOP-00444 | OMOE E3179 m |
| Total PAHs (Great Lakes Basin Agreement) (1) | 1 | N/A | 2023/03/28 | CAM SOP - 00301 | EPA 8270 m |
| Total Suspended Solids | 1 | 2023/03/28 | 2023/03/29 | CAM SOP-00428 | SM 23 2540D m |
| Volatile Organic Compounds in Water | 1 | N/A | 2023/03/28 | CAM SOP-00228 | EPA 8260D |

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your P.O. #: ENV-BRM
Your Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your C.O.C. #: 926372-02-01

**Attention: Francois Chartier**

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

**Report Date: 2023/03/31**
Report #: R7570106
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BUREAU VERITAS JOB #: C383871**
**Received: 2023/03/24, 15:00**

dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Total PAHs include only those PAHs specified in the sewer use by-by-law.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C383871
Report Date: 2023/03/31

exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## BURLINGTON STORM SEWER (WATER)

| Bureau Veritas ID | | | VJM954 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2023/03/24 11:00 | | |
| COC Number | | | 926372-02-01 | | |
| | UNITS | Criteria | BH4D | RDL | QC Batch |
| **Inorganics** | | | | | |
| Total BOD | mg/L | 15 | ND | 2 | 8570836 |
| pH | pH | 6.5:8.5 | 7.57 | | 8574667 |
| Phenols-4AAP | mg/L | 0.008 | ND | 0.0010 | 8575797 |
| Total Suspended Solids | mg/L | 15 | **29** | 10 | 8576897 |
| Total Cyanide (CN) | mg/L | 0.02 | ND | 0.0050 | 8574373 |
| **Miscellaneous Parameters** | | | | | |
| Nonylphenol Ethoxylate (Total) | mg/L | 0.01 | ND | 0.005 | 8575257 |
| Nonylphenol (Total) | mg/L | 0.001 | ND | 0.001 | 8575253 |
| **Metals** | | | | | |
| Chromium (VI) | ug/L | 40 | ND | 0.50 | 8574511 |
| Mercury (Hg) | mg/L | 0.0004 | ND | 0.00010 | 8576652 |
| Total Arsenic (As) | ug/L | 20 | 1.7 | 1.0 | 8578971 |
| Total Cadmium (Cd) | ug/L | 8 | ND | 0.090 | 8578971 |
| Total Chromium (Cr) | ug/L | 80 | ND | 5.0 | 8578971 |
| Total Copper (Cu) | ug/L | 40 | ND | 0.90 | 8578971 |
| Total Lead (Pb) | ug/L | 120 | ND | 0.50 | 8578971 |
| Total Manganese (Mn) | ug/L | 50 | **88** | 2.0 | 8578971 |
| Total Nickel (Ni) | ug/L | 80 | 2.0 | 1.0 | 8578971 |
| Total Phosphorus (P) | ug/L | 400 | ND | 100 | 8578971 |
| Total Selenium (Se) | ug/L | 20 | ND | 2.0 | 8578971 |
| Total Silver (Ag) | ug/L | 120 | ND | 0.090 | 8578971 |
| Total Zinc (Zn) | ug/L | 40 | ND | 5.0 | 8578971 |
| **Semivolatile Organics** | | | | | |
| Naphthalene | ug/L | - | ND | 0.3 | 8574031 |
| Di-N-butyl phthalate | ug/L | 15 | ND | 2 | 8574031 |
| Bis(2-ethylhexyl)phthalate | ug/L | 8.8 | ND | 2 | 8574031 |
| 3,3'-Dichlorobenzidine | ug/L | 0.8 | ND | 0.8 | 8574031 |

| | |
|---|---|
| No Fill | No Exceedance |
| Grey | Exceeds 1 criteria policy/level |
| Black | Exceeds both criteria/levels |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: The City of Burlington Storm Sewer Discharge By-Law 59-2022
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C383871
Report Date: 2023/03/31

exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## BURLINGTON STORM SEWER (WATER)

| Bureau Veritas ID | | | VJM954 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2023/03/24 11:00 | | |
| COC Number | | | 926372-02-01 | | |
| | UNITS | Criteria | BH4D | RDL | QC Batch |
| Pentachlorophenol | ug/L | 2 | ND | 1 | 8574031 |
| Phenanthrene | ug/L | - | ND | 0.2 | 8574031 |
| Anthracene | ug/L | - | ND | 0.2 | 8574031 |
| Fluoranthene | ug/L | - | ND | 0.2 | 8574031 |
| Pyrene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(a)anthracene | ug/L | - | ND | 0.2 | 8574031 |
| Chrysene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(b/j)fluoranthene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(k)fluoranthene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(a)pyrene | ug/L | - | ND | 0.2 | 8574031 |
| Indeno(1,2,3-cd)pyrene | ug/L | - | ND | 0.2 | 8574031 |
| Dibenzo(a,h)anthracene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(g,h,i)perylene | ug/L | - | ND | 0.2 | 8574031 |
| Dibenzo(a,i)pyrene | ug/L | - | ND | 0.2 | 8574031 |
| Benzo(e)pyrene | ug/L | - | ND | 0.2 | 8574031 |
| Perylene | ug/L | - | ND | 0.2 | 8574031 |
| Dibenzo(a,j) acridine | ug/L | - | ND | 0.4 | 8574031 |
| 7H-Dibenzo(c,g) Carbazole | ug/L | - | ND | 0.4 | 8574031 |
| 1,6-Dinitropyrene | ug/L | - | ND | 0.4 | 8574031 |
| 1,3-Dinitropyrene | ug/L | - | ND | 0.4 | 8574031 |
| 1,8-Dinitropyrene | ug/L | - | ND | 0.4 | 8574031 |
| **Calculated Parameters** | | | | | |
| Total PAHs | ug/L | 2 | ND | 0.9 | 8572477 |
| **Volatile Organics** | | | | | |
| Benzene | ug/L | 2 | ND | 0.40 | 8574211 |
| Chloroform | ug/L | 2 | ND | 0.40 | 8574211 |
| 1,2-Dichlorobenzene | ug/L | 5.6 | ND | 0.80 | 8574211 |
| 1,4-Dichlorobenzene | ug/L | 6.8 | ND | 0.80 | 8574211 |

| | |
|---|---|
| No Fill | No Exceedance |
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Bureau Veritas Job #: C383871
Report Date: 2023/03/31

exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## BURLINGTON STORM SEWER (WATER)

| Bureau Veritas ID | | | VJM954 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2023/03/24 11:00 | | |
| COC Number | | | 926372-02-01 | | |
| | UNITS | Criteria | BH4D | RDL | QC Batch |
| cis-1,2-Dichloroethylene | ug/L | 5.6 | ND | 1.0 | 8574211 |
| trans-1,3-Dichloropropene | ug/L | 5.6 | ND | 0.80 | 8574211 |
| Ethylbenzene | ug/L | 2 | ND | 0.40 | 8574211 |
| Methylene Chloride(Dichloromethane | ug/L | 5.2 | ND | 4.0 | 8574211 |
| 1,1,2,2-Tetrachloroethane | ug/L | 17 | ND | 0.80 | 8574211 |
| Tetrachloroethylene | ug/L | 4.4 | ND | 0.40 | 8574211 |
| Toluene | ug/L | 2 | ND | 0.40 | 8574211 |
| Trichloroethylene | ug/L | 7.6 | ND | 0.40 | 8574211 |
| Total Xylenes | ug/L | 4.4 | ND | 0.40 | 8574211 |
| **PCBs** | | | | | |
| Aroclor 1016 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1221 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1232 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1242 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1248 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1254 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1260 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1262 | ug/L | - | ND | 0.05 | 8578001 |
| Aroclor 1268 | ug/L | - | ND | 0.05 | 8578001 |
| Total PCB | ug/L | 0.4 | ND | 0.05 | 8578001 |
| **Microbiological** | | | | | |
| Escherichia coli | CFU/100mL | 200 | <10 | 10 | 8573093 |
| **Surrogate Recovery (%)** | | | | | |
| 2,4,6-Tribromophenol | % | - | 49 | | 8574031 |
| 2-Fluorobiphenyl | % | - | 64 | | 8574031 |
| D14-Terphenyl (FS) | % | - | 94 | | 8574031 |
| D5-Nitrobenzene | % | - | 56 | | 8574031 |
| D8-Acenaphthylene | % | - | 76 | | 8574031 |

| | |
|---|---|
| No Fill | No Exceedance |
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## BURLINGTON STORM SEWER (WATER)

| Bureau Veritas ID | | | VJM954 | | |
|---|---|---|---|---|---|
| Sampling Date | | | 2023/03/24 11:00 | | |
| COC Number | | | 926372-02-01 | | |
| | UNITS | Criteria | BH4D | RDL | QC Batch |
| Decachlorobiphenyl | % | - | 100 | | 8578001 |
| 4-Bromofluorobenzene | % | - | 95 | | 8574211 |
| D4-1,2-Dichloroethane | % | - | 113 | | 8574211 |
| D8-Toluene | % | - | 92 | | 8574211 |

| | |
|---|---|
| No Fill | No Exceedance |
| Grey | Exceeds 1 criteria policy/level |
| Black | Exceeds both criteria/levels |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: The City of Burlington Storm Sewer Discharge By-Law 59-2022



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Bureau Veritas Job #: C383871
Report Date: 2023/03/31

exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## TEST SUMMARY

**Bureau Veritas ID:** VJM954
**Sample ID:** BH4D
**Matrix:** Water

**Collected:** 2023/03/24
**Shipped:**
**Received:** 2023/03/24

| Test Description | Instrumentation | Batch | Extracted | Date Analyzed | Analyst |
|---|---|---|---|---|---|
| Sewer Use By-Law Semivolatile Organics | GC/MS | 8574031 | 2023/03/26 | 2023/03/27 | Adriana Zurita |
| Biochemical Oxygen Demand (BOD) | DO | 8570836 | 2023/03/24 | 2023/03/29 | Gurjot Kaur |
| Chromium (VI) in Water | IC | 8574511 | N/A | 2023/03/27 | Theodora Luck |
| Total Cyanide | SKAL/CN | 8574373 | 2023/03/27 | 2023/03/27 | Kruti Jitesh Patel |
| Mercury in Water by CVAA | CV/AA | 8576652 | 2023/03/28 | 2023/03/28 | Jaswinder Kaur |
| Total Metals Analysis by ICPMS | ICP/MS | 8578971 | 2023/03/29 | 2023/03/29 | Nan Raykha |
| E.coli, (CFU/100mL) | PL | 8573093 | N/A | 2023/03/24 | Soham Patel |
| Total Nonylphenol in Liquids by HPLC | LC/FLU | 8575253 | 2023/03/27 | 2023/03/29 | Furneesh Kumar |
| Nonylphenol Ethoxylates in Liquids: HPLC | LC/FLU | 8575257 | 2023/03/27 | 2023/03/29 | Furneesh Kumar |
| Polychlorinated Biphenyl in Water | GC/ECD | 8578001 | 2023/03/28 | 2023/03/30 | Farag Mansour |
| pH | AT | 8574667 | 2023/03/27 | 2023/03/27 | Taslima Aktar |
| Phenols (4AAP) | TECH/PHEN | 8575797 | N/A | 2023/03/27 | Mandeep Kaur |
| Total PAHs (Great Lakes Basin Agreement) | CALC | 8572477 | N/A | 2023/03/28 | Automated Statchk |
| Total Suspended Solids | BAL | 8576897 | 2023/03/28 | 2023/03/29 | Shaneil Hall |
| Volatile Organic Compounds in Water | GC/MS | 8574211 | N/A | 2023/03/28 | Narayan Ghimire |



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## GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|---|---|
| Package 1 | 6.0°C |

Sample VJM954 [BH4D] : VOC Analysis: Due to sample matrix, sample required dilution. Detection limits were adjusted accordingly.

**Results relate only to the items tested.**



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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

## QUALITY ASSURANCE REPORT



| | | | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8574031 | 2,4,6-Tribromophenol | 2023/03/27 | 89 | 10 - 130 | 88 | 10 - 130 | 71 | % | | | | |
| 8574031 | 2-Fluorobiphenyl | 2023/03/27 | 88 | 30 - 130 | 80 | 30 - 130 | 74 | % | | | | |
| 8574031 | D14-Terphenyl (FS) | 2023/03/27 | 95 | 30 - 130 | 96 | 30 - 130 | 100 | % | | | | |
| 8574031 | D5-Nitrobenzene | 2023/03/27 | 78 | 30 - 130 | 74 | 30 - 130 | 73 | % | | | | |
| 8574031 | D8-Acenaphthylene | 2023/03/27 | 83 | 30 - 130 | 75 | 30 - 130 | 74 | % | | | | |
| 8574211 | 4-Bromofluorobenzene | 2023/03/28 | 101 | 70 - 130 | 101 | 70 - 130 | 98 | % | | | | |
| 8574211 | D4-1,2-Dichloroethane | 2023/03/28 | 111 | 70 - 130 | 106 | 70 - 130 | 108 | % | | | | |
| 8574211 | D8-Toluene | 2023/03/28 | 98 | 70 - 130 | 101 | 70 - 130 | 89 | % | | | | |
| 8578001 | Decachlorobiphenyl | 2023/03/30 | 100 | 60 - 130 | 90 | 60 - 130 | 86 | % | | | | |
| 8570836 | Total BOD | 2023/03/29 | | | | | ND,RDL=2 | mg/L | NC | 30 | 93 | 80 - 120 |
| 8574031 | 1,3-Dinitropyrene | 2023/03/27 | 95 | 30 - 130 | 96 | 30 - 130 | ND, RDL=0.4 | ug/L | NC | 40 | | |
| 8574031 | 1,6-Dinitropyrene | 2023/03/27 | 94 | 30 - 130 | 94 | 30 - 130 | ND, RDL=0.4 | ug/L | NC | 40 | | |
| 8574031 | 1,8-Dinitropyrene | 2023/03/27 | 90 | 30 - 130 | 91 | 30 - 130 | ND, RDL=0.4 | ug/L | NC | 40 | | |
| 8574031 | 3,3'-Dichlorobenzidine | 2023/03/27 | 83 | 30 - 130 | 96 | 30 - 130 | ND, RDL=0.8 | ug/L | NC | 40 | | |
| 8574031 | 7H-Dibenzo(c,g) Carbazole | 2023/03/27 | 100 | 30 - 130 | 92 | 30 - 130 | ND, RDL=0.4 | ug/L | NC | 40 | | |
| 8574031 | Anthracene | 2023/03/27 | 81 | 30 - 130 | 80 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(a)anthracene | 2023/03/27 | 97 | 30 - 130 | 99 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(a)pyrene | 2023/03/27 | 101 | 30 - 130 | 103 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(b/j)fluoranthene | 2023/03/27 | 92 | 30 - 130 | 100 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(e)pyrene | 2023/03/27 | 96 | 30 - 130 | 98 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(g,h,i)perylene | 2023/03/27 | 122 | 30 - 130 | 115 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Benzo(k)fluoranthene | 2023/03/27 | 102 | 30 - 130 | 93 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Bis(2-ethylhexyl)phthalate | 2023/03/27 | 83 | 30 - 130 | 86 | 30 - 130 | ND,RDL=2 | ug/L | NC | 40 | | |
| 8574031 | Chrysene | 2023/03/27 | 97 | 30 - 130 | 97 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Dibenzo(a,h)anthracene | 2023/03/27 | 113 | 30 - 130 | 106 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Dibenzo(a,i)pyrene | 2023/03/27 | 82 | 30 - 130 | 81 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Dibenzo(a,j) acridine | 2023/03/27 | 121 | 30 - 130 | 113 | 30 - 130 | ND, RDL=0.4 | ug/L | NC | 40 | | |
| 8574031 | Di-N-butyl phthalate | 2023/03/27 | 70 | 30 - 130 | 97 | 30 - 130 | ND,RDL=2 | ug/L | NC | 40 | | |
| 8574031 | Fluoranthene | 2023/03/27 | 85 | 30 - 130 | 84 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Indeno(1,2,3-cd)pyrene | 2023/03/27 | 105 | 30 - 130 | 103 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |



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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

## QUALITY ASSURANCE REPORT(CONT'D)



| | | | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8574031 | Naphthalene | 2023/03/27 | 76 | 30 - 130 | 69 | 30 - 130 | ND, RDL=0.3 | ug/L | | | | |
| 8574031 | Pentachlorophenol | 2023/03/27 | 65 | 30 - 130 | 65 | 30 - 130 | ND,RDL=1 | ug/L | NC | 40 | | |
| 8574031 | Perylene | 2023/03/27 | 96 | 30 - 130 | 89 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Phenanthrene | 2023/03/27 | 82 | 30 - 130 | 82 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574031 | Pyrene | 2023/03/27 | 84 | 30 - 130 | 85 | 30 - 130 | ND, RDL=0.2 | ug/L | NC | 40 | | |
| 8574211 | 1,1,2,2-Tetrachloroethane | 2023/03/28 | 107 | 70 - 130 | 105 | 70 - 130 | ND, RDL=0.40 | ug/L | NC | 30 | | |
| 8574211 | 1,2-Dichlorobenzene | 2023/03/28 | 97 | 70 - 130 | 103 | 70 - 130 | ND, RDL=0.40 | ug/L | NC | 30 | | |
| 8574211 | 1,4-Dichlorobenzene | 2023/03/28 | 110 | 70 - 130 | 117 | 70 - 130 | ND, RDL=0.40 | ug/L | 2.1 | 30 | | |
| 8574211 | Benzene | 2023/03/28 | 95 | 70 - 130 | 101 | 70 - 130 | ND, RDL=0.20 | ug/L | 2.4 | 30 | | |
| 8574211 | Chloroform | 2023/03/28 | 103 | 70 - 130 | 108 | 70 - 130 | ND, RDL=0.20 | ug/L | NC | 30 | | |
| 8574211 | cis-1,2-Dichloroethylene | 2023/03/28 | 104 | 70 - 130 | 108 | 70 - 130 | ND, RDL=0.50 | ug/L | 3.3 | 30 | | |
| 8574211 | Ethylbenzene | 2023/03/28 | 86 | 70 - 130 | 94 | 70 - 130 | ND, RDL=0.20 | ug/L | NC | 30 | | |
| 8574211 | Methylene Chloride(Dichloromethane) | 2023/03/28 | 120 | 70 - 130 | 121 | 70 - 130 | ND, RDL=2.0 | ug/L | NC | 30 | | |
| 8574211 | Tetrachloroethylene | 2023/03/28 | 90 | 70 - 130 | 96 | 70 - 130 | ND, RDL=0.20 | ug/L | NC | 30 | | |
| 8574211 | Toluene | 2023/03/28 | 93 | 70 - 130 | 101 | 70 - 130 | ND, RDL=0.20 | ug/L | NC | 30 | | |
| 8574211 | Total Xylenes | 2023/03/28 | | | | | ND, RDL=0.20 | ug/L | NC | 30 | | |
| 8574211 | trans-1,3-Dichloropropene | 2023/03/28 | 107 | 70 - 130 | 107 | 70 - 130 | ND, RDL=0.40 | ug/L | NC | 30 | | |
| 8574211 | Trichloroethylene | 2023/03/28 | 104 | 70 - 130 | 111 | 70 - 130 | ND, RDL=0.20 | ug/L | 4.5 | 30 | | |
| 8574373 | Total Cyanide (CN) | 2023/03/27 | 100 | 80 - 120 | 99 | 80 - 120 | ND, RDL=0.0050 | mg/L | NC | 20 | | |
| 8574511 | Chromium (VI) | 2023/03/27 | 102 | 80 - 120 | 103 | 80 - 120 | ND, RDL=0.50 | ug/L | NC | 20 | | |
| 8574667 | pH | 2023/03/27 | | | 102 | 98 - 103 | | | 0.017 | N/A | | |
| 8575253 | Nonylphenol (Total) | 2023/03/29 | 102 | 50 - 130 | 115 | 50 - 130 | ND, RDL=0.001 | mg/L | NC | 40 | | |
| 8575257 | Nonylphenol Ethoxylate (Total) | 2023/03/29 | 115 | 50 - 130 | 94 | 50 - 130 | ND, RDL=0.005 | mg/L | NC | 40 | | |
| 8575797 | Phenols-4AAP | 2023/03/27 | 99 | 80 - 120 | 99 | 80 - 120 | ND, RDL=0.0010 | mg/L | NC | 20 | | |
| 8576652 | Mercury (Hg) | 2023/03/28 | 90 | 75 - 125 | 102 | 80 - 120 | ND, RDL=0.00010 | mg/L | NC | 20 | | |
| 8576897 | Total Suspended Solids | 2023/03/29 | | | | | ND, RDL=10 | mg/L | 15 | 20 | 100 | 85 - 115 |



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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

## QUALITY ASSURANCE REPORT(CONT'D)



| | | | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8578001 | Aroclor 1016 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578001 | Aroclor 1221 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578001 | Aroclor 1232 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578001 | Aroclor 1242 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 30 | | |
| 8578001 | Aroclor 1248 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 30 | | |
| 8578001 | Aroclor 1254 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 30 | | |
| 8578001 | Aroclor 1260 | 2023/03/30 | 107 | 60 - 130 | 94 | 60 - 130 | ND, RDL=0.05 | ug/L | NC | 30 | | |
| 8578001 | Aroclor 1262 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578001 | Aroclor 1268 | 2023/03/30 | | | | | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578001 | Total PCB | 2023/03/30 | 107 | 60 - 130 | 94 | 60 - 130 | ND, RDL=0.05 | ug/L | NC | 40 | | |
| 8578971 | Total Arsenic (As) | 2023/03/29 | 105 | 80 - 120 | 103 | 80 - 120 | ND, RDL=1.0 | ug/L | | | | |
| 8578971 | Total Cadmium (Cd) | 2023/03/29 | 101 | 80 - 120 | 99 | 80 - 120 | ND, RDL=0.090 | ug/L | NC | 20 | | |
| 8578971 | Total Chromium (Cr) | 2023/03/29 | 101 | 80 - 120 | 98 | 80 - 120 | ND, RDL=5.0 | ug/L | NC | 20 | | |
| 8578971 | Total Copper (Cu) | 2023/03/29 | 105 | 80 - 120 | 102 | 80 - 120 | ND, RDL=0.90 | ug/L | 0.23 | 20 | | |
| 8578971 | Total Lead (Pb) | 2023/03/29 | 101 | 80 - 120 | 100 | 80 - 120 | ND, RDL=0.50 | ug/L | NC | 20 | | |
| 8578971 | Total Manganese (Mn) | 2023/03/29 | 101 | 80 - 120 | 97 | 80 - 120 | ND, RDL=2.0 | ug/L | 1.4 | 20 | | |
| 8578971 | Total Nickel (Ni) | 2023/03/29 | 99 | 80 - 120 | 99 | 80 - 120 | ND, RDL=1.0 | ug/L | NC | 20 | | |
| 8578971 | Total Phosphorus (P) | 2023/03/29 | 106 | 80 - 120 | 105 | 80 - 120 | ND, RDL=100 | ug/L | | | | |
| 8578971 | Total Selenium (Se) | 2023/03/29 | 108 | 80 - 120 | 106 | 80 - 120 | ND, RDL=2.0 | ug/L | | | | |
| 8578971 | Total Silver (Ag) | 2023/03/29 | 104 | 80 - 120 | 102 | 80 - 120 | ND, RDL=0.090 | ug/L | | | | |



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Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

## QUALITY ASSURANCE REPORT(CONT'D)



| | | | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| 8578971 | Total Zinc (Zn) | 2023/03/29 | 103 | 80 - 120 | 104 | 80 - 120 | ND, RDL=5.0 | ug/L | 1.2 | 20 | | |

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).



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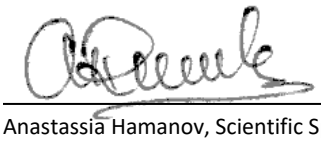
Microbiology testing is conducted at 6660 Campobello Rd. Chemistry testing is conducted at 6740 Campobello Rd.

Bureau Veritas Job #: C383871
Report Date: 2023/03/31

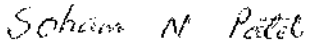
exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist



Soham Patel, Senior Analyst

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.



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Bureau Veritas
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Page 1 of 1

# CHAIN OF CUSTODY RECORD

| INVOICE TO: | | REPORT TO: | | PROJECT INFORMATION: | | Laboratory Use Only: | |
|---|---|---|---|---|---|---|---|
| Company Name: | #30554 exp Services Inc | Company Name: | EXP Services Inc | Quotation #: | C20374 | Bureau Veritas Job #: | Bottle Order #: |
| Attention: | Accounts Payable | Attention: | Francois Chartier | P.O. #: | ENV-BRW STREAM 2 | | 926372 |
| Address: | 1595 Clark Blvd<br>Brampton ON L6T 4V1 | Address: | Thabiso.Modise@exp.com | Project: | GTR-22029875-A0 | COC #: | Project Manager: |
| Tel: | (905) 793-9800 Fax: (905) 793-0641 | Tel: | (905) 793-9800 Ext: 2523 Fax: | Project Name: | | C#926372-02-01 | Patricia Legette |
| Email: | AP@exp.com; Karen.Burke@exp.com | Email: | Francois.Chartier@exp.com | Site #: | 1056 and 1060 Brant St, Burlington | | |
| | | | | Sampled By: | Thabiso Modise | | |

**MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY**

| Regulation 153 (2011) | Other Regulations | Special Instructions |
|---|---|---|
| ☐ Table 1 ☐ Res/Park ☐ Medium/Fine<br>☐ Table 2 ☐ Ind/Comm ☐ Coarse<br>☐ Table 3 ☐ Agri/Other ☐ For RSC<br>☐ Table ___ | ☐ CCME ☑ Sanitary Sewer Bylaw<br>☐ Reg 558 ☑ Storm Sewer Bylaw<br>☐ MISA Municipality Burlington<br>☐ PWQO ☐ Reg 406 Table ___<br>☐ Other ___ | |

*Include Criteria on Certificate of Analysis (Y/N)?* Y

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

**Regular (Standard) TAT:** ☑
*(will be applied if Rush TAT is not specified)*
*Standard TAT = 5-7 Working days for most tests.*
*Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.*

**Job Specific Rush TAT (if applies to entire submission)**
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled | Time Sampled | Matrix | Field Filtered (please circle): Metals / Hg / Cr VI | Burlington Storm Sewer | Burlington Storm Sewer - Dissolved Metals by ICP/MS | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | BH 4D | 24/Mar/23 | 11:00 | GW | NO | ✓ | | 16 | Please include COC in final report |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |

24-Mar-23 15:00
Patricia Legette
C383871
RJM ENV-1094

| * RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time | # jars used and not submitted |
|---|---|---|---|---|---|---|
| THABISO MODISE | 23/03/24 | 14:47 | | 23/03/24 | 15:00 | |

| Laboratory Use Only | | | | |
|---|---|---|---|---|
| Time Sensitive | Temperature (°C) on Recei | 6/6/6 | Custody Seal Present | Yes ☐ |
| | | | Intact | No ☑ |

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/COC-TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/ENVIRONMENTAL-LABORATORIES/RESOURCES/CHAIN-CUSTODY-FORMS-COCS.

SAMPLES MUST BE KEPT COOL ( < 10° C ) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

White: Bureau Veritas Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Job #: C383871
Report Date: 2023/03/31

exp Services Inc
Client Project #: GTR-22029875-A0
Site Location: 1056 and 1060 Brant St, Burlington, ON
Your P.O. #: ENV-BRM
Sampler Initials: TM

## Exceedance Summary Table – Burlington Storm Sewer

### Result Exceedances

| Sample ID | Bureau Veritas ID | Parameter | Criteria | Result | DL | UNITS |
|---|---|---|---|---|---|---|
| BH4D | VJM954-07 | Total Manganese (Mn) | 50 | 88 | 2.0 | ug/L |
| BH4D | VJM954-04 | Total Suspended Solids | 15 | 29 | 10 | mg/L |

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.


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# Appendix E – Construction and Post-Construction Flow Rate Calculation

# APPENDIX E: Dewatering Flow Rates

1056 & 1060 Brant St
GTR-22029875-B0

**Table E-1: Construction and Post Construction Dewatering Assessments**

| Parameters | Symbols | Unit | Construction | Post Construction |
|---|---|---|---|---|
| Geological Formation | - | - | Glacial Deposit | Glacial Deposit |
| **INPUTS** | | | | |
| Ground Elevation | - | mASL | **101.64** | **101.64** |
| Highest Groundwater Elevation | - | mASL | **100.55** | **100.55** |
| Lowest Top Slab Elevation | - | mASL | **97.64** | **97.64** |
| Lowest Foundation Invert Elevation | - | mASL | **96.14** | - |
| Height of Static Water Table Above the Base of the Water-Bearing Zone | **H** | m | 15.55 | 15.55 |
| Dewatering Target Elevation | - | mASL | 95.14 | 97.14 |
| Height of Target Water Level Above the Base of Water-Bearing Zone | **$h_w$** | m | 10.14 | 12.14 |
| Drawdown | **s** | m | 5.41 | 3.41 |
| Dupuit Check (> 45%) | | m | 65% | 78% |
| Base of Aquifer / Water Bearing Zone | - | mASL | **85.00** | **85.00** |
| Hydraulic Conductivity | **K** | m/s | **1.1E-06** | **1.1E-06** |
| Length of Excavation | - | m | **43.50** | **43.50** |
| Width of Excavation | - | m | **35.10** | **35.10** |
| Equivalent Radius (equivalent perimeter) | **$r_e$** | m | 25.02 | 25.02 |
| Method to Calculate Radius of Influence | - | - | **Cooper-Jacob** | **Cooper-Jacob** |
| Time (days) | | | **30.00** | **365.00** |
| Time (seconds) | **t** | s | 2592000 | 31536000 |
| Specific Yield | **Sy** | | **0.10** | **0.10** |
| **OUTPUTS** | | | | |
| Cooper-Jacob's Radius of Influence from Sides of Excavation | **Rcj** | m | 31.89 | 111.22 |
| Radius of Influence | **Ro** | m | 56.90 | 136.24 |
| Dewatering Flow Rate (unconfined radial flow component) | **Q** | $m^3$/day | **51.5** | **17.0** |
| Factor of Safety | **fs** | - | 2.00 | 1.50 |
| Dewatering Flow Rate (multiplied by factor of safety) | **Q.fs** | $m^3$/day | **103** | **25** |
| Precipitation Event | - | mm/day | 25 | - |
| Volume from Precipitation | - | $m^3$/day | 38 | - |
| Total Volume (L/day) Discharge of Groundwater (Construction dewatering) **without Safety Factor** (including precipitation | - | $m^3$/day | **90** | **-** |
| Total Volume (L/day) Discharge of Groundwater (Construction dewatering) **with Safety Factor** (including precipitation) | - | $m^3$/day | **141** | **-** |

| | | | |
|---|---|---|---|
| Precipitation Event 2 year storm | - | mm/day | 57.3 |
| Volume from Precipitation | - | $m^3$/event | 87 |
| Precipitation Event 100 year storm | - | mm/day | 124.7 |
| Volume from Precipitation | - | $m^3$/event | 190 |

**Notes:**
mASL - meters above sea level

**Analytical Solution for Estimating Radial Flow from an Unconfined Aquifer to a Fully-Penetrating Excavation**

$$Q_w = \frac{\pi K(H^2 - h^2)}{Ln\,[\frac{R_o}{r_e}]}$$ (Based on the Dupuit-Forcheimer Equation)

$$r_e = \frac{a+b}{\pi} \qquad R_o = R_{cj} + r_e \qquad R_{cj} = \sqrt{2.25KDt/S}$$

Where:

$Q_w$ = Flow rate per unit length of excavation ($m^3$/s)

K = Hydraulic conductivity (m/s)

H = Height of static water table above base of water-bearing zone (m)

$h_w$ = Height of target water level above the base of water-bearing zone (m)

Rcj=Cooper Jacob Radius of Influence (m)

$R_o$=Radius of influence (m)

re=Equivalent perimeter (m)

# Appendix F – Architectural Drawings



VIEW ON BRANT STREET (NORTH)

PRELIMINARY

WZMH ARCHITECTS

# BRANT STREET

Burlington, Ontario

Project No:
8192.00

Date
2024-01-19




PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

CONTEXT PLAN

N

| | |
|---|---|
| Project No: 8192.00 | Date 2024-01-19 |
| Scale: | Drawing No: |

**BURLINGTON**

**BRANT ST**

*Gross Floor Area Calculation*

*The sum of areas of each floor of a building, but shall include a basement or cellar when used for commerical purpose. Measure shall be from the exterior face of outside walls, or from the center line of partition and common walls. GFA shall not include floor spaced devated to:*

*A) vehicle parking;*
*B) storage;*
*C) air handling equipment;*
*D) enclosed mall and hallways, excluding kiosk, stairways;*
*E) elevators and associated equipment;*
*F) washroom;*
*G) foyers, lobbies, but not waiting areas/rooms*

| PROPOSED BUILDING GFA | RESIDENTIAL GFA | | INDOOR AMENITY | | TOTAL GFA | | OUTDOOR AMENITY | |
|---|---|---|---|---|---|---|---|---|
| | sm | sf | sm | sf | sm | sf | sm | sf |
| ABOVE GRADE | | | | | | | | |
| GROUND | 530 | 5,705 | 188 | 2,024 | 718 | 7,728 | 157 | 1,690 |
| 2ND | 785 | 8,450 | | | 785 | 8,450 | | |
| 3RD | 847 | 9,117 | | | 847 | 9,117 | | |
| 4TH | 847 | 9,117 | | | 847 | 9,117 | | |
| 5TH | 623 | 6,706 | | | 623 | 6,706 | | |
| 6TH | 623 | 6,706 | | | 623 | 6,706 | | |
| 7TH | 593 | 6,383 | | | 593 | 6,383 | | |
| 8TH | 593 | 6,383 | | | 593 | 6,383 | | |
| 9TH | 593 | 6,383 | | | 593 | 6,383 | | |
| 10TH | 593 | 6,383 | | | 593 | 6,383 | | |
| 11TH | 532 | 5,726 | | | 532 | 5,726 | | |
| **TOTAL GFA (ABOVE)** | 7,159 | 77,059 | 188 | 2,024 | 7,347 | 79,082 | | |
| **TOTAL GFA** | **7,159** | **77,059** | **188** | **2,024** | **7,347** | **79,082** | **157** | **1,690** |

***Note: Amenity area included in residential GFA**

| | sm | sf |
|---|---|---|
| **TOTAL RESIDENTIAL GFA** | **7,347** | **79,082** |

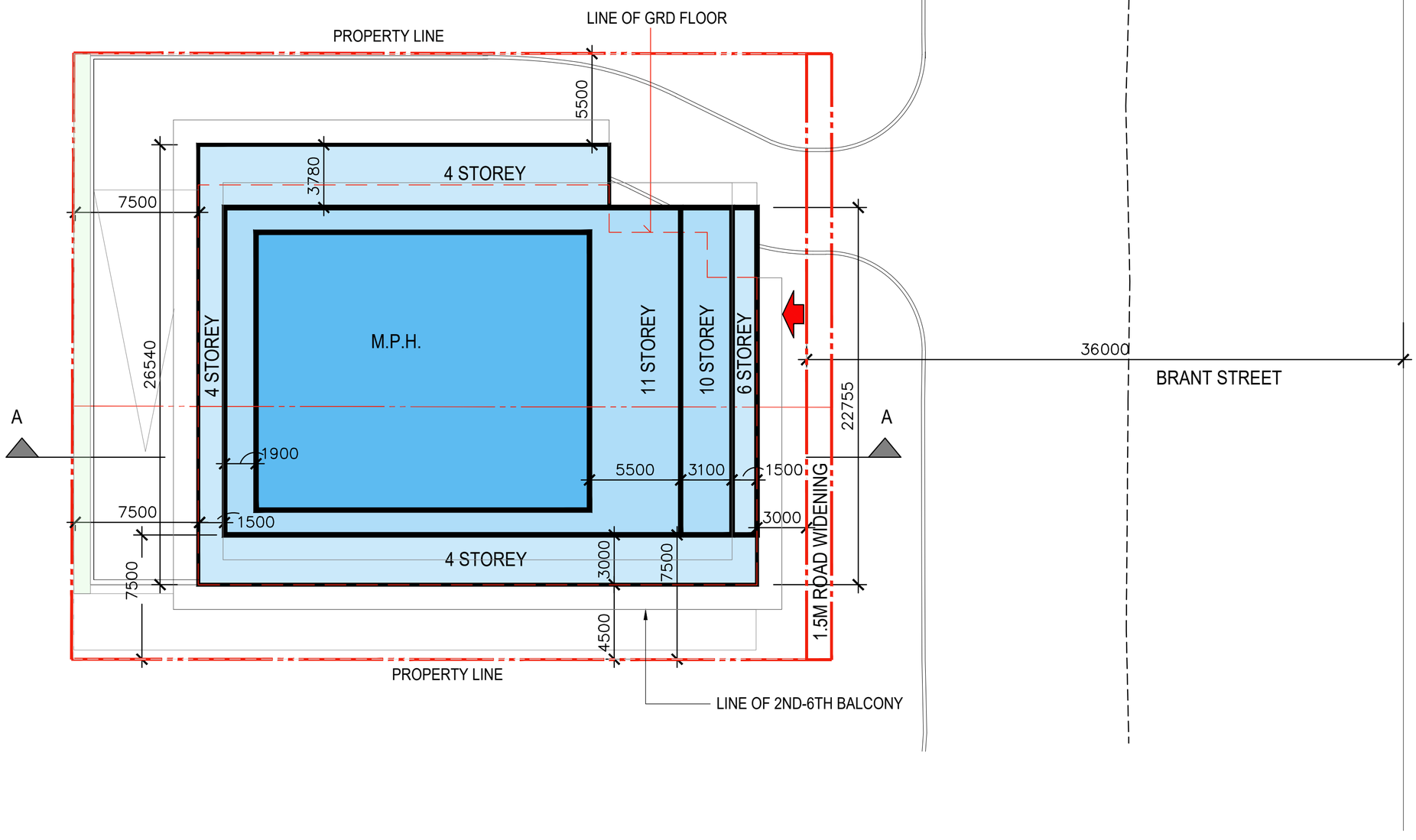
| **DENSITY** | |
|---|---|
| **SITE AREA** | **1,674.57** |
| **PROPOSED DENSITY OVER ENTIRE SITE** | **4.39** |

| PROPOSED BUILDING UNIT MIX | AVG UNIT SIZE 655.18sf / 60.87sm | | |
|---|---|---|---|
| | 1BED/STUDIO | 2BED | 3BED |
| GROUND | | | |
| 2ND | 6 | 3 | 1 |
| 3RD | 3 | 4 | 3 |
| 4TH | 3 | 4 | 3 |
| 5TH | 8 | 2 | |
| 6TH | 8 | 2 | |
| 7TH | 8 | 1 | |
| 8TH | 8 | 1 | |
| 9TH | 8 | 1 | |
| 10TH | 8 | 1 | |
| 11TH | 4 | 1 | 2 |
| **TOTAL UNITS** | **64** | **20** | **9** |
| **PERCENTAGE** | **69%** | **21.0%** | **10%** |
| TOTAL UNITS | | | **93** |

**PARKING COUNT**

| PARKING COUNT | |
|---|---|
| **GROUND** | 6 |
| **P1** | 20 |
| **TOTAL** | **26** |

PRELIMINARY




PRELIMINARY

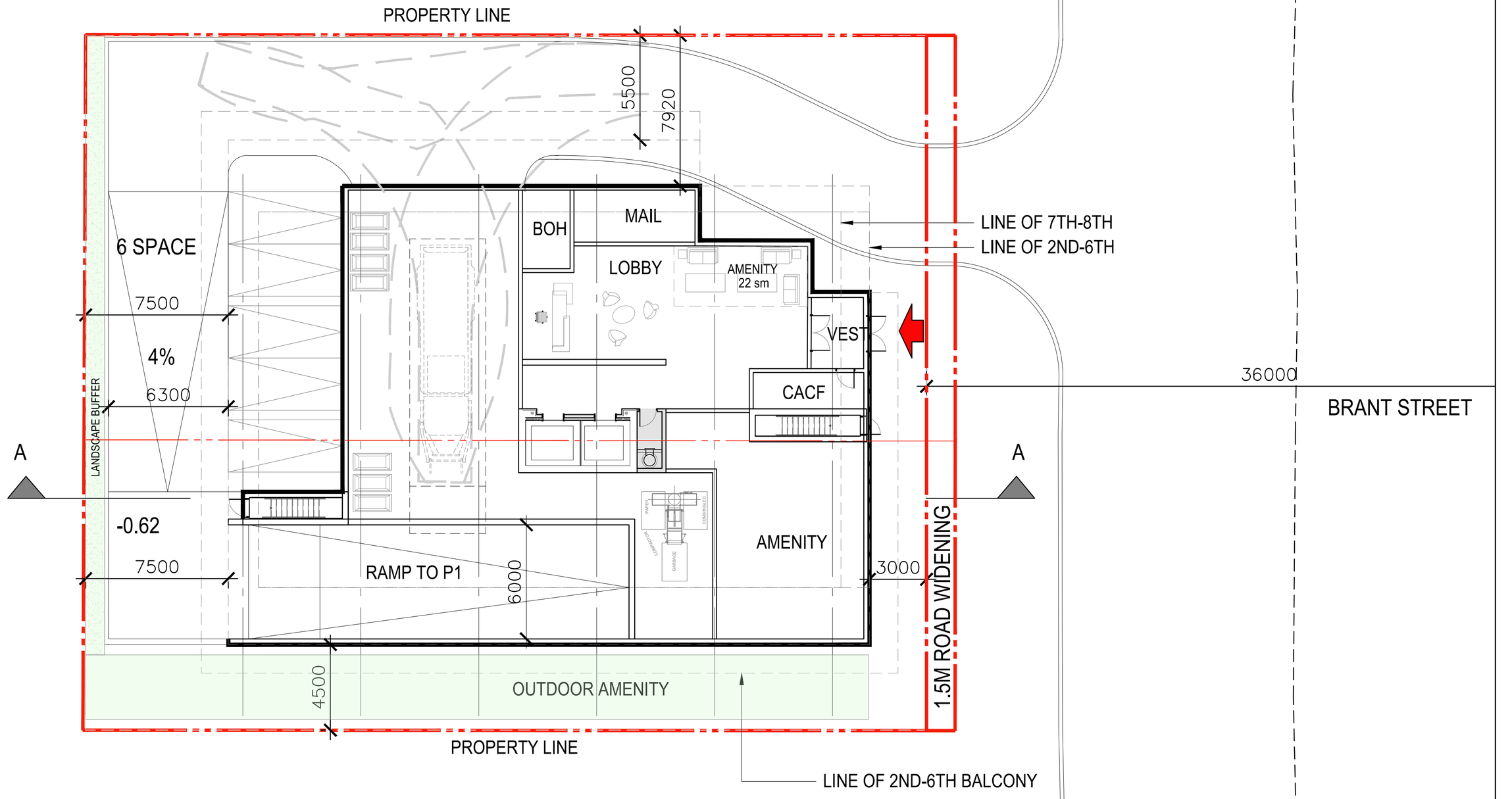
WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

SITE PLAN

N

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| Project No: 8192.00 | Date 2024-01-19 |
| Scale: 1:200 | Drawing No: |




PRELIMINARY

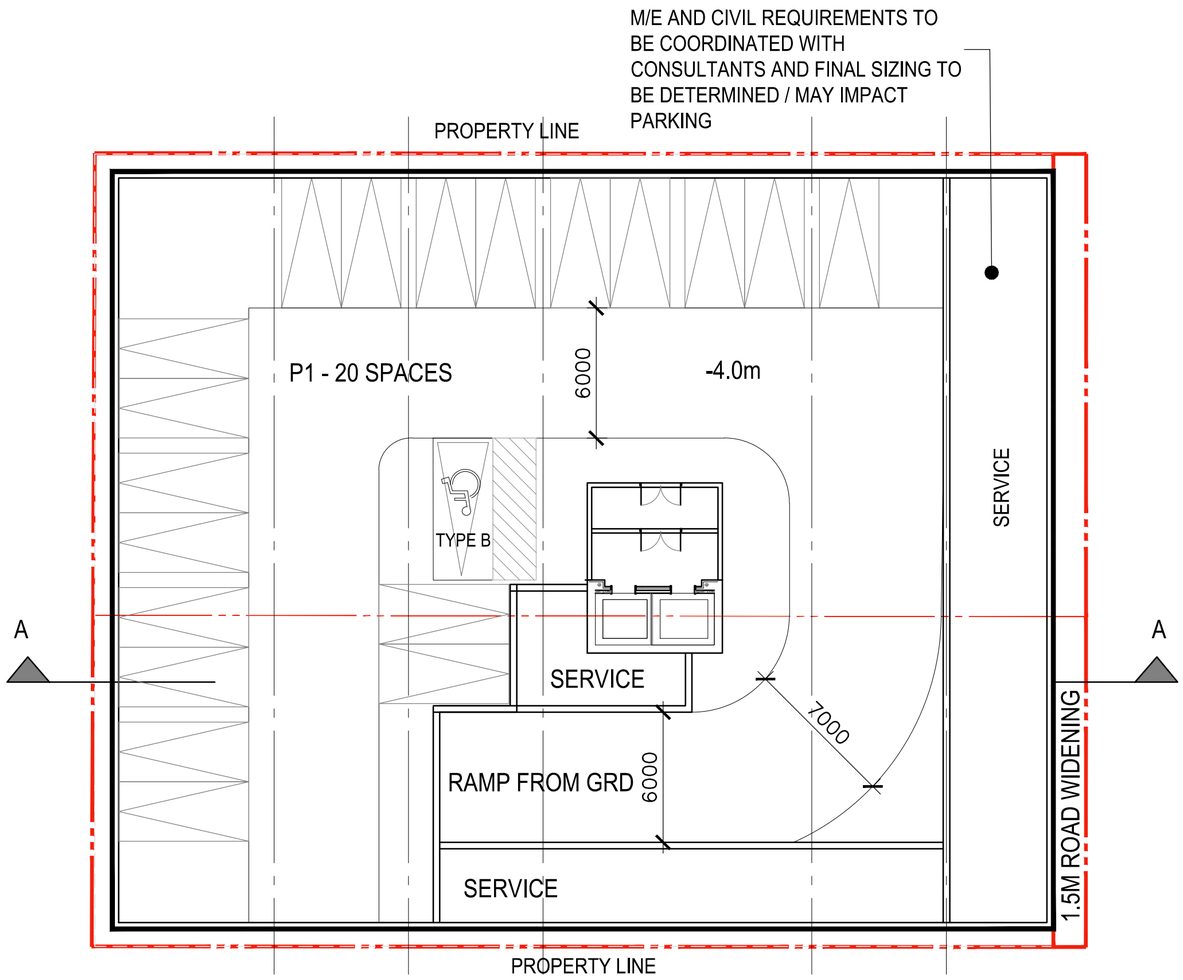
WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

GROUND FLOOR
PARKING RAMP OPTION

N

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|---|---|
| Project No: 8192.00 | Date 2024-01-19 |
| Scale: 1:150 | Drawing No: |




P1 - 20 SPACES

PRELIMINARY

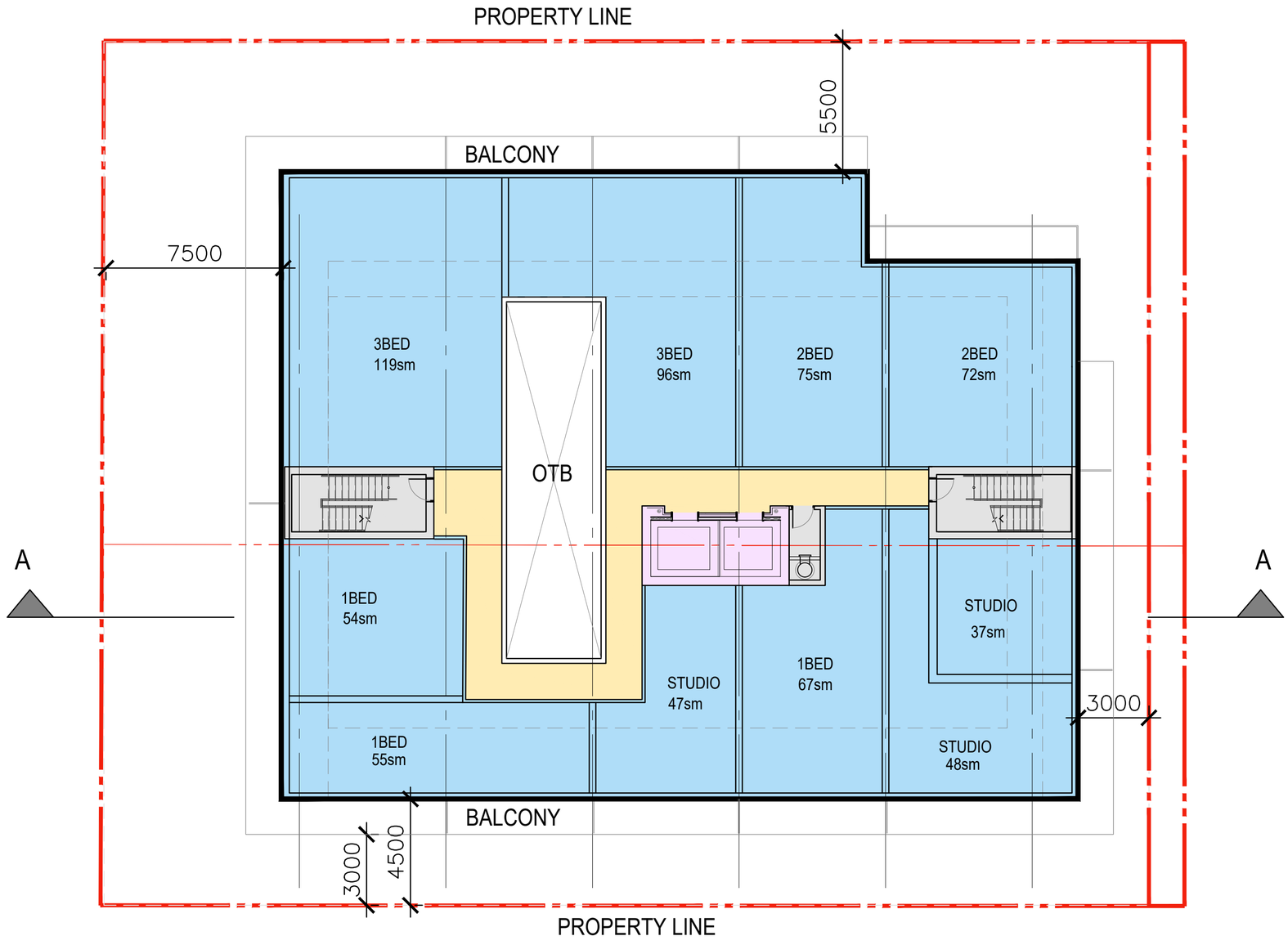
WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

P1 LEVELS
PARKING RAMP OPTION

N

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|---|---|
| Project No:<br>8192.00 | Date<br>2024-01-19 |
| Scale:<br>1:200 | Drawing No: |




PRELIMINARY

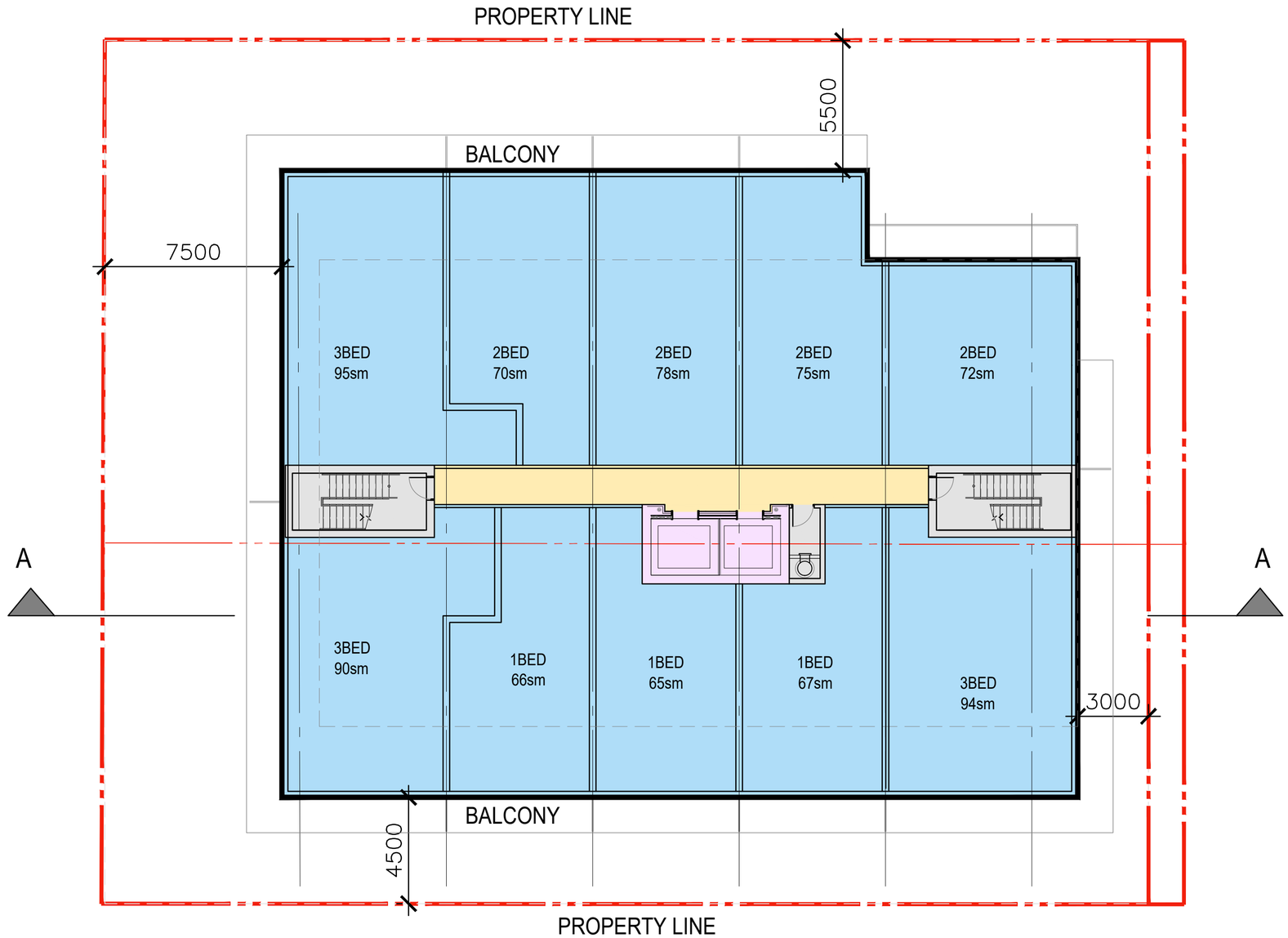
WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

2ND FLOOR

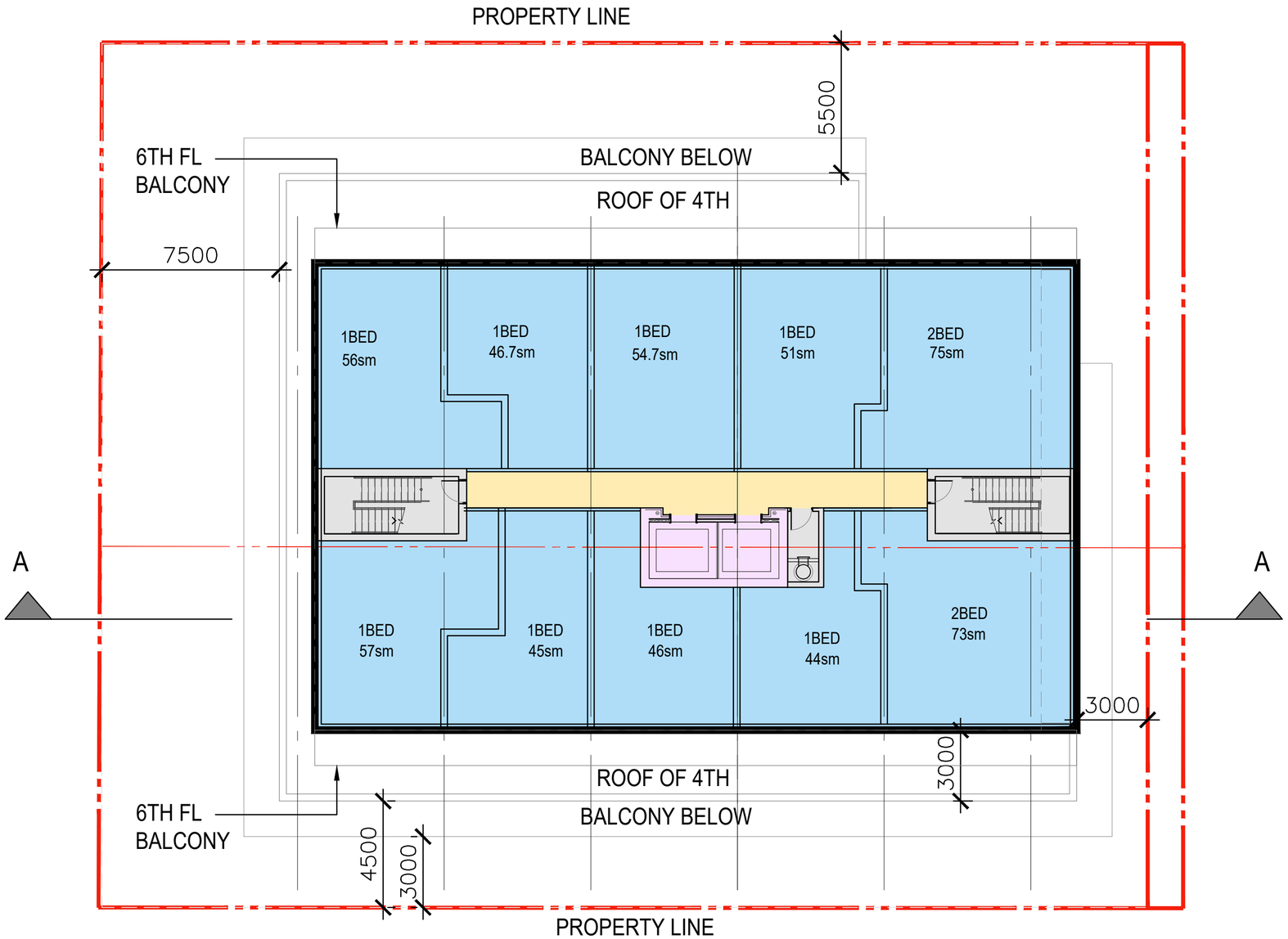
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| Project No: 8192.00 | Date 2024-01-19 |
| Scale: 1:150 | Drawing No: |



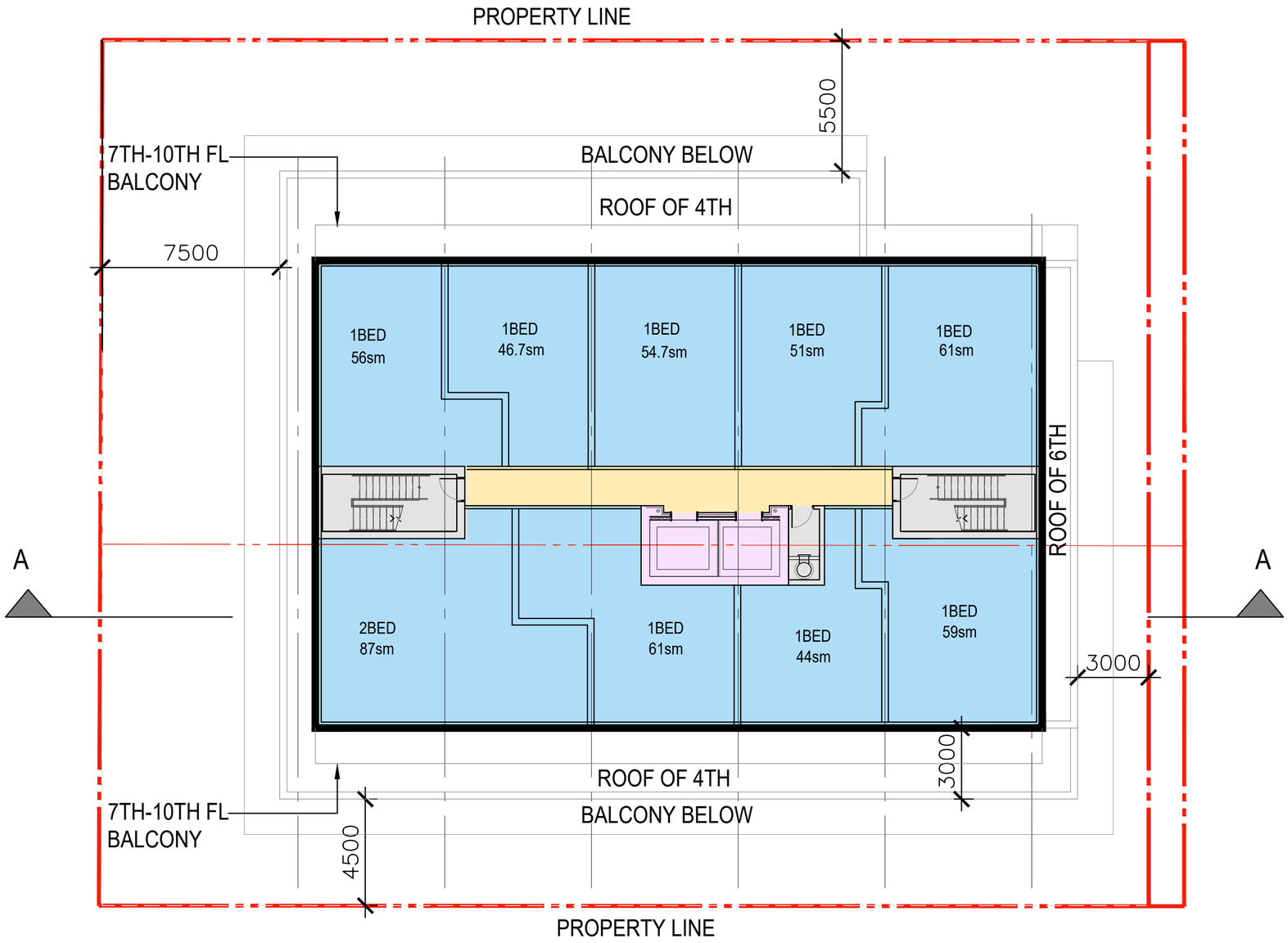

PRELIMINARY

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|---|---|---|---|---|---|
| WZMH ARCHITECTS | | BRANT STREET<br>Burlington, Ontario | 3RD-4TH FLOORS | N | Project No:<br>8192.00 / Date<br>2024-01-19 / Scale:<br>1:150 / Drawing No: |



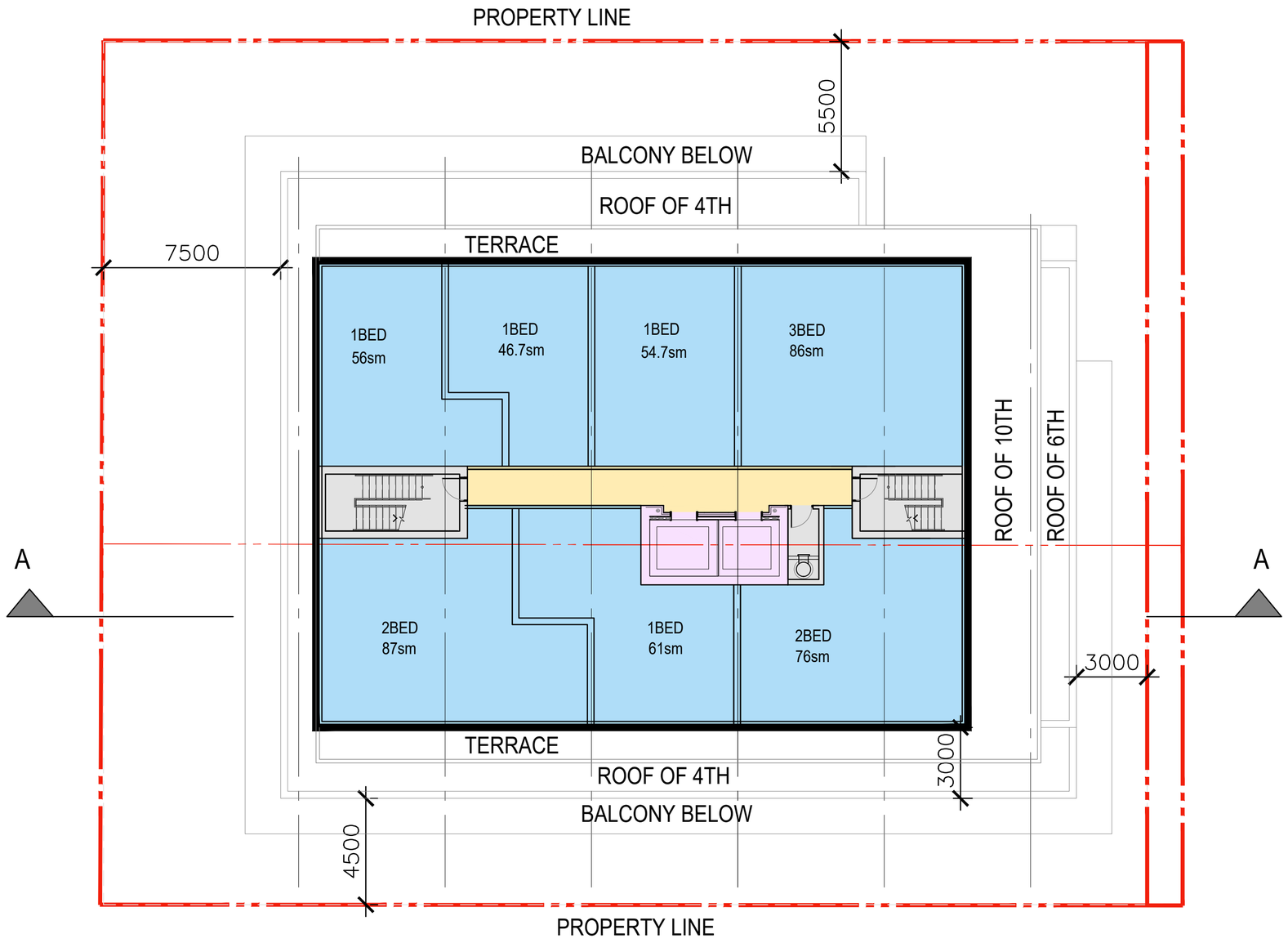

PRELIMINARY

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|---|---|---|---|---|---|
| WZMH ARCHITECTS | | BRANT STREET<br>Burlington, Ontario | 5TH-6TH FLOORS | N | Project No:<br>8192.00 / Date<br>2024-01-19 / Scale:<br>1:150 / Drawing No: |



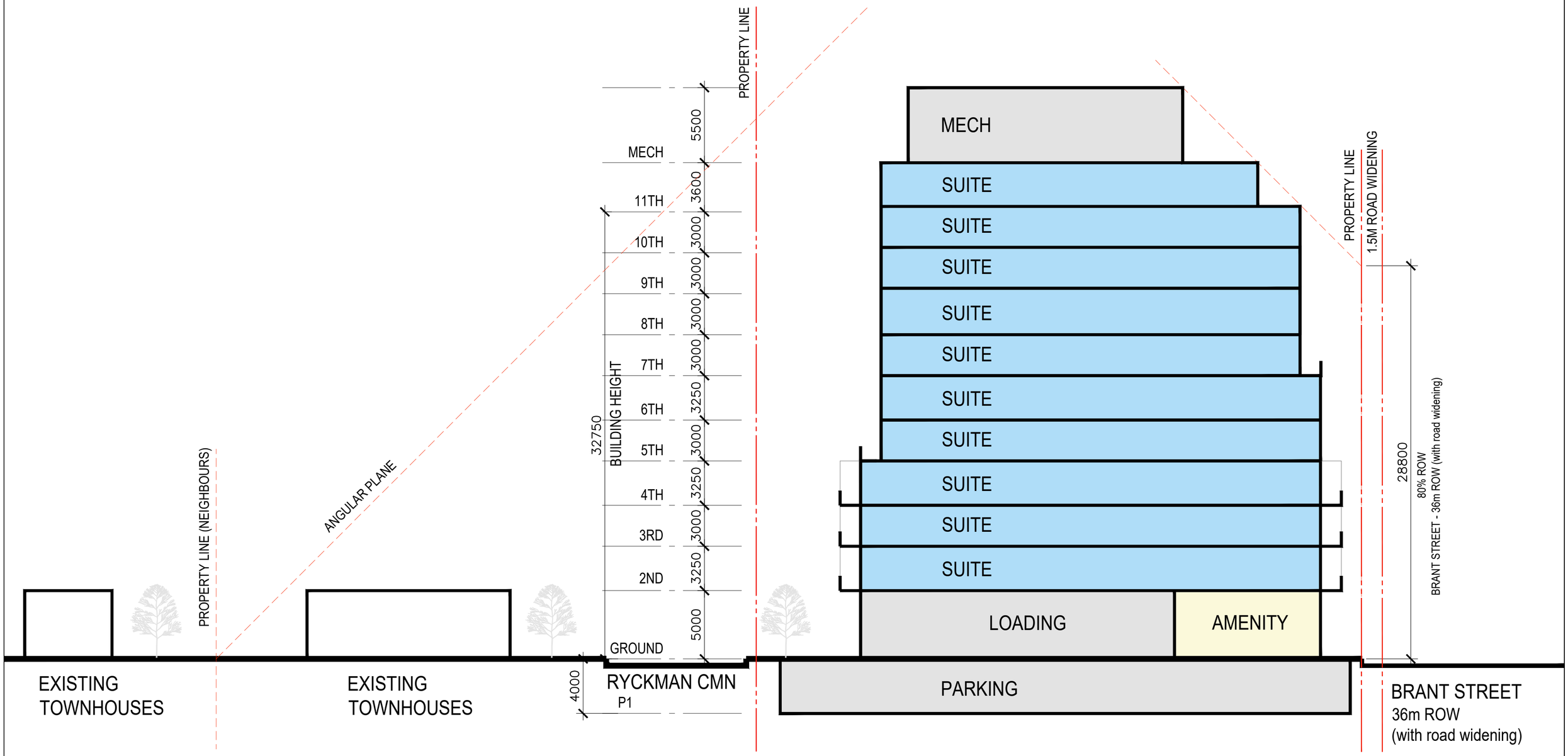

PRELIMINARY

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| WZMH ARCHITECTS | | BRANT STREET<br>Burlington, Ontario | 7TH-10TH FLOORS | N | Project No:<br>8192.00 / Date<br>2024-01-19 / Scale:<br>1:150 / Drawing No: |




PRELIMINARY

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| WZMH ARCHITECTS | | BRANT STREET<br>Burlington, Ontario | 11TH FLOOR | N | Project No:<br>8192.00 / Date<br>2024-01-19 / Scale:<br>1:150 / Drawing No: |




PRELIMINARY

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|---|---|---|---|---|---|
| WZMH ARCHITECTS | | BRANT STREET<br>Burlington, Ontario | SECTION A-A | Project No:<br>8192.00 | Date<br>2024-01-19 |
| | | | | Scale:<br>1:200 | Drawing No: |



PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

AERIAL VIEW

| Project No: 8192.00 | Date 2024-01-19 |
| --- | --- |
| Scale: | Drawing No: |



PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

3D VIEWS
VIEW FROM NORTH WEST

| Project No: 8192.00 | Date 2024-01-19 |
| --- | --- |
| Scale: | Drawing No: |



PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

3D VIEW
VIEW FROM NORTH EAST

| Project No: 8192.00 | Date 2024-01-19 |
| --- | --- |
| Scale: | Drawing No: |



PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

3D VIEW
VIEW ON BRANT STREET (NORTH)

| | |
|---|---|
| Project No: 8192.00 | Date 2024-01-19 |
| Scale: | Drawing No: |



PRELIMINARY

WZMH ARCHITECTS

BRANT STREET
Burlington, Ontario

3D VIEW
VIEW LOOKING EAST

| Project No: | Date |
|---|---|
| 8192.00 | 2024-01-19 |
| Scale: | Drawing No: |