

Functional Servicing and Stormwater Management Report



Project: 48 Grenoble Drive

Tenblock

Application No: 22 127125 NNY 16 OZ

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Executive Summary

Lithos Group Inc. (Lithos) was retained by Tenblock (the “Owner”) to prepare a Functional Servicing and Stormwater Management (FSR-SWM) Report in support of a Zoning By-law Amendment Application for a proposed residential development at 48 Grenoble Drive, in the City of Toronto (the “City”). The following is a summary of our conclusions:

Storm Drainage

A detailed Stormwater Management (SWM) report will be prepared during the Site Plan Application stage. The site stormwater discharge will be controlled to the 2-year pre-development flow and will be connected to the existing 300mm diameter storm sewer on Grenoble Drive. In order to attain the target flows and meet the City’s Wet Weather Flow Management Guidelines (WWFMG), quantity controls will be utilized and up to 440.82 m³ on-site storage will be required for the proposed residential development. The stormwater management (SWM) system will be designed to provide enhanced level (Level 1) protection as specified by the Ministry of Environment, Conservation and Parks (MECP). Quality control will be provided for the subject site for a minimum total suspended solids (TSS) removal of 80%.

Sanitary Sewers

Four (4) separate connections will be provided for the proposed development: one for the East Tower; one for the Podium; one for the West Tower and one for the Parkland Dedication. All sanitary connections from the proposed development will connect to a proposed 375 mm diameter sanitary sewer on Grenoble Drive flowing West, and the sanitary connection from the Parkland Dedication will connect to the existing 450 mm diameter sanitary sewer, along the Easement, located at the West side of the site. The additional net discharge flow from the entire property (proposed and existing development), is anticipated at approximately 14.91 L/s.

According to the “Downstream Sanitary Capacity Analysis Report”, prepared by Lithos Group Inc., dated July, 2023 (**included in Appendix G**), the analysis of the external sanitary drainage area indicates that Criteria 1 and 2 (of Table 1: Capacity Criteria for Sanitary and Combined Sewers, City’s Sanitary Sewer Capacity Assessment Guidelines) have been achieved and the proposed site does not affect flow conditions downstream, while the existing sanitary sewer infrastructure can support the proposed development.

Water Supply

Three (3) separate water lines will serve the proposed Podium, East and West towers. As per the City’s guidelines, these waterlines will split into domestic and fire connections. Furthermore, due to the fact that the proposed Towers exceed 84m in height, two (2) additional fire lines will be provided for each of the proposed Towers. In addition, one (1) waterline will be service the proposed Parkland dedication. Water supply for the site will be from the existing 400 mm diameter watermain on the East side of Deauville Lane and the existing 400 mm diameter watermain on the North side of Grenoble Drive.

It is anticipated that a total design flow of 167.74L/s will be required to support the proposed development. The results of the fire hydrant test, conducted by Lithos Group Inc., on May 5, 2022, reveal that the existing water infrastructure along Grenoble Drive and Deauville Lane will be able to support the proposed development.

Site Grading

The proposed grades will match current drainage patterns wherever feasible. Grades will be maintained along property lines to the extent practical.

Furthermore, under post-development conditions, there will be no surface drainage towards the Parkland Dedication portion of the site from the residential development.

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1.0 Introduction

Lithos Group Inc. (Lithos) was retained by Tenblock (the “Owner”) to prepare a Functional Servicing and Stormwater Management (FSR-SWM) Report in support of a Zoning By-law Amendment Application for a proposed residential use development at 48 Grenoble Drive (M3C 1C8), in the City of Toronto (City).

The purpose of this report is to provide site-specific information for the City’s review with respect to the infrastructure required to support the proposed development. More specifically, the report will present details on sanitary discharge, water supply and an outline of the storm drainage pattern.

We contacted the City’s engineering department to obtain existing information in preparation of this report. The following documents were available for our review:

- Plan and profile drawings of Deauville Lane, from Grenoble Drive to Rochefort Drive, drawing No. D-186-01, dated October, 1959;
- Plan and profile drawings of Easement, from Grenoble Drive to St. Dennis Drive, drawing No. SA-58-R-01, dated January, 1967;
- Plan and profile drawings of Grenoble Drive, from Gateway Boulevard to Deauville Lane, drawing No. G-113-03, January, 1967;
- Plan and profile drawings of Gateway Boulevard, drawing No. ST-391-R, February, 1967;
- Toronto CU Maps of Grenoble Drive and Deauville Lane;

Furthermore, the following documents were provided for our view:

- Geotechnical engineering report by Grounded Engineering Inc., dated July 4, 2023;
- Hydrogeological review report by Grounded Engineering Inc., dated March 10, 2022 (revised June 30, 2023);
- Site Plan prepared by Diamond Schmitt Architects, dated July 10, 2023;
- Site Statistics prepared by Diamond Schmitt Architects, dated July 10, 2023;
- Survey Plan prepared by R. AVIS SURVEYING INC., dated August 4, 2021.

2.0 Site Description

The existing site is approximately 6,749 m² (0.675 hectares). It is currently occupied by a residential development and by outdoor parking area. The site is bound by a residential development to the north, Deauville Lane to the east, Grenoble Drive to the south and Parkland to the west. Refer to **Figures 1** and **2** following this report and site photographs in **Appendix A**.

The entire City was deemed as an area of basement flooding. As shown in the updated map, included in **Appendix B**, Environmental Assessment (EA) Studies are being performed across the City of Toronto, separated in areas. According to the “*Current Basement Flooding Investigation Environmental Assessment Studies*” for the City of Toronto found online, the site is located in area 55 into which, EA study is in progress. Although the study is in progress the City informed us that, a InfoWorks ICM model was available for our review. Our analysis was based on the InfoWorks ICM model provided by the City.

3.0 Site Proposal

The proposed development will be comprised of:

- A residential high-rise development; and,
- Parkland area to be dedicated to the City.

The proposed development will consist of a 6-storey podium with two (2) high-rise, 39-storey and 43-storey towers, supporting residential use. It will consist of 1066 residential units and will be facilitated by three (3) levels of underground parking.

The existing site is approximately 0.675 hectares. In addition, under post-development conditions, approximately 0.068 ha will be conveyed to the City for parkland dedication; therefore, the proposed site area will be 0.607 ha. The total development will be approximately 74,717 m² of Gross Floor Area (GFA). Please refer to [Appendix B](#) for the proposed site plan and statistics.

4.0 Terms of Reference and Methodology

4.1. Terms of Reference

The Terms of Reference used for the scope of this report were based on the City's Sewer Capacity Assessment Guidelines, July 2021, the January 2021 Second Edition of the City of Toronto Design Criteria for Sewers and Watermains and the November 2006 Wet Weather Flow Management Guidelines (WWFMG).

All erosion and sediment control BMP's shall be designed, constructed and maintained in all development sites in accordance with the GTA CA's Erosion and Sediment Control Guidelines for Urban Construction (2005) and/or other City of Toronto requirements on a site-by-site basis.

4.2. Methodology: Stormwater Drainage and Management

This report provides a high-level Stormwater Management (SWM) review of the pre-development and post-development conditions and comments on opportunities to reduce peak flows. A detailed Stormwater Management (SWM) Report will be prepared at the Site Plan Application stage.

The proposed development will be designed to meet the City's WWFMG and the standards of the Province of Ontario as set out in the Ministry of Environment, Conservation and Parks (MECP) 2003 Stormwater Management Planning and Design Manual (SWMPD). The following design criteria will be reviewed:

- Post-development peak flow for the 100-year storm event from the site will be controlled to the two (2)-year target flow;
- A specified rainfall depth of 5 mm is to be retained on-site, as required by the WWFMG; and,
- A safe overland flow will be provided for all flows in excess of the 100-year storm event.

4.3. Methodology: Sanitary Discharge

The sanitary sewage discharge from the site will be determined using sanitary sewer design sheets that incorporate the land use and building statistics, as supplied by the design team. The calculated values provide peak sanitary discharge flow that considers infiltration.

The estimated sanitary discharge flows from the proposed site will be calculated based on the criteria shown in **Table 4-1** below.

Table 4-1 – Sanitary Flows

Usage	Design Flow	Units	Population Equivalent
Residential	240 (for existing municipal sewer segments) 450 (for proposed municipal sewer segment)	Litres / capita / day	Townhouse unit = 2.7 ppu Studio/1 Bedroom Unit = 1.4 ppu 2 Bedroom Unit = 2.1 ppu 3 Bedroom Unit = 3.1 ppu

Based on the calculated peak flows, the adequacy of the existing infrastructure to support the proposed development will be discussed.

4.4. Methodology: Water Usage

The fire flow requirements were estimated using the method prescribed by the Fire Underwriters Survey (FUS). This method is based on the fire protected building floors, the type and combustibility of the structural frame and the separation distances with adjoining building units. The domestic water usage was calculated based on the City's design criteria (OBC Table 8.2.3.B) outlined in **Table 4-2** below.

Table 4-2 – Water Usage

Usage	Water Demand	Units
Residential	190	Litres / capita / day

Pressure and flow testing have been conducted on hydrants, in the vicinity of the proposed development to obtain existing flows, residual and static pressure on the existing infrastructure along Grenoble Drive and Deauville Lane.

5.0 Stormwater Management and Drainage

5.1. Existing Conditions

According to available records, there are three (3) existing storm sewers abutting the subject property. More specifically, there is:

- A 300 mm diameter storm sewer on Grenoble Drive, flowing west;
- A 375 mm diameter storm sewer within the parkland area, flowing south; and
- A 450 mm diameter storm sewer on Deauville Lane, flowing north.

Residential Development

Following an investigation (please refer to 'Site Investigation And Dye Test Report' prepared by Lithos Group dated November 1st, 2022 in **Appendix B**), it was discovered that storm runoff from the existing building located at 48 Grenoble Drive is directed towards the storm sewer networks at Grenoble Drive, Deauville Lane and the existing Easement located at the west side of the site. Refer to pre-development drainage area plan in **Figure DAP-1** in **Appendix C**.

Furthermore, our investigation showed that the existing storm service connection from the existing building, is to the existing 375 mm diameter storm sewer, along the existing Easement located at the west side of the site.

All existing storm services will be removed from the right-of-way and capped at the City's main and this work is to be performed by City forces at the Owner's expense. Lastly, there is no overland external storm flow towards our site under pre-development conditions.

Parkland Dedication

The existing Park and future Parkland Dedication is located at the western portion of the site. As mentioned above, storm runoff from that area flows overland uncontrolled towards the City's storm sewer networks at Grenoble Drive and the existing Easement.

The existing run-off coefficients are estimated based on the infiltration of the area as well as the City's WWFMG guidelines. **Table 5-1** shows the input parameters which are illustrated on the pre-development drainage area plan in **Figure DAP-1** in **Appendix C**.

Table 5-1 – Target Input Parameters

Catchment	Drainage Area (ha)	Design "C"	Tc (min.)
A1 Pre – towards Grenoble Drive	0.269	0.43	10
A2 Pre – towards Easement	0.394	0.50	10
A3 Pre – towards Deauville Lane	0.012	0.50	10

Peak flows calculated for the existing conditions are shown in **Table 5-2** below. Detailed calculations are in **Appendix C**.

Table 5-2 – Target Peak Flows

Catchment	Peak Flow Rational Method (L/s)		
	2-year	5-year	100-year
A1 Pre – towards Grenoble Drive	28.4	42.4	80.5
A2 Pre – towards Easement	48.2	72.1	136.9
A3 Pre – towards Deauville Lane	1.5	2.2	4.2

As shown in **Table 5-2**, post-development flows towards Grenoble Drive and towards the Easement will need to be controlled to the target flow of 28.4 L/s and 48.2 L/s respectively. Furthermore, there will be no storm runoff towards Deauville Lane under post-development conditions, up to a 100-year storm event.

5.2. Stormwater Management

In order to meet the WWFMG criteria, the post development flow rate from the subject site is to be controlled to the two (2)-year target flow established in **Section 4.2**.

The post-development drainage areas and runoff coefficients are indicated on **Figure DAP-2**, located in **Appendix C** and summarized in **Table 5-3** below.

Table 5-3 – Post-development Input Parameters

Drainage Area	Drainage Area (ha)	"C"	Tc (min.)
A1 Post - (Controlled)	0.607	0.90	10
A2 Post – (Uncontrolled)	0.068	0.50	10

5.2.1. Water Balance

Residential Development

The City's WWFMG requires 5 mm of onsite runoff from any rainfall event to be retained over the entirety of the site. A 5 mm of rainfall over 6,073m² equates to a required water balance volume of 30.37 m³. In order to achieve this, the following low impact development (LID) techniques may be implemented:

- Collecting rainwater in storage tanks to be reused for irrigation purposes; and,
- Green roof and planters.

Detailed calculations will be provided during the detailed design stage of Site Plan Application.

Parkland Dedication

The parkland dedication area will be designed to be composed exclusively by softscape areas, thus it will meet the water balance requirement.

5.2.2. Quantity Controls

As mentioned in **Section 5.1** storm runoff from the existing property drains towards three (3) storm sewer networks.

Due to the fact that storm runoff, up to a 100-year storm event, will not drain towards the Deauville Lane under post-development conditions, a quantity control analysis will not be required. Therefore, a quantity control analysis has been prepared for each storm network adjacent to the site in order to assess the pre to post development impacts on each network.

5.2.2.1 Post-development flows towards Grenoble Drive

Using the City's intensity-duration-frequency (IDF) data, modified rational method calculations were undertaken to determine the maximum storage required during each storm event. Results for the 2, 5 and 100-year storm events are provided in **Table 5-4**. The detailed post-development quantity control calculations are provided in **Appendix C**.

Table 5-4 – Post-development Quantity Control as per City Requirements (towards Grenoble Drive)

Site	Storm Event	Target Flow (L/s)	Required Storage Volume (m ³)
48 Grenoble Drive	2-year	28.4	165.89
	5-year		239.87
	100-year		440.82

As shown in **Table 5-4**, in order to control post-development flows to 2-year pre-development conditions, a target flow of 28.4 L/s is to be satisfied. The minimum required on-site storage is 440.82 m³ for the 100-year storm event. This can be achieved through the design and installation of an underground storage tank and flow control devices, details of which will be provided through the detailed design stage of Site Plan Application.

5.2.2.2 Post-development flows towards Easement

Using the City's intensity-duration-frequency (IDF) data, modified rational method calculations were undertaken to determine the maximum storage required during each storm event. Results for the 2, 5 and 100-year storm events are provided in **Table 5-5**. The detailed post-development quantity control calculations are provided in **Appendix C**.

Table 5-5 – Post-development Quantity Control as per City Requirements (towards Easement)

Site	Storm Event	Target Flow (L/s)	Post-development Uncontrolled Flow (L/s)
Parkland Dedication	2-year	48.2	8.3
	5-year		12.4
	100-year		23.5

As shown on **Table 5-5**, under post-development conditions, uncontrolled flow towards the Easement during a 100-year storm event is smaller than the two (2)-year pre-development target flow, therefore, no stormwater storage is required and the existing storm infrastructure along the Easement will not be negatively affected by the proposed Parkland dedication.

5.2.3 Quality Controls

Stormwater treatment must meet Enhanced Protection criteria as defined by the MECP 2003 SWMPD Manual, including a minimum of 80% of total suspended solids removal (TSS). Quality control and the need of additional measures will be discussed during Site Plan Application.

5.3 Proposed Storm Connections

Residential Development

The storm sewer system for the residential development will be designed to meet the City's requirements and discharge into the existing 300 mm diameter storm on Grenoble Drive via a 200 mm diameter storm lateral connection with a minimum grade of 2.00% (or equivalent design).

Therefore, the proposed development will not adversely affect flow conditions upstream and downstream of the subject site. Further details about the stormwater management will be provided during Site Plan Application. For the stormwater service connection please refer to **“Proposed Servicing Figure” Figure 3** in **Appendix F**.

Parkland Dedication

The proposed SWM plan in conjunction with the proposed grading and servicing, retains enough runoff volume to reduce the post-development flows below the pre-development target flows for each storm event. Consequently, no stormwater storage will be required for the Parkland Dedication portion of the site.

The storm sewer system for the Parkland Dedication will discharge into the existing 375 mm diameter storm along the Easement at the west side of the site, via a 150 mm diameter storm lateral connection with a minimum grade of 2.00% (or equivalent design). Further details about the stormwater management will be provided during Site Plan Application. For the stormwater service connection please refer to **“Proposed Servicing Figure” Figure 3** in **Appendix F**.

6.0 Sanitary Drainage System

6.1 Existing Sanitary Drainage System

The existing site is currently occupied by one (1) residential building. According to available records, there is one (1) sanitary sewer, abutting the subject property. More specifically there is:

- A 450 mm diameter sanitary sewer on the west side of the subject property and within the parkland area, flowing south towards Grenoble Drive.

Following an investigation (please refer to 'Site Investigation And Dye Test Report' prepared by Lithos Group dated November 1st, 2022 in **Appendix B**), it was discovered that the existing sanitary service connection from the existing building, is to the existing 450 mm diameter sanitary sewer, along the existing Easement located at the west side of the site. All existing sanitary services will be removed from the right-of-way and capped at the City's main and this work is to be performed by City forces at the Owner's expense.

Following our review of the information provided by the City, the sanitary network abutting our property eventually discharges into the trunk sewer between Don Mills Road and Don Valley Parkway.

6.2 Existing and Proposed Sanitary Flows

The sanitary flow generated by the proposed development at 48 Grenoble Drive was compared to the existing flow in order to quantify the net increase in the sanitary sewer.

Using the design criteria outlined in **Section 4.3** and existing site information, the sanitary discharge flow from the existing residential building is estimated at 4.19 L/s. Detailed calculations can be found in **Appendix D**.

Residential Development

Using the design criteria outlined in **Section 4.3** and the proposed development statistics, the proposed development will discharge 19.10 L/s into the City's infrastructure.

The capacity of the existing sanitary sewer network along Grenoble Drive to accommodate the post-development sanitary flow, will be discussed under **Section 8.0** of this report.

Parkland Dedication

Due to the absence of any permanent structures at the parkland design, there will be no sanitary discharge assumed into the City's infrastructure from the future Parkland Dedication, at this stage.

6.3 Proposed Sanitary Connection

Residential Development

The new service connections cannot run under the parkland dedication area to tie into the existing sewer segments located at the easement area, west of the subject property. Furthermore, the service connections should connect to sewers in the roadway for future serviceability.

In addition, the installation of new sewers under the parkland dedication area could inhibit the use of the parkland in the future. Consequently, in order to support the proposed development, a sanitary sewer extension, with a 375mm diameter, is proposed to the existing sanitary sewer system.

Therefore a new 375mm diameter sanitary sewer with a minimum grade of 1.0% is proposed along Grenoble Drive, flowing West. The required horizontal separation of 2.5m cannot be achieved between the existing 400mm diameter watermain and the proposed 375mm diameter sanitary sewer on Grenoble Drive, therefore, low pressure air testing of the new sanitary sewer according to TS 410.07.16.04.03 shall be performed.

Three (3) separate 150mm lateral connections will be provided for the proposed development: one for the East Tower; one for the Podium; and one for the West Tower.

Parkland Dedication

A 150mm diameter sanitary lateral will connect to the existing 450 mm sanitary sewer along the Easement at the west side of the site. (refer to **"Proposed Servicing Figure" Figure 3** in **Appendix F**).

7.0 Groundwater

According to the "Geotechnical Engineering Report" prepared by 'Grounded Engineering Inc.' dated July 4, 2023 and to the "Hydrogeological Review Report" prepared by Grounded Engineering Inc.', dated March 10th, 2022 (revised June 30, 2023), the stabilized ground water level is at an elevation of approximately 119.50 masl.

The results of groundwater sampling on site, reveal that groundwater exceeds the City's limits of total suspended solids, cyanide, BOD and manganese for discharging into the storm sewer network, however it is within the City's limits for discharging into the sanitary and combined sewer network. The results of the Hydrogeological review report can be found in **Appendix B**.

7.1 Long Term Dewatering

The proposed development will be serviced by three (3) basement levels, with the lowest basement slab elevation at 117.00 masl. Therefore it is anticipated that the proposed underground construction will be partially submerged under the existing groundwater table. Following that fact, the proposed underground construction is proposed to be water-tight.

7.2 Short Term Dewatering

Site dewatering during construction, under the worst case scenario, is anticipated at 252,000 L/day, which translates to approximately 2.92 L/s. Following the fact that the existing network along Grenoble Drive can accommodate the proposed total net flow of 14.91 L/s under post-development conditions, it is anticipated that it will be capable to accommodate the groundwater discharge during construction. Groundwater will be discharged into the proposed 375mm diameter sanitary sewer along Grenoble Drive.

8.0 Sanitary Sewer Capacity Analysis

The existing site is located in City's Basement Flooding Area 55 and the Basement flooding model for this area has been provided for our review.

The Downstream Sanitary Capacity Analysis Report, prepared by Lithos Group Inc., dated July, 2023 (included in [Appendix G](#)), has been provided in order to identify the impact of the proposed development into the existing sanitary network. Sanitary flow from the proposed development will be discharged into the City's sanitary network. A sanitary sewer analysis has been conducted using pre-development and post-development flows outlined in [Section 6.0](#).

According to the Sewer Capacity Analysis, four (4) model scenarios were developed to assess the sewer condition. Scenarios and findings are listed below:

- **Scenario 1:** Existing DWF Conditions (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions);
- **Scenario 2:** Proposed DWF Conditions (240L/c/d) (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions);
- **Scenario 3:** Existing Extreme WWF Conditions (May 12,2000 storm event) (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions);
- **Scenario 4:** Proposed Extreme WWF Conditions (May 12,2000 storm event) (240 L/c/d) (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions); and,

Sanitary sewer analysis has been prepared up to the 600 mm diameter sanitary trunk sewer between Don Mills Road and Don Valley Parkway (trunk connection, MH_ID#: MH5512534175), downstream of the site, in order to evaluate the impact of the proposed development to the existing sanitary network.

In addition, the Downstream Sanitary Capacity Analysis Report, prepared by Lithos Group Inc., dated July, 2023 ([included in Appendix G](#)), correctly represents the sewer system, including any updates to the model to reflect changes (i.e. sewer construction), since the model was initially prepared.

The drainage system has also been evaluated to include all sanitary peak flow rates and groundwater being discharged to the municipal sewer system from all active and recent development applications located within the affected sanitary sewershed.

Seven (7) new development applications were found within the Basement Flooding Area 55 from the City's development applications on the Application Information Centre. **Table 8-1** shows the new developments which have been incorporated into our analysis to account for "existing conditions".

Table 8-1 – New Developments

No	Site Address	Residential Population	Non-Residential Area (ha)	Non - Residential Population	Total population	Groundwater Flow (L/s)
1.	7, 11 Rochefort Drive	2667	-	-	2667	-
2.	789, 793 Don Mills Road, & 10 Ferrand Drive	3800	3.59	4	3804	-
3.	25 St Dennis Drive	1298	0.11	1	1299	-
4.	7 St Dennis Drive, 10 Grenoble Drive	4983	-	-	4983	-
5.	200 Gateway Boulevard	1572	-	-	1572	5.67
6.	1185 Eglinton Ave E, 2 Sonic Way	1244	-	-	1244	-
7.	805 Don Mills Road	1764	-	-	1764	-

In addition, best efforts have been made to include all flows from Private Water discharge agreements in the sewershed.

8.1 Capacity Assessment Results

The analysis conducted by Lithos Group Inc., dated July, 2023 (**included in Appendix G**), shows that:

- **Under Dry Weather Flow (DWF) Conditions**, for both existing and proposed scenarios, the system operates under free flow conditions and no sewers are surcharging in the downstream network, from the site up to the 600 mm diameter sanitary trunk sewer between Don Mills Road and Don Valley Parkway (trunk connection, MH_ID#: MH5512534175); and,
- **Under Extreme Wet Weather Flow (WWF) (May 12, 2000 storm event) Conditions**, for both existing and proposed scenarios, the existing sanitary sewer system experiences minor surcharging with freeboard (freeboard > 1.8 m) at eleven (11) manholes. The minimum freeboard attained within the sewer segments is 1.94m.

According to Table 1: Capacity Criteria for Sanitary and Combined Sewers, in Sewer Capacity Assessment Guidelines please see below the conclusions of our Analysis:

Criterion 1: Under Dry Weather Flow conditions, the system operates under free flow conditions and no surcharge (HGL is below the pipe obvert) occurs.

Criterion 2: Under proposed Wet Weather Flow conditions (with Mitigation Measures), which include I&I generated under the May 12, 2000 storm event, the HGL in the downstream sewers is at least 1.80 m below grade.

Due to the above, Criteria 1 and 2 (of Table 1: Capacity Criteria for Sanitary and Combined Sewers, City's Sanitary Sewer Capacity Assessment Guidelines) have been achieved; therefore, no mitigation measures are required from our property and there is adequate local system capacity.

The Downstream Sanitary Capacity Analysis demonstrates that the proposed residential development at 48 Grenoble Drive does not increase the risk of basement flooding and can be serviced by the existing sanitary network.

Results of the analysis can be found in [Appendix G](#).

9.0 Water Supply System

9.1 Existing System

Based on plans provided by the City, the existing watermain system consists of the following waterlines:

- A 400 mm diameter watermain on the south side of Deauville Lane; and
- A 400 mm diameter watermain on the west side of Grenoble Drive.

The existing water service connection from the site, is to the existing 400 mm diameter watermain on the west side of Grenoble Drive. All existing water services will be removed from the right-of-way and capped at the City's main and this work is to be performed by City forces at the Owner's expense.

Two (2) fire hydrant flow tests were carried out by Lithos Group Inc., on May 5, 2022 along Deauville Lane and Grenoble Drive, to determine the flow and pressure in the existing 400 mm diameter watermain.

The results of the test conducted on Deauville Lane indicate that the existing static pressure is 620 KPa (90 psi) and 101.55 L/sec (1609 USPGM) of water is available with a residual pressure of 592 KPa (86 psi). Similarly, according to the test conducted on Grenoble Drive, the existing static pressure is 592 KPa (86 psi) and 66.96 L/sec (1061 USPGM) of water is available with a residual pressure of 558 KPa (81 psi). The full detailed report is included in [Appendix E](#).

9.2 Proposed Water Supply Requirements

The estimated water consumption was calculated based on the occupancy rates shown on [Table 4-2](#), based on the City's watermain design criteria revised in January 2021.

Residential Development

It is anticipated that an average consumption of approximately 4.16 L/s (359,424 L/day), a maximum daily consumption of 6.24 L/s (539,136 L/day) and a peak hourly demand of 9.37 L/s (33,732 L/hr) will be required to service this development with domestic water. Detailed calculations are found in [Appendix E](#).

The fire flow requirements were calculated using the method prescribed by the Fire Underwriters Survey (FUS) 2020 be undertaken to assess the minimum requirement for fire suppression. The fire flow calculations is conducted for the largest storey, by area, and for the two immediately adjacent storeys.

According to the letter Type of Construction Proposed, provided by “Diamond Schmitt” dated May 12, 2023 (found in [Appendix B](#)) and the letter regarding sprinkler system provided by “Smith and Andersen” dated May 11, 2023 (found in [Appendix B](#)).

As a result to the above mentioned method, we have selected Levels 1, 2 and 3 to determine the fire flow demand. [Table 9.1](#) illustrates the input parameters used for the FUS calculations.

According to our calculations, a minimum fire suppression flow of approximately 161.50 L/s (2,560 USGPM) will be required. Refer to detailed calculations found in [Appendix E](#).

Table 9.1 – Fire Flow Input Parameters

Parameter	Frame used for Building	Combustibility of Contents	Presence of Sprinklers	Separation Distance			
				North	West	South	East
Value according to FUS options	non-combustible construction	limited combustible occupancy	Yes	3.1m to 10m	> 45m	30.1m to 45m	> 45m
Surcharge/reduction from base flow	0.8	15%	30%	20%	0%	5%	0%

In summary, the required design flow is the sum of ‘the minimum fire suppression flow’ and the ‘maximum daily demand’ ($161.50 + 6.24 = 167.74$ L/s, 2659 USGPM).

The results of the hydrant flow test carried out by Lithos Group Inc., on May 5, 2022 along Grenoble Drive, indicate that 269.74 L/s (4274.80 USGPM) of water is available with a pressure of 138KPa (20.0 psi) revealing that the existing water infrastructure will support the proposed development. The hydrant flow test can be found in [Appendix E](#).

Parkland Dedication

Due to the absence of any permanent structures at the parkland design, no equipment is currently proposed, at this stage.

9.3 Proposed Watermain Connection

Residential Development

According to the Ontario Building Code (OBC), for each building greater than 84m in height an additional fire line is required. Three (3) separate domestic connections will be provided for the proposed development: one for the South Tower; one for the Podium and one for the North Tower. The connections will be as follows:

West Tower

Residential-Use of the high-rise building: one (1) 200 mm diameter fire split to a 150 mm domestic water will connect on the 400 mm watermain on Grenoble Drive and one (1) 200 mm diameter fire will connect on the 400 mm watermain sewer on Deauville Lane;

East Tower

Residential-Use of the high-rise building: one (1) 200 mm diameter fire split to a 150 mm domestic water will connect on the on the 400 mm watermain sewer on Deauville Lane and one (1) 200 mm diameter fire will connect on the 400 mm watermain sewer on Grenoble Drive;

Podium

Residential-Use of the Podium: one (1) 150 mm diameter fire split to a 100 mm domestic water will connect on the 400 mm watermain on Deauville Lane;

Parkland Dedication

Parkland Area to be dedicated to the City: one (1) 50 mm diameter domestic water will connect on the 400 mm watermain sewer on Grenoble Drive;

According to City's standard drawing T-1104.02-3, fire and domestic connections on Grenoble Drive and Deauville Lane will be split two (2) meters away from the property line and valve and boxes will be installed on each service at the property line. For details (refer to **"Proposed Servicing Figure" Figure 3** in **Appendix F**).

10.0 Site Grading

10.1 Existing Grades

The subject site drains mainly towards Grenoble Drive and the easement areas west of the property, with a small portion of the property, at its north-east corner, draining towards Deauville Lane.

10.2 Proposed Grades

The proposed grades will maintain the existing drainage patterns wherever feasible. Grades will be maintained along property lines to the extent practical. Furthermore, under post-development conditions, there will be no surface drainage towards the Parkland Dedication portion of the site from the residential development.

11.0 Conclusions and Recommendations

Based on our investigations, we conclude the following:

Storm Drainage

A detailed Stormwater Management (SWM) report will be prepared during the Site Plan Application stage. The site stormwater discharge will be controlled to the 2-year pre-development flow and will be connected to the existing 300mm diameter storm sewer on Grenoble Drive. In order to attain the target flows and meet the City's Wet Weather Flow Management Guidelines (WWFMG), quantity controls will be utilized and up to 440.82 m³ on-site storage will be required for the proposed residential development. The stormwater management (SWM) system will be designed to provide enhanced level (Level 1) protection as specified by the Ministry of Environment, Conservation and Parks (MECP). Quality control will be provided for the subject site for a minimum total suspended solids (TSS) removal of 80%.

Sanitary Sewers

Four (4) separate connections will be provided for the proposed development: one for the East Tower; one for the Podium; one for the West Tower and one for the Parkland Dedication. All sanitary connections from the proposed development will connect to a proposed 375 mm diameter sanitary sewer on Grenoble Drive flowing West, and the sanitary connection from the Parkland Dedication will connect to the existing 450 mm diameter sanitary sewer, along the Easement, located at the West side of the site. The additional net discharge flow from the entire property (proposed and existing development), is anticipated at approximately 14.91 L/s.

According to the “Downstream Sanitary Capacity Analysis Report”, prepared by Lithos Group Inc., dated July, 2023 (**included in Appendix G**), the analysis of the external sanitary drainage area indicates that Criteria 1 and 2 (of Table 1: Capacity Criteria for Sanitary and Combined Sewers, City’s Sanitary Sewer Capacity Assessment Guidelines) have been achieved and the proposed site does not affect flow conditions downstream, while the existing sanitary sewer infrastructure can support the proposed development.

Water Supply

Three (3) separate water lines will serve the proposed Podium, East and West towers. As per the City’s guidelines, these waterlines will split into domestic and fire connections. Furthermore, due to the fact that the proposed Towers exceed 84m in height, two (2) additional fire lines will be provided for each of the proposed Towers. In addition, one (1) waterline will be service the proposed Parkland dedication. Water supply for the site will be from the existing 400 mm diameter watermain on the East side of Deauville Lane and the existing 400 mm diameter watermain on the North side of Grenoble Drive.

It is anticipated that a total design flow of 167.74 L/s will be required to support the proposed development. The results of the fire hydrant test, conducted by Lithos Group Inc., on May 5, 2022, reveal that the existing water infrastructure along Grenoble Drive and Deauville Lane will be able to support the proposed development.



LOCATION PLAN
RESIDENTIAL USE DEVELOPMENT
48 GRENABLE DRIVE
TORONTO, ONTARIO

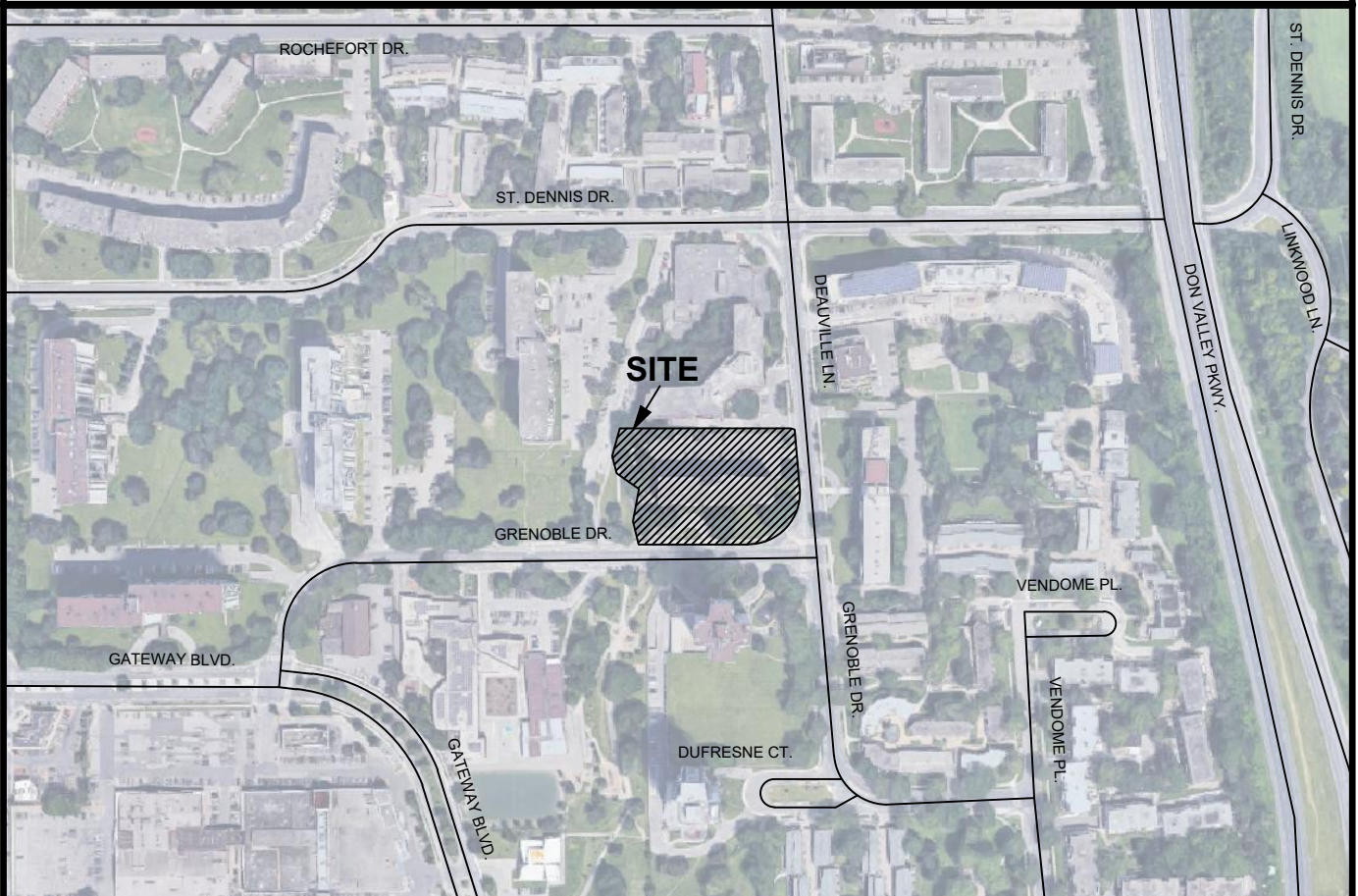
150 Bermondsey Road, Toronto, Ontario M4A 1Y1

DATE: JULY 2023

SCALE: N.T.S.

PROJECT No: PUD21-110

FIGURE No: FIG 1



AERIAL PLAN
RESIDENTIAL USE DEVELOPMENT
48 GRENABLE DRIVE
TORONTO, ONTARIO

150 Bermondsey Road, Toronto, Ontario M4A 1Y1

DATE: JULY 2023

SCALE: N.T.S.

PROJECT No: PUD21-110

FIGURE No: FIG 2

Appendix A

Site Photographs



North East Corner of Property along Deauville Lane – Facing South West



South West Corner along Grenoble Drive – Facing North East



South East Corner along Grenoble Drive – Facing North West

Appendix B

Background Information

PLAN OF SURVEY OF
PART OF BLOCK G2
REGISTERED PLAN M-834
CITY OF TORONTO

SCALE 1 : 250

R. AVIS SURVEYING INC.

METRIC : DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

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NOTES AND LEGEND

BEARINGS SHOWN HEREON ARE GRID BEARINGS AND ARE DERIVED FROM OBSERVE REFERENCE POINTS (S) AND (B) HAVING A BEARING OF N15°41'52" E BY REAL TIME NETWORK (RTN) OBSERVATION, ZONE 10, CENTRAL MERIDIAN 79° 30' WEST LONGITUDE
(1) MODIFIED TRANSVERSE MERCATOR PROJECTION, NAD 83 (CSRS-2010)

3' MTM ZONE 10 COORDINATES		
NAD83(CSRS-2010) (CENTRAL MERIDIAN 79°30' WEST LONGITUDE)		
	NORTHING	EASTING
A	4841837.355	318364.595
B	4841857.513	318425.919
C	4841898.285	318444.610
D	4841930.651	318430.958

- DENOTES SURVEY MONUMENT FOUND
 - RB DENOTES SURVEY MONUMENT PLANTED
 - SB DENOTES ROUND IRON BAR
 - IB DENOTES STANDARD IRON BAR
 - WT DENOTES WITNESS
 - W(1042) DENOTES EDWARDS & GUNN LIMITED
 - (OU) DENOTES ORIGIN UNKNOWN
 - MEAS/N DENOTES MEASURED
 - N,S,E,W DENOTES NORTH, SOUTH, EAST, WEST
 - RP DENOTES REGISTERED PLAN M-834
 - P1 DENOTES SURVEYOR'S REAL PROPERTY REPORT BY P.SALNA COMPANY LTD., O.L.S. DATED OCTOBER 08, 2001
 - P2 DENOTES PLAN 66R-11956
 - BD DENOTES BRICK
 - BRW DENOTES BRICK RETAINING WALL
 - BF DENOTES BOARD FENCE
 - CLF DENOTES CHAIN LINK FENCE
 - CONC. DENOTES CONCRETE
 - CB DENOTES CONCRETE
 - FI DENOTES FIRE HYDRANT
 - GM DENOTES GAS METER
 - C DENOTES COLUMN
 - LS DENOTES LIGHT STANDARD
 - MM DENOTES MANHOLE
 - TS DENOTES TRAFFIC SIGN
 - TR DENOTES TRANSFORMER
 - (T) DENOTES TOP OF CURB
 - (B) DENOTES BOTTOM OF CURB
 - (G) DENOTES GUTTER
 - AV DENOTES AIR VENT
 - ICV DENOTES IRRIGATION CONTROL VALVE
 - SAN DENOTES SANITARY
 - PED DENOTES PEDIESTAL
 - DENOTES OVERHEAD WIRE
- 0.109 DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER 0.10 metres
- 0.109 DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER 0.10 metres
- DENOTES SPOT ELEVATION

AREA = 6748.9 sq. m.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.

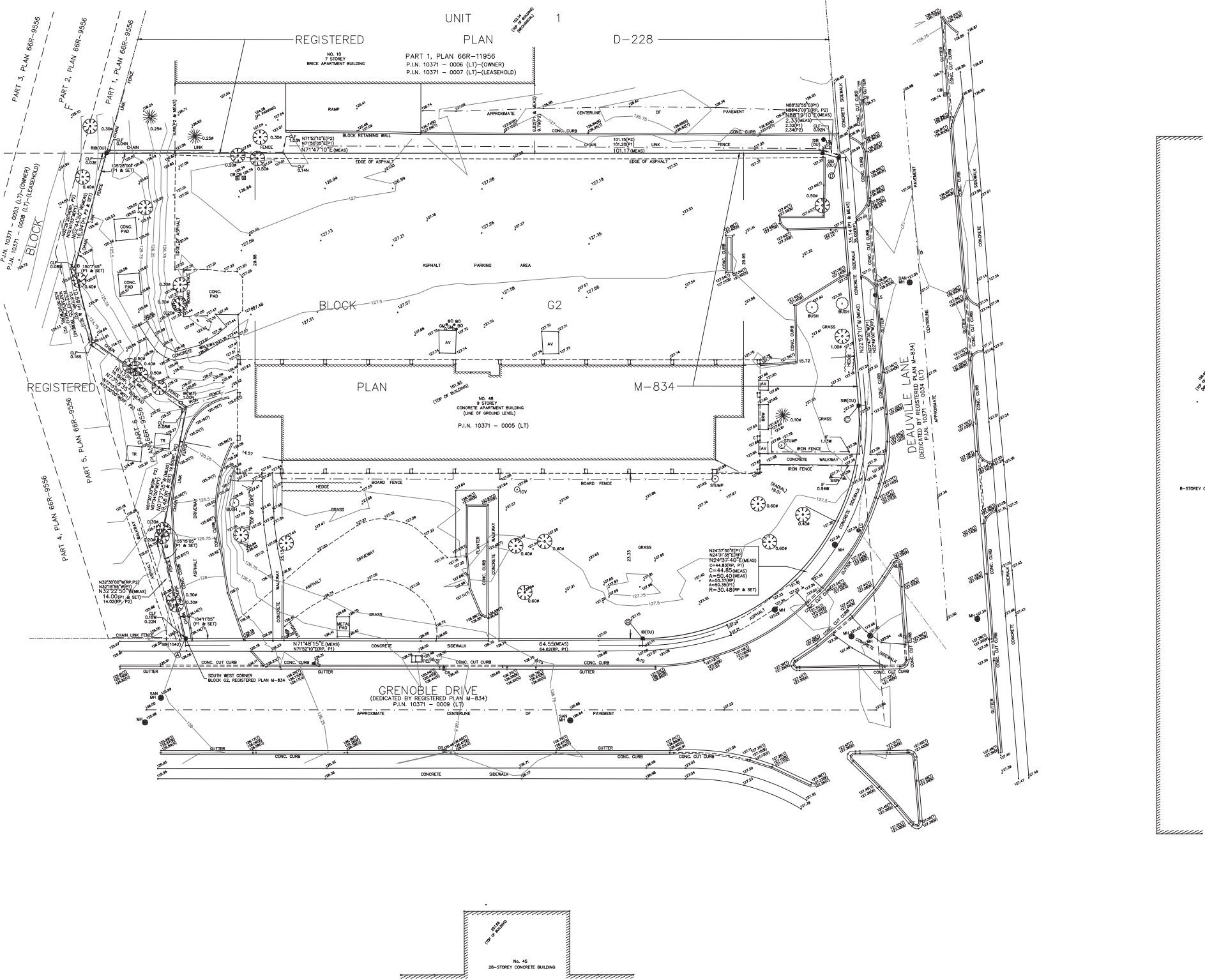
2. THE SURVEY WAS COMPLETED ON THE 4th DAY OF AUGUST, 2021

AUGUST 5, 2021
DATE

PIRATHEEPAN RAMACHANDRAN
Ontario Land Surveyor

R. AVIS SURVEYING INC.
SUITE 203
235 YORKLAND BOULEVARD
TORONTO, ONTARIO
M2J 4Y8
TEL: (416) 490-8352 FAX: (416) 491-8206
www.ravissurveying.com

CHECKED BY : P.R. O.L.S.	PROJECT No. : 3487-0
CALCULATED BY : .B	DRAWING No. : 3487-0T
DRAWN BY : .B	



The Green Roof Statistics Template is required to be submitted for Site Plan Control Applications where a green roof is required under the Toronto Municipal Code Chapter 492, Green Roofs. Complete the table below and copy it directly onto the Roof Plan submitted as part of any Site Plan Control Application requiring a green roof in accordance with the By-law. Refer to Section 4.492.1 of the Municipal Code for a complete list of defined terms, and greater clarity and certainty regarding the intent and application of the terms included in the template. The Toronto Municipal Code Chapter 492, Green Roofs can be found online at: http://www.toronto.ca/bylaws/municipalcode/1184_492.pdf

Green Roof Statistics

	Proposed
Gross Floor Area, as defined in Green Roof Bylaw (m ²)	81,162
Total Roof Area (m ²)	998
Area of Residential Private Terraces (m ²)	0
Rooftop Outdoor Amenity Space, if in a Residential Building (m ²)	0
Area of Renewable Energy Devices (m ²)	0
Tower (s) Roof Area with floor plate less than 750 m ²	0
Total Available Roof Space (m ²)	998
Green Roof Coverage	Required: 0% Proposed: 0%
Coverage of Available Roof Space (m ²)	100% 0%
Coverage of Available Roof Space (%)	0% 0%

ISSUED

No.	Date	Description
1	09/18/2023	ISSUED FOR ZBA/SPA
2	02/08/2023	ISSUED FOR ZBA/SPA2
3	05/11/2023	ISSUED FOR ZBA/SPA3
4	07/10/2023	ISSUED FOR ZBA/SPA3

1.0 SUMMARY

SITE AREA	6,749	m ²
TOTAL GFA	74,717	m ²
FS	11.1	

PARKLAND DEDICATION	676	m ²
POPS	540	m ²

RENTAL REPLACEMENT UNITS	109
NET NEW AFFORDABLE RENTAL	1
NEW RESIDENTIAL UNITS	956
TOTAL RESIDENTIAL UNITS	1066

2.0 BUILDING HEIGHT

WEST TOWER	EAST TOWER
Tower: 140.8m	Tower: 123.8m
MPH: 7.5m	MPH: 7.5m
TOTAL: 140.4m	TOTAL: 136.4m

3.0 FLOOR AREA

Level	# of Levels	GCA/Level	Total GCA	Res GFA*	Amenity (Ext)	Amenity (Int)	Deductions	Non-Res GFA	Total GFA
m ²		m ²		m ²		m ²		m ²	
P3	1	9,656	9,656	9,656	-	-	-	9,656	-
P2	1	5,620	5,620	5,620	58	624	-	5,652	58
P1	1	5,272	5,272	5,272	68	732	-	5,304	68
TOTALS	3	11,899	126,896	126	1,356	-	-	11,863	126

WEST TOWER (L7-MPH)

7 - Amenity	1	835	8,985	835	8,985	59	632	785	8,450	716	7,707	60	946	-	-	59	632
8 to 43	36	835	30,040	32,447	28,123	302,715	-	-	-	-	-	1,926	20,721	-	-	28,163	302,715
Lower MPH	1	835	8,985	835	8,985	555	5,971	-	-	-	-	280	3,014	-	-	555	5,971
Upper MPH	1	835	8,985	835	8,985	625	6,724	-	-	-	-	210	2,261	-	-	625	6,724
TOTALS	39	32,563	350,401	32,563	316,042	785	8,450	716	7,707	2476	26,652	-	-	-	-	29,361	316,042

EAST TOWER (L7-MPH)

7 - Amenity	1	790	8,504	57	614	785	8,450	673	7,244	60	946	-	-	-	-	57	614
8 to 39	32	790	25,290	272,111	23,568	253,684	-	-	-	-	1,712	18,428	-	-	-	23,568	253,684
Lower MPH	1	790	8,504	790	8,504	515	5,543	-	-	-	-	275	2,960	-	-	515	5,543
Upper MPH	1	790	8,504	790	8,504	594	6,388	-	-	-	-	196	2,105	-	-	594	6,388
TOTALS	36	27,660	297,822	24,734	266,239	785	8,450	673	7,244	2,243	24,138	-	-	-	-	24,734	266,239

PODIUM (L1-6)

Lower TH	1	482	5,188	482	5,188	472	5,081	0	-	-	-	10	108	-	-	472	5,081
1	1	3,285	35,360	3,285	35,360	2,015	21,689	432	4,650	510	5,490	562	5,942	208	2,239	2,223	23,928
M	1	3,285	35,360	3,285	35,360	1,768	19,025	-	-	198	2,126	1,320	14,208	-	-	1,768	19,025
2	1	3,335	35,688	3,335	35,688	3,214	34,593	-	-	-	-	121	1,305	-	-	3,214	34,593
3	1	3,335	35,688	3,335	35,688	3,214	34,593	-	-	-	-	121	1,305	-	-	3,214	34,593
4	1	3,335	35,688	3,335	35,688	3,214	34,593	-	-	-	-	121	1,305	-	-	3,214	34,593
5	1	3,335	35,688	3,335	35,688	3,214	34,593	-	-	-	-	121	1,305	-	-	3,214	34,593
6	1	3,335	35,688	3,335	35,688	3,214	34,593	-	-	-	-	121	1,305	-	-	3,214	34,593
TOTALS	5			23,727	255,395	20,523	218,758	432	4,650	708	7,616	2,488	26,763	208	2,239	20,531	220,997

GRAND TOTAL		Total GCA		Res GFA*		Amenity (Ext)		Amenity (Int)		Deductions		Non-Res GFA		Total GFA	
SUBTOTAL		m2	sq ft	m2	sq ft	m2	sq ft	m2	sq ft	m2	sq ft	m2	sq ft	m2	sq ft
		95,719	1,030,314	74,545	802,395	2,002	21,548	2,097	22,567	18,870	203,113	208	2,239	74,753	804,634
GRAND TOTAL		95,719	1,030,314	74,545	802,013	2,002	21,549	2,097	22,567	18,805	203,496	208	2,239	74,717	804,252

*GFA exemption as per By-Law 569-2013

4.0 AMENITY

	Total units	Exterior		Exterior/ unit (m ²)	Interior		Interior/ unit (m ²)
		m ²	ft ²		m ²	ft ²	
WEST TOWER	477	785	8,450	1.85	716	7,707	1.50
EAST TOWER	393	785	8,450	2.00	673	7,244	1.71
PODIUM	196	432	4,650	2.20	708	7,616	3.61
TOTALS	1066	2,002	21,549	1.88	2,097	22,567	1.97

5.0 PARKING

Level	Residential Car Parking			Visitor Car Parking			Total Car Parking	Bicycle Parking		Total Bicycles Parking
	Regular	BF	Total	Regular	Car Share	BF		Long-Term	Short-Term	
P1	38	4	42	5	4	3	12	54	1,013	1,013
P2	101	12	113	-	-	-	-	113	-	-
P3	25	-	25	-	-	-	-	25	-	-
1	-	-	-	-	-	-	2	2	214	214
TOTALS	164	16	180	5	4	3	14	194	1013	1227

BF = BARRIER FREE
Vehicle Parking Rate achieved: 0.18
Visitor Vehicle Parking: 0.01 "2+0.01"
Resident Vehicle Parking: 0.17

6.0 STORAGE

	Storage (m ³)
WEST BUILDING	0
EAST BUILDING	0
PODIUM	980.2
TOTAL	980.2

7.0 LOADING

Level	Count	Type
1	1	Type C Loading
1	1	Type G Loading

8.0 WASTE

Level	Type	Area (m ²)
1	Bulky Storage	10
1	Garbage Room	198
1	Bulky Storage	10
1	Garbage Room	90
TOTAL		398

UNIT DISTRIBUTION

Level	1B	1B-D	2B	3B	Total
WEST TOWER (L7-43)					
8-39 per level	8	0	4	7	13
8-39 Total	288	0	144	36	468
MPH	4	0	5	3	12
TOTALS	288	0	148	41	477

EAST TOWER (L7-39)

8-39 per level	6	31	2	7	12
8-39 Total	192	96	64	32	384
MPH	4	0	5	9	18
TOTALS	192	96	68	37	393

MARKET UNITS AT PODIUM (L1-6)

1	0	0	0	0	0
M	0	0	0	2	2
2	0	0	1	5	7
3	0	0	1	5	7
4	0	0	1	5	7
5	0	0	1	5	7
6	0	0	1	5	7
TOTALS	0	0	5	25	30

TOTAL NEW RES UNITS (East, West Tower & Podium)

TOTALS	552	101	241	111	956
50%	11%	25%	12%		
18	18-D	28	38		
Avg sq ft	537	671	633	648	
Range sq ft	485-590	600-678	611-690	625-1240	

RENTAL REPLACEMENT AT PODIUM (L1-6)

1	0	0	0	0	0
M	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
TOTALS	0	0	0	0	0

NEW NET AFFORDABLE RENTAL UNITS AT PODIUM (L1-6)

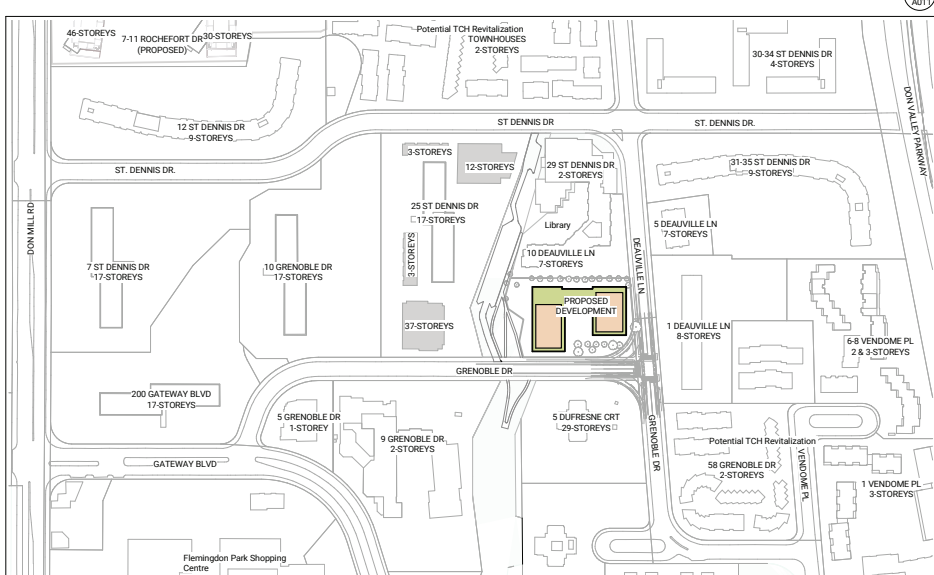
1	0	0	0	0	0
M	0	0	0	1	1
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
TOTALS	0	0	0	1	1

GRAND TOTAL	552	101	302	111	1066
	18	18-D	28	38	

Bird-Friendly Design Statistics

	North	South	East	West	Total (m2)	Total (%)
Glazing Area (m ²)	722	884	422	671	2699	100%
Untreated Area (m ²)	0	0	0	0	0	0
Treated Area (m ²)	722	884	422	671	2699	100%
Low-Reflectance	0	0	0	0	0	0
Opaque Glass (m ²)	722	884	422	671	2699	100%
Visual Markers (m ²)	0	0	0	0	0	0
Shaded (m ²)	0	0	0	0	0	0
For Site Plan Approval applications received before January 1, 2020, treat the first 12m above grade						
	North (Floor 7)	South (Floor 7)	East (Floor 7)	West (Floor 7)	Total (m2)	Total (%)
Glazing Area (m ²)	138	88	81	98	405	100%
Untreated Area (m ²)	0	0	0	0	0	0
Treated Area (m ²)	138	88	81	98	405	100%
Low-Reflectance	0	0	0	0	0	0
Opaque Glass (m ²)	138	88	81	98	405	100%
Visual Markers (m ²)	0	0	0	0	0	0
Shaded (m ²)	0	0	0	0	0	0
* Include this section only when applicable and provide relevant floor numbers for reference.						
Building Window : Wall Ratio	0.62:1					

Project Statistics

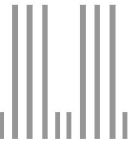


Contractor Must Check & Verify all Dimensions on the Job.
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This Drawing is Not to be Used for Construction Until Signed by the Architect.

48 Grenoble Drive
211033

CONTEXT PLAN, STATISTICS & TEMPLATE
1:2000

A011



ISSUED

No.	Date	Description
1	09/18/2022	ISSUED FOR ZBA/SPAD
2	02/08/2023	ISSUED FOR ZBA/SPAD
3	05/11/2023	ISSUED FOR ZBA/SPAD
4	07/10/2023	ISSUED FOR ZBA/SPAD

NOTES:

1. COLLECTION VEHICLE ACCESS DRIVEWAY TO BE LEVELLED MAX 8%.
2. A TRAINED ON-SITE STAFF MEMBER WILL BE AVAILABLE TO MANOEUVRE BINS FOR THE CITY COLLECTION DRIVER AND ALSO ACT AS A FLAGMAN WHEN THE TRUCK IS REVERSING. IN THE EVENT THAT ON-SITE STAFF IS UNAVAILABLE AT THE TIME THE CITY COLLECTION VEHICLE ARRIVES AT THE SITE, THE COLLECTION VEHICLE WILL LEAVE THE SITE AND NOT RETURN UNTIL THE NEXT SCHEDULED COLLECTION DAY.
3. ALL ASPHALT WITHIN THE CITY'S RIGHT OF WAY IS TO BE SUPERPAVE MAX 8% PER CITY STANDARDS.
4. BE ADVISED THAT SHOULD ANY PARTY, INCLUDING THE APPLICANT OR ANY SUBSEQUENT OWNER, APPLY FOR MORE THAN ONE CONDOMINIUM CORPORATION ENCOMPASSING ANY OR ALL OF THIS DEVELOPMENT OR MAKE AN APPLICATION THAT RESULTS IN A LAND DIVISION, STAFF MAY REQUIRE LEGAL ASSURANCES, INCLUDING BUT NOT LIMITED TO EASEMENTS, WITH RESPECT TO THE APPROVED SERVICES. SUCH ASSURANCES WILL BE DETERMINED AT THE TIME OF APPLICATION FOR CONDOMINIUM APPROVAL.
5. THE OWNER IS REQUIRED TO INSTALL AND MAINTAIN A PREMISE ISOLATION DEVICE FOR ALL APPLICABLE WATER SERVICES IN ACCORDANCE WITH TORONTO MUNICIPAL CODE, CHAPTER B61 WATER SUPPLY, THE BUILDING CODE, AND CSA B64 SERIES STANDARDS.
6. BEFORE SOLID WASTE COLLECTION SERVICES ARE TO BEGIN THE CITY WILL BE PROVIDED WITH A LETTER CERTIFIED BY A PROFESSIONAL ENGINEER THAT IN CASES WHERE A COLLECTION VEHICLE IS REQUIRED TO DRIVE ONTO OR OVER A SUPPORTED STRUCTURE (SUCH AS AN UNDERGROUND PARKING GARAGE) CAN SAFELY SUPPORT A FULLY LOADED COLLECTION VEHICLE (35,000 KILOGRAMS) AND CONFORMS TO THE FOLLOWING:
 - (A) DESIGN CODE - ONTARIO BUILDING CODE
 - (B) DESIGN LOAD - CITY BULK LIFT VEHICLE IN ADDITION BUILDING CODE REQUIREMENTS
 - (C) IMPACT FACTOR - 4% FOR MAXIMUM VEHICULAR SPEEDS TO 15KM/H AND 30% FOR HIGHER SPEEDS
7. PROVIDE AND MAINTAIN A WARNING SYSTEM TO ALERT DRIVERS WHEN EXITING THE UNDERGROUND PARKING GARAGE THAT LARGE TRUCKS ARE MANOEUVRING WITHIN THE DRIVEWAY MIRROR.
8. ALL EXISTING ACCESSES, CURB CUTS, TRAFFIC CONTROL SIGNALS THAT ARE NO LONGER REQUIRED HAVE BEEN REMOVED AND REINSTATE THE CURB, GUTTER AND BOULEVARD WITHIN THE CITY'S RIGHT-OF-WAY, IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE CHIEF ENGINEER AND EXECUTIVE.
 - P1-H DENOTES VISITOR PARKING USE SERVICES.
 - P1-R DENOTES RESIDENT PARKING USE.
 - P1-EV DENOTES PARKING STATIONS WITH EVSE.

Contractor Must Check & Verify all Dimensions on the Job.

Do Not Scale Drawings.

All Drawings, Specifications and Related Documents are the Copyright Property of the Architect and Must be Returned Upon Request. Reproduction of Drawings, Specifications and Related Documents in Part or in Whole is Forbidden Without Written permission of the Architect.

This Drawing is Not to be Used for Construction Until Signed by the Architect.

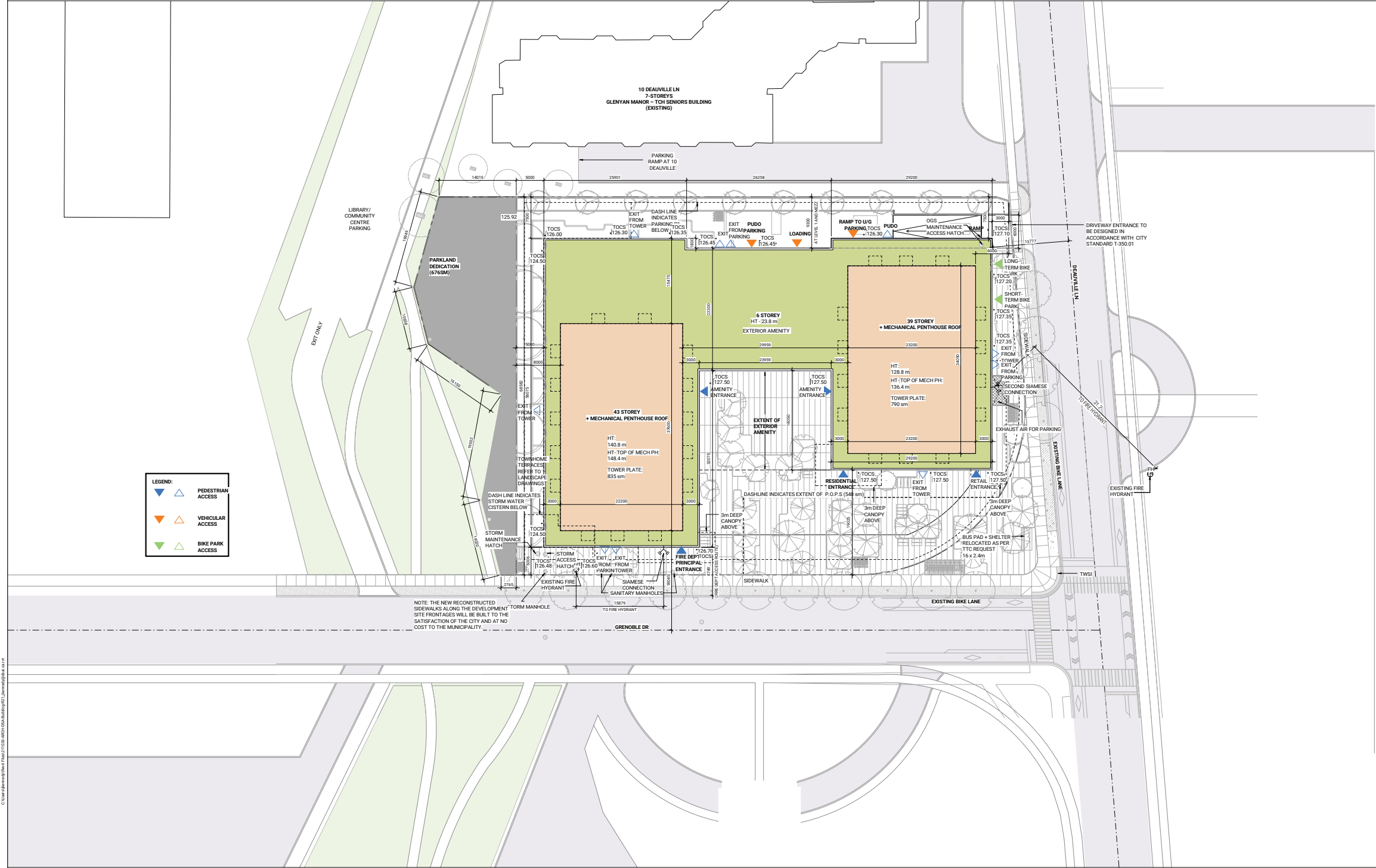
48 Grenoble Drive

211033

SITE PLAN

As indicated

A012



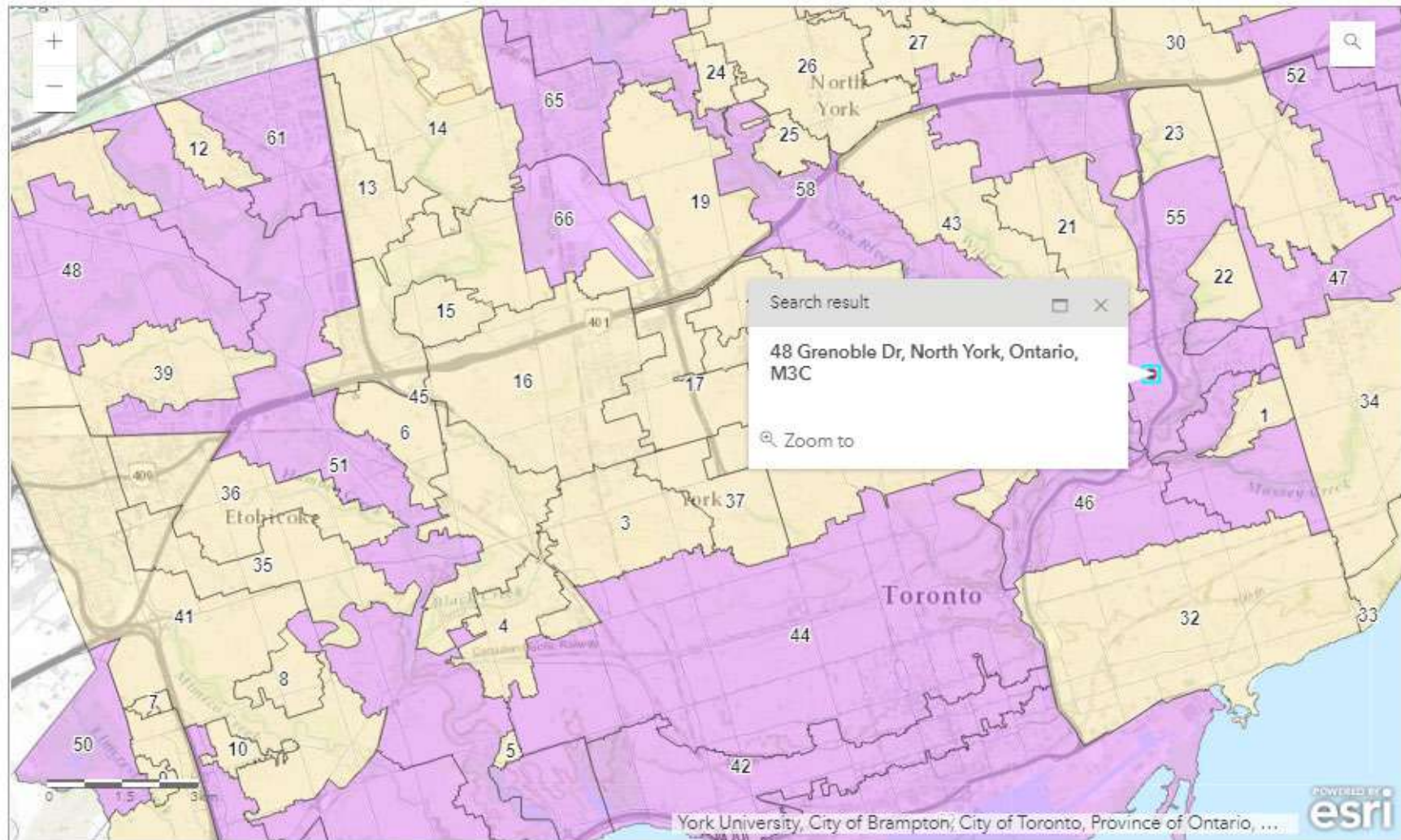
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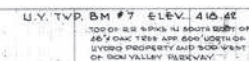
2023/04/10 10:55 AM

Map Legend

- Basement Flooding Study Completed
- Basement Flooding Study in Progress (started before 2019)
- Basement Flooding Study in Progress (started in 2019)

For more information enter an address in the search bar and/or click on the shaded area in the map





6	(P. 62-63)	WILLY KEATHE AIR BRUSH	BY	
7	(P. 64)	UNDERGROUND SERVICES REVISIO AS BUILT	BY	
8	(P. 65-67)	EXPANDED HYDROGRAPHIC SURVEYING	BY	
9	(P. 68-69)	ROAD IMPROVEMENT PROJECTS ON G-3 ROAD	BY	
10	(P. 70)	STAIRS, GLASSER REVISI REVISI	BY	
11	(P. 71-72)	PROPOSED NORTH WINDMILL WINDMILL ON ROAD	BY	
12	(P. 73-74)	PROPOSED NORTH WINDMILL WINDMILL ON ROAD	BY	

DATE: DATE APPROVED: _____

REVISIONS

FLEMINGDON

WEBIN COMMUNITY

DIVISION OF TORONTO INDUSTRIAL LEASING

APPROVED _____

PROJECT PLANNING ALLOCATION
FOR DEVELOPMENTAL WORK

R.V. ANDERSON & ASSOCIATES LTD.
ARCHITECTS ENGINEERS

SENIOR DEVELOPMENT CONSULTANTS

DRAWN BY: R.V. ANDERSON
CHECKED BY: R.V. ANDERSON
DATE: 10-1-88

DRAWING NO. 51002

TOWNSHIP OF NORTH YORK
ENGINEERING DEPARTMENT

DEAUVILLE LAKE

SCALE: _____

BY: _____
DATE: 10-1-88

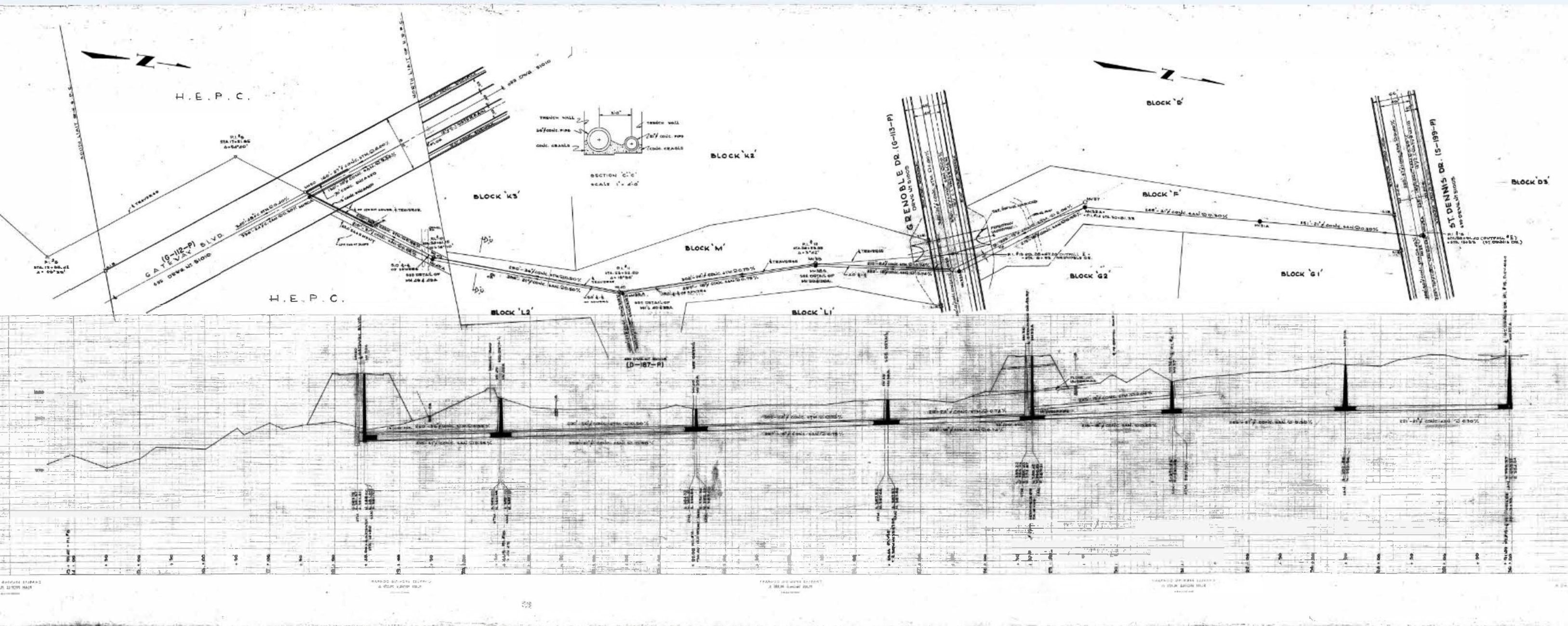
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PAGE _____

DATE: _____ DRAWN BY: _____

ONE: _____

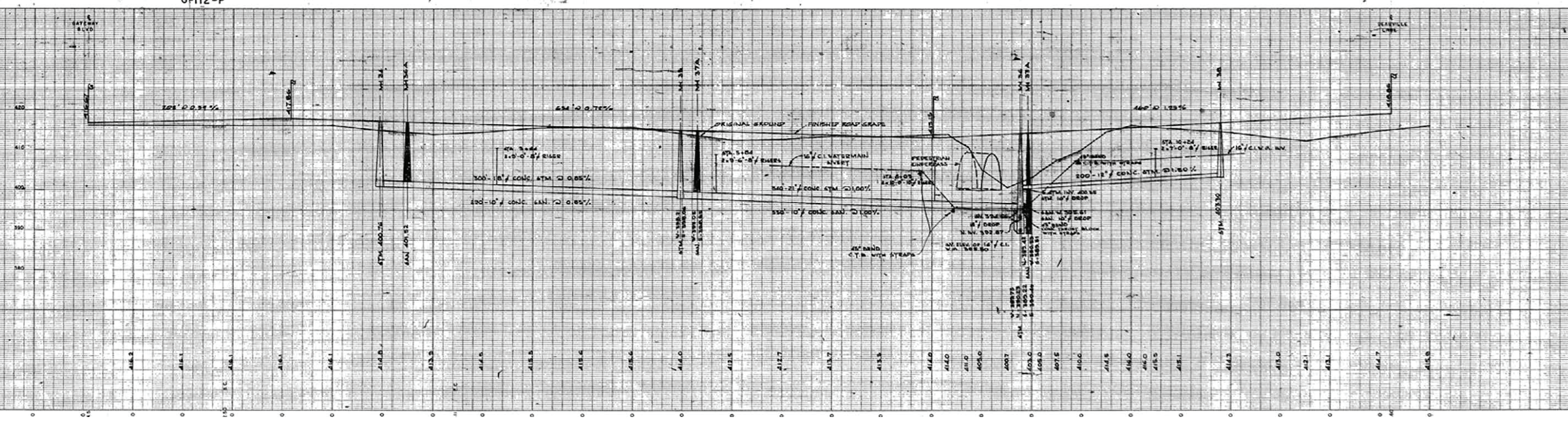
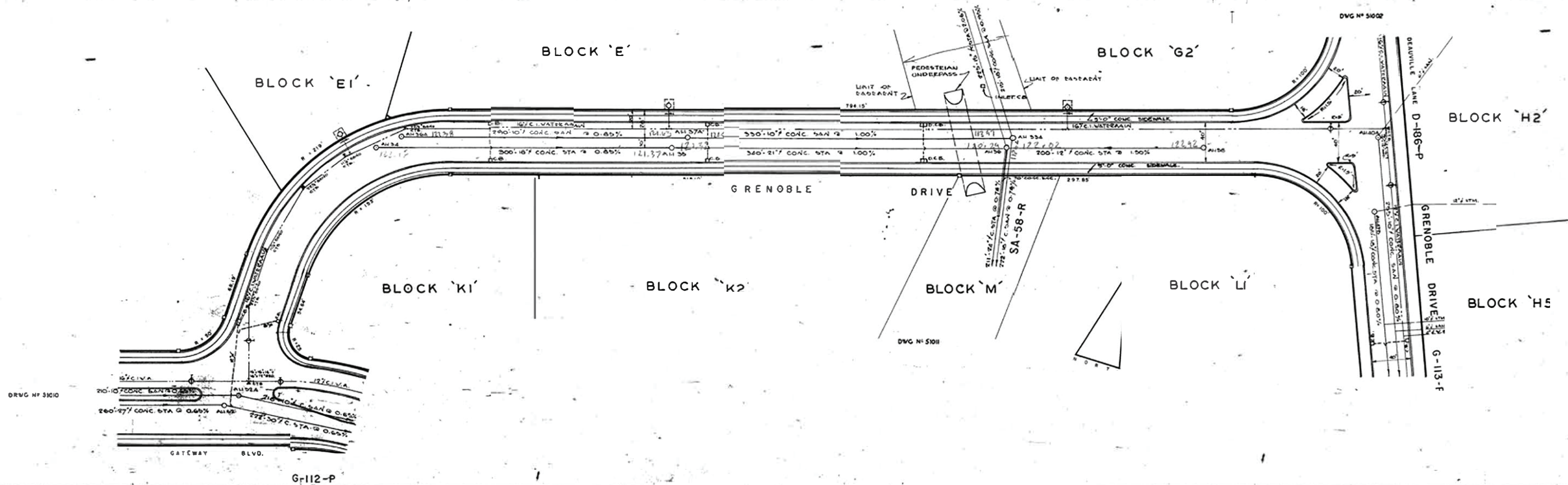
E.L. Anderson

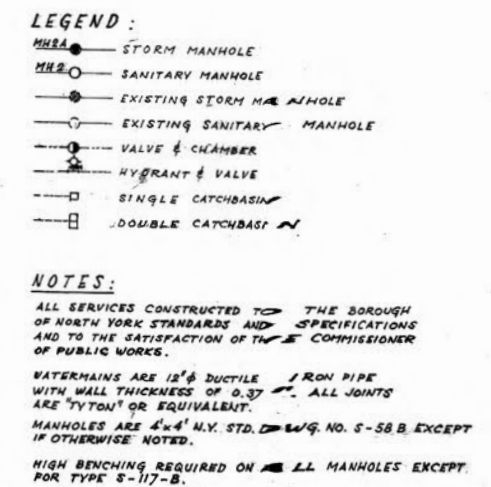
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PART OF PLAN & PROFILE SA-58-R-01

PART OF PLAN & PROFILE G-113-03





D	NOV. 68	AS CONSTRUCTED	D	M. 10
C				
B				
A				
ISSUE	DATE	R E V I S I O N		BY: AP



E. D. RICHARD

REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

R. ANDERSON ASSOCIATES LIMITED

CONSULTING ENGINEERS

194 WILSON AVENUE MU-1-5155

TORONTO, ONTARIO

BOROUGH OF NORTH YORK

DEPARTMENT OF PUBLIC WORKS

STORM & SANITARY

OUTFALL

APPROVED

JUL 30 1967

BOROUGH OF NORTH YORK

PLANNING DEPT.

Per: [Signature]

PERSONAL FILE

SCALE

HORIZ. 1" = 40'

VERT. 1" = 10'

DATE: FEB - 1967

BY: [Signature]

BENCH MARK

THP OF NORTH YORK

DATUM

(SEE DESCRIPTION ABOVE)

DRAWN BY: H. J. M. / P. M.

APPROVED: E. D. R.

FILE NO. 803

CHECKED BY: E. S. S.

DATE: [Blank]

ST-391-R

206-4-03

SUB-DIV. 666

PHASE II

General Information	
Date: November 1, 2022	Report No. : R22-11-01-01
Project No. : PUD21-110	Address : 48 Grenoble Drive
Owner : Tenblock	Region/Municipality: City of Toronto

Attendants			
	Name	Title	Contact Info.
Lithos Inspector	Keyvan Vahedi	Senior Project Coordinator	437-776-4086
Lithos Inspector	Pradeep Oleti	Construction Inspector	905-609-3435

Weather Condition			
☒ Sunny	☒ Cold	☐ Light Rain	☐ Windy
☐ Partly Cloudy	☐ Cool	☐ Heavy Rain	☐ Foggy
☐ Overcast	☐ Warm	☐ Light Snow	
Temperature : +6°C	☐ Hot	☐ Heavy Snow	

Existing Facilities at Project/Site
The subject property is occupied by a nine(9) story residential building .



General Information	
Date: November 1, 2022	Report No. : R22-11-01-01
Project No. : PUD21-110	Address : 48 Grenoble Drive
Owner : Tenblock	Region/Municipality: City of Toronto

Background and Summary of Findings

Background:

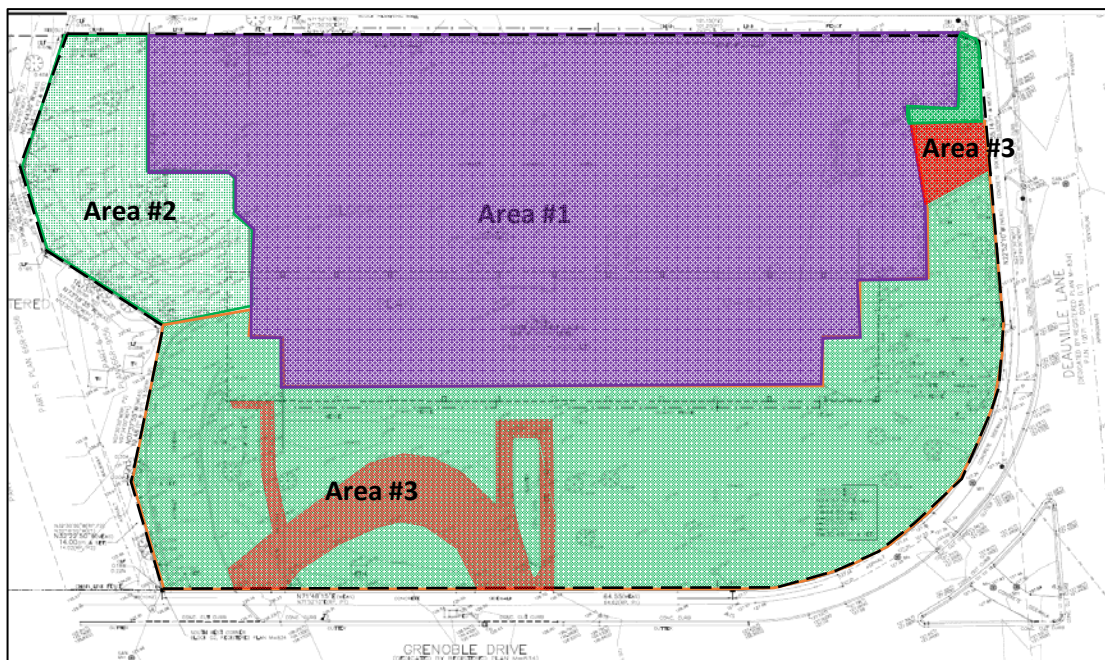
Further to our previous site inspection at 48 Grenoble Drive, on September 22nd, 2021, we conducted three (3) dye tests on the existing Storm and Sanitary within the site, in order to confirm the Storm and Sanitary discharge pattern within the subject site.

Based on the finding from our previous site investigation, the subject site consists of 3 areas as bellow:

Area #1 : All the storm runoff from this area is discharged into the existing storm network within the property; no storm outlet was visible within the building.

Area #2: This area includes unpaved areas within the property and all storm runoff within this area, infiltrates into the ground.

Area#3: This area includes paved areas within the property and all storm runoff within this area, flows overland and is captured by existing CBs along Grenoble Drive.



Summary of findings:

Area #1 consists of an existing nine (9) storey building and a parking area.

In order to confirm the Storm and Sanitary discharge pattern within Area#1, three (3) dye test conducted on the Storm and Sanitary network within the existing building, as well as existing catch basin within the parking area.

The results of the dye tests confirmed that:

- All Storm runoff from roof of the existing building is discharged into an existing 375mm dia. Storm Sewer, along the easment, west of the subject site.
- All Storm runoff from the Parking area is collected by an existing CB and discharged into an existing 375mm dia. Storm Sewer, along the easment, west of the subject site.
- All Sanitary discharge from the existing building is conveyed into an existing 450mm dia. Sanitary Sewer, along the easment, west of the subject site.

Region/Municipality: **City of Toronto**

Inv. 119.49

Inv. 120.06

Inv. 118.73

Inv. 118.56

Inv. 118.49

Storm MH3

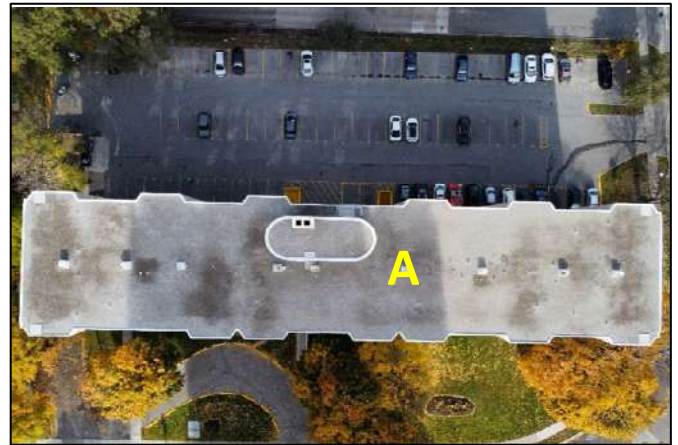
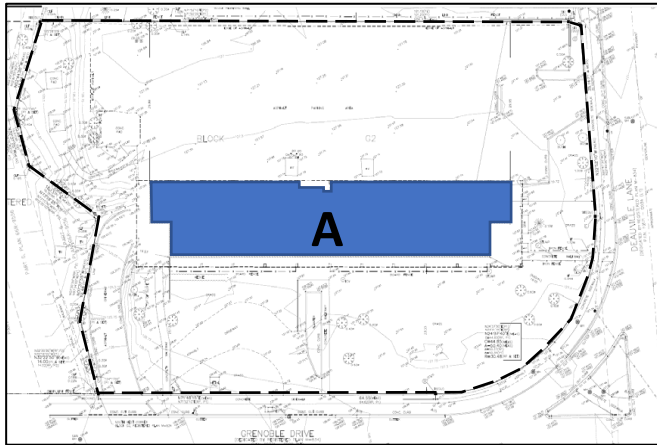
General Information	
Date: November 1, 2022	Report No. : R22-11-01-01
Project No. : PUD21-110	Address : 48 Grenoble Drive
Owner : Tenblock	Region/Municipality: City of Toronto

Investigation Details

Dye Test #1:

In order to identify/confirm the Storm runoff discharge pattern, within the existing building, a Dye Test conducted on one of the existing roof drains and the dye was observed at Storm MH3.

The result of the dye test confirmed that, all the storm runoff from the roof of the existing building is conveyed into the existing 375mm dia storm sewer along the Easement.



Roof Drain - Before Dye Test



Roof Drain - After Tye Test



MH3 - Before Dye Test



MH3 - After Dye Test

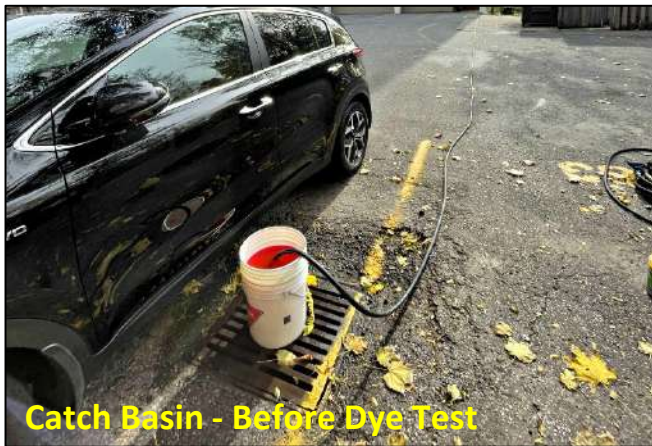
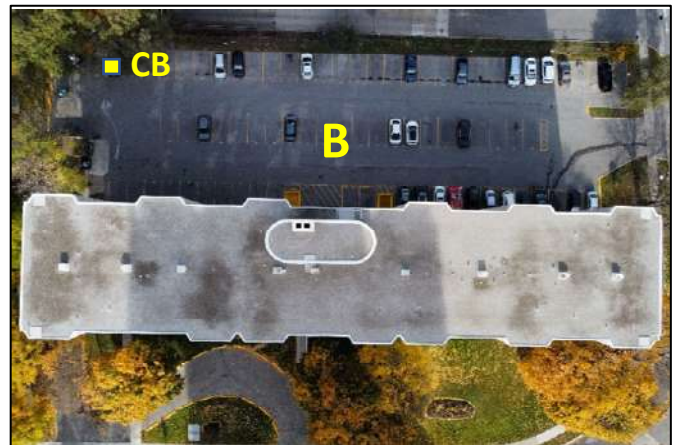
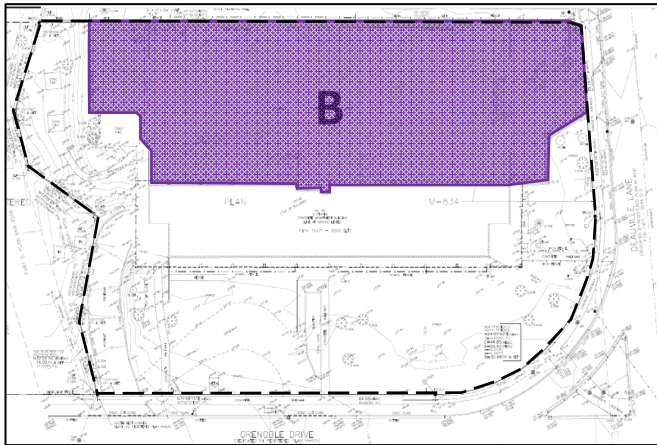
General Information	
Date: November 1, 2022	Report No. : R22-11-01-01
Project No. : PUD21-110	Address : 48 Grenoble Drive
Owner : Tenblock	Region/Municipality: City of Toronto

Investigation Details

Dye Test #2:

In order to identify/confirm the Storm runoff discharge pattern, within the existing Parking area, a Dye Test conducted on the existing CB within the parking area and the dye was observed at Storm MH3.

The result of the dye test confirmed that, all the storm runoff from the Parking area is conveyed into the existing 375mm dia storm sewer along the Easement.



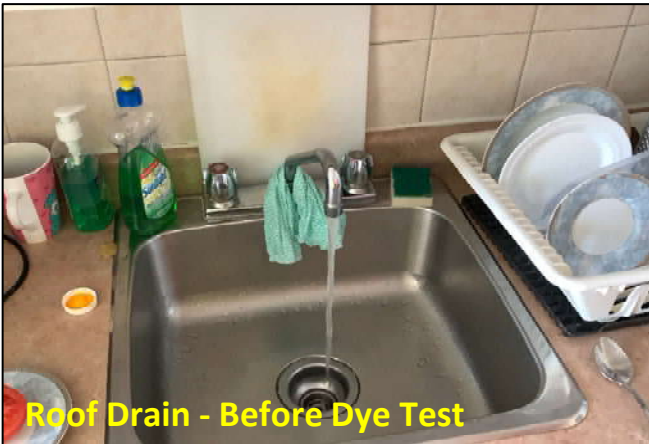
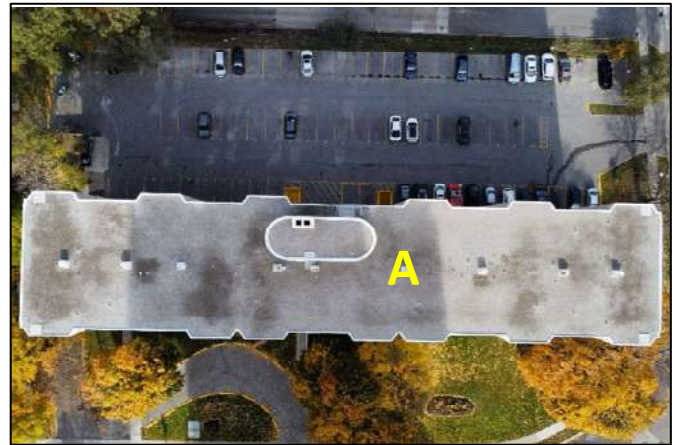
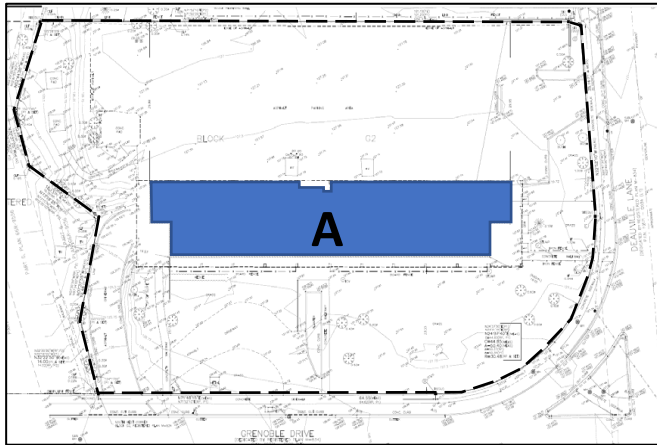
General Information	
Date: November 1, 2022	Report No. : R22-11-01-01
Project No. : PUD21-110	Address : 48 Grenoble Drive
Owner : Tenblock	Region/Municipality: City of Toronto

Investigation Details

Dye Test #3:

In order to identify/confirm the Sanitary discharge pattern, within the existing building, a Dye Test conducted on one of sanitary sinks within the building and the dye was observed at Sanitary MH2.

The result of the dye test confirmed that, all the Sanitary discharge from the existing building is conveyed into the existing 450mm dia sanitary sewer along the Easement.



Roof Drain - Before Dye Test



Roof Drain - After Tye Test



MH2 - Before Dye Test



MH2 - After Dye Test

March 18, 2022

Attention:
Chief Engineer and Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering
55 John Street, 16th Floor
Toronto, ON M5v 3C6

cc:
General Manager, Toronto Water
c/o Manager, Environmental Monitoring and Protection Unit
30 Dee Ave, Toronto ON M9N 1S9

Re: 48 Grenoble Drive, Toronto, ON
Our Project No. 22.161

Dear Sir or Madam,

I, Anthony Mirvish, confirm that all buildings on the subject lands (48 Grenoble Drive) can be constructed water-tight below grade in a manner that will resist hydrostatic pressure without any necessity for Private Water Drainage System (subsurface drainage system) consisting of but not limited to weeping tile(s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer.

Sincerely,
Honeycomb Group Inc.



Anthony Mirvish, P. Eng.
Principal
anthony.mirvish@honeycombgroup.ca
416-451-9806





30 Soudan Ave., Suite 200
Toronto, Ontario M4S 1V6
Direct line: 416.322.4112
mkelling@tenblock.ca

Microbjo Properties Inc. c/o Tenblock
30 Soudan Avenue, Suite 200
Toronto, ON M4S 1V6

March 18, 2022

Attention: Chief Engineer and Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering
Metro Hall
55 John Street, 16th Floor
Toronto ON M5V 3C6

cc: General Manager, Toronto Water
c/o Manager, Environmental Monitoring and Protection Unit
30 Dee Ave, Toronto ON M9N 1S9

Dear Sir or Madam,

I, Tenblock, confirm and undertake that I will construct and maintain all building(s) on the subject lands (48 Grenoble Drive) in a manner which shall be completely water-tight below grade and resistant to hydrostatic pressure without any necessity for Private Water Drainage System (subsurface drainage system) consisting of but not limited to weeping tile(s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer.

Sincerely,
Tenblock

Matthew Kelling, Development Manager
mkelling@tenblock.ca

I, Matthew Kelling, have the authority to bind the corporation.



Smith + Andersen

1100 – 100 Sheppard Ave. East, Toronto ON, M2N 6N5

416 487 8151 f 416 487 9104 smithandandersen.com

2023-05-11

Attention: Chief Engineer and Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering

cc: General Manager, Toronto Water
c/o Manager, Environmental Monitoring and Protection Unit
30 Dee Ave, Toronto ON M9N 1S9

Dear Sir or Madam,

I Vadim Vatoutine, confirm that all building(s) on the subject lands 48 Grenoble Dr. will be designed and constructed in a manner without Private Water Drainage System (subsurface drainage system) consisting of but not limited to weeping tile(s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer. Underground structure(s) of the proposed building(s) will be built completely watertight without any direct or indirect connection to the City sewer for the discharge of groundwater (from a PWDS or floor drain or other infrastructure).

I understand that a Private Water Drainage System as an emergency back up system is not permitted, as part of this proposal.

Yours truly,

SMITH + ANDERSEN



Vadim Vatoutine, P.Eng.
Senior Project Manager

d 647 475 3958

Vadim.Vatoutine@smithandandersen.com

21729.002.m.001. - 48 Grenoble Dr - GW Letter.docx

HYDROGEOLOGICAL REVIEW REPORT

PREPARED FOR:

Tenblock
30 Soudan Avenue, Suite 200
Toronto, ON M4S 1V6

ATTENTION:

Matthew Kelling

48 Grenoble Drive | Toronto, Ontario

Grounded Engineering Inc.

File No. 21-195

Issued March 10, 2022

Revised June 30, 2023



Executive Summary

Grounded Engineering Inc. (Grounded) was retained by Tenblock to conduct a Hydrogeological Review for the proposed redevelopment of 48 Grenoble Drive in Toronto, Ontario (site). The conclusions of the investigation are summarized as follows:

Development Information

Current Development					
Development Phase	Above Grade Levels	Below Grade Levels			
		Level #	Lowest Finished Floor		Approximate Base of Footings (masl)
			Depth (m)	Elevation (masl)	
1 Building	9	1	Unknown	Unknown	Unknown

Proposed Development					
Development Phase	Above Grade Levels	Below Grade Levels			
		Level #	Lowest Finished Floor		Approximate Base of Footings (masl)
			Depth (m)	Elevation (masl)	
1 Building (2 towers and associated podium)	Podium - 6	3	10.5	P2 – 120.0	P2 – 118.5*
	West Tower - 43			P3 – 117.0	P3 – 115.5*
	East Tower - 39				

*Underside of raft foundation

Site Conditions

Site Stratigraphy				
Stratum/Formation	Aquifer or Aquitard	Depth Range (mbgs)	Elevation Range (masl)	Hydraulic Conductivity (m/s)
Fill	Aquifer	0.0 – 3.1	127.5 – 124.4	$1.0 \times 10^{-5***}$
Upper Sands	Aquifer	3.1 – 6.9	124.4 – 120.6	$3.6 \times 10^{-6**}$
Upper Glacial Till	Aquifer	6.9 – 20.2	120.6 – 107.3	$5.5 \times 10^{-8*}$
Silts and Clays	Aquitard	20.2 – 26.3	107.3 – 101.2	$1.6 \times 10^{-8*}$
Lower Sands	Aquifer	26.3 – 36.7	101.2 – 90.8	$1.5 \times 10^{-6*}$
Lower Glacial Till	Aquifer	36.7 – 39.7	90.8 – 87.8	$1.0 \times 10^{-7***}$

*Indicates conductivity was calculated by Slug Test

**Indicates conductivity was estimated using grain size analysis

***Indicates conductivity was estimated using typical published values from Freeze and Cherry (1979)

Maximum Groundwater Elevation		
Monitoring Well ID	Depth Below Grade (m)	Elevation (masl)
BH1	13.1	114.2
BH2	15.2	111.9
BH3	16.2	115.5
BH4	14.8	113.1



Maximum Groundwater Elevation		
BH5	10.6	118.2
BH6	17.5	109.6
BH7	30.2	97.3
BH8	30.7	98.4
BH9	30.4	97.5
MAGWL Assessment Option		Option 1
Maximum Anticipated Groundwater Level (MAGWL)		119.5*

*Highest water level reading of Elev. 118.2± m was observed.

Groundwater Quality				
Sample ID	Sample Date	Sample Expiry Date	City of Toronto Storm Sewer Limits	City of Toronto Sanitary and Combined Sewer Limits
SW-UF-BH2	Feb 16, 2022	Nov 16, 2022	Exceeds	Meets

Groundwater Control

Stored Groundwater (pre-excavation/dewatering)					
Volume of Excavation (m ³)	Volume of Excavation Below Water Table (m ³)	Volume of Stored Groundwater		Volume of Available Groundwater	
		(m ³)	(L)	(m ³)	(L)
53,526	28,079	8,400	8,400,000	6,200	6,200,000

Short Term (Construction) Groundwater Quantity – Safety Factor of 1.5 Used					
Groundwater Seepage		Design Rainfall Event (25mm)		Total Daily Water Takings	
L/day	L/min	L/day	L/min	L/day	L/min
110,000	76.4	142,000	98.6	252,000	175.0

Long Term (Permanent) Groundwater Quantity – Safety Factor of 1.5 Used						
Scenario	Groundwater Seepage		Infiltration Design Rainfall Event (25mm)		Total Daily Water Takings	
	L/day	L/day	L/min	L/day	L/day	L/min
Drained Structure	105,000	72.9	22,000	15.3	127,000	88.2
Fully Watertight Structure	0	0	0	0	0	0

Maximum Zone of Influence (m)		
Site	Short Term (Construction)	Long Term (Permanent)
48 Grenoble Dr.	Soldier Pile & Lagging – 18±	Soldier Pile & Lagging – 15±



Fully Watertight Structure – 0±

Maximum Potential Settlement (mm)		
Site	Short Term (Construction)	Long Term (Permanent)
48 Grenoble Dr.	Solider Pile & Lagging – 11±	Solider Pile & Lagging – 3± Fully Watertight Structure – 0±

Regulatory Requirements	Drained Structure	Fully Watertight Structure
Environmental Activity and Sector Registry (EASR) Posting	Required	Required
Short Term Permit to Take Water (PTTW)	Not Required	Not Required
Long Term Permit to Take Water (PTTW)	Required	Not Required
Short Term Discharge Agreement City of Toronto	Required	Required
Long Term Discharge Agreement City of Toronto	Required	Not Required



384 Adelaide Street West, Suite 100
Toronto, ON M5V 1R7

t: 416 862 8800

1050 West Pender Street, Suite 2010
Vancouver, BC V6E 3S7

t: 604 674 0866

1776 Broadway, Suite 2200
New York, NY 10019

t: 212 710 4329

www.dsai.ca
info@dsai.ca

May 12, 2023

Sarra Karavasili, P. Eng.
Lithos Groups Inc.
Main Office: 416-366-9610-x1
www.LithosGroup.ca
Sarrak@LithosGroup.ca
150 Bermondsey Rd, Unit #200
Toronto, Ontario M4A 1Y1

Dear Sarra,

RE: 48 Grenoble
Type of Construction Proposed

We are the architects for 48 Grenoble proposed multi-unit residential building. In our letter dated May 9, 2023, we identified the design of the proposed building for 48 Grenoble to follow the below requirements of the Ontario Building Code: Group C, any height, any area, sprinklered, non-combustible construction (sentence 3.2.2.42 OBC). Floor assemblies shall be fire separation with a fire-resistance no less than 2hr. Mezzanines shall have a fire-resistance rating no less than 1hr. Loadbearing walls, columns, and arches shall have a fire-resistance rating no less than that required for the supported assembly, which is 2hr for floor and 1hr for mezzanines. Exit stairs and elevating devices will have enclosures with a fire rating of no less than 1hr according to sentence 3.4.4.1 and 3.5.3.1 of the Ontario Building Code. The current design of the building assumes concrete structure throughout for the building.

Lithos Group was retained to provide civil engineering services for this proposal. Their letter dated May 12, 2023, describes the building classification using Fire Underwriters Survey, based on the Ontario Building Code classification we provided.

The fire resistance of the floor and structural members and the rating for horizontal opening required by Ontario Building Code for this building are matched in the letter prepared by Lithos Group.

Liviu Vasile Budur, OAA

Senior Associate

t: 416 862 8800 x 484

livuibudur@dsai.ca

www.dsai.ca



May 12, 2023

Liviu Budur
OAA, LEED GA
t: 416 862 8800 x 484
livubudur@dsai.ca
www.dsai.ca
384 Adelaide Street West, Suite 100
Toronto, Ontario, Canada M5V 1R7

Dear Liviu,

Re: Response to 48 Grenoble Type of Construction Proposed

Based on the letter prepared by "Diamond Schmitt Architects" dated May 9, 2023 all structural elements, walls, arches, floors, and roofs of the proposed multi-unit residential building for 48 Grenoble will be constructed with a minimum 1-hour fire resistance rating and will be constructed with non-combustible materials, so according to FUS2020 requirements the proposed development will be a Non-combustible Construction (Type II) and the Required Fire Flow will be determined using a Construction Coefficient (C) of 0.8. Furthermore, due to the fact that all vertical openings and exterior vertical communications will be properly protected (one hour rating) and the Construction Coefficient will be below 1.0, the Total Effective Area (A) will be determined considering only the single largest Floor Area plus 25% of each of the two immediately adjoining floors according to FUS2020 requirements.

Yours truly,

LITHOS GROUP INC.

A handwritten signature in black ink, appearing to read "Sarra Karavasili".

Sarra Karavasili, P.E., M.A.Sc.
Project Manager
Email: sarrak@lithosrgoup.ca



Smith + Andersen

1100 – 100 Sheppard Ave. East, Toronto ON, M2N 6N5

416 487 8151 f 416 487 9104 smithandandersen.com

2023-05-11

Attention: Chief Engineer and Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering
North York Civic Centre
5100 Yonge Street, 4th floor
Toronto, Ontario, M2N 5V7

Dear Sir or Madam,

I Bram Atlin, confirm that the sprinkler system of all building(s) on the subject lands 48 Grenoble Drive will be designed and constructed in a manner which meets the requirements of NFPA 13 as well as all other NFPA standards as required by code. The proposed sprinkler system for the subject development will be automatic with flow valve alarm.

Yours truly,

SMITH + ANDERSEN

Bram Atlin, P.Eng.
Principal



21729.002.m.001 - 48 Grenoble Dr - Sprinkler Letter.docx

From: Matthew Kelling <mkelling@tenblock.ca>
Sent: November 23, 2022 4:14 PM
To: sarrak@lithosgroup.ca; John Pasalidis
Subject: FW: 48 Grenoble - park servicing comments

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Sarra,

A while back we had discussed how to deal with ECS's comments about the park with respect to servicing and stormwater. See Parks' response below. Let me know if you have any further questions.

Cheers,
Matthew

Matthew Kelling
Development Manager
416.831.3195

From: James Yun <James.Yun@toronto.ca>
Sent: Wednesday, November 23, 2022 4:01 PM
To: Matthew Kelling <mkelling@tenblock.ca>
Cc: Joe Amato <Joe.Amato2@toronto.ca>; Carol Martin <Carol.Martin@toronto.ca>; Eric Stadnyk <Eric.Stadnyk@toronto.ca>; Vitumbiko Mhango <Vitumbiko.Mhango@toronto.ca>
Subject: RE: 48 Grenoble - park servicing comments

Hi Matthew,

PFR confirms that all the following services will be required for the new public park at 48 Grenoble Drive:

- Storm servicing (stubbed at streetline)
- Sanitary servicing (stubbed at streetline)
- Water servicing (water chamber)
- Electrical service

In regards to stormwater, private lands must capture their stormwater within their own private lands. No water can run off onto the park. A trench drain spanning the entire length of private lands abutting the park or other stormwater solution will be required to capture all stormwater runoff currently shown sheeting towards the park as indicated on the Grading Plan.

The storm servicing should be stubbed at the streetline of the park for future stormwater management when the Above Base Park Improvement items are installed and SWM is required on the park site to satisfy Toronto Water.

At the Base Park Improvement level, the park can drain onto the adjacent Flemington Park Trail if the storm system is not at maximum capacity. There are two existing catch basins on the adjacent Flemington Park Trail.

I trust that this satisfies ECS' request.

Regards,

James Yun, MCIP, RPP

Parks Planner

Parks Development & Capital Projects

City of Toronto - Parks, Forestry & Recreation

Office: (416) 392-1740

Cell: (437) 232-4777

James.Yun@toronto.ca



From: Matthew Kelling [<mailto:mkelling@tenblock.ca>]

Sent: October 25, 2022 6:51 PM

To: James Yun <James.Yun@toronto.ca>

Subject: 48 Grenoble - park servicing comments

Hi James,

I am reaching out for assistance in responding to two ECS comments that pertain to the parkland dedication for 48 Grenoble (memo attached for reference).

The first comment states:

As part of the Zoning By-Law Amendment application, it must be confirmed that the park can be serviced for storm, sanitary and water servicing based on the depth and location of municipal services and factoring in crossings with other sewers and utilities. The typical servicing requirements from Parks, Forestry & Recreation (PFR) division for public parkland includes:

- 2.8.1. Storm servicing (control manhole will be required just inside property line);*
- 2.8.2. Sanitary servicing (control manhole will be required just inside property line);*
- 2.8.3. Water servicing (minimum 50mm domestic water service, shut-off valves, water meter and backflow preventers in chambers, etc. will be required just inside property line); and,*
- 2.8.4. Electrical Service Connection (minimum 100 Amp service with electrical panel in a lockable cabinet just inside property line).*

*The engineer is to contact PFR to confirm the exact needs of PFR to ensure the required services are provided and that the sizes of the proposed services will provide adequate capacity for the parks intended use. **Written confirmation from PFR for the required services for the public park is to be appended to the FSR.***

After reviewing your Parks memo, I note that the four listed items are reflected in item #7 of "Conditions of Parkland Conveyance", so this question may have already been answered. Regardless, can you please help us respond to the highlighted request by clarifying/confirming the servicing requirements for the parkland dedication at 48 Grenoble Drive in a separate email that can be appended to our revised report?

The second comment states:

The Servicing & SWM Report fails to recognize how the lands to be dedicated to the City as Public Parkland will be handled for stormwater management. As part of the ZBA application, it must be confirmed how the stormwater management requirements (quantity control, quality control and water balance) for the public parkland is intended to be handled. Please note that separate SWM controls will be required. Alternatively, the subject site may over control peak flows to compensate for the Public Parkland draining uncontrolled (for quantity control). ECS notes that typically PFR prefers the latter option. Regardless, the Public Parkland is required to be self-contained for drainage (it cannot drain to the subject site or vice versa) and the Public Parkland requires a separate storm control manhole and storm service connection. Please review and revise accordingly

I wanted to get your initial thoughts on this comment given that the park has obviously not been designed. Our civil engineers are looking into options, but wanted to engage with you as well.

Cheers,

Matthew Kelling

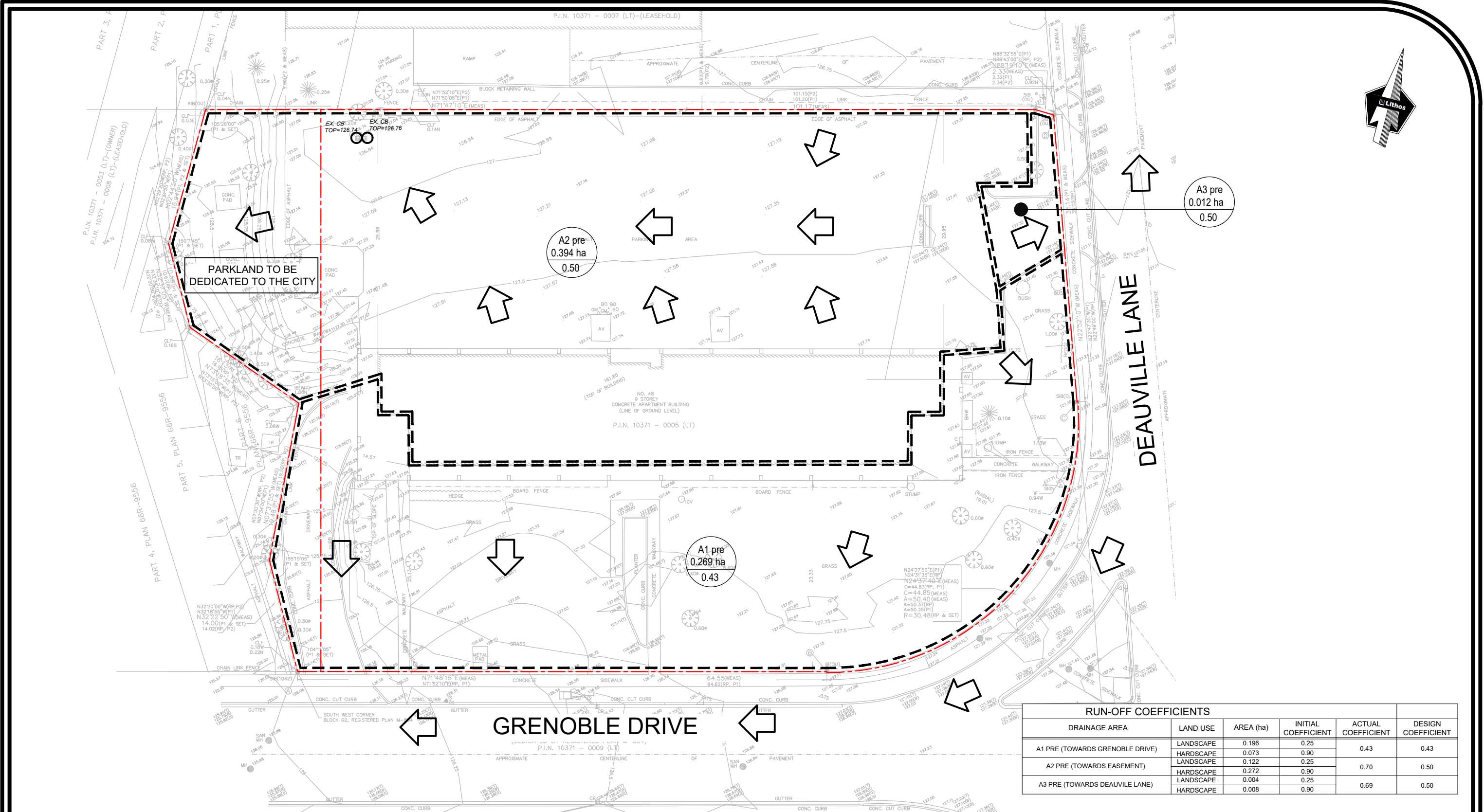
Development Manager

Tenblock

30 Soudan Ave., Suite 200
Toronto, ON M4S 1V6
O: 416.322.4112
C: 416.831.3195

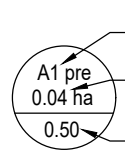
Appendix C

Storm Analysis

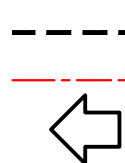


150 Bermondsey Road, Toronto, Ontario M4A 1Y1

LEGEND



STORM DRAINAGE
AREA NUMBER
DRAINAGE AREA (ha)
COMPOSITE RUNOFF
COEFFICIENT



PRE-DEVELOPMENT STORM
DRAINAGE AREA
PROPERTY LINE
MAJOR DRAINAGE PATTERN

PRE-DEVELOPMENT
DRAINAGE AREA PLAN
RESIDENTIAL USE DEVELOPMENT
48 GRENOBLE DRIVE
TORONTO, ONTARIO

DATE: JULY 2023

PROJECT No: UD21-110

SCALE: N.T.S.

FIGURE No: DAP1



Prepared By: Isaak Chlorotiris, P.E., M.A.Sc.
Reviewed by: John Pasalidis, P.Eng., M.A.Sc.

Rational Method Pre-Development Flow Calculation

48 Grenoble Drive

File No. UD21-110
City of Toronto
Date: July 2023

Area Number	Area (ha)	Actual Coefficient	Design Coefficient
A1 Pre – towards Grenoble Drive	0.269	0.43	0.43
A2 Pre – towards Easement	0.394	0.70	0.50
A3 Pre – towards Deauville Lane	0.012	0.69	0.50

Rational Method Calculation

A1 Pre – towards Grenoble Drive

Event 2-year IDF Data Set City of Toronto a = 21.80 c = -0.780

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A1 Pre – towards Grenoble Drive	0.269	0.43	0.12	10	88.2	0.028	28.4

Event 5-year IDF Data Set City of Toronto a = 32.00 c = -0.790

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A1 Pre – towards Grenoble Drive	0.269	0.43	0.12	10	131.8	0.042	42.4

Event 100-year IDF Data Set City of Toronto a = 59.70 c = -0.800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A1 Pre – towards Grenoble Drive	0.269	0.43	0.12	10	250.3	0.080	80.5

A2 Pre – towards Easement

Event 2-year IDF Data Set City of Toronto a = 21.80 c = -0.780

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A2 Pre – towards Easement	0.394	0.50	0.20	10	88.2	0.048	48.2

Event 5-year IDF Data Set City of Toronto a = 32.00 c = -0.790

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A2 Pre – towards Easement	0.394	0.50	0.20	10	131.8	0.072	72.1

Event 100-year IDF Data Set City of Toronto a = 59.70 c = -0.800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A2 Pre – towards Easement	0.394	0.50	0.20	10	250.3	0.137	136.9

A3 Pre – towards Deauville Lane

Event 2-year IDF Data Set City of Toronto a = 21.80 c = -0.780

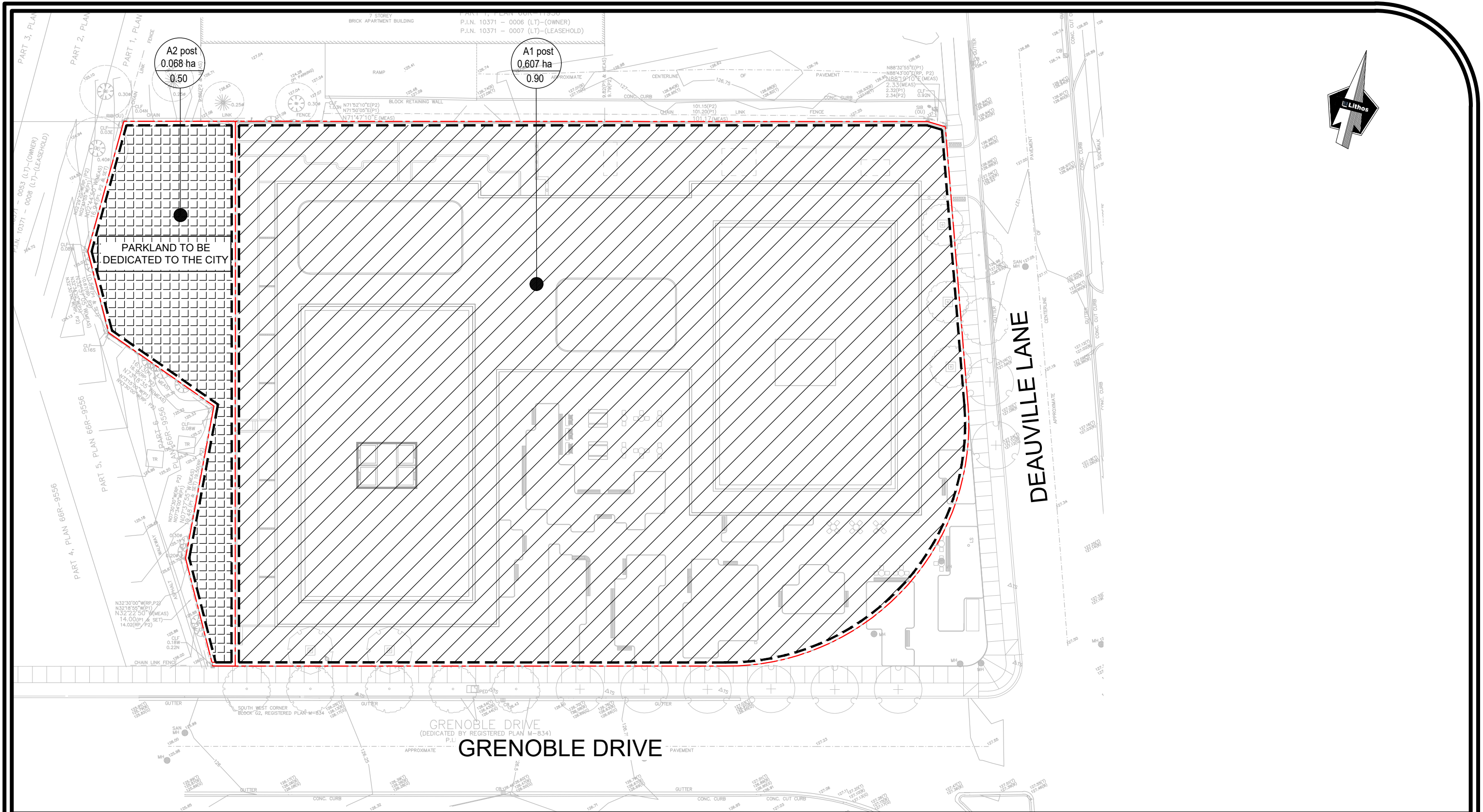
Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A3 Pre – towards Deauville Lane	0.012	0.50	0.01	10	88.2	0.001	1.5

Event 5-year IDF Data Set City of Toronto a = 32.00 c = -0.790

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A3 Pre – towards Deauville Lane	0.012	0.50	0.01	10	131.8	0.002	2.2

Event 100-year IDF Data Set City of Toronto a = 59.70 c = -0.800

Area Number	A (ha)	C	AC	Tc (min.)	I (mm/h)	Q (m³/s)	Q (L/s)
A3 Pre – towards Deauville Lane	0.012	0.50	0.01	10	250.3	0.004	4.2



150 Bermondsey Road, Toronto, Ontario M4A 1Y1

LEGEND

- STORM DRAINAGE AREA NUMBER
- DRAINAGE AREA (ha)
- COMPOSITE RUNOFF COEFFICIENT
- POST-DEVELOPMENT STORM DRAINAGE AREA
- PROPERTY LINE

POST-DEVELOPMENT DRAINAGE AREA PLAN RESIDENTIAL USE DEVELOPMENT 48 GRENABLE DRIVE TORONTO, ONTARIO	
DATE: JULY 2023	PROJECT No: UD21-110
SCALE: N.T.S.	FIGURE No: DAP2



Modified Rational Method - Two Year Storm

Site Flow and Storage Summary - towards Grenoble Drive

City of Toronto

File No. UD21-110

Date: July 2023

		A1 Post - Controlled			
		Area (A1) = 0.607 ha "C" = 0.90 AC1 = 0.55 Tc = 10.0 min Time Increment = 5.0 min Allowable Release Rate = 28.4 L/s Min.Storage = 165.89 m³			
2-Year Design Storm					
	a=	21.80			
	c=	-0.78			
	I =	A(T) ^c			
(1)	(2)	(3)	(4)	(5)	(6)
Time	Rainfall	Storm	Runoff	Target Released	Total Required
	Intensity	Runoff	Volume	Volume	Storage
		(A1 Post)	(A1 Post)	(A1 Post)	(A1 Post)
(min)	(mm/hr)	(m³/s)	(m³)	(m³)	(m³)
10.0	88.2	0.134	80.34	0.00	80.34
15.0	64.3	0.098	87.83	0.00	87.83
20.0	51.4	0.078	93.57	0.00	93.57
25.0	43.2	0.066	98.28	0.00	98.28
30.0	37.4	0.057	102.30	0.00	102.30
35.0	33.2	0.050	105.83	0.00	105.83
40.0	29.9	0.045	108.98	0.00	108.98
45.0	27.3	0.041	111.84	0.00	111.84
50.0	25.1	0.038	114.47	0.00	114.47
55.0	23.3	0.035	116.89	0.00	116.89
60.0	21.8	0.033	119.15	0.00	119.15
65.0	20.5	0.031	121.27	0.00	121.27
70.0	19.3	0.029	123.26	0.00	123.26
75.0	18.3	0.028	125.15	0.00	125.15
80.0	17.4	0.026	126.94	0.00	126.94
85.0	16.6	0.025	128.64	0.00	128.64
90.0	15.9	0.024	130.27	0.00	130.27
95.0	15.2	0.023	131.83	0.00	131.83
100.0	14.6	0.022	133.32	0.00	133.32
105.0	14.1	0.021	134.76	0.00	134.76
110.0	13.6	0.021	136.15	0.00	136.15
115.0	13.1	0.020	137.49	0.00	137.49
120.0	12.7	0.019	138.78	0.00	138.78
125.0	12.3	0.019	140.03	0.00	140.03
130.0	11.9	0.018	141.25	0.00	141.25
135.0	11.6	0.018	142.42	0.00	142.42
140.0	11.3	0.017	143.57	0.00	143.57
145.0	11.0	0.017	144.68	0.00	144.68
150.0	10.7	0.016	145.76	0.00	145.76
155.0	10.4	0.016	146.82	0.00	146.82
160.0	10.1	0.015	147.85	0.00	147.85
165.0	9.9	0.015	148.85	0.00	148.85
170.0	9.7	0.015	149.83	0.00	149.83
175.0	9.5	0.014	150.79	0.00	150.79
180.0	9.3	0.014	151.73	0.00	151.73
185.0	9.1	0.014	152.65	0.00	152.65
190.0	8.9	0.013	153.54	0.00	153.54
195.0	8.7	0.013	154.42	0.00	154.42
200.0	8.5	0.013	155.29	0.00	155.29
205.0	8.4	0.013	156.13	0.00	156.13
210.0	8.2	0.012	156.96	0.00	156.96
215.0	8.1	0.012	157.78	0.00	157.78
220.0	7.9	0.012	158.58	0.00	158.58
225.0	7.8	0.012	159.36	0.00	159.36
230.0	7.6	0.012	160.14	0.00	160.14
235.0	7.5	0.011	160.90	0.00	160.90
240.0	7.4	0.011	161.64	0.00	161.64
245.0	7.3	0.011	162.38	0.00	162.38
250.0	7.2	0.011	163.10	0.00	163.10
255.0	7.1	0.011	163.81	0.00	163.81
260.0	6.9	0.011	164.51	0.00	164.51
265.0	6.8	0.010	165.20	0.00	165.20
270.0	6.7	0.010	165.89	0.00	165.89



Modified Rational Method - Five Year Storm

Site Flow and Storage Summary - towards Grenoble Drive

City of Toronto

File No. UD21-110

Date: July 2023

		A1 Post - Controlled			
		Area (A1) = 0.607 ha			
		"C" = 0.90			
		AC1 = 0.55			
		Tc = 10.0 min			
		Time Increment = 5.0 min			
		Allowable Release Rate = 28.4 L/s			
		Min.Storage = 239.87 m ³			
5-Year Design Storm					
a =		32.00			
c =		-0.79			
I =		A(T) ^c			
(1)	(2)	(3)	(4)	(5)	(6)
Time	Rainfall	Storm	Runoff	Target Released	Total Required
	Intensity	Runoff (A1 Post)	Volume (A1 Post)	Volume (A1 Post)	Storage (A1 Post)
(min)	(mm/hr)	(m³/s)	(m³)	(m³)	(m³)
10.0	131.8	0.200	120.06	0.00	120.06
15.0	95.7	0.145	130.73	0.00	130.73
20.0	76.2	0.116	138.87	0.00	138.87
25.0	63.9	0.097	145.53	0.00	145.53
30.0	55.3	0.084	151.21	0.00	151.21
35.0	49.0	0.074	156.18	0.00	156.18
40.0	44.1	0.067	160.63	0.00	160.63
45.0	40.2	0.061	164.65	0.00	164.65
50.0	37.0	0.056	168.33	0.00	168.33
55.0	34.3	0.052	171.74	0.00	171.74
60.0	32.0	0.049	174.90	0.00	174.90
65.0	30.0	0.046	177.87	0.00	177.87
70.0	28.3	0.043	180.66	0.00	180.66
75.0	26.8	0.041	183.29	0.00	183.29
80.0	25.5	0.039	185.79	0.00	185.79
85.0	24.3	0.037	188.18	0.00	188.18
90.0	23.2	0.035	190.45	0.00	190.45
95.0	22.3	0.034	192.62	0.00	192.62
100.0	21.4	0.032	194.71	0.00	194.71
105.0	20.6	0.031	196.71	0.00	196.71
110.0	19.8	0.030	198.64	0.00	198.64
115.0	19.1	0.029	200.51	0.00	200.51
120.0	18.5	0.028	202.31	0.00	202.31
125.0	17.9	0.027	204.05	0.00	204.05
130.0	17.4	0.026	205.74	0.00	205.74
135.0	16.9	0.026	207.37	0.00	207.37
140.0	16.4	0.025	208.96	0.00	208.96
145.0	15.9	0.024	210.51	0.00	210.51
150.0	15.5	0.024	212.01	0.00	212.01
155.0	15.1	0.023	213.48	0.00	213.48
160.0	14.7	0.022	214.91	0.00	214.91
165.0	14.4	0.022	216.30	0.00	216.30
170.0	14.1	0.021	217.66	0.00	217.66
175.0	13.7	0.021	218.99	0.00	218.99
180.0	13.4	0.020	220.29	0.00	220.29
185.0	13.1	0.020	221.56	0.00	221.56
190.0	12.9	0.020	222.80	0.00	222.80
195.0	12.6	0.019	224.02	0.00	224.02
200.0	12.4	0.019	225.22	0.00	225.22
205.0	12.1	0.018	226.39	0.00	226.39
210.0	11.9	0.018	227.54	0.00	227.54
215.0	11.7	0.018	228.66	0.00	228.66
220.0	11.5	0.017	229.77	0.00	229.77
225.0	11.3	0.017	230.86	0.00	230.86
230.0	11.1	0.017	231.92	0.00	231.92
235.0	10.9	0.017	232.97	0.00	232.97
240.0	10.7	0.016	234.01	0.00	234.01
245.0	10.5	0.016	235.02	0.00	235.02
250.0	10.4	0.016	236.02	0.00	236.02
255.0	10.2	0.015	237.00	0.00	237.00
260.0	10.0	0.015	237.97	0.00	237.97
265.0	9.9	0.015	238.93	0.00	238.93
270.0	9.8	0.015	239.87	0.00	239.87



Modified Rational Method - Hundred Year Storm

Site Flow and Storage Summary - towards Grenoble Drive

City of Toronto

File No. UD21-110

Date: July 2023

		A1 Post - Controlled			
		Area (A1) = 0.607 ha "C" = 0.90 AC1= 0.55 Tc = 10.0 min Time Increment = 5.0 min Allowable Release Rate = 28.4 L/s Min.Storage = 440.82 m³			
100-Year Design Storm					
	a=	59.70			
	c=	-0.80			
	I =	A(T) ^c			
(1)	(2)	(3)	(4)	(5)	(6)
Time	Rainfall	Storm	Runoff	Target Released	Total Required
	Intensity	Runoff	Volume	Volume	Storage
		(A1 Post)	(A1 Post)	(A1 Post)	(A1 Post)
(min)	(mm/hr)	(m³/s)	(m³)	(m³)	(m³)
10.0	250.3	0.380	228.03	0.00	228.03
15.0	181.0	0.275	247.29	0.00	247.29
20.0	143.8	0.218	261.94	0.00	261.94
25.0	120.3	0.183	273.89	0.00	273.89
30.0	103.9	0.158	284.06	0.00	284.06
35.0	91.9	0.140	292.96	0.00	292.96
40.0	82.6	0.125	300.89	0.00	300.89
45.0	75.1	0.114	308.06	0.00	308.06
50.0	69.1	0.105	314.62	0.00	314.62
55.0	64.0	0.097	320.67	0.00	320.67
60.0	59.7	0.091	326.30	0.00	326.30
65.0	56.0	0.085	331.57	0.00	331.57
70.0	52.8	0.080	336.52	0.00	336.52
75.0	49.9	0.076	341.19	0.00	341.19
80.0	47.4	0.072	345.63	0.00	345.63
85.0	45.2	0.069	349.84	0.00	349.84
90.0	43.2	0.066	353.87	0.00	353.87
95.0	41.3	0.063	357.71	0.00	357.71
100.0	39.7	0.060	361.40	0.00	361.40
105.0	38.2	0.058	364.95	0.00	364.95
110.0	36.8	0.056	368.36	0.00	368.36
115.0	35.5	0.054	371.65	0.00	371.65
120.0	34.3	0.052	374.82	0.00	374.82
125.0	33.2	0.050	377.90	0.00	377.90
130.0	32.2	0.049	380.87	0.00	380.87
135.0	31.2	0.047	383.76	0.00	383.76
140.0	30.3	0.046	386.56	0.00	386.56
145.0	29.5	0.045	389.28	0.00	389.28
150.0	28.7	0.044	391.93	0.00	391.93
155.0	27.9	0.042	394.51	0.00	394.51
160.0	27.2	0.041	397.02	0.00	397.02
165.0	26.6	0.040	399.47	0.00	399.47
170.0	25.9	0.039	401.86	0.00	401.86
175.0	25.4	0.038	404.20	0.00	404.20
180.0	24.8	0.038	406.48	0.00	406.48
185.0	24.3	0.037	408.72	0.00	408.72
190.0	23.7	0.036	410.90	0.00	410.90
195.0	23.3	0.035	413.04	0.00	413.04
200.0	22.8	0.035	415.14	0.00	415.14
205.0	22.3	0.034	417.20	0.00	417.20
210.0	21.9	0.033	419.21	0.00	419.21
215.0	21.5	0.033	421.19	0.00	421.19
220.0	21.1	0.032	423.13	0.00	423.13
225.0	20.7	0.031	425.04	0.00	425.04
230.0	20.4	0.031	426.91	0.00	426.91
235.0	20.0	0.030	428.75	0.00	428.75
240.0	19.7	0.030	430.56	0.00	430.56
245.0	19.4	0.029	432.34	0.00	432.34
250.0	19.1	0.029	434.09	0.00	434.09
255.0	18.8	0.028	435.81	0.00	435.81
260.0	18.5	0.028	437.51	0.00	437.51
265.0	18.2	0.028	439.18	0.00	439.18
270.0	17.9	0.027	440.82	0.00	440.82

 Lithos		Modified Rational Method Two Year Storm Site Flow and Storage Summary - towards Easement 48 Grenoble Drive									
A2 Post - Uncontrolled											
Area (A2) = 0.068 ha		<table><tr><th colspan="2">2-Year Design Storm</th></tr><tr><td>a=</td><td>21.80</td></tr><tr><td>c=</td><td>-0.78</td></tr><tr><td>I =</td><td>A(T)^c</td></tr></table>		2-Year Design Storm		a=	21.80	c=	-0.78	I =	A(T) ^c
2-Year Design Storm											
a=	21.80										
c=	-0.78										
I =	A(T) ^c										
Coefficient "C" = 0.50											
AC2= 0.034											
Tc = 10.0 min											
Time Increment = 5.0 min											
Max. Release Rate = 8.3 L/s											
Type	Area (ha)	Coefficient "C"									
Landscaped	0.068	0.50									
Hardscaped	0.000	0.90									
Total Area (A5 Post)	0.068	0.50									
2-yr Pre-Development Site											
Release Rate towards Easement (A2-pre)=		48.2	L/s								
Site Release Rate towards Easement (A2 Post)=		8.3	L/s								
(1)	(2)	(3)	(4)								
Time	Rainfall	Storm	Runoff								
	Intensity	Runoff	Volume								
		(A2 post)	(A2 post)								
(min)	(mm/hr)	(m³/s)	(m³)								
10.0	88.2	0.008	4.97								
15.0	64.3	0.006	5.43								
20.0	51.4	0.005	5.79								
25.0	43.2	0.004	6.08								
30.0	37.4	0.004	6.33								
35.0	33.2	0.003	6.54								
40.0	29.9	0.003	6.74								
45.0	27.3	0.003	6.92								
50.0	25.1	0.002	7.08								
55.0	23.3	0.002	7.23								
60.0	21.8	0.002	7.37								
65.0	20.5	0.002	7.50								
70.0	19.3	0.002	7.62								
75.0	18.3	0.002	7.74								
80.0	17.4	0.002	7.85								
85.0	16.6	0.002	7.96								
90.0	15.9	0.001	8.06								
95.0	15.2	0.001	8.15								
100.0	14.6	0.001	8.24								
105.0	14.1	0.001	8.33								
110.0	13.6	0.001	8.42								
115.0	13.1	0.001	8.50								
120.0	12.7	0.001	8.58								
125.0	12.3	0.001	8.66								
130.0	11.9	0.001	8.73								
135.0	11.6	0.001	8.81								
140.0	11.3	0.001	8.88								
145.0	11.0	0.001	8.95								
150.0	10.7	0.001	9.01								
155.0	10.4	0.001	9.08								
160.0	10.1	0.001	9.14								
165.0	9.9	0.001	9.21								
170.0	9.7	0.001	9.27								
175.0	9.5	0.001	9.32								
180.0	9.3	0.001	9.38								
185.0	9.1	0.001	9.44								
190.0	8.9	0.001	9.50								
195.0	8.7	0.001	9.55								
200.0	8.5	0.001	9.60								
205.0	8.4	0.001	9.66								
210.0	8.2	0.001	9.71								
215.0	8.1	0.001	9.76								
220.0	7.9	0.001	9.81								
225.0	7.8	0.001	9.86								
230.0	7.6	0.001	9.90								
235.0	7.5	0.001	9.95								
240.0	7.4	0.001	10.00								
245.0	7.3	0.001	10.04								
250.0	7.2	0.001	10.09								
255.0	7.1	0.001	10.13								
260.0	6.9	0.001	10.17								
265.0	6.8	0.001	10.22								
270.0	6.7	0.001	10.26								

 Lithos		Modified Rational Method Five Year Storm Site Flow and Storage Summary - towards Easement 48 Grenoble Drive									
A2 Post - Uncontrolled											
Area (A2) = 0.068 ha		<table><tr><th colspan="2">5-Year Design Storm</th></tr><tr><td>a=</td><td>32.00</td></tr><tr><td>c=</td><td>-0.79</td></tr><tr><td>I =</td><td>A(T)^c</td></tr></table>		5-Year Design Storm		a=	32.00	c=	-0.79	I =	A(T) ^c
5-Year Design Storm											
a=	32.00										
c=	-0.79										
I =	A(T) ^c										
Coefficient "C" = 0.50											
AC2= 0.034											
Tc = 10.0 min											
Time Increment = 5.0 min											
Max. Release Rate = 12.4 L/s											
Type	Area (ha)	Coefficient "C"									
Landscaped	0.068	0.50									
Hardscaped	0.000	0.90									
Total Area (A5 Post)	0.068	0.50									
2-yr Pre-Development Site											
Release Rate towards Easement (A2-pre)=		48.2	L/s								
Site Release Rate towards Easement (A6 Post)=		12.4	L/s								
(1)	(2)	(3)	(4)								
Time	Rainfall	Storm	Runoff								
	Intensity	Runoff (A2 post)	Volume (A2 post)								
(min)	(mm/hr)	(m ³ /s)	(m ³)								
10.0	131.8	0.012	7.42								
15.0	95.7	0.009	8.08								
20.0	76.2	0.007	8.59								
25.0	63.9	0.006	9.00								
30.0	55.3	0.005	9.35								
35.0	49.0	0.005	9.66								
40.0	44.1	0.004	9.93								
45.0	40.2	0.004	10.18								
50.0	37.0	0.003	10.41								
55.0	34.3	0.003	10.62								
60.0	32.0	0.003	10.82								
65.0	30.0	0.003	11.00								
70.0	28.3	0.003	11.17								
75.0	26.8	0.003	11.33								
80.0	25.5	0.002	11.49								
85.0	24.3	0.002	11.64								
90.0	23.2	0.002	11.78								
95.0	22.3	0.002	11.91								
100.0	21.4	0.002	12.04								
105.0	20.6	0.002	12.16								
110.0	19.8	0.002	12.28								
115.0	19.1	0.002	12.40								
120.0	18.5	0.002	12.51								
125.0	17.9	0.002	12.62								
130.0	17.4	0.002	12.72								
135.0	16.9	0.002	12.82								
140.0	16.4	0.002	12.92								
145.0	15.9	0.001	13.02								
150.0	15.5	0.001	13.11								
155.0	15.1	0.001	13.20								
160.0	14.7	0.001	13.29								
165.0	14.4	0.001	13.38								
170.0	14.1	0.001	13.46								
175.0	13.7	0.001	13.54								
180.0	13.4	0.001	13.62								
185.0	13.1	0.001	13.70								
190.0	12.9	0.001	13.78								
195.0	12.6	0.001	13.85								
200.0	12.4	0.001	13.93								
205.0	12.1	0.001	14.00								
210.0	11.9	0.001	14.07								
215.0	11.7	0.001	14.14								
220.0	11.5	0.001	14.21								
225.0	11.3	0.001	14.28								
230.0	11.1	0.001	14.34								
235.0	10.9	0.001	14.41								
240.0	10.7	0.001	14.47								
245.0	10.5	0.001	14.53								
250.0	10.4	0.001	14.60								
255.0	10.2	0.001	14.66								
260.0	10.0	0.001	14.72								
265.0	9.9	0.001	14.78								
270.0	9.8	0.001	14.83								

 Lithos		Modified Rational Method Hundred Year Storm Site Flow and Storage Summary - towards Easement 48 Grenoble Drive									
A2 Post - Uncontrolled											
Area (A2) = 0.068 ha Coefficient "C" = 0.50 AC2= 0.034 Tc = 10.0 min Time Increment = 5.0 min Max. Release Rate = 23.5 L/s		<table><tr><th colspan="2">100-Year Design Storm</th></tr><tr><td>a=</td><td>59.70</td></tr><tr><td>c=</td><td>-0.80</td></tr><tr><td>I =</td><td>A(T)^c</td></tr></table>		100-Year Design Storm		a=	59.70	c=	-0.80	I =	A(T) ^c
100-Year Design Storm											
a=	59.70										
c=	-0.80										
I =	A(T) ^c										
Type	Area (ha)	Coefficient "C"									
Landscaped	0.068	0.50									
Hardscaped	0.000	0.90									
Total Area (A5 Post)	0.068	0.50									
2-yr Pre-Development Site Release Rate towards Easement (A2-pre)= 48.2 L/s											
Site Release Rate towards Easement (A2 Post)= 23.5 L/s											
(1)	(2)	(3)	(4)								
Time	Rainfall	Storm	Runoff								
	Intensity	Runoff (A2 post)	Volume (A2 post)								
(min)	(mm/hr)	(m ³ /s)	(m ³)								
10.0	250.3	0.024	14.10								
15.0	181.0	0.017	15.29								
20.0	143.8	0.013	16.20								
25.0	120.3	0.011	16.94								
30.0	103.9	0.010	17.57								
35.0	91.9	0.009	18.12								
40.0	82.6	0.008	18.61								
45.0	75.1	0.007	19.05								
50.0	69.1	0.006	19.46								
55.0	64.0	0.006	19.83								
60.0	59.7	0.006	20.18								
65.0	56.0	0.005	20.50								
70.0	52.8	0.005	20.81								
75.0	49.9	0.005	21.10								
80.0	47.4	0.004	21.37								
85.0	45.2	0.004	21.63								
90.0	43.2	0.004	21.88								
95.0	41.3	0.004	22.12								
100.0	39.7	0.004	22.35								
105.0	38.2	0.004	22.57								
110.0	36.8	0.003	22.78								
115.0	35.5	0.003	22.98								
120.0	34.3	0.003	23.18								
125.0	33.2	0.003	23.37								
130.0	32.2	0.003	23.55								
135.0	31.2	0.003	23.73								
140.0	30.3	0.003	23.90								
145.0	29.5	0.003	24.07								
150.0	28.7	0.003	24.24								
155.0	27.9	0.003	24.40								
160.0	27.2	0.003	24.55								
165.0	26.6	0.002	24.70								
170.0	25.9	0.002	24.85								
175.0	25.4	0.002	25.00								
180.0	24.8	0.002	25.14								
185.0	24.3	0.002	25.28								
190.0	23.7	0.002	25.41								
195.0	23.3	0.002	25.54								
200.0	22.8	0.002	25.67								
205.0	22.3	0.002	25.80								
210.0	21.9	0.002	25.92								
215.0	21.5	0.002	26.05								
220.0	21.1	0.002	26.17								
225.0	20.7	0.002	26.28								
230.0	20.4	0.002	26.40								
235.0	20.0	0.002	26.51								
240.0	19.7	0.002	26.63								
245.0	19.4	0.002	26.74								
250.0	19.1	0.002	26.84								
255.0	18.8	0.002	26.95								
260.0	18.5	0.002	27.06								
265.0	18.2	0.002	27.16								
270.0	17.9	0.002	27.26								



Water Quality Calculations

48 Grenoble Drive

File No. UD21-110

Date: July 2023

Prepared By: Isaak Chlorotiris, P.E., M.A.Sc.

Reviewed by: John Pasalidis, P.Eng., M.A.Sc.

Surface	Method	Effective TSS Removal	Area (ha)	% Area of Controlled Site	Overall TSS Removal
Rooftop/ Terraces/Green Roof/Walkways/Landscape/Hardscape	Inherent	80%	0.607	100%	80%
Total			0.607	100%	80%

Note: Uncontrolled water does not account in the above calculations

Appendix D

Sanitary Data Analysis



SANITARY SEWER DESIGN SHEET
48 Grenoble Drive
CITY OF TORONTO

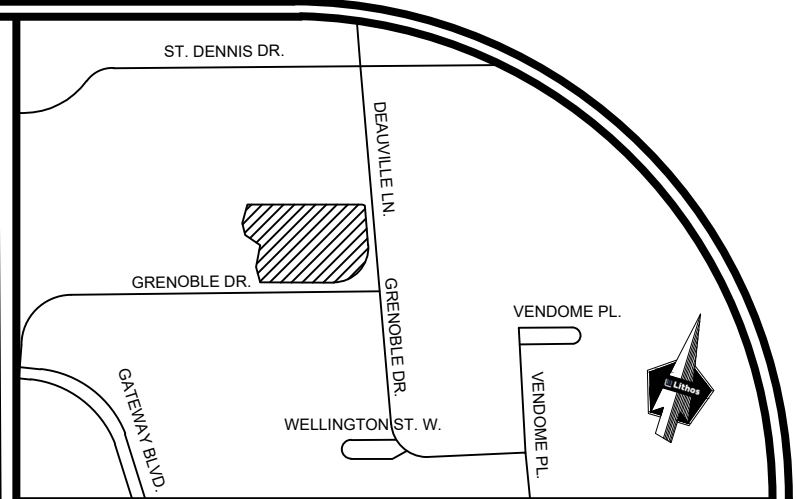
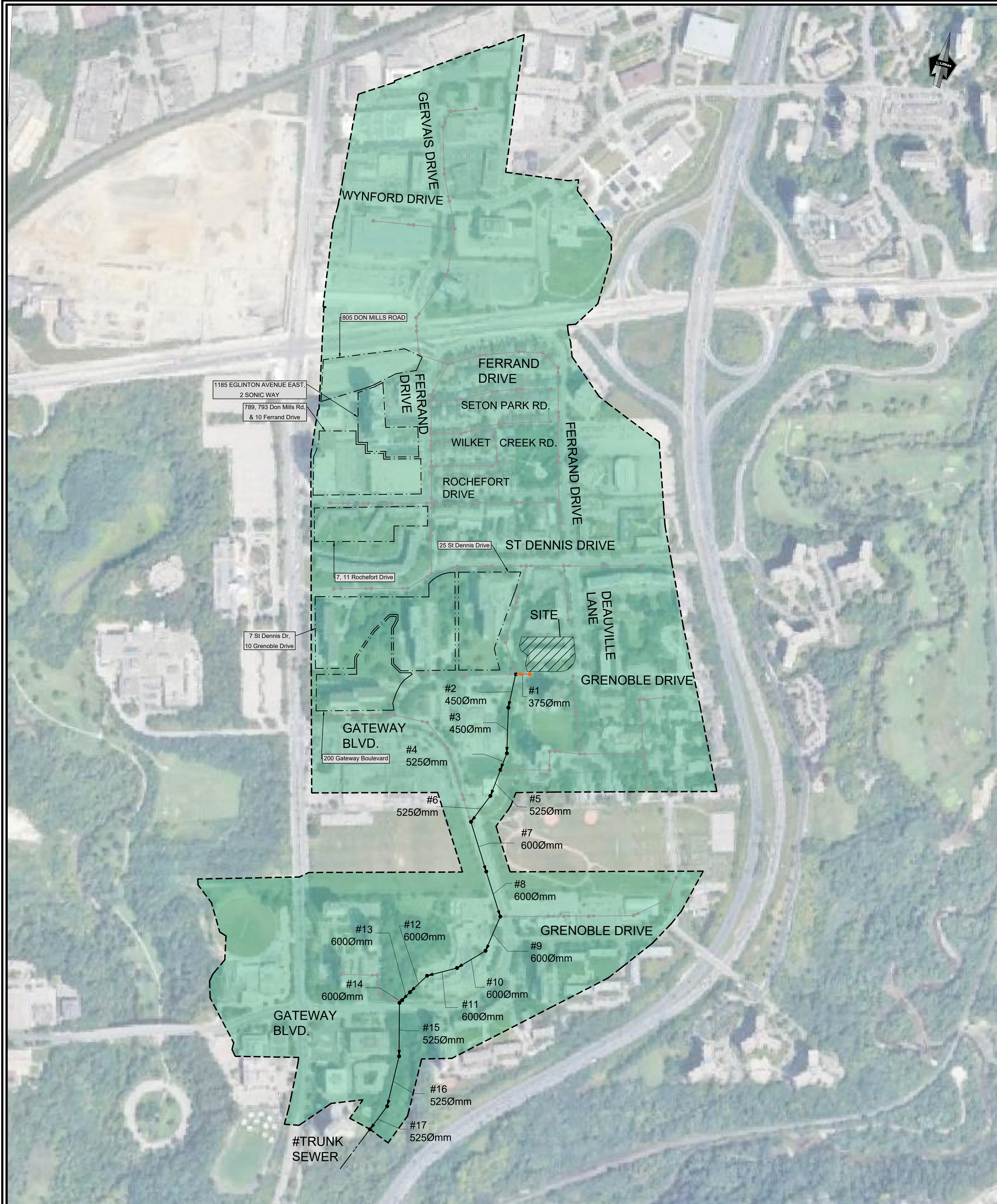
LOCATION	RESIDENTIAL								PARKLAND		COMMERCIAL		FLOW										SEWER DESIGN					
	SECTION AREA	NUMBER OF UNITS						SECTION POP.	SECTION AREA	SECTION POP.	COMM AREA	SECTION POP.	TOTAL ACCUM. POP.	AVERAGE RESIDENTIAL FLOW '@' 240 L/c/d	HARMON PEAKING FACTOR	RES. PEAK FLOW (L/s)	AVERAGE COMMERCIAL FLOW @ 250 L/c/d	TOTAL ACCUM. AREA	INFILT. @ 0.26 L/s/ha.	TOTAL SANITARY FLOW (L/s)	PEAK GROUNDWATER FLOW (L/s)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAPACITY n = 0.013 (L/sec)	% of DESIG CAPACITY (%)	
		Single	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																					
		Fam. Dwell.	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																					
(ha.)	@ 3.5 ppu	@ 2.7	@ 1.4 ppu	@ 1.4 ppu	@ 2.1 ppu	@ 3.1 ppu	(persons)	(ha.)	(persons)	(ha.)	(persons)	(persons)	(L/s)		(L/s)	(L/s)	(ha.)	(L/s)	(L/s)	(L/s)	(L/s)							
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Existing Condition																												
Residential Development	0.675	0.00	0.00	0	112	48	32	357			0	0	357	0.99	4.05	4.01	0.00	0.675	0.18	4.01	0.00	4.19						
Proposed Condition																												
Residential Development	0.607	0	0	0	653	302	111	1,893	0.000	0	0.000	0	1,893	5.26	3.60	18.95	0.00	0.607	0.16	18.95	0.00	19.10						
Parkland Dedication	0.068	0	0	0	0	0	0	0	0.068	1	0.000	0	1	0.00	4.50	0.00	0.00	0.068	0.02	0.00	0.00	0.02						
Residential Flow Rate - 240 litres/capita/day																												
Commercial/Office Flow Rate - 250 litres/capita/day																												
Firehouse Flow Rate - 180000 L/ha/day																												
Infiltration - 0.26 L/ha																												
Foundation allowance - 3.0 L/ha																												
Peaking Factor = 1 + [14 / (4 + P ^{0.5})], P=Population in thousands																												
Site Area (ha):					0.675																							
			Prepared by: Isaak Chlorotiris, P.E., M.A.Sc. Reviewed by: John Pasalidis, P.Eng., M.A.Sc. Date: July 2023										Project: 48 Grenoble Drive Project: UD21-110 City of Toronto										Sheet 1 OF 2					



SANITARY SEWER DESIGN SHEET

48 Grenoble Drive
CITY OF TORONTO

LOCATION	RESIDENTIAL								PARKLAND		COMMERCIAL		FLOW										SEWER DESIGN									
	SECTION AREA	NUMBER OF UNITS						SECTION POP.	SECTION AREA	SECTION POP.	COMM AREA	SECTION POP.	TOTAL ACCUM.	AVERAGE	HARMON PEAKING	RES. PEAK FLOW	AVERAGE	TOTAL ACCUM.	INFILT.	TOTAL	PEAK	TOTAL	PIPE LENGTH	PIPE DIA.	SLOPE	FULL FLOW CAPACITY	% of DESIG CAPACITY					
		Single	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																									
		Fam. Dwell.																														
(ha.)	@ 3.5 ppu	@ 2.7	@ 1.4 ppu	@ 1.4 ppu	@ 2.1 ppu	@ 3.1 ppu	(persons)	(ha.)	(persons)	(ha.)	(persons)	(persons)	(L/s)		(L/s)	(L/s)	(ha.)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	n = 0.013	(%)						
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27					
Existing Condition																																
Residential Development	0.675	0.00	0.00	0	112	48	32	357			0	0	357	0.99	4.05	4.01	0.00	0.675	0.18	4.01	0.00	4.19										
Proposed Condition																																
Residential Development	0.607	0	0	0	653	302	111	1,893	0.000	0	0.000	0	1,893	9.86	3.60	35.53	0.00	0.607	0.16	35.53	0.00	35.69										
Parkland Dedication	0.068	0	0	0	0	0	0	0	0.068	1	0.000	0	1	0.00	4.50	0.00	0.00	0.068	0.02	0.00	0.00	0.02										
Residential Flow Rate - 450 litres/capita/day													Total Post Flow (Residential Development)										35.69		375		1.0%		175.33		20.4%	
Commercial/Office Flow Rate - 250 litres/capita/day													Total Net Flow (Towards Downstream Sanitary Network)										31.50									
Firehouse Flow Rate - 180000 L/ha/day																																
Infiltration - 0.26 L/ha																																
Foundation allowance - 3.0 L/ha																																
Peaking Factor = 1 + [14 / (4 + P ^{0.5})], P=Population in thousands																																
Site Area (ha):					0.675																											
			Prepared by: Isaak Chlorotiris, P.E., M.A.Sc. Reviewed by: John Pasalidis, P.Eng., M.A.Sc. Date: July 2023										Project: 48 Grenoble Drive										Sheet 2 OF 2									
													Project: UD21-110																			
													City of Toronto																			

LOCATION PLAN
NTS

LEGEND

-
- EXISTING UPSTREAM MANHOLE
 ● EXISTING DOWNSTREAM MANHOLE
 ● PROPOSED MANHOLE
 — EXISTING UPSTREAM SANITARY SEWER
 — EXISTING DOWNSTREAM SANITARY SEWER
 — PROPOSED SANITARY SEWER
 - - - TRUNK SEWER
 ■ INFILTRATION AREA
 ■ DRAINAGE AREA (ha)
 # 1 NUMBERED SEGMENT
 [] FUTURE DEVELOPMENT

1.	ISSUED FOR ZBA APPLICATION	JULY 10, 2023	NM
NO	REVISION	DATE	BY

CITY OF TORONTO

DOWNSTREAM SANITARY SEWER NETWORK DRAINAGE AREA PLAN

RESIDENTIAL DEVELOPMENT
48 GRENoble DRIVEWAY
TORONTO, ONTARIO

ENGINEERING AND CONSTRUCTION
SERVICES DIVISION

ACCEPTED TO BE IN ACCORDANCE WITH THE CITY OF TORONTO
STANDARDS. THIS ACCEPTANCE IS NOT TO BE CONSTRUCTED AS
VERIFICATION OF ENGINEERING CONTENT.

Manager, Development Engineering

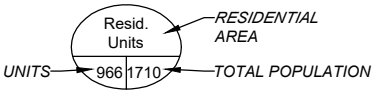
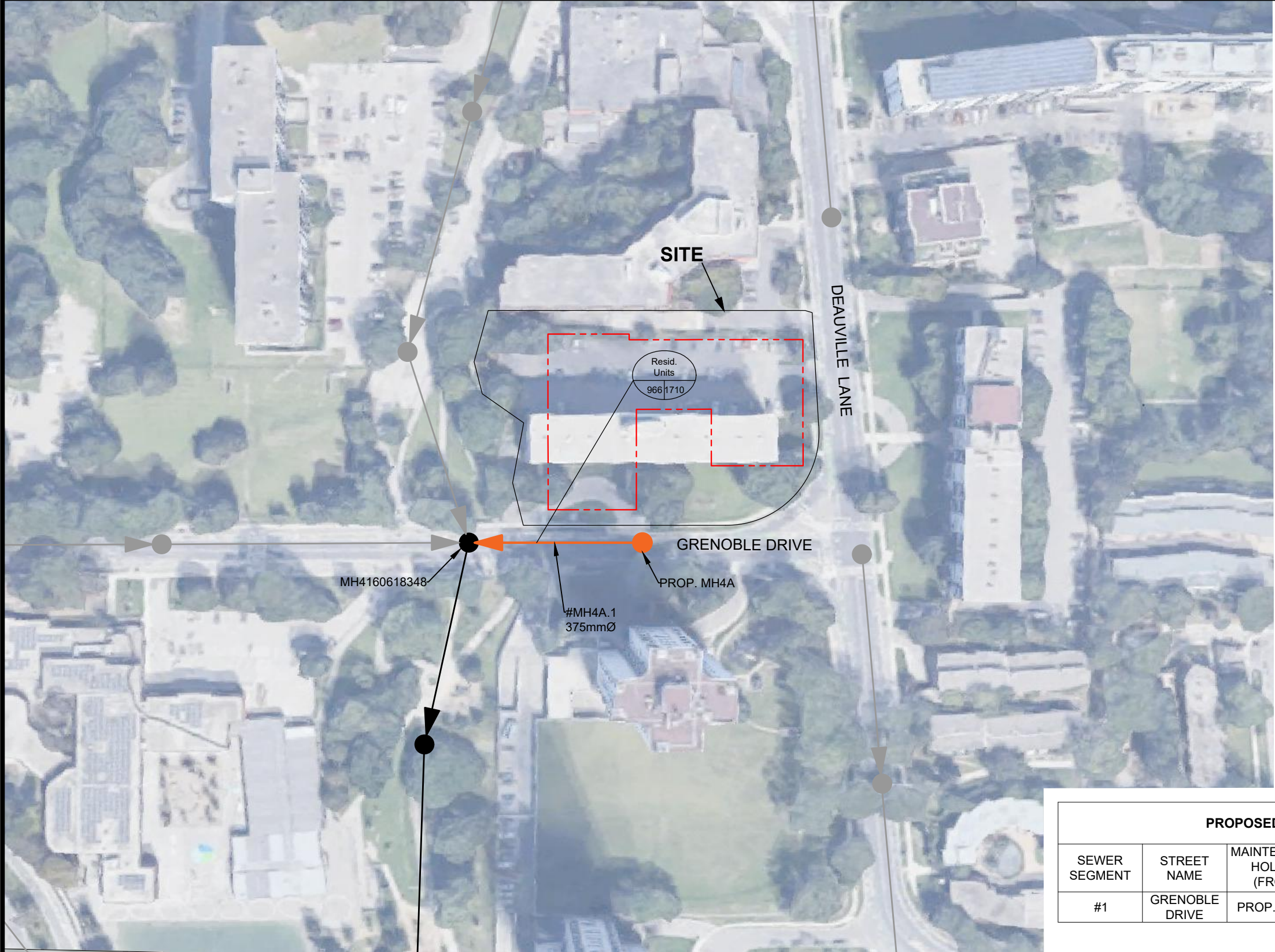
Date _____



150 Bermondsey Road, Toronto, Ontario M4A 1Y1

DESIGNED BY: IN	DATE: AUG 25, 2022	CHECKED BY: NM
DRAWN BY: IN	PROJECT No:	APPROVED BY: NM
SCALE: N.T.S.		DRAWING No:
© COPYRIGHT 2023 Lithos Group Ltd.		UD21-110

DOWNSTREAM SANITARY SEWER SEGMENT INFORMATION							
SEWER SEGMENT	STREET NAME	MAINTENNACE HOLE ID (FROM)	MAINTENNACE HOLE ID (TO)	TYPE	SIZE (mm)	LENGTH (m)	SLOPE (%)
#1	GRENOBLE DRIVE	PROP. MH4A	MH4160618348	CIR	375	38.1	1.00
#2	ST. DENIS DRIVE	MH4160618348	MH4153818354	CIR	450	68.00	0.75
#3	ST. DENIS DRIVE	MH4153818354	MH4145118379	CIR	450	90.60	0.79
#4	ST. DENIS DRIVE	MH4145118379	MH4141618377	CIR	525	35.30	0.45
#5	ST. DENIS DRIVE	MH4141618377	MH4136018374	CIR	525	55.40	0.52
#6	GATEWAY BLVD.	MH4136018374	MH4130018354	CIR	525	64.20	0.55
#7	GATEWAY BLVD.	MH4130018354	MH4121518413	CIR	600	103.40	0.30
#8	GATEWAY BLVD.	MH4121518413	MH4113918467	CIR	600	93.30	0.30
#9	GATEWAY BLVD.	MH4113918467	MH4106518460	CIR	600	74.00	0.57
#10	GATEWAY BLVD.	MH4106518460	MH4101518417	CIR	600	66.00	0.61
#11	GATEWAY BLVD.	MH4101518417	MH4098218365	CIR	600	61.40	0.60
#12	GATEWAY BLVD.	MH4098218365	MH4094118343	CIR	600	47.40	0.65
#13	GATEWAY BLVD.	MH4094118343	MH4092218333	CIR	600	21.60	38.06
#14	GATEWAY BLVD.	MH4092218333	MH4091818330	CIR	600	7.6	1.45
#15	GATEWAY BLVD.	MH4091818330	MH5512534151	CIR	525	105.90	3.49
#16	GATEWAY BLVD.	MH5512534151	MH5512534152	CIR	525	101.80	2.03
#17	GATEWAY BLVD.	MH5512534152	MH5512534175	CIR	525	57.10	3.49



PROPOSED SANITARY SEWER SEGMENT INFORMATION							
SEWER SEGMENT	STREET NAME	MAINTENNACE HOLE ID (FROM)	MAINTENNACE HOLE ID (TO)	TYPE	SIZE (mm)	LENGTH (m)	SLOPE (%)
#1	GRENABLE DRIVE	PROP. MH4A	MH4160618348	CIR	375	38.1	1.00



150 Bermondsey Road, Toronto, Ontario M4A 1Y1

LEGEND

- EXISTING UPSTREAM MANHOLE
- EXISTING DOWNSTREAM MANHOLE
- PROPOSED MANHOLE
- EXISTING UPSTREAM SANITARY SEWER
- EXISTING DOWNSTREAM SANITARY SEWER
- PROPOSED SANITARY SEWER
- BUILDING PERIMETER AT GROUND LEVEL

PROPOSED SANITARY NETWORK
DRAINAGE AREA PLAN
RESIDENTIAL USE DEVELOPMENT
48 GRENABLE DRIVE
TORONTO, ONTARIO

DATE: JULY 2023	PROJECT No: UD21-110
SCALE: N.T.S.	FIGURE No: DAP4



SANITARY SEWER DESIGN
City of Toronto
48 Grenoble Drive
City of Toronto

page 1

DESCRIPTION Sewer Segment				FROM	TO	RESIDENTIAL SECTION POP. (persons)	COMMERCIAL SECTION POP. @' 110 ppha (persons)	OFFICE SECTION POP. @' 330 ppha (persons)	PARKLAND SECTION POP. @' 10 ppha (persons)	AVERAGE RESIDENTIAL FLOW '@' 450 L/c/d (L/s)	DRY WEATHER						
											RES. PEAK FLOW (L/s)	AVERAGE COMMERCIAL FLOW '@' 250 L/c/d (L/s)	AVERAGE OFFICE FLOW '@' 250 L/c/d (L/s)	PARKLAND FLOW '@' 250 L/c/d (L/s)	INFILT '@' 0.26 L/s/ha (L/s)	PEAK GROUNDWATER FLOW (L/s)	TOTAL SANITARY FLOW (L/s)
Sewer Segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
	#1	PROP. MH4A	MH4160618348	1,893	0	0	0	9.86	35.53	0.000	0.000	0.000	0.160	0.000	35.687		
Manning Equation: Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s) D: pipe size (mm) S: slope (grade) of pipe (%) n: roughness coefficient												Project No.: PUD21-110 City of Toronto					



SANITARY SEWER DESIGN
City of Toronto
48 Grenoble Drive
City of Toronto

page 2

WET WEATHER							SANITARY SEWER DESIGN INFORMATION						DRY WEATHER	WET WEATHER
RES. PEAK FLOW	AVERAGE COMMERCIAL FLOW '@' 250 L/c/d	AVERAGE OFFICE FLOW '@' 250 L/c/d	AVERAGE PARKLAND FLOW '@' 250 L/c/d	INFILT '@' 5.0 L/s/ha	PEAK GROUNDWATER FLOW	TOTAL SANITARY FLOW	size	slope	length	Q full	Q full	V full	capacity (%)	capacity (%)
(L/s)	(L/s)	(L/s)					(mm)	(%)	(m)	(m³/s)	(L/s)	(m/s)		
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
35.527	0.000	0.000	0.000	3.1	0.000	38.602	375	1.00%	38.10	0.175	175.33	1.59	20.4%	22.0%
Manning Equation: $Q_{cap.} = (D/1000)^{2.667} (S/100)^{0.5} / (3.211 \cdot n) \cdot 1000 \text{ (L/s)}$ D: pipe size (mm) S: slope (grade) of pipe (%) n: roughness coefficient														
												Project No.: PUD21-110		
												City of Toronto		

SANITARY SEWER DESIGN
City of Toronto
48 Grenoble Drive
City of Toronto

DESCRIPTION	Sewer Segment	FROM	TO	GROUND ELEVATION	UPPER INVERT	UPPER OBVERT	LOWER INVERT	LOWER OBVERT	TOTAL SANITARY FLOW	Q/Qf	D/Df	WATER DEPTH	CRITICAL DEPTH Yc	CRITICAL VELOCITY Vc	FLOW VELOCITY V	FROUDE NUMBER	FLOW
				(m)	(m)	(m)	(m)	(m)	(L/s)			(m)	(m)	(m/s)	(m/s)		
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Sewer Segment	#1	PROP. MH4A	MH4160618348	126.40	122.17	122.55	121.79	122.17	35.69	0.204	0.300	0.141	0.135	1.150	1.065	0.82	subcritical
															Project No.: PUD21-110		
															City of Toronto		

SANITARY SEWER DESIGN
City of Toronto
 48 Grenoble Drive
 City of Toronto

page 4

DESCRIPTION	Sewer Segment	FROM	TO	TOTAL SANITARY FLOW	HGL SLOPE	U/s HGL	U/s obv-HGL	MANHOL E LOSS	D/s HGL	D/s obv-HGL	U/s SURCHARGE	FREEBOARD
				(L/s)		(m)	(m)		(m)	(m)	(m)	(m)
49	50	51	52	53	54	55	56	57	58	59	60	61
Sewer Segment	#1	PROP. MH4A	MH4160618348	38.602	0.000485	122.31	0.23	0.04	121.97	0.20	0.00	4.09
										Project No.: PUD21-110		
										City of Toronto		

Appendix E

Water Data Analysis



WATER DEMAND

48 Grenoble Dr

Project No: UD21-110

Date: July 2023

Prepared by: Isaak Chlorotiris, P.E., M.A.Sc.

Reviewed by: John Pasalidis, P.Eng., M.A.Sc.

Fire Flow Calculation

- 1 $F = 220 C (A)^{1/2}$
 Where F= Fire flow in Lpm
 C= construction type coefficient
 = 0.8 non-combustible construction
 A = total floor area in sq.m. excluding basements, includes garage*

		Area Applied
Level 2=	3214.0 m ²	100%
Level 1=	3991.0 m ²	25%
Level 3=	3214.0 m ²	25%
=	5,015 sq.m.	

Note: The levels indicated, reference the floors with the largest areas, which considers the total floor areas which span through the east and west towers, and podium (Please refer to building stats).

F = 12,464 L/min
 F = 12,000 L/min Round to nearest 1000 l/min

- 2 Occupancy Reduction
 15% reduction for limited combustible occupancy
 F = 10200 L/min
- 3 Sprinkler Reduction
 30% Reduction for NFPA automatic sprinkler system
 F = 7140 l/min

- 4 Separation Charge
 20% North 3.1m to 10m
 0% East > 45m
 5% South 30.1m to 45m
 0% West > 45m
 25% Total Separation Charge, 2550 L/min

F = 9,690 L/min
 161.50 L/s
 F = 2560 US GPM

Domestic Flow Calculations

Population High Rise = 1,893 Persons from Site Statistics
 Average Day Demand = 190 L/cap/day 1 US Gallon=3.785 L
 Residential Flow= 4.16 L/s

Retail/Commercial Area= 0 m2 from Site Statistics
 Average Day Demand= 2.8 L/m2/day 1 US GPM=15.852L/s
 Retail/Commercial Flow= 0.00 L/s

Total Flow= 4.16 L/s
 = 64.87 US GPM

Max. Daily Demand Peaking Factor = 1.5
 Max. Daily Demand = 6.24 L/s = 99 US GPM

or
 Max. Hourly Demand Peaking Factor = 2.25
 Max. Hourly Demand = 9.37 L/s = 148 US GPM

Max Daily Demand = 6.24 L/s
 Fire Flow = 161.50 L/s

Required 'Design' Flow = 167.74 L/s
 2659 US GPM

Note: Required 'Design' Flow is the maximum of either:
 1) Fire Flow + Maximum Daily Demand
 2) Maximum Hourly Demand



WATER DEMAND

48 Grenoble Dr

Project No: UD21-110

Date: July 2023

Prepared by: Isaak Chlorotiris, P.E., M.A.Sc.

Reviewed by: John Pasalidis, P.Eng., M.A.Sc.

Pressure Losses

Hazen-Williams Formula

$$V = KCR_h^{0.63}XS^{0.54}$$

k= 0.85 - conversion factor (0.849 for SI units and 1.318 for US customary units)

C= 140 - roughness coefficient (PVC : 140-150)

S= h_f/L

R_h= D/4 - hydraulic radius (D/4 for full flow, A/P_w for partially flow)

Fire Fighting and Domestic Head Loss

Flow Requirements= 167.74 l/s
Diameter= 200 mm
Area= 1.77E-02
L= 8.5 m
V= 9.49 m/s
S= 4.27E-01
R_h= 0.04
H_f= 3.63 m
= 5.17 psi

Flow Test (dated: May 5, 2022)

when:	Static Pressure =	86 psi	Flow =	0 gpm	=	0	L/s
	Residual Pressure =	81 psi	Flow =	1061.22 gpm	=	66.96	L/s

Pressure

(psi)	Flow (L/s)
86	0.0
81	67.0

Based on the Pressure/Flow relationship, we have to confirm that the flow requirement of 167.74 L/s can be provided at minimum pressure (20.3 psi + Losses) as set out by the FUS guidelines

73.5 167.74

Fire Flow is above minimum of 25.47 psi (20.3+H_f)

Since the flow of 167.74 L/s required for the proposed development is provided in the existing watermain at 73.5 psi (which is more than the minimum of 25.47 psi), we anticipate that the existing watermain infrastructure can support the proposed development.

Flow available at 20psi = 4275 gpm = 269.70 L/s

$$\begin{aligned}Q_{avail} @ 20psi &= Q_T ((P_S - P_A) / (P_S - P_R))^{0.54} \\&= 1061.22 \times ((86 - 20) / (86 - 81))^{0.54} \\&= 4275 \text{ gpm}\end{aligned}$$



WATER DEMAND

48 Grenoble Dr

Project No: UD21-110

Date: July 2023

Prepared by: Isaak Chlorotiris, P.E., M.A.Sc.

Reviewed by: John Pasalidis, P.Eng., M.A.Sc.

Pressure Losses

Hazen-Williams Formula

$$V = kCR_h^{0.63} \times S^{0.54}$$

k= 0.85 - conversion factor (0.849 for SI units and 1.318 for US customary units)

C= 140 - roughness coefficient (PVC : 140-150)

S= h_f/L

R_h= D/4 - hydraulic radius (D/4 for full flow, A/P_w for partially flow)

Fire Fighting and Domestic Head Loss

Flow Requirements= 167.14 l/s

Diameter= 200 mm

Area= 1.77E-02

L= 14.5 m

V= 9.46 m/s

S= 4.25E-01

R_h= 0.04

H_f= 6.16 m

= 8.76 psi

Assuming zero head losses

Flow Test (dated: May 5, 2022)

when: Static Pressure = 90 psi
Residual Pressure = 86 psi

Flow = 0 gpm = 0 L/s
Flow = 1609.42 gpm = 101.55 L/s

Pressure (psi)	Flow (L/s)
90	0.0
86	101.6

83.4 **167.14**

Based on the Pressure/Flow relationship, we have to confirm that the flow requirement of 167.14 L/s can be provided at minimum pressure (20.3 psi + Losses) as set out by the FUS guidelines

Fire Flow is above minimum of 29.06 psi (20.3+H_f)

Since the flow of 167.14 L/s required for the proposed development is provided in the existing watermain at 83.4 psi (which is more than the minimum of 29.06 psi), we anticipate that the existing watermain infrastructure can support the proposed development.

Flow available at 20psi = 7549 gpm = 476.29 L/s

$$\begin{aligned} Q_{\text{avail @ 20psi}} &= Q_T ((P_S - P_A) / (P_S - P_R))^{0.54} \\ &= 1609.42 \times ((86 - 20) / (86 - 81))^{0.54} \\ &= 7549 \text{ gpm} \end{aligned}$$

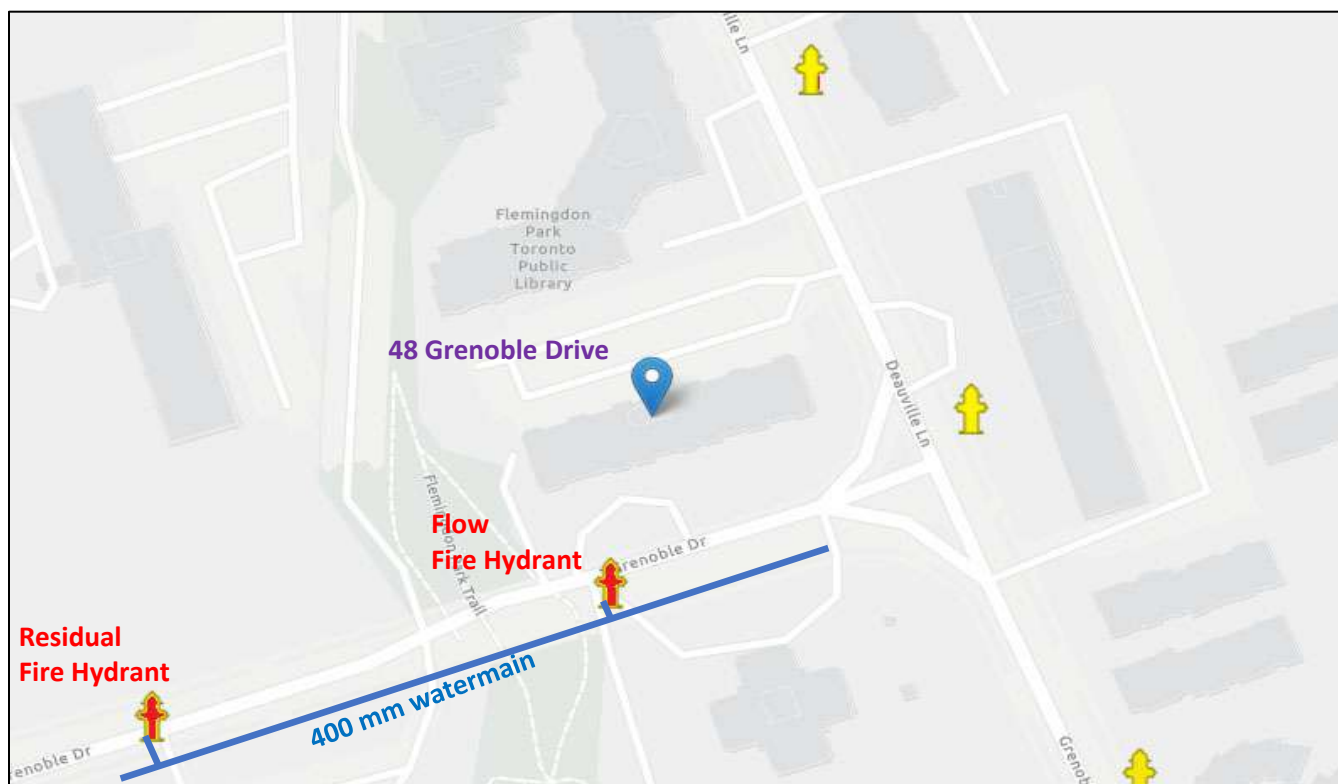
General Information

Report No. : **FHR-22-05-05-02** Date : **05-May-22**
 Project No. : **PUD21-110**
 Site Address/Location: **48 Grenoble Dr, To**
 Region/Municipality: **City of Toronto**
 Residual Fire Hydrant Location/description : **OP/ 9 GRENOBLE DR/HY4015064**
 Flow Fire Hydrant Location/description : **48 GRENOBLE DR/HY4015071**
 Watermain Pipe Size (mm) : **400 mm**
 Test Equipment Orifice Size (in) : **2.5**
 Test Equipment Orifice coefficient : **0.9**
 Date of test: **May 5,2022**
 Time of test: **12:30 pm**
 Temperature: **12°C**
 Testing Method : **NFPA 291 (Recommended Practice for Fire Flow Testing and Marking of Hydrants)**

Attendants

	Name	Title	Contact Info.
Lithos Inspector	Keyvan Vahedi, P.Eng.	Senior Project Coordinator	(437)-776-4086
Lithos Inspector	Surabhi Suresh	Project Coordinator	(647)-394-1527
Lithos Inspector	Pradeep Kumar Oleti	Construction Inspector	(905) 609-3435
City of Toronto Rep.	Jim Popouski	Inspector	(647)-458-6073

Site Plan/Sketch



Pressure Readings (PSIG)

Flow Hydrant's Outlet Condition	C-0 { Outlet #1 : Close Outlet #2 : Close	C-1 { Outlet #1 : Open Outlet #2 : Close	C-2 { Outlet #1 : Open Outlet #2 : Open
Residual Fire Hydrant	86	82	81
Flow Fire Hydrant		18	10

General Information

Report No. : **FHR-22-05-05-02**

Date : **05-May-22**

Project No. : **PUD21-110**

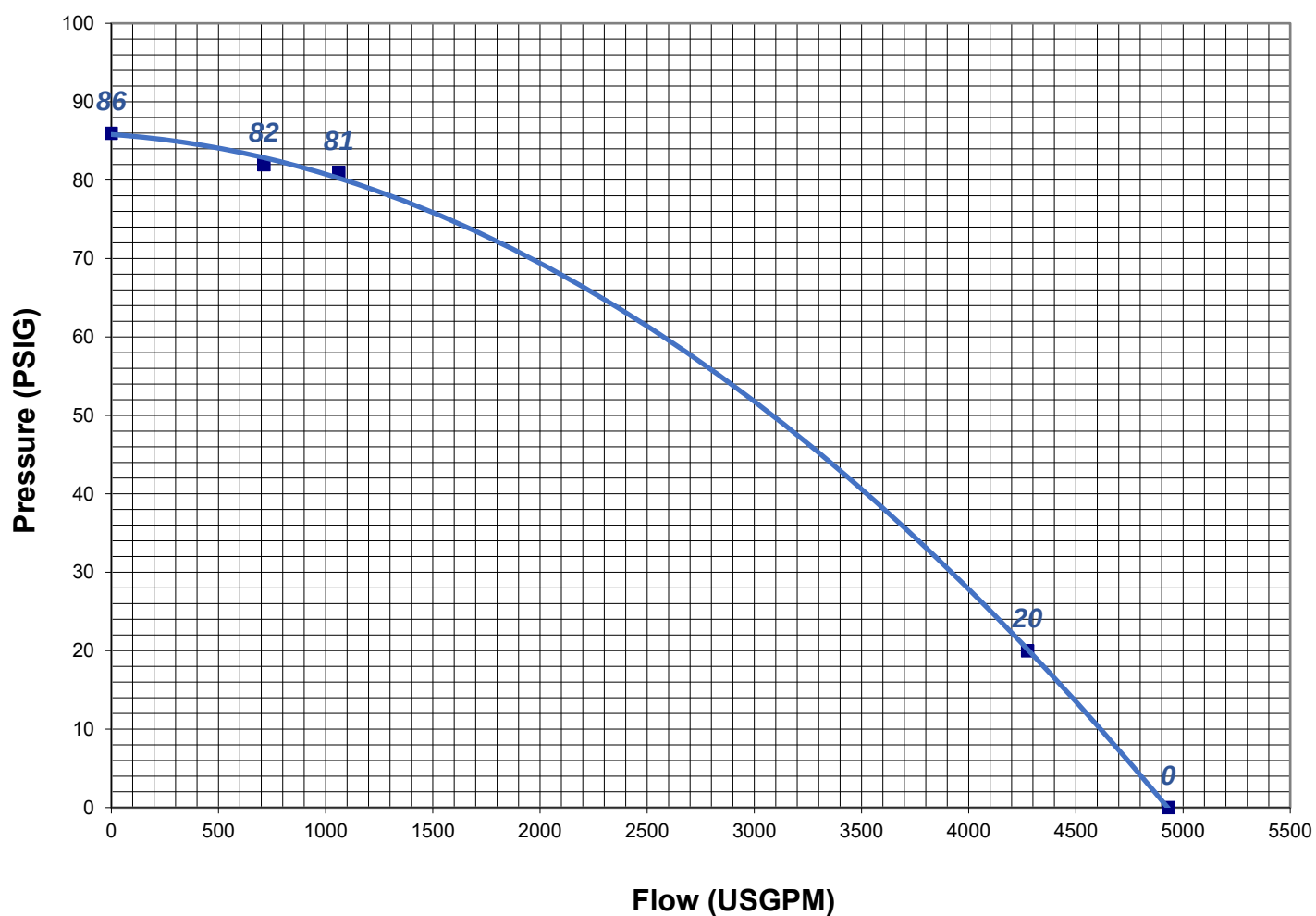
Site Address/Location: **48 Grenoble Dr, To**

Region/Municipality: **City of Toronto**

Pressure-Flow Table

Condition		C-0	C-1	C-2	C(20)	C(0)
Pressure (PSIG)		86	82	81	20	0
Flow	(USGPM)	0	711.89	1061.22	4274.80	4931.64
	(L/S)	0.00	44.92	66.96	269.74	311.19

Pressure-Flow Graph



Result

Maximum available flow at 20PSI = 4274.80 USGPM or 269.74 L/s

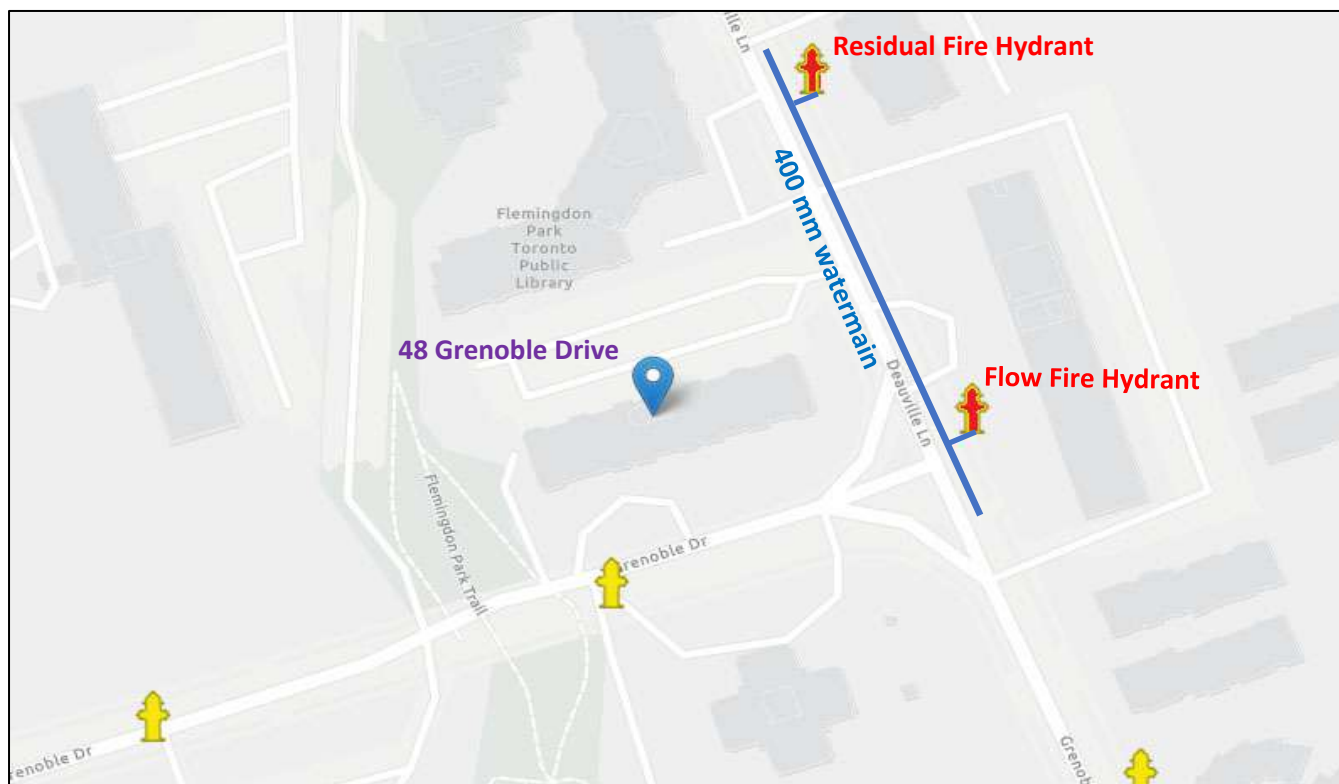
General Information

Report No. : **FHR-22-05-05-03** Date : **05-May-22**
 Project No. : **PUD21-110**
 Site Address/Location: **48 Grenoble Dr, To**
 Region/Municipality: **City of Toronto**
 Residual Fire Hydrant Location/description : **5 DEAUVILLE LANE/HY4015267**
 Flow Fire Hydrant Location/description : **1 DEAUVILLE LANE/HY4015242**
 Watermain Pipe Size (mm) : **400 mm**
 Test Equipment Orifice Size (in) : **2.5**
 Test Equipment Orifice coefficient : **0.9**
 Date of test: **May 5, 2022**
 Time of test: **1:00 pm**
 Temperature: **12°C**
 Testing Method : **NFPA 291 (Recommended Practice for Fire Flow Testing and Marking of Hydrants)**

Attendants

	Name	Title	Contact Info.
Lithos Inspector	Keyvan Vahedi, P.Eng.	Senior Project Coordinator	(437)-776-4086
Lithos Inspector	Surabhi Suresh	Project Coordinator	(647)-394-1527
Lithos Inspector	Pradeep Kumar Oleti	Construction Inspector	(905) 609-3435
City of Toronto Rep.	Jim Popouski	Inspector	(647)-458-6073

Site Plan/Sketch



Pressure Readings (PSIG)

Flow Hydrant's Outlet Condition	C-0 { Outlet #1 : Close Outlet #2 : Close	C-1 { Outlet #1 : Open Outlet #2 : Close	C-2 { Outlet #1 : Open Outlet #2 : Open
Residual Fire Hydrant	90	88	86
Flow Fire Hydrant		35	23

General Information

Report No. : **FHR-22-05-05-03**

Date : **05-May-22**

Project No. : **PUD21-110**

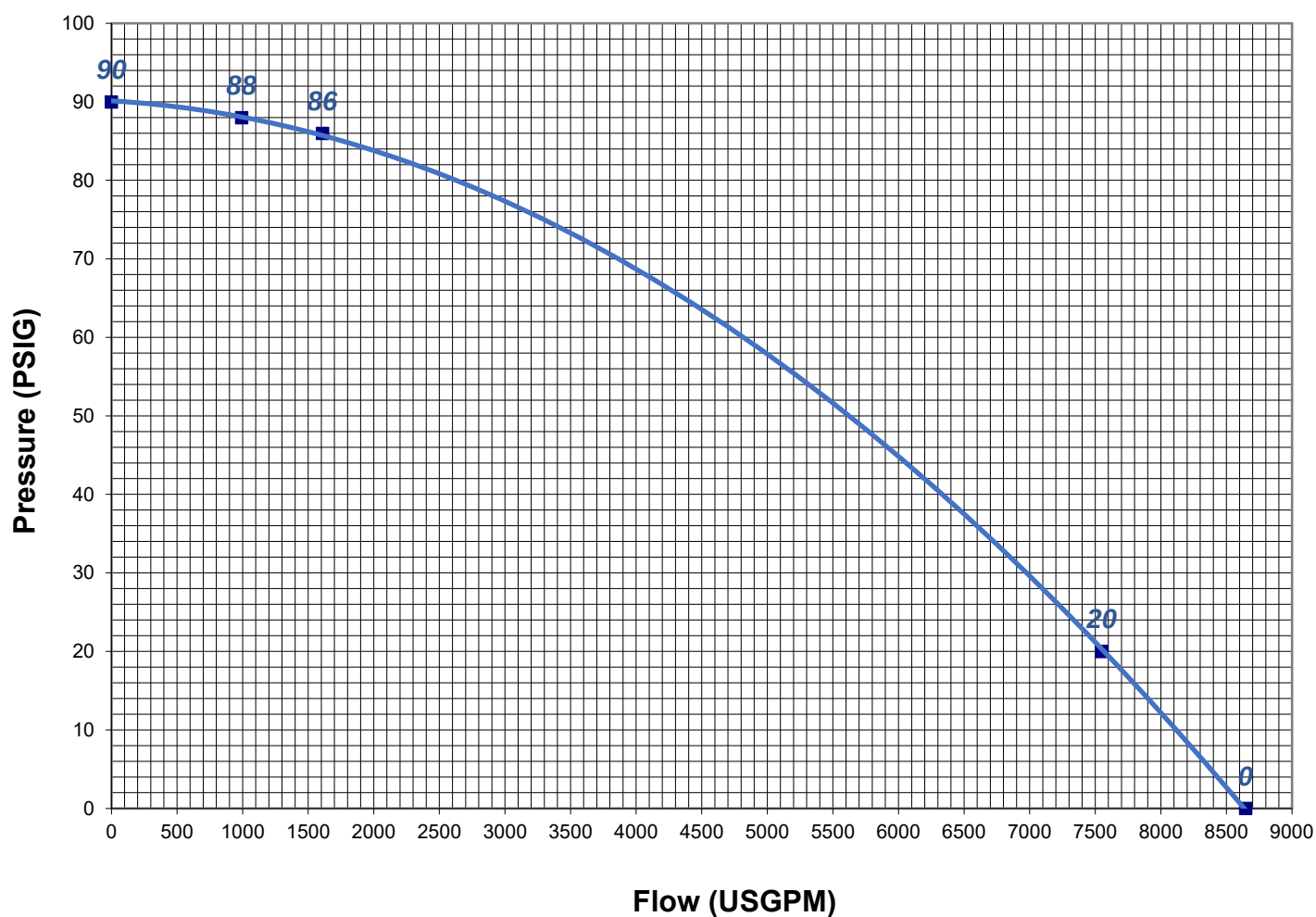
Site Address/Location: **48 Grenoble Dr, To**

Region/Municipality: **City of Toronto**

Pressure-Flow Table

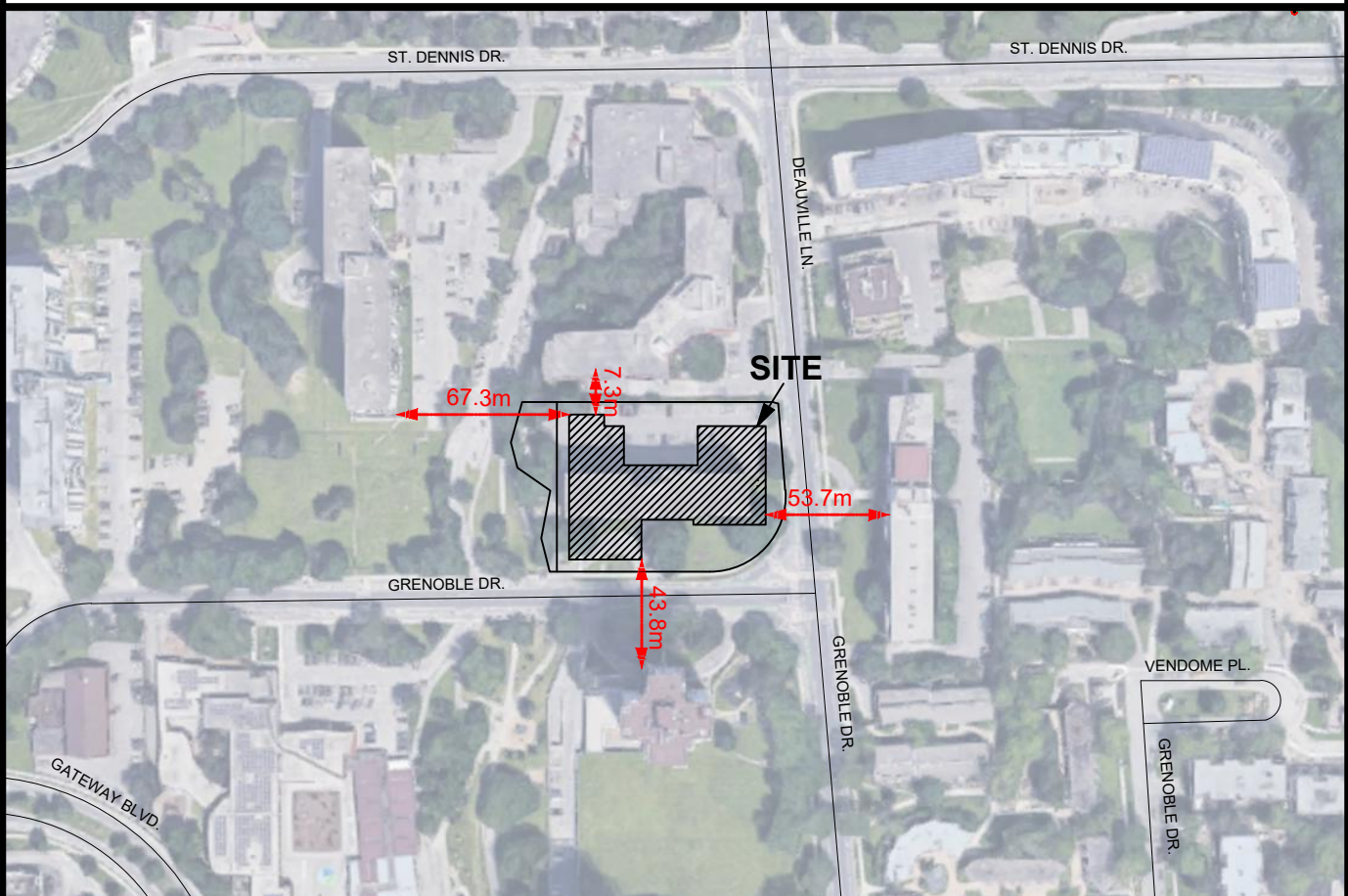
Condition		C-0	C-1	C-2	C(20)	C(0)
Pressure (PSIG)		90	88	86	20	0
Flow	(USGPM)	0	992.68	1609.42	7549.36	8646.66
	(L/S)	0.00	62.64	101.55	476.36	545.60

Pressure-Flow Graph



Result

Maximum available flow at 20PSI = 7549.36 USGPM or 476.36 L/s



SEPARATION DISTANCES

RESIDENTIAL USE DEVELOPMENT
48 GRENABLE DRIVE
TORONTO, ONTARIO

150 Bermondsey Road, Toronto, Ontario M4A 1Y1

DATE: JULY 2023

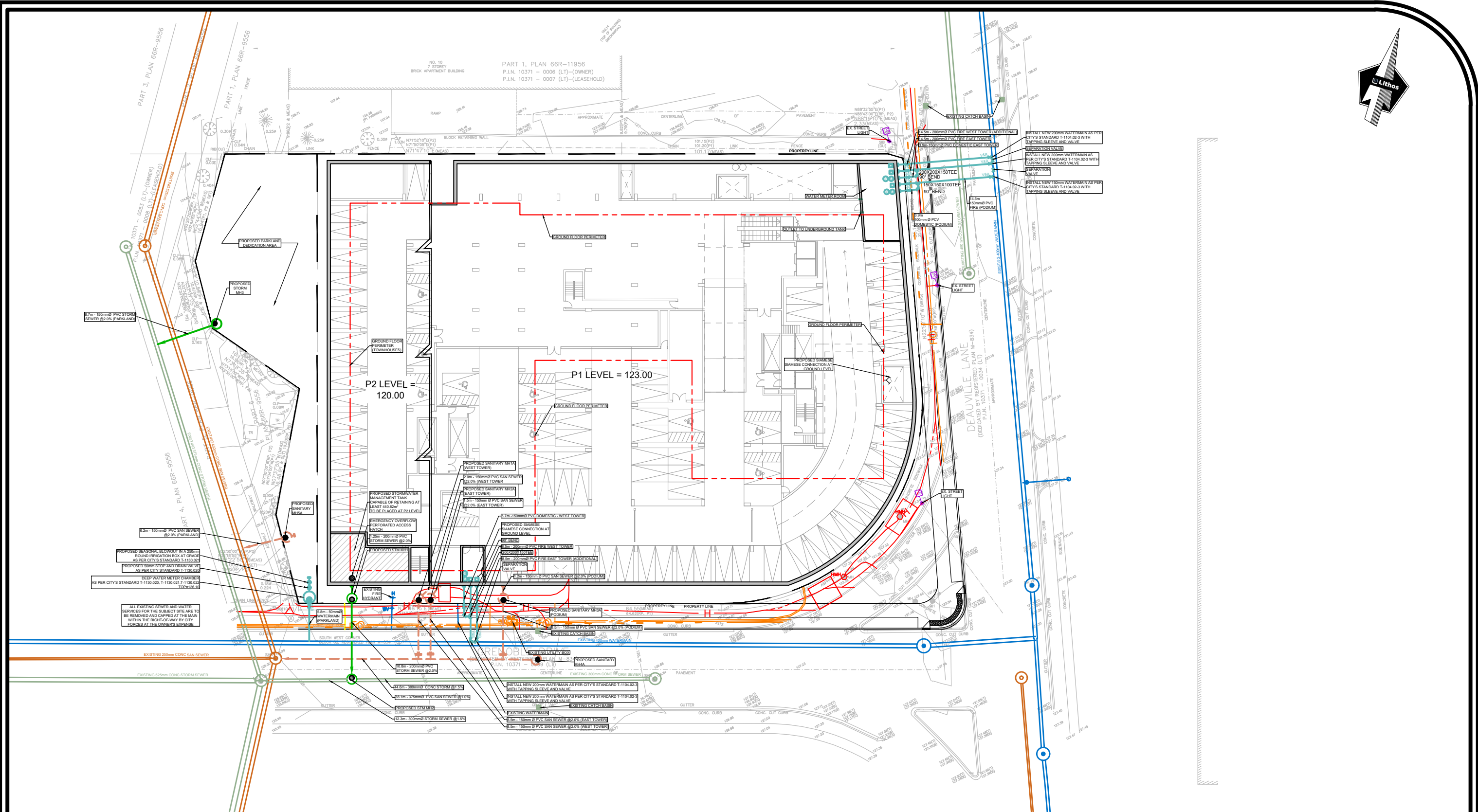
SCALE: N.T.S.

PROJECT No: PUD21-110

FIGURE No: FIG 4

Appendix F

Engineering Figures



150 Bermondsey Road, Toronto, Ontario M4A 1Y1

LEGEND

— —	PROPERTY LINE	— —	PROPOSED DEVELOPMENT	— —	EXISTING HYDRO LINE
— —	EXISTING SANITARY SEWER	— —	PROPOSED SANITARY SEWER	— —	EXISTING CABLE LINE
— —	EXISTING WATERMAIN	— —	PROPOSED WATERMAIN	— —	EXISTING FIBRE OPTIC LINE
— —	EXISTING STORM SEWER	— —	PROPOSED STORM SEWER	— —	GAS
— —		— —		— —	EXISTING GAS MAIN

PROPOSED SERVICING FIGURE
RESIDENTIAL USE DEVELOPMENT
48 GRENABLE DRIVE
TORONTO, ONTARIO

DATE: JULY 2023	PROJECT No: UD21-110
SCALE: N.T.S.	FIGURE No: FIG 3

Appendix G

Sanitary Sewer Capacity Analysis

Downstream Sanitary Capacity Analysis Report



Project: 48 Grenoble Drive

Tenblock

Application No: 22 127125 NNY 16 OZ

Lithos Group Inc.
150 Bermondsey Road
North York, ON M1A-1Y1
Tel: (416) 750-7769
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PREPARED BY:



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Water Resources Analyst

AUTHORIZED FOR ISSUE BY:

LITHOS GROUP INC.



Nick Moutzouris, P.Eng., M.A.Sc.
Principal

Identification	Date	Description of issued and/or revision
Downstream Sanitary Capacity Report	July 10 th , 2023	Issued for ZBA

Statement of Conditions

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Executive Summary

Lithos Group Inc. (Lithos) was retained by Tenblock (the “Owner”) to prepare a Downstream Sanitary Capacity Analysis Report in support of a Zoning By-law Amendment Application for a proposed residential development at 48 Grenoble Drive, in the City of Toronto (the “City”). The following is a summary of our conclusions:

Existing Conditions

The sanitary flow from the site discharges to the 450 mm diameter sanitary sewer, along the existing Easement, flowing south. The existing sanitary discharge flow from the site is estimated at 4.19 L/s. The downstream analyzed sanitary network consists of sixteen (16) sewer segments from the subject property up to the 600 mm diameter sanitary trunk sewer between Don Mills Road and Don Valley Parkway (trunk connection, MH_ID#: MH5512534175). Under existing **Dry Weather Flow (DWF)** Conditions, the modeling results show that the existing sanitary system operates under free flow conditions and no surcharge occurs. Under existing **Extreme Wet Weather Flow (WWF)** Conditions (May 12, 2000 storm event), the modelling results show that the existing sanitary system experiences minor surcharging with freeboard (freeboard > 1.8 m) at eleven (11) sewer segments. In addition, the minimum available freeboard at the entire network is calculated at 2.15m (Pipe ID: MH5512534151.1).

Proposed Conditions

Sanitary flow from the proposed residential development will be discharged to the proposed 375 mm diameter sanitary sewer on Grenoble Drive, flowing west.

Flow generation from the site, consists of a **Dry Weather Flow (DWF)** of approximately 19.10 L/s and an infiltration allowance of about 0.16 L/s, resulting in a net increase of 14.91 L/s in the proposed conditions.

Under proposed **Dry Weather Flow (DWF)** Conditions the modelling results show that the sanitary system operates under free flow conditions, while under **Extreme Wet Weather Flow (WWF)** Conditions (May 12, 2000 storm event), the modelling results show that the sanitary system experiences minor surcharging with freeboard (freeboard > 1.8 m) at eleven (11) sewer segments. In addition, the minimum available freeboard at the entire network is calculated at 1.94m (Pipe ID: MH4153818354.1).

Conclusion

According to Table 1: Capacity Criteria for Sanitary and Combined Sewers, in Sewer Capacity Assessment Guidelines:

Criterion 1: Under Dry Weather Flow conditions, the system operates under free flow conditions and no surcharge (HGL is below the pipe obvert) occurs.

Criterion 2: Under proposed Wet Weather Flow conditions (with Mitigation Measures), which include I&I generated under the May 12, 2000 storm event, the HGL in the downstream sewers is at least 1.80 m below grade.

The Downstream Sanitary Capacity Analysis demonstrates that the proposed residential development at 48 Grenoble Drive does not increase the risk of basement flooding and can be serviced by the existing sanitary network.

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- Appendix A– Infoworks Result Sheets
- Appendix B– Sanitary Sewer Design Sheet

1.0 Introduction

Lithos Group Inc. (Lithos) was retained by Tenblock (the “Owner”) to prepare a Downstream Sanitary Capacity Analysis Report in support of a Zoning By-law Amendment Application for a proposed residential development at 48 Grenoble Drive, in the City of Toronto (the “City”).

The purpose of this report is to provide site-specific information for the City for their review with respect to the municipal sanitary infrastructure downstream, required to support the proposed residential development.

The following documents were available for our review:

- InfoWorks ICM model prepared as part of the City’s Basement Flooding Study Area 55, completed in 2023;
- City of Toronto Infoworks CS Basement Flooding Model Studies Guideline, dated October 2014;
- Engineering Design Guidelines for the City of Toronto (January 2021);
- Sewer Capacity Assessment Guidelines for the City of Toronto (July 2021); and,
- Google Maps Overhead Satellite Imagery, Google Street View, and ESRI Base maps.



Figure 1-1 Site Overview

2.0 Sanitary Servicing Design Criteria

As per the City of Toronto's Design Criteria for Sewers and Watermains, the following guidelines were used in this analysis:

Table 2.1 – Sanitary Flows

Usage	Design Flow	Units	Population Equivalent
Residential	240	Litres / capita / day	Townhouse unit = 2.7 ppu Studio/1 Bedroom Unit = 1.4 ppu 2 Bedroom Unit = 2.1 ppu 3 Bedroom Unit = 3.1 ppu

In addition, the design criteria used for this analysis were based on the City of Toronto's Sanitary Sewer Surcharge Approval Guideline for Development Applications. During **Dry Weather Flow (DWF)** Conditions, no surcharging of existing or proposed sewers should apply. With respect to the **Wet Weather Flow (WWF)** Conditions, the minimum hydraulic grade line (HGL) depth of 1.8m below the road grade for both existing and proposed sewers should apply.

Furthermore, according to the Sewer Capacity Assessment Guidelines for the City of Toronto (July 2021), the following criteria need to be achieved:

- 1) Under proposed design flow (design sanitary sewage and design I&I allocation rate) conditions, there will be no surcharge (HGL is below pipe obvert) in the sewer system. Otherwise, mitigation measures will be required.
- 2) Under proposed **Extreme WWF** Conditions (design sanitary sewage and estimated WWF I&I), which includes I&I generated under the May 12, 2000 storm event (estimate equivalent 25-year design storm, where no WWF I&I for May 12, 2000 event is available from BFPP studies), the HGL in the sewer will be at least 1.80 m below grade. Otherwise, mitigation measures will be required.
- 3) Under proposed **Extreme WWF** Conditions, WWF mitigation measures (includes WWF/I&I reduction, sewer upsizing and upgrades) will ensure that the proposed HGL will be no greater, than the existing HGL. The proposed peak flow rate will be no greater than existing peak flow rate at the connection to the trunk sewer or pumping station.

3.0 Site Description

The subject property is located within the City's Basement Flooding Area 55 (BFA55). The basement flooding EA for BFA55 was completed in 2023. The sewershed for BFA55 is fully serviced by separate storm and sanitary sewers.

3.1 Existing Site

The existing site is approximately 6,749 m² (0.675 hectares). It is currently occupied by a residential development and by outdoor parking area. The site is bound by a residential development to the north, Deauville Lane to the east, Grenoble Drive to the south and Parkland to the west, as shown in **Figure 1-1**.

Using the design criteria outlined in **Section 2.0** and existing site information, the sanitary discharge flow from the existing residential building is estimated at 4.19 L/s (including inflow and infiltration from the site). Please refer to **Appendix A** for more details.

3.2 Proposed Site

The proposed development will be comprised by:

- A residential high-rise development; and,
- Parkland area to be dedicated to the City.

The proposed development will consist of a 6-storey podium with two (2) high-rise, 39-storey and 43-storey towers, supporting residential use.

It will consist of 1066 residential units and will be facilitated by three (3) levels of underground parking. The total development will be approximately 74,717 m² of Gross Floor Area (GFA).

Using the design criteria outlined in **Section 2.0**, a total population of one thousand eight hundred and ninety three (1,893) people was considered to estimate the proposed total discharge flow of 19.10 L/s, (0.16 L/s infiltration flow and 18.94 L/s sanitary flow) from the proposed development. Therefore, the additional net discharge flow from the proposed development is anticipated at 14.91 L/s. Please refer to **Appendix A** for more details.

4.0 Sanitary Capacity and Overflow Analysis

A capacity analysis was conducted using the City's InfoWorks ICM sewer model (the "Model"). This Model was developed in 2023 as a part of basement flooding remediation and a water quality improvement master plan for Area 55. In addition, the Model has been updated with all future developments available in the City's Development Applications found online and the latest version was used for this analysis.

The model was used to analyze the sanitary sewer network from the proposed development up to the 600 mm diameter sanitary trunk sewer between Don Mills Road and Don Valley Parkway (trunk connection, MH_ID#: MH5512534175). Please refer to **Figure DAP3** which demonstrate the existing downstream sanitary network.

The following assumptions were made when performing the capacity analysis:

- The model used the RTK unit hydrograph approach to generate an I/I rate of 3 L/s/ha during the May 12, 2000 storm. This approach allows for the generation of different I/I rates during the ramped analysis. The 3 L/s/ha value reflects a number of different potential sources including infiltration from public and private properties as well as potential inflows including downspouts, perforated MH lids etc. Since the I/I rate is independent of the DWF, the 3 L/s/ha rate was calculated without modelling the DWF component;
- The models assumed the downstream boundary conditions as “Free Flow”, as available flow monitoring data suggested limited surcharging conditions with no negative impact on local collection system;
- The existing pipe properties, modelling approach, and other assumptions made in the preparation of the provided InfoWorks model are correct and the provided BFA55 InfoWorks model can be used to perform the analysis;
- The Analysis can be conducted by assessing the difference in the system performance between the existing and proposed scenarios under both Dry Weather Flow (DWF) and Weather Flow (WWF) conditions;
- Sanitary flows and private water/groundwater from the subject site and other development sites within the sewershed were manually added to each applicable sewer section for sanitary analysis. As such, these flows were modelled as additional foul flows in the InfoWorks model;
- New developments and their respective groundwater infiltration flows were determined from the City’s Application Information Centre (AIC);
- The foundation drainage (peak groundwater discharge rates) from the subject site added into the model were manually added and modelled as base flow;
- The City’s design criteria are valid to estimate populations and flow generation rates within the study area;
- Design (proposed) conditions can be assessed using dry weather conditions as modelled in BFA55;
- Wastewater flow can be assessed using patterns and per capita flow rates presented in the BFA55 model and technical modelling report;
- Wet Weather Flow (WWF) conditions can be assessed by running the BFA55 model with the (Oriole Yard) May 12, 2000 storm hyetographs;
- Best efforts have been made to include all peak flows from Private Water Discharge Agreements in the sanitary sewershed; and,
- In the absence of flow monitoring data, no parameter adjustments were made in the BFA55 model.

5.0 Model Preparation

A review of the available data was undertaken to determine any necessary changes or revisions required to be incorporated into the received BFA55 model. There were no pipe upgrades to the analyzed network since the completion of the BFA55 model in 2023.

The subject property is located in a subcatchment area within the BFA55 model. The population estimate for the subcatchment has been increased to account for the existing and the proposed (future) population change. The existing sanitary flows estimated, were applied to the subcatchment area and were maintained under the post-development scenario. In addition, the flow generated from the proposed Parkland, calculated at 0.02 L/s, has been taken into account to the existing and the proposed conditions.

5.1 Recent Developments

All the recent development applications since the completion of the model from the City's website were taken into consideration. The City's Design Criteria were used to estimate the population within the Basement Flooding Area 55 (BFA55). Recent developments and their associated site flows were estimated as shown in the table below.

Recent developments and their associated site flows were estimated as shown in **Table 5.1** below.

Table 5.1 Recent developments Included in the Model

No	Site Address	Residential Population	Non-Residential Area (ha)	Non - Residential Population	Total population	Groundwater Flow (L/s)
1.	7, 11 Rochefort Drive	2667	-	-	2667	-
2.	789, 793 Don Mills Road, & 10 Ferrand Drive	3800	3.59	4	3804	-
3.	25 St Dennis Drive	1298	0.11	1	1299	-
4.	7 St Dennis Drive, 10 Grenoble Drive	4983	-	-	4983	-
5.	200 Gateway Boulevard	1572	-	-	1572	5.67
6.	1185 Eglinton Ave E, 2 Sonic Way	1244	-	-	1244	-
7.	805 Don Mills Road	1764	-	-	1764	-

5.2 Model Calibration – Observation for Future Use

Due to lack of existing flow monitoring data, the model simulation was not compared to observed data for proper calibration of the model and the current version is considered that represent realistic conditions.

Upon review of the City's Infoworks ICM model, the parameters of baseflow, diurnal pattern, per capita flow rates and population are summarized in **Table 5.2**

Table 5.2 – Input Parameters (Dry Weather)

Baseflow (L/s)	Diurnal Pattern Factor	Per Capita Flow Rate (L/c/d)	Population within a single Subcatchment
0.02 - 3.53	0.43 -3.00	240	0 – 2,705

Based on the results derived from the simulation of the existing Dry Weather conditions, the following observations were made:

- Baseflow values larger than 1.5 L/s under Dry Weather conditions could ensue to erroneous results.
- Large fluctuations of the factors of the diurnal pattern result into perceived errors
- Taking into account that the Drainage Area is approximately 125.7 ha and the peak flow rate is estimated at 379.54 L/s, we postulate that the existing modelled network k deviate from realistic flow conditions.

For Wet Weather flow conditions the parameters of initial loss, runoff coefficient and roughness are summarized in **Table 5.3**.

Table 5.3 – Input Parameters (Wet Weather)

Surface Type	Parameters		
	Initial Loss (m)	Runoff Coefficient	Roughness
Impervious	0.000071	1.00	0.009

Although the peak flow responses are overestimated, the current analysis has been conducted without any modifications and parameters adjustments (worst case scenario).

6.0 Model Scenarios

The capacity analysis was performed on all receiving sanitary sewers from the development up to the last collector sanitary sewer before the trunk connection (MH_ID#: MH5512534175). Four (4) scenarios were considered for the analysis, covering both Dry Weather Flow (DWF) and Wet Weather Flow (WWF) conditions:

1. Existing DWF Conditions (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions);
2. Proposed DWF Conditions (240L/c/d) (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions);
3. Existing Extreme WWF Conditions (May 12,2000 storm event) (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions);
4. Proposed Extreme WWF Conditions (May 12,2000 storm event) (240 L/c/d) (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions);

Table 6.1 Analysis Scenario Breakdown

Scenario	Sanitary discharge from Subject Property (L/s) *	I-I pattern (L/s/ha)
Sc. 1: Existing DWF Conditions	4.19	0.26
Sc. 2: Proposed DWF Conditions (240 L/c/d)	19.10	0.26
Sc. 3: Existing Extreme WWF Conditions (May 12, 2000 storm event)	4.19	3.00
Sc. 4: Proposed Extreme WWF Conditions (May 12, 2000 storm event) (240 L/c/d)	19.10	3.00

*Note: Sanitary discharge flow represents the peaked population flow with the addition of I-I allowance for Dry Weather Flow (DWF) Conditions, and May 12, 2000 storm event for Extreme Wet Weather Flow (WWF) Conditions.

The utilized in the model I/I values of 0.26 l/s/ha and 3.0 l/s/ha are considered for Dry Weather Flow (DWF) and Wet Weather Flow (WWF) Conditions respectively.

Furthermore, the existing model, provided by the City, includes the RTK method generating the wet weather flow in the sanitary system. According to the City's InfoWorks CS Basement Flooding Model Studies Guidelines, the RTK unit hydrograph method calculates infiltration and inflow entering the sanitary sewers during wet weather events.

The total I/I in the sanitary sewer system is determined by combining triangular unit hydrographs from three components of flow:

- Rapid inflow (short-term response);
- Moderate infiltration (medium-term response); and,
- Slow infiltration (long-term response).

The following three parameters describe the shape and volume of runoff that enters the sanitary sewer:

- “R” is the fraction of precipitation that becomes direct inflow;
- “T” is the time to peak of the hydrograph; and,
- “K” is the ratio of the recession time to time to peak.

“R” can be equated to the area under the unit hydrograph curve and represents I/I volume per unit area as a fraction of precipitation. The InfoWorks CS model allows for the direct input of RTK parameters on a separate tab, as demonstrated in [Figure 3](#).

The I/I component was derived as the instantaneous difference between the total flow of the event and the dry weather flow. The peak I&I value for the extreme May 12, historic storm event is 3.00 l/s/ha. Please refer to [Figure 2](#), found in [Appendix A](#), for more details.

The results for each of the Downstream Sanitary Capacity Analysis scenarios are summarized in the following sections.

7.0 Results

7.1 Existing Dry Weather Flow (DWF) Conditions

Under the **Existing Dry Weather Flow (DWF)** Conditions plus I/I allowance, the findings can be summarized as follows:

- The peak flow in the segment with the maximum pipe utilization, 102%, (Pipe ID: MH4121518413.1, Map ID: #8) is 343.42 L/s;
- The minimum available freeboard, in the downstream sewer segments is 2.42m (Pipe ID: MH5512534151.1, Map ID: #16);
- The peak flow at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is calculated at 391.19 L/s. The pipe utilization is at 49% of pipe capacity;
- The HGL at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is 92.95m, with a freeboard of 4.48m; and,
- Under this scenario, the sanitary sewer system operates under free flow conditions and no surcharge occurs.

[Table 7.1](#) and [Figure DAP3-1](#) following this report summarizes the HGL and the peak flows under this scenario.

7.2 Proposed Dry Weather Flow (DWF) Conditions (240 L/c/d)

Under the **Proposed Dry Weather Flow (DWF)** Conditions plus I/I allowance, the findings can be summarized as follows:

- The peak flow in the proposed 375mm diameter sewer segment is 19.10 L/s with a pipe utilization, 11%, (Pipe ID: MH4A.1, Map ID: #1);
- The peak flow in the segment with the maximum pipe utilization, 107%, (Pipe ID: MH4160618348.1, Map ID: #2) is 263.30 L/s;
- The minimum available freeboard, in the downstream sewer segments is 2.41m (Pipe ID: MH5512534151.1, Map ID: #16);
- The peak flow at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is calculated at 404.90 L/s. The pipe utilization is at 50% of pipe capacity;
- The HGL at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is 92.95m, with a freeboard of 4.48m; and,
- Under this scenario, the sanitary sewer system operates under free flow conditions and no surcharge occurs.

Table 7.2 and **Figure DAP3-2** following this report summarizes the HGL and the peak flows under this scenario.

7.3 Existing Extreme Wet Weather Flow (WWF) Conditions (May 12, 2000 storm)

Under the **Existing Extreme Wet Weather Flow (WWF)** Conditions, Dry Weather Flow (DWF) plus the estimated I/I under the May 12, 2000 storm event, the findings can be summarized as follows:

- The peak flow in the segment with the maximum pipe utilization, 145%, (Pipe ID: MH4121518413.1, Map ID: #8) is 488.28 L/s;
- The minimum available freeboard, in the downstream sewer segments is 2.15m (Pipe ID: MH5512534151.1, Map ID: #16);
- The peak flow at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is calculated at 611.86 L/s. The pipe utilization is at 76% of pipe capacity;
- The HGL at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is 93.07m, with a freeboard of 4.36m; and,
- Under this scenario, the sanitary sewer system experienced minor surcharging with freeboard (freeboard>1.8m) at eleven (11) segments.

Table 7.4 and **Figure DAP3-3** following this report summarizes the HGL and the peak flows under this scenario.

7.4 Proposed Extreme Wet Weather Flow (WWF) Conditions (May 12, 2000 storm) (240 L/c/d)

Under the **Proposed Extreme Wet Weather Flow (WWF)** Conditions, Dry Weather Flow (DWF) plus the estimated I/I under the May 12, 2000 storm event, the findings can be summarized as follows:

- The peak flow in the proposed 375mm diameter sewer segment is 23.29 L/s with a pipe utilization, 13%, (Pipe ID: MH4A.1, Map ID: #1);
- The peak flow in the segment with the maximum pipe utilization, 148%, (Pipe ID: MH4121518413.1, Map ID: #8) is 496.35 L/s;
- The minimum available freeboard, in the downstream sewer segments is 1.94m (Pipe ID: MH4153818354.1, Map ID: #3);
- The peak flow at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is calculated at 620.44 L/s. The pipe utilization is at 77% of pipe capacity;
- The HGL at the last collector sanitary sewer before the trunk connection (MH5512534152.1) is 93.07m, with a freeboard of 4.36m; and,
- Under this scenario, the sanitary sewer system experienced minor surcharging with freeboard (freeboard>1.8m) at eleven (11) segments.

Table 7.5 and **Figure DAP3-4** following this report summarizes the HGL and the peak flows under this scenario.

8.0 Conclusion

Based on the analysis and assumptions undertaken for this report, the conclusions are as follows.

- The proposed development will have an estimated population of one thousand eight hundred and ninety two (1,893) persons and a peak sanitary flow of 19.10 L/s (including inflow and infiltration peak flow);
- Conveyance capacity of the existing sanitary sewer system was assessed based on the City's Design Criteria (January 2021);
- New developments and their respective groundwater infiltration flows were determined from the City's Application Information Centre (AIC);
- The model has been updated to include all sanitary peak flow rates including peak flow rates from groundwater being discharged to the municipal sanitary system from all active and recent development applications located within the affected sanitary sewershed;
- Best efforts have been made to include all peak flows from Private Water discharge agreements in the sanitary sewershed;
- Four (4) scenarios covering both existing and proposed development conditions were analyzed;

- Under **Dry Weather Flow (DWF)** Conditions, for both existing and proposed scenarios, the system operates under free flow conditions and no sewers are surcharging in the downstream network, from the site up to the 600 mm diameter sanitary trunk sewer between Don Mills Road and Don Valley Parkway (trunk connection, MH_ID#: MH5512534175); and,
- Under **Extreme Wet Weather Flow (WWF) (May 12, 2000 storm event)** Conditions, for both existing and proposed scenarios, simulation results indicate that the downstream network is expected to experience minor surcharging with freeboard (freeboard > 1.8 m) at eleven (11) sewer segments. The minimum freeboard attained within the sewer segments is 1.94m;

According to Table 1: Capacity Criteria for Sanitary and Combined Sewers, in Sewer Capacity Assessment Guidelines:

Criterion 1: Under Dry Weather Flow conditions, the system operates under free flow conditions and no surcharge (HGL is below the pipe invert) occurs.

Criterion 2: Under proposed Wet Weather Flow conditions (with Mitigation Measures), which include I&I generated under the May 12, 2000 storm event, the HGL in the downstream sewers is at least 1.80 m below grade.

The Downstream Sanitary Capacity Analysis demonstrates that the proposed residential development at 48 Grenoble Drive does not increase the risk of basement flooding and can be serviced by the existing sanitary network.

APPENDIX A
Infoworks Result Sheets



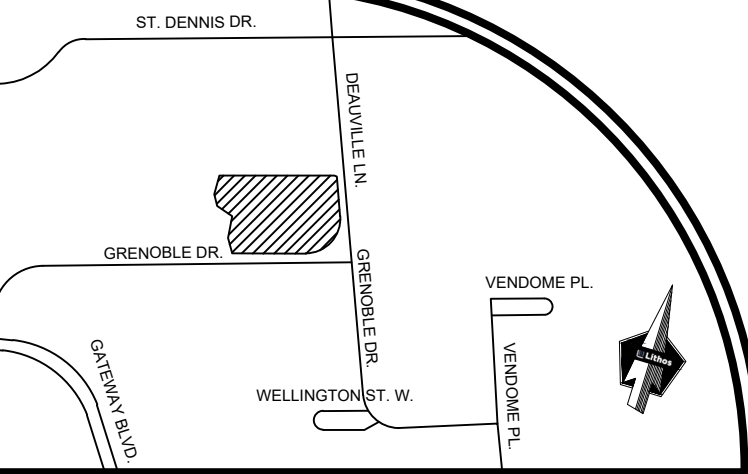
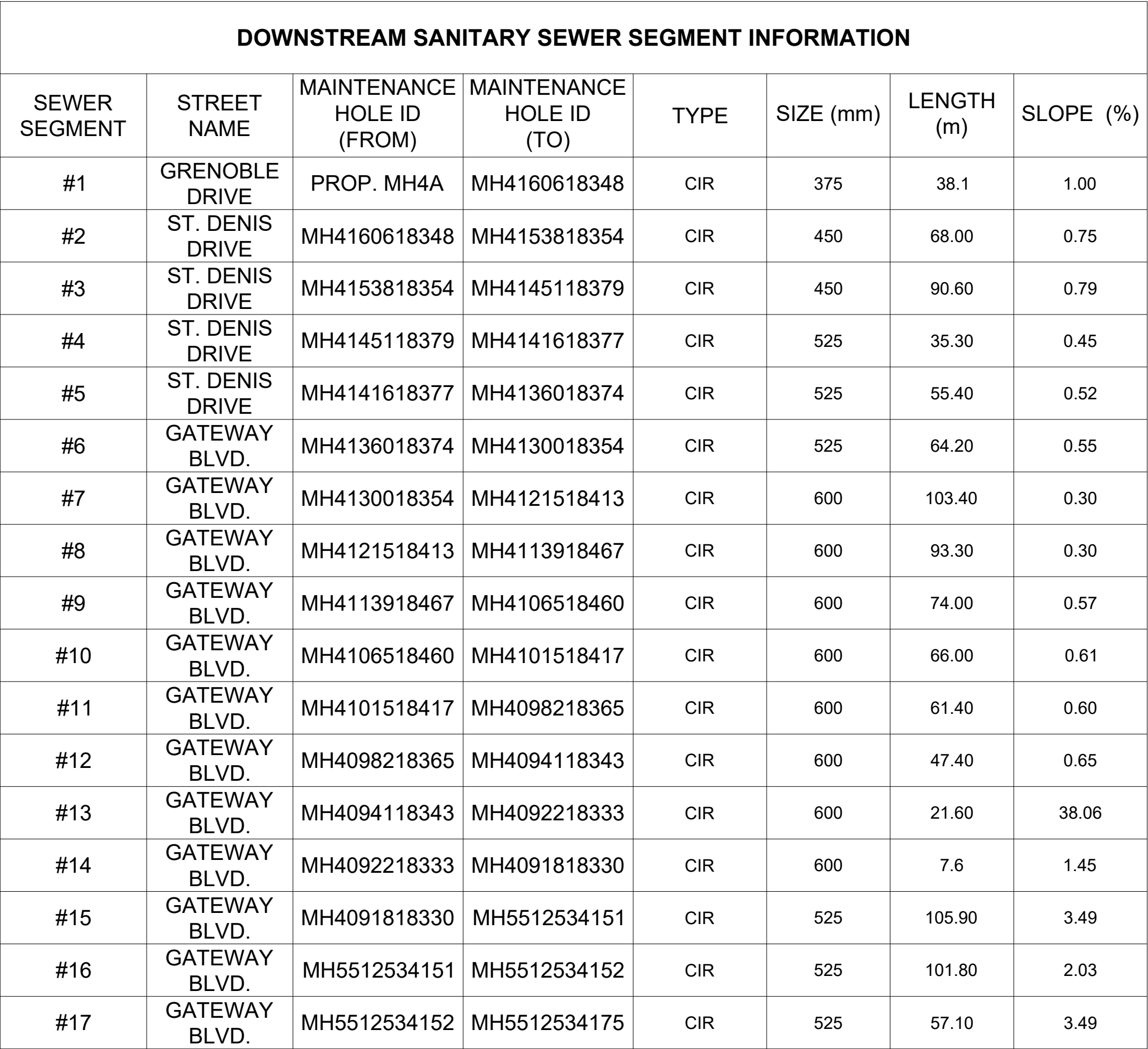
Table 7.1
Existing Dry Weather Flow (DWF) Analysis
(base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions)

48 Grenoble Drive

File No. UD21-110

City of Toronto
Date: July 2023

Pipe ID	MAP ID	Length (m)	Diameter (mm)	Upstream Ground Elevation (m)	Downstream Ground Elevation (m)	Upstream Invert (m AD)	Downstream Invert (m AD)	Slope (%)	Full flow Capacity (l/s)	SC1: Existing DWF					
										Peak Flow (l/s)	Full-Flow Capacity Utilization (%)	Max HGL (m AD)	Surcharge Status	Maximum Surcharging (m)	Minimum Available Freeboard (m)
MH4160618348.1	#2	68.00	450	125.96	122.29	118.66	118.15	0.75	246.96	247.79	100.00%	119.07	Free Flow	N/A	6.89
MH4153818354.1	#3	90.60	450	122.29	126.82	118.13	117.41	0.79	254.22	247.89	98.00%	118.51	Free Flow	N/A	3.78
MH4145118379.1	#4	35.30	525	126.82	121.37	117.15	116.99	0.45	289.60	247.88	86.00%	117.53	Free Flow	N/A	9.29
MH4141618377.1	#5	55.40	525	121.37	126.89	116.99	116.70	0.52	311.22	261.10	84.00%	117.36	Free Flow	N/A	4.01
MH4136018374.1	#6	64.20	525	126.89	123.84	116.67	116.32	0.55	317.60	260.89	82.00%	117.05	Free Flow	N/A	9.84
MH4130018354.1	#7	103.40	600	123.84	121.88	116.24	115.93	0.30	336.26	342.06	102.00%	116.75	Free Flow	N/A	7.09
MH4121518413.1	#8	93.30	600	121.88	120.62	115.90	115.62	0.30	336.43	343.42	102.00%	116.39	Free Flow	N/A	5.50
MH4113918467.1	#9	74.00	600	120.62	119.84	115.35	114.93	0.57	462.67	354.71	77.00%	115.75	Free Flow	N/A	4.87
MH4106518460.1	#10	66.00	600	119.84	119.89	114.90	114.50	0.61	478.10	366.46	77.00%	115.30	Free Flow	N/A	4.54
MH4101518417.1	#11	61.40	600	119.89	120.14	114.47	114.10	0.60	476.73	366.45	77.00%	114.87	Free Flow	N/A	5.02
MH4098218365.1	#12	47.40	600	120.14	117.08	114.07	113.76	0.65	496.65	366.44	74.00%	114.46	Free Flow	N/A	5.68
MH4094118343.1	#13	21.60	600	117.08	108.08	113.18	104.96	38.06	3788.50	366.44	10.00%	113.32	Free Flow	N/A	3.76
MH4092218333.1	#14	7.60	600	108.08	105.99	104.96	104.85	1.45	738.84	366.44	50.00%	105.27	Free Flow	N/A	2.81
MH4091818330.1	#15	105.90	525	105.99	97.54	99.71	96.01	3.49	804.03	390.83	49.00%	99.98	Free Flow	N/A	6.01
MH5512534151.1	#16	101.80	525	97.54	97.43	94.80	92.73	2.03	613.38	390.82	64.00%	95.12	Free Flow	N/A	2.42
MH5512534152.1	#17	57.10	525	97.43	93.78	92.68	90.69	3.49	803.02	391.19	49.00%	92.95	Free Flow	N/A	4.48



LEGEND

-  FREE FLOW
 SURCHARGING W. FREEBOARD >1.8
 CRITICALLY SURCHARGING W. FREEBOARD < 1.8
 EXISTING UPSTREAM MANHOLE
 EXISTING DOWNSTREAM MANHOLE
 PROPOSED MANHOLE
 TRUNK SEWER
 DRAINAGE AREA
 INFILTRATION AREA
 #1 NUMBERED SEGMENT
 FUTURE DEVELOPMENT

1.	ISSUED FOR ZBA APPLICATION	JULY 10, 2023	NM
NO	REVISION	DATE	BY

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CITY OF TORONTO

RESIDENTIAL DEVELOPMENT
48 GRENOBLE DRIVEWAY
TORONTO, ONTARIO



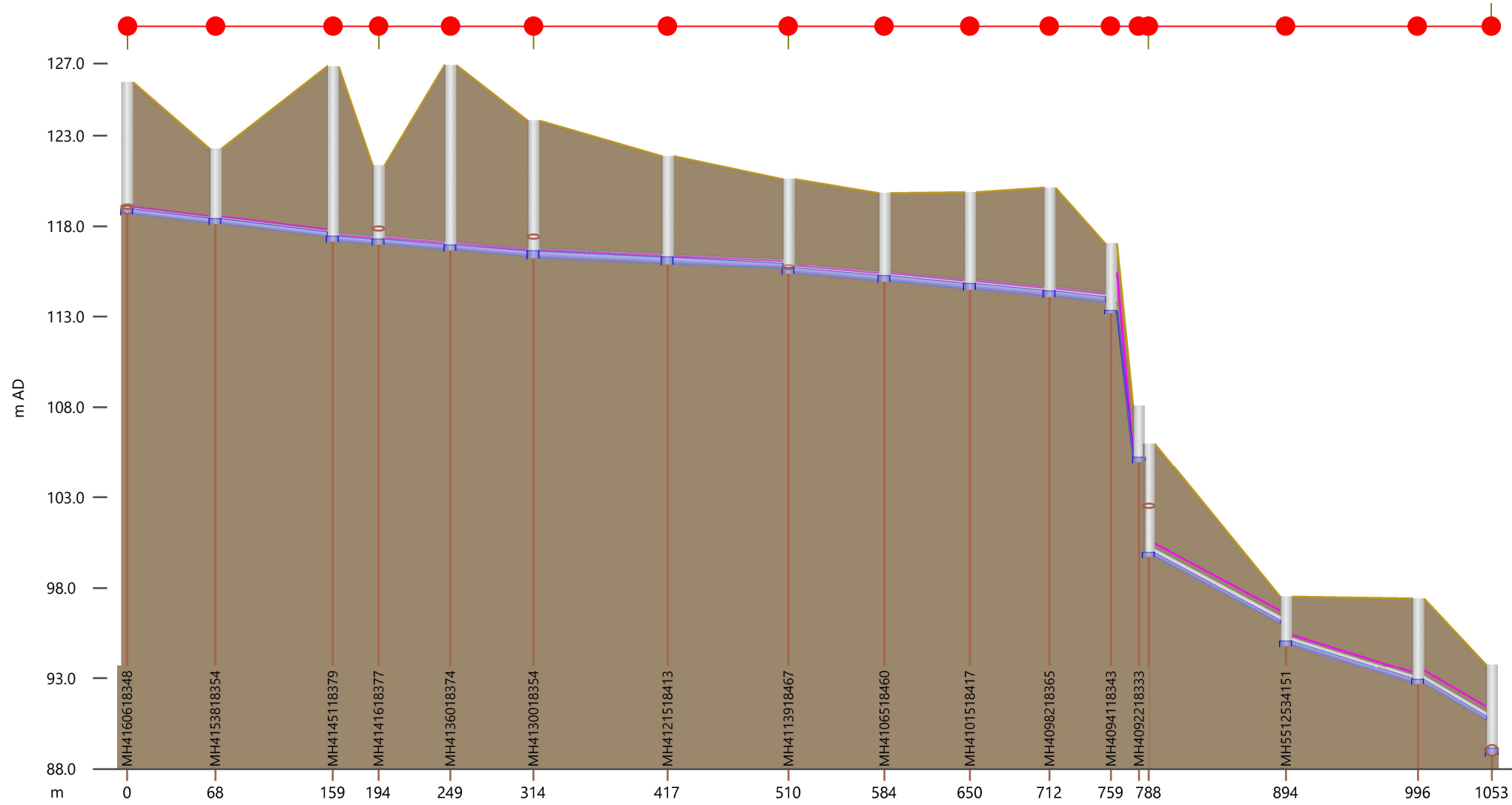
ACCEPTED TO BE IN ACCORDANCE WITH THE CITY OF TORONTO
STANDARDS. THIS ACCEPTANCE IS NOT TO BE CONSTRUCTED AS
VERIFICATION OF ENGINEERING CONTENT.

Manager, Development Engineering Date



150 Bermondsey Road, Toronto, Ontario M4A 1Y1

DESIGNED BY: IC	DATE: AUG 25, 2022	CHECKED BY: NM
DRAWN BY: IC	PROJECT No: UD21-110	APPROVED BY: NM
SCALE: N.T.S.		DRAWING No: DAP3-1
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Link	-	-	-	-	-	MH4130018354.1	-	-	-	-	-	-	MH4091818330.1	-	-
length (m)	68.0	90.6	35.3	55.4	64.2	103.4	93.3	74.0	66.0	61.4	47.4	-	105.9	101.8	57.1
width (mm)	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
height (mm)	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
us inv (m AD)	118.660	118.130	-	116.990	116.670	116.240	115.900	115.350	114.900	114.470	-	-	99.710	94.800	92.680
ds inv (m AD)	118.150	117.410	-	116.700	116.320	115.930	115.620	114.930	114.500	114.100	-	-	96.010	92.730	90.690
grad (m/m)	0.00750	0.00795	-	0.00523	0.00545	0.00300	0.00300	0.00568	0.00606	0.00603	-	-	0.03494	0.02033	0.03485
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	MH5512534151	-
ground (m AD)	-	122.293	126.821	-	126.894	123.842	121.882	120.618	119.845	119.893	-	-	105.988	97.540	97.430

Scenario 1: Existing Dry Weather Flow (DWF) Analysis
 (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions)



Table 7.2

48 Grenoble Drive

Proposed Dry Weather Flow (DWF) Analysis (240 L/c/d)

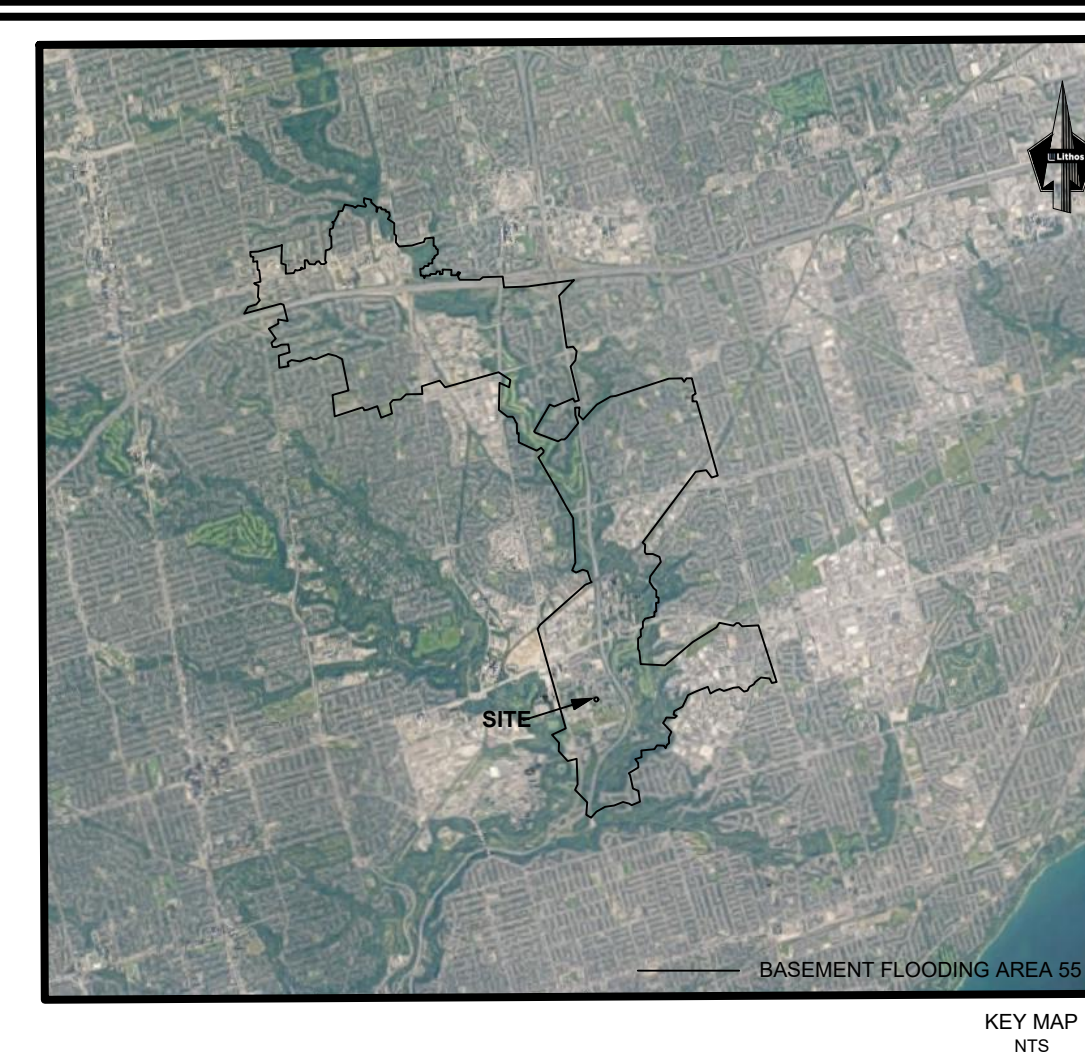
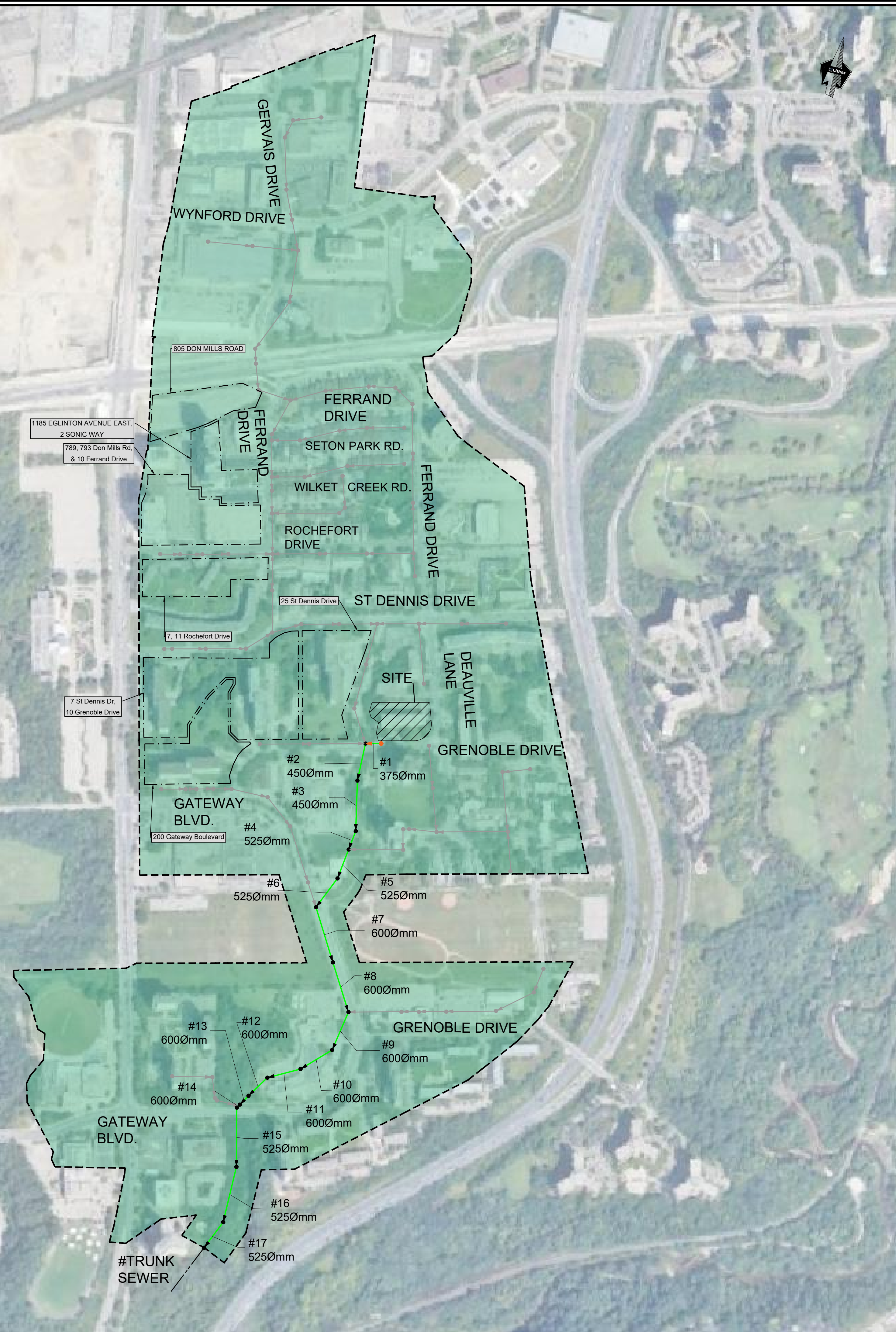
(base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions)

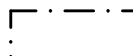
File No. UD21-110

City of Toronto

Date: July 2023

Pipe ID	MAP ID	Length (m)	Diameter (mm)	Upstream Ground Elevation (m)	Downstream Ground Elevation (m)	Upstream Invert (m AD)	Downstream Invert (m AD)	Slope (%)	Full flow Capacity (l/s)	SC3: Proposed DWF with 100 Extra Units (240 L/c/d)					
										Peak Flow (l/s)	Full-Flow Capacity Utilization (%)	Max HGL (m AD)	Surcharge Status	Maximum Surcharging (m)	Minimum Available Freeboard (m)
MH4A.1	#1	38.10	375	126.4	125.96	122.17	121.79	1.00	176.86	19.10	11.00%	122.25	Free Flow	N/A	4.15
MH4160618348.1	#2	68.00	450	125.96	122.29	118.66	118.15	0.75	246.96	263.30	107.00%	119.20	Free Flow	N/A	6.76
MH4153818354.1	#3	90.60	450	122.29	126.82	118.13	117.41	0.79	254.22	263.43	104.00%	118.59	Free Flow	N/A	3.70
MH4145118379.1	#4	35.30	525	126.82	121.37	117.15	116.99	0.45	289.6	263.36	91.00%	117.55	Free Flow	N/A	9.27
MH4141618377.1	#5	55.40	525	121.37	126.89	116.99	116.70	0.52	311.22	276.21	89.00%	117.38	Free Flow	N/A	3.99
MH4136018374.1	#6	64.20	525	126.89	123.84	116.67	116.32	0.55	317.60	275.73	87.00%	117.09	Free Flow	N/A	9.80
MH4130018354.1	#7	103.40	600	123.84	121.88	116.24	115.93	0.30	336.26	356.77	106.00%	116.80	Free Flow	N/A	7.04
MH4121518413.1	#8	93.30	600	121.88	120.62	115.90	115.62	0.30	336.43	358.12	106.00%	116.41	Free Flow	N/A	5.47
MH4113918467.1	#9	74.00	600	120.62	119.84	115.35	114.93	0.57	462.67	369.19	80.00%	115.76	Free Flow	N/A	4.86
MH4106518460.1	#10	66.00	600	119.84	119.89	114.90	114.50	0.61	478.10	380.67	80.00%	115.31	Free Flow	N/A	4.53
MH4101518417.1	#11	61.40	600	119.89	120.14	114.47	114.10	0.60	476.73	380.66	80.00%	114.88	Free Flow	N/A	5.01
MH4098218365.1	#12	47.40	600	120.14	117.08	114.07	113.76	0.65	496.65	380.65	77.00%	114.47	Free Flow	N/A	5.67
MH4094118343.1	#13	21.60	600	117.08	108.08	113.18	104.96	38.06	3788.50	380.65	10.00%	113.32	Free Flow	N/A	3.75
MH4092218333.1	#14	7.60	600	108.08	105.99	104.96	104.85	1.45	738.84	380.65	52.00%	105.27	Free Flow	N/A	2.81
MH4091818330.1	#15	105.90	525	105.99	97.54	99.71	96.01	3.49	804.03	404.54	50.00%	99.98	Free Flow	N/A	6.00
MH5512534151.1	#16	101.80	525	97.54	97.43	94.80	92.73	2.03	613.38	404.54	66.00%	95.13	Free Flow	N/A	2.41
MH5512534152.1	#17	57.10	525	97.43	93.78	92.68	90.69	3.49	803.02	404.90	50.00%	92.95	Free Flow	N/A	4.48



LEGEND	
	FREE FLOW
	SURCHARGING W/ FREEBOARD >1.8
	CRITICALLY SURCHARGING W/ FREEBOARD <1.8
	EXISTING UPSTREAM MANHOLE
	EXISTING DOWNSTREAM MANHOLE
	PROPOSED MANHOLE
	TRUNK SEWER
	DRAINAGE AREA
	INFILTRATION AREA
	NUMBERED SEGMENT
	FUTURE DEVELOPMENT

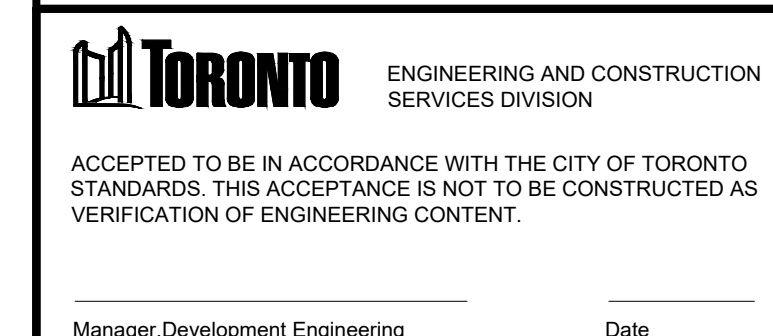
DOWNSTREAM SANITARY SEWER SEGMENT INFORMATION							
SEWER SEGMENT	STREET NAME	MAINTENANCE HOLE ID (FROM)	MAINTENANCE HOLE ID (TO)	TYPE	SIZE (mm)	LENGTH (m)	SLOPE (%)
#1	GRENOBLE DRIVE	PROP. MH4A	MH4160618348	CIR	375	38.1	1.00
#2	ST. DENIS DRIVE	MH4160618348	MH4153818354	CIR	450	68.00	0.75
#3	ST. DENIS DRIVE	MH4153818354	MH4145118379	CIR	450	90.60	0.79
#4	ST. DENIS DRIVE	MH4145118379	MH4141618377	CIR	525	35.30	0.45
#5	ST. DENIS DRIVE	MH4141618377	MH4136018374	CIR	525	55.40	0.52
#6	GATEWAY BLVD.	MH4136018374	MH4130018354	CIR	525	64.20	0.55
#7	GATEWAY BLVD.	MH4130018354	MH4121518413	CIR	600	103.40	0.30
#8	GATEWAY BLVD.	MH4121518413	MH4113918467	CIR	600	93.30	0.30
#9	GATEWAY BLVD.	MH4113918467	MH4106518460	CIR	600	74.00	0.57
#10	GATEWAY BLVD.	MH4106518460	MH4101518417	CIR	600	66.00	0.61
#11	GATEWAY BLVD.	MH4101518417	MH4098218365	CIR	600	61.40	0.60
#12	GATEWAY BLVD.	MH4098218365	MH4094118343	CIR	600	47.40	0.65
#13	GATEWAY BLVD.	MH4094118343	MH4092218333	CIR	600	21.60	38.06
#14	GATEWAY BLVD.	MH4092218333	MH4091818330	CIR	600	7.6	1.45
#15	GATEWAY BLVD.	MH4091818330	MH5512534151	CIR	525	105.90	3.49
#16	GATEWAY BLVD.	MH5512534151	MH5512534152	CIR	525	101.80	2.03
#17	GATEWAY BLVD.	MH5512534152	MH5512534175	CIR	525	57.10	3.49

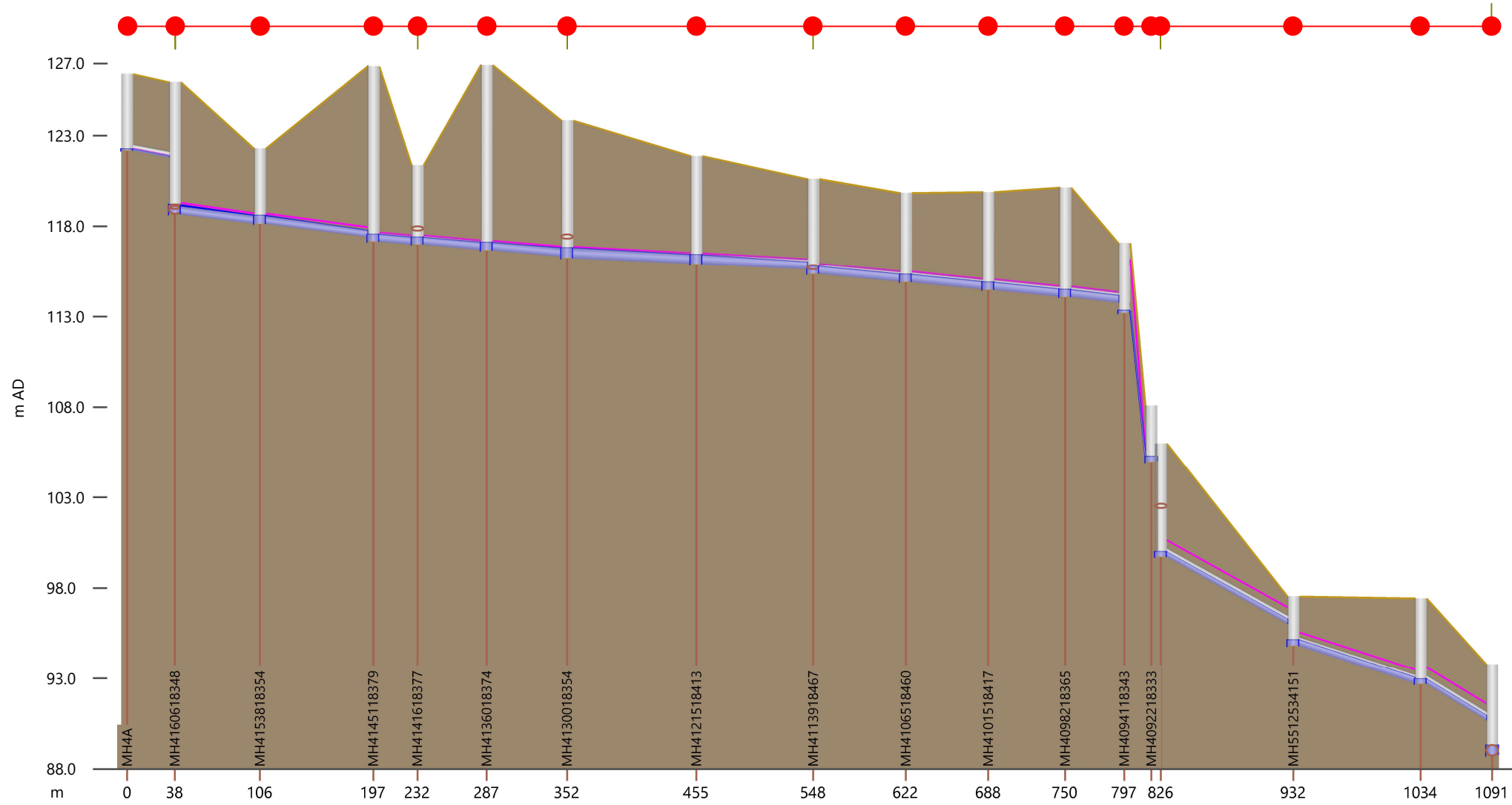
1.	ISSUED FOR ZBA APPLICATION	JULY 10, 2023	NM
NO	REVISION	DATE	RY

CITY OF TORONTO

TYPE OF CONDITIONS OF THE DOWNSTREAM SEWER NETWORK - SCENARIO 2

RESIDENTIAL DEVELOPMENT
48 GRENOBLE DRIVEWAY
TORONTO, ONTARIO





Link	-	-	-	-	-	-	-	-	-	-	-	-	-	MH4091818330.1	-	-
length (m)	38.1	68.0	90.6	35.3	55.4	64.2	103.4	93.3	74.0	66.0	61.4	47.4	-	105.9	101.8	57.1
width (mm)	375	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
height (mm)	375	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
us inv (m AD)	-	118.660	118.130	-	116.990	116.670	116.240	115.900	115.350	114.900	114.470	-	-	99.710	94.800	92.680
ds inv (m AD)	-	118.150	117.410	-	116.700	116.320	115.930	115.620	114.930	114.500	114.100	-	-	96.010	92.730	90.690
grad (m/m)	-	0.00750	0.00795	-	0.00523	0.00545	0.00300	0.00300	0.00568	0.00606	0.00603	-	-	0.03494	0.02033	0.03485
Node		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (m AD)	-	-	122.293	126.821	-	126.894	123.842	121.882	120.618	119.845	119.893	-	-	-	97.540	97.430

Scenario 2 - Proposed Dry Weather Flow (DWF) Analysis (240 L/c/d)
 (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions)



Table 7.3

48 Grenoble Drive

Existing Extreme Wet Weather Flow (WWF) Analysis (May 12, 2000 storm event)

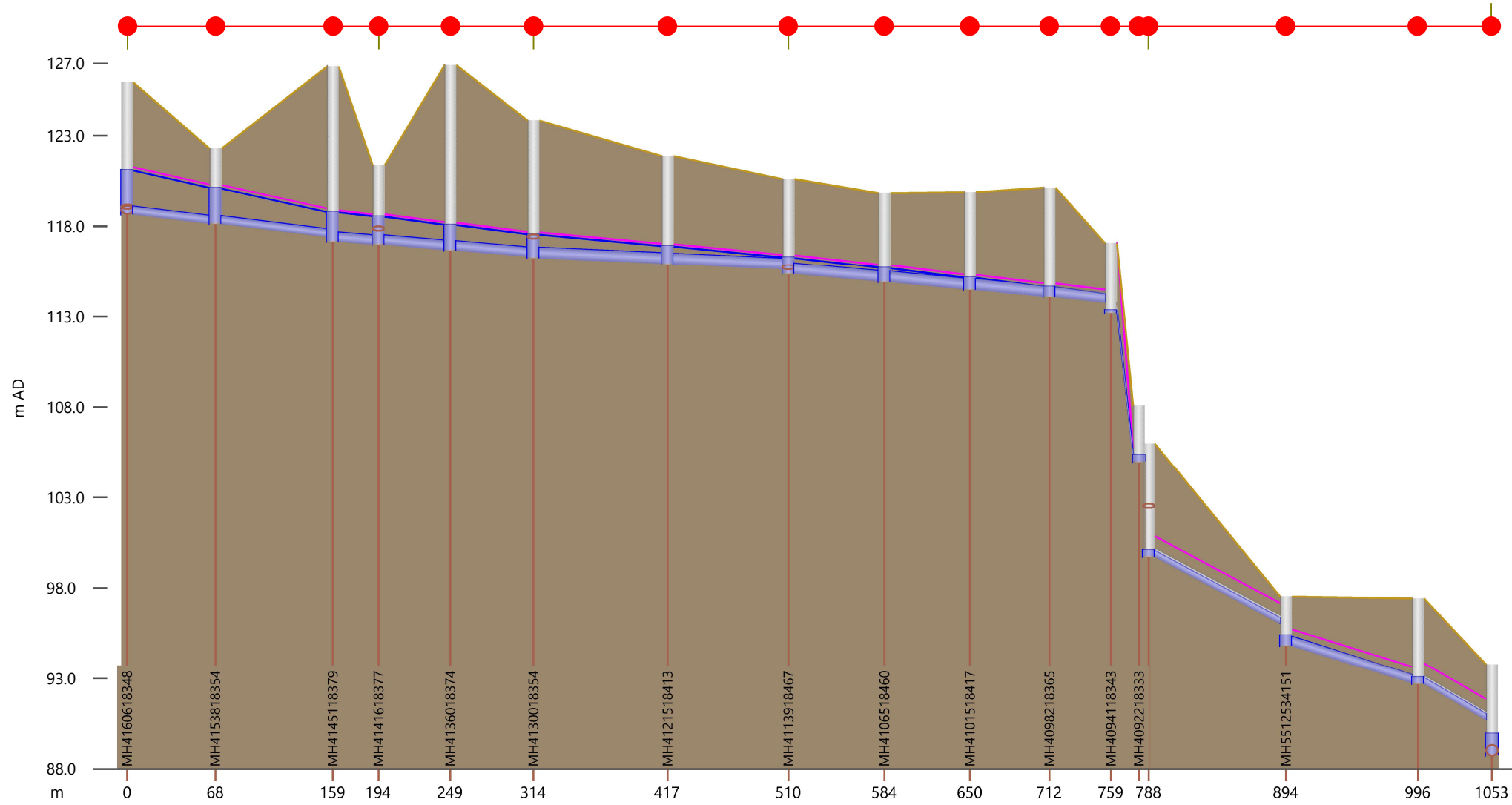
(base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions)

File No. UD21-110

City of Toronto

Date: July 2023

Pipe ID	MAP ID	Length (m)	Diameter (mm)	Upstream Ground Elevation (m)	Downstream Ground Elevation (m)	Upstream Invert (m AD)	Downstream Invert (m AD)	Slope (%)	Full flow Capacity (l/s)	SC4: Existing Extreme WWF - May 12, 2000					
										Peak Flow (l/s)	Full-Flow Capacity Utilization (%)	Max HGL (m AD)	Surcharge Status	Maximum Surcharging (m)	Minimum Available Freeboard (m)
MH4160618348.1	#2	68.00	450	125.96	122.29	118.66	118.15	0.75	246.96	341.57	138.00%	121.11	Surcharging w.freeboard>1.18	2.00	4.84
MH4153818354.1	#3	90.60	450	122.29	126.82	118.13	117.41	0.79	254.22	343.63	135.00%	120.12	Surcharging w.freeboard>1.18	1.54	2.17
MH4145118379.1	#4	35.30	525	126.82	121.37	117.15	116.99	0.45	289.60	344.16	119.00%	118.80	Surcharging w.freeboard>1.18	1.13	8.02
MH4141618377.1	#5	55.40	525	121.37	126.89	116.99	116.70	0.52	311.22	382.19	123.00%	118.56	Surcharging w.freeboard>1.18	1.05	2.81
MH4136018374.1	#6	64.20	525	126.89	123.84	116.67	116.32	0.55	317.60	382.43	120.00%	118.10	Surcharging w.freeboard>1.18	0.90	8.79
MH4130018354.1	#7	103.40	600	123.84	121.88	116.24	115.93	0.30	336.26	476.00	142.00%	117.57	Surcharging w.freeboard>1.18	0.73	6.27
MH4121518413.1	#8	93.30	600	121.88	120.62	115.90	115.62	0.30	336.43	488.28	145.00%	116.92	Surcharging w.freeboard>1.18	0.42	4.96
MH4113918467.1	#9	74.00	600	120.62	119.84	115.35	114.93	0.57	462.67	517.99	112.00%	116.29	Surcharging w.freeboard>1.18	0.34	4.33
MH4106518460.1	#10	66.00	600	119.84	119.89	114.90	114.50	0.61	478.10	540.61	113.00%	115.71	Surcharging w.freeboard>1.18	0.21	4.13
MH4101518417.1	#11	61.40	600	119.89	120.14	114.47	114.10	0.60	476.73	540.53	113.00%	115.16	Surcharging w.freeboard>1.18	0.09	4.74
MH4098218365.1	#12	47.40	600	120.14	117.08	114.07	113.76	0.65	496.65	540.51	109.00%	114.65	Free Flow	N/A	5.49
MH4094118343.1	#13	21.60	600	117.08	108.08	113.18	104.96	38.06	3788.50	540.51	14.00%	113.35	Free Flow	N/A	3.73
MH4092218333.1	#14	7.60	600	108.08	105.99	104.96	104.85	1.45	738.84	540.50	73.00%	105.36	Free Flow	N/A	2.72
MH4091818330.1	#15	105.90	525	105.99	97.54	99.71	96.01	3.49	804.03	607.33	76.00%	100.10	Free Flow	N/A	5.89
MH5512534151.1	#16	101.80	525	97.54	97.43	94.80	92.73	2.03	613.38	607.11	99.00%	95.39	Surcharging w.freeboard>1.18	0.07	2.15
MH5512534152.1	#17	57.10	525	97.43	93.78	92.68	90.69	3.49	803.02	611.86	76.00%	93.07	Free Flow	N/A	4.36



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Scenario 3 - Existing Extreme Wet Weather Flow (WWF) Analysis
(May 12, 2000 storm event)
 (base model updated with all other development applications and existing site flow (not the proposed site flows) + reflective of current sewer system conditions)



Table 7.4
Proposed Extreme Wet Weather Flow (WWF) Analysis (May 12, 2000 storm event) (240 L/c/d)
(base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions)

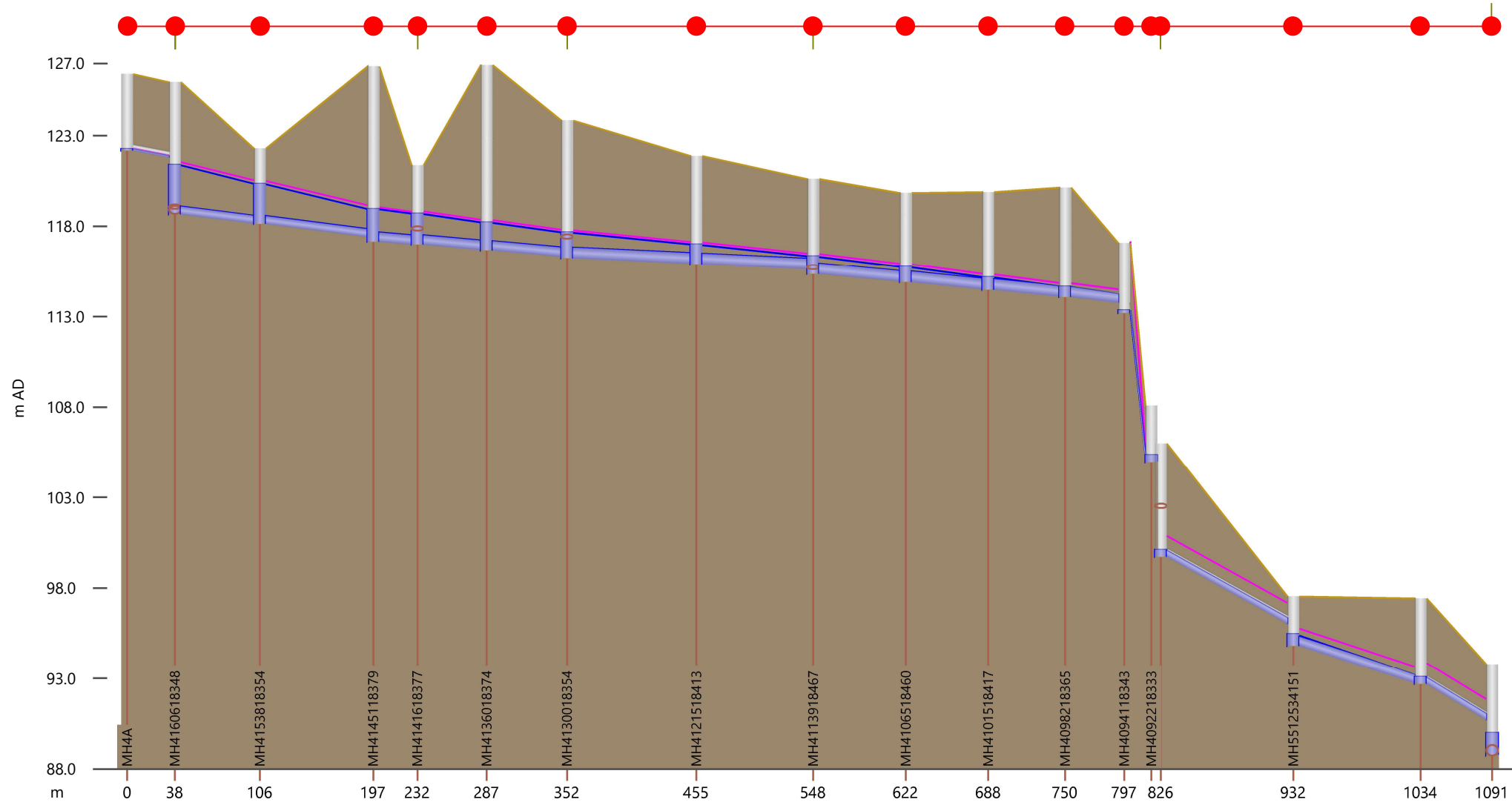
48 Grenoble Drive

File No. UD21-110

City of Toronto

Date: July 2023

Pipe ID	MAP ID	Length (m)	Diameter (mm)	Upstream Ground Elevation (m)	Downstream Ground Elevation (m)	Upstream Invert (m AD)	Downstream Invert (m AD)	Slope (%)	Full flow Capacity (l/s)	SC6: Proposed Extreme WWF - May 12, 2000 with 100 Extra Units (240L/c/d)					
										Peak Flow (l/s)	Full-Flow Capacity Utilization (%)	Max HGL (m AD)	Surcharge Status	Maximum Surcharging (m)	Minimum Available Freeboard (m)
MH4A.1	#1	38.10	375	126.4	125.96	122.17	121.79	1.00	176.86	23.29	13.00%	122.26	Free Flow	N/A	4.14
MH4160618348.1	#2	68.00	450	125.96	122.29	118.66	118.15	0.75	246.96	352.01	143.00%	121.40	Surcharging w.freeboard>1.8	2.29	4.56
MH4153818354.1	#3	90.60	450	122.29	126.82	118.13	117.41	0.79	254.22	354.00	139.00%	120.35	Surcharging w.freeboard>1.8	1.77	1.94
MH4145118379.1	#4	35.30	525	126.82	121.37	117.15	116.99	0.45	289.6	354.53	122.00%	118.96	Surcharging w.freeboard>1.8	1.29	7.86
MH4141618377.1	#5	55.40	525	121.37	126.89	116.99	116.70	0.52	311.22	390.54	125.00%	118.71	Surcharging w.freeboard>1.8	1.20	2.66
MH4136018374.1	#6	64.20	525	126.89	123.84	116.67	116.32	0.55	317.60	390.84	123.00%	118.23	Surcharging w.freeboard>1.8	1.03	8.67
MH4130018354.1	#7	103.40	600	123.84	121.88	116.24	115.93	0.30	336.26	484.29	144.00%	117.67	Surcharging w.freeboard>1.8	0.83	6.17
MH4121518413.1	#8	93.30	600	121.88	120.62	115.90	115.62	0.30	336.43	496.35	148.00%	117.00	Surcharging w.freeboard>1.8	0.50	4.88
MH4113918467.1	#9	74.00	600	120.62	119.84	115.35	114.93	0.57	462.67	525.94	114.00%	116.35	Surcharging w.freeboard>1.8	0.40	4.27
MH4106518460.1	#10	66.00	600	119.84	119.89	114.90	114.50	0.61	478.10	548.39	115.00%	115.76	Surcharging w.freeboard>1.8	0.26	4.08
MH4101518417.1	#11	61.40	600	119.89	120.14	114.47	114.10	0.60	476.73	548.35	115.00%	115.19	Surcharging w.freeboard>1.8	0.12	4.71
MH4098218365.1	#12	47.40	600	120.14	117.08	114.07	113.76	0.65	496.65	548.34	110.00%	114.66	Free Flow	N/A	5.48
MH4094118343.1	#13	21.60	600	117.08	108.08	113.18	104.96	38.06	3788.50	548.34	14.00%	113.35	Free Flow	N/A	3.73
MH4092218333.1	#14	7.60	600	108.08	105.99	104.96	104.85	1.45	738.84	548.34	74.00%	105.37	Free Flow	N/A	2.71
MH4091818330.1	#15	105.90	525	105.99	97.54	99.71	96.01	3.49	804.03	615.74	77.00%	100.10	Free Flow	N/A	5.89
MH5512534151.1	#16	101.80	525	97.54	97.43	94.80	92.73	2.03	613.38	615.59	100.00%	95.46	Surcharging w.freeboard>1.8	0.14	2.08
MH5512534152.1	#17	57.10	525	97.43	93.78	92.68	90.69	3.49	803.02	620.44	77.00%	93.07	Free Flow	N/A	4.36



Link	-	-	-	-	-	-	-	-	-	-	-	-	-	MH4091818330.1	-	-
length (m)	38.1	68.0	90.6	35.3	55.4	64.2	103.4	93.3	74.0	66.0	61.4	47.4	-	105.9	101.8	57.1
width (mm)	375	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
height (mm)	375	450	450	525	525	525	600	600	600	600	600	600	-	525	525	525
us inv (m AD)	-	118.660	118.130	-	116.990	116.670	116.240	115.900	115.350	114.900	114.470	-	-	99.710	94.800	92.680
ds inv (m AD)	-	118.150	117.410	-	116.700	116.320	115.930	115.620	114.930	114.500	114.100	-	-	96.010	92.730	90.690
grad (m/m)	-	0.00750	0.00795	-	0.00523	0.00545	0.00300	0.00300	0.00568	0.00606	0.00603	-	-	0.03494	0.02033	0.03485
Node		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (m AD)	-	-	122.293	126.821	-	126.894	123.842	121.882	120.618	119.845	119.893	-	-	-	97.540	97.430

Scenario 4 - Proposed Extreme Wet Weather Flow (WWF) Analysis (May 12, 2000 storm event) (240 L/c/d)
 (base model updated with all other development applications and the proposed site flows considering 240L/c/d average wastewater flow generation + reflective of current sewer system conditions)

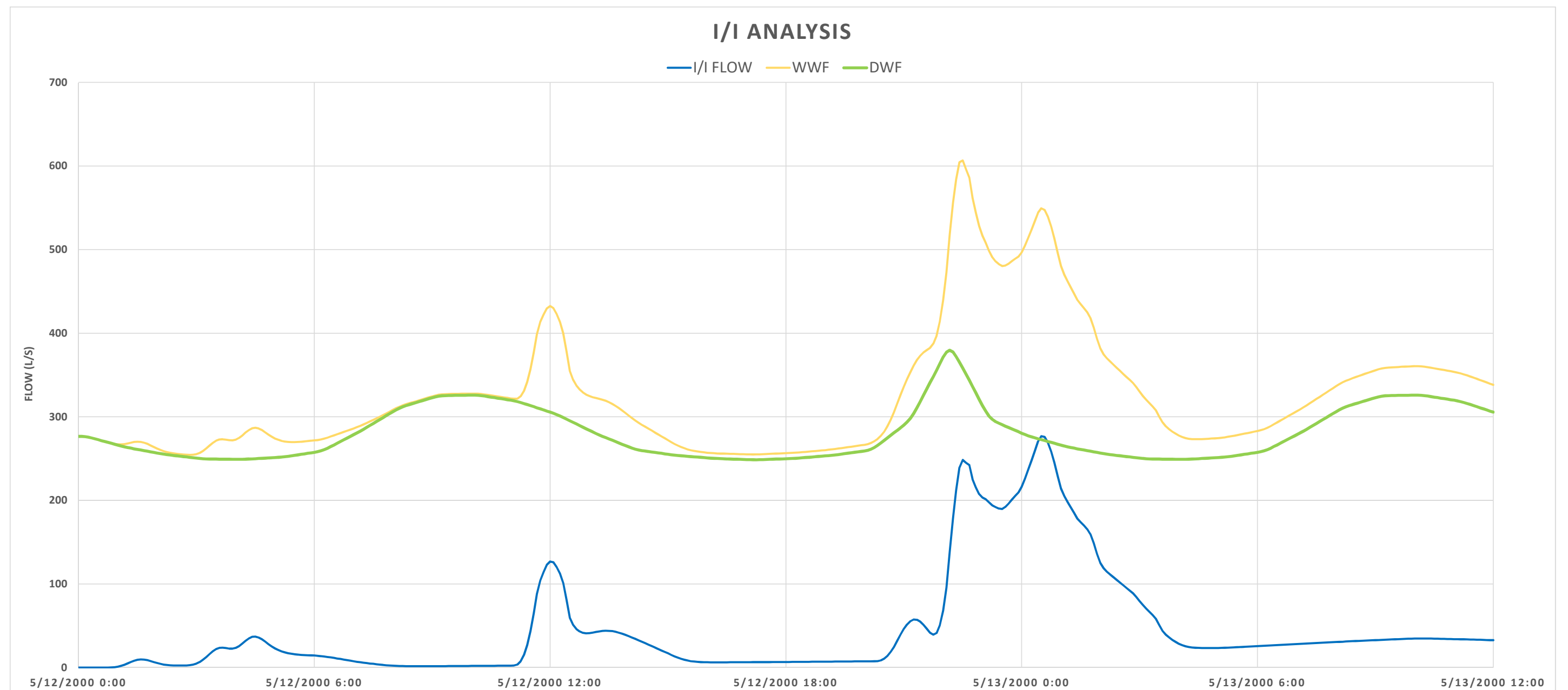


Figure 3 - Derivation of I/I Flows (Location MH5512534152.1)

	RTK hydrograph ID	Response ratio R - short term	Time to peak T - short term (hours)	Recession limb ratio K - short term	Response ratio R - medium term	Time to peak T - medium term (hours)	Recession limb ratio K - medium term	Response ratio R - long term	Time to peak T - long term (hours)	Recession limb ratio K - long term
►	55-SAN	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN1	0.016	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN2	0.050	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN3	0.017	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN4	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN5	0.049	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN6	0.024	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN7	0.025	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN8	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN9	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN10	0.026	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN11	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN12	0.110	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN13	0.017	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN14	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN15	0.064	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN16	0.035	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN17	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN18	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN19	0.020	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN20	0.035	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN21	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN22	0.020	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
	Prifile 55-SAN23	0.018	0.500	1.000	0.018	2.000	1.000	0.018	12.000	1.000
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Runoff surface

Ground infiltration

RTK hydrograph

Monthly R

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Figure 3 - Infoworks Model RTK Hydrograph

APPENDIX B
Sanitary Sewer Design Sheet



SANITARY SEWER DESIGN SHEET
48 Grenoble Drive
CITY OF TORONTO

LOCATION	RESIDENTIAL								PARKLAND		COMMERCIAL		FLOW										SEWER DESIGN					
	SECTION AREA	NUMBER OF UNITS						SECTION POP.	SECTION AREA	SECTION POP.	COMM AREA	SECTION POP.	TOTAL ACCUM. POP.	AVERAGE RESIDENTIAL FLOW '@' 240 L/c/d	HARMON PEAKING FACTOR	RES. PEAK FLOW (L/s)	AVERAGE COMMERCIAL FLOW @ 250 L/c/d	TOTAL ACCUM. AREA	INFILT. @ 0.26 L/s/ha.	TOTAL SANITARY FLOW (L/s)	PEAK GROUNDWATER FLOW (L/s)	TOTAL DESIGN FLOW (L/s)	PIPE LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	FULL FLOW CAPACITY n = 0.013 (L/sec)	% of DESIG CAPACITY (%)	
		Single	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																					
		Fam. Dwell.	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																					
(ha.)	@ 3.5 ppu	@ 2.7	@ 1.4 ppu	@ 1.4 ppu	@ 2.1 ppu	@ 3.1 ppu	(persons)	(ha.)	(persons)	(ha.)	(persons)	(persons)	(L/s)			(L/s)	(L/s)	(ha.)	(L/s)	(L/s)	(L/s)	(L/s)				(L/sec)	(%)	
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Existing Condition																												
Residential Development	0.675	0.00	0.00	0	112	48	32	357			0	0	357	0.99	4.05	4.01	0.00	0.675	0.18	4.01	0.00	4.19						
Proposed Condition																												
Residential Development	0.607	0	0	0	653	302	111	1,893	0.000	0	0.000	0	1,893	5.26	3.60	18.95	0.00	0.607	0.16	18.95	0.00	19.10						
Parkland Dedication	0.068	0	0	0	0	0	0	0	0.068	1	0.000	0	1	0.00	4.50	0.00	0.00	0.068	0.02	0.00	0.00	0.02						
Residential Flow Rate - 240 litres/capita/day															Total Post Flow (Residential Development)										19.10			
Commercial/Office Flow Rate - 250 litres/capita/day															Total Net Flow (Towards Downstream Sanitary Network)										14.91			
Firehouse Flow Rate - 180000 L/ha/day																												
Infiltration - 0.26 L/ha																												
Foundation allowance - 3.0 L/ha																												
Peaking Factor = 1 + [14 / (4 + P ^{0.5})], P=Population in thousands																												
Site Area (ha): 0.675																												
			Prepared by: Isaak Chlorotiris, P.E., M.A.Sc. Reviewed by: John Pasalidis, P.Eng., M.A.Sc. Date: July 2023										Project: 48 Grenoble Drive Project: UD21-110 City of Toronto										Sheet 1 OF 2					



SANITARY SEWER DESIGN SHEET

48 Grenoble Drive
CITY OF TORONTO

LOCATION	RESIDENTIAL								PARKLAND		COMMERCIAL		FLOW										SEWER DESIGN					
	SECTION AREA	NUMBER OF UNITS						SECTION POP.	SECTION AREA	SECTION POP.	COMM AREA	SECTION POP.	TOTAL ACCUM.	AVERAGE	HARMON PEAKING	RES. PEAK FLOW	AVERAGE	TOTAL ACCUM.	INFILT.	TOTAL	PEAK	TOTAL	PIPE LENGTH	PIPE DIA.	SLOPE	FULL FLOW CAPACITY	% of DESIG CAPACITY	
		Single	Townhouse	Studio	1 Bed Apts.	2 Bed Apts.	3 Bed Apts.																					
		Fam. Dwell.																										
(ha.)	@ 3.5 ppu	@ 2.7	@ 1.4 ppu	@ 1.4 ppu	@ 2.1 ppu	@ 3.1 ppu	(persons)	(ha.)	(persons)	(ha.)	(persons)	(persons)	(L/s)		(L/s)	(L/s)	(ha.)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(L/sec)	(%)		
column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Existing Condition																												
Residential Development	0.675	0.00	0.00	0	112	48	32	357			0	0	357	0.99	4.05	4.01	0.00	0.675	0.18	4.01	0.00	4.19						
Proposed Condition																												
Residential Development	0.607	0	0	0	653	302	111	1,893	0.000	0	0.000	0	1,893	9.86	3.60	35.53	0.00	0.607	0.16	35.53	0.00	35.69						
Parkland Dedication	0.068	0	0	0	0	0	0	0	0.068	1	0.000	0	1	0.00	4.50	0.00	0.00	0.068	0.02	0.00	0.00	0.02						
Residential Flow Rate - 450 litres/capita/day																Total Post Flow (Residential Development)								35.69				
Commercial/Office Flow Rate - 250 litres/capita/day																Total Net Flow (Towards Downstream Sanitary Network)								31.50				
Firehouse Flow Rate - 180000 L/ha/day																												
Infiltration - 0.26 L/ha																												
Foundation allowance - 3.0 L/ha																												
Peaking Factor = 1 + [14 / (4 + P ^{0.5})], P=Population in thousands																												
Site Area (ha): 0.675																												
		Prepared by: Isaak Chlorotiris, P.E., M.A.Sc. Reviewed by: John Pasalidis, P.Eng., M.A.Sc. Date: July 2023											Project: 48 Grenoble Drive Project: UD21-110 City of Toronto											Sheet 2 OF 2				