FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

579, 619 LAKESHORE ROAD EAST AND 1022, 1028 CAVEN STREET

CITY OF MISSISSAUGA
REGION OF PEEL

PREPARED FOR:

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CONSULTING ENGINEERS

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Star Seeker Inc. to prepare a Functional Servicing and Stormwater Management Report. This report will support the applications for an Official Plan Amendment (OPA) and a Zoning By-Law Amendment (ZBA) required to permit the proposed re-development of 579, 619 Lakeshore Road East and 1022, 1028 Caven Street in the City of Mississauga, Region of Peel (hereby known as the 'proposed development').

The purpose of this report is to demonstrate that the proposed development can be developed in accordance with the City of Mississauga (City) and Region of Peel (Region) guidelines and standards from a water, wastewater, and stormwater management perspective.

1.1 Site Description

The existing site is approximately 2.42 ha and currently consists of two (2) existing commercial buildings, two (2) residential dwellings, and associated parking, asphalt, and landscape areas. The existing site, located in a mixed-use neighbourhood, is bound by Lakeshore Road East to the south, low-rise residential buildings and Caven Street to the east, a high-rise apartment building to the north, and a mixed-use commercial and residential development to the west. The elements envisioned for the proposed development include:

- Four residential buildings with at-grade non-residential space in the podium of two buildings.
- Surface parking and three (3) levels of underground parking.
- Proposed site access from Lagoon Street and Caven Street.

Architectural floor plans and site statistics are included in the Site Plan prepared by Quadrangle Architects Limited, dated July 11, 2022, which is provided in Appendix A.

1.2 Background Information

The following drawings, design standards, and documents were referenced during the preparation of this report:

- Project Status Report - Project No. DARC 20-200 W1, prepared by the City of Mississauga, dated September 9, 2020
- Subsurface Utility Engineering (SUE) on-site locates, prepared by R&B Locating, dated July 2021
- City of Mississauga Transportation and Works Development Requirements Manual – Section 8 Storm Drainage Design Requirements, dated November 2020
- Region of Peel Public Works Design, Specifications & Procedures Manual – Sanitary Sewer Design Criteria, dated March 2017
- Region of Peel Public Works Design, Specifications & Procedure Manual – Watermain Design Criteria, dated June 2010
- As-Constructed Drawing No. 44089-D & 44090-D – Port Credit Trunk Sewers and Forcemains, prepared by Genivar, dated April 2012

- As-Constructed Drawing No. 24973-D & 24974-D – Lakeshore Road Prop. 300 mm Watermain, prepared by Region of Peel, dated November 2000

- As-Recorded Drawing No. 59415-D – Caven Street Prop. 300 mm Watermain, prepared by Region of Peel, dated July 2018

- As-Constructed Drawing No. C-457900 – Proposed Servicing Plan, prepared by JSW & Associates, dated March 2015

- As-Recorded Drawing No C-4920 & C-4945 – Plan & Profile of Lakeshore Road, prepared by Township of Toronto, dated February 1960

- As-Recorded Drawing No C-4927 – Plan & Profile of Aviation Road, prepared by Township of Toronto, dated January 1960

- Map Z-7 – City Stormwater Infrastructure Assets, prepared by City of Mississauga, dated November 2013

As-Constructed and As-Recorded drawings are provided in Appendix A.

2.0 Water Servicing

Region of Peel is responsible for the operation and maintenance of the public water and treatment system in the City of Mississauga, and all local systems must connect to the Regional system. The existing and proposed water servicing is discussed in the following sections.

2.1 Existing Water Servicing

A review of the SUE investigation results and drawings referenced in Section 1.2 (Appendix A), identifies the following water servicing infrastructure in proximity to the proposed development:

- A 300 mm dia. polyvinyl chloride (PVC) watermain located within Lakeshore Road East.

- A 600 mm dia. concrete pressure pipe (CPP) feeder main located within Lakeshore Road East.

- An abandoned 200 mm dia. cast iron (CI) watermain located within Lakeshore Road East.

- A 300 mm dia. PVC watermain located within Caven Street.

- A 300 mm dia. ductile iron (DI) watermain located within Caven Street.

- An abandoned 150 mm dia. (material unknown) watermain located within Caven Street.

- A 200 mm dia. (material unknown) water service lateral connected to the existing 300 mm dia. PVC watermain on Lakeshore Road East servicing the existing development.

The capacities of the existing watermains are unknown currently. The Region's Connection Demand Table is provided in Appendix B for the Region to verify the existing capacities and confirm if they are sufficient to service the proposed development.

2.2 Design Water Demand

The water demand was estimated for the proposed development in accordance with the Region of Peel Public Works Design, Specifications & Procedure Manual - Watermain Design Criteria (June 2010). An average daily demand of 280 L/cap/day was used. An equivalent population was determined for the proposed development using a unit rate occupancy density of 2.7 persons per units, in accordance with the Region of Peel Public Works Design, Specifications & Procedures Manual – Sanitary Sewer Design Criteria (March 2017). Table 1 below outlines the equivalent population estimate and Table 2 outlines the estimated domestic water demand generated by the proposed development. Supporting calculations are provided in Appendix B.

Table 1: Equivalent Population Estimate

Number of Units	Population Per Unit	Total Persons
1070	2.7	2889

Table 2: Estimated Domestic Design Water Demand

Building Type	Total Site Area (ha)	Population	Average Daily Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Residential	2.42	2889	9.36	18.73	28.09

Note: Total site area is based on Site Plan prepared by Quadrangle Architects Limited (July 2022).

As presented in Table 2, a domestic water service will be required to convey a peak flow rate of 19.92 L/s.

2.3 Fire Flow Demand

The Fire Underwriters Survey method was used to estimate the fire flow demand for each proposed building of the proposed development. Flow requirements were based on the largest single floor Gross Floor Area (GFA) as depicted by the Site Plan prepared by Quadrangle Architects Limited, dated July 11, 2022 (Appendix A).

This calculation is based on the following assumptions:

- Building will use non-combustible construction (unprotected metal structural components) with a co-efficient of 0.8 was applied to the fire flow calculations.
- The vertical openings and exterior vertical communications are properly protected therefore, the total floor area used in the calculation includes the largest floor and 25% of the two immediately adjoining floors.
- Proposed building will be equipped with an automatic sprinkler system which reduces the initial fire flow demand of the building by up to 50%. The automated sprinkler system is to be designed by the Mechanical Engineer at subsequent design stages and is therefore not included in this report.

Table 3 summarizes the estimated fire flow requirements and durations necessary to meet fire protection for each building within the proposed development. Supporting calculations are provided in Appendix B.

Table 3: Estimated Fire Flow Demand

Development	Fire Flow Requirement (L/s)	Fire Flow Duration (hours)
Building A (16-storeys)	133	2.0
Building B (16 Storeys)	167	2.0
Building C & D (4 Storeys)	233	3.5

It should be noted that the fire flows determined from the FUS method is a conservative estimate for comparison purposes only. At the detailed design stage, the Mechanical Engineer will confirm the required fire flow rates and the Architect will design fire separation methods per the determined fire flow rate to meet municipally available flows and pressures.

A hydrant flow test was carried out by Classic Fire Protection Inc. on May 20, 2021 for the existing 300 mm watermain along Lakeshore Road East. Based on the hydrant flow test results, we anticipate a minimum of 439 L/s (or 6,965 USGPM) projected flow to be available within the municipal water system, at a residual pressure of 20 psi. The fire flow demand is defined by the building requiring the most fire flow. As such, the existing water service is sufficient to meet the fire flow demand of 233 L/s. The results of the hydrant flow test have been included in Appendix B.

2.4 Proposed Water Servicing

The proposed development is proposed to be serviced by the existing 200 mm diameter water connection extending from the existing 300 mm diameter PVC watermain within Lakeshore Road East. The water connection will split at the property line into a 200 mm diameter fire line and a 100 mm diameter domestic service. The service will extend to the underground parking limit for the new buildings. The Preliminary Servicing Plan (C701) illustrates the location of the proposed water connection. The internal water system of the building will be designed by the Mechanical Engineer at the detailed design stage.

3.0 Sanitary Servicing

The Region of Peel is responsible for the operation and maintenance of the sanitary sewer network in the City of Mississauga and all local systems must connect to the Regional system. The existing and proposed sanitary servicing is outlined in the following sections.

3.1 Existing Sanitary Servicing

A review of the SUE investigation results and drawings referenced in Section 1.2 (Appendix A), identifies the following sanitary servicing infrastructure in proximity to the proposed development:

- A twin 750 mm dia. concrete pressure pipe (CPP) forcemain located within Lakeshore Road East.
- A 250 mm dia. vitrified clay (VC) sanitary sewer draining west to east located within the south lane of Lakeshore Road East.
- A 200 mm – 300 mm dia. (material unknown) sanitary sewer draining west to east located within the north boulevard of Lakeshore Road East, connecting to the 250 mm dia. VC sanitary sewer located within Lakeshore Road East.
- A 250 mm dia. VC sanitary sewer draining east to west located within Lakeshore Road East.
- A 250 mm dia. (material unknown) sanitary sewer draining north to south located within Caven Street connecting to the 250 mm dia. sanitary sewer within Lakeshore Road East.
- A 250 mm dia. PVC sanitary sewer draining north to south located within Lagoon Street connecting to the 250 mm dia. sanitary sewer on Lakeshore Road East.
- A 200 mm dia. (material unknown) sanitary service lateral connected to a property line manhole located within the Lakeshore Road East boulevard.
- A 150 mm dia. (material unknown) sanitary service lateral connected to the 250 mm dia. sanitary sewer located within Lakeshore Road East.

The capacities of the existing sanitary sewers are unknown at this time. The Region's Connection Demand Table is provided in Appendix B for the Region to verify the existing capacities and confirm if they are sufficient to service the proposed development.

3.2 Design Sanitary Flow

The design sanitary flows and equivalent population for the proposed development were calculated with reference to the Region of Peel Public Works Design, Specifications & Procedures Manual – Sanitary Sewer Design Criteria (March 2017). In accordance with the Region of Peel design criteria, a unit sewage flow of 302.8 L/capita/day was used to determine the average daily flow for the proposed development. Infiltration flow into the sanitary sewer and a peaking factor were applied to the unit sewage flow to obtain the total estimated design sewage flow.

A summary of the sanitary design flows is presented in Table 4. Supporting calculations are provided in Appendix C.

Table 4: Estimated Sanitary Design Flows

Building Type	**Total Site Area** (ha)	**Total Persons**	**Average Daily Flow** (L/s)	**Peak Flow** (L/s)	**Infiltration Flow** (L/s)	**Total Sanitary Flow** (L/s)
Residential	2.42	2889	10.12	34.99	0.48	35.48

Note: Total sanitary flow includes infiltration flow and peak flow.

As presented in Table 4, a sanitary service is to be sized to convey 35.48 L/s to service the proposed development.

3.3 Proposed Sanitary Servicing

Sanitary servicing for the proposed development is proposed to be provided by a 200 mm dia. PVC lateral extending from a property line manhole, connecting to the existing 250 mm dia. sanitary sewer on Lakeshore Road East draining west to east. The pipe capacity for a 200 mm dia. lateral sloping at 2% is approximately 46 L/s, which is greater than the total sanitary design flow of 35.48 L/s. Therefore, the proposed sanitary lateral would be sufficient to convey the design sanitary flow. The Preliminary Servicing Plan (C701) illustrates the location of the proposed sanitary lateral and the connection to the underground parking structure. The internal sanitary system of the building will be designed by the Mechanical Engineer at the detailed design stage. As previously noted, Crozier is coordinating with the Region to confirm the capacity of the existing sanitary sewers.

4.0 Storm Servicing

The storm servicing for the proposed development in both the existing and proposed conditions are outlined in the following sections.

4.1 Existing Storm Servicing

A review of the SUE investigation results, drawings referenced in Section 1.2, and City Stormwater Infrastructure Assets Map Z-7 (Appendix A), identifies the following storm servicing infrastructure in proximity to the proposed development:

- A 575 mm dia. concrete storm sewer draining east to west located within Lakeshore Road East.
- A 450 mm dia. (material unknown) storm sewer service at the southwest corner of the proposed development draining south, connecting to the 575 mm dia. concrete storm sewer located within Lakeshore Road East.
- A 375 mm dia. (material unknown) storm sewer draining west to east located within Lakeshore Road East.
- A 600 mm – 675 mm dia. (material unknown) storm sewer draining east to west from Caven Street located within Lakeshore Road East.
- A 300 mm dia. (material unknown) storm sewer draining west to east located within Lakeshore Road East.
- A 600 mm dia. storm sewer draining north to south located within the Storm Sewer Easement along the west property line of the site, connecting to the storm sewer network of the adjacent development.
- A 600 mm dia. (material unknown) storm sewer draining north to south located within Caven Street, connecting to the 600 mm – 675 mm dia. storm sewer located within Lakeshore Road East.
- A storm sewer service (material and size unknown) at the southeast corner of the proposed development draining east towards the 600 mm dia. storm sewer located within Caven Street.

4.2 Existing Drainage Conditions

According to the topographic survey completed by R-PE Surveying Ltd. dated March 2, 2021, the existing topography conveys stormwater drainage to Caven Street, Lagoon Street and Lakeshore Road East.

The pre-development drainage conditions are illustrated by Figure 1. The existing site has been delineated into the following catchments based on the existing topography:

- Catchment 101 (A = 2.1 ha; RC = 0.87) consists of drainage from most of the existing commercial site. The minor system runoff is collected and conveyed by an existing internal storm sewer network to the existing storm sewers along Lakeshore Road East. The major system runoff is conveyed overland toward the Lakeshore Road East right-of-way (R.O.W.) via the Lagoon Street R.O.W. Drainage from Catchment 101, conveyed to the Lakeshore Road East R.O.W., continues west towards Cooksville Creek.

- Catchment 102 (A = 0.14 ha; RC = 0.69) consists of drainage from Lot 88 to 90, including a small portion of the existing parking area at the eastern limits of the existing site. The minor system runoff from Catchment 102 is assumed to be captured by the existing storm sewer system within the Caven Street R.O.W. and continues to the existing 600 mm – 675 mm dia. storm sewer within the Lakeshore Road East R.O.W. which drains west towards Cooksville Creek. The major system runoff from Catchment 102 is conveyed overland to the Lakeshore Road East R.O.W. via the Caven Street R.O.W. Major system drainage from Catchment 102 conveyed to the Lakeshore Road East R.O.W. continues east towards Cawthra Creek.

- Catchment 103 (A = 0.18 ha; RC = 0.77) consists of drainage from the existing commercial building and associated asphalt parking area within Lot 81 to 85 at the southeast corner of the existing site. The minor system runoff from Catchment 103 is captured by an existing internal storm sewer network and conveyed towards the existing storm sewer within the Caven Street R.O.W. which drains to the existing storm sewer on the Lakeshore Road East R.O.W. The minor system drainage from Catchment 103 conveyed to the existing storm sewer in the Lakeshore Road East R.O.W. continues west towards Cooksville Creek. The major system runoff from Catchment 103 is conveyed overland to the Lakeshore Road East R.O.W. via the Caven Street R.O.W. Major system drainage from Catchment 103 conveyed to the Lakeshore Road East R.O.W. continues east towards Cawthra Creek.

- Catchment EX1 (A = 0.01 ha; RC = 0.25) consist of the backyard drainage from the existing dwelling on Lot 87 along the east property line of the existing site. The minor and major system runoff is conveyed overland to Catchment 102.

- Catchment EX2 (A = 0.01 ha; RC = 0.25) consist of the backyard drainage from the existing dwelling on Lot 86 along the east property line of the existing site. The minor and major system runoff is conveyed overland to Catchment 101.

4.3 Proposed Storm Servicing

Storm servicing for the proposed development is proposed to be provided by a 350 mm dia. concrete lateral extending from the existing manhole on the northeast corner of Lakeshore Road East and Lagoon Street, which connects to the existing 525 mm dia. storm sewer on Lakeshore Road East draining east to west. The pipe capacity of a 350 mm dia. lateral sloping at 2% is approximately 206 L/s, which is greater than the total control peak flow of 155.40 L/s (Refer to Section 5.0 for details). Therefore, the proposed storm lateral would be sufficient to convey the storm peak flow. details regarding peak flow and stormwater management are further discussed in Section 5.0. The Preliminary Servicing Plan (C701) illustrates the location of the proposed storm lateral, property line manhole, oil/grit separator, and the connection to the underground parking structure. The internal storm system will be designed by the Mechanical Engineer at the detailed design stage.

4.4 Proposed Drainage Conditions

Based on the Site Plan prepared by Quadrangle Architects Limited dated July 11, 2022, the proposed development will consist of four residential condominium buildings, with a 3-level below grade parking structure, at-surface parking, and landscape areas. The proposed development will have access from the Lagoon Street R.O.W. and the Caven Street R.O.W.

The proposed site grading divides the proposed development into four post-development drainage catchment areas, as represented on the Post-Development Drainage Plan (Figure 2).

- Catchment 201 (A = 2.29 ha; RC = 0.75) consist of drainage from most of the proposed development, including the proposed building footprints, paved areas, and landscape areas. Stormwater runoff up to the 100-year storm event will be collected and conveyed to a proposed internal stormwater management storage tank by an internal storm sewer network. The stormwater management storage tank will be in the underground parking structure at the southwest corner of the underground parking garage. Emergency flows will be directed overland to the Caven Street R.O.W. and subsequently to the Lakeshore Road East R.O.W. Refer to Section 5.0 for details pertaining to the proposed stormwater management (SWM). Drainage from Catchment 201 conveyed to the Lakeshore Road East R.O.W. continues west towards Cooksville Creek.

- Catchment UC1 (A = 0.06 ha; RC = 0.88) consists of uncontrolled drainage from the western area of the proposed development and a portion of the Lagoon Street R.O.W. The minor and major system runoff from this catchment is conveyed overland to the Lakeshore Road East R.O.W. via the Lagoon Street R.O.W. Drainage from Catchment UC1 conveyed to the Lakeshore Road East R.O.W. continues west towards Cooksville Creek.

- Catchment UC2 (A = 0.06 ha; RC = 0.90) consists of uncontrolled drainage from the southern area of the proposed development. The runoff from this catchment is conveyed overland to the Lakeshore Road East R.O.W. Drainage from Catchment UC2 conveyed to the Lakeshore Road East R.O.W. continues west towards Cooksville Creek.

- Catchment UC3 (A = 0.01 ha; RC = 0.90) consists of uncontrolled drainage from the eastern area of the proposed development. The minor and major system runoff from this catchment is conveyed overland to the Caven Street R.O.W. The minor system runoff will be conveyed by the existing storm sewers within the Caven Street R.O.W. and continue to the existing 600 mm – 675 mm dia. storm sewers within the Lakeshore Road East R.O.W. which drain towards Cooksville Creek. The major system runoff will be conveyed to the Lakeshore Road East R.O.W. via the Caven Street R.O.W. and continue east towards Cawthra Creek.

- Catchment EX1 (A = 0.01 ha; RC = 0.25) consist of the backyard drainage from the existing dwelling on Lot 87 along the east property line of the existing site. The minor and major system runoff is conveyed overland to Catchment 201.

- Catchment EX2 (A = 0.01 ha; RC = 0.25) consist of the backyard drainage from the existing dwelling on Lot 86 along the east property line of the existing site. The minor and major system runoff is conveyed overland to Catchment 201.

Refer to the Preliminary Grading Plan (Drawing 702) and Post Development Drainage Plan (Figure 2) for proposed site grading and drainage patterns.

5.0 Stormwater Management

Stormwater management design criteria were established in accordance with the City of Mississauga Project Status Report dated September 9, 2020, as well as Credit Valley Conservation (CVC) SWM Criteria dated August 2012. As per the Project Status Report, the SWM criteria applicable to the proposed development area are follows:

Water Quantity Control

The proposed development is located on the boundary between the Cooksville Creek Watershed and the Cawthra Creek Watershed. Stormwater drainage conveyed to the Cooksville Creek Watershed is required to control the 100-year post-development peak flow rate to the 2-year pre-development peak flow rate. Stormwater drainage conveyed to the Cawthra Creek Watershed is required to control the 2-year post-development peak flow rate to the 10-year pre-development peak flow rate. The maximum pre-development runoff coefficient to be used for the re-development site cannot exceed 0.50 in accordance with the City of Mississauga Transportation and Works Development Requirements Manual – Section 8 Storm Drainage Design Requirements dated November 2020.

Water Quality Control

Private stormwater discharging from the proposed development must achieve Ontario Ministry of the Environment, Conservation and Parks (MECP) Enhanced Level of protection (80% total suspended solids (TSS) removal) for water quality control prior to discharging to the City's storm sewer network.

Water Balance

Retention of the first 5 mm of rainfall for private development areas is required by way of infiltration, reuse, evapotranspiration, or filtration.

5.1 Stormwater Quantity Control

As outlined in Section 5.0, the proposed development is located on the boundary between the Cooksville Creek Watershed and the Cawthra Creek Watershed. The following Sections outlined the stormwater quantity control requirements for drainage to each watershed.

5.1.1 Cooksville Creek

As outlined in Section 5.0, stormwater drainage conveyed to the Cooksville Creek Watershed is required to control the 100-year post-development peak flow rate to the 2-year pre-development peak flow rate. The rational method has been used to determine the 2-year pre-development peak flow rates generated by the existing site catchments draining to Cooksville Creek. Calculations were completed using City of Mississauga intensity-duration-frequency (IDF) data, and a maximum runoff coefficient of 0.50. The 2-year pre-development peak flow rates generated by the existing site catchments draining to Cooksville Creek are outlined in Table 5. Supporting calculations are provided in Appendix D.

Table 5: Summary of Pre-Development Peak Flow Rates

	Pre-Development Catchments (L/s)					
	101	**102**	**103**	**EX1**	**EX2**	**Total Peak Flow**
2-year Flow Rate (L/s)	176.44	11.34	14.76	0.44	0.47	203.45

As presented in Table 5, the 2-year pre-development peak flow rate generated by the portion of the existing site draining to Cooksville Creek is 203.45 L/s. This peak flow rate has been taken as the target rate for stormwater quantity control for drainage to Cooksville Creek.

The Rational Method has also been used to determine the 100-year post development peak flow rate generated by the catchments draining to Cooksville Creek in an uncontrolled condition. Note: minor system runoff from Catchment UC3 is assumed to be collected and conveyed by the existing storm sewers within the Caven Street and Lakeshore Road East R.O.W.s, which drain towards Cooksville Creek. It has been assumed that existing sewers within the Caven Street RO.W. were designed to collect and convey runoff from a 5-year storm event. As such, for the purpose of determining the post-development peak flow rates generated by the catchments draining to Cooksville Creek, the 5-year runoff from Catchment UC3 has been accounted for. Results are presented in Table 6, along with a relative difference to the target rate. Supporting calculations are provided in Appendix D.

Table 6: Summary of Post-Development Peak Flow Rates (Uncontrolled)

	Post-Development Catchments (L/s)							
	201 (100-yr)	**UC1 (100-yr)**	**UC2 (100-yr)**	**UC3 (5-yr)**	**EX1 (100-yr)**	**EX2 (100-yr)**	**Total Peak Flow**	**Percent Difference Relative to Target Rate**
Flow Rate (L/s)	845.32	23.95	21.67	2.43	1.29	1.38	896.04	340%

As presented in Table 6, the post-development peak flows generated by the proposed development draining to Cooksville Creek exceed the target rate. Therefore, stormwater quantity controls are required for these catchments.

The Modified Rational Method was used to determine the required stormwater quantity control for the post-development catchments draining to Cooksville Creek. As outlined in Section 4.4, stormwater runoff from Catchments 201, EX1, and EX2 will be captured and controlled within Catchment 201 prior to discharging to the Lakeshore Road East storm sewer. Furthermore, stormwater runoff from Catchments UC1, UC2, and UC3 will drain uncontrolled. Therefore, stormwater quantity controls provided within Catchment 201 must be overcontrolled to account for this uncontrolled runoff. A summary of the controlled flows to Lakeshore Road East, as well as the required stormwater quantity control volume is presented in Table 7. Supporting calculations are provided in Appendix D.

Table 7: Summary of Post-Development Peak Flow Rates (Controlled)

	Post-Development Catchment Peak Flows (L/s)		Percent Difference Relative to Target Rate	Required Storage Volume (m^3)
	Uncontrolled Catchments (UC1, UC2, UC3)	Controlled Catchments (201, EX1, EX2)		
Flow Rate (L/s)	48.05	155.40	0%	702

As presented in Table 7, a total of 702 m^3 of on-site storage is required to provide the requisite water quantity control for drainage to Cooksville Creek. Detailed calculations are provided in Appendix D.

The requisite storage volume is proposed to be provided within an underground stormwater tank located within the underground parking structure. The underground stormwater tank will be designed in accordance with the Architectural, Structural, and Mechanical building design details and specifications at the detailed design stage. Details pertaining to the required flow control device will also be determined at the detailed design stage.

5.1.2 Cawthra Creek

As outlined in Section 5.0, stormwater drainage conveyed to the Cawthra Creek Watershed is required to control the 2-year post-development peak flow rate to the 10-year pre-development peak flow rate. The rational method has been used to determine the 10-year pre-development peak flow rates generated by the existing site catchments draining to Cawthra Creek.

As outlined in Section 5.1.1, it has been assumed that the existing storm sewers within the Caven Street and Lakeshore Road East R.O.W.s, which drain towards Cooksville Creek, were designed to collect and convey runoff from a 5-year storm event. As such, for the purpose of determining the 10-year pre-development runoff draining to Cawthra Creek, the 10-year pre-development peak flow rate has been reduced by the 5-year pre-development peak flow rate. Calculations were completed using City of Mississauga IDF data, and a maximum runoff coefficient of 0.50. The 10-year pre-development peak flow rates generated by the existing site catchments draining to Cawthra Creek are outlined in Table 8. Supporting calculations are provided in Appendix D.

Table 8: Summary of Pre-Development Peak Flow Rates

Return Period	Pre-Development Catchments (L/s)				
	102	103	EX1	Total Peak Flow	Target Rate (10-year – 5-year)
5-Year	15.24	19.84	0.59	35.67	8.26
10-Year	18.77	24.43	0.73	43.93	

As presented in Table 8, the 10-year pre-development peak flow rate generated by the portion of the existing site draining to Cawthra Creek is 8.26 L/s. This peak flow rate has been taken as the target rate for stormwater quantity control for drainage to Cawthra Creek.

The Rational Method has also been used to determine the 2-year post development peak flow rate generated by the post-development catchment (Catchment UC3) draining to Cawthra Creek in an uncontrolled condition. Results are presented in Table 9, along with a relative difference to the target rate. Supporting calculations are provided in Appendix D.

Table 9: Summary of Post-Development Peak Flow Rates (Uncontrolled)

	Post-Development Catchments (L/s) UC3	Percent Difference Relative to Target Rate
2-year Flow Rate (L/s)	1.81	-78%

As presented in Table 9, the post-development peak flows generated by the proposed development draining to Cawthra Creek do not exceed the target rate. Therefore, stormwater quantity controls are not required for these catchments.

5.2 Stormwater Quality Control

As outlined in Section 5.0, stormwater quality controls must be incorporated into the proposed development to promote an Enhanced Level of Protection (Level 1), in accordance with the MECP (March 2003) guidelines. Enhanced water quality protection involves the removal of at least 80% of total suspended solids from 90% of the annual stormwater runoff volume.

A Stormceptor EF10 oil/grit separator (OGS) is proposed to provide the requisite water quality control for Catchment 201. The OGS will be installed downstream of the underground stormwater tank and will treat stormwater runoff prior to discharging to the City's storm sewer network.

The new Stormceptor EF/EFO model's sized for 60% removal based on the ETV particle-size distribution (PSD) is comparable to sizing for 80% removal of the Stormceptor Fine PSD. The sizing results in Appendix D reflects this qualification. A technical bulletin explaining the equivalency is included in Appendix D.

Runoff from uncontrolled Catchments UC1, UC2, UC3 will not be captured by the OGS. Uncontrolled Catchment UC1 consist primarily of the existing Lagoon Street drainage. Understanding that the relative change in imperviousness between the existing and proposed conditions for UC1 is negligible, stormwater quality controls are not warranted for this Catchment. Uncontrolled Catchments UC2 and UC3 consist primarily of pedestrian walkways and boulevard, which contribute minimal sediment contamination. Therefore, stormwater quality control is not warranted for these catchments either.

5.3 Water Balance

As outlined in Section 5.0, runoff from the 5 mm storm event must be retained on site. The requisite water balance retention volume was calculated considering initial abstraction of runoff based on impervious areas of the proposed development.

The proposed development has a total of 1.89ha of impervious area. As such, a volume of 95 m^3 (1.89 ha x 5 mm) is required to be retained onsite to achieve the water balance criteria. The storage will be provided via dead storage in the proposed stormwater tank which will be reused throughout the proposed development as grey water, or for irrigation purposes. Once the final plan area of the underground stormwater tank has been established during detailed design, the dead storage details will be determined.

Runoff from Catchments flowing uncontrolled in the post-development condition (UC1, UC2. UC3) will not be captured, and therefore cannot be retained on-site. However, the storage volume provided within the stormwater tank will compensate for the uncontrolled catchments.

5.4 Sustainable Stormwater Management

Low Impact Development (LID) strategies will be considered for use throughout the proposed development during the detailed design stage. The following LID strategies may be applicable for this site:

- Rainwater Harvesting**:** With minimal pretreatment, the captured rainwater within the underground storage tanks can be used for outdoor non-potable water uses such as irrigation, or in the buildings as gray water.

- Green Roofs: This method is beneficial due to its water quality, water balance, and peak flow control benefits. In addition to water resource management, green roofs improve energy efficiency, reduce urban heat island effects, and create greenspace for passive recreation.

- Enhanced Topsoil: Enhanced topsoil provides water quality benefits in addition to water balance storage which will reduce the infrastructure required to store the required water balance volume.

6.0 Conclusion and Recommendations

The existing site is approximately 2.42 ha and currently consists of two (2) existing commercial structures, two (2) residential dwellings, and associated parking, asphalt, and landscape areas.

The proposed development will consist of four (4) residential structures, two of which will include grade-related, non-residential areas, three (3) levels of underground parking, surface parking and access from Lagoon Street and Caven Street.

Based on details contained in this report, conclusions for the proposed development include:

- Water demand for the proposed development will be provided by the existing 200 mm diameter PVC water connection extending from the existing 300 mm diameter watermain within Lakeshore Road East. The water connection will split at the property line into a 200 mm diameter fire line and a 100 mm diameter domestic service. The internal water distribution system will be designed by the Mechanical Engineer at the detailed design stage.

- Sanitary servicing for the proposed development will be provided using a 200 mm diameter PVC sanitary service which will connect to the existing 250 mm diameter sanitary sewer within Lakeshore Road East, via the existing control manhole at the south property line.

- Quantity control will be provided via an underground stormwater tank and peak flow control. The underground stormwater tank will provide the required storage volume (702 m^3).

- Quality control will be provided via an oil/grit separator (OGS) Stormceptor Model EF10 (or approved equivalent) sized to provide an enhanced level of protection (80% TSS removal).

- Water balance will be provided as dead storage within the proposed stormwater tank. A volume of 95 m^3 is required.

Based on the above conclusions, we recommend the approval of the Official Plan Amendment and Zoning By-Law Amendment for the proposed mixed-use development from the perspective of functional servicing and preliminary stormwater management.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

Jayesh Boily, E.I.T.
Land Development

C.F. CROZIER & ASSOCIATES INC.

Matt Britton, P.Eng.
Project Manager – Land Development

JB/cj

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APPENDIX A

Background Information

BDP.
Quadrangle

Quadrangle Architects Limited
901 King Street West, Suite 701 Toronto, ON M5V 3H5
t 416 598 1240 www.bdpquadrangle.com

579, 619 Lakeshore Road East and 1022, 1028 Caven Street

579, 619 Lakeshore Road East and 1022, 1028 Caven Street
Mississauga, Ontario
for
Star Seeker Inc.

Project No. 17125
Date 11 July 2022
Issued for Rezoning-R1

ARCHITECTURAL DRAWINGS

BUILDING A

	BACH		1 BED				1 BED + DEN									2 BED				2 BED+DEN									Totals
SUITE TYPES	B-A	B-B	1-A	1-B	1-C	1-D	1D-A	1D-B	1D-C	1D-D	1D-E	1D-F	1D-G	1D-H	1D-I	2-A	2-B	2-C	2-D	2D-A	2D-B	2D-C	2D-D	2D-E	2D-F	2D-G	2D-H	2D-I	
AREA (sm)							52.9	53.7	54.6	56.0	56.2	56.3	56.8	59.0	59.5	66.5	65.2	62.5	67.9	72.2	76.6	77.9	80.4	80.8	81.1	84.8	89.4	99.1	
AREA (sf)							569	578	588	603	605	606	611	635	640	716	702	673	731	777	825	839	865	870	873	913	962	1,067	
16											4	1	1	2			1		1			1	1	1		1			14
15											4	1	1	2			1		1			1	1	1		1			14
14											4	1	1	2			1		1			1	1	1		1			14
13											4	1	1	2			1		1			1	1	1		1			14
12											4	1	1	2			1		1			1	1	1		1			14
11											4	1	1	2			1		1			1	1	1		1			14
10											4	1	1	2			1		1			1	1	1		1			14
9											4	1	1	2			1		1			1	1	1		1			14
8											4	1	1	2			1		1			1	1	1		1			14
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6							1	1	1		12	1	1	11		1						1		1	1			1	33
5							1	1	1		12	1	1	11		1						1		1	1			1	33
4							1	1	1		12	1	1	11		1						1		1	1			1	33
3							1	1	1		12	1	1	11		1						1		1	1			1	33
2											10	1	1	9		1		1	0			1		1	1			1	27
Ground Floor							0	0		1	8			8	3	1				1	1						1	0	24
Subtotals	0	0	0	0	0	0	4	4	4	1	102	14	14	79	3	6	9	1	9	1	1	14	9	14	5	9	1	5	
TOTAL		0				0									225				25									59	309
Percentage		0%				0%									73%				8%									19%	Suites
BARRIER FREE SUITES (hatched in grey)																													
Required (15%)	0		34													13													47
Provided	0		79													14													93

BUILDING B

	BACH			1 BED					1 BED + DEN																					
SUITE TYPES	B-A	B-B	B-C	1-A	1-B	1-C	1-D	1-E	1D-A	1D-B	1D-C	1D-D	1D-E	1D-F	1D-G	1D-H	1D-I	1D-J	1D-K	1D-L	1D-M	1D-N	1D-O	1D-P	1D-Q	1D-R	1D-S	1D-T	1D-U	1D-V
AREA (sm)	29.1	30.8	37.0	39.4	44.5	45.5	46.3	47.1	51.0	51.1	51.3	55.2	53.3	54.4	56.4	57.0	57.7	58.1	58.3	58.4	58.6	59.2	59.3	59.6	59.9	60.4	60.4	61.1	62.5	63.3
AREA (sf)	313	332	398	424	479	490	498	507	549	550	552	594	574	586	607	614	621	625	628	629	631	637	638	642	645	650	650	658	673	681
16			1					2	2			1	1				4	4					1							
15			1					2	2			1	1				4	4					1							
14			1					2	2			1	1				4	4					1							
13			1					2	2			1	1				4	4					1							
12			1					2	2			1	1				4	4					1							
11			1					2	2			1	1				4	4					1							
10			1					2	2			1	1				4	4					1							
9			1					2	2			1	1				4	4					1							
8			1					2	2			1	1				4	4					1							
7													1		1	1	2	2								1	1		1	1
6		9				1	6				7								1		1							1		
5		9				1	6				7								1		1							1		
4		9				1	6				7								1		1							1		
3		9				1	6				7								1		1							1		
2		6				1	6				4			1						2								1		
Ground Floor	3			1	5					1	4											1		1	1					
Subtotals	3	42	9	1	5	5	33	18	18	1	36	9	10	1	1	1	38	38	4	2	4	1	9	1	1	1	1	5	1	1
TOTAL			54					59																						184
Percentage			11%					12%																						38%
BARRIER FREE SUITES (hatched in grey)																														
Required (15%)	9			37																										
Provided	9			38																										

	2 BED																				2BED+D									Totals
SUITE TYPES	2-A	2-B	2-C	2-D	2-E	2-F	2-G	2-H	2-I	2-J	2-K	2-L	2-M	2-N	2-O	2-P	2-Q	2-R	2-S	2-T	2D-A	2D-B	2D-C	2D-D	2D-E	2D-F	2D-G	2D-H	2D-I	59
AREA (sm)	57.8	58.9	59.7	60.8	61.0	61.4	63.2	63.8	64.1	64.7	65.0	65.9	67.8	68.3	69.4	69.7	70.9	71.3	71.4	73.5	74.1	75.2	78.2	78.4	82.9	84.2	87.2	88.4	133.6	
AREA (sf)	622	634	643	656	657	661	680	687	690	696	700	709	728	735	747	750	763	767	769	791	798	809	842	844	892	906	939	952	1,438	
16																2				2			4							24
15																2				2			4							24
14																2				2			4							24
13																2				2			4							24
12																2				2			4							24
11																2				2			4							24
10																2				2			4							24
9																2				2			4							24
8																2				2			4							24
7																2							2							15
6		1	1	1	1	1	2		1	1	1		1	2				1	1		2	1			1			1	1	47
5		1	1	1	1	1	2		1	1	1		1	2				1	1		2	1			1			1	1	47
4		1	1	1	1	1	2		1	1	1		1	2				1	1		2	1			1			1	1	47
3		1	1	1	1	1	2		1	1	1		1	2				1	1		2	1			1			1	1	47
2		1	1		1		2		1		1		1	1					1		2	1					1	1	1	37
Ground Floor	1						2	1				1			1		1							1		1				26
Subtotals	1	5	5	4	5	4	12	1	5	4	5	1	5	9	1	20	1	4	5	18	10	5	38	1	4	1	1	5	5	
TOTAL																				115									70	482
Percentage																				24%									15%	Suites
Required (15%)	28																													65
Provided	28																													66

BUILDING C

	BACH		1 BED		1 BED + DEN			2 BED			2 BED + DEN			Totals
SUITE TYPES	B-A	B-B	1-A	1-B	1D-A	1D-B	1D-C	2-A	2-B	2-C	2D-A	2D-B	2D-C	
AREA (sm)	39.6	40.2	49.2	50.4	56.7	58.6	59.4	65.8	66.9	68.8	75.6			
AREA (sf)	426	433	530	543	610	631	639	708	720	738	814			
6	1	1	1	8	1	1	5	1	1	1	1			22
5	1	1	1	8	1	1	5	1	1	1	1			22
4	1	1	1	8	1	1	5	1	1	1	1			22
3	1	1	1	8	1	1	5	1	1	1	1			22
2	1	1	1	8	1	1	5	1	1	1	1			22
Ground Floor														0
Subtotals	5	5	5	40	5	5	25	5	5	5	5	0	0	
TOTAL		10		45			35			15			5	110
Percentage		9%		40%			32%			14%			5%	Suites
BARRIER FREE SUITES (hatched in grey)														
Required (15%)	2		12					3						15
Provided	5		25					5						30

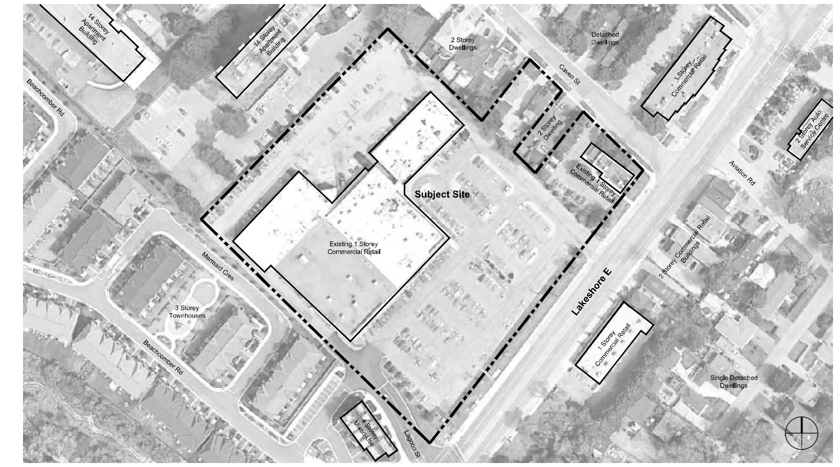
BUILDING D

	BACH			1 BED					1 BED + DEN				2 BED				2 BED + DEN			Totals
SUITE TYPES	B-A	B-B	B-C	1-A	1-B	1-C	1-D	1-E	1D-A	1D-B	1D-C	1D-D	2-A	2-B	2-C	2-D	2D-A	2D-B	2D-C	
AREA (sm)	33.1	35.1	40.2	44.8	49.2	50.4	0.0	0.0	58.6	60.4			61.8	65.7	71.4	71.6	75.6			
AREA (sf)	356	378	433	482	530	543	0	0	631	650	0	0	665	707	769	770	814	0	0	
6		1	1		1	11			1	8			1	1	1	1	2			29
5	3	1	1	3	1	11			1	8			1	1	1	1	2			35
4	3	1	1	3	1	11			1	8			1	1	1	1	2			35
3	3	1	1	3	1	11			1	8			1	1	1	1	2			35
2	3	1	1	3	1	11			1	8			1	1	1	1	2			35
Ground Floor																				0
Subtotals	12	5	5	12	5	55	0	0	5	40	0	0	5	5	5	5	10	0	0	
TOTAL			22					72				45				20			10	169
Percentage			13%					43%				27%				12%			5%	Suites
BARRIER FREE SUITES (hatched in grey)																				
Required (15%)	4			18									5							23
Provided	5			40									5							45

BUILDING A, B, C AND D

	BACH		1 BED		1 BED+DEN		2 BED		2 BED+DEN		Totals
SUITE TYPES	Requested	Providing	Requested	Providing	Requested	Providing	Requested	Providing	Requested	Providing	
Building A		0		0		225		25		59	309
Building B		54		59		184		115		70	482
Building C		10		45		35		15		5	110
Building D		22		72		45		20		10	169
Subtotals	N/A	86	N/A	176	N/A	489	N/A	175	N/A	144	
TOTAL		86		176		489		175		144	1070
AVG. AREA (sm)		35.638	51.1	38.9	62.7	57.339	74.3	65.881	85.9	83.785	
AVG. AREA (sf)		383.6	550.04	418.72	674.9	617.2	799.77	709.14	924.63	901.86	
Percentage	10%	8%	15%	17%	45%	46%	20%	16%	10%	13%	
BARRIER FREE SUITES (hatched in grey)											
Required (15%)	13		100				48				148
Provided	13		100				48				148

1 A101 Context Plan
SCALE: N/A



2 A101 Key Plan
SCALE: N/A

PROJECT STATISTICS

BUILDING A

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	0225-2007, C4-14 GFA Exempt* (sm)	City-Wide By-Law 0225-2007, C4-14 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	STUDIO	1B	1B+D	2B	2B+D	Total Suites	Retail Useable sm	Retail Useable sf
MPH	215.2	1	215.2	2,316		0.0	0			0	0	0	0	0	0	0.0	0
Level 8-16	1,031.7	9	9,285.3	99,947	447	8,838.1	55,134			0	0	72	18	36	126	0.0	0
Level 7	1,031.7	1	1,031.7	11,105	962	69.3	746			0	0	0	0	0	0	0.0	0
Level 3-6	2,199.0	4	8,796.0	94,680	199	8,597.3	52,541			0	0	112	4	16	132	0.0	0
Level 2	2,199.0	1	2,199.0	23,670	50	2,013.7	21,675			0	0	21	2	4	27	0.0	0
Ground	2,184.0	1	2,184.0	23,509	318	1,854.2	19,959	0	0	0	0	20	1	3	24	0.0	0
Building A Total			23,711.2	255,227		21,372.6	230,055	0	0	0	0	225	25	59	309	0.0	0
			Required Amenity to be deducted from GFA =			618 sm (2sm/unit)				0%	0%	73%	8%	19%	100%		

Residential GFA = 20,755 sm
Non-Residential GFA = 0 sm
Total GFA for Density Calculation = 20,754.6 sm

BUILDING B

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	0225-2007, C4-14 GFA Exempt* (sm)	City-Wide By-Law 0225-2007, C4-14 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	STUDIO	1B	1B+D	2B	2B+D	Total Suites	Retail Useable sm	Retail Useable sf
MPH	338.4	1	338.4	3,643		0.0	0			0	0	0	0	0	0	0.0	0
Level 8-16	1616.9	9	14,552.1	156,639	561	13,990.9	150,598			9	18	117	36	36	216	0.0	0
Level 7	1616.9	1	1,616.9	17,404	605	1,011.7	10,890			0	0	11	2	2	15	0.0	0
Level 3-6	3203.8	4	12,815.2	137,943	1,260	11,555.0	124,378			36	28	40	60	24	188	0.0	0
Level 2	3203.8	1	3,203.8	34,486	365	2,839.1	30,561			6	7	8	10	6	37	0.0	0
Ground	3171.5	1	3,171.5	34,138	600	2,571.2	27,677	0	0	3	6	8	7	2	26	0.0	0
Building B Total			35,697.9	384,252		31,968.0	344,103	0	0	54	59	184	115	70	482	0.0	0
			Required Amenity to be deducted from GFA =			964 sm (2sm/unit)				11%	12%	38%	24%	15%	100%		

Residential GFA = 31,004 sm
Non-Residential GFA = 0 sm
Total GFA for Density Calculation = 31,004.0 sm

BUILDING C

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	0225-2007, C4-14 GFA Exempt* (sm)	City-Wide By-Law 0225-2007, C4-14 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	STUDIO	1B	1B+D	2B	2B+D	Total Suites	Retail Useable sm	Retail Useable sf
MPH	219.8	1	219.8	2,366	0	0.0	0			0	0	0	0	0	0	0.0	0
Level 6	1360.7	1	1,360.7	14,647	33	1,327.7	14,291			2	9	7	3	1	22	0.0	0
Leve 3-5	1360.7	3	4,082.1	43,940	99	3,983.1	42,874			6	27	21	9	3	66	0.0	0
Level 2	1360.7	1	1,360.7	14,647	33	1,327.7	14,291			2	9	7	3	1	22	0.0	0
Ground	2031.4	1	2,031.4	21,866	169	308.5	3,321	1,554	16,727	0	0	0	0	0	0	1,554.0	16,727
Building C Total			9,054.7	97,465		6,947.0	74,778	1,554	16,727	10	45	35	15	5	110	1,554.0	16,727
			Required Amenity to be deducted from GFA =			220 sm (2sm/unit)				9%	41%	32%	14%	5%	100%		

Residential GFA = 6,727 sm
Non-Residential GFA = 1,554 sm
Total GFA for Density Calculation = 8,281.0 sm

BUILDING D

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	0225-2007, C4-14 GFA Exempt* (sm)	City-Wide By-Law 0225-2007, C4-14 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	STUDIO	1B	1B+D	2B	2B+D	Total Suites	Retail Useable sm	Retail Useable sf
MPH	225	1	225.0	2,422		0.0	0			0	0	0	0	0	0	0.0	0
Level 6	1810.4	1	1,810.4	19,487	33	1,777.4	19,132			2	12	9	4	2	29	0.0	0
Level 3-5	2056.7	3	6,170.1	66,415	99	6,071.6	65,354			16	45	27	12	6	106	0.0	0
Level 2	2056.7	1	2,056.7	22,138	33	2,023.9	21,785			5	15	9	4	2	35	0.0	0
Ground	2711.3	1	2,711.3	29,184	349	596.2	6,417	1,767	19,015	0	0	0	0	0	0	1,776.0	19,117
Building D Total			12,973.5	139,647		10,469.0	112,688	1,767	19,015	22	72	45	20	10	169	1,776.0	19,117
			Required Amenity to be deducted from GFA =			338 sm (2sm/unit)				13%	43%	27%	12%	6%	100%		

Residential GFA = 10,131 sm
Non-Residential GFA = 1,767 sm
Total GFA for Density Calculation = 11,897.5 sm

BELOW GRADE PARKING

Floor	GBA/Typ. Floor (sm)	No. Typ. Floors	GBA Gross Building Area (no exclusions) sm	GBA sf	0225-2007, C4-14 GFA Exempt* (sm)	City-Wide By-Law 0225-2007, C4-14 GFA (Res) sm	GFA (Res) sf	GFA (Non-Res) sm	GFA (Non-Res) sf	NOTE
P1	20685	1	20,685.0	222,653	58	20,627.2	222,031.2			See parking statistics below.
P2	20685	1	20,685.0	222,653	50	20,625.2	222,009.7			
P3	20685	1	20,685.0	222,653	50	20,625.2	222,009.7			
TOTAL GBA AND GFA BELOW GRADE			41,370.0	445,307		61,877.6	666,050			

TOTAL DEVELOPMENT

TOTAL GBA ABOVE GRADE	sm	sf	TOTAL GFA ABOVE GRADE	sm	sf	NUMBER OF UNITS	STUDIO	1B	1B+D	2B	2B+D	
BUILDING A	23,711	255,227	BUILDING A	20,755	223,403	BUILDING A	0	0	225	25	59	309
BUILDING B	35,698	384,252	BUILDING B	31,004	333,727	BUILDINGB	54	59	184	115	70	482
BUILDING C	9,055	97,465	BUILDING C	8,281	89,137	BUILDING C	10	45	35	15	5	110
BUILDING D	12,974	139,647	BUILDING D	11,897	128,064	BUILDING D	22	72	45	20	10	169
						TOTAL	86	175	489	175	144	1070
						%	8%	16%	46%	16%	13%	
TOTAL GBA =	81,437	876,591	TOTAL GFA =	71,937	774,330	TOTAL UNIT=			1,070			

FSI

		sf		NOTE
Gross Site Area	24,239.00 sm	260,909	Gross FSI: 2.97	
RES GFA	68,617 sm	738,588	(Total GFA ABOVE GRADE/Gross Site Area)	
NON-RES GFA	3,321 sm	35,742		
Total GFA (above + below grade)	133,815 sm	1,440,381		

VEHICULAR PARKING

Parking Breakdown
Required

Residential - Occupant					
Studio	1.0	x	86		86
1B	1.0	x	176		176
1B+D	1.0	x	489		489
2B	1.0	x	175		175
2B+D	1.0	x	144		144
Total					1070
Shared Visitor/Retail					
0.2/unit	0.2	x	1070		214
Total				Total	1284 spaces
Accessible Spaces	34	1 space + 3% of total			
Included in TOTAL above					

BICYCLE & STORAGE LOCKERS

Bicycle Zone 1					Required	Provided
Residential						
Long-Term	0.6/unit	0.6	x	1,070	642	701
Short-Term	0.05/unit	0.05	x	1,070	50	67
Retail (Long-Term)	0.15 spaces per 100m2	0.15	x	3,321.00	5	5
Retail (Short-Term)	0.25 spaces per 100m2	0.2	x	3,321.00	7	7
					704	780
TOTAL	Required	Provided				
Class A (Long-Term)	647	706				
Class B (Short-Term)	60	74				
Storage Lockers						
Total Locker/Storage Provided				1757		

LOADING

			Required	Provided
Residential				
BUILDING A	> 30 Dwelling Units	Type G	1	1
BUILDING B	> 30 Dwelling Units	Type C & G	1	1
Retail	3,321.00 sm	Type C & G	2	2
BUILDING C	1554 sm			
BUIDLING D	1766.5 sm			
TOTAL			4	4

*One per apartment containing minimum of 30 dwelling units

VEHICULAR PARKING LOCATION

Parking Space Location
Provided

Level	RESIDENTIAL	Shared Visitor/Retail	TOTAL
Surface	X	27	27
P1	296	187	483
P2	499	X	499
P2	332	X	332
TOTAL	1127	214	1341
EV Parking Spaces	20% of Total Residential Parking Spaces		214
	10% of Shared Visitor/Retail Parking Spaces		21

AMENITY SPACE

Residential		Required	Provided
TOTAL Res Amenity	5.0sm/dwelling unit	5,350.00 sm	3,958.50 sm
Total Interior Amenity	min. 2 sm/dwelling unit	2,140.00 sm	1,879.70 sm
Required Indoor Amenity Deducted from Gross Floor Area			
Building A			912.8 sm
Building B			966.9 sm
Building C			0 sm
Building D			0 sm
Total Outdoor Amenity	min. 3 sm/dwelling unit	3,210.00 sm	2078.80 sm
Bulding A			755.3 sm
Building B			1323.5 sm
Building C			0 sm
Bluding D			0

NOTES

RGFA Exclusions assumed above:
*as per By-law 0225-2007, C4-14 Zone Gross Floor Area is reduced by;

any part of the building used for mechanical floor area, stairwells, elevators, motor vehicle parking, bicycle parking, storage lockers, below-grade storage, any enclosed area used for the collection or storage of disposable or recyclable waste generated within the building, common facilities for the use of the residents of the building, a day care and amenity area

*NRGFA as per By-law - 0225-2007, C4-14 Zone, NRGFA excludes the following;

(1) any part of the building, structure or part thereof used for mechanical floor area; (2) areas of stairwells, washrooms or elevators; (3) any enclosed area used for the collection or storage of disposable or recyclable waste generated within the building or structure or part thereof; (4) any part of the building or structure or part thereof above or below established grade used for motor vehicle parking or the provision of loading spaces; (5) any part of the building, structure or part thereof below established grade used for storage incidental to other uses in the building, structure or part thereof or provided and reserved for the personal needs of the occupants of the building, structure or part thereof including lunch rooms, lounges or fitness rooms; (6) accessory outdoor tank. (0379-2009)

3 A101 Project Statistics
SCALE: N/A

G:\17125-579 to 603 lakeshore rd e\Drawings\Arch\CAD\2022-06-29 rezoning package\17125 - A100- stats- context.dwg, 2022-07-12 4:31pm

REZONING REVISION
REVISION RECORD

2022-07-11 REZONING APPLICATION
ISSUE RECORD

BDP. Quadrangle

Quadrangle Architects Limited
901 King Street West, Suite 701 Toronto, ON M5V 3H5
t 416 598 1240 www.bdpquadrangle.com

579, 619 Lakeshore Road East and 1022, 1028 Caven Street

17125	N/A	AR	KVE
PROJECT	SCALE	DRAWN	REVIEWED

Context Plan and Statistics

A100

Existing 14 Storey Apartment Building

Existing 4 Storey Dwellings

Existing 4
Storey Dwellings

Existing 4
Storey Dwellings

Existing 2 Storey Dwelling

Existing 2 Storey Dwelling

Existing 2 Storey Dwelling

Existing 2 Storey Dwelling

Existing 2 Storey Dwelling

Existing 2
Semi-Detached
Storey Dwelling

PROPERTY LINE

4.5m LANDSCAPE BUFFER

PRIVATE PATIOS

BUILDING A
16 STOREY
RESIDENTIAL TOWER

GROUND FLOOR FFE = 82.10

AVERAGE GRADE = 82.18

BUILDING HEIGHT = 52.72m

134.45 TOFR

6TH FLOOR ROOF

102.00 TOFR

STORM SEWER EASEMENT

LANDSCAPE BUFFER

PROPERTY LINE

PROPOSED PRIVATE DRIVEWAY

Ramp

DROP-OFF

PROPOSED SIAMESE CONNECTION

FIRE HYDRANT

OUTLINE OF GROUND FLOOR

6TH FLOOR ROOF

102.00 TOFR

BUILDING B
16 STOREY
RESIDENTIAL TOWER
WEST

GROUND FLOOR FFE = 82.10

AVERAGE GRADE = 82.05

BUILDING HEIGHT = 52.85m

134.45 TOFR

BUILDING B
16 STOREY
RESIDENTIAL TOWER
EAST

GROUND FLOOR FFE = 82.10

AVERAGE GRADE = 82.05

BUILDING HEIGHT = 52.85m

134.45 TOFR

PROPOSED PRIVATE DRIVEWAY

DROP-OFF

PROPOSED SIAMESE CONNECTION

FIRE HYDRANT

PROPOSED PRIVATE DRIVEWAY

PROPOSED SIAMESE CONNECTION

FIRE HYDRANT

RETAIL GROUND LEVEL ROOF

89.36 TOFR

BUILDING C
6 STOREY RESIDENTIAL

GROUND FLOOR FFE = 81.96

AVERAGE GRADE = 81.53

BUILDING HEIGHT = 24.23m

105.31 TOFR

5 STOREY

101.36 TOFR

RETAIL GROUND LEVEL ROOF

89.36 TOFR

BUILDING D
6 STOREY RESIDENTIAL

GROUND FLOOR FFE = 81.80

AVERAGE GRADE = 81.71

BUILDING HEIGHT = 24.05m

105.31 TOFR

Proposed Recreation Path

5.0m LANDSCAPE BUFFER

PROPERTY LINE

27 SHARED VISITOR/RETAIL PARKING SPACES

PROPOSED LAY-BY PARKING

PROPOSED LAY-BY PARKING

Caven Street

Lakeshore Road East

LASCON STREET

PROPERTY LINE

PROPERTY LINE

PARKING NOTES:

1. MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
   - 2600mm WIDE X 5200mm LONG (NO SIDES OBSTRUCTED)
   - 2900mm WIDE X 5200mm LONG (ONE SIDE OBSTRUCTED)
   - 3200mm WIDE X 5200mm LONG (TWO SIDES OBSTRUCTED)
2. MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 7000mm UNLESS OTHERWISE NOTED.
3. MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2100mm THROUGHOUT.

PARKING LEGEND:

- RESIDENTIAL PARKING SPACE
- VISITOR PARKING SPACE
- RETAIL PARKING SPACE
- BIKE/STORAGE LOCKER (1830x915)
- BIKE PARKING (STACKED - 3900x916)
- BIKE PARKING (HORIZONTAL - 1800X600)
- BIKE PARKING (VERTICAL - 1200x600)
- PAINTED LINES

TYPICAL · ONE SIDE OBSTRUCTED · FUTURE EV(E) CHARGING STATION PAINTED ONLY

ACCESSIBLE · ACCESSIBLE + TYPE A · ACCESSIBLE + TYPE B

LEGEND

- BUILDING ENTRANCE (PRIMARY)
- BUILDING ENTRANCE (SECONDARY)
- BUILDING EXIT
- PARKING ENTRANCE
- LOADING ENTRANCE
- 80.00 PROPOSED GRADE
- 80.00 EXISTING GRADE
- 100.00 TOFR TOP OF FINISHED ROOF
- PROPERTY LINE
- FIRE ROUTE
- SETBACK/ EASEMENT LINE
- LINE OF BUILDING
- LINE OF BUILDING AT GRADE
- LINE OF BUILDING BELOW GRADE

REZONING REVISION

REVISION RECORD

2022-07-11 REZONING APPLICATION

ISSUE RECORD

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t 416 598 1240 www.bdpquadrangle.com

579, 619 Lakeshore Road East and 1022, 1028 Caven Street

17125 PROJECT · 1:250 SCALE · AR DRAWN · KVE REVIEWED

Site Plan

A101

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS		
DATE	DETAILS	INIT.
NOV 00	AS CONSTRUCTED	EWK

LAKESHORE ROAD

SEE PLAN 24971-D

SEE PLAN 24974-D

SEE PLAN 23358-D

CAVEN ST

CAWTHA RD

AVIATION

CANADIAN TIRE

K.F.C.

Ex WM TO BE ABANDONED

300 Gv & B CAP & CO BACK TO TEE

200 v & B

45° BENDS

PROP 300 WM

3.5m

300 x 200 TEE & 200 v & B

300 Gv & B

300 x 300 TEE

CONNECT TO Ex WM

CONNECT TO Ex WM WITH 2-45° BENDS

150 Gv & B

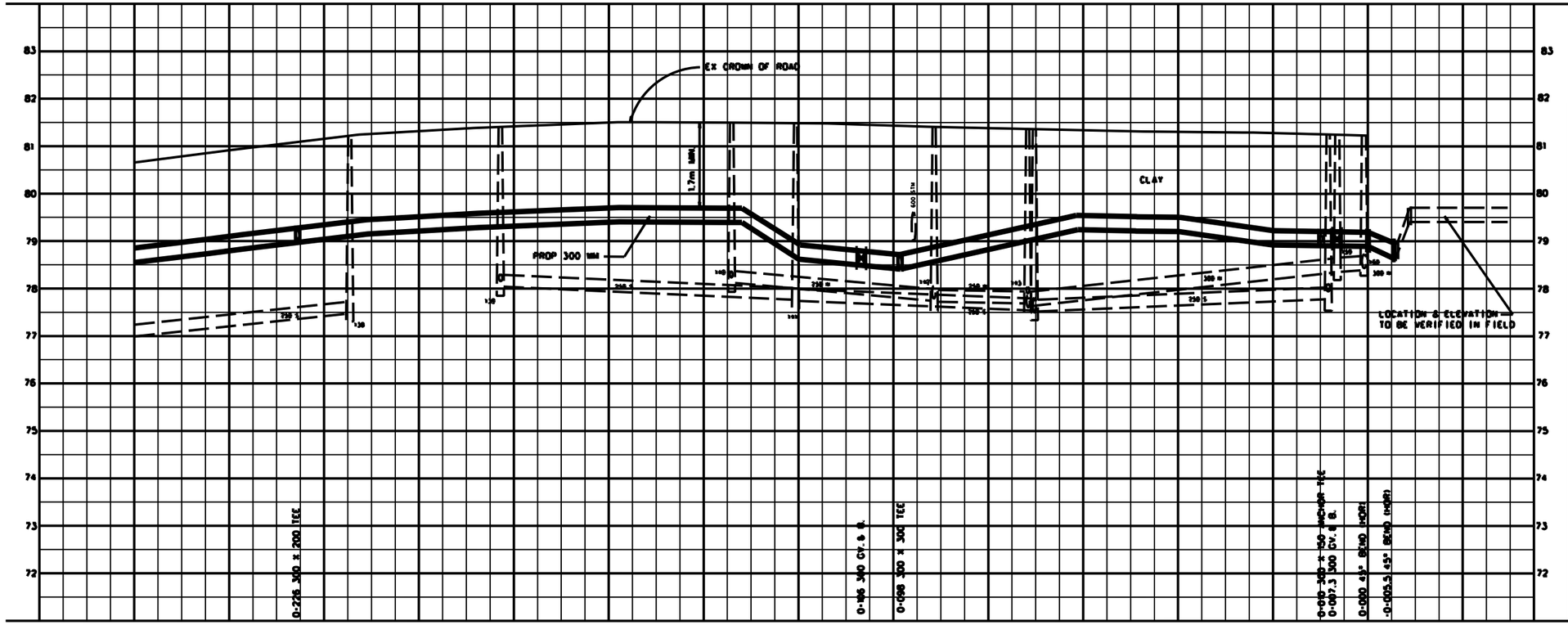
2-45° BENDS

300 x 150 ANCHOR TEE

300 PVC WM

PLUG Ex 25mm WM

FOR WM & SANITARY DETAILS & NOTES SEE DWG'S 24982-D &24983-D



78.65	78.80	79.05	79.20	79.30	79.40	79.40	79.40	78.60	78.45	78.80	79.25	79.20	78.90	78.85	78.60	79.40	EL. BOTTOM WM.
0+260	0+240	0+220	0+200	0+180	0+160	0+140		0+120	0+100	0+080	0+060	0+040	0+020	0+000			CHAINAGE

General Notes

- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD
- DENOTES BUILDING - NOT LOCATED
- DENOTES BUILDING LOCATED
- TYPE 'B' BEDDING UNLESS OTHERWISE NOTED (SAN)

B.M. NO. ELEV.

THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION LOCATION OF EXISTING UTILITIES APPROXIMATE ONLY. TO BE VERIFIED IN FIELD BY CONTRACTOR.

DESIGNED BY

CHKD.

APPROVED BY

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Public Works

LAKESHORE ROAD

from Cawtha Rd. to Mississauga Rd.

PROP. 300mm WATERMAIN

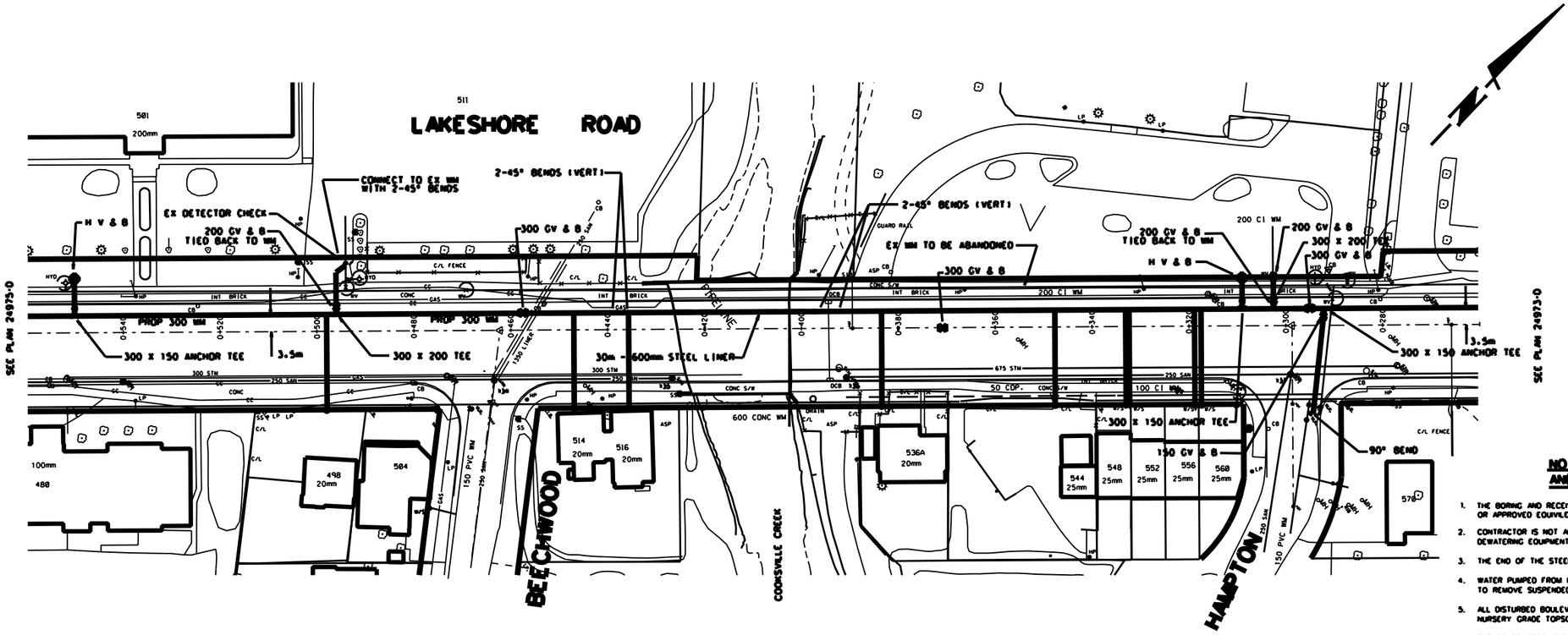
Sta. 0+000 To Sta. 0+260

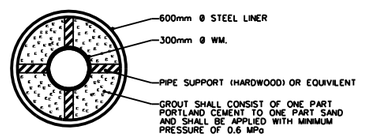
LOTS	AREA 2-7	PROJECT NO. 99-1340 WM	
CHECKED BY	DRAWN BY Ed K	PLAN NO. 24973-D	
DATE MAR 99	SHEET 1 OF 11		

24973_d.dgn 18/12/06 3:04:09 PM

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS		
DATE	DETAILS	INIT.
NOV 00	AS CONSTRUCTED	EWK



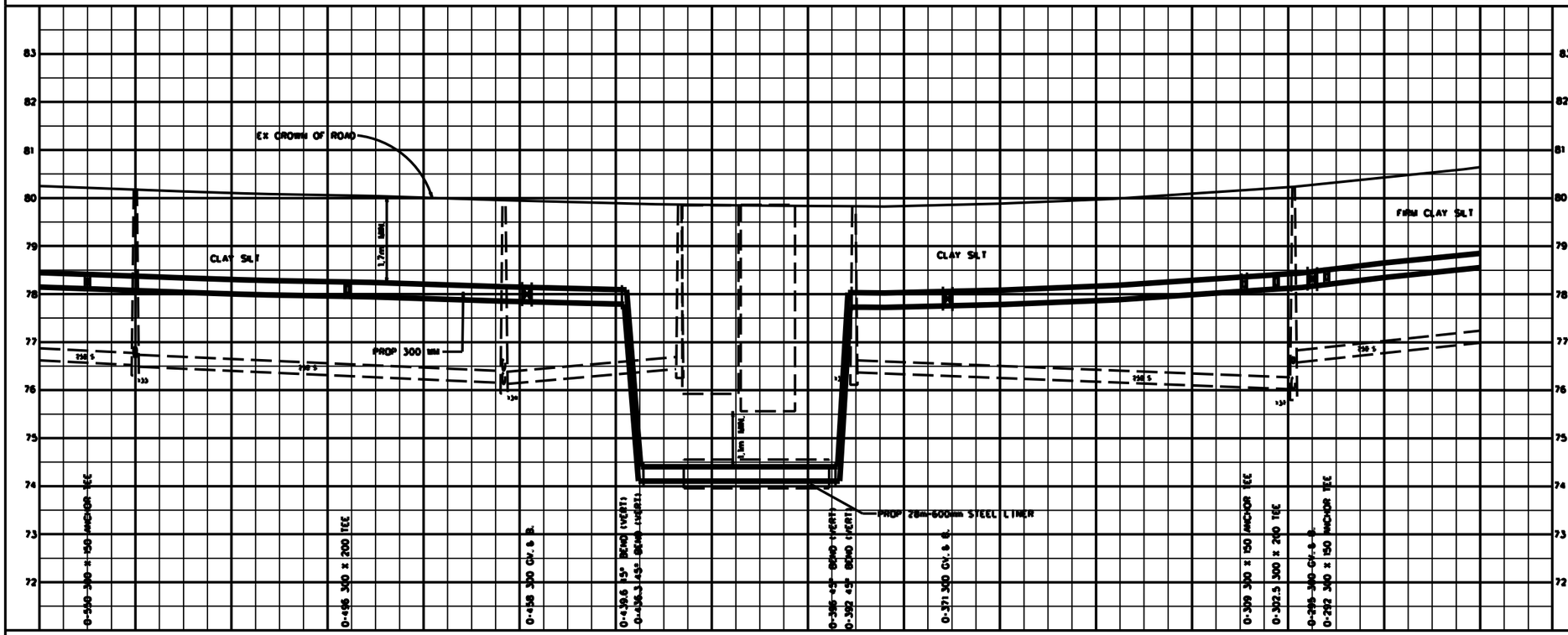


LINER DETAIL

N.T.S.

NOTES FOR THE BORE PIT AND RECEIVING PIT

1. THE BORING AND RECEIVING PITS HAVE TO BE CONSTRUCTED USING CLOSED SHEATHING OR APPROVED EQUIVILENT.
2. CONTRACTOR IS NOT ALLOWED TO WORK IN THE PITS IF HE DOES NOT HAVE SUFFICIENT DEWATERING EQUIPMENT ON SITE TO MAINTAIN THE PITS IN A DRY WORKING CONDITION.
3. THE END OF THE STEEL LINER WILL BE 0.5m MIN. FROM THE FACE OF THE BRIDGE (TUNNEL) FOOTING.
4. WATER PUMPED FROM BORING AND RECEIVING PITS TO BE DISCHARGED INTO A FILTER BAG, TO REMOVE SUSPENDED PARTICULATE TO THE SATISFACTION OF CITY OF MISSISSAUGA.
5. ALL DISTURBED BOULEVARD AREAS NEAR CREEK CHANNAL ARE TO BE REINSTATED WITH 100mm NURSERY GRADE TOPSOIL AND SODDED AS SOON AS POSSIBLE AFTER CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT SILT ON THE ROADWAY DOES NOT ENTER CREEK CHANNAL TO ACHIEVE THIS THE CONTRACTOR MAY HAVE TO ERECT SILT FENCE AND/OR PUT IN HAY BALES AS PER CITY OF MISSISSAUGA REQUIREMENT.



78.15	78.05	78.00	77.95	77.90	77.85	77.80	77.85	77.85	77.85	77.80	77.85	78.00	78.10	78.35	78.55 EL. BOTTOM WM.
0+560	0+540	0+520	0+500	0+480	0+460	0+440	0+420	0+400	0+380	0+360	0+340	0+320	0+300	0+280	0+260 CHAINAGE

General Notes

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- DENOTES BUILDING - NOT LOCATED
- DENOTES BUILDING LOCATED TYPE 'B' BEDDING UNLESS OTHERWISE NOTED (SAN)

B.M. NO. ELEV.

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DESIGNED BY | CHKD. | APPROVED BY

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL TELEPHONE COMPANY
CONSUMERS GAS COMPANY
MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ELECTRIC POWER COMM. OF ONTARIO
HYDRO ELECTRIC COMM. CITY OF MISSISSAUGA
HYDRO ELECTRIC COMM. CITY OF BRAMPTON
CABLE TELEVISION

10m 0 10 20 30m HORIZONTAL SCALE

1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Public Works

LAKESHORE ROAD

From Cawthra Rd. to Mississauga Rd.

PROP. 300mm WATERMAIN

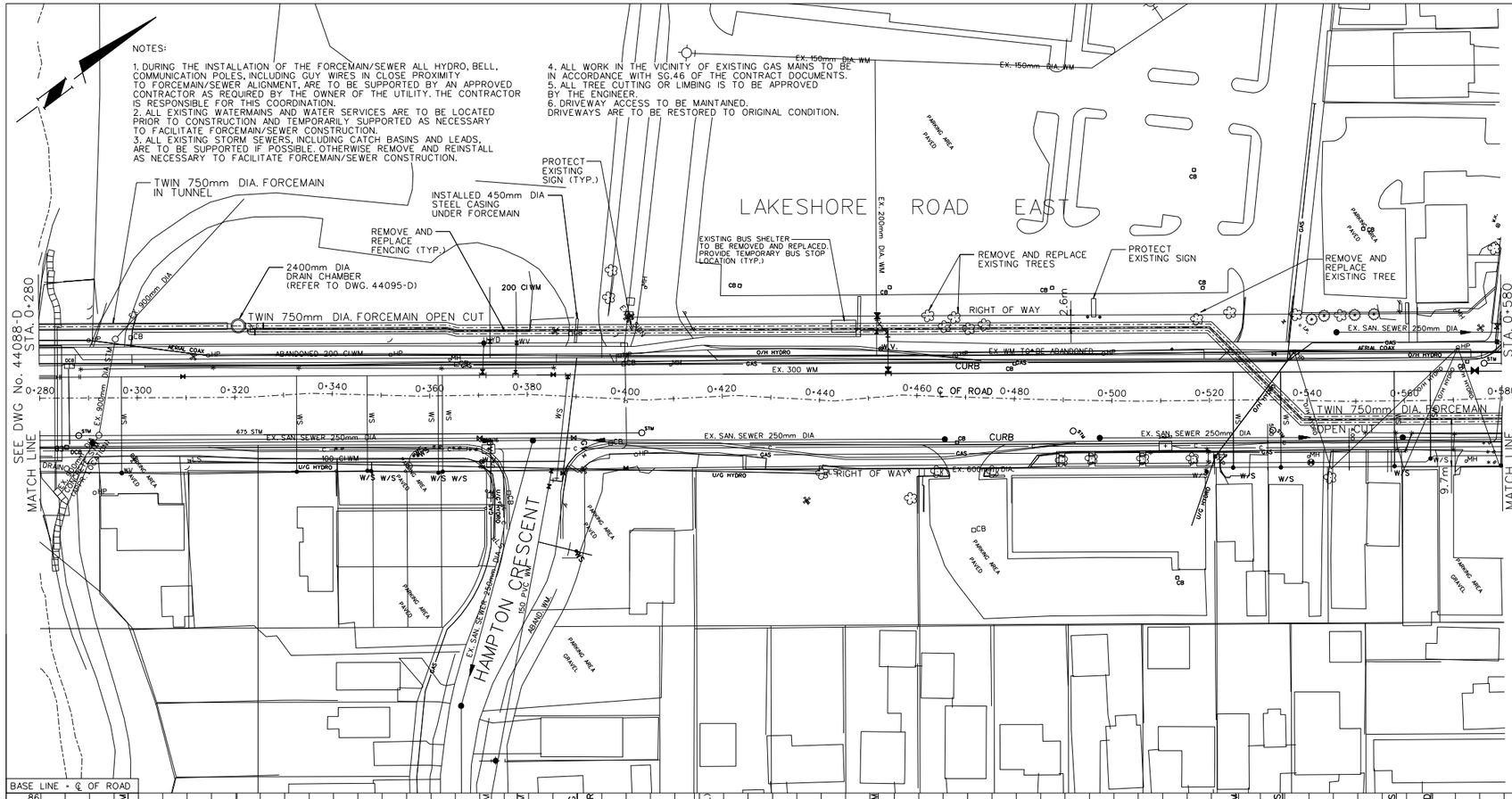
Sta. 0+260 To Sta. 0+560

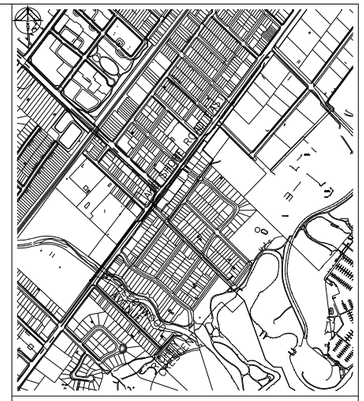
LOTS	AREA 2.7	PROJECT NO. 99-1340 WM
CHECKED BY	DRAWN BY Ed K	
DATE MAR 99	SHEET 2 OF 11	PLAN NO. 24974-D

24974_d.dgn 18/12/06 3:05:10 PM

NOTES:

1. DURING THE INSTALLATION OF THE FORCEMAIN/SEWER ALL HYDRO, BELL, COMMUNICATION POLES, INCLUDING GUY WIRES IN CLOSE PROXIMITY TO FORCEMAIN/SEWER ALIGNMENT, ARE TO BE SUPPORTED BY AN APPROVED CONTRACTOR AS REQUIRED BY THE OWNER OF THE UTILITY. THE CONTRACTOR IS RESPONSIBLE FOR THIS COORDINATION.
2. ALL EXISTING WATERMAINS AND WATER SERVICES ARE TO BE LOCATED PRIOR TO CONSTRUCTION AND TEMPORARILY SUPPORTED AS NECESSARY TO FACILITATE FORCEMAIN/SEWER CONSTRUCTION.
3. ALL EXISTING STORM SEWERS, INCLUDING CATCH BASINS AND LEADS, ARE TO BE SUPPORTED IF POSSIBLE. OTHERWISE REMOVE AND REINSTALL AS NECESSARY TO FACILITATE FORCEMAIN/SEWER CONSTRUCTION.
4. ALL WORK IN THE VICINITY OF EXISTING GAS MAINS TO BE IN ACCORDANCE WITH SG.46 OF THE CONTRACT DOCUMENTS.
5. ALL TREE CUTTING OR LIMBING IS TO BE APPROVED BY THE ENGINEER.
6. DRIVEWAY ACCESS TO BE MAINTAINED. DRIVEWAYS ARE TO BE RESTORED TO ORIGINAL CONDITION.





KEY PLAN - N.T.S.

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.
NOV. 2009	ISSUED FOR TENDER	C.S.
APR. 2012	AS CONSTRUCTED	C.S.

General Notes

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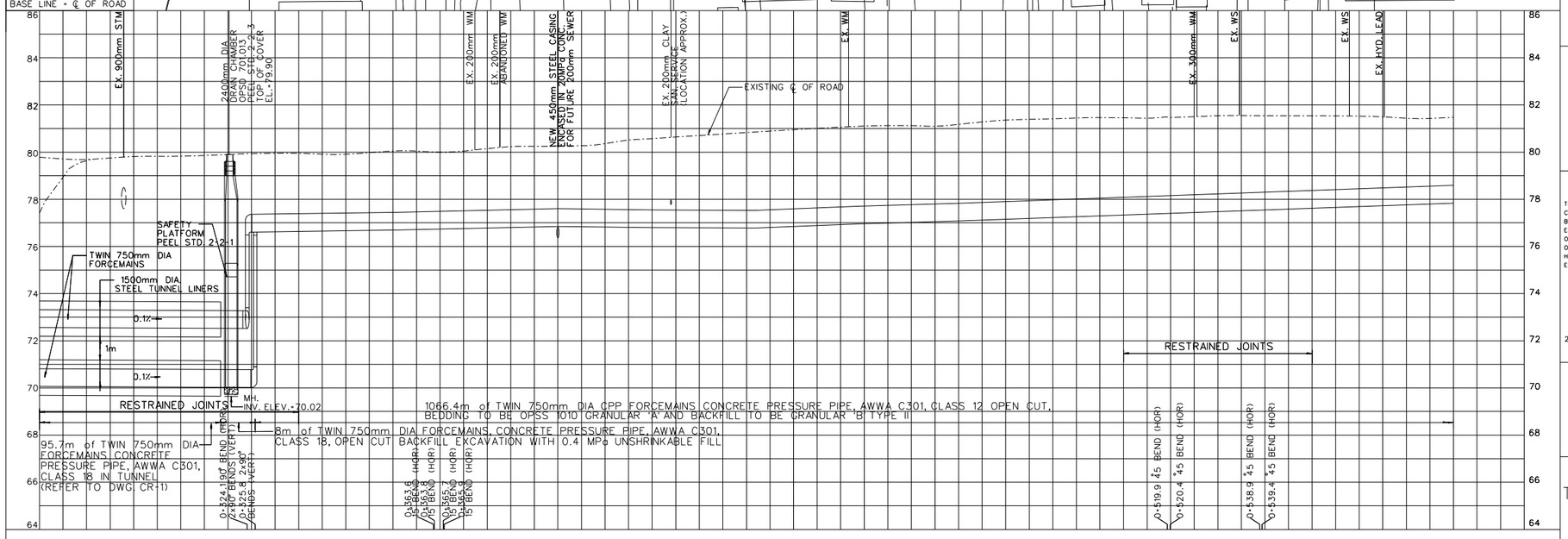
- DENOTES BUILDING LOCATED
- TYPE 'B' BEDDING UNLESS OTHERWISE NOTED (SAN)

ELEVATIONS ARE BASED ON CITY OF MISSISSAUGA DATUM AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCH 805, HAVING A PUBLISHED ELEVATION OF 80.528m. TO OBTAIN GEODETIC ELEVATIONS (1978 G.S.C. RE -ADJUSTMENT) SUBTRACT (0.121 m) FROM VALUES SHOWN HERE IN.

BENCH MARK LOCATION
ON THE NORTH FACE AT THE EAST CORNER OF CONCRETE CORNER POST OF A BRIDGE OVER COOKSVILLE CREEK, NORTH SIDE OF LAKESHORE ROAD (HIGHWAY ROAD No.2), 45.72m EAST OF BEECHWOOD AVENUE.

THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION
LOCATION OF EXISTING UTILITIES APPROXIMATE ONLY, TO BE VERIFIED IN FIELD BY CONTRACTOR

BASE LINE - ℄ OF ROAD



79.78		79.90 79.93 79.94														81.47 EXISTING GROUND	
72.56		70.02 70.02 72.52														77.88 SEWER INVERT	
0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560	0+580	℄ OF ROAD CHAINAGE	

10m 0 10 20 30m HORIZONTAL SCALE
2m 0 2 4 6m VERTICAL SCALE

GENIVAR

600 Cochrane Drive, Suite 500, Markham, ON, L3R 5K3
Telephone: (905) 475-7270 / Fax: (905) 475-5994

ORIGINALLY STAMPED BY C.G. STEPHEN ON NOV. 16, 2009

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

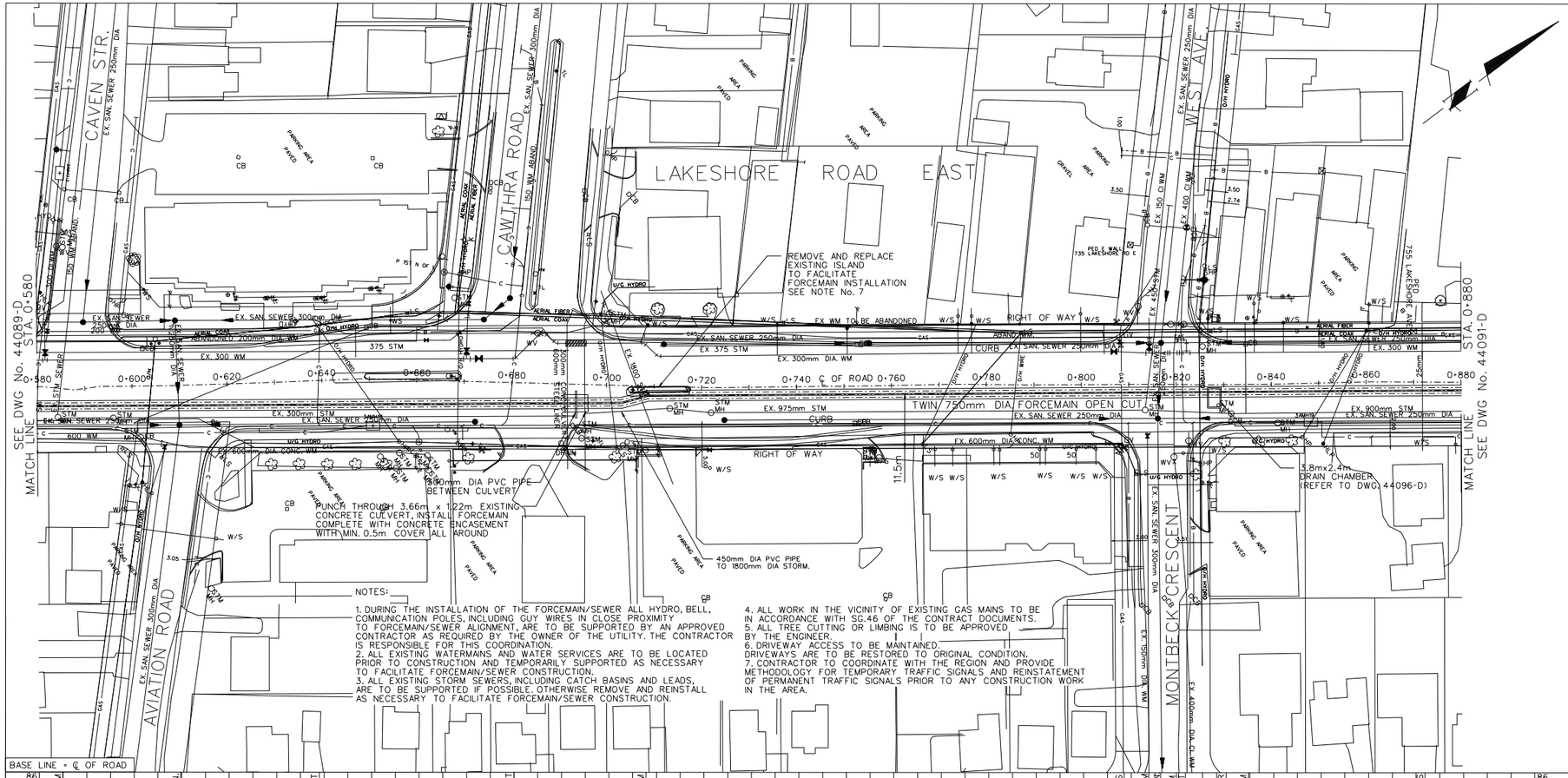
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
BELL CANADA	ENERSOURCE TELECOM
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	HYDRO ONE TELECOM
ONTARIO MINISTRY OF TRANSPORTATION	ROGERS CABLE
ONTARIO CLEAN WATER AGENCY	ALLSTREAM
HYDRO ONE NETWORKS	PSN (PUBLIC SECTOR NETWORK)
ENERSOURCE, HYDRO MISSISSAUGA	FUTUREWAY (FCI BROADBAND)

Region of Peel
Working for you

PORT CREDIT
TRUNK SEWERS AND FORCEMAINS

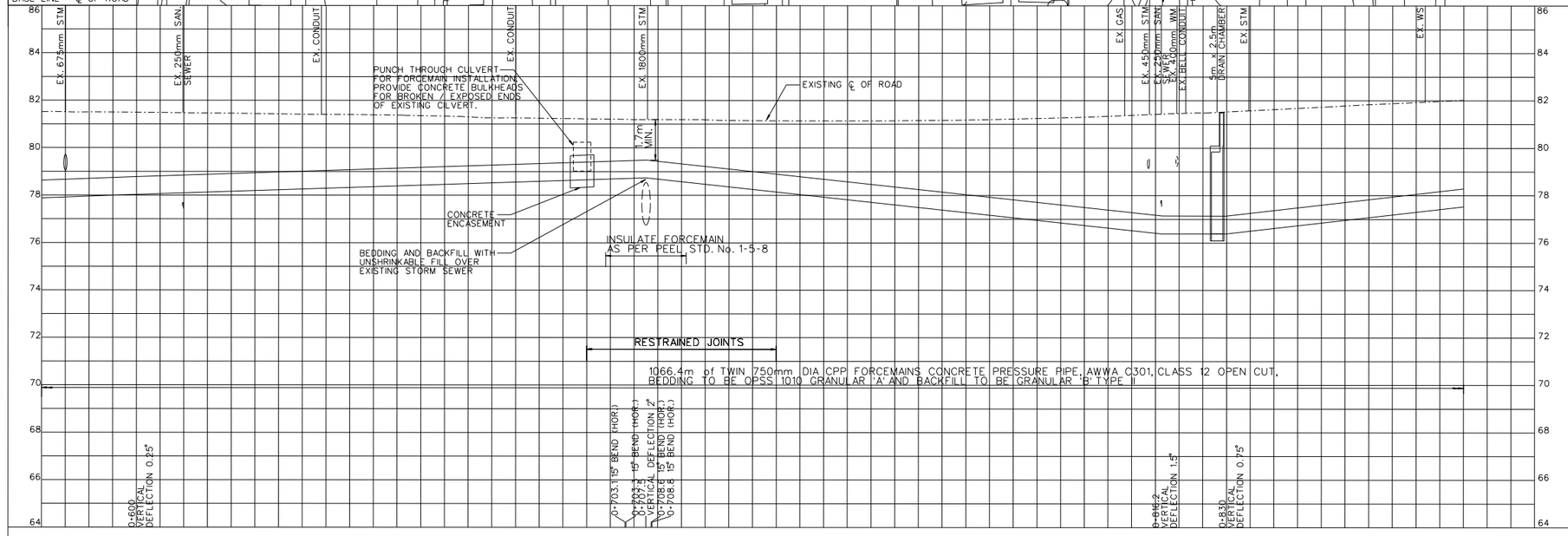
LAKESHORE ROAD EAST
Sta. 0+280 To Sta. 0+580

CAD Area	Area	Z-07	Project No. 09-2406S
Checked by CGS	Drawn by	KK	
Date MARCH 2008	Sheet	2 of 7	Plan No. 44089-D

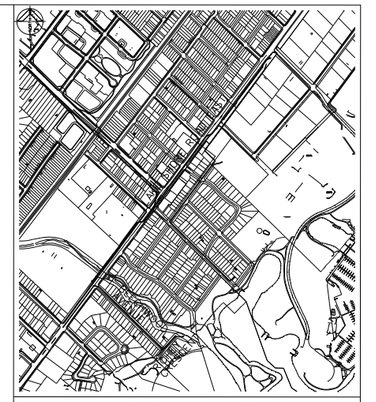


NOTES:

1. DURING THE INSTALLATION OF THE FORCEMAIN/SEWER ALL HYDRO, BELL, COMMUNICATION POLES, INCLUDING GUY WIRES IN CLOSE PROXIMITY TO FORCEMAIN/SEWER ALIGNMENT, ARE TO BE SUPPORTED BY AN APPROVED CONTRACTOR AS REQUIRED BY THE OWNER OF THE UTILITY. THE CONTRACTOR IS RESPONSIBLE FOR THIS COORDINATION.
2. ALL EXISTING WATERMAINS AND WATER SERVICES ARE TO BE LOCATED PRIOR TO CONSTRUCTION AND TEMPORARILY SUPPORTED AS NECESSARY TO FACILITATE FORCEMAIN/SEWER CONSTRUCTION.
3. ALL EXISTING STORM SEWERS, INCLUDING CATCH BASINS AND LEADS, ARE TO BE SUPPORTED IF POSSIBLE. OTHERWISE REMOVE AND REINSTALL AS NECESSARY TO FACILITATE FORCEMAIN/SEWER CONSTRUCTION.
4. ALL WORK IN THE VICINITY OF EXISTING GAS MAINS TO BE IN ACCORDANCE WITH SG.46 OF THE CONTRACT DOCUMENTS.
5. ALL TREE CUTTING OR LIMBING IS TO BE APPROVED BY THE ENGINEER.
6. DRIVEWAY ACCESS TO BE MAINTAINED. DRIVEWAYS ARE TO BE RESTORED TO ORIGINAL CONDITION.
7. CONTRACTOR TO COORDINATE WITH THE REGION AND PROVIDE METHODOLOGY FOR TEMPORARY TRAFFIC SIGNALS AND REINSTATEMENT OF PERMANENT TRAFFIC SIGNALS PRIOR TO ANY CONSTRUCTION WORK IN THE AREA.



81.47																	82.03	EXISTING GROUND
73.44																	78.22	SEWER INVERT
0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	℄ OF ROAD CHAINAGE		



KEY PLAN - N.T.S.

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
TRANSIT			ONT. HYDRO		
PARKS & REC.			CTV		
ONT. CLEAN WATER					

REVISIONS

DATE	DETAILS	INIT.
NOV. 2009	ISSUED FOR TENDER	C.S.
APR. 2012	AS CONSTRUCTED	C.S.

General Notes

- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD
- DENOTES BUILDING - NOT LOCATED
- DENOTES BUILDING LOCATED
- TYPE 'B' BEDDING UNLESS OTHERWISE NOTED (SAN)

ELEVATIONS ARE BASED ON CITY OF MISSISSAUGA DATUM AND WERE DERIVED FROM CITY OF MISSISSAUGA BENCH 805, HAVING A PUBLISHED ELEVATION OF 80.528m. TO OBTAIN GEODETIC ELEVATIONS (1978 G.S.C. RE -ADJUSTMENT) SUBTRACT (0.121 m) FROM VALUES SHOWN HERE IN.

BENCH MARK LOCATION
ON THE NORTH FACE AT THE EAST CORNER OF CONCRETE CORNER POST OF A BRIDGE OVER COOKSVILLE CREEK, NORTH SIDE OF LAKESHORE ROAD (HIGHWAY ROAD No.2), 45.72m EAST OF BEECHWOOD AVENUE.

THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION
LOCATION OF EXISTING UTILITIES APPROXIMATE ONLY, TO BE VERIFIED IN FIELD BY CONTRACTOR

GENIVAR
600 Cochrane Drive, Suite 500, Markham, ON, L3R 5K3
Telephone: (905) 475-7270 / Fax: (905) 475-5994

ORIGINALLY STAMPED BY C.G. STEPHEN ON NOV. 16, 2009

Designed by ____ Chkd. ____ Approved by ____

NOTICE TO CONTRACTOR
48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBREOPTIC PROVIDERS:
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
BELL CANADA	ENERSOURCE TELECOM
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	HYDRO ONE TELECOM
ONTARIO MINISTRY OF TRANSPORTATION	ROGERS CABLE
ONTARIO CLEAN WATER AGENCY	ALLSTREAM
HYDRO ONE NETWORKS	PSN (PUBLIC SECTOR NETWORK)
ENERSOURCE, HYDRO MISSISSAUGA	FUTUREWAY (FCI BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE
2m 0 2 4 6m VERTICAL SCALE

Region of Peel
Working for you

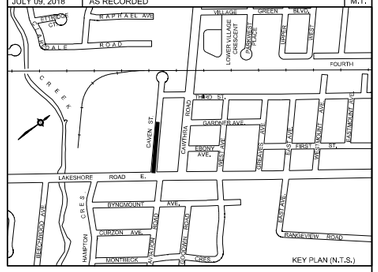
PORT CREDIT TRUNK SEWERS AND FORCEMAINS

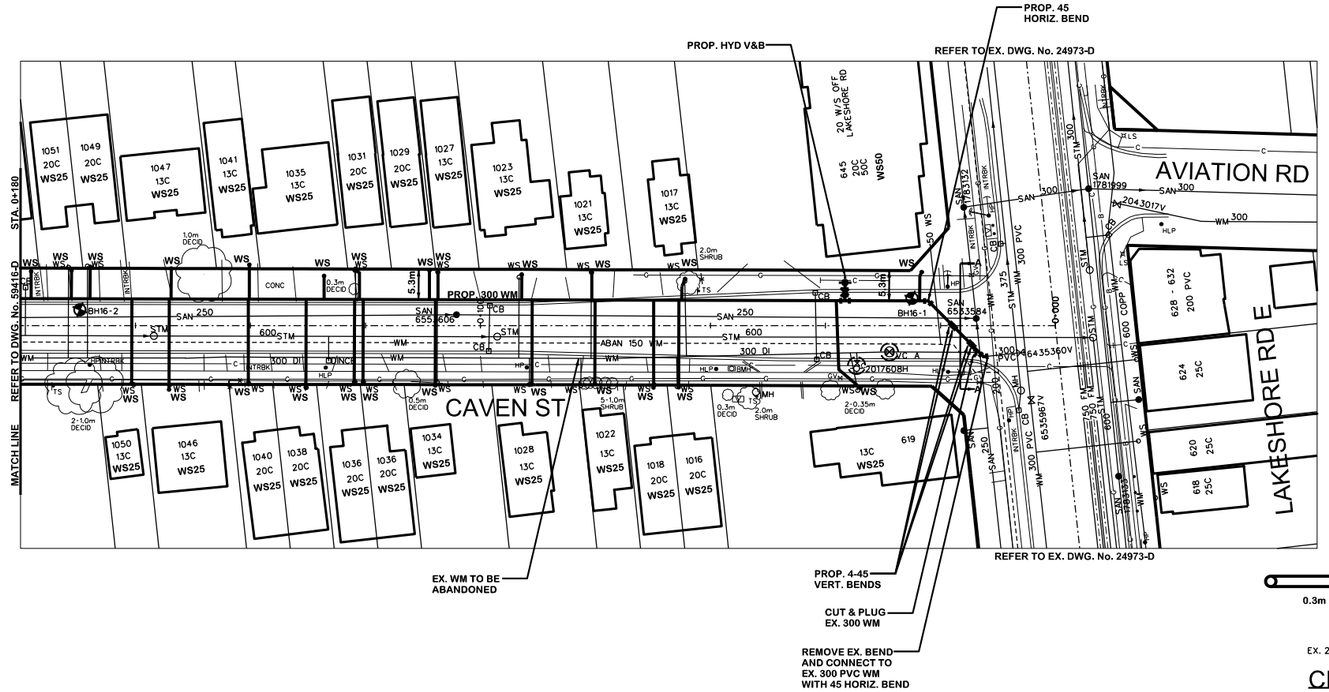
LAKESHORE ROAD EAST
Sta. 0+580 To Sta. 0+880

CAD Area	Area	Z-06	Project No. 09-2406S
Checked by CGS	Drawn by	KK	
Date MARCH 2008	Sheet	3 of 7	Plan No. 44090-D

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN SEWERS	OCT. 02, 2015	M.T.	GAS MAINS	SEPT.24, 2015	M.T.
STORM SEWERS	OCT. 02, 2015	M.T.	BELL U/G CABLE	SEPT.30, 2015	M.T.
WATERMAINS	OCT. 02, 2015	M.T.	HYDRO U/G CABLE	SEPT.24, 2015	M.T.
TRANSIT	MAY 00, 2014	M.T.	HYDRO ONE	OCT. 02, 2015	M.T.
PARKS & REC.	SEPT.28, 2015	M.T.	CTV	SEPT 18, 2015	M.T.
ONT. CLEAN WATER	OCT. 16. 2015	M.T.	COMMUNIC. CABLES	OCT. 01. 2015	M.T.

REVISIONS		
DATE	DETAILS	INIT.
JUNE 16, 2016	ISSUED FOR PUCC	M.T.
FEB. 15, 2017	ISSUED FOR TENDER	M.T.
MAY 29, 2017	ISSUED FOR CONSTRUCTION	M.T.
JULY 09, 2018	AS RECORDED	M.T.



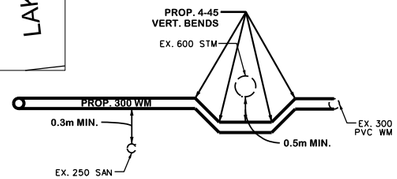


WATERMAIN

VALVES - CLOW CANADA
HYDRANTS - McAVITY M67B
WATERMAIN - PVC DR18 AWWA C900 (IPEX, BIONAX)

NOTE:

1. FOR GENERAL NOTES, DETAILS AND LEGEND SEE DWG. 59420-D

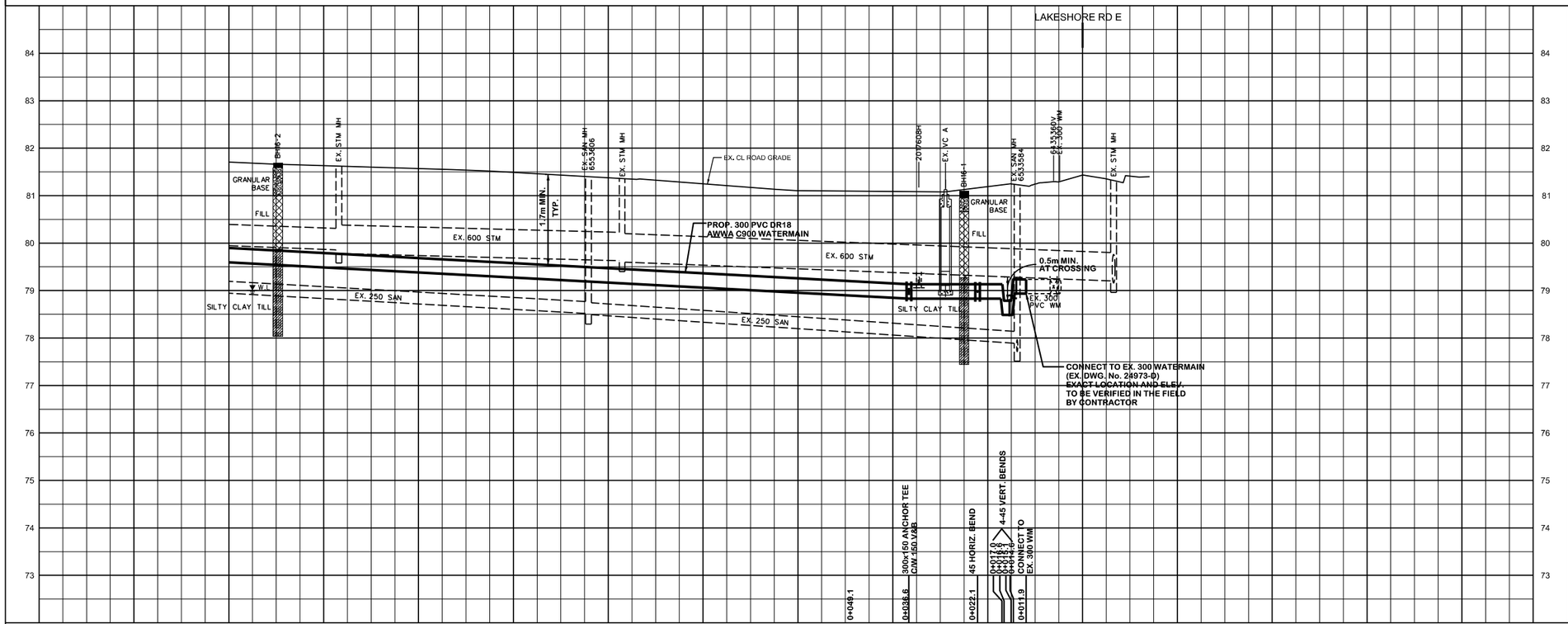


CROSS-SECTION A-A

N.T.S.

ON SHALLOW STORM PIPE, WS ARE INSTALLED UNDER EXISTING STORM SEWER

THIS DRAWING TO BE USED FOR WATERMAIN CONSTRUCTION ONLY



General Notes

All Driveways Are ASPHALT Unless Otherwise Noted
All Water And Sanitary Service Locations Are Approximate And Must Be Located Accurately In The Field
All Horizontal And Vertical Bends Are In Degrees
All Pipes Size In mm
20C Existing Water Service, Size In mm
WS25 Proposed Water Service, Size In mm
B.M. No. Elev.
Description
Location
The Contractor Is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location Of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

Designed by _____ Chkd. _____ Approved by _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
CITY OF MISSISSAUGA WORKS DEPT.
CITY OF BRAMPTON WORKS DEPT.
TOWN OF CALEDON WORKS DEPT.
BELL CANADA
ENBRIDGE INCORPORATED-GAS DISTRIBUTION
ONTARIO MINISTRY OF TRANSPORTATION
ONTARIO CLEAN WATER AGENCY
HYDRO ONE NETWORKS
ENERSOURCE, HYDRO MISSISSAUGA
HYDRO ONE BRAMPTON

CABLE TELEVISION/FIBREOPTIC PROVIDERS:
BELL CANADA
ENERSOURCE TELECOM
HYDRO ONE TELECOM
ROGERS CABLE
ALLSTREAM
PSN (PUBLIC SECTOR NETWORK)
FUTUREWAY (FCB BROADBAND)

10m 0 10 20 30m HORIZONTAL SCALE
1m 0 1 2 3m VERTICAL SCALE

Region of Peel
Working for you

CAVEN STREET

(FROM LAKESHORE RD E TO END)

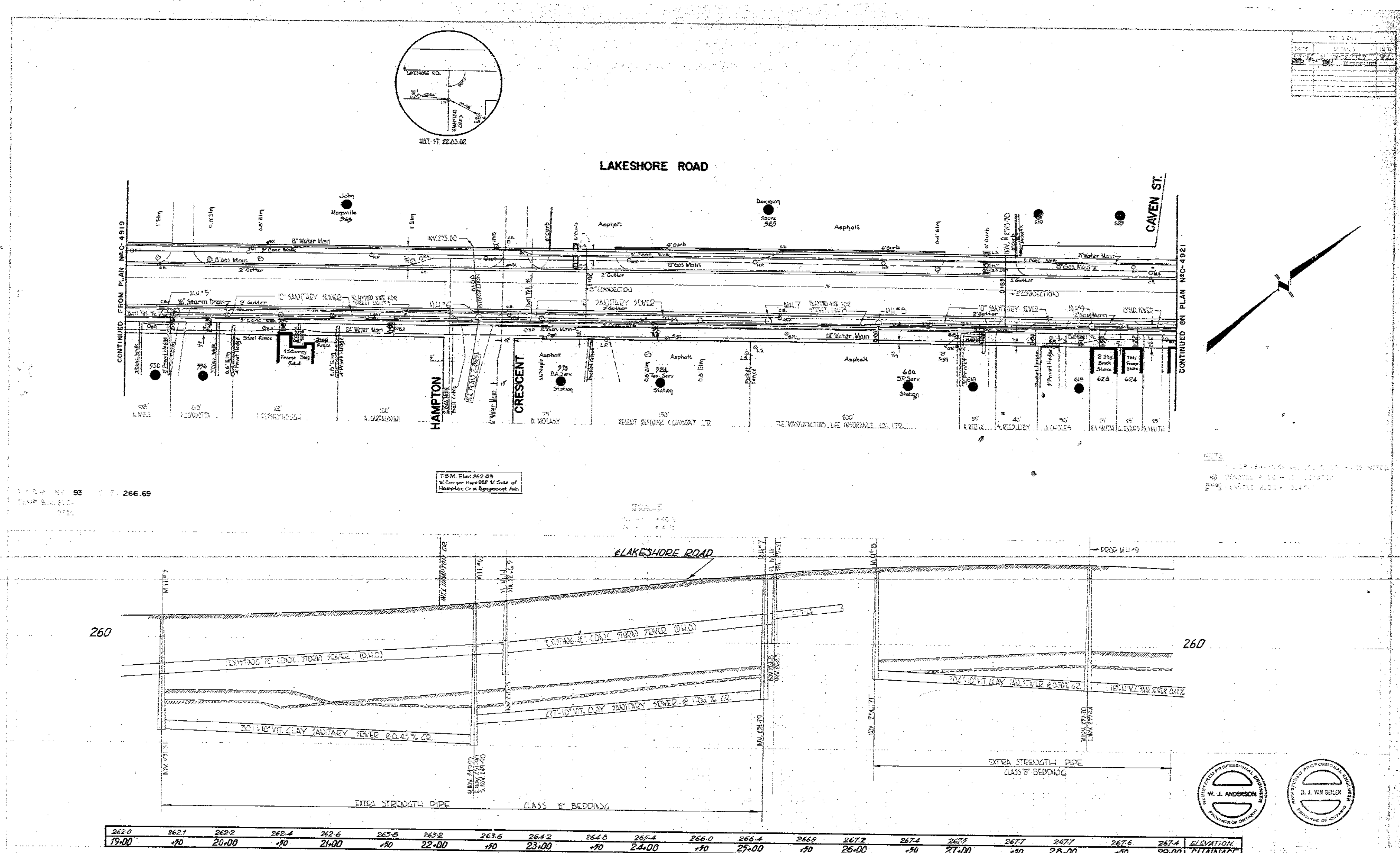
PROP. 300mm WATERMAIN

STA. 0+000 TO STA. 0+180

79.60	79.49	79.38	79.28	79.17	79.06	78.96	78.85	78.83		BOT.EL. OF WM.
81.71	81.63	81.57	81.49	81.38	81.25	81.10	81.09	81.19	81.43	EX. ROAD ELEV.
0+180	0+160	0+140	0+120	0+100	0+080	0+060	0+040	0+020	0+000	ROAD CHAINAGE

RESTRAINED JOINTS: 0+048.1 | 0+036.6 | 0+022.1 | 0+017.0 | 0+013.7 | 0+010.6 | 0+011.9

CAD Area		Area	Z-07
Checked by		Drawn by	M.T.
Date	JAN 2016	Sheet	1 of 2
Project No.	16-1310-A		
Plan No.	59415-D		



262·0	262·1	262·2	262·4	262·6	263·8	263·2	263·6	264·2	264·8	265·4	266·0	266·4	266·9	267·2	267·4	267·5	267·7	267·7	267·6	267·4	ELEVATION
19+00	+50	20+00	+50	21+00	+50	22+00	+50	23+00	+50	24+00	+50	25+00	+50	26+00	+50	27+00	+50	28+00	+50	29+00	CHAINAGE

TOWNSHIP OF TORONTO
COUNTY OF PEEL
ENGINEERING DEPARTMENT

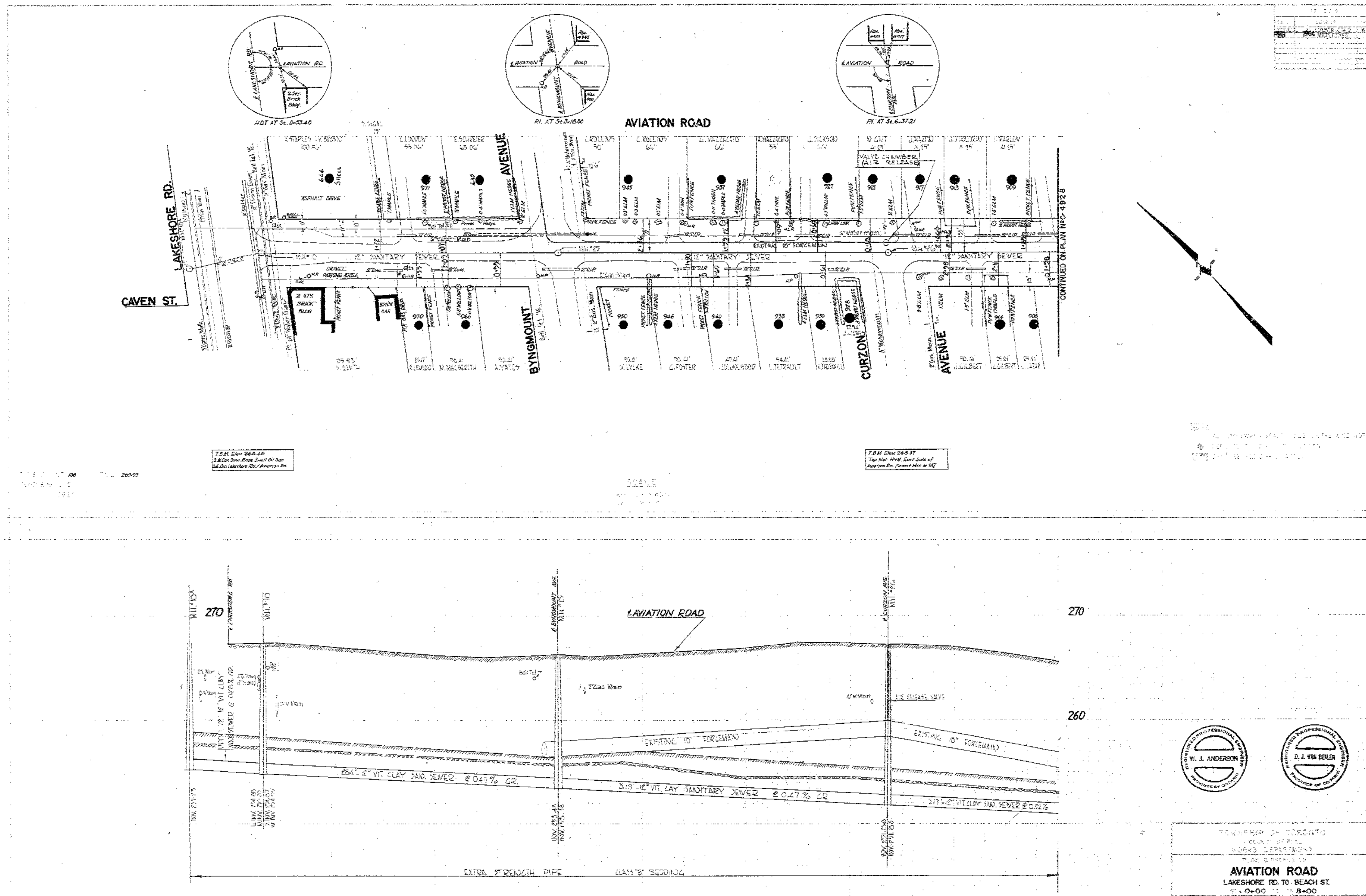
PLAN & PROFILE OF

LAKESHORE ROAD

EAST LIMIT OF PORT CREDIT TO 4000' E'LY
STN 19+00 TO STN 29+00

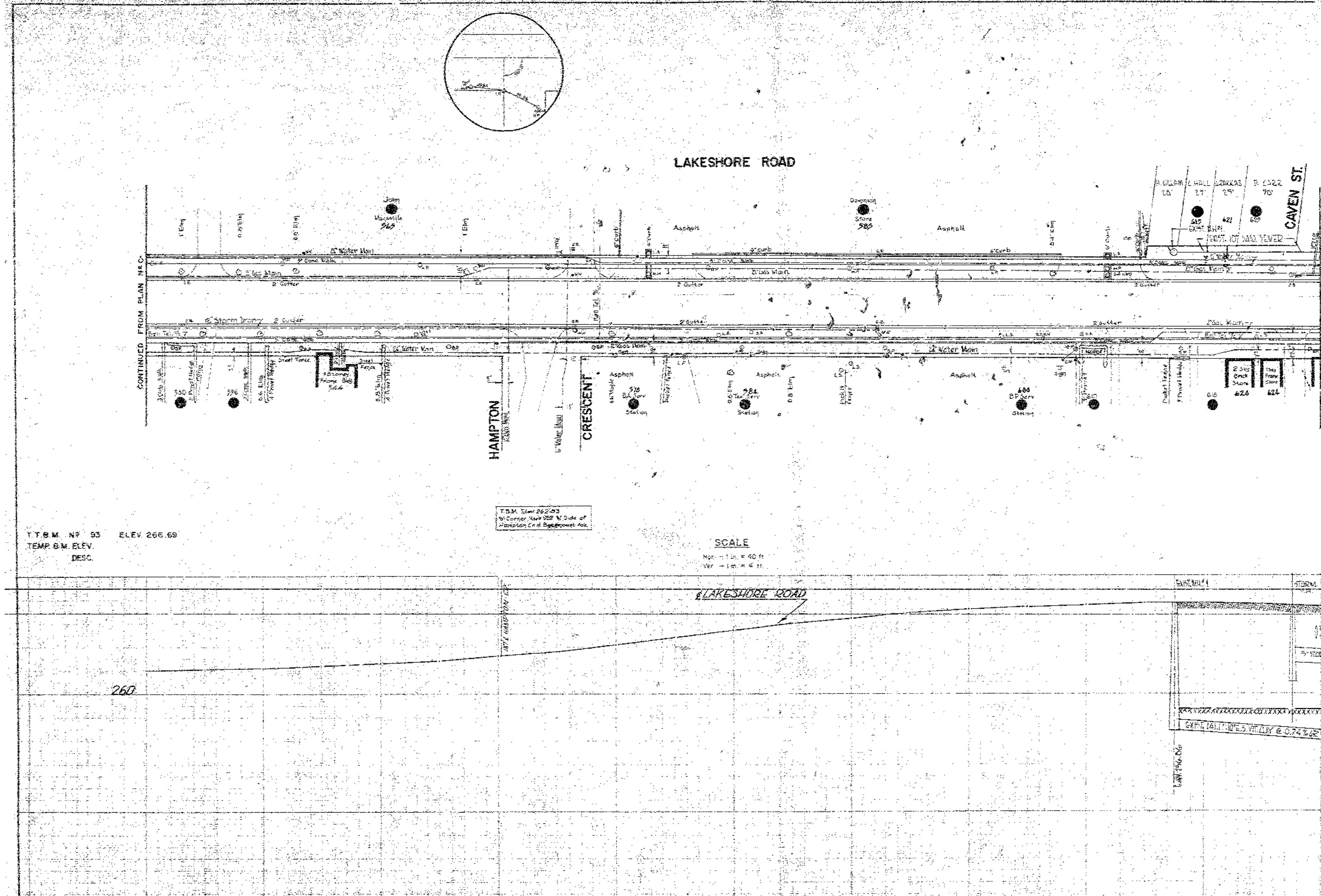
D.J.V.B.	G.SUKKEL	16-61
FEB. 29/1960	2 of 19	C-4920

4920



ELEVATION	267.3	267.4	267.0	266.6	266.2	266.0	266.2	266.3	266.1	266.4	266.7	266.9	267.5	267.4	267.3	267.3	267.0	266.4	265.6
CHAINAGE	0+00	+50	1+00	+50	2+00	+50	3+00	+18.80	+50	4+00	+50	5+00	+50	6+00	+37.21	+50	7+00	+50	8+00

C-4927



NOTE

ALL DRIVEWAYS GRAVEL UNLESS OTHERWISE NOTED

● DENOTES BLDG – NOT LOCATED

DENOTES BLDG – LOCATED

ALL PIPE TO HAVE CLASS "B" BEDDING

262.0	262.1	262.2	262.4	262.6	263.0	263.2	263.6	264.2	264.8	265.4	266.0	266.4	266.9	267.2	267.4	267.5	267.7	267.7	267.6	267.4	ELEVATION
19+00	+50	20+00	+50	21+00	+50	22+00	+50	23+00	+50	24+00	+50	25+00	+50	26+00	+50	27+00	+50	28+00	+50	29+00	CHAINAGE

W. J. ANDERSON — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

G. J. VAN BEILEN — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

TOWNSHIP OF TORONTO
COUNTY OF PEEL
ENGINEERING DEPARTMENT

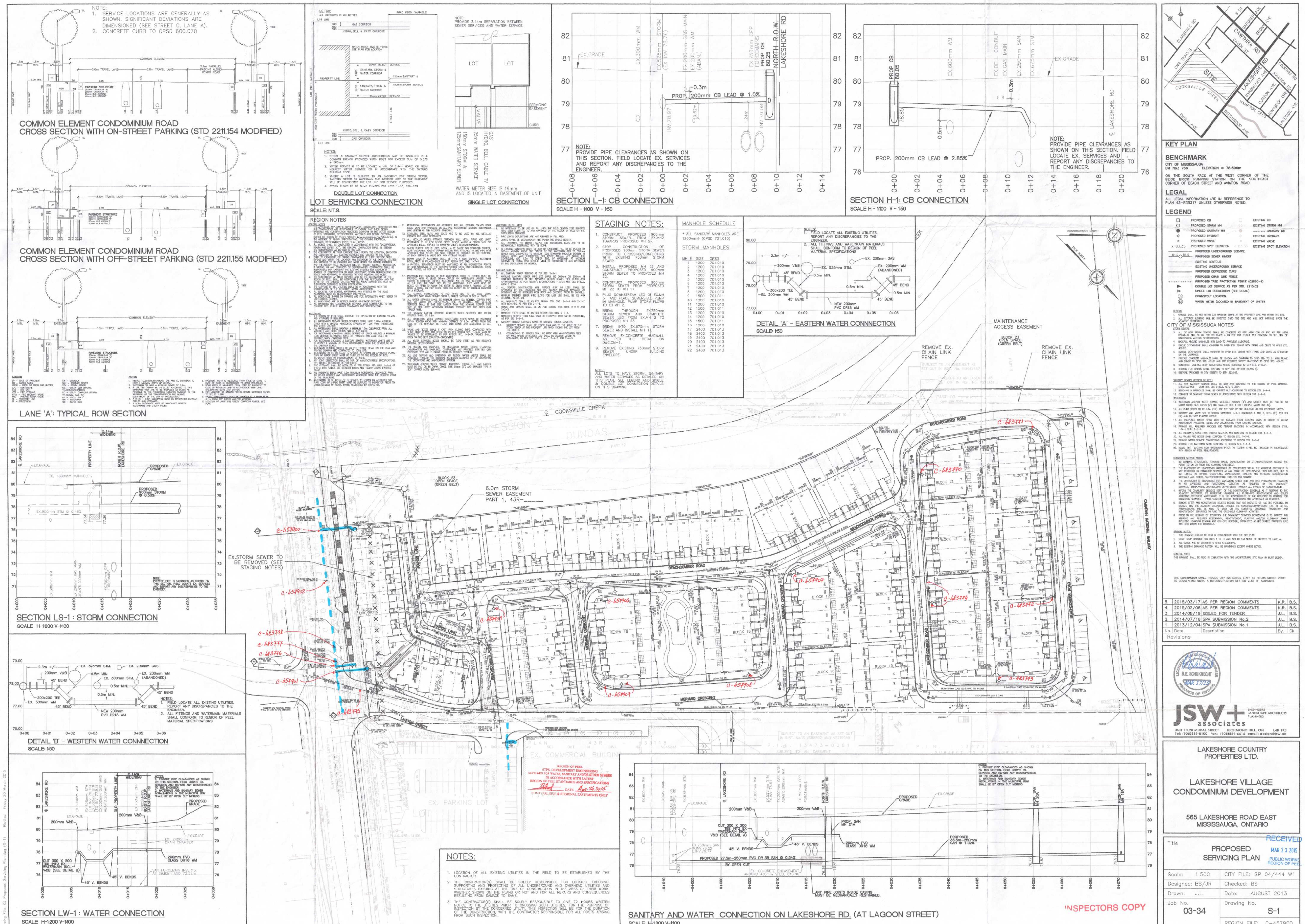
PLAN & PROFILE OF

LAKESHORE ROAD

EAST LIMIT OF PORT CREDIT TO 4000' E'LY
STN. 19+00 TO STN. 25+00

LOT/S 11	CON./RANGE 2 S.D.S.	AREA 2 & 3
DESIGN BY D.J.V.B.	DRAWN BY A. SUKKEL	PROJECT Nº 15-61
DATE FEB.29/1960	SHEET 1 OF 6	PLAN Nº C-4945

C-4945


COMMON ELEMENT CONDOMINIUM ROAD CROSS SECTION WITH ON-STREET PARKING (STD 2211.154 MODIFIED)
COMMON ELEMENT CONDOMINIUM ROAD CROSS SECTION WITH OFF-STREET PARKING (STD 2211.155 MODIFIED)
LANE 'A': TYPICAL ROW SECTION
NOTE: 1. SERVICE LOCATIONS ARE GENERALLY AS SHOWN. SIGNIFICANT DEVIATIONS ARE DIMENSIONED (SEE STREET C, LANE A). 2. CONCRETE CURB TO OPSD 600.070
LOT SERVICING CONNECTION
SCALE: N.T.S.
DOUBLE LOT CONNECTION
SINGLE LOT CONNECTION
WATER METER SIZE IS 19mm AND IS LOCATED IN BASEMENT OF UNIT
NOTE: PROVIDE 2.44m SEPARATION BETWEEN SEWER SERVICES AND WATER SERVICE
SECTION L-1: CB CONNECTION
SCALE H - 1:100 V - 1:50
SECTION H-1: CB CONNECTION
SCALE H - 1:100 V - 1:50
NOTE: PROVIDE PIPE CLEARANCES AS SHOWN ON THIS SECTION. FIELD LOCATE EX. SERVICES AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
PROP. 200mm CB LEAD @ 1.0%
PROP. 200mm CB LEAD @ 2.85%
NORTH R.O.W. LAKESHORE RD
PROP CB 80.25
PROP CB 80.05
REGION NOTES
STAGING NOTES:
MANHOLE SCHEDULE
STORM MANHOLES
DETAIL 'A' - EASTERN WATER CONNECTION
SCALE: 1:50
DETAIL 'B' - WESTERN WATER CONNECTION
SCALE: 1:50
SECTION LS-1 : STORM CONNECTION
SCALE H-1:200 V-1:100
SECTION LW-1 : WATER CONNECTION
SCALE H-1:200 V-1:100
SANITARY AND WATER CONNECTION ON LAKESHORE RD. (AT LAGOON STREET)
SCALE H-1:200 V-1:100
NOTES:
EX.STORM SEWER TO BE REMOVED (SEE STAGING NOTES)
6.0m STORM SEWER EASEMENT PART 1, 43R-
BLOCK 23 OPEN SPACE (GREEN BELT)
MAINTENANCE ACCESS EASEMENT
REMOVE EX. CHAIN LINK FENCE
COOKSVILLE CREEK
BEACHCOMBER ROAD
MERMAID CRESCENT
LAGOON STREET
RAPIDS LANE
CANADIAN NATIONAL RAILWAY
EX. COMMERCIAL BUILDING
EX. PARKING LOT
REGION OF PEEL ETPS, DEVELOPMENT ENGINEERING REVIEWED FOR WATER, SANITARY AND/OR STORM SEWERS IN ACCORDANCE WITH LATEST REGION OF PEEL STANDARDS AND SPECIFICATIONS DATE Apr. 24, 2015 MUNICIPAL SITE & REGIONAL EASEMENTS ONLY
KEY PLAN
BENCHMARK
CITY OF MISSISSAUGA
BM No.: 756 ELEVATION = 78.596m
ON THE SOUTH FACE AT THE WEST CORNER OF THE BEIGE BRICK PUMPING STATION ON THE SOUTHEAST CORNER OF BEACH STREET AND AVIATION ROAD.
LEGAL
ALL LEGAL INFORMATION ARE IN REFERENCE TO PLAN 43-R35317 UNLESS OTHERWISE NOTED.
LEGEND
CITY OF MISSISSAUGA NOTES
5. 2015/03/17 AS PER REGION COMMENTS K.R. B.S.
4. 2015/02/06 AS PER REGION COMMENTS K.R. B.S.
3. 2014/08/19 ISSUED FOR TENDER J.L. B.S.
2. 2014/07/18 SPA SUBMISSION No.2 J.L. B.S.
1. 2013/12/04 SPA SUBMISSION No.1 J.L. B.S.
No. Date Description By. Ck.
Revisions
B.E. SCHUNKNECHT
JSW+ associates
ENGINEERS LANDSCAPE ARCHITECTS PLANNERS
UNIT 10,20 MURAL STREET RICHMOND HILL, ON L4B 1K3
Tel: (905)889-8100 Fax: (905)889-6616 email: design@jsw.ca
LAKESHORE COUNTRY PROPERTIES LTD.
LAKESHORE VILLAGE CONDOMINIUM DEVELOPMENT
565 LAKESHORE ROAD EAST MISSISSAUGA, ONTARIO
Title
PROPOSED SERVICING PLAN
RECEIVED MAR 2 3 2015 PUBLIC WORKS REGION OF PEEL
Scale: 1:500
CITY FILE: SP 04/444 W1
Designed: BS/JR
Checked: BS
Drawn: J.L.
Date: AUGUST 2013
Job No. 03-34
Drawing No. S-1
REGION FILE: C-457900
INSPECTORS COPY
AS Constructed by: Con Drain
Inspection by: John Sabine
2015/12/18
C-457900
C-457900
C-457901
C-457902
C-483775
C-483776
C-483777
C-483778
C-457906
C-457907
C-457908
C-457909
C-483770
C-483771
C-483772
C-483773
C-483774

City Stormwater Infrastructure Assets

MAP Z–7

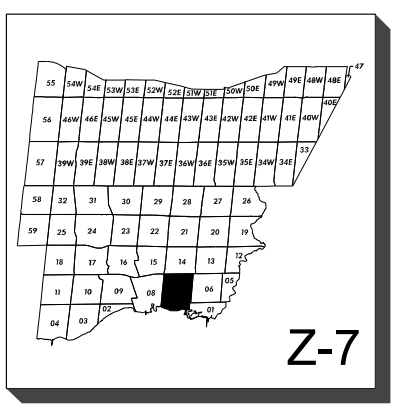
Where water courses and stormwater pipes pass under roadways or other infrastructure, a bridge or culvert is implied

This is a schematic representation of the City's storm drainage system and is not to scale.

All pipe sizes are in mm

Legend

- Storm Drains
- Watercourses and Shoreline
- Ditches
- Catch Basins
- Maintenence Holes
- Outfalls
- Storm Water Management Facilities



0 100 200
metres

MISSISSAUGA
Leading today for tomorrow

26/11/2013

APPENDIX B

Water Demand Calculations

Connection Demand Table

WATER CONNECTION

Connection point [3] WND 6536128				
Existing 300mm diameter watermain on Lakeshore Road East				
Pressure zone of connection point			5	
Total equivalent population to be serviced [1]			2889 persons	
Total lands to be serviced			2.42 ha	
Hydrant flow test				
	Hydrant flow test location		Lakeshore Road East	
		Pressure (kPa)	Flow (in l/s)	Time
	Minimum water pressure	586	450	
	Maximum water pressure	600	446	

No.	Water Demand		
	Demand type	**Demand**	**Units**
1	Average day flow	9.36	l/s
2	Maximum day flow	18.73	l/s
3	Peak hour flow	28.09	l/s
4	Fire flow [2]	233.3	l/s
Analysis			
5	Maximum day plus fire flow	261.39	l/s

WASTEWATER CONNECTION

Phase 1

Connection point [4] 1783131		
Existing 250mm Sanitary Sewer on Lakeshore Road East		
Total equivalent population to be serviced		2889 persons
Total lands to be serviced		2.42 ha
6	Wastewater sewer effluent (in l/s)	35.48

[1] Please refer to design criteria for population equivalencies
[2] Please reference the Fire Underwriters Survey Document
[3] Please specify the connection point ID
[4] Please specify the connection point (wastewater line or manhole ID)
Also, the “total equivalent population to be serviced” and the “total lands to be serviced” should reference the connection point. (the FSR should contain one copy of Site Servicing Plan)

Please include the graphs associated with the hydrant flow test information table
Please provide Professional Engineer's signature and stamp on the demand table
All required calculations must be submitted with the demand table submission.

CROZIER CONSULTING ENGINEERS

Project: 579-603 Lakeshore Rd. E **Created By:** JB/JL **Date:** 2021.11.09
Project No.: 1876-5866 **Checked By:** MB **Updated:** 2022.10.21

Domestic Water Demand

Site Area:	2.42	ha
Number of Units:	1070	units
Population Density:	2.7	PPU
Population:	2889	

Notes & References

PPU density obtained from Region of Peel Public Works Design, Specifications & Procedure Manual - Sanitary Sewer Design Criteria (March 2017) - Section 2.1

Design Parameters

Average Demand (L/capita/d)
280

Region of Peel Public Works Design, Specifications & Procedure Manual - Watermain Design Criteria (June 2010) - Section 2.3

Water Demand:

Average Daily Demand =	808,920	L/day
	9.36	**L/s**

Peaking Factors

Max Day =	2.0
Peak Hour =	3.0

Region of Peel Public Works Design, Specifications & Procedure Manual - Watermain Design Criteria (June 2010) - Section 2.3

Average Day =	9.36	L/s
Max Day =	**18.73**	L/s
Peak Hour =	**28.09**	L/s

Max Day = Average Day Demand * Max Day
Peak Hour = Average Day Demand * Peak Hour

Municipality	Average Daily Water Demand (L/s)	Max Day Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel	9.36	18.73	28.09

CROZIER CONSULTING ENGINEERS

1876-5886 579-603 Lakeshore Road East
Fire Protection Volume Calculation Building A

Date: 2021.11.09
Designed By: JB
Checked By: MB/NC

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \text{sqrt } A$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = Single largest Floor Area
plus 25% of immediately adjoining floors

Proposed Buildings

A =	3,299	sq.m.	2199 sq.m	approximate area of largest floor
C =	0.8	Non-combustible construction	1100 sq.m	25% of the two adjoining floors

Therefore F = 10,108 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Non-Combustible	0%

0 L/min reduction
10,108 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Building will have automatic sprinklers - 50% reduction

5,054 L/min reduction

1876-5886 579-603 Lakeshore Road East
Fire Protection Volume Calculation Building A

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed Buildings

Name			**Distance**	**Separation**	**Charge**	**Surcharge**
North	Residential	Ex 14-storey apartment	35.0 m	30.1 to 45 m	5%	505.4
South	Residential	Building B	24.0 m	20.1 to 30 m	10%	1010.8
East	Residential	Ex 2-Storey Dwelling	18.9 m	10.1 to 20 m	15%	1516.2
West	Residential	Ex 4-Storey Dwellings	61.0 m	>45 m	0%	0.0
						3,032 L/min Surcharge

Determine Required Fire Flow

No.1	10,108		
No. 2	0	reduction	
No. 3	-5,054	reduction	
No. 4	3,032	surcharge	
Required Flow:	**8,087 L/min**		
Rounded to nearest 1000 L/min:	**8,000 L/min**	or	133.3 L/s
			2,113 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	**2.0**
10,000	2.0
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

1876-5886 579-603 Lakeshore Road East
Fire Protection Volume Calculation Building B

Date: 2021.11.09
Designed By: JB
Checked By: MB/NC

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = Single largest Floor Area
plus 25% of immediately adjoining floors

Proposed Buildings

A =	4,806	sq.m.	3204 sq.m	approximate area of largest floor
C =	0.8	Non-combustible construction	1602 sq.m	25% of the two adjoining floors

Therefore F = 12,201 L/min

Fire flow determined above shall not exceed:
30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Limited Combustible	0%

0 L/min reduction
12,201 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Building will have automatic sprinklers - 50% reduction

6,100 L/min reduction

1876-5886 579-603 Lakeshore Road East
Fire Protection Volume Calculation Building B

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed Buildings

Name			**Distance**	**Separation**	**Charge**	**Surcharge**
North	Residential	Building A	24.0 m	20.1 to 30 m	10%	1220.1
South	Residential	Building C&D	20.6 m	20.1 to 30 m	10%	1220.1
East	Residential	Ex Semi-Detatched Dwelling	31.5 m	30.1 to 45 m	5%	610.0
West	Residential	Ex 4-Storey Dwelling	24.6 m	20.1 to 30 m	10%	1220.1

4,270 L/min Surcharge

Determine Required Fire Flow

No.1	12,201		
No. 2	0	reduction	
No. 3	-6,100	reduction	
No. 4	4,270	surcharge	
Required Flow:	**10,371**	**L/min**	
Rounded to nearest 1000 L/min:	**10,000**	**L/min**	or 166.7 L/s
			2,642 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	**2.0**
12,000	2.5
14,000	3.0
16,000	3.5
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

CROZIER CONSULTING ENGINEERS

1876-5886 579-603 Lakeshore Road East
Fire Protection Volume Calculation Buildings C & D

Date: 2021.11.09
Designed By: JB
Checked By: MB/NC

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

1. An estimate of fire flow required for a given area may be determined by the formula:

$$F = 220 * C * \sqrt{A}$$

where

F = the required fire flow in litres per minute

C = coefficient related to the type of construction:

=	1.5	for wood frame construction (structure essentially all combustible)
=	1.0	for ordinary construction (brick or other masonry walls, combustible floor and interior)
=	0.8	for non-combustible construction (unprotected metal structural components)
=	0.6	for fire-resistive construction (fully protected frame, floors, roof)

A = Single largest Floor Area
plus 25% of immediately adjoining floors

Proposed Buildings

A =	7,114	sq.m.	4743 sq.m	approximate area of largest floor
C =	0.8	Non-combustible construction	2371 sq.m	25% of the two adjoining floors

Therefore F = 14,845 L/min

Fire flow determined above shall not exceed:

30,000 L/min for wood frame construction
30,000 L/min for ordinary construction
25,000 L/min for non-combustible construction
25,000 L/min for fire-resistive construction

2. Values obtained in No. 1 may be reduced by as much as 25% for occupancies having low contents fire hazard or may be increased by up to 25% surcharge for occupancies having a high fire hazard.

Non-Combustible	-25%	Free Burning	15%
Limited Combustible	-15%	Rapid Burning	25%
Combustible	0% (No Change)		

Limited Combustible	0%

0 L/min reduction
14,845 L/min

Note: Flow determined shall not be less than 2,000 L/min

3. Sprinklers - The value obtained in No. 2 above may be reduced by up to 50% for complete automatic sprinkler protection. The credit for the system will be a maximum of 30% for an adequately designed system conforming to NFPA 13 and other NFPA sprinkler standards. 10% may be granted if the water supply is standard for both the system and fire departement hose lines required. Additional credit of up to 10% may be given for a fully supervised system.

Building will have automatic sprinklers - 50% reduction

7,422 L/min reduction

Water Supply for Public Fire Protection
Fire Underwriters Survey

Part II - Guide for Determination of Required Fire Flow

4. Exposure - To the value obtained in No. 2, a percentage should be added for structures exposed within 45 metres by the fire area under consideration. The percentage shall depend upon the height, area, and construction of the building(s) being exposed, the separation, openings in the exposed building(s), the length and height of exposure, the provision of automatic sprinklers and/or outside sprinklers in the building(s) exposed, the occupancy of the exposed building(s) and the effect of hillside locations on the possible spread of fire.

Separation	Charge	Separation	Charge
0 to 3 m	25%	20.1 to 30 m	10%
3.1 to 10 m	20%	30.1 to 45 m	5%
10.1 to 20 m	15%		

Exposed Buildings

Name			**Distance**	**Separation**	**Charge**	**Surcharge**
North	Residential	Ex. Semi-Detahced Dwelling	8.6 m	3.1 to 10 m	20%	2968.9
South	Residential	Ex Dwelling across Lakeshore Rd E	39.9 m	30.1 to 45 m	5%	742.2
East	Residential	Ex Dwellings across Coven St	32.8 m	30.1 to 45 m	5%	742.2
West	Residential	Ex Dwellings	18.1m	10.1 to 20m	15%	2226.7

6,680 L/min Surcharge

Determine Required Fire Flow

No.1	14,845		
No. 2	0	reduction	
No. 3	-7,422	reduction	
No. 4	6,680	surcharge	
Required Flow:	**14,102 L/min**		
Rounded to nearest 1000 L/min:	**14,000 L/min**	or	233.3 L/s
			3,698 USGPM

Required Duration of Fire Flow

Flow Required L/min	Duration (hours)
2,000 or less	1.0
3,000	1.25
4,000	1.5
5,000	1.75
6,000	2.0
8,000	2.0
10,000	2.0
12,000	2.5
14,000	3.0
16,000	**3.5**
18,000	4.0
20,000	4.5
22,000	5.0
24,000	5.5
26,000	6.0
28,000	6.5
30,000	7.0
32,000	7.5
34,000	8.0
36,000	8.5
38,000	9.0
40,000 and over	9.5

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CONSULTING ENGINEERS

PROJECT: 579-603 Lakeshore Rd. E **DESIGN:** JB
PROJECT No.: 1876-5886 **CHECK:** MB/NC
DATE: 2021.11.09

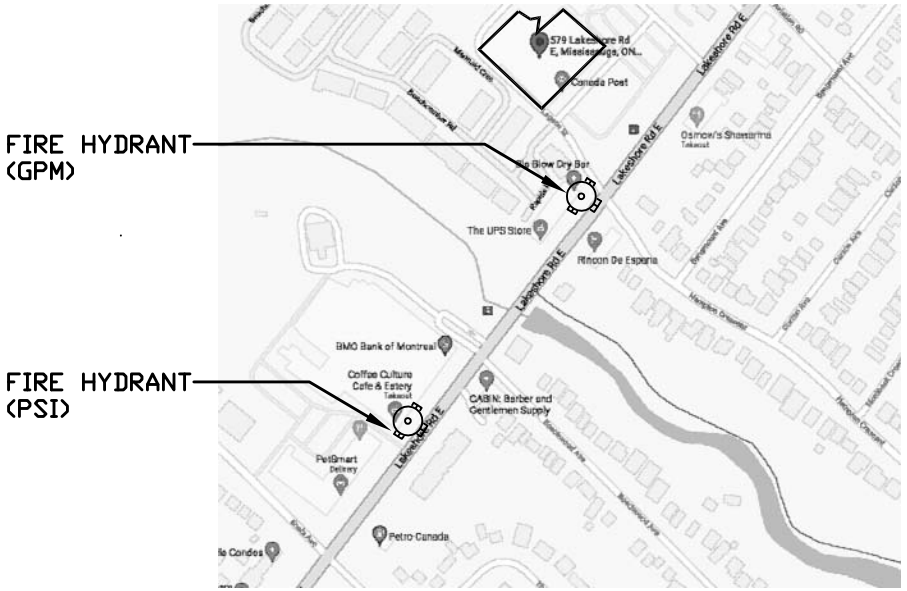
Projected Fire Flows - Hydrant Test Dated May 20, 2021

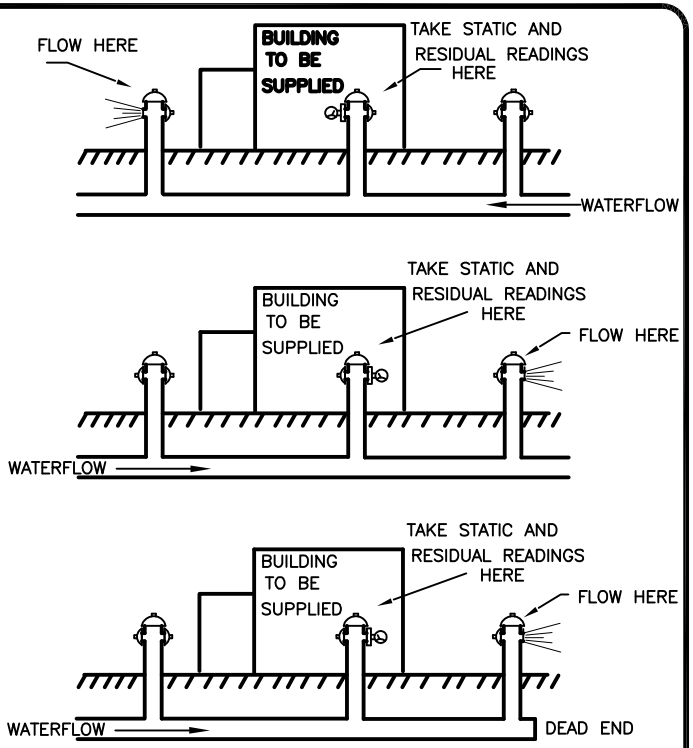
Test	Hydrant Location / ID	Static Pressure	Residual Pressure during Test	Flow from Hydrant Test	Desired Residual Pressure	Projected Fire Flow Available at 20 psi	Projected Fire Flow Available at 20 psi
		Ps	Pt	Qt	Pr	Qr	Qr
		(psi)	(psi)	(USGPM)	(psi)	(USGPM)	(L/s)
1	Intersection of Lakeshore Rd. E & Fergus Ave.	88	87	725	20	7,078	447
2			85	1324		7,142	451

$Q_r = Q_t \times ((P_s - P_r)/(P_s - P_t))^{0.54}$ Formula to determine available flow as per AWWA M17 (1989)

NOTE: Projected fire flow availability is calculated on the basis of hydrant tests carried out by Classic Fire Protection Inc. dated May 20, 2021

Location of test: Flow: Approximately 100m east of Lakeshore Road East & Fergus Avenue intersection
Residual: Approximately 140m west of Lakeshore Road East & Fergus Avenue intersection





TEST:	PLAY PIPE	C=	STATIC(PSI)	RESIDUAL(PSI)	PITOT(PSI)	FLOW(USGPM)
	1x1 1/8					
	2x1 1/8					
	3x1 1/8					
	4x1 1/8					
	1x1 3/4					
	2x1 3/4					
	3x1 3/4					
	4x1 3/4					
	PITOTLESS NOZZLE					
1	1x1 3/4		88	87	48	725
2	2x1 3/4		88	85	40/40	1324

OUTLET TYPE

- ☐ COEF.=0.90 OUTLET SMOOTH AND WELL ROUNDED
- ☐ COEF.=0.80 OUTLET SQUARE AND SHARP
- ☐ COEF.=0.70 OUTLET SQUARE AND PROJECTING INTO BARREL
- ☒ HOSE MONSTER LITTLE HOSE MONSTER 1 3/4"
- ☐ HOSE MONSTER OPEN ATMOSPHERE 1 3/4"

Client:

Location:

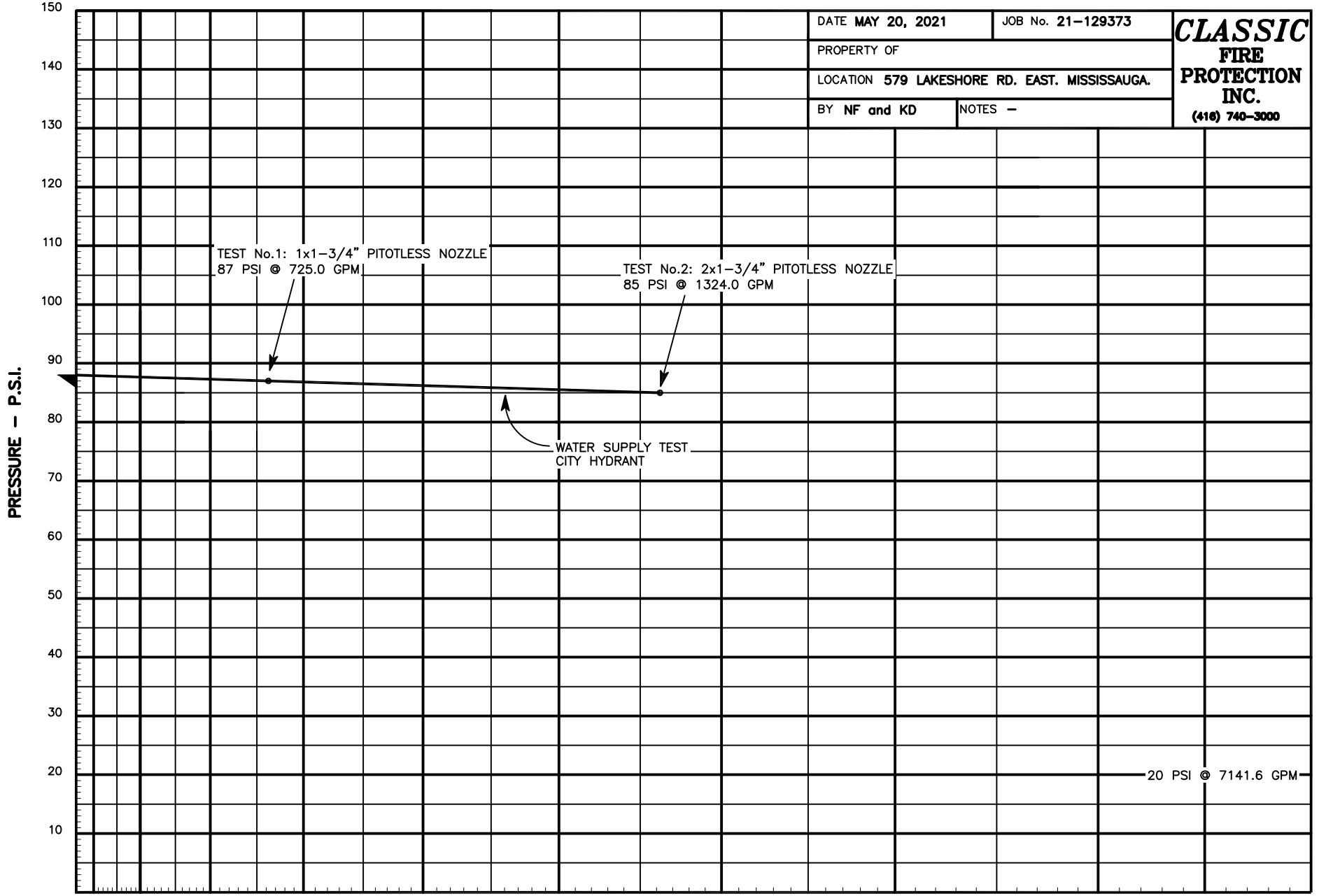
579 LAKESHORE RD. EAST

MISSISSAUGA, ON

DEDICATED SERVICE SINCE 1988
CLASSIC FIRE PROTECTION INC.
645 GARYRAY DR.
North York, ON
M9L 1P9
(416) 740-3000
Web: www.classicfire.com

WATER SUPPLY GRAPH

DATE **MAY 20, 2021**	JOB No. **21–129373**	***CLASSIC*** **FIRE PROTECTION INC.** **(416) 740–3000**	
PROPERTY OF			
LOCATION **579 LAKESHORE RD. EAST. MISSISSAUGA.**			
BY **NF and KD**	NOTES –		



APPENDIX C

Sanitary Flow Calculations

Domestic Sanitary Design Flow

Site Area:	2.42	ha
Number of Units:	1070	units
Population Density:	2.7	PPU
Population:	2889	

Notes & References

Region of Peel Public Works Design, Specifications & Procedure Manual - Sanitary Sewer Design Criteria (March 2017)

Design Parameters

Average Flow (L/capita/d)
302.8

Region of Peel Public Works Design, Specifications & Procedure Manual - Sanitary Sewer Design Criteria (March 2017)

Sanitary Design Flow:

Average Daily Flow =	302.8	L/capita/d	Average Daily Flow = Average Daily Flow (L/cap./day) * population / 86400
Average Daily Flow =	**10.12**	L/s	
Harmon Peak Factor: M =	**3.46**		M = 1 + 14 / (4 + (p/1000) ^.5
Peak Flow =	**34.99**	L/s	Peak Flow = Average Daily Flow * M
Infiltration Flow: Infiltration =	0.2	L/ha/s	Region of Peel Public Works Design, Specifications & Procedure Manual - Sanitary Sewer Design Criteria (March 2017)
Total Infiltration =	**0.48**	L/s	
Total Peak Flow =	**35.48**	L/s	Total Peak Flow = Peak Flow + Total Infiltration

Summary Table

Average Daily Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
10.12	3.46	34.99	0.48	35.48

APPENDIX D

Stormwater Management Calculations

Project: 579-603 Lakeshore Rd E
Project No.: 1876-5866
Created By: JB
Reviewed by: MB
Date: 2021.11.09
Updated: -

Modified Rational Calculations - Input Parameters

Storm Data: Mississauga

Time of Concentration: T_c = 15 min

(per City of Mississauga Transportation and Works Development Requirements Manual – Section 8 Storm Drainage Design Requirements dated November 2020.)

Return Period	A	B	C	I (mm/hr)
2 yr	610	4.6	0.78	59.89
5 yr	820	4.6	0.78	80.51
10 yr	1010	4.6	0.78	99.17
25 yr	1160	4.6	0.78	113.89
50 yr	1300	4.7	0.78	127.13
100 yr	1450	4.9	0.78	140.69

Pre - Development Conditions				
Catchment ID	**Area** (ha)	**Area** (m^2)	C_{Design}	C_{Actual}
101	2.10	21,043	0.50	0.87
102	0.14	1,352	0.50	0.69
103	0.18	1,760	0.50	0.77
EX1	0.01	105	0.25	0.25
EX2	0.01	112	0.25	0.25
Total Site	**2.44**	24,155	--	0.85

Post- Development Conditions				
Catchment ID	**Area** (ha)	**Area** (m^2)	**Weighted C**	**100-Year Adjusted C**
201	2.29	22,889	0.75	**0.94**
UC1	0.06	608	0.88	**1.00**
UC2	0.06	550	0.90	**1.00**
UC3	0.01	108	0.90	**1.00**
EX1	0.01	105	0.25	**0.31**
EX2	0.01	112	0.25	**0.31**
Total Site	**2.44**	24,155	0.75	**0.94**

Per City of Mississauga Transportation and Works Development Requirements Manual – Section 8 Storm Drainage Design Requirements dated November 2020, an adjustment of 1.25 is to be applied to the 100-year post-development C values

Project: 579-603 Lakeshore Rd E
Project No.: 1876-5866
Created By: JB
viewed by: MB
Date: 2021.11.09
Updated: -

Modified Rational Calculations - Peak Flows Summary (Cooksville Creek)

Equations:

Peak Flow

$$Q_{post} = 0.0028 \cdot C_{post} \cdot i(T_d) \cdot A$$

Pre-Development Peak Flows (L/s)

Return Period	Pre-Development Catchments					Total Peak Flow (Target Rate)
	101	102	103	EX1	EX2	
2 yr	176.44	11.34	14.76	0.44	0.47	203.45

Post-Development Peak Flows (L/s) - Uncontrolled

Return Period	Post-Development Catchment						Total Peak Flow
	201	UC1	UC2	UC3	EX1	EX2	
5 Year				2.43			896.04
100 Year	845.32	23.95	21.67		1.29	1.38	

Note: Assumed existing sewers on Caven Street have been designed to convey the 5-year storm event.

Post-Development Peak Flows (L/s) - Controlled

Return Period	Post-Development Catchment		Total Peak Flow
	Peak Flow for Uncontrolled Catchments (UC1, UC2, UC3 [5-year])	Peak Flow for Controlled Catchments (201, UC3, EX1, EX2)	
100 Year	48.05	155.40	203.45

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Project: 579-603 Lakeshore Rd E
Project No.: 1876-5866

Date: 2021.11.09
Revised: -
Designed By: JB
Checked By: MB

MODIFIED RATIONAL METHOD CALCULATIONS - 100 YEAR STORM EVENT

Rainfall Intensity Equation:

$$I = \frac{A}{(T+b)^c}$$

City of Mississauga IDF (100-Year)	
a=	1450
b=	4.9
c=	0.78

CONTROLLED AREA

Drainage Area ID = 201, EX1, EX2
Drainage Area = 2.31 ha
Runoff Coefficient = 0.93

Controlled Release Rate at MH1 = 155.4 L/s

Max. Storage Volume Required = 701.3 m3
Storage Volume Provided = 702.0 m3

UNCONTROLLED AREA

Drainage Area ID = UC1, UC2, UC3(5 yr)
Drainage Area = 0.13 ha
Runoff Coefficient = 1.00

Target Site Release Rate = 203.4 L/s

Controlled Release Rate at MH1 = 155.4 L/s
Uncontrolled Release Rate = 48.05 L/s
Total Site Release Rate = 203.4 L/s

Time (minutes)	Rainfall Intensity (mm/hr)	Q_{Runoff} (L/s)	$Q_{Release}$ (L/s)	Storage Volume Required (m^3)	Q_{Runoff} (L/s)
15	140.7	841.9	155.4	617.9	48.1
20	118.1	706.9	155.4	661.8	40.3
25	102.4	612.9	155.4	686.2	35.0
30	90.8	543.2	155.4	698.1	31.0
35	81.8	489.4	155.4	701.3	27.9
40	74.6	446.3	155.4	698.2	25.5
45	68.7	411.0	155.4	690.2	23.4
50	63.8	381.5	155.4	678.4	21.8
55	59.6	356.4	155.4	663.5	20.3
60	56.0	334.8	155.4	646.0	19.1
65	52.8	316.0	155.4	626.4	18.0
70	50.0	299.4	155.4	604.9	17.1
75	47.6	284.7	155.4	581.9	16.2
80	45.4	271.5	155.4	557.5	15.5
85	43.4	259.7	155.4	531.9	14.8
90	41.6	249.0	155.4	505.2	14.2
95	40.0	239.2	155.4	477.6	13.6
100	38.5	230.2	155.4	449.1	13.1
105	37.1	222.0	155.4	419.8	12.7
110	35.8	214.5	155.4	389.8	12.2
115	34.7	207.4	155.4	359.1	11.8
120	33.6	200.9	155.4	327.9	11.5
125	32.6	194.9	155.4	296.1	11.1
130	31.6	189.2	155.4	263.8	10.8
135	30.7	183.9	155.4	231.1	10.5
140	29.9	179.0	155.4	197.9	10.2
145	29.1	174.3	155.4	164.3	9.9
150	28.4	169.9	155.4	130.4	9.7
155	27.7	165.7	155.4	96.0	9.5
160	27.0	161.8	155.4	61.4	9.2
165	26.4	158.1	155.4	26.4	9.0
170	25.8	154.5	154.5	0.0	8.8
175	25.3	151.2	151.2	0.0	8.6

Project: 579-603 Lakeshore Rd E
Project No.: 1876-5866
Created By: JB
Reviewed by: MB
Date: 2021.11.09
Updated: -

Modified Rational Calculations - Peak Flows Summary (Cawthra Creek)

Equations:

Peak Flow

$$Q_{post} = 0.0028 \bullet C_{post} \bullet i(T_d) \bullet A$$

Pre-Development Peak Flows (L/s)

Return Period	Pre-Development Catchments			Total Peak Flow	Target Rate (10 yr - 5yr)
	102	103	EX1		
5 yr	15.24	19.84	0.59	35.67	8.26
10 yr	18.77	24.43	0.73	43.93	

Note: Only major drainage is conveyed towards Cawthra Creek. Minor drainage is collected and conveyed via existing sewers on Caven Street towards Cooksville Creek. It is assumed that the existing sewers on Caven Street have been designed to convey the 5-year storm event.

Post-Development Peak Flows (L/s) - Uncontrolled

Return Period	Post-Development Catchment	Total Peak Flow
	UC3	
2 Year	1.81	1.81

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

11/09/2021

Province:	Ontario
City:	Mississauga
Nearest Rainfall Station:	TORONTO INTL AP
Climate Station Id:	6158731
Years of Rainfall Data:	20

Site Name:	579 Lakeshore Road E

Drainage Area (ha):	2.31
Runoff Coefficient 'c':	0.74

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	60.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	55.60
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	155.40
Peak Conveyance (maximum) Flow Rate (L/s):	
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	579 Lakeshore Road E
Project Number:	1876-5866
Designer Name:	Jayesh Boily
Designer Company:	C.F. Crozier & Assoociates
Designer Email:	jboily@cfcrozier.ca
Designer Phone:	519-807-2809
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	44
EF6	51
EF8	56
EF10	60
EF12	64

Recommended Stormceptor EF Model: EF10

Estimated Net Annual Sediment (TSS) Load Reduction (%): 60

Water Quality Runoff Volume Capture (%): > 90

imbrium

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

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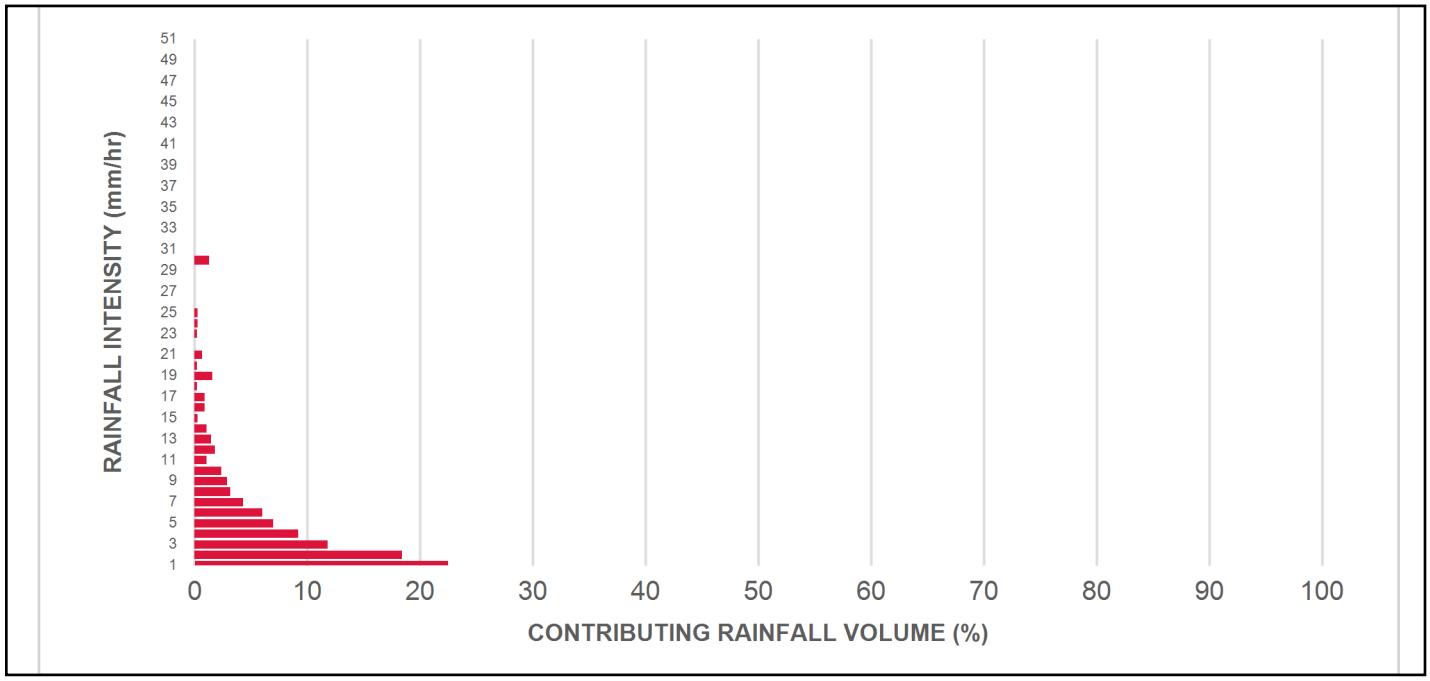
Upstream Flow Controlled Results

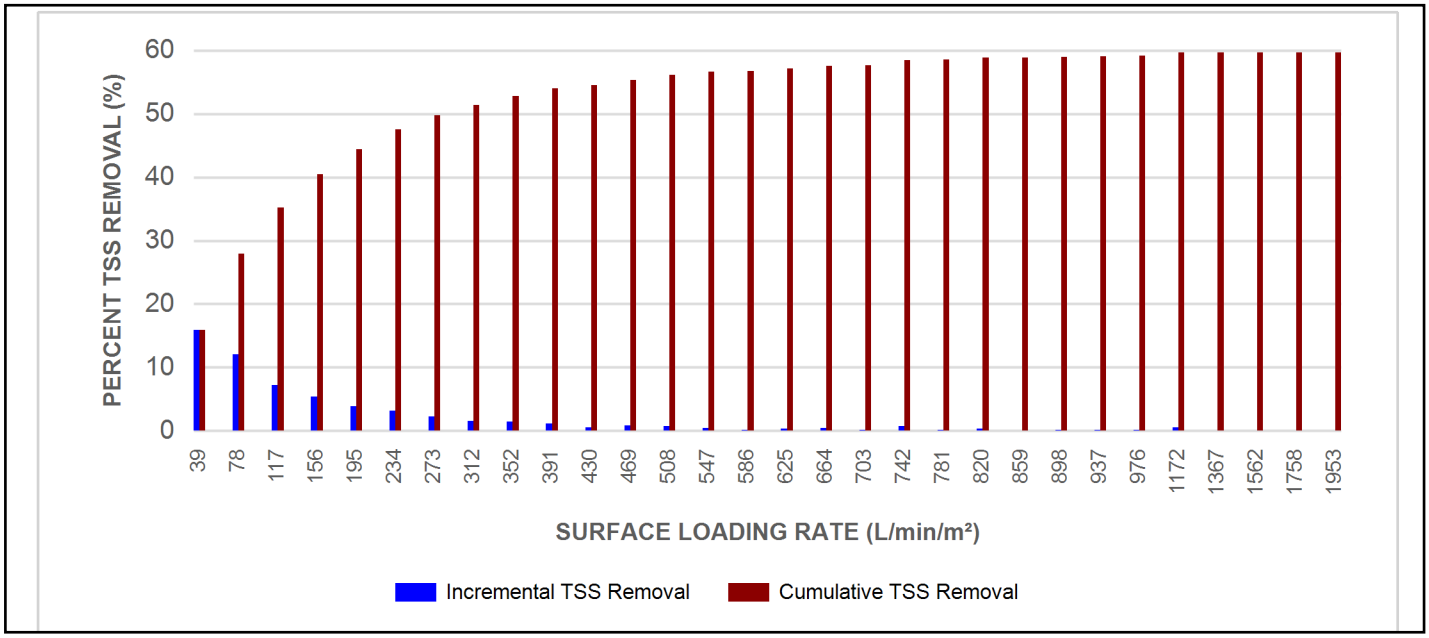
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	22.5	22.5	4.75	285.0	39.0	70	15.9	15.9
2	18.4	40.9	9.50	570.0	78.0	66	12.1	27.9
3	11.8	52.7	14.26	855.0	117.0	62	7.2	35.2
4	9.2	61.9	19.01	1141.0	156.0	58	5.4	40.5
5	7.0	68.9	23.76	1426.0	195.0	55	3.8	44.4
6	6.0	74.9	28.51	1711.0	234.0	53	3.2	47.5
7	4.3	79.2	33.26	1996.0	273.0	52	2.2	49.8
8	3.2	82.4	38.02	2281.0	312.0	51	1.6	51.4
9	2.9	85.3	42.77	2566.0	352.0	50	1.4	52.8
10	2.4	87.7	47.52	2851.0	391.0	48	1.1	54.0
11	1.1	88.7	52.27	3136.0	430.0	48	0.5	54.5
12	1.8	90.5	57.03	3422.0	469.0	47	0.9	55.3
13	1.5	92.1	61.78	3707.0	508.0	47	0.7	56.1
14	1.1	93.1	66.53	3992.0	547.0	47	0.5	56.6
15	0.3	93.5	71.28	4277.0	586.0	46	0.2	56.7
16	0.9	94.3	76.03	4562.0	625.0	46	0.4	57.1
17	0.9	95.3	80.79	4847.0	664.0	46	0.4	57.5
18	0.2	95.5	85.54	5132.0	703.0	46	0.1	57.6
19	1.6	97.1	90.29	5417.0	742.0	45	0.7	58.4
20	0.2	97.3	95.04	5703.0	781.0	45	0.1	58.5
21	0.7	98.0	99.79	5988.0	820.0	45	0.3	58.8
22	0.0	98.0	104.55	6273.0	859.0	45	0.0	58.8
23	0.2	98.2	109.30	6558.0	898.0	45	0.1	58.9
24	0.3	98.5	114.05	6843.0	937.0	44	0.1	59.0
25	0.3	98.7	118.80	7128.0	976.0	44	0.1	59.1
30	1.3	100.0	142.56	8554.0	1172.0	46	0.6	59.7
35	0.0	100.0	155.00	9300.0	1274.0	47	0.0	59.7
40	0.0	100.0	155.00	9300.0	1274.0	47	0.0	59.7
45	0.0	100.0	155.00	9300.0	1274.0	47	0.0	59.7
50	0.0	100.0	155.00	9300.0	1274.0	47	0.0	59.7
Estimated Net Annual Sediment (TSS) Load Reduction =								**60 %**

Climate Station ID: 6158731 *Years of Rainfall Data*: 20

RAINFALL DATA FROM TORONTO INTL AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

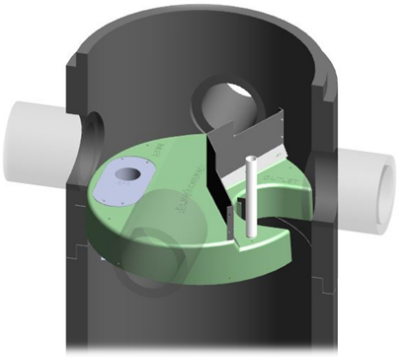
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

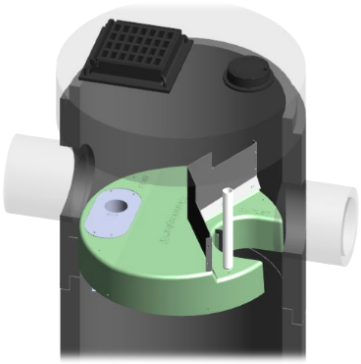
DESIGN FLEXIBILITY

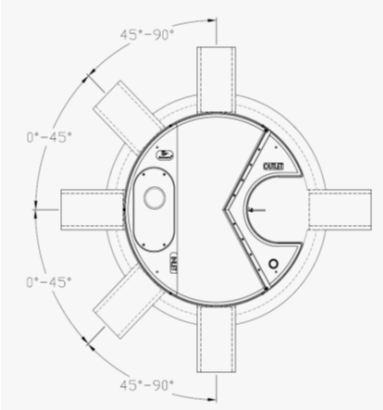
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results Stormceptor® EF

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	46	1320	48	1980	35
30	70	690	46	1350	48	2010	34
60	67	720	45	1380	49	2040	34
90	63	750	45	1410	49	2070	33
120	61	780	45	1440	48	2100	33
150	58	810	45	1470	47	2130	32
180	56	840	45	1500	46	2160	32
210	54	870	45	1530	45	2190	31
240	53	900	45	1560	44	2220	31
270	52	930	44	1590	43	2250	30
300	51	960	44	1620	42	2280	30
330	50	990	44	1650	42	2310	30
360	49	1020	44	1680	41	2340	29
390	48	1050	45	1710	40	2370	29
420	48	1080	45	1740	39	2400	29
450	48	1110	45	1770	39	2430	28
480	47	1140	46	1800	38	2460	28
510	47	1170	46	1830	37	2490	28
540	47	1200	47	1860	37	2520	27
570	46	1230	47	1890	36	2550	27
600	46	1260	47	1920	36	2580	27
630	46	1290	48	1950	35		

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1

4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

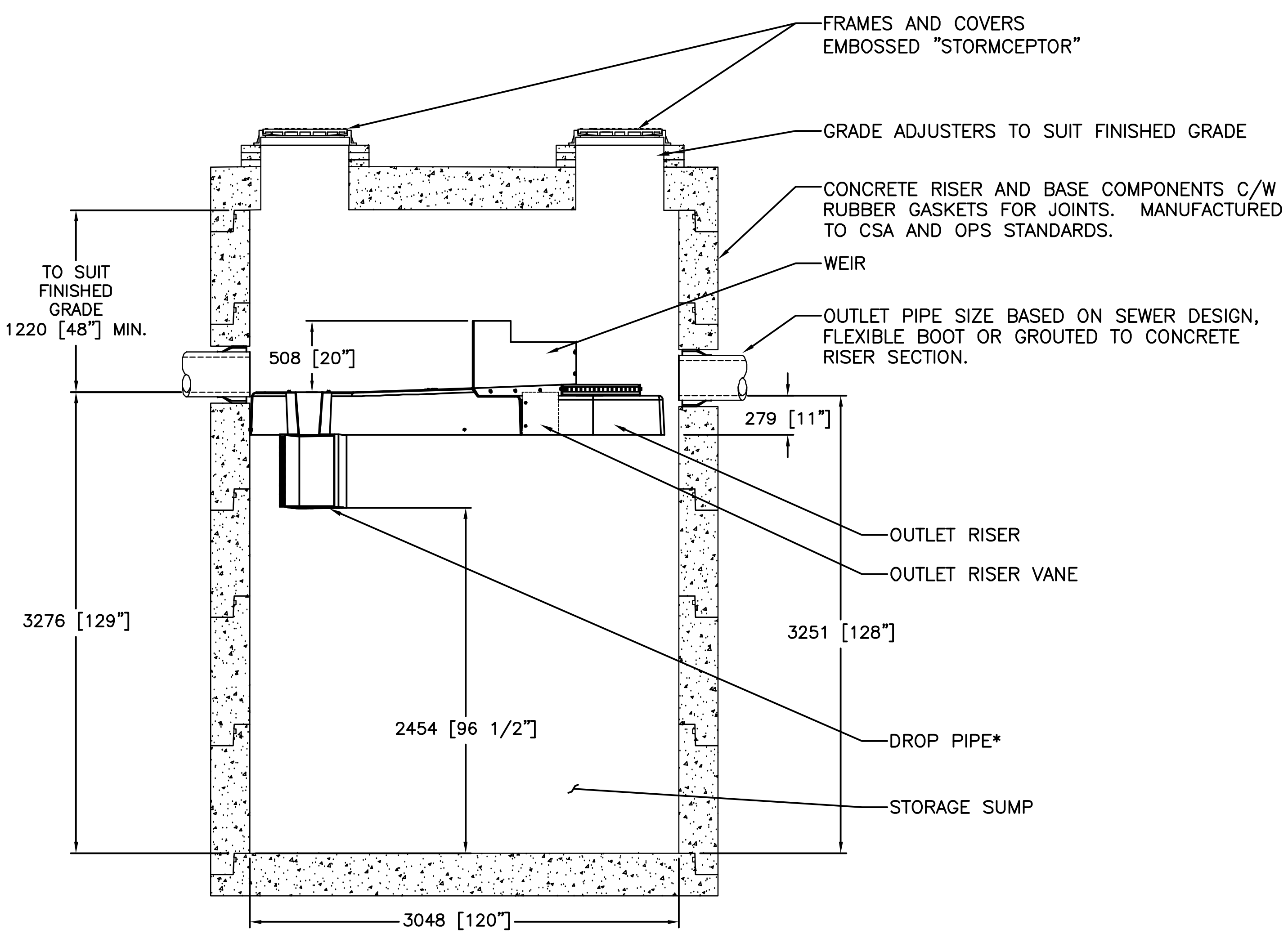
The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

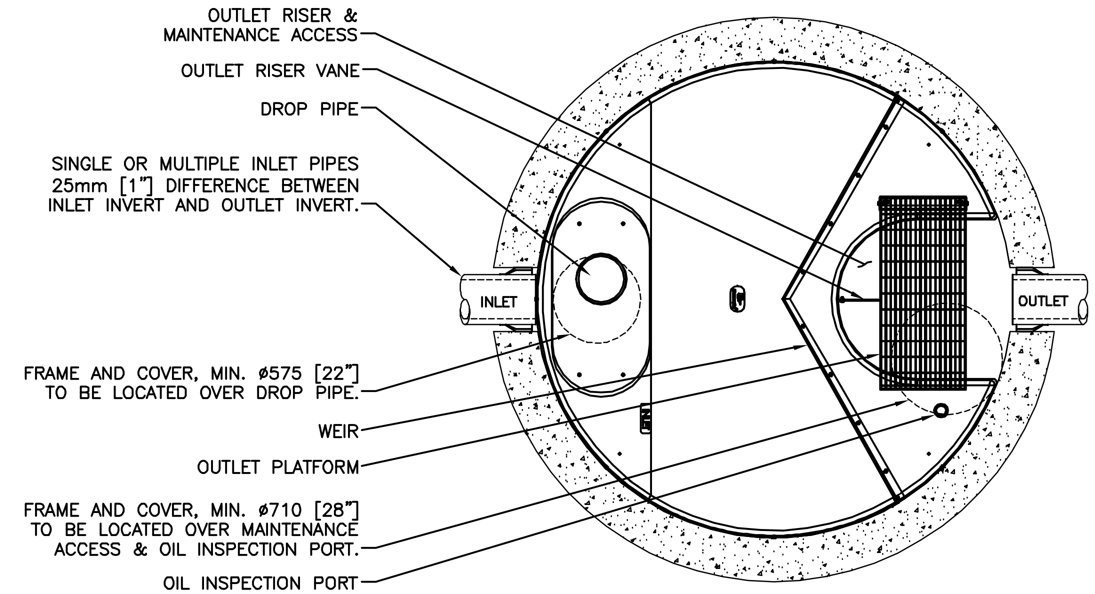
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

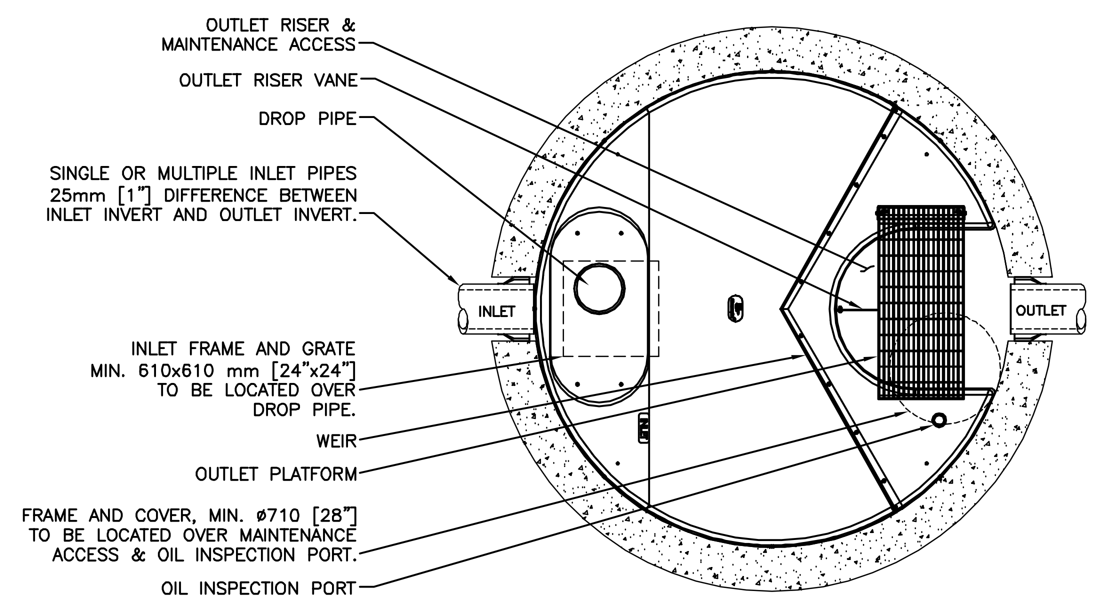
DRAWING NOT TO BE USED FOR CONSTRUCTION



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF10 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO10 (OIL CAPTURE CONFIGURATION).

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF10
STRUCTURE ID	*
WATER QUALITY FLOW RATE (L/s)	*
PEAK FLOW RATE (L/s)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
DRAINAGE AREA (HA)	*
DRAINAGE AREA IMPERVIOUSNESS (%)	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor by Imbrium Systems ("Imbrium"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Imbrium. Failure to comply is done at the user's own risk and Imbrium expressly disclaims any liability or responsibility for such use.

If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Imbrium immediately for re-evaluation of the design. Imbrium accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

MARK	DATE	REVISION DESCRIPTION	BY
####	####	####	####
####	####	####	####
####	####	####	####
1	6/8/18	OUTLET PLATFORM	JSK
0	5/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

imbrium®
407 FAIRVIEW DRIVE, WHITBY, ON L1N 3A9
TF 800-565-4801 CA 416-960-9900 INTL +1-416-960-9900

DATE: 5/26/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EF10	SEQUENCE No.: *
SHEET: 1 OF 1	

I:\IMBRIUM\PRODUCTS\STORMCEPTOR\STORMCEPTOR EF40 DRAWINGS & DETAILS\STANDARD DETAILS\EF10-DETAIL.DWG 4/12/2019 10:55 AM

TECHNICAL BULLETIN

Sizing Stormceptor® EF/EFO for Removal of Canadian ETV and Stormceptor Fine Particle Size Distributions

(Issued April 23, 2018)

The Canadian ETV Particle Size Distribution ("ETV PSD", shown in Table 1 below) is reasonably representative of the PSD of particulates found in typical urban stormwater runoff, and was used in sediment removal and scour performance testing of Stormceptor® EF/EFO in compliance with the provisions of the Canadian ETV protocol titled *Procedure for Laboratory Testing of Oil-Grit Separators*. Municipalities across Canada are increasingly adopting the sediment removal target of 60% removal of the ETV PSD when sizing an oil-grit separator for pretreatment of stormwater runoff, replacing former sediment removal targets that were based on removal of coarser particle size distributions.

Imbrium Systems supports and recommends adoption of 60% removal of the ETV PSD as a Canada-wide standard for sizing of Stormceptor® EF/EFO. However, it is recognized that in some areas there may continue to be sediment removal targets that are based on removal of coarser particle size distributions. Imbrium engineers have performed extensive sizing analyses to determine the estimated removal efficiency of various coarser PSDs as compared to 60% removal of the ETV PSD. Removal efficiencies were calculated for a wide range of influent flow rates, utilizing Stokes' Law for particle settling and the dimensions and hydraulic capacities of each Stormceptor model size.

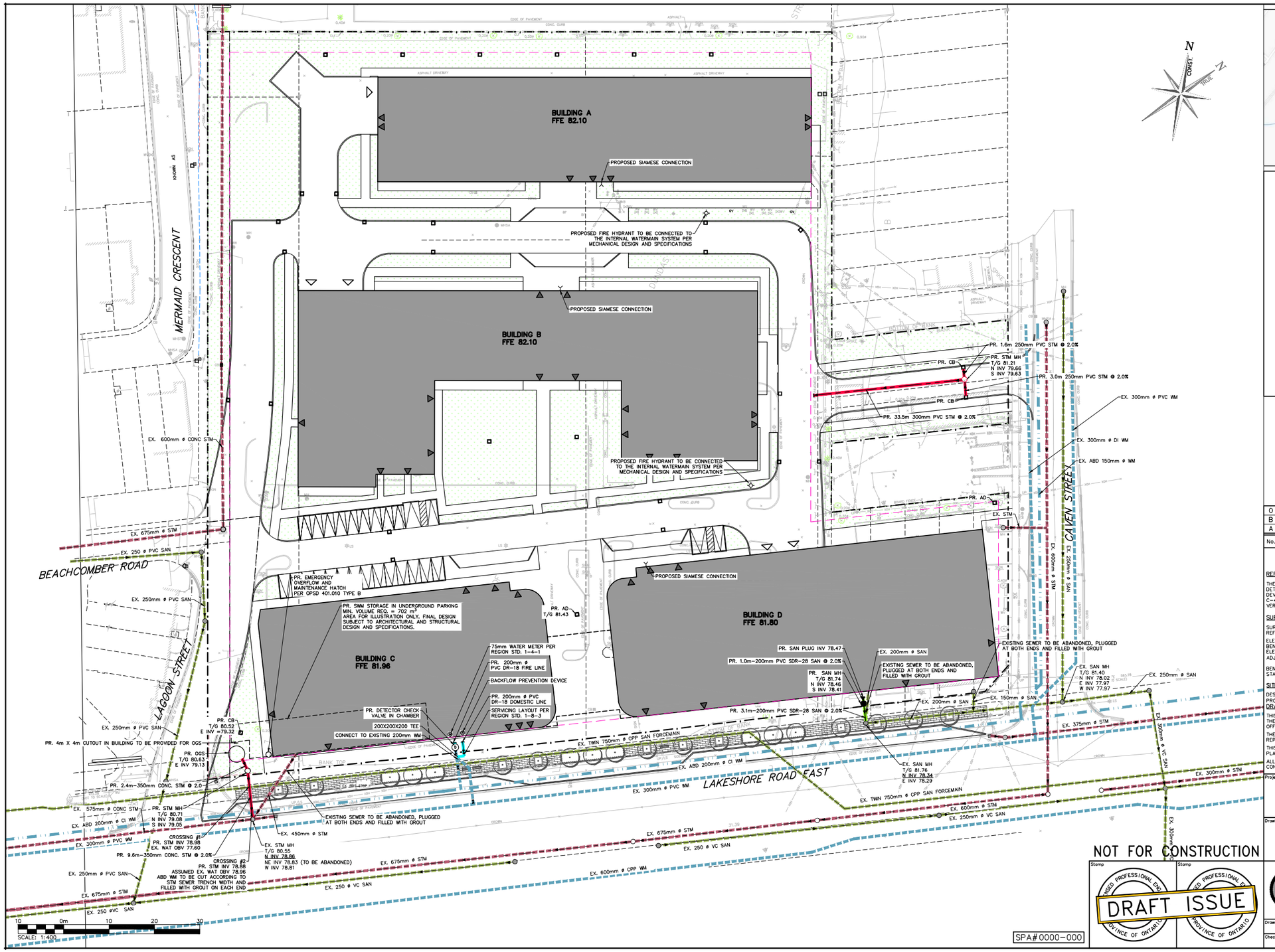
Based on these analyses, sizing Stormceptor® EF/EFO for 60% removal of the ETV PSD is comparable to sizing for 80% removal of the Stormceptor Fine PSD.

Table 1: Particle Size Distribution of Test Sediment

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

The particle size distribution shown in Table 1 above is the Canadian ETV Particle Size Distribution ("ETV PSD") specified in the Canadian ETV protocol titled *Procedure for Laboratory Testing of Oil-Grit Separators*.

FIGURES



LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN & GATE VALVE
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- EXISTING SANITARY SEWER & MANHOLE
- PROPOSED WATERMAIN & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE CONNECTION
- PROPOSED WATER METER
- PROPOSED BACKFLOW PREVENTOR
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED ELECTRICAL TRANSFORMER

No.	ISSUE / REVISION	YYYY/MMM/DD
O	ISSUED FOR FIRST SUBMISSION	2022/OCT/21
B	ISSUED FOR COORDINATION	2022/SEP/09
A	ISSUED FOR COORDINATION	2021/NOV/09

REFERENCED AS-BUILT/AS-CONSTRUCTED DRAWINGS:

THE FOLLOWING AS-BUILT/AS-CONSTRUCTED DRAWINGS WERE REFERENCED TO DETERMINE THE EXISTING CONDITIONS SURROUNDING THE PROPOSED DEVELOPMENT:24973-D, 24974-D, 44089-D, 44090-D, 59415-D, C-457900, C-4920, C-4945, C-4927, & MAP Z-7. All EXISTING INFRASTRUCTURE IS TO BE VERIFIED IN THE FIELD.

SURVEY NOTES:

SURVEY COMPLETED BY R-PE SURVEYING LTD. (2021/MAR/02)
REFERENCE No.: 20-315

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 756 HAVING AN ORTHOMETRIC ELEVATION OF 78.596 METRES. ELEVATIONS ARE REFFERED TO THE CANADIAN VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD-1928:PRE-1978).

BENCHMARK IS ON THE SOUTH FACE AT THE WEST CORNER OF BEIGE BRICK PUMPING STATION ON THE SOUTHEAST CORNER OF BEACH STREET AND AVIATION ROAD.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY QUADRANGLE ARCHITECTS LIMITED.
PROJECT No.: 17125 DATED (2022/JUL/11)

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

579-603 LAKESHORE ROAD EAST
CITY OF MISSISSAUGA

Drawing

PRELIMINARY SERVICING PLAN

NOT FOR CONSTRUCTION

Stamp

LICENSED PROFESSIONAL ENGINEER
DRAFT ISSUE
PROVINCE OF ONTARIO

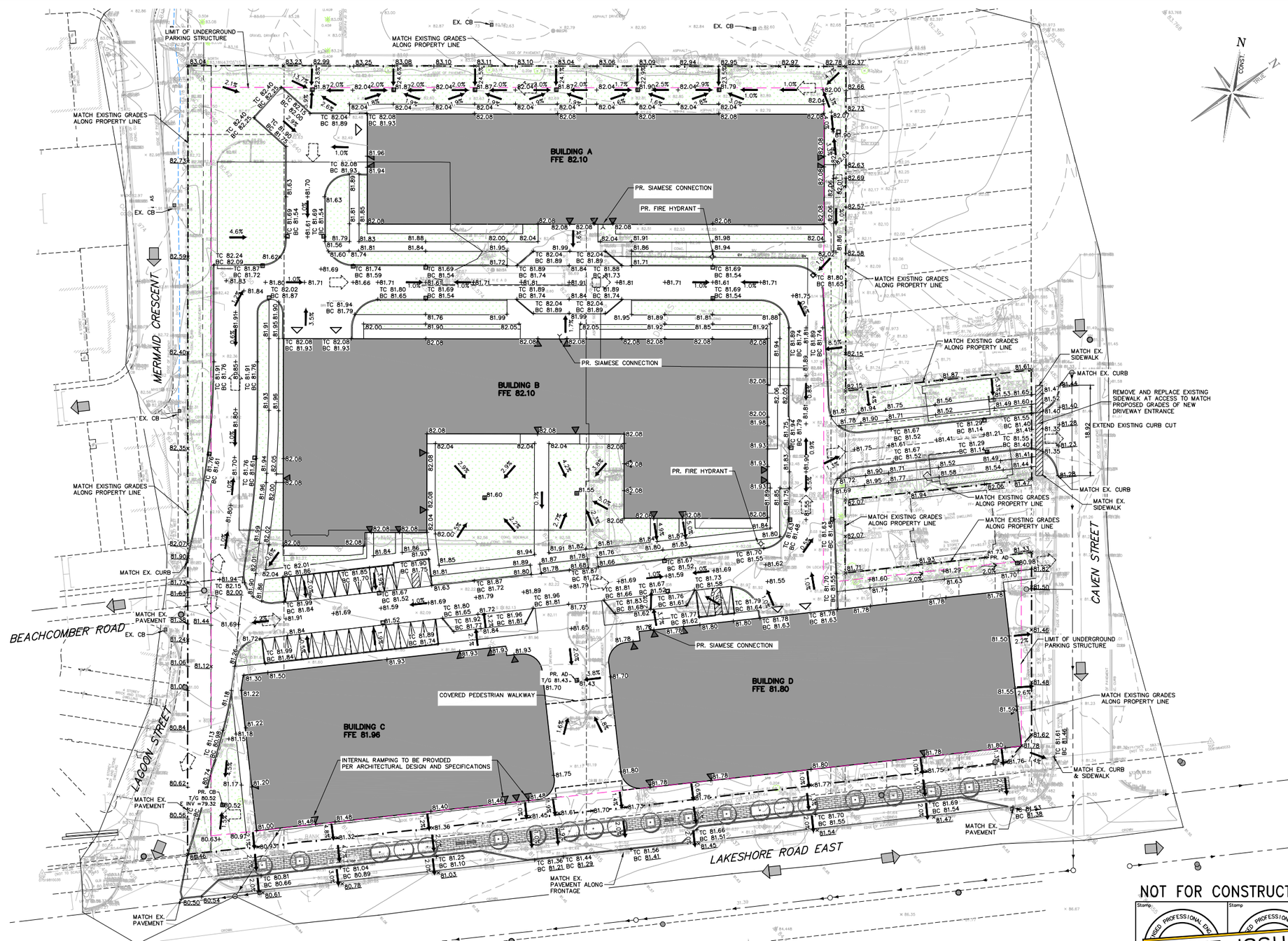
Stamp

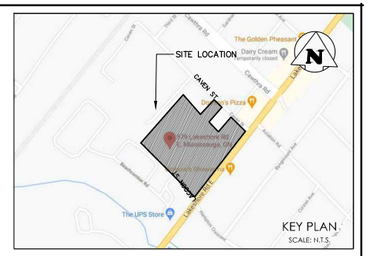
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

SPA# 0000-000

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B./MB	Project No.	1876-5866
Check	J.B.	Check	M.B./N.C.	Scale	1:400
				Dwg.	701





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING OVERLAND FLOW DIRECTION
- PROPOSED OVERLAND FLOW DIRECTION
- ×215.00 EXISTING GRADE
- ×215.00 PROPOSED GRADE
- ×215.00 PROPOSED GRADE (TO MATCH EXISTING)
- 2.0% PROPOSED SLOPE AND DIRECTION
- 2.0% PROPOSED GRASSED SWALE
- PROPOSED SLOPE (3:1 MAX.)
- BUILDING ENTRANCE (PERSONNEL DOOR)
- BUILDING ENTRANCE (OVERHEAD DOOR)
- PROPOSED ELECTRICAL TRANSFORMER
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE (FIRE DEPT.) CONNECTION
- PROPOSED LIMIT OF UNDERGROUND PARKING

No.	ISSUE / REVISION	YYYY/MMM/DD
O	ISSUED FOR FIRST SUBMISSION	2022/OCT/21
B	ISSUED FOR COORDINATION	2022/SEP/09
A	ISSUED FOR COORDINATION	2021/NOV/09

REFERENCED AS-BUILT/AS-CONSTRUCTED DRAWINGS:

THE FOLLOWING AS-BUILT/AS-CONSTRUCTED DRAWINGS WERE REFERENCED TO DETERMINE THE EXISTING CONDITIONS SURROUNDING THE PROPOSED DEVELOPMENT:24973-D, 24974-D, 44089-D, 44090-D, 59415-D, C-457900, C-4920, C-4945, C-4927, & MAP Z-7. All EXISTING INFRASTRUCTURE IS TO BE VERIFIED IN THE FIELD.

SURVEY NOTES:

SURVEY COMPLETED BY R-PE SURVEYING LTD. (2021/MAR/02)
REFERENCE No.: 20-315

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 756 HAVING AN ORTHOMETRIC ELEVATION OF 78.596 METRES. ELEVATIONS ARE REFFERED TO THE CANADIAN VERTICAL DATUM OF 1928, PRE-1978 ADJUSTMENT (CGVD-1928:PRE-1978).

BENCHMARK IS ON THE SOUTH FACE AT THE WEST CORNER OF BEIGE BRICK PUMPING STATION ON THE SOUTHEAST CORNER OF BEACH STREET AND AVIATION ROAD.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY QUADRANGLE ARCHITECTS LIMITED. PROJECT No.: 17125 DATED (2022/JUL/11)

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT. DO NOT SCALE THIS DRAWING.

ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project

579-603 LAKESHORE ROAD EAST
CITY OF MISSISSAUGA

Drawing

PRELIMINARY GRADING PLAN

NOT FOR CONSTRUCTION

Stamp: LICENSED PROFESSIONAL ENGINEER — DRAFT ISSUE — PROVINCE OF ONTARIO

Stamp: LICENSED PROFESSIONAL ENGINEER — DRAFT ISSUE — PROVINCE OF ONTARIO

SPA# 0000-000

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B./MB	Project No.	1876-5866
Check	J.B.	Check	M.B./N.C.	Scale	1:400
				Dwg.	702

10 0m 10 20 30
SCALE: 1:400

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.25m)
- EXISTING CONTOUR (0.50m)
- EXISTING DITCH
- EXISTING GRADE (× 215.00)
- EXISTING OVERLAND FLOW DIRECTION
- STORM DRAINAGE CATCHMENT
- EXISTING STORM SEWER
- CATCHMENT I.D. (ID)
- AREA (ha) | RUNOFF COEFFICIENT (A | RC)

No.	ISSUE / REVISION	YYYY/MMM/DD
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A	ISSUED FOR COORDINATION	2021/NOV/09

REFERENCED AS-BUILT/AS-CONSTRUCTED DRAWINGS:

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SURVEY NOTES:

SURVEY COMPLETED BY R-PE SURVEYING LTD. (2021/MAR/02)
REFERENCE No.: 20-315

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BENCHMARK IS ON THE SOUTH FACE AT THE WEST CORNER OF BEIGE BRICK PUMPING STATION ON THE SOUTHEAST CORNER OF BEACH STREET AND AVIATION ROAD.

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE PLAN BY QUADRANGLE ARCHITECTS LIMITED.
PROJECT No.: 17125 DATED (2022/JUL/11)

DRAWING NOTES:

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

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ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

Project
579-603 LAKESHORE ROAD EAST
CITY OF MISSISSAUGA

Drawing
PRE-DEVELOPMENT DRAINAGE PLAN

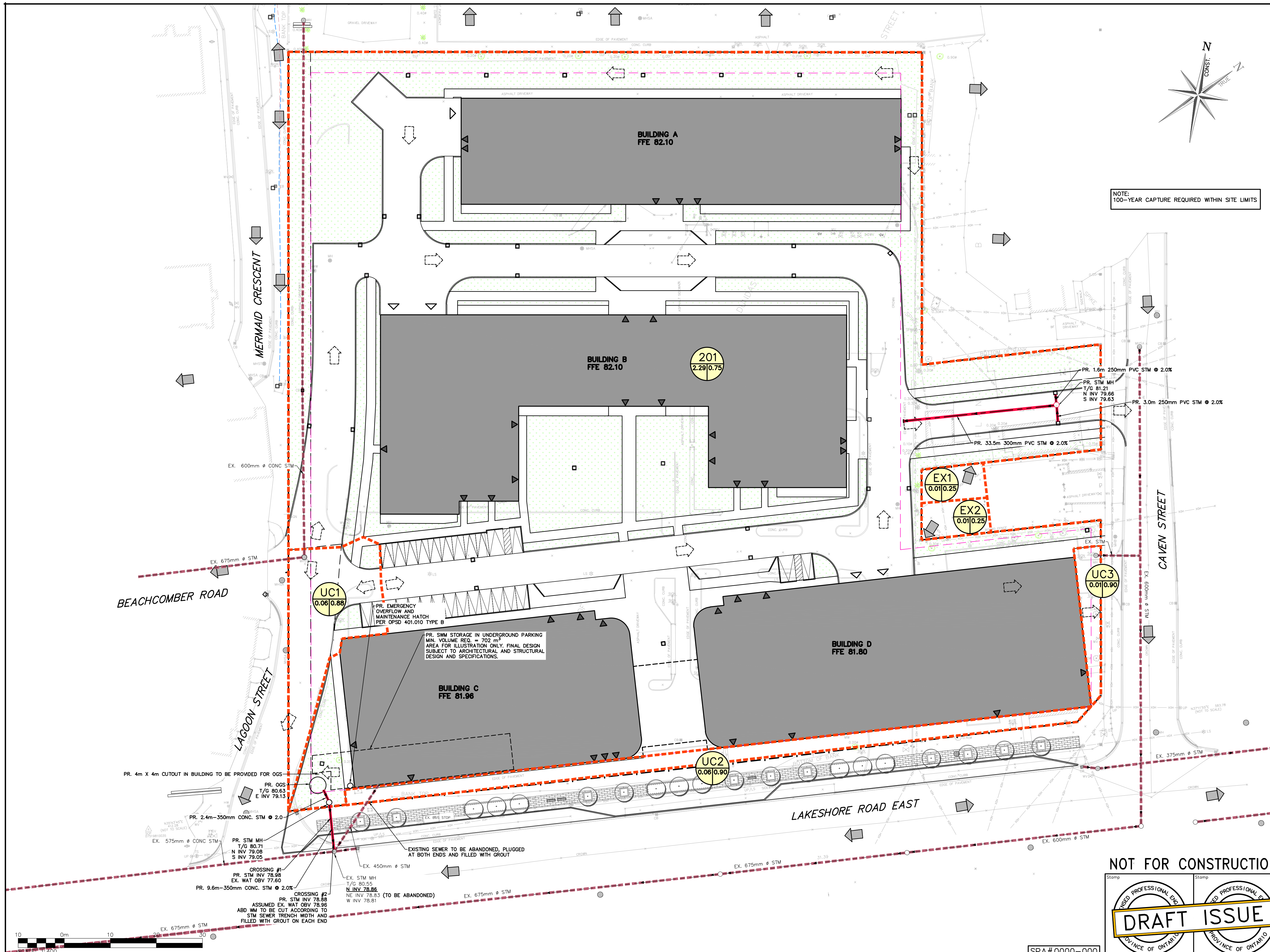
NOT FOR CONSTRUCTION

Stamp: LICENSED PROFESSIONAL ENGINEER — DRAFT ISSUE — PROVINCE OF ONTARIO

SPA# 0000-000

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B./MB	Project No.	1876-5866
Check	J.B.	Check	M.B./N.C.	Scale	1:400
				Dwg.	FIG 1



NOT FOR CONSTRUCTION

SPA# 0000-000

DRAFT ISSUE

LEGEND

	PROPERTY LINE
	EXISTING CONTOUR (0.25m)
	EXISTING CONTOUR (0.5m)
	EXISTING DITCH
× 215.00	EXISTING GRADE
	EXISTING OVERLAND FLOW DIRECTION
	STORM DRAINAGE CATCHMENT
	EXISTING OVERLAND FLOW DIRECTION
	PROPOSED OVERLAND FLOW DIRECTION
ID	CATCHMENT I.D.
A | RC	AREA (ha) RUNOFF COEFFICIENT

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0	ISSUED FOR FIRST SUBMISSION	2022/OCT/21
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SITE PLAN NOTES:

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Project

579–603 LAKESHORE ROAD EAST
CITY OF MISSISSAUGA

Drawing

POST-DEVELOPMENT DRAINAGE PLAN

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON M5B 1M4
416.477.3392 T
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B./MB	Project No.	1876-5866
Check	J.B.	Check	M.B./N.C.	Scale 1:400	Dwg FIG 2