FUNCTIONAL SERVICING & PRELIMINARY STORMWATER MANAGEMENT REPORT

1840 – 1850 BLOOR STREET EAST

CITY OF MISSISSAUGA
REGION OF PEEL

PREPARED FOR:

RANEE MANAGEMENT

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
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AUGUST 2024

CFCA FILE NO. 1788-5378

CROZIER
CONSULTING ENGINEERS

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Ranee Management to prepare a Functional Servicing & Preliminary Stormwater Management Report to support the Official Plan, Zoning By-Law Amendment and Site Plan Approval applications for the proposed infill development located at 1840 – 1850 Bloor Street East in the City of Mississauga, Regional Municipality of Peel (Peel Region).

This report provides information about the water and sanitary servicing as well as stormwater management according to the applicable standards and requirements of the City of Mississauga, Peel Region and TRCA.

2.0 Site Description

The subject property in its entirety is approximately 3.93 ha and currently consists of two (2) 14-storey residential apartment buildings with associated underground and surface parking areas, as well as landscaped areas. The site is bound by:

- Bloor Street to the North
- A residential apartment complex to the East beyond a servicing easement
- Commercial/ Industrial buildings to the South
- A Hydro Corridor to the West

The proposed development is an infill in the back of the property. Envisioned for the development are two (2) 18-storey residential towers connected with a 4-storey podium, one level of underground parking and a 3-storey above grade parking structure. The proposed residential development will have an individual municipal address. In addition to the construction of the new buildings, the existing internal roadway, surface parking and associated landscaping will be modified as required to accommodate the development and improve traffic flow.

3.0 Water Servicing

The Region of Peel is responsible for the operation and maintenance of the public water supply and treatment system in the City of Mississauga. Any local water supply system will connect to the Region's municipal water network.

3.1 Existing Water Servicing

A review of City of Mississauga and Peel Region as-constructed drawings indicate that there is an existing 300mm diameter PVC watermain on the north-side of Bloor Street (Peel Region drawing 57349-D dated as-recorded Oct. 24, 2017).

Based on the Subsurface Utility Plan prepared (Onsite Locates, December 16, 2019), existing Building A and B both have individual water connections to the 300mm PVC watermain along Bloor Street. The plan also shows one (1) fire hydrant located on site, approximately half-way between Building A and B, south of the entrance road connecting the two surface parking lots.

3.2 Design Water Demand

The Region of Peel Linear Infrastructure Sanitary Sewer Manual (March 2017) was used to determine the equivalent population estimate for the existing and proposed buildings. Table 1 uses a unit rate occupancy density of 2.7 persons/unit to determine the equivalent population for each building. The detailed calculations are provided in Appendix A.

Table 1: Equivalent Population Estimate

Type	Building	Number of Units	Total Persons
Existing	A	167	451
	B	167	451
Proposed	C & D	433	1169
	Site Total	**767**	**2071**

The total population for the proposed buildings is 1169 persons which brings the site total to 2071 including the existing buildings.

The Region of Peel Linear Infrastructure Watermain Design Criteria (June 2010) was used to determine the maximum domestic water demand generated by the proposed development based on the equivalent population estimate. An average daily water demand of 280 L/cap/day was used. Table 2 summarizes the estimated design water demand. Appendix A contains detailed water demand calculations.

Table 2: Existing/ Proposed Domestic Water Demand

Standard	Building	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Peak Hourly Demand (L/s)
Region of Peel Public Works Design, Specification & Procedures Manual – Linear Infrastructure Watermain Design Criteria (June 2010)	Existing Buildings A and B	2.92	5.85	8.77
	Proposed Buildings C and D	**3.79**	**7.58**	**11.37**
	Entire Site Total	*6.71*	*13.42*	*20.13*

Note: Site total domestic water demand is the sum of the existing buildings and proposed buildings.

For this application, the domestic water service for proposed building C & D will be designed to convey a water demand equivalent to the peak hourly demand of 11.37 L/s, as shown in Table 2.

3.3 Fire Flow Demand

The Fire Underwriters Survey (FUS) method was used to estimate the fire flow demand for each building within the proposed development area. This calculation estimates the preliminary watermain size required to service each building for fire protection and does not provide a recommendation for fire protection. We assume the towers have non-combustible construction and therefore, a construction coefficient of 0.8 was applied to the fire flow calculations (Water Supply for Public Fire Protection by Fire Underwriters Survey, 1999). We assume the proposed residential buildings will be equipped with automatic sprinkler systems which reduces the initial fire flow demand of each building by up to 50%. Each automated sprinkler system is to be designed by the Mechanical Engineer; therefore, the detailed design of the system is not included in this report. Table 3 summarizes the required fire flow demand and duration of flow required for the proposed buildings C & D.

Table 3: Estimated Fire Flow Demand

Method	Demand Flow (L/s)	Duration (h)
Water Supply for Public Fire Protection by Fire Underwriters Survey (1999)	183.3	2.5

Note: Floor area was determined by the largest floor plus 25% of each of the two immediately adjoining floors

As shown in Table 3, the proposed fire line is required to accommodate a fire flow demand of 183.3 L/s for a duration of 2.5 hours. This is based on the fire flow demand of Level 01, with floor area of 5474.5 m^2 and 25% of the adjoining floors, for total area of 8211.8 m^2.

Refer to Appendix A for detailed calculations of the proposed fire flow.

3.4 Proposed Water Servicing

The proposed development will have a single connection into the existing 300mm diameter PVC watermain on the north-side of Bloor Street. The connection will split at the property line into an individual 100mm diameter domestic water service and individual 200mm diameter fire line. The services will extend to the underground parking limit for the new buildings. The existing buildings will continue to use their existing water connections.

The proposed water servicing plan is shown on Drawing C102 – Site Servicing Plan. The Mechanical Engineer will design the internal private water system including the internal sprinkler system within the building and underground parking structure.

4.0 Sanitary Servicing

Peel Region is responsible for the operation and maintenance of the public sewage collection and treatment system in the City of Mississauga. Any local sewage system will connect to the Region's municipal sanitary sewage network.

4.1 Existing Sanitary Servicing

A review of City of Mississauga and Peel Region as-constructed drawings indicate that there is an existing 375mm diameter PVC sanitary sewer running west-east on the north-side of Bloor Street and an existing 825mm concrete sanitary sewer running north-south adjacent to the property, according to Peel Region drawing 57349-D dated as-recorded Oct. 24, 2017. The 825mm concrete sewer is shown on the as-constructed drawing C-6460, dated December 8, 1964.

Review of the Subsurface Utility Plan prepared by Onsite Locates and dated December 16, 2019 shows that existing Building A and B both have individual sanitary connections. Building A outlets to a manhole at the property line within the site's driveway, which ultimately outlets to the 375mm sanitary sewer on Bloor Street. Building B is assumed to outlet to a manhole adjacent to the surface parking lot, this manhole conveys sanitary flows to the north-south 825mm sanitary sewer in the easement adjacent to the property.

4.2 Design Sanitary Flow

The sanitary design flow for the subject property was calculated using the Region of Peel Public Works Design, Specifications & Procedures Manual – Linear Infrastructure Sanitary Sewer Manual (March 2017) and the equivalent population estimate described in Section 3.2. A unit sewage flow of 302.8 L/cap/d was used, and infiltration flow and a peaking factor were applied to the unit sewage flow to obtain the total estimated design sewage flow.

A summary of the results is presented in Table 4, and detailed calculations are provided in Appendix B.

Table 4: Existing/Proposed Sanitary Design Flows

Standard	Building	Average Flow (L/s)	*Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Flow (L/s)
Region of Peel Public Works Design, Specification & Procedures Manual – Linear Infrastructure Sanitary Sewer Manual (March 2017)	Existing Buildings A and B	3.16	3.83	12.10	0.36	12.46
	Proposed Buildings C and D	**4.10**	**3.76**	**15.39**	**0.43**	**15.81**
	Entire Site Total	*7.26*	-	*27.49*	*0.79*	*28.27*

Note: Site total sanitary flow is the sum of the existing buildings and proposed buildings.

The proposed sanitary service for Buildings C and D must convey a total design sanitary flow of 15.81 L/s as indicated in Table 4.

4.3 Proposed Sanitary Servicing

The development is proposed to be serviced by a 250mm diameter sanitary sewer at a slope of 1% which has a capacity of 59 L/s. The service lateral capacity exceeds the sanitary design flow of 15.81 L/s and is therefore sufficient to convey the flow. The service lateral with extend from the underground parking structure to the existing property line manhole near the Bloor Street site entrance and ultimately outlet to the existing 375mm diameter sanitary sewer on Bloor Street. The existing buildings A and B will continue to use their respective individual connections. The proposed sanitary servicing plan is shown on Drawing C102 – Site Servicing Plan. The internal building plumbing will be designed by the Mechanical Engineer's details and specifications.

5.0 Drainage Conditions

5.1 Existing Drainage

The subject property currently consists of two (2) 14-storey residential apartment buildings with associated underground and surface parking areas, as well as landscaped areas.

According to the Subsurface Utility Plan prepared (Onsite Locates, December 16, 2019) the following storm sewers exist in proximity to the site:

- A 1350mm diameter storm sewer conveys stormwater between Bridgewood Drive and Bloor Street
- A 525mm diameter storm sewers existing on the south side of Bloor Street to convey stormwater east along Bloor Street
- A 375mm diameter storm sewer exists from the site to the existing 525mm storm sewer on Bloor Street

The site was split into pre-development catchments based on the topographic survey completed by Speight, Van Nostrand & Gibson Limited (Ref No. 1-775 PEEL) and Storm Tributary Areas by F. Schaeffer & Associates dated January 1966 (Project No. 65-E-54). The Storm Tributary Areas by F. Schaeffer & Associates delineates the area of the Site which has been accounted for discharging into the Bloor Street storm sewer.

Pre-Development Catchments 1, 2, 3, 5, and 101 (2.64 ha total), shown in the Pre-Development Drainage Plan, are areas of the site accounted for in the Storm Tributary Areas. Pre-Development Catchments UC01 and UC02 have not been accounted for by the Storm Tributary Areas. The following pre-development catchments have been established:

- Catchments 1 and 3 (0.19 ha total): Has been accounted for in the Storm Tributary Areas and Conveys major system drainage uncontrolled to the Bloor Street right-of-way (R.O.W.).
- Catchments 2 and 5 (1.6 ha total): Accounted for in the Storm Tributary Areas. Minor system drainage is collected in internal storm sewer networks with respective connections to the Bloor Street municipal storm sewer. Major system drainage is conveyed overland to a low-point of 127.31 along the north-east property line and is ultimately conveyed through the easement.
- Catchment 101 (0.85 ha): Accounted for in the Storm Tributary Areas and is the pre-development catchment within the storm sewer catchment for the proposed buildings. Post-development peak flows must be equal to or less than the peak flows from this catchment. Minor system drainage is collected in the internal storm sewer network of the two existing buildings and discharge to the Bloor Street municipal storm sewer. Major system drainage is conveyed overland to a low-point of 127.31 along the north-east property line and is ultimately conveyed through the easement.
- Catchment UC01 (1.01 ha): No minor system controls. Conveys major system drainage overland to a low-point of 127.31 along the north-east property line and is ultimately conveyed through the easement.

- Catchment UC02 (0.28 ha): No minor system controls. Conveys major system drainage overland to the south-east property line

A subsurface utility locate survey prepared by Onsite Locates (December 2019) indicates that each existing building has its own individual internal storm sewer network complete with area drains and catch basins. Each building's network has an individual storm outlet to a municipal storm sewer in the Bloor Street R.O.W. Building A (Catchment 5 and part of 101) conveys stormwater from a property line manhole through a 375mm diameter sewer to an existing storm manhole within the Bloor Street R.O.W. Stormwater is then conveyed east through an existing 525mm diameter sewer. Building B (Catchment 2 and part of 101) conveys stormwater via a property line manhole through a 525mm diameter sewer to an existing storm manhole within the Bloor Street R.O.W. Stormwater is then conveyed east through an existing 600mm diameter sewer.

The existing drainage conditions are illustrated on Figure 1 – Pre- Development Drainage Plan.

5.2 Proposed Drainage

The proposed development, as described in Section 2.0 is a residential tower infill complete with two (2) 18-storey residential towers connected with a 4-storey podium, one level of underground parking and a 3-storey above grade parking structure. In addition to the construction of the new buildings, the existing internal roadway, surface parking and associated landscaping will be modified as required to accommodate the development and improve traffic flow.

The proposed drainage design generally maintains the site elevations and the general drainage divide, however due to the new roadway layout and new curbs for the entire site, Catchment 201, as shown on Figure 2 – Post-Development Drainage Plan, will consist of Pre-Development Catchment 101, UC01 and a small portion of UC02. The remaining catchments and their drainage will be unchanged. The main overland flow route for the site will remain unchanged and will continue to utilize the outlet on the east side to the easement adjacent to the property.

The grading of the site results in the following catchments:

- Catchments UC02 (0.24 ha): Maintains existing drainage patterns, conveys major system drainage overland to the south-east property line. The area was reduced from the pre-development condition and included in Catchment 201.

- Catchment UC03 (0.41 ha): This catchment will maintain existing drainage patterns as Catchment UC01 with a decrease in drainage area. Drainage is conveyed via a bioswale to an overland to a low-point of 127.31 along the north-east property line and is ultimately conveyed through the easement per existing conditions. The 100-year post-development peak flows generated from Catchment UC03 are less than the 100-year pre-development peak flows generated by UC01, therefore, providing a net reduction in peak-flows to the easement.

- Catchment 1 (0.18 ha): Maintains existing drainage patterns, conveys major system drainage overland to the Blood Street right-of-way (R.O.W.).

- Catchment 2 (0.96 ha): Maintains existing drainage patterns. Minor system flows are conveyed from Building B through internal storm system and discharge to a 600mm sewer in the Bloor Street R.O.W.

- Catchment 3 (0.007 ha): Maintains existing drainage patterns, conveys major system drainage uncontrolled to the Bloor Street R.O.W.

- Catchment 5 (0.64 ha): Maintains existing drainage patterns, Minor system flows are conveyed from Building A through internal storm system and discharge to a 525mm sewer in the Bloor Street R.O.W.

- Catchment 201 (1.43 ha): Conveys minor system stormwater flows controlled to the existing 525mm storm sewer located in Bloor Street R.O.W. Major system drainage patterns is maintained, stormwater still flows overland to a low-point of 127.31 along the north-east property line and is ultimately conveyed through the easement.

The proposed conditions are illustrated on Figure 2 – Post-Development Drainage Plan. As shown in Figure 2, stormwater runoff from the proposed development, catchment 201 will be captured in catch basins and area drains located throughout the roadway and parking surfaces. Minor system drainage will be conveyed to a stormwater tank located within the underground parking structure. From the stormwater tank, stormwater will be conveyed via the proposed internal storm sewer system to a property line manhole which will then outlet to a storm manhole in the Bloor Street R.O.W., ultimately discharging into the existing 525mm concrete sewer.

6.0 Stormwater Management

Upon reviewing the Toronto and Region Conservation Authority (TRCA) Regulation Mapping, we found that the site is located within the Etobicoke Creek watershed but is outside TRCA regulated area. Based on the TRCA Stormwater Management Criteria dated August 2012, there are no quantity control requirements for our area. However, as noted in the Planning Application Status Report from the City of Mississauga, the site must control the post-development runoff to the 10-Year storm event or existing sewer capacity constraints.

Water Quantity Control

The 100-year peak flows from the post-development condition will be controlled to the 10-year pre-development peak flows accounted for in the Bloor Street sewer. The existing catchment area being conveyed to the Bloor Street sewer is based on Storm Tributary Areas (November 1965, Project 65-E-54) by F. Schaeffer and Associates Ltd.

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 the City of Mississauga Development Requirements Manual (September 2016) to achieve the water balance criteria.

6.1 Stormwater Quantity Control

The pre-development runoff was calculated using the Catchment 101 area which accounts for the extent of major works within the Storm Tributary Areas (Schaeffer, November 1965). Therefore, the 100-year peak flows from Catchment 201 will be less than or equal to the 10-year peak flows from Catchment 101. All other areas accounted for by the Storm Tributary Area (Catchment 1, 2, 3, & 5) will maintain existing drainage patterns.

Using the City of Mississauga intensity-duration frequency data (IDF), the Modified Rational Method was used to determine the post-development peak flow rates for stormwater runoff for Catchment 201. The amount of on-site storage was determined by comparing the post-development peak flow rates to the maximum allowable release rate established by the 10-year pre-development peak flow for Catchment 101.

The stormwater runoff from Catchment 1, 2, 3, and 5 will remain unchanged, therefore no stormwater management controls were included for these areas. Additionally, Catchment UC02 and UC03 will be reduced in the post-development conditions and will maintain existing drainage patterns, therefore, no stormwater management controls were included for this area. 100-year post-development peak flows from UC03 will be less than the 100-year pre-development peak flows from UC01, providing net reduction in peak flows through the easement. See Appendix C for detailed calculations.

Table 5: Summary of Peak Flows and Storage Volume

Catchment 101	Catchment 201		Storage Required with 210mm Orifice Plate	Storage Provided
Uncontrolled Pre-Development	Uncontrolled Post-Development	Controlled Post-Development*		
141.34 L/s	586.68 L/s	130.69 L/s	548.43 m^3	700.00 m^3

*An additional 1.13 L/s has been added to the post-development peak flow to account for long-term dewatering based on Hydrogeological Assessment by Englobe dated August 2024.

Stormwater runoff for Catchment 201 is proposed to discharge to the municipal storm sewer in Bloor Street via a proposed 375mm diameter storm sewer at a 1.3% slope that extends from the underground parking for Buildings C and D. The storm sewer design sheet located in Appendix C provides capacity details for each leg of storm sewer proposed for the development.

As shown in Table 5, stormwater flow controls are required to attenuate the post-development peak flows to the allowable release rate of 141.34 L/s. Therefore, a 210mm orifice plate and underground stormwater tank will be used to attenuate the post-development flows. The underground stormwater tank will be built into the parking structure and sized to accommodate the required storage volume of 548.43 m^3. A 700 m^3 underground stormwater tank has been provided and the detailed tank sizing will be provided by the Architect when the underground parking structure design is finalized. Appendix C contains the detailed calculations and orifice sizing.

6.2 Long-Term Groundwater Dewatering

Based on the Hydrogeological Assessment prepared by Englobe dated August 2024, the Site will require long-term dewatering. The maximum long-term groundwater discharge estimate presented by Englobe is 1.13 L/s. The dewatering flow was accounted for in the post-development peak flow calculations. Englobe indicated that the groundwater exceeds the storm water quality criteria, therefore, the groundwater will need to be treated in accordance with the City of Mississauga Storm Sewer By-Law 259-05 prior to discharge. The dewatering and groundwater treatment system will be designed by a dewatering consultant and specifications will be provided at the detailed design

stage. The dewatering consultant and owner are to design and maintain the system such that it will be able to provide the requisite quality treatment during the lifetime of the building.

6.3 Stormwater Quality Control

Stormwater quality controls for the site must incorporate measures to provide an Enhanced Level of Protection (Level 1) according to the MOECP (March 2003) guidelines. Enhanced water quality protection involved the removal of at least 80% of TSS from 90% of the annual runoff volume. Water quality control will be provided using an oil/grit separator (OGS).

A treatment train approach including an OGS and LID measures will be used to achieve the stormwater quality control criteria. A Stormceptor EF8 will be provided downstream of the underground stormwater tank and orifice plate, to provide quality control for Buildings C and D prior to discharging to the City's storm sewer network.

The new Stormceptor EF/EFO model's sized for 60% removal of the ETV PSD is comparable to sizing for 80% removal of the Stormceptor Fine PSD. The sizing results in Appendix C reflects this qualification. A technical bulletin explaining the equivalency is included in Appendix C.

6.4 Water Balance

As stated by the City of Mississauga Development Requirements Manual (September 2016), the minimum requirement to promote water balance is retention of the 5 mm rainfall event. The water balance retention volume was calculated considering initial abstraction of runoff based on impervious areas in Catchment 201.

Table 6: Water Balance Storage Requirement

Standard	Criteria	Impervious Area (ha)	Storage Required (m^3)	Storage Provide (m^3)
City of Mississauga Development Requirements Manual (September 2016)	Retention of first 5mm	1.37	68.50	71.90

A bioswale is proposed to retain and infiltrate the 5 mm rainfall event. Details of the bioswale are provide in Section 6.4 and Drawing C103 – Site Grading Plan, Additional measures such as intensive green roof, rainwater irrigation of at-grade landscape and green roof, and rainwater re-use toilets in the amenity space will be considered at later stages of detailed design. The rainwater harvesting will be provided via pumping of dead storage in Catchment 201's stormwater storage tank. Re-use systems and pumps are to be designed by the Mechanical Engineer and will be finalized at detailed design.

6.5 Sustainable Stormwater Management

Low Impact Development (LID) strategies have been considered for use throughout the development. A bioswale will be implemented along the south portion of Site. The bioswale will retain the 5 mm event as well as treat and attenuate stormwater runoff. This feature slows the water to allow sedimentation, filtration through the soil matrix, evapotranspiration, and infiltration into the underlying native soil. The stone trench of the bioswale is sized to retain 68.50m^2 and proposed to have a height of 0.70m and width of 1.20m. Supporting calculations are provided in Appendix C and a bioswale detail is provided on Drawing C103 – Site Grading Plan. Additional measures such as intensive green roof, rainwater irrigation of at-grade landscape and green roof, and rainwater re-use toilets in the amenity space will be considered at later stages of detailed design.

7.0 Conclusions and Recommendations

The proposed development can be serviced for water, sanitary, and stormwater in accordance with the City of Mississauga and TRCA requirements and standards. Our conclusions and recommendations include:

1. Existing buildings A and B will maintain their existing water, storm, and sanitary servicing schemes. Drainage catchments for the existing buildings will be reduced as a result of the site re-grading.

2. Water demand for proposed Buildings C and D will be provided using a 200 mm diameter fire line and 100 mm diameter domestic line extending from the existing 300mm diameter watermain located in the Bloor Street R.O.W.

3. Sanitary servicing for Buildings C and D will be provided with a 250mm diameter sanitary sewer at a slope of 1% extending from the existing 375mm sanitary sewer on Bloor Street via connection to the existing property line manhole.

4. Stormwater runoff from post-development Catchment 201 will be controlled to the 10-year pre-development peak flow rates from pre-development Catchment 101 currently draining to the storm sewer on Bloor Street. Quantity control has been provided using an underground stormwater tank and an orifice plate.

5. Water quality for Catchment 201 will be provided through an OGS (Stormceptor Model EF8 or approved equivalent) to achieve enhanced protection (80% TSS removal).

6. Water balance for the Site will be provided through the retention of the 5 mm rainfall event and will be achieved through the use of LIDs. LID details will be finalized at later stages of detailed design.

Based on the above conclusions we support the proposed development application from the perspective of water supply, sanitary servicing, and stormwater management.

Respectfully submitted,

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Jayesh Boily, E.I.T.
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APPENDIX A

Water Demand Calculations

CROZIER & ASSOCIATES Consulting Engineers

Project: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 11/11/2021
Designed By: JB
Checked By: DD

Buildings C and D - Fire Flow Calculations - Fire Underwriters Survey Method

Water Supply for Public Fire Protection (1999)
Fire Underwriters Survey
Notes:

1.) The development will use ordinary construction (C-value = 1.0).
2.) The building is assumed to have no automatic sprinkler protection.
3.) The building is classified as a low hazard occupancy as per the appendix of the Water Supply for Public Fire Protection (1999) by FUS.

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 = The total floor area in square metres (including all storeys, but excluding basements at least 50 percent below grade) in the building considered.

Proposed Development

0.8	C-Value	Largest Floor	5474.5 sq.m	Note: Level 01
		(Plus 25% of Adjoining Floors)	2737.25 sq.m	
			8211.8 sq.m	

Therefore F = 15,900 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)		

-15% Reduction(%)
-2,385 L/min reduction

Subtotal = 13,515 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.

☑ **Assume complete automatic sprinkler protection (50% reduction)**
-6,758 L/min reduction

Water Supply for Public Fire Protection - 1999
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%	>45 m	0%

Exposed buildings

Name	Distance (m)	Charge	Surcharge (L/min)
Existing Building A	33	5%	676
Existing Building B	30	10%	1,352
Existing Building to the South	30	10%	1,352
	n/a	0%	0
		Total Surcharge	**3,379**

Determine Required Fire Flow

No.1	15,900		
No. 2	-2,385	reduction	
No. 3	-6,758	reduction	
No. 4	3,379	surcharge	
Required Flow:	**10,136**	**L/min**	
Rounded to nearest 1000 L/min:	**11,000**	**L/min**	or **183.3 L/s**
			2,904.0 USGPM

Note: USGPM = 0.264*(L/min)

Required Duration of Fire Flow

Flow Required (L/min)	Duration (hours)
2,000 or less	1.00
3,000	1.25
4,000	1.50
5,000	1.75
6,000	2.00
8,000	2.00
10,000	**2.00**
12,000	**2.50**
14,000	3.00
16,000	3.50
18,000	4.00
20,000	4.50
22,000	5.00
24,000	5.50
26,000	6.00
28,000	6.50
30,000	7.00
32,000	7.50
34,000	8.00
36,000	8.50
38,000	9.00
40,000 and over	9.50

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Existing Population Estimate

Site Area

3.93 ha

	Residential (# of units)
Building A	167
Building B	167
TOTAL	334

Residential Population:

Apartment:	2.7	persons/unit
Residential Population:	**902**	persons
EXISTING POPULATION	**902**	persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

\\Crozier-Files\Milton-Projects\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\Design\Civil_Water\[2021.11.09_5378_Ex_Prop Wtr_San Demand.xlsx]Population Estimates

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Proposed Population Estimate

Site Area

3.93 ha

	Residential (# of units)
Proposed Buildings	
Building C	218
Building D	215
TOTAL	433

Residential Population:

Apartment:	2.7	persons/unit
Residential Population:	**1169**	persons
PROPOSED POPULATION:	**1169**	persons
TOTAL SITE POPULATION:	**2071**	persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

I:\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\Design\Civil_Water\[5378_ Ex_Prop Wtr_San Demand.xlsx]Population Estimates

CROZIER & ASSOCIATES Consulting Engineers

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Existing Water Demand

Population Estimate:

Residential:	902 persons
TOTAL POPULATION:	902 persons

Design Criteria:

Average Daily Demand:	0.280	m^3/cap.day
Maximum Daily Demand Peaking Factor:	2.00	
Maximum Hourly Demand Peaking Factor:	3.00	

Source: Peel Region Public Works Watermain Design Criteria, June 2010.

Residential Demand:

Average Day Demand:	252.50	m^3/day
	2.92	L/s
Maximum Day Demand:	505.01	m^3/day
	5.85	L/s
Maximum Hourly Demand:	757.51	m^3/day
	8.77	L/s

Total Average Day Demand:	**2.92**	L/s
Total Maximum Day Demand:	**5.85**	L/s
Total Maximum Hourly Demand:	**8.77**	L/s

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Proposed Water Demand

Population Estimate:

Residential:	1169 persons
TOTAL POPULATION:	1169 persons

Design Criteria:

Average Daily Demand:	0.280 m^3/cap.day
Maximum Daily Demand Peaking Factor:	2.00
Maximum Hourly Demand Peaking Factor:	3.00

Source: Peel Region Public Works Watermain Design Criteria, June 2010.

Residential Demand:

Average Day Demand:	327.35 m^3/day
	3.79 L/s
Maximum Day Demand:	654.70 m^3/day
	7.58 L/s
Maximum Hourly Demand:	982.04 m^3/day
	11.37 L/s

Total Average Day Demand:	**3.79** L/s
Total Maximum Day Demand:	**7.58** L/s
Total Maximum Hourly Demand:	**11.37** L/s

\\Crozier-Files\Milton-Projects\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\Design\Civil_Water\[2021.11.09_5378_ Ex_Prop Wtr_San Demand.xlsx]Population Estimates

APPENDIX B

Sanitary Sewage Demand Calculations

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Existing Population Estimate

Site Area

3.93 ha

	Residential (# of units)
Building A	167
Building B	167
TOTAL	334

Residential Population:

Apartment:	2.7	persons/unit
Residential Population:	**902**	persons
EXISTING POPULATION	**902**	persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

\\Crozier-Files\Milton-Projects\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\Design\Civil_Water\[2021.11.09_5378_Ex_Prop Wtr_San Demand.xlsx]Population Estimates

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 2021-11-09
Revised: -
Design: JB
Check: DD

Proposed Population Estimate

Site Area

3.93 ha

	Residential (# of units)
Proposed Buildings	
Building C	218
Building D	215
TOTAL	433

Residential Population:

Apartment:	2.7	persons/unit
Residential Population:	**1169**	persons
PROPOSED POPULATION:	**1169**	persons
TOTAL SITE POPULATION:	**2071**	persons

Source: Peel Region Public Works Design Criteria Manual - Sanitary Sewer, March 2017.

I:\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\Design\Civil_Water\[5378_ Ex_Prop Wtr_San Demand.xlsx]Population Estimates

CROZIER & ASSOCIATES
Consulting Engineers

Project: 1840 - 1850 Bloor Street East
Address: 1840 - 1850 Bloor Street East
Project No.: 1788-5378

Date: 11/9/2021
Revised: -
Design: JB
Check: DD

Existing Sanitary Flow

Site Area:

1.79 ha

Population Estimates:

Residential:	902	persons
TOTAL POPULATION:	902	persons

Design Criteria:

Unit Sewage Flow:	0.3028	m^3/cap.day
Infiltration:	0.200	L/s/ha

Peaking Factor (Commercial Land Use):

Modified Harmon Formula

$$M = 1+\frac{14}{4+\sqrt{Pe}}$$

Source: Peel Region Sanitary Sewer Design Criteria, March 2017. Standard Drawing 2-9-2

Residential Sanitary Flow:

Average Dry Weather Flow:	273.07	m^3/day
	3.16	L/s

Total Dry Weather Sanitary Flow:	3.16	L/s
Peaking Factor:	3.83	
Total Peak Sanitary Flow:	12.10	L/s
Inflow/Infiltration Allowance:	0.36	L/s
Total Design Sanitary Flow:	12.46	L/s

Project:	1840 - 1850 Bloor Street East	Date:	11/9/2021
Address:	1840 - 1850 Bloor Street East	Revised:	-
Project No.:	1788-5378	Design:	JB
		Check:	DD

Proposed Sanitary Flow

Site Area:

2.14 ha

Population Estimates:

Residential:	1169	persons
TOTAL POPULATION:	1169	persons

Design Criteria:

Unit Sewage Flow:	0.3028	m^3/cap.day
Infiltration:	0.200	L/s/ha

Peaking Factor (Commercial Land Use):

Modified Harmon Formula

$$M = 1+\frac{14}{4+\sqrt{Pe}}$$

Source: Peel Region Sanitary Sewer Design Criteria, March 2017. Standard Drawing 2-9-2

Residential Sanitary Flow:

Average Dry Weather Flow:	354.00	m^3/day
	4.10	L/s

Total Dry Weather Sanitary Flow:	4.10	L/s
Peaking Factor:	3.76	
Total Peak Sanitary Flow:	15.39	L/s
Inflow/Infiltration Allowance:	0.43	L/s
Total Design Sanitary Flow:	15.81	L/s

APPENDIX C

Stormwater Management Calculations

Project: 1840-1850 Bloor St
Project No.: 1788-5378
Created By: JB
Checked By: RB
Date: 2021-11-08
Updated: 2024-08-15

Modified Rational Calculations - Peak Flows Summary - Bloor Street

Target Flow Rate - Capacity of Storm Sewer Method

	C	i (mm/hr)	A (ha)	Q (m3/s)	Q (L/s)*
Storm Sewer Capacity for Catchment 101	0.60	99.17	0.85	0.14	141.34
Catchment 201 Orifice Control	1.00	140.69	1.50	1.31	130.69

* Additional 1.13 L/s has been added to the post-development peak flow to account for long-term dewatering based on Hydrogeological Assessment by Englobe dated August 2024.

Equations:

Peak Flow

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

CROZIER CONSULTING ENGINEERS

Project: 1840-1850 Bloor St
Project No.: 1788-5378
Created By: JB
Checked By: RB
Date: 2021-11-08
Updated: 2024-08-15

Modified Rational Calculations - Input Parameters - Bloor Street

Storm Data: Mississauga

Time of Concentration: T_c = 15 min (per city of Mississauga standards)

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 101)			
	Area (ha)	**Area** (m^2)	**C**
Capacity of Storm Sewer (Within Catchment 203)	**0.85**	**8,545**	**0.60**

Capacity of Storm Sewer on Bloor Street based on site area being conveyed to Bloor Street and RC from Storm Tributary Areas and Storm Sewer Design Chart (F. Schaffer & Associates Limited, Project No.: 65-E-54, Jan 1966)

Note: 2.64ha total of site area was accounted for in Bloor Street sewer at RC = 0.60. Above only considers target for catchment 103 which encloses the extent of works for major changes, other site area remains as is and is assumed to historically adhere to storm sewer capacity constraints. With on-site controls total discharge is equivalent or less than target peak flow.

Post - Development Conditions (Catchment 201)					
Land Use	**Area** (ha)	**Area** (m^2)	**C**	**Weighted Average C @ 2, 5, 10-year**	**Weighted Average C @ 100-year**
Pervious	0.13	1,300	0.25	**0.02**	**0.03**
Impervious	1.37	13,700	0.90	**0.82**	**1.03**
Total Site	**1.50**	**15,000**	**-**	**0.84**	**1.00**

Max C = 1.00

Equations:

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

Intensity
$i(T_d) = A / (T + B)^C$

Note: For city of Mississauga apply adjusment factor to RC as follows

10-year	1.00
25-year	1.10
50-year	1.20
100-year	1.25

Project: 1840-1850 Bloor St
Project No.: 1788-5378
Created By: JB
Checked By: RB
Date: 2021-11-08
Updated: 2024-08-15

Modified Rational Calculations - Bloor Street

City of Mississauga Control Criteria

Control 100-year Post-Development Peak Flows to Target Flow Rate (storm sewer capacity)

100 yr: Uncontrolled Post-Development Flow

Q_{post} = 586.68 L/s

10 yr: Target Flow Rate (Based on Storm Sewer Capacity)

Q_{target} = 141.34 L/s

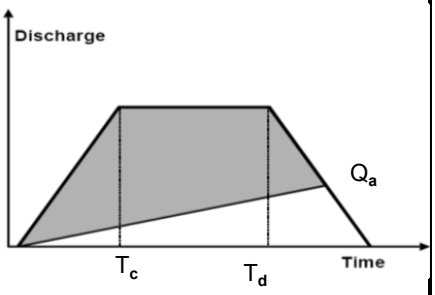
$Q_{orifice\ (i.e.\ 100\text{-}year\ controlled\ post\text{-}development\ flow)}$ = 129.56 L/s

Capacity of Storm Sewer on Bloor Street based on site area being conveyed to Bloor Street and RC from Storm Tributary Areas and Storm Sewer Design Chart (F. Schaffer & Associates Limited, Project No.: 65-E-54, Jan 1966)

Note: Since Qorifice < Qtarget there will be no impact on the existing storm sewer. On-site controls are provided to control the 100-year post development peak flow to the target peak flow (i.e. capacity of storm sewer based on assigned area and RC)

Storage Volume Determination

T_d	i (mm/hr)	T_d (sec)	Q_{Uncont} (m^3/s)	S_d (m^3)
5	242.53	300	1.01	225.67
10	176.31	600	0.74	343.96
15	140.69	900	0.59	411.40
20	118.12	1200	0.49	455.04
25	102.41	1500	0.43	485.10
30	90.77	1800	0.38	506.44
35	81.77	2100	0.34	521.74
40	74.58	2400	0.31	532.60
45	68.68	2700	0.29	540.09
50	63.75	3000	0.27	544.90
55	59.56	3300	0.25	547.56
60	55.95	3600	0.23	548.43
65	52.81	3900	0.22	547.81
70	50.03	4200	0.21	545.92
75	47.58	4500	0.20	542.93
80	45.38	4800	0.19	538.97
85	43.39	5100	0.18	534.18
90	41.60	5400	0.17	528.64
95	39.97	5700	0.17	522.42
100	38.47	6000	0.16	515.61
			Required Storage Volume:	**548.43**



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

Storage
$S_d = Q_{post} \cdot T_d - Q_{target} (T_d + T_c) / 2$

WATER BALANCE

Infiltrate based on 5mm across impervious area

Impervious Area: 1.37 ha

Infiltration Storage Required: 68.50 m3

Project: 1840-1850 Bloor St
Project No.: 1788-5378
Designed by: JB
Checked by: RB

Date: 2021-11-08
Updated: 2024-08-15

Orifice Release Rate

MUNICIPALITY: City of Mississauga

Target Control Rate:	141.34	L/s
Orifice Type:	Plate	
Invert Elevation:	124.83	m
Diameter of Orifice:	210	mm
Area of Orifice (A):	0.0346	sq.m
Orifice Coefficient (Cd):	0.620	Orifice Plate

Capacity of Storm Sewer on Bloor Street based on site area being conveyed to Bloor Street and RC from Storm Tributary Areas and Storm Sewer Design Chart (F. Schaffer & Associates Limited, Project No.: 65-E-54, Jan 1966)

Calculation of Head

Centroid Elevation:	124.94	m
Water Elevation:	126.79	m
Upstream Head*, (h):	1.86	m

Qa: (Cd)(A)(2gh)^0.5

Actual Controlled Discharge, Qa:	**0.1296**	**cms**
	129.56	**L/s**

*Head is based upon orifice area @ orifice face not Vena Contracta

CROZIER & ASSOCIATES Consulting Engineers

Project: 1840-1850 Bloor St | **Created By:** JB | **Date:** 2021-11-09
Project No.: 1788-5378 | **Checked By:** RB | **Updated:** 2024.08.15

Bio-Swale Storage Sizing

Swale Length:	214.88	m
Required Storage Volume (Excluding Stone):	68.5	cu.m
Void Ratio:	0.4	
Required Storage Volume (Including Stone):	171.3	cu.m
Groundwater Elevation:	123.90	m
Lowest Bottom of Swale Grade:	127.03	m
Bottom of the Stone:	126.33	m
Available Separation between swale and stone:	2.43	m
Provide Stone Storage Width:	1.20	m
Provide Stone Storage Length:	214.00	m
Minimum Stone Storage Height Required:	0.67	m
Stone Storage Depth provided:	0.70	m

Note: Groundwater elevation is based on interpretation of borehole hole logs by Terraprobe Inc. dated Novemeber 28, 2019. Upon review of the borehole logs, measured water levels, soil layers and well screen depths, it was determine that the groundwater elevation along the southern portion of the proposed building is 123.9m.

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Project: 1840-1850 Bloor St
Project No.: 1788-5378
Created By: JB
Checked By: RB
Date: 2021-11-08
Updated: 2024-08-15

Modified Rational Calculations - Easement

Pre-Development Condition (Catchment UC01)				
Area (Ha)	**Area (m^2)**	**C**	**$I_{100\text{-}Yr}$ (mm/hr)**	**100-Yr Peak Flow (L/s)**
1.01	10,100	0.25	140.69	**99.47**

Post-Development Condition (Catchment UC03)				
Area (Ha)	**Area (m^2)**	**C**	**$I_{100\text{-}Yr}$ (mm/hr)**	**100-Yr Peak Flow (L/s)**
0.41	4,100	0.25	140.69	**40.38**

Equations:

Peak Flow

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

CROZIER
CONSULTING ENGINEERS

1840-1850 Bloor St
STORM SEWER DESIGN SHEET

Municipality: Mississauga
100 YEAR DESIGN STORM
A 1450 **B** 4.9 **C** 0.78

PROJECT: 1840-1850 Bloor St.
PROJECT No.: 1788-5378
FILE: Storm Sewer Design
Date: November 15, 2021
Revised: August 15, 2024
Design: JB
Check: RB

INITIAL TIME OF CONCENTRATION (min) 15.00 MANNINGS "n" 0.013

DRAINAGE AREA ID	FROM MH	TO MH	AREA (A) Ha	RUN-OFF COEFF	A x C	CUMMUL. A x C	TIME OF CONC. min	I mm/hr	Q l/sec	SLOPE %	PIPE DIA. mm	Area m2	VEL. m/sec	LENGTH m	TIME OF FLOW min	CAPACITY l/sec	% CAPACITY
302	**CB 3**	**MH 2**	0.12	0.63	0.08	0.08	15.00	**140.69**	**30.79**	**2.00**	**375**	0.11	2.25	**54.7**	0.41	**247.95**	12
301	**PLUG 1/TANK**	**MH 2**	**SEWER 100% FULL DUE TO HEAD IN TANK**						**199.91**	**1.30**	**375**	0.11	1.81	**44.0**	0.41	**199.91**	100
	MH 2	**OGS**	**ORIFICE CONTROLLED FLOW RATE**						**130.69**	**1.30**	**375**	0.11	1.81	**59.1**	0.54	**199.91**	65
	OGS	**MH 1**	**ORIFICE CONTROLLED FLOW RATE**						**130.69**	**2.00**	**375**	0.11	2.25	**5.9**	0.04	**247.95**	53
	MH 1	**EX MH**	**ORIFICE CONTROLLED FLOW RATE**						**130.69**	**2.00**	**375**	0.11	2.25	**14.3**	0.11	**247.95**	53

Note: A factor of 1.25 has been applied to the 100-year post-development runoff coefficients per the City of Mississauga Stormwater Management Guidelines

Stormceptor®

Rinker MATERIALS™

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/15/2024

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

Site Name:	1840 Bloor Street

Drainage Area (ha):	1.50
Runoff Coefficient 'c':	0.84

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

Required Water Quality Runoff Volume Capture (%):	
Estimated Water Quality Flow Rate (L/s):	39.18
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	130.69
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	
Estimated Average Annual Sediment Volume (L/yr):	808

Project Name:	1840 Bloor Street
Project Number:	1788-5378
Designer Name:	Jayesh Boily
Designer Company:	C.F. Crozier & Assoociates
Designer Email:	jboily@cfcrozier.ca
Designer Phone:	905-875-0026
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	48
EF6	55
EF8	60
EF10	63
EF12	66

Recommended Stormceptor EF Model: EF8

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.

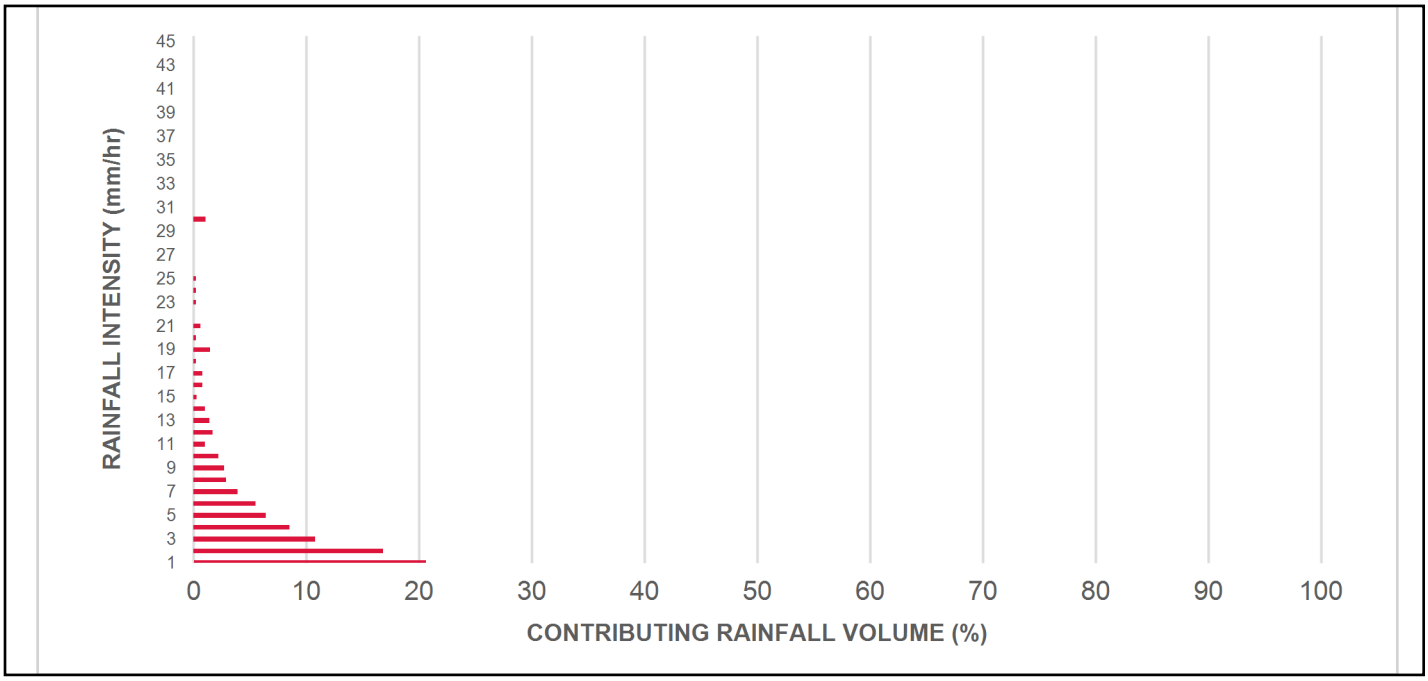
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Upstream Flow Controlled Results

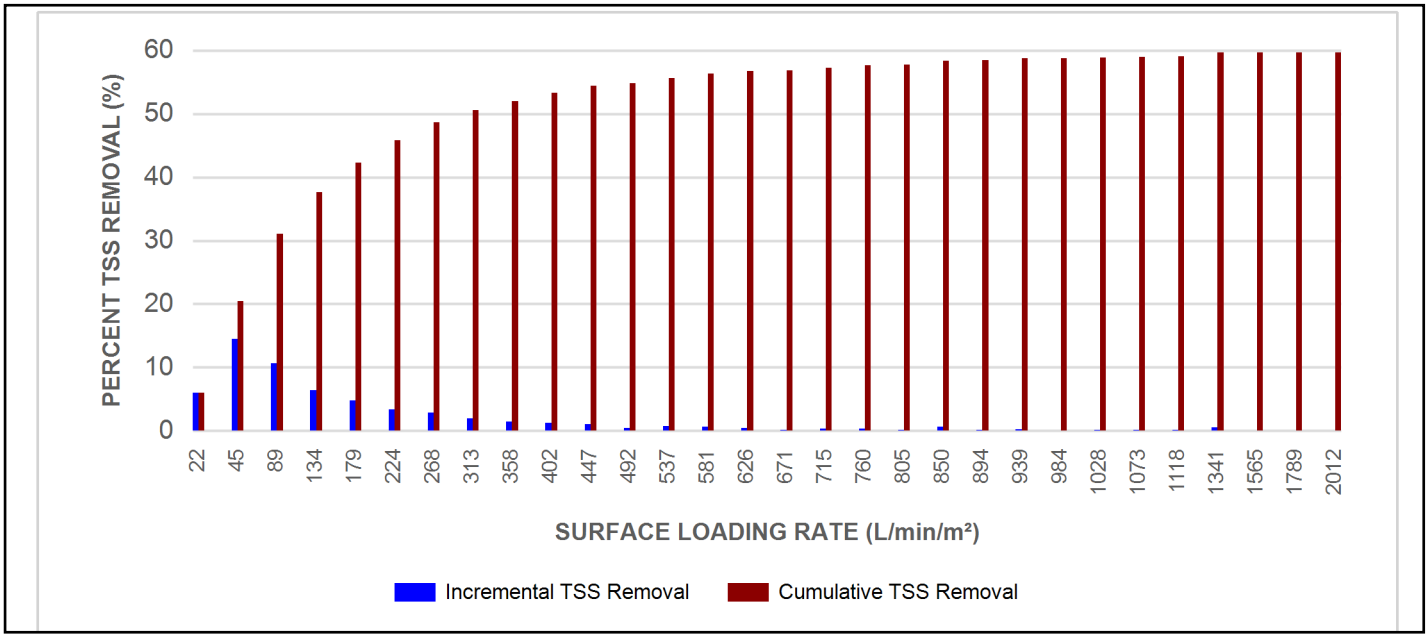
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.5	8.5	1.75	105.0	22.0	70	6.0	6.0
1.00	20.6	29.1	3.50	210.0	45.0	70	14.5	20.5
2.00	16.8	45.9	7.01	420.0	89.0	63	10.6	31.1
3.00	10.8	56.7	10.51	631.0	134.0	60	6.4	37.6
4.00	8.5	65.2	14.01	841.0	179.0	57	4.8	42.3
5.00	6.4	71.6	17.51	1051.0	224.0	53	3.4	45.8
6.00	5.5	77.0	21.02	1261.0	268.0	52	2.8	48.6
7.00	3.9	81.0	24.52	1471.0	313.0	51	2.0	50.6
8.00	2.9	83.9	28.02	1681.0	358.0	50	1.4	52.0
9.00	2.7	86.5	31.53	1892.0	402.0	48	1.3	53.3
10.00	2.2	88.7	35.03	2102.0	447.0	48	1.0	54.4
11.00	1.0	89.7	38.53	2312.0	492.0	47	0.5	54.8
12.00	1.7	91.3	42.03	2522.0	537.0	47	0.8	55.6
13.00	1.4	92.8	45.54	2732.0	581.0	46	0.7	56.3
14.00	1.0	93.7	49.04	2942.0	626.0	46	0.4	56.7
15.00	0.3	94.0	52.54	3153.0	671.0	46	0.1	56.8
16.00	0.8	94.8	56.04	3363.0	715.0	45	0.4	57.2
17.00	0.8	95.7	59.55	3573.0	760.0	45	0.4	57.6
18.00	0.2	95.8	63.05	3783.0	805.0	45	0.1	57.7
19.00	1.5	97.3	66.55	3993.0	850.0	45	0.7	58.3
20.00	0.2	97.5	70.06	4203.0	894.0	45	0.1	58.4
21.00	0.6	98.2	73.56	4414.0	939.0	44	0.3	58.7
22.00	1.8	100.0	77.06	4624.0	984.0	44	0.8	59.5
23.00	0.2	100.2	80.56	4834.0	1028.0	44	0.1	59.6
24.00	0.2	100.5	84.07	5044.0	1073.0	45	0.1	59.7
25.00	0.2	100.7	87.57	5254.0	1118.0	45	0.1	59.8
30.00	1.1	101.8	105.08	6305.0	1341.0	48	0.6	60.4
35.00	-1.8	100.0	122.60	7356.0	1565.0	44	N/A	59.6
40.00	0.0	100.0	131.00	7860.0	1672.0	41	0.0	59.6
45.00	0.0	100.0	131.00	7860.0	1672.0	41	0.0	59.6
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

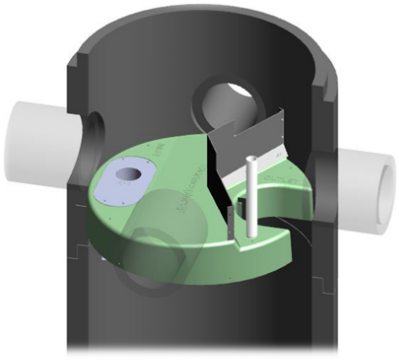
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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.

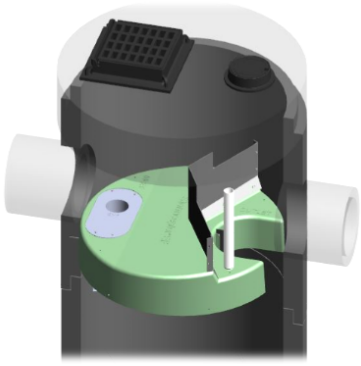
DESIGN FLEXIBILITY

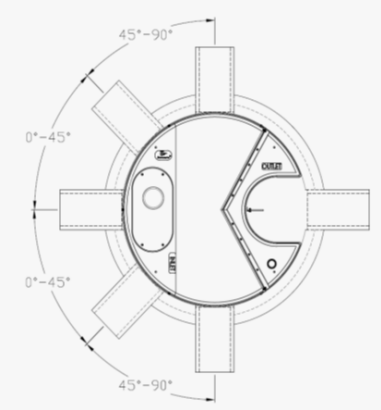
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend 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	2600	26

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 of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

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.

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.

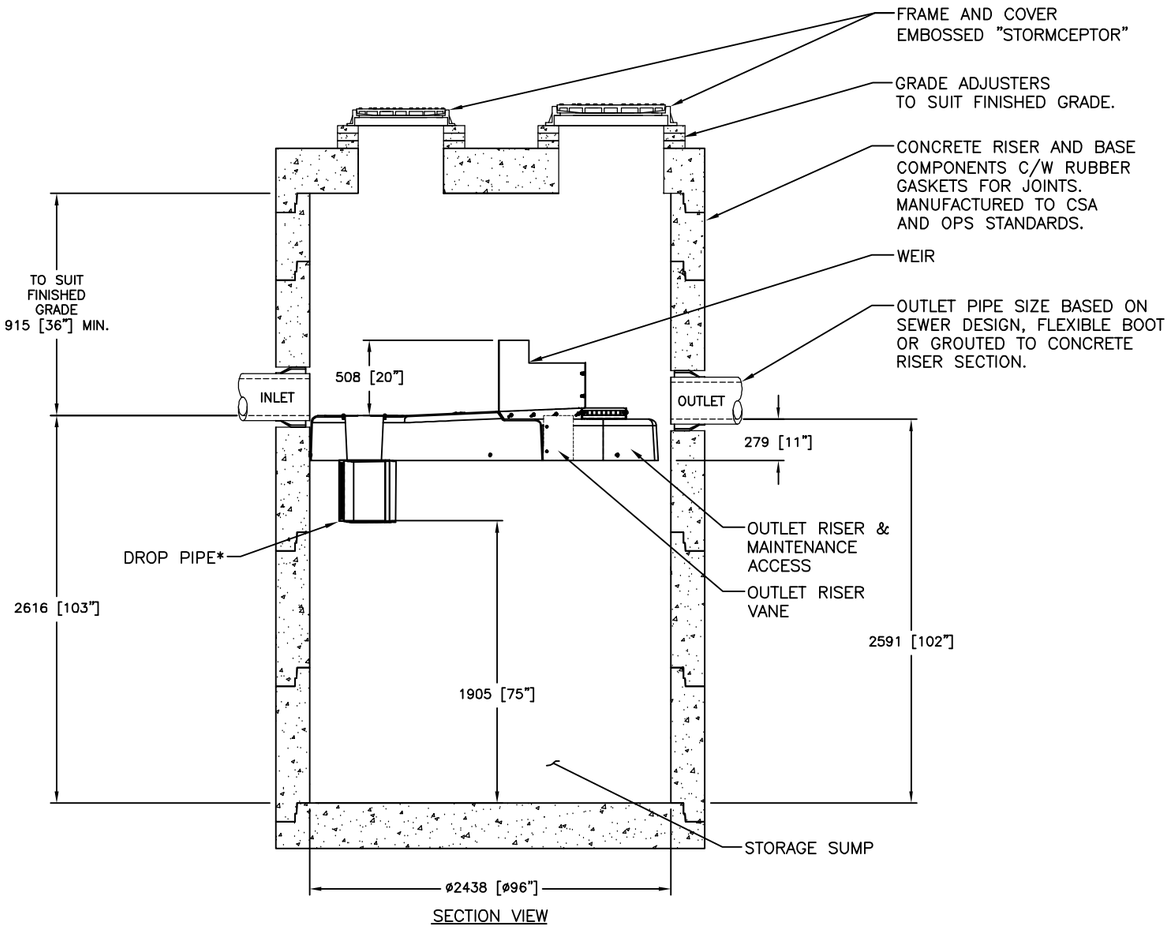
Based on these analyses, sizing Stormceptor® EF/EFO for 60% removal of the ETV PSD is comparable to sizing for 80% removal of the Stormceptor Fine PSD.

Table 1: Particle Size Distribution of Test Sediment

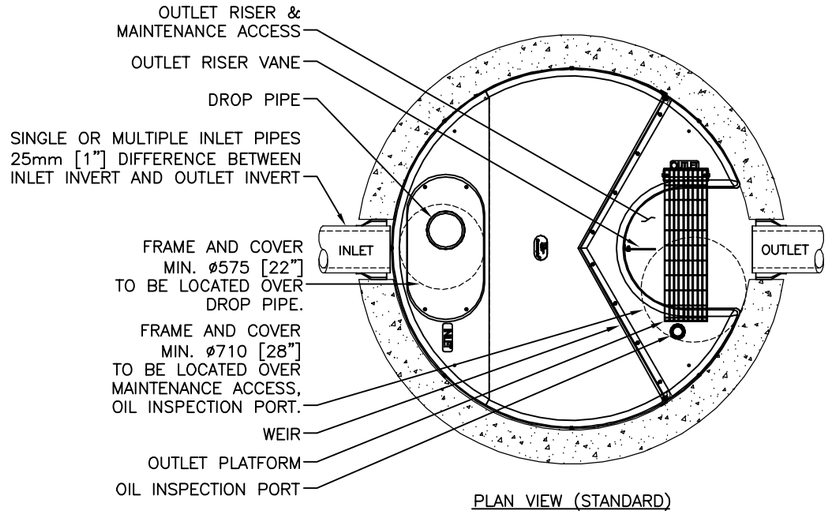
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

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*.

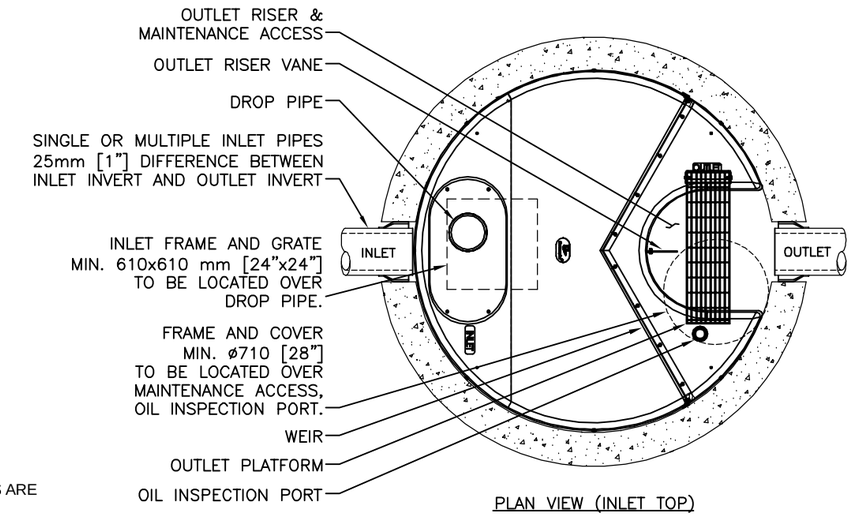
DRAWING NOT TO BE USED FOR CONSTRUCTION



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 EF8 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO8 (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.

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.

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).

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF8				
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

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 9A9
TF 800-565-4501 CA 416-665-9600 INTL +1-416-665-9600

DATE:	5/26/2017
DESIGNED:	JSK
DRAWN:	JSK
CHECKED:	BSF
APPROVED:	*
PROJECT No.:	EF8
SEQUENCE No.:	*
SHEET:	1 OF 1

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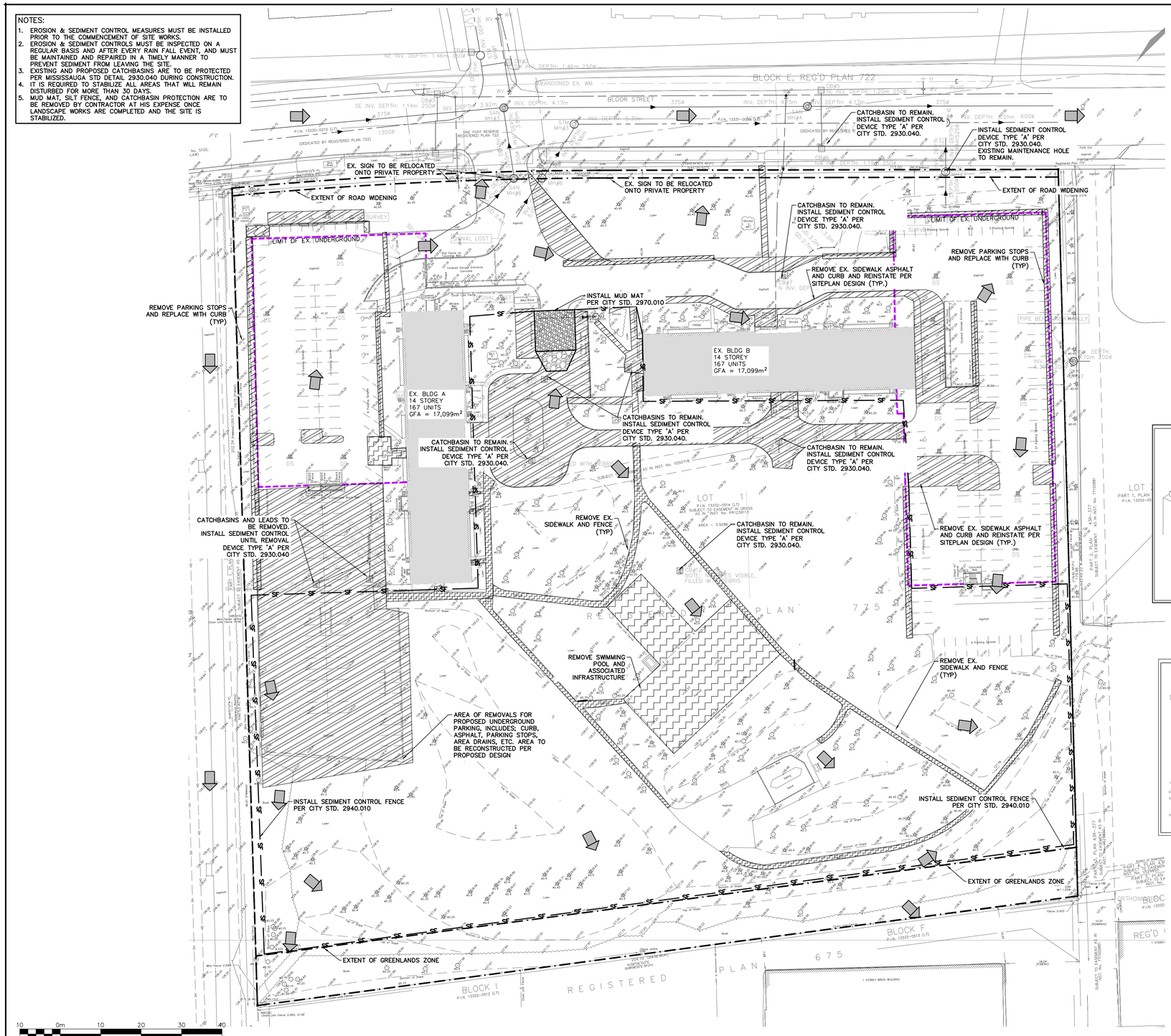
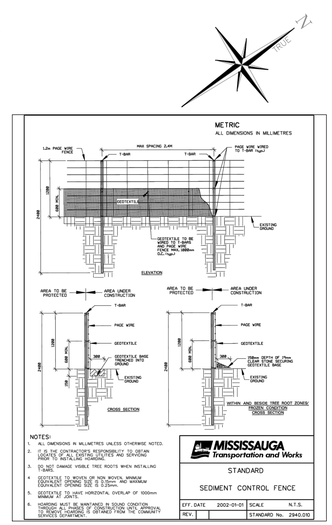
FIGURES & DRAWINGS

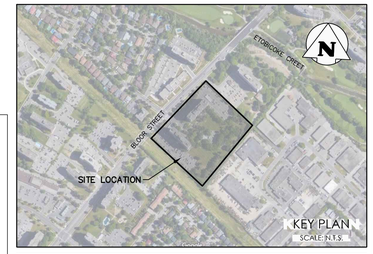
NOTES:

1. EROSION & SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE COMMENCEMENT OF SITE WORKS.
2. EROSION & SEDIMENT CONTROLS MUST BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN FALL EVENT, AND MUST BE MAINTAINED AND REPAIRED IN A TIMELY MANNER TO PREVENT SEDIMENT FROM LEAVING THE SITE.
3. EXISTING AND PROPOSED CATCHBASINS ARE TO BE PROTECTED PER MISSISSAUGA STD DETAIL 2930.040 DURING CONSTRUCTION.
4. IT IS REQUIRED TO STABILIZE ALL AREAS THAT WILL REMAIN DISTURBED FOR MORE THAN 30 DAYS.
5. MUD MAT, SILT FENCE, AND CATCHBASIN PROTECTION ARE TO BE REMOVED BY CONTRACTOR AT HIS EXPENSE ONCE LANDSCAPE WORKS ARE COMPLETED AND THE SITE IS STABILIZED.



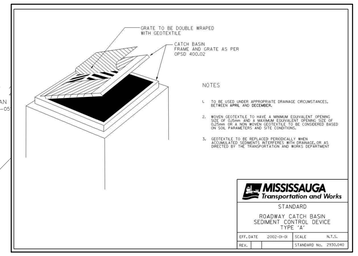
CITY FILE: OZ/OPA 20 3

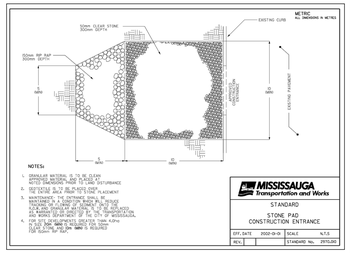




LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.5m)
- EXISTING CONTOUR (1.0m)
- EXISTING DITCH
- HP EXISTING HYDRO POLE
- X X EXISTING FENCE
- 215.00 EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- MUD-MAT; SEE DETAIL
- SF SILT FENCE; SEE DETAIL
- EXISTING UNDERGROUND PARKING
- EX. HARD SURFACE TO BE REMOVED AND REINSTATED PER SITEPLAN DESIGN
- EX. HARD SURFACE TO BE REMOVED AND REPLACED WITH CURB PER OPSD 600.110
- EX. HARD SURFACE TO BE REMOVED AND LANDSCAPED PER SITEPLAN DESIGN





No.	ISSUE / REVISION	YYYY/MMM/DD
3	ISSUED FOR 3RD SUBMISSION OPA/ZBA	2024/AUG/19
2	ISSUED FOR 2ND SUBMISSION OPA/ZBA	2022/NOV/16
1	ISSUED FOR 1ST SUBMISSION OPA/ZBA	2020/FEB/19

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE GEODETIC AND ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 985.
HAVING A PUBLISHED ELEVATION OF 129.292m

LOCAL BENCHMARK:

TABLET IS SET HORIZONTALLY AT THE BASE OF A CONCRETE TRAFFIC POLE AT THE NORTH-WEST CORNER OF BLOOR STEET AND BRIDGEWOOD DRIVE.

SURVEY NOTES:

SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/22) REFERENCE No.: 190-0075.

GREENLAND ZONE ADDED DECEMBER 21, 2020. GREENLAND ZONE LOCATION TAKEN FROM ONLINE CITY OF MISSISSAUGA ZONING BY-LAW MAPPING.

PROPOSED WIDENING AND ADDITIONAL TOPOGRAPHIC INFORMATION ADDED ON ADJACENT PROPERTYIES JANUARY 2021.

BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED THE WESTERLY LIMIT OF LOT 1, REGISTERED PLAN 775, HAVING A BEARING OF N46°03'40"W

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE SITE PLAN BY IBI GROUP.
DRAWING No.: A003, RE-ISSUED FOR OPA & ZBA, DATED 2022/11/16
PROJECT No.: 120303

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.

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MISSISSAUGA

Project

1840 & 1850 BLOOR ST.

CITY OF MISSISSAUGA

Drawing

REMOVALS AND EROSION & SEDIMENT CONTROL PLAN

NOT FOR CONSTRUCTION

Stamp

Stamp

LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.08.19
1788-5378
PROVINCE OF ONTARIO

CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
905 875 0026 T
905 875 4915 F
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B.	Project No.	1788-5378
Check	J.B.	Check	R.B.	Scale 1:500	Dwg. C101

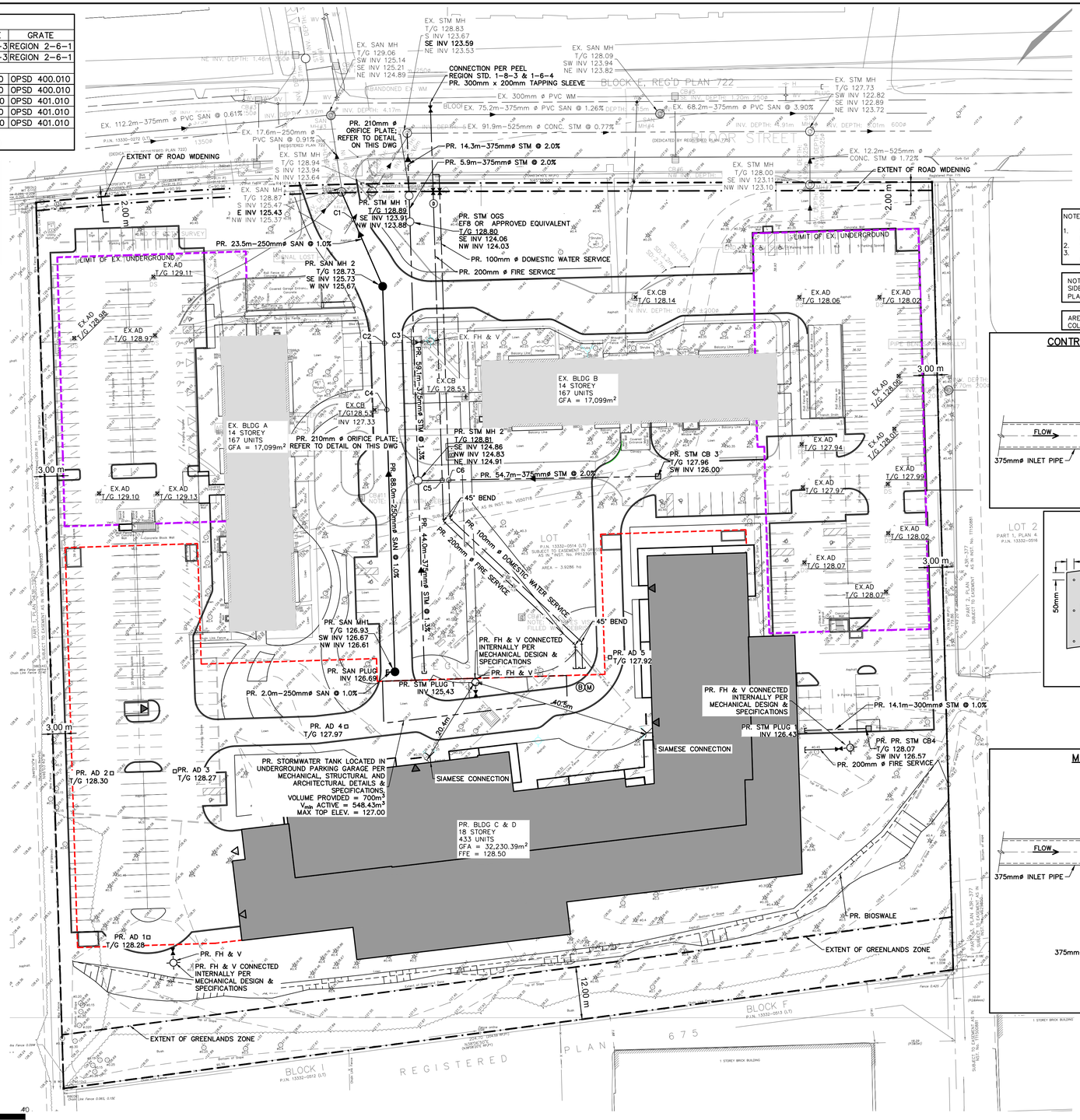
I:\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\CAD\Civil_Sheets\5378_C100.dwg, 2024-08-19 4:56:31 PM, AutoCAD PDF (General Documentation).pc3

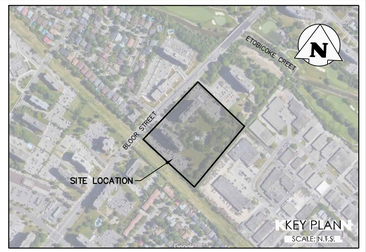
SERVICE STRUCTURES

ID	TYPE	SIZE (mm)	STRUCTURE	GRATE
1	SAN MH	1200 ø	REGION 2-5-3	REGION 2-6-1
2	SAN MH	1200 ø	REGION 2-5-3	REGION 2-6-1
1	STM MH	1200 ø	OPSD 701.010	OPSD 400.010
2	STM MH	1200 ø	OPSD 701.010	OPSD 400.010
3	STM CB	600 x 600	OPSD 705.010	OPSD 401.010
4	STM CBMH	1200 ø	OPSD 701.010	OPSD 401.010
5	STM CB	600 x 600	OPSD 705.010	OPSD 401.010
	STM OGS	STORMCEPTOR EF8 (OR APPROVED EQUIVALENT)		

CROSSINGS

ID	UPPER		LOWER		SEP.
	TYPE	EL.(m)	TYPE	EL.(m)	(m)
C1	SAN INV	125.50	STM OBV	124.32	1.18
C2	WM INV	126.97	SAN OBV	126.16	0.81
C3	WM INV	126.97	STM OBV	124.99	1.98
C4	STM INV	127.33	SAN OBV	126.31	1.02
C5	WM INV	126.83	STM OBV	125.40	1.43
C6	WM INV	126.88	STM OBV	125.43	1.45





NOTES:

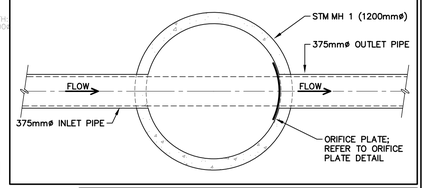
1. STORM SERVICE CONNECTIONS AND SEWERS TO BE SDR-35 PVC
2. SANITARY SERVICE CONNECTIONS TO BE SDR-28 PVC
3. THE 100mm AND 200mm WATER SERVICE CONNECTIONS TO BE PVC DR-18

NOTE: FOR LAYOUT OF THE PROPOSED DEVELOPMENT (PAVEMENT, SIDEWALK, CURBS, TRAFFIC SIGNS ETC., SEE ARCHITECTURAL SITE PLAN).

AREA DRAINS TO BE DESIGNED BY MECHANICAL ENGINEER TO COLLECT ALL SURFACE DRAINAGE

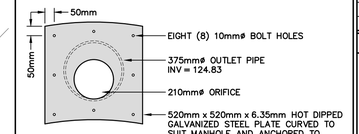
CONTROL MANHOLE DETAIL (STM MH 1)

SCALE: N.T.S.



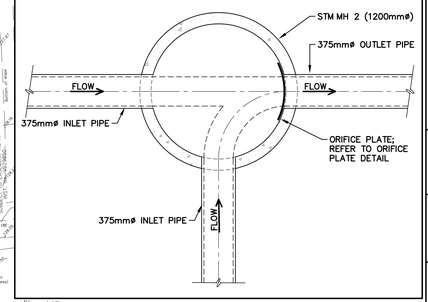
PERMANENT ORIFICE PLATE DETAIL

SCALE: N.T.S.



MANHOLE DETAIL (STM MH 2)

SCALE: N.T.S.



NOT FOR CONSTRUCTION

LEGEND

- PROPERTY LINE
- EXISTING WATERMAIN & GATE VALVE
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED WATERMAIN & GATE VALVE
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE CONNECTION
- (M) PROPOSED WATER METER
- (D) PROPOSED DETECTOR CHECK VALVE IN CHAMBER
- (B) PROPOSED BACKFLOW PREVENTER
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SINGLE / DOUBLE CATCHBASIN
- PROPOSED SANITARY SEWER & MANHOLE
- PROPOSED UNDERGROUND PARKING
- EXISTING UNDERGROUND PARKING
- C1 PROPOSED CROSSING; REFER TO CROSSINGS TABLE ON C102

No.	ISSUE / REVISION	YYYY/MMM/DD
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2	ISSUED FOR 2ND SUBMISSION OPA/ZBA	2022/NOV/16
1	ISSUED FOR 1ST SUBMISSION OPA/ZBA	2020/FEB/19

ELEVATION NOTE:

ELEVATIONS SHOWN ON THIS PLAN ARE GEODETIC AND ARE DERIVED FROM THE CITY OF MISSISSAUGA BENCHMARK No. 985, HAVING A PUBLISHED ELEVATION OF 129.292m

LOCAL BENCHMARK:

TABLET IS SET HORIZONTALLY AT THE BASE OF A CONCRETE TRAFFIC POLE AT THE NORTH-WEST CORNER OF BLOOR STEET AND BRIDGEWOOD DRIVE.

SURVEY NOTES:

SURVEY COMPLETED BY SPEIGHT, VAN NOSTRAND & GIBSON LIMITED. (2019/MAY/22) REFERENCE No.: 190-0075.

GREENLAND ZONE ADDED DECEMBER 21, 2020. GREENLAND ZONE LOCATION TAKEN FROM ONLINE CITY OF MISSISSAUGA ZONING BY-LAW MAPPING.

PROPOSED WIDENING AND ADDITIONAL TOPOGRAPHIC INFORMATION ADDED ON ADJACENT PROPERTIES JANUARY 2021.

BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED THE WESTERLY LIMIT OF LOT 1, REGISTERED PLAN 775, HAVING A BEARING OF N46°03'40"W

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE SITE PLAN BY IBI GROUP.
DRAWING No.: A003, RE-ISSUED FOR OPA & ZBA, DATED 2022/11/16
PROJECT No.: 120303

DRAWING NOTES:

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MISSISSAUGA

Project

1840 & 1850 BLOOR ST.

CITY OF MISSISSAUGA

Drawing

SITE SERVICING PLAN

Stamp

Stamp

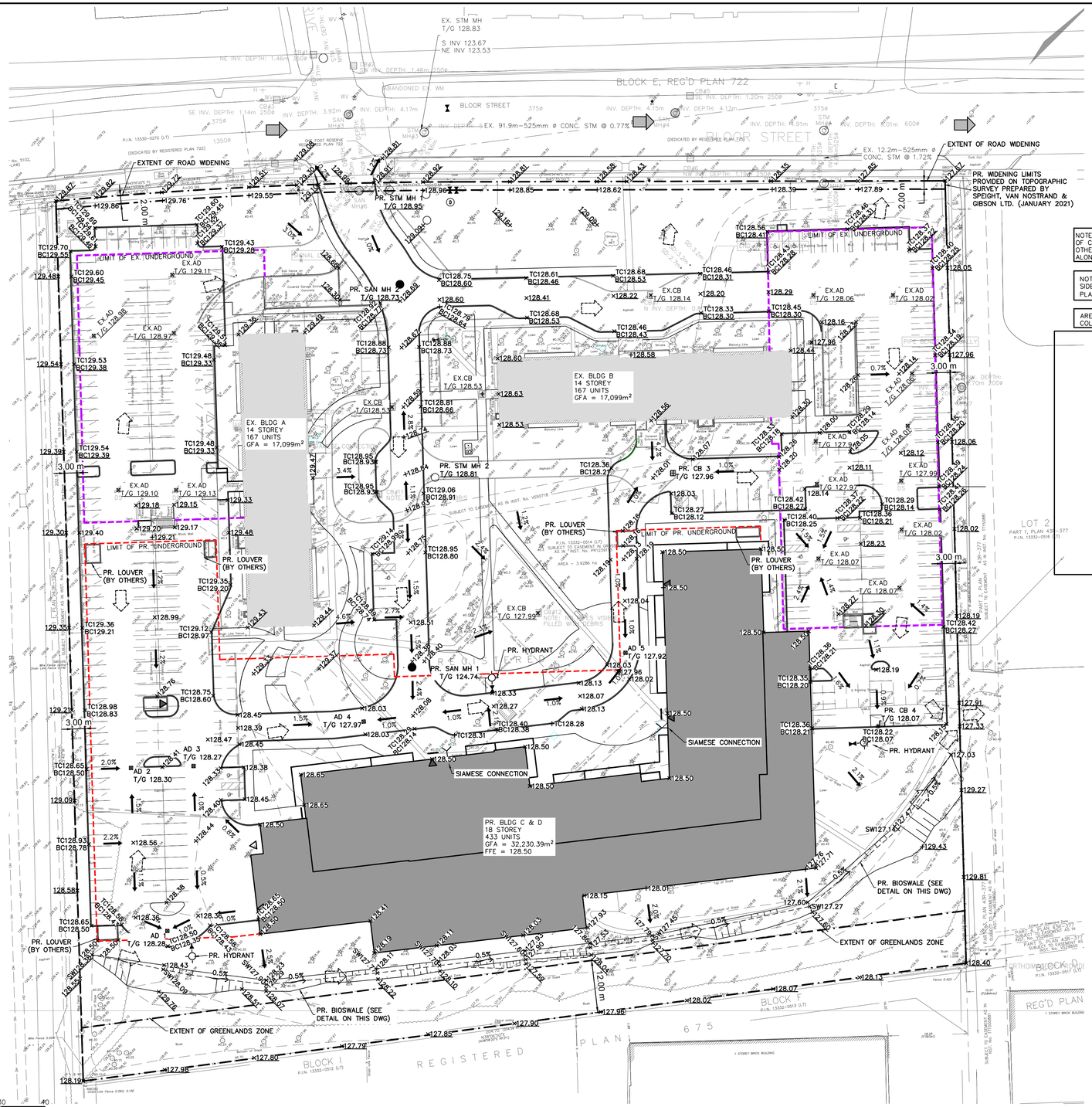
LICENSED PROFESSIONAL ENGINEER R. D. BABIC 100523818 2024.08.19 1788-5378 PROVINCE OF ONTARIO

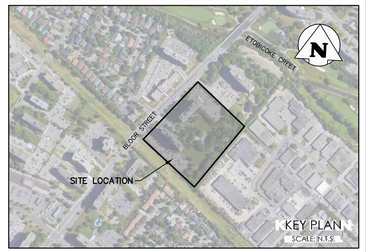
CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B.	Project No.	1788-5378
Check	J.B.	Check	R.B.	Scale	1:500
				Dwg.	C102

CITY FILE: OZ/OPA 20 3

I:\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\CAD\Civil_Sheets\5378_C100.dwg, 2024-08-19 4:56:50 PM, AutoCAD PDF (General Documentation).pc3





LEGEND

- PROPERTY LINE
- EXISTING CONTOUR (0.25m)
- x153.00 EXISTING GRADE
- x153.00 PROPOSED GRADE
- x153.00 PROPOSED GRADE (TO MATCH EXISTING)
- 2.0% PROPOSED MINOR FLOW DIRECTION
- PROPOSED MAJOR OVERLAND FLOW DIRECTION
- PROPOSED UNDERGROUND PARKING
- EXISTING UNDERGROUND PARKING
- PROPOSED SLOPE (3:1 MAX.)
- BUILDING ENTRANCE (PERSONNEL DOOR)
- BUILDING ENTRANCE (OVERHEAD DOOR)
- PROPOSED FIRE HYDRANT & GATE VALVE
- PROPOSED SIAMESE (FIRE DEPT.) CONNECTION

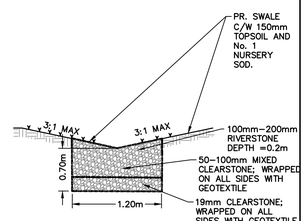
NOTE: ALL PROPOSED CURB IS BARRIER PER OPSD 600.110. TOP OF CURB GRADE TO BE 0.15m ABOVE BOTTOM OF CURB, UNLESS OTHERWISE SHOWN. NOTE, ONLY BC GRADES HAVE BEEN SHOWN ALONG ROADWAY.

NOTE: FOR LAYOUT OF THE PROPOSED DEVELOPMENT (PAVEMENT, SIDEWALK, CURBS, TRAFFIC SIGNS ETC., SEE ARCHITECTURAL SITE PLAN).

AREA DRAINS TO BE DESIGNED BY MECHANICAL ENGINEER TO COLLECT ALL SURFACE DRAINAGE

BIOSWALE DETAIL

SCALE: N.T.S.



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HAVING A PUBLISHED ELEVATION OF 129.292m

LOCAL BENCHMARK:

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SURVEY NOTES:

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REFERENCE No.: 190–0075.

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PROPOSED WIDENING AND ADDITIONAL TOPOGRAPHIC INFORMATION ADDED ON ADJACENT PROPERTYIES JANUARY 2021.

BEARINGS SHOWN HEREON ARE ASTRONOMIC AND ARE REFERRED THE WESTERLY LIMIT OF LOT 1, REGISTERED PLAN 775, HAVING A BEARING OF N46°03'40"W

SITE PLAN NOTES:

DESIGN ELEMENTS ARE BASED ON SITE SITE PLAN BY IBI GROUP.
DRAWING No.: A003, RE–ISSUED FOR OPA & ZBA, DATED 2022/11/16
PROJECT No.: 120303

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MISSISSAUGA

Project

1840 & 1850 BLOOR ST.

CITY OF MISSISSAUGA

Drawing

SITE GRADING PLAN

NOT FOR CONSTRUCTION

Stamp

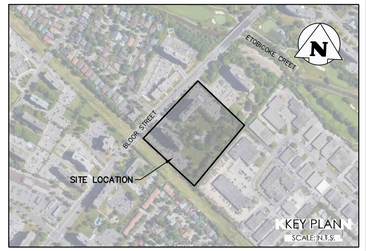
Stamp

LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.08.19
1788-5378
PROVINCE OF ONTARIO

CITY FILE: OZ/OPA 20 3

CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
905875-0026 T
905875-4915 F
WWW.CFCROZIER.CA

Drawn	J.B.	Design	J.B.	Project No.	1788–5378
Check	J.B.	Check	R.B.	Scale	1:500
				Dwg.	C103



LEGEND

- PROPERTY LINE
- EXISTING GRADE
- EXISTING OVERLAND FLOW DIRECTION
- EXISTING STORM DRAINAGE CATCHMENT
- ID / A | RC — CATCHMENT I.D. / AREA (ha) | RUNOFF COEFFICIENT
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN

No.	ISSUE / REVISION	YYYY/MMM/DD
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MISSISSAUGA

Project

1840 & 1850 BLOOR ST.

CITY OF MISSISSAUGA

Drawing

PRE-DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

CITY FILE: OZ/OPA 20 3

Stamp

Stamp

LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.08.19
1788-5378
PROVINCE OF ONTARIO

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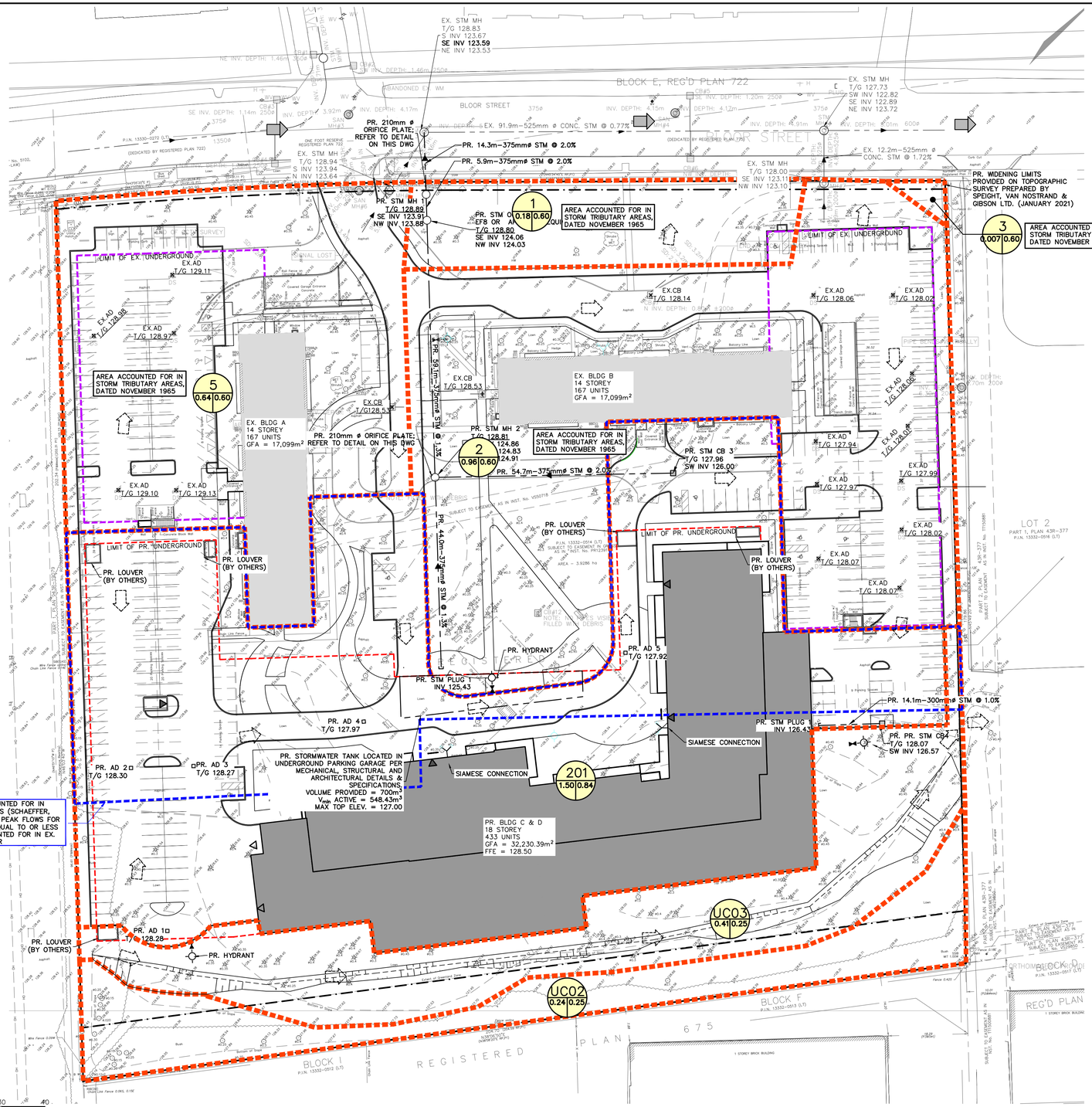
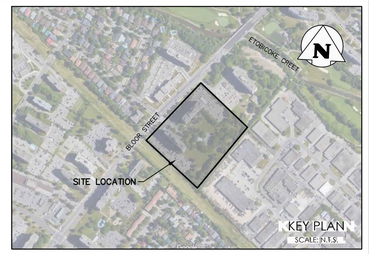
905 875 0026 T
905 875 4915 F
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
J.B.	J.B.		1788-5378
Check	Check	Scale	Dwg.
J.B.	R.B.	1:500	FIG 1

I:\1700\1788 - Ranee Management\5378 - 1840 - 1850 Bloor St\CAD\Civil_Sheets\5378_C100.dwg, 2024-08-19 4:57:39 PM, AutoCAD PDF (General Documentation).pc3





LEGEND

- PROPERTY LINE
- EXISTING GRADE (×215.00)
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED STORM DRAINAGE CATCHMENT
- CATCHMENT I.D. (ID)
- AREA (ha) | RUNOFF COEFFICIENT (A | RC)
- EXISTING STORM SEWER & MANHOLE
- EXISTING SINGLE / DOUBLE CATCHBASIN
- PROPOSED STORM SEWER & MANHOLE
- PROPOSED SINGLE / DOUBLE CATCHBASIN

No.	ISSUE / REVISION	YYYY/MMM/DD
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SITE PLAN NOTES:

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PROJECT No.: 120303

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MISSISSAUGA

Project
1840 & 1850 BLOOR ST.
CITY OF MISSISSAUGA

Drawing
POST–DEVELOPMENT DRAINAGE PLAN

NOT FOR CONSTRUCTION

CITY FILE: OZ/OPA 20 3

Stamp

Stamp
LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.08.19
1788-5378
PROVINCE OF ONTARIO

CROZIER CONSULTING ENGINEERS
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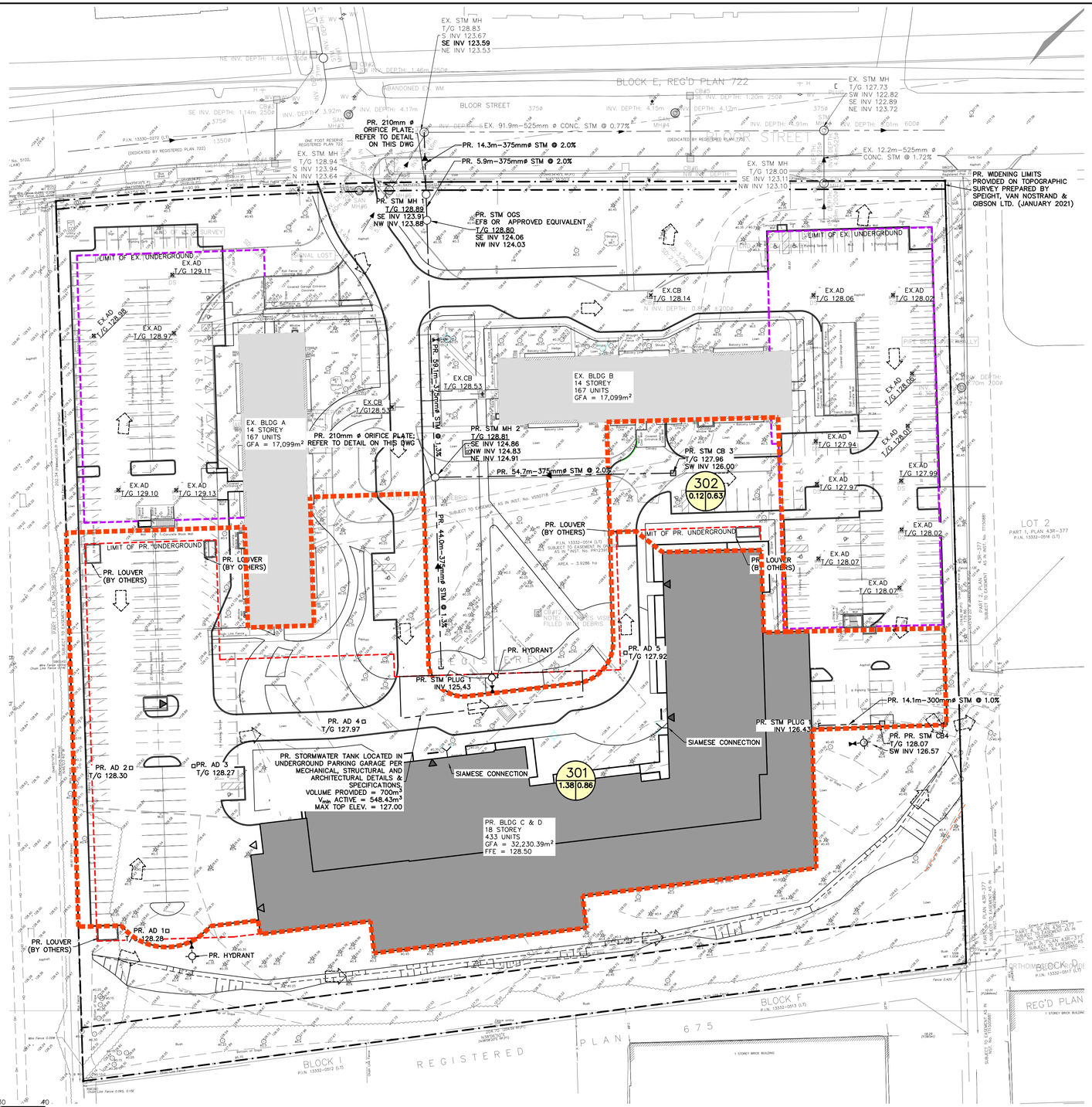
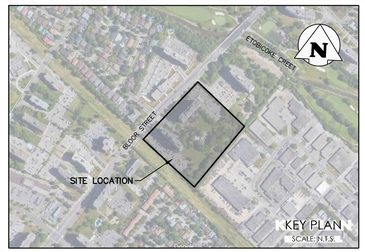
Drawn	J.B.	Design	J.B.	Project No.	1788–5378
Check	J.B.	Check	R.B.	Scale 1:500	Dwg. FIG 2





LEGEND

- PROPERTY LINE
- EXISTING GRADE (×215.00)
- PROPOSED OVERLAND FLOW DIRECTION
- PROPOSED STORM DRAINAGE CATCHMENT
- CATCHMENT I.D. (ID)
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MISSISSAUGA

Project
1840 & 1850 BLOOR ST.
CITY OF MISSISSAUGA

Drawing
POST–DEVELOPMENT DRAINAGE PLAN (MINOR DRAINAGE)

NOT FOR CONSTRUCTION

Stamp

Stamp
LICENSED PROFESSIONAL ENGINEER
R. D. BABIC
100523818
2024.08.19
1788-5378
PROVINCE OF ONTARIO

CITY FILE: OZ/OPA 20 3

CROZIER CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON L9T 6P4
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Drawn	J.B.	Design	J.B.	Project No.	1788–5378
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