Queenscorp (Erin Mills) Group

4099 Erin Mills Parkway, City of Mississauga

Functional Servicing and Stormwater Management Report (FSR/SWM)

October 28, 2024

4099 Erin Mills Park, City of Mississauga

Functional Servicing and Stormwater Management Report (FSR/SWM)

October 28, 2024

Prepared By:
Arcadis Professional Services (Canada) Inc.
8133 Warden Ave, Unit 300
Markham, ON L6G 1B3
Canada
Phone: 1 905 763 2322
www.arcadis.com

Prepared For:
Queenscorp (Erin Mills) Group

Our Ref:
#137429

Shazia Nishat, Ph.D., P.Eng.
Civil Engineer
Land Engineering

Nav Grewal, CD, BSc
Associate Manager
Land Engineering

Version Control

Issue	Revision No.	Date Issued	Description
First Submission	1	August 2022	Issued for ZBA Submission
Second Submission	**2**	**October 2024**	**Issued for ZBA Submission**

Contents

Tables

Figures

Appendices

1 Introduction

1.1 Background

Arcadis Professional Services (Canada) Inc. (Arcadis) was retained by the Queenscorp (Erin Mills) Group (the "Client") to prepare a Functional Servicing Report and Stormwater Management Report (FSR/SWM) in support of a Zoning By-Law Amendment (ZBA) application for a development comprising of five (5) mid to high-rise residential buildings (ranging from 5-14 storeys) and four (4) stacked townhouse blocks with a total of gross floor area (GFA) of 58,293 m^2 (57,503 m^2 residential + 790 m^2 retail) at 4099 Erin Mills Parkway, in the City of Mississauga (the "City") and the Region of Peel (the "Region").

The purpose of this report is to provide site specific information for the City of Mississauga and the Region of Peel's review with respect to infrastructure required to support the proposed development regarding storm drainage, water supply, and sanitary discharge.

We have obtained information regarding existing storm, sanitary and water services on Erin Mills Parkway, Folkway Drive, Sawmill Valley Drive, Farrier Court and the existing site. The following documents were reviewed:

- Plan and Profile drawings received from the Region of Peel;
- Plan and Profile drawings received from the City of Mississauga;
- Topographic Survey and Locates prepared by JD Barnes Ltd, dated February 14th, 2022;
- Site Plan (Partial Re-Submission) prepared by Turner Fleischer Architects Inc. (TFAI), dated September 19th, 2024; and
- Site Statistics (Partial Rezoning Submission) prepared by TFAI, dated September 19th, 2024.

1.2 Site Description

The existing 26,391 m^2 (2.64ha) site is located on the east side of Erin Mills Parkway between Hwy 403 and Burnhamthorpe Road West. The site is bounded by Erin Mills Parkway to the west, Folkway Drive to the north, Sawmill Valley Drive to the west and existing townhouses and Farrier Court to the south. The legal description is as follows: Block II, Registered Plan M-247, City of Mississauga, Regional Municipality of Peel. The site's municipal address is 4099 Erin Mills Parkway (Pkwy), Mississauga, ON, L5L 3P9. Please refer to **Figures FIG-1 and FIG-2** in **Appendix A** for the location and aerial plans of the site respectively.

The existing site is currently comprised of a one-storey brick building serving as a retail/commercial plaza with an asphalt parking lot. The existing site has private vehicle accesses off of Erin Mills Parkway, Folkway Drive and Sawmill Valley Drive. The site generally slopes from northwest to southeast. The storm flows are collected through a series of existing catch basins across the site's parking lot and are carried via an existing storm network to the discharge point at Farrier Court, south of the site.

Under pre-development conditions, external drainage from the existing townhouse development to the south enters the site and is conveyed through a swale to an existing catch basin which discharges to the existing site's storm outlet in Farrier Court. Under the post-development conditions, this external drainage will not be blocked and will continue to be conveyed in a similar way along the southern property limit. The proposed stormwater management design will account for this flow and further details will be provided in **Section 5.0**. The site is located in an area of the City that is well established and serviced by a network of municipal infrastructure including roads, sewers, watermains, and other services and utilities.

2 Development Proposal

The 26,391 m^2 (2.64ha) site is located on the east side of Erin Mills Parkway between Hwy 403 and Burnhamthorpe Road West. The proposed development will include one (1) high-rise (14-storeys), four (4) mid-rise residential buildings (ranging from 5 to 8 storeys), and four (4) stacked townhouse blocks with a total GFA of 58,293 m^2 (57,503 m^2 residential + 790 m^2 retail). Additionally, the site will feature a private road network with three access points to Erin Mills Parkway, Folkway Drive and Sawmill Valley Drive and 2 levels of underground parking. The entire development will include 925 parking spaces. Please refer to **Appendix A** for the proposed Site Plan and site statistics prepared by TFAI (September 2024).

3 Terms of Reference and Methodology

3.1 Terms of Reference

The Terms of Reference used for the scope of this report were based on current Region of Peel Public Works Stormwater Design Criteria and Procedural Manual, Region of Peel Transportation and Works Department Water and Wastewater Branch Standards and the City of Mississauga standards and specifications (City Guidelines).

3.2 Methodology: Stormwater Drainage and Management

The following report provides a review of the pre- and post-development site conditions and comments on opportunities to reduce post-development peak flows. Requirements set by the City of Mississauga, Region of Peel and Ministry of the Environment Conservation and Parks (MECP) were reviewed. The following SWM criteria are to be applied:

Water Quantity
Post-development stormwater discharge to be limited to pre-development levels for the 2–100-year storms as well as the Regional Storm. Post-development discharge to City's storm sewer system to be determined using City's IDF curves and post-development discharge to Regional's storm sewer system to be determined using Region's IDF curves. A maximum runoff coefficient of 0.50 shall be used in calculating the pre-development peak runoff.

Water Balance
Runoff resulting from a 5 mm rainfall event or best efforts shall be retained on-site using Low Impact Development (LID) practices including infiltration, evapotranspiration and/or water reuse measures.

Water Quality
Enhanced Level 1 Protection, with a long-term average removal of 80% of the Total Suspended Solids (TSS) must be achieved on an annual loading basis.

3.3 Methodology: Sanitary Discharge

The sanitary sewage flows will be determined using sanitary sewer design calculations that consider the land use and building statistics as supplied by the design team. The calculated values provide peak sanitary flow discharge with infiltration considerations. The estimated sanitary flows in the proposed site will be calculated based on the Peel Region 2020 DC Background Study criteria shown in **Table 3.1** below.

Table 3.1 Sanitary Criteria

USAGE	DESIGN FLOW	UNITS	PERSONS PER AREA
Residential (Apartments)	302.8	Litres / Person / Day	Large Apartments (> 228 m^2) = 3.0 ppu Large Apartments (< 228 m^2) = 1.6 ppu
Residential (Multiples)	302.8	Litres / Person / Day	Townhouses = 3.4 ppu
Commercial/Retail	302.8	Litres / Person / Day	50 persons/ha
Infiltration	0.2	Litres / sec / ha	-

Based on the calculated peak flows, the adequacy of the loading infrastructure to support the proposed development will be discussed in **Section 6: Sanitary Drainage System**.

3.4 Methodology: Water Usage

The water usage flows will be determined using watermain design calculations that consider the land use and building statistics as supplied by the design team. The domestic water usage will be calculated based on the Region of Peel's watermain design criteria and standards. Specifically, the proposed water system will be designed to satisfy the following demand conditions:

- Average consumption rate;
- Max day factor; and,
- Peak hour factor.

The domestic water usage was based on the Region of Peel design criteria for water demand is summarized in **Table 3.2** below.

Table 3.2 Water Usage

USAGE	WATER DEMAND	UNITS	MAX DAY FACTOR	PEAK HOUR FACTOR
Residential	280	Litres / Capita / Day	2.0	3.0
ICI	300	Litres / Employee / Day	1.4	3.0

Fire suppression flow calculations were undertaken in accordance with the Region of Peel fire suppression standards. Pressure and flow testing to determine the adequacy of the existing watermain to support the proposed development with fire suppression in accordance with the Fire Underwriters Survey (FUS) Guidelines will be discussed in the subsequent **Section 7: Water Supply System**.

4 Groundwater

A Hydrogeological Report is required to determine the impacts of groundwater and potential permanent discharge to the municipal systems as it relates to the flow rate and quality of the groundwater. A Hydrogeological Report is not available with this submission and will be provided when available with future submissions.

5 Stormwater Management and Drainage

5.1 Stormwater Management Criteria

Based on a review of the City Guidelines, the Stormwater Management Criteria applicable to the site are as outlined in **Table 5.1** below.

Table 5.1 Stormwater Management Criteria

CRITERIA	REQUIREMENT
Water Balance	Retain 5 mm onsite
Quantity Control	Post to Pre for all storms (i.e. 2, 5, 10, 25, 50 & 100 year) & Regional Storm.
Quality Control	80% TSS Removal

The project site is located in the Mullet Creek Watershed as identified by the City of Mississauga Watershed Boundaries; figure attached in **Appendix B** for reference. Below is an excerpt from the City of Mississauga Transportation and Works Department Storm Drainage Design Requirements identifying the original source of the water quantity design guidelines:

Mullet Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) & Regional storm	Hydrologic Model: GAWSER Model-Return period peak flows based on 24 hour SCS Type II distribution Gateway West Subwatershed Study (Gartner Lee Limited & Cosburn Patterson Mather, 1999) Gateway West Subwatershed Study Update by Kidd Consulting (Update in Progress)
	Consider storm sewer constraints outlined in Streetsville Area Drainage Study (Dillon, 1994)	

It is also important to note that the subject site is located outside the Streetsville Area Drainage Study (Dillon 1994) boundary and as a result this component of the above criteria is not applicable. Please refer to the City of Mississauga Watershed Boundaries figure attached in **Appendix B** for further detail.

5.2 Existing Storm Sewer System

According to the plan and profiles and existing information reviewed as stated in Section 1.1, the following existing storm sewers are available in the vicinity of the site:

- Existing 600 mm CONC. storm sewer on Farrier Court, flowing east as per existing plan and profile drawing 30525-D provided by the Region of Peel.
- Existing 825 mm CONC. storm sewer on Sawmill Valley Drive flowing southeast as per existing plan and profile drawing 54895-D provided by the Region of Peel.
- Existing 525 mm CONC. storm sewer on Folkway Drive, flowing northeast as per existing plan and profile drawing C-16185, provided by the City of Mississauga.
- Existing 300 mm PVC storm sewer on the northeast side of Erin Mills Parkway, flowing southeast as per existing plan and profile drawing 26218-D, provided by the Region of Peel.
- Existing 450 mm CONC. storm sewer on the southwest side of Erin Mills Parkway, flowing southeast as per existing plan and profile drawing 26218-D, provided by the Region of Peel.

The existing site stormwater drains to the 600 mm CONC storm sewer on Farrier Court and ultimately discharges to Mullet Creek downstream. This discharge strategy will be maintained in the proposed condition.

5.3 Existing Storm Drainage

The pre-development drainage patterns have been illustrated in **Figure DAP-01** which can be found in **Appendix B** for reference. The existing site has been identified as **Area A1Pre** (2.639 ha) drains to the existing 600 mm CONC storm sewer on Farrier Court via existing roof drains and on-site catchbasins. Allowable release rates were determined via the site area (2.64 ha) and the associated pre-development runoff coefficients. The allowable 2, 5, 10, 25, 50- and 100-year (2-100-year) release rates were determined using the City's IDF data for the corresponding 2-100-year storm events and a time of concentration of 15 minutes. In keeping with the City of Mississauga stormwater management design criteria, although the site is paved in the existing condition, a maximum pre-development runoff coefficient of 0.5 was used to determine the target release rates. Pre-development target release rates were calculated using the modified rational method for the 2-100-year City of Mississauga storms. Visual OTTHYMO version 6.2 (VO) was used to model the site hydrology and pre-development target release rate for the Regional Storm. The site is to have post-development flows controlled to pre-development levels. **Table 5.2** below summarizes the allowable site release rates. Please refer to **Appendix B** for detailed calculations and VO outputs/results.

Table 5.2 Allowable Release Rates

RETURN PERIOD (YEARS)	AREA (ha)	STORM INTENSITY (mm/hr)	ALLOWABLE RELEASE RATE (L/s)
2	2.64	59.9	**219.5**
5	2.64	80.5	**295.1**
10	2.64	99.2	**363.5**
25	2.64	113.9	**417.5**
50	2.64	127.1	**466.0**
100	2.64	140.7	**515.7**
Regional Storm	2.64	Please refer **Appendix B**	**375.0**

5.4 Stormwater Management Plan

Quantity Control will be provided via a stormwater management tank and an orifice tube on the P1 level of the underground parking structure, quality control by a StormFilter/MFS Unit, and water balance via rainwater retention and reuse through irrigation.

Under post-development conditions, the majority of the storm drainage (95%) will be captured via Roof Drains, and Area Drains and will be controlled to the internal building storm drainage collection system. A small external area (0.127 ha) from the east will be picked up by the proposed storm drainage system. The controlled drainage from the building internal system (roof drains, internal area drains, and landscaped areas) is identified as A1Post and the controlled external drainage area as EXT1. A small area on the north side of the property along Sawmill Valley Drive and a small area on the west side of the property along Folkway Drive will flow uncontrolled to the north and west respectively. The two (2) uncontrolled flow areas have been lumped together as A2Post. A2Post accounts for uncontrolled flows to the City's ROW.

The post-development drainage patterns have been illustrated in **Figure DAP-02** included in **Appendix B**. The relevant drainage parameters of the post-development drainage areas can be found in **Appendix B** and are summarized below in **Table 5.3**.

Table 5.2 Post-Development Input Parameters

Drainage Area	Drainage Area (ha)	C	Tc (min.)
A1Post (Controlled – To Building Internal-Storm System)	2.479	0.79	15
A2Post (Uncontrolled – To Sawmill Valley and Folkway Dr.)	0.1602	0.58	15
EXT	0.1274	0.44	15

5.5 Quantity Control

Detention storage will be provided in an underground stormwater management tank within the P1 level with a footprint of 281.8 m^2. The outflow will be controlled by a 300 mm orifice tube. Please refer to **Drawing C201** and **Drawing C101,** in **Appendix E**, for the servicing and grading details respectively. Using the City's IDF curve data for A1Post, and EXT1, modified rational method calculations were undertaken to determine the maximum storage required during each storm event. Uncontrolled flows from A2Post were also calculated using the City's IDF curve data. VO version 6.2 was used to determine the post-development target release rate for the Regional Storm. Based on the modified rational method and VO modeling, the target site release rates, storage volumes and associated HGL depths are outlined in **Table 5.4** below. For detailed calculations please refer to **Appendix B**.

Table 5.3 Proposed Release Rates and Storage Details

RETURN PERIOD (YEARS)	SITE ALLOWABLE RELEASE RATE (L/s)	CONTROLLED RELEASE RATE A1POST+EXT1 (L/s)	UNCONTROLLED RELEASE RATE A2POST (L/s)	TOTAL RELEASE RATE (L/s)	TANK HGL DEPTH (m)	REQUIRED TANK STORAGE (m^3)	PROVIDED TANK STORAGE (m^3)
2	204.0	177.0	15.6	192.6	0.5	140.7	140.7
5	274.2	215.8	20.9	236.7	0.7	209.2	209.2
10	337.7	247.2	25.8	273.0	1.0	274.4	274.4
25	384.9	286.8	32.6	319.4	1.3	369.5	369.5
50	426.4	324.3	39.7	364.0	1.7	472.5	472.5
100	470.1	353.9	45.7	399.7	2.0	562.6	562.6
Regional Storm	375	320	23	340		465	793.3

As can be seen in **Table 5.4**, the total release rates (controlled + external + uncontrolled) from the site are well below the corresponding target release rates and 300 mm orifice tube are capable of supporting the proposed development. The 281.8 m^2 stormwater management tank provides a maximum storage of 793.3 m^3, thereby sufficiently providing the required storage volumes as shown in **Table 5.4.**

5.6 Water Balance

Based on the 5 mm retention requirements, the site water balance volume required is 132 m^3. Initial Abstraction for the site totals 43.8 m^3, leaving 88.2 m^3 to be provided in the stormwater management tank for re-use. Flows from the site will be treated for quality through a StormFilter unit, model SF0824 (standard detail provided in **Appendix B**) and directed to the stormwater management tank within the P1 level. This water will be stored in a 0.6 m deep sump beneath the orifice tube outlet and will be pumped for reuse via irrigation and/or mechanical methods to achieve the water balance targets. 0.35 m of the 0.6 m deep sump will be available as retention storage. **Table 5.5** below summarise the 5 mm retention for the site. Please refer to **Appendix B** for Water Balance calculations.

Table 5.5 Water Balance

Criteria	Area (m^2)	Volume of Water (m^3)
Total Volume of Water to be Retained on Site	26,391	132.0
Conventional Roof	9,488	9.5
Green Roof	0	0.0
Landscape	1,234	6.2
Landscape over P1	5,619	28.1
Permeable Pavers	0	0.0
Impervious	10,050	0.0
Volume Retained through Initial Abstraction		43.8
Volume to be Reused within 72 hrs		88.2
Retention Volume Provided		98.6

Irrigation calculations and/or mechanical calculations will be provided during the detailed design stage to confirm and support the design strategy and water re-use methods noted above.

5.7 Quality Control

As mentioned in **Section 3.2**, 80% TSS removal is required in order to meet the City's SWM guidelines. Majority of the site (62%) is covered by buildings (hence roofs) and landscaped areas. Quality control via landscape and rooftop areas are inherently clean as they are not exposed to oil and grit. Quality control will be provided via a StormFilter unit, model SF0824 as specified by Contech Engineered Solutions. This unit will be placed downstream of the stormwater management tank and will treat water to an 80% TSS removal rate as required by the City of Mississauga. Therefore, all the drainage captured from the site will be treated via the filter unit and the minimum City required 80% TSS removal will be achieved. Please refer to **Appendix B** for detailed TSS removal calculations.

Please also refer to **Appendix B** for details on the proposed StormFilter unit as well as a copy of the verification statement for this unit from ETV Canada.

5.8 Stormwater Outlet

The proposed StormFilter unit will ultimately convey drainage through a control manhole and proposed 525 mm diameter concrete storm service at a 1.1% slope to the existing 600 mm storm pipe in Farrier Court. Discharging to Farrier Court maintains the site's existing stormwater discharge location. The 525 mm storm pipe @ 1.1% slope will have a full flow capacity of approximately 451.1 L/s, which will be adequate to convey the major system discharge of **399.5 L/s** (Orifice Controlled incl. EXT drainage) during the 100-yr storm event. The controlled from the site ensure that the existing storm network has sufficient capacity to support the proposed development. Please refer to **Drawing C201**, the site servicing plan, in **Appendix E**, for the storm sewer layout.

6 Sanitary Drainage System

According to the plan and profiles and existing information reviewed as stated in Section 1.1, the following existing sanitary sewers are available in the vicinity of the site:

- Existing 250 mm PVC sanitary sewer on Farrier Court, flowing east as per existing plan and profile drawing 30525-D provided by the Region of Peel.
- Existing 250 mm PVC sanitary sewer on Sawmill Valley Drive flowing southeast as per existing plan and profile drawing 54895-D provided by the Region of Peel.
- There is no existing sanitary sewer infrastructure available on Folkway Drive fronting the subject site as per existing plan and profile drawing C-16185, provided by the City of Mississauga.
- There is no existing sanitary sewer infrastructure available on Erin Mills Parkway fronting the subject site as per existing plan and profile drawing 26218-D, provided by the Region of Peel.

The existing commercial plaza on the site, discharges its sanitary flows through an existing control manhole and into the existing 250 mm PVC sanitary sewer on Farrier Court. This discharge strategy will be maintained in the proposed condition.

6.1 Pre-Development Sanitary Flows

The current land is occupied by a commercial plaza and large parking lot. There is an existing sanitary service connection that services the existing commercial/retail plaza, which is located at the southeast side of the site, discharging to Farrier Court. The existing pre-development sanitary flows have been approximated below using the Region of Peels Sanitary Sewer Design Criteria. Detailed Calculations are provided in **Appendix C**.

Table 6.1 Pre-Development Equivalent Population Calculations

LAND USE	SITE AREA (ha) OR GFA (ha)	POPULATION DENSITY (pp/ha)	TOTAL POPULATION (Capita)
Existing Commercial	2.64	50	132

The calculated pre-development flow contribution is:

- Pre-Development Flow = (pop x 302.8 L/cap/day x peaking factor)/86,400 + Infiltration Allowance
- Pre-Development Flow = (132 x 302.8 x 4.21)/86400 + 0.5
- Pre-Development Flow = **2.50 L/s**

6.2 Post-Development Sanitary Flows

The anticipated sanitary discharge flows for the proposed site were calculated based on the Region's design criteria outlined in **Table 3.1** in **Section 3.3**, along with the proposed site statistics found in **Appendix A**. The unit count and population density of the Apartment and Row Dwelling areas as well as the GFA of the commercial area were considered in the analysis. Additionally, the Harmon Peaking Factor equation was applied in order to evaluate the post-development peak sanitary flows. The design inputs for the subject site are shown in **Table 6.2** below.

Table 6.2 Post-Development Equivalent Population Calculations

LAND USE	SITE AREA	RESIDENTIAL UNITS / COMMERCIAL GFA	POPULATION DENSITY (ppu or pp/ha)	POPULATION (persons)
Residential (Apartments)	1.43	597	1.6	955
Commercial (Apartments)		0.0777 ha	50	4
			Total (Apartments)	959
Residential (Townhouses)	1.21	112	3.4	381
			TOTAL (SITE)	1340

* Population density criteria as per Region of Peel 2020 DC Background Study (as mentioned in **Table 3.1**):
- Singles/Semi 4.2.
- Multiples (Townhouses) 3.4.
- Large Apartments (larger than 750 square feet) 3.0. @ >228.6 sqm
- Small Apartments (equal to or less than 750 square feet) 1.6. @ =<228.6 sqm

The calculated post-development flow contribution is:

- Post-Development Flow = (pop x 302.8 L/cap/day x peaking factor) / 86,400 + Infiltration Allowance
- Post-Development Flow = [(959 x 3.81) + (381 x 4.03)] x 302.8 / 86400 + 0.5
- Post-Development Flow = **18.7 L/s**

The sanitary discharge flow calculated above was calculated using the Region of Peel Sanitary Sewer Design Criteria of 302.8 litres/capita/day, and an infiltration rate of 0.2 L/s/ha. Based on the above criteria, a net peak design flow of 18.7 L/s was calculated for the subject property. This is an increase of **16.2 L/s** against the existing pre-development sanitary discharge flows. Please refer to **Appendix C** for detailed sanitary flow calculations.

6.3 Proposed Sanitary Connection

The proposed development consists of one (1) high-rise and four mid-rise residential apartment buildings with 790 m^2 of retail space. The site also features four (4) stacked townhouse blocks and a large underground parking structure. The entire development will be serviced through the underground parking structure as designed by the Mechanical engineer. The sanitary flows will ultimately discharge through proposed sanitary control manhole MH1A and be conveyed to the existing 250 mm PVC sanitary sewer in Farrier Court via a proposed 250 mm diameter PVC sanitary service at 0.5%. The 250 mm sanitary pipe @ 0.5% slope will have a full flow capacity of approximately 43.9 L/s, which will be adequate to convey the total proposed sanitary discharge of **18.7 L/s.** Please refer to **Drawing C201**, the site servicing plan, in **Appendix E** for the sanitary sewer layout.

7 Water Supply System

7.1 Existing System

According to the plan and profiles and existing information reviewed as stated in Section 1.1, the following existing watermains are available in the vicinity of the site:

- Existing 50 mm copper water service on Farrier Court, as per existing plan and profile drawing 30525-D provided by the Region of Peel.
- Existing 200 mm PVC watermain on Sawmill Valley Drive, as per existing plan and profile drawing 54895-D provided by the Region of Peel.
- Existing 300 mm PVC watermain on Folkway Drive, as per existing plan and profile drawing C-16185, provided by the City of Mississauga.
- Existing 300 mm PVC watermain on Erin Mills Parkway, as per existing plan and profile drawing 26218-D, provided by the Region of Peel.

Hydrant flow tests were completed on Sawmill Valley Drive and Erin Mills Parkway on May 4th, 2022, and the results were compared against the domestic and fire flow demands from the proposed development in order to assess the adequacy of the existing water infrastructure.

7.2 Proposed Water Supply

The estimated water consumption for the proposed commercial development was calculated based on the water demand shown in **Table 3.2** in **Section 3.4**, based on the Region of Peel's watermain design criteria revised June 2010 and the Ontario Building Code.

The water supply for public fire protection was calculated based on the guidelines provided by the FUS, to demonstrate that the existing flows and pressure are adequate to meet the minimum requirement for fire suppression outlined in the FUS.

5.2.1 Proposed Water Supply Requirements

The estimated water consumption as well as fire demand calculations were carried out for each of the five (5) buildings (Buildings A, B, C, D and E) and the proposed stacked townhouses. It is anticipated that an average daily consumption of approximately 4.3 L/s, a max daily demand of 8.7 L/s and a peak hourly demand of 13.0 L/s will be required to service this entire proposed development with domestic water. Detailed calculations have been included in **Appendix D**. According to the fire demand calculations, a minimum fire suppression flow of approximately 151.0 L/s at a pressure of 150 kPa (20 PSI) will be required for the proposed site. Please refer to the detailed calculations found in **Appendix D**.

The results from the hydrant test conducted on Erin Mills Parkway adjacent to the proposed development shows that approximately 606.5 L/s (9,613 USGPM) is available at a pressure of 20 PSI. Based on the results of this test, it is anticipated that the existing 300 mm watermain on Erin Mills Parkway will meet sufficient fire suppression capacity to service the proposed development.

7.3 Hydrant Coverage

There are two existing hydrants located within the development's proximity along Erin Mills Parkway. Additionally, there is one existing hydrant on the north side of Folkway Drive, two existing hydrants on Sawmill Valley Drive and one existing hydrant on Farrier Court within the vicinity of the proposed development. Due to the size of the proposed development, four private hydrants are being proposed within the property to ensure there is adequate hydrant coverage. Please refer to **Drawing C201**, the site servicing plan, in **Appendix E** for the locations of the existing, and proposed hydrants as outlined above.

7.4 Proposed Watermain Connection

Water supply for the site will be provided by a connection made to the existing 300 mm diameter watermain on Folkway Drive and the existing 300 mm diameter watermain on Erin Mills Parkway. Private fire hydrants will be placed throughout the site and serviced via the mechanical system's fire system. Please refer to **Drawing C201**, the site servicing plan, in **Appendix E**.

8 Site Grading

8.1 Existing Grades

The overall grade difference across the site is approximately 6.75 m and it slopes from northwest to southeast. Under pre-development conditions, drainage from the site, is captured in existing catch basins and conveyed through an internal sewer network to the ultimate discharge point at Farrier Court. A small external area at the southeast side of the site drains back toward the subject site but is picked up via an existing swale and catch basin. This will be maintained in the proposed condition.

8.2 Proposed Grades

The proposed grades will match current drainage patterns wherever feasible. Grades will be maintained along property lines to the extent practical and where this is not possible, retaining walls and 3:1 maximum slopes will be used to match the existing grade. Storm events up to and including the Regional Storm and the 100-year storm design event, will be captured within the site. Overland flow for events exceeding those noted above, will be directed to the southeast corner of the site and ultimately to Sawmill Valley Drive via the proposed drive aisles and landscape areas across the site. Please refer to **Appendix E** for more grading information.

9 Site Access

According to the architectural plans, three (3) vehicular accesses to the proposed development will be made. One access will be off Erin Mills Parkway, another off of Folkway Drive and the third access will connect to Sawmill Valley Drive at the north side of the site.

10 Utilities

As this development is within an urbanized area of the City, all utilities, including telephone, cable, and electricity and gas are readily available to service the subject property.

11 Conclusions and Recommendations

Based on our investigations, we conclude the following:

Stormwater Management
SWM Criteria are achieved via retention/detention storage in the 281.8 m^2 stormwater management tank within the P1 level, a 300 mm orifice tube, a stormwater quality unit and water reuse via irrigation/mechanical. Table 11.1 summarizes the proposed SWM measures. Stormwater drainage will be conveyed via a proposed 525 mm diameter concrete storm sewer at a 1.1% slope to the existing 600 mm storm pipe in Farrier Court, thereby maintaining the site's existing stormwater discharge location.

Table 11.1 Stormwater Management Summary

CRITERIA	REQUIREMENT	METHOD	CRITERION ACHIEVED?
Quantity Control	Post to pre control for all storms (i.e. 2, 5, 10, 25, 50 & 100 year) & Regional Storm.	Underground Detention Storage	Y
Quality Control	80% TSS Removal	StormFilter Unit (model SF0824)	Y
Water Balance	Retain 5 mm onsite	Irrigation and Mechanical as required.	Y

Sanitary Sewers
In the pre-development condition, the existing site generates approximately 2.5 L/s of sanitary flow and in the post-development condition, the proposed site generates approximately 18.7 L/s of sanitary flow. The expected increase in peak sanitary discharge flow in the post development condition is approximately 16.2 L/s. The flow will be directed to an existing 250 mm diameter sanitary sewer in the Farrier Court and will be conveyed by a proposed 250 mm diameter sanitary service connection at 0.5% slope.

Water Supply
Water supply for the site will be provided by a connection made to the existing 300 mm diameter watermain on Folkway Drive and the existing 300 mm diameter watermain on Erin Mills Parkway. The average domestic water consumption rates anticipated to be drawn from the existing water networks is approximately 4.3 L/s, a maximum daily consumption of 8.7 L/s and a peak hourly demand of 13.0 L/s. The site requires a minimum flow rate of 151.0 L/s at a pressure of 150 kPa (20 PSI) to account for both fire and domestic flows. The hydrant results show 606.5 L/s of water supply available in the watermain system. No improvements are required to the existing municipal watermain system. Four private hydrants are proposed within the subject site to provide required fire coverage.

Site Grading

The proposed grades will match current drainage patterns wherever feasible. Grades will be maintained along property lines to the extent practical and where this is not possible, retaining walls and 3:1 maximum slopes will be used to match the existing grade. Storm events up to and including the Regional Storm and the 100-year storm design event, will be captured within the site. Overland flow for events exceeding those noted above, will be directed to the east corner of the site and ultimately to Sawmill Valley Drive via the proposed drive aisles and landscape areas across the site. Please refer to **Appendix E** for more grading information.

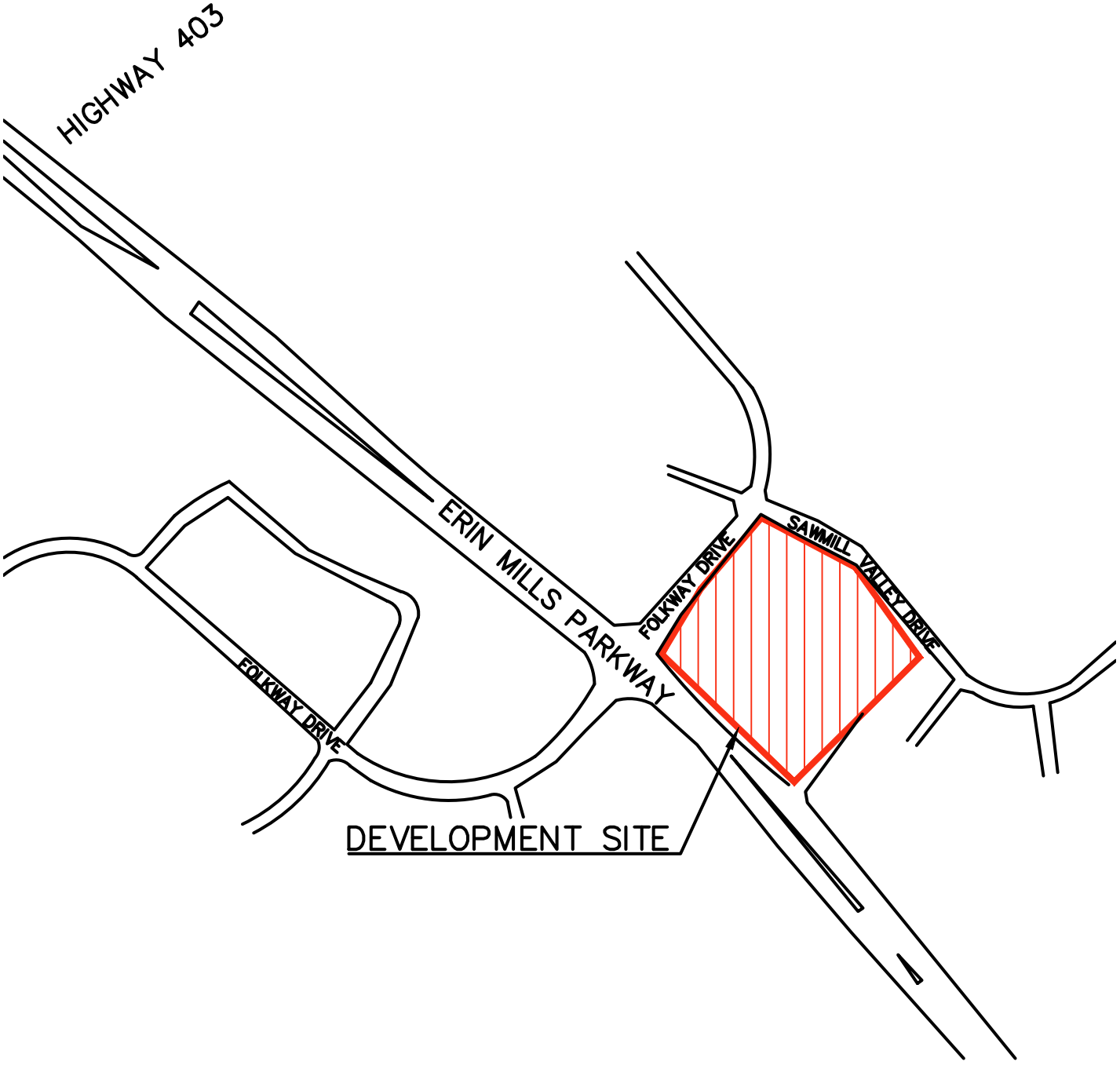
Recommendations

In summary, the site and the proposed re-development can be adequately serviced in respect to water supply, sanitary drainage, stormwater drainage, and SWM. The stormwater quantity and quality controls can be implemented in accordance with the City's SWM guidelines.

Accordingly, we hereby recommend the adoption of this report as it relates to the provision of servicing works, and for the purposes of Zoning By-Law Amendment approval.

Appendix A

Background Information



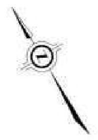
CLIENT QUEENSCORP GROUP 2 QUEEN ELIZABETH BLVD, ETOBICOKE, ON, M8Z 1L8	PROJECT NAME 4099 ERIN MILLS PARKWAY		ARCADIS		
	SCALE: NTS	DATE: 2024-03-19	FIGURE NAME LOCATION PLAN	FIGURE NO. FIG-1	REVISION 1
	PROJECT ENG: SN	DRAWN BY: SN			
	CHECKED BY: NG	APPROVED BY: NG			
	PROJECT NO: 137429				

CLIENT QUEENSCORP GROUP	PROJECT NAME 4099 ERIN MILLS PARKWAY		ARCADIS		
2 QUEEN ELIZABETH BLVD, ETOBICOKE, ON, M8Z 1L8	SCALE: NTS	DATE: 2022-07-18	FIGURE NAME AERIAL PLAN	FIGURE NO. FIG-2	REVISION 1
	PROJECT ENG: ND	DRAWN BY: GO			
	CHECKED BY: NG	APPROVED BY: ND			
	PROJECT NO: 137429				

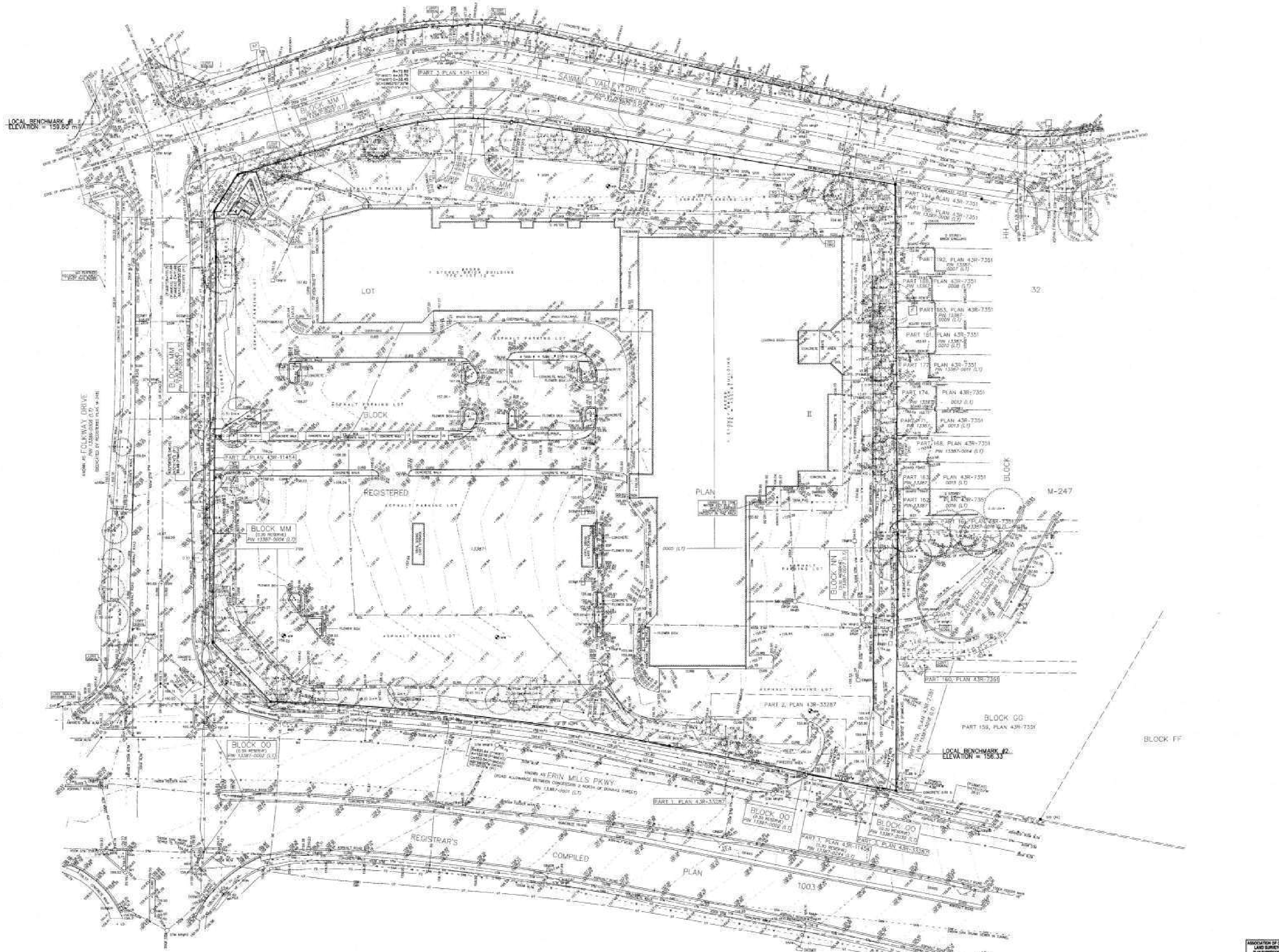
File Location: J:\137429_4099ErinMills\7.0_Production\7.03_Design\04_Civil\Sheets\Figures\137429-FIG-2-Aerial Plan.dwg Last Saved: March 19, 2024, by shazia.nishat Plotted: Tuesday, March 19, 2024 4:37:31 PM by Shazia Nishat

10mm

SCALE CHECK
1 in



SEWER INVERT DATA TABLE



SEWER INVERT NOTE:

UNDERGROUND UTILITY NOTES

DATA QUALITY LEVEL

CAUTION: CALL BEFORE YOU DIG

PLAN OF SURVEY ILLUSTRATING TOPOGRAPHY OF

BLOCK II
REGISTERED PLAN M-247
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

SCALE 1 : 300

J.D. BARNES LIMITED
©COPYRIGHT

METRIC

ELEVATION NOTE

LOCAL BENCHMARK #1

LOCAL BENCHMARK #2

NOTES

INTEGRATION DATA

LEGEND

TOPOGRAPHIC LEGEND

AREA = 26405 Sq. m.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

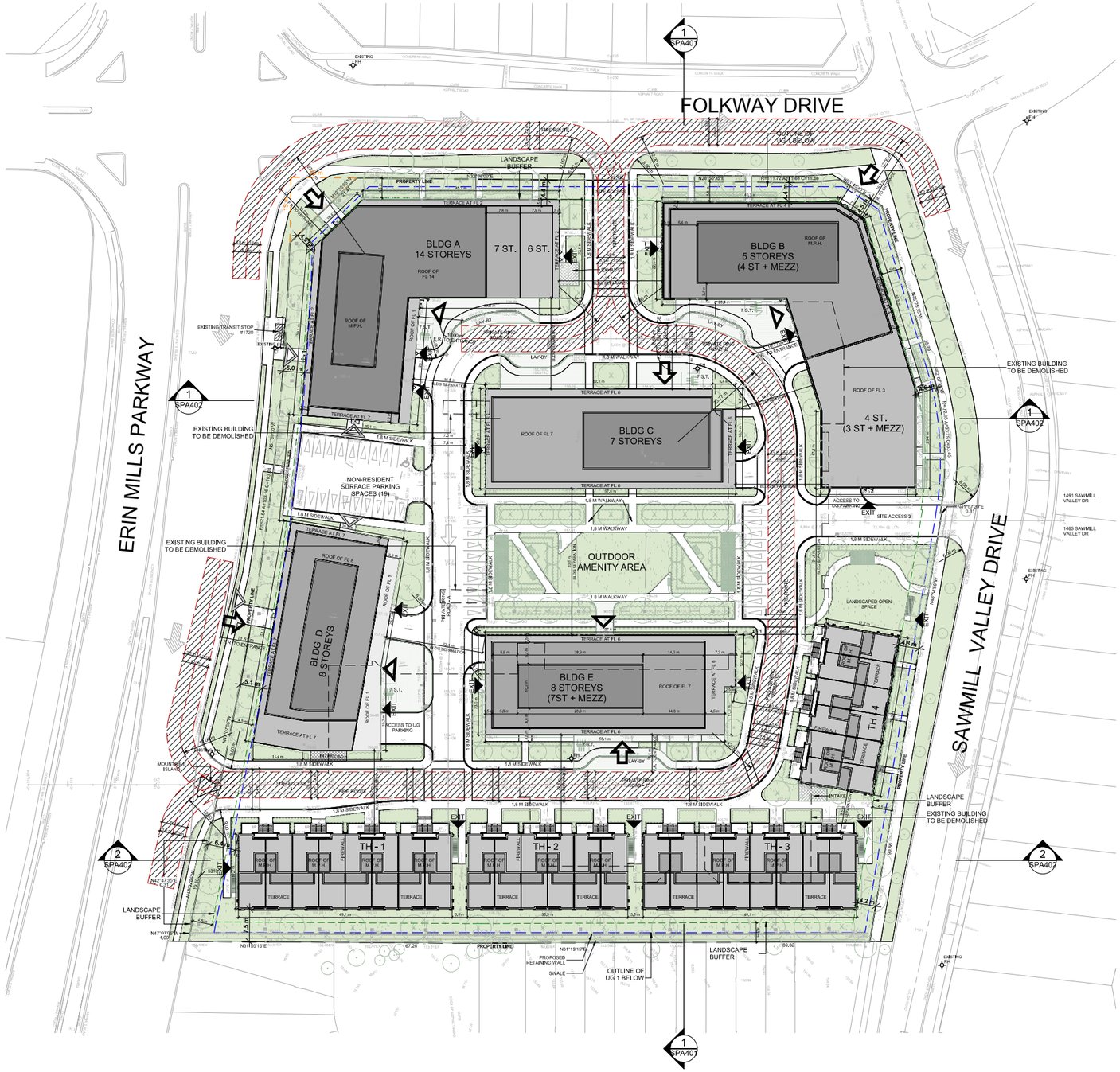
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 4th DAY OF JANUARY, 2022.

Feb. 16th, 2022
DATE

ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2187123

J.D. BARNES LIMITED
LAND INFORMATION SPECIALISTS



1 SPA401 SITE PLAN / ROOF PLAN - ULTIMATE
1 : 500

2024-10-24 3:49:20 PM

TURNER FLEISCHER

67 Lesmill Road
Toronto, ON, M3B 2T8
T 416 425 2222
turnerfleischer.com

LEGEND

- PRIMARY RESIDENTIAL ENTRANCE
- SECONDARY RESIDENTIAL ENTRANCE
- RETAIL ENTRANCE
- EXIT
- FIRE HYDRANT
- SIAMESE CONNECTION
- S.T. — SHORT TERM BIKES
- OUTLINE OF UG1
- LANDSCAPE BUFFER
- EXISTING BUILDING TO BE DEMOLISHED

#	DATE	DESCRIPTION	BY
2	2024-09-19	PARTIAL REZONING SUBMISSION	MNZ
1	2022-08-22	OFFICIAL PLAN AND REZONING SUBMISSION	AYU

QUEENSCORP

PROJECT
4099 Erin Mills Parkway, Mississauga, ON

DRAWING
SITE PLAN / ROOF PLAN

PROJECT NO.	19.001
PROJECT DATE	2024-09-19
DRAWN BY	ATS
CHECKED BY	AYU
SCALE	1 : 500

ONTARIO ASSOCIATION OF ARCHITECTS
RUSSELL LAFLEISCHER
LICENCE
6004

DRAWING NO. SPA005 | REV. 2

STATISTICS

	M2	SF
PROPOSED SITE AREA:	**26,391**	**284,076**
NEW PROPOSAL GFA	**58,293**	**627,469**
FSI	**2.21**	
NEW RESIDENTIAL UNIT#	**709**	

	M2	SF	%
Building Area	**10,856**	**116,858**	**41.1%**
Landscaped Area	**10,689**	**115,055**	**40.5%**
Paved Area	**4,846**	**52,161**	**18.4%**
Total Site Area	**26,391**	**284,074**	**100.0%**

GFA BREAKDOWN

(GFA EXCLUDES U/G PARKING , MECH.P.H., EXIT STAIR WELLS, INDOOR AMENITY SPACE, BICYCLE STORAGE , GARBAGE CHUTES, GARBAGE ROOM PER CITY OF MISSISSAUGA ZONING BY LAW)

	DESCRIPTION		RESIDENTIAL					RETAIL		TOTAL GFA	
			TOTAL GFA		NET SALEABLE						
	TYPE	FLOORS #	m2	ft2	m2	ft2	UNIT	m2	ft2	m2	ft2
U/G PARKING		2	520	5592						520	5,592
BUILDING 'A'	RESIDENTIAL BASE	15(14+MEZZ.)	17,934	193,043	16,221	174,597	256	408	4,392	18,342	197,435
BUILDING 'B'	RESIDENTIAL BASE	5(4+MEZZ.)	6,120	65,871	5,086	54,742	74			6,120	65,871
BUILDING 'C'	RESIDENTIAL BASE	7	6,668	71,768	5,955	64,097	82			6,668	71,768
BUILDING 'D'	RESIDENTIAL BASE	8	6,950	74,807	6,250	67,272	93	382	4,109	7,332	78,916
BUILDING 'E'	RESIDENTIAL BASE	8(7+MEZZ.)	7,247	78,003	6,485	69,800	92			7,247	78,003
TOTAL			45,437	489,085	39,996	430,508	597	790	8,500	46,227	497,585

	DESCRIPTION		RESIDENTIAL					RETAIL		TOTAL GFA	
			TOTAL GFA		NET SALEABLE						
	TYPE	FLOORS #	m2	ft2	m2	ft2	UNIT			m2	ft2
B TO B STACKED TOWNHOUS	108.3M2/ UNIT	4	12,066	129,881	12,066	129,881	112			12,066	129,881

PROPOSED PARKING SUPPLY

RESIDENTIAL	UNITS #	MIN. RATE	PARKING SPACES
BUILDING 'A'	256	1.1	282
BUILDING 'B'	74	1.1	81
BUILDING 'C'	82	1.1	91
BUILDING 'D'	93	1.1	103
BUILDING 'E'	92	1.1	102
B-B STACKED TOWNHOUSES	112	1.1	123
SUB TOTAL	709	1.1	783
NON-RESIDENTIAL			
RESIDENTIAL VISITOR	709	0.2	142
RETAIL	790	5/100M2	40
SUB TOTAL (BEFORE SHARING)			182
SUB TOTAL (AFTER SHARING)			142
TOTAL (BEFORE SHARING)			965
TOTAL (AFTER SHARING)			925

**MINIMUM PARKING RATE AS PER PROPOSED SITE SPECIFIC BY-LAW*

AMENITY REQUIRED

5.6m2 per unit	3970 m2

AMENITY PROVIDED

INDOOR	1790 m2
OUTDOOR	2270 m2
TOTAL	4061 m2

BICYCLE PARKING - REQUIRED

	RESIDENTIAL		NON-RESIDENTIAL		TOTAL
USE	RATIO	SPACES	RATIO	SPACES	
SHORT TERM (CLASS B)	0.05 / UNIT	35	0.20 / 100m²	0	**35**
LONG TERM (CLASS A)	0.60 / UNIT	425	0.15 / 100m²	0	**425**
TOTAL REQUIRED		**460**		**0**	**460**

** BICYCLE PARKING RATIOS AS PER CITY OF MISSISSAUGA ZONING BY-LAW*

**BICYCLE PARKING SPACES SHALL NOT BE REQUIRED FOR NON-RESIDENTIAL USES WITH LESS THAN 1000 m² OF GFA - NON-RESIDENTIAL.*

BICYCLE PARKING - PROVIDED

	RESIDENTIAL		
FLOOR	SHORT TERM (CLASS B)	LONG TERM (CLASS A)	SUB-TOTAL
FLOOR 1	35	126	161
U/G LEVEL 1		299	299
TOTAL PROVIDED	**35**	**425**	**460**

PROPOSED PARKING PROVIDED

FLOOR	USE		TOTAL
	RESIDENTIAL	NON- RESIDENTIAL	
FLOOR 1		39	39
U/G LEVEL 1	556	103	659
U/G LEVEL 2	227		227
TOTAL PROVIDED	**783**	**142**	**925**
RATIO	**1.10**		

EVSE PARKING - PROVIDED

EVSE	
RESIDENTIAL	NON-RESIDENTIAL
157	15
157	**15**
20%	**10%**

ACCESSIBLE PARKING - PROVIDED

FLOOR	SPACES		TOTAL
	RESIDENTIAL	VISITOR	
FLOOR 1		1	1
U/G LEVEL 1	2	5	7
U/G LEVEL 2	?		2
TOTAL PROVIDED	**4**	**6**	**10**

UNIT MIX SUMMARY

BLDG		SALEABLE					AVG. UNIT SIZE	
	BUILDING	1B	2B	2B+D	3B	TOTAL	m²	ft²
BLDG A+B+C+D +E	A	192	35	17	12	256	**63.4**	**682**
	B	43	17	8	6	74	**68.7**	**740**
	C	37	26	14	5	82	**72.6**	**782**
	D	53	30	3	7	93	**67.2**	**723**
	E	65	9	11	7	92	**70.5**	**759**
	SUBTOTAL	390	117	53	37	597	**67.0**	**721**
	TOTAL UNITS	**390**	**170**		**37**	**597**		
	UNIT MIX	65,3%	19,6%	8,9%	6,2%	100,0%		
	UNIT MIX TOTAL	65,3%	28,5%		6,2%	100,0%		
	AVG UNIT SIZE (m²)	58,2	75,2	86,5	105,5	67,0		
	AVG UNIT SIZE (ft²)	627	810	931	1,135	721		
	AVG UNIT SIZE TOTAL (m²)	58.2	78.7		91.0	67.0		
	AVG UNIT SIZE TOTAL (ft²)	627	848		980	721		

TH UNIT MIX PROVIDED

BLDG	TYPE	AVG UNIT SIZE	
	2B	m2	ft2
	TH	112	107.7	1160
TOTAL UNITS	**112**		

GROSS FLOOR AREA DEFINITION

CITY OF MISSISSAUGA ZONING BY-LAW 0225-2007

Gross Floor Area (GFA)

means the sum of the areas of each storey of a building, structure or part thereof, above or below established grade, excluding storage below established grade and a parking structure above or below established grade, measured from the exterior of outside walls, orfrom the midpoint of common walls.

Gross Floor Area / (GFA) - Apartment Zone

means the sum of the areas of each storey of a building above or below established grade, measured from the exterior of outside walls of the building including floor area occupied by interior walls but excluding 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 collectionor 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. (0174-2017)

Gross Floor Area / (GFA) - Residential

means the sum of the areas of each storey of a building measured from the exterior of outside walls but shall not include any part of the building used for motor vehicle parking.

Gross Floor Area / (GFA) - Non-Residential

means the sum of the areas of each storey above or below established grade, measured from the exterior of outside walls, or from the midpoint of common walls, including the area of any floor system or assembly located within a storey which is designed or used for access and passage by persons and including all parts of the building or structure or part thereof below established grade used for retail,office, industrial or warehouse uses, but excluding 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)

Height

means, with reference to the height of a building, structure or part thereof, except a detached dwelling, semi-detached, duplex, triplex, fourplex, townhouse, back to back townhouse or stacked townhouse, the vertical distance between the established grade and:
(1.1) the highest point of the roof surface of a flat roof; or
(1.2) the mean height level between the eaves and ridge of a sloped roof,
(1.3) the mean height level between the eaves and highest point of the flat roof where there is a flat roof on top of a sloped roof; or
(1.4) the highest point of a structure without a roof.

TURNER FLEISCHER

67 Lesmill Road
Toronto, ON, M3B 2T8
T 416 425 2222
turnerfleischer.com

DRAWING LIST

Sheet Name	Sheet Number

2	2024-09-19	PARTIAL REZONING SUBMISSION	MNZ
1	2022-08-22	OFFICIAL PLAN AND REZONING SUBMISSION	AYU
#	DATE	DESCRIPTION	BY

QUEENSCORP

PROJECT
4099 Erin Mills Parkway, Mississauga, ON

DRAWING
STATISTICS

PROJECT NO. 19.001
PROJECT DATE 2024-09-19
DRAWN BY ATS
CHECKED BY AYU
SCALE 1 : 1

ONTARIO ASSOCIATION OF ARCHITECTS
RUSSELL L.FLEISCHER
LICENCE
8004

DRAWING NO. SPA002
REV. 2

2024-10-24 3:49:07 PM

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL RESIDENTIAL		RETAIL		TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE				RETAIL			
			m²	ft²	m²	ft²	m²	ft²	m²	ft²	m²	ft²
BLDG A	BLDG A Floor 1	6	423.1	4,554	393.4	4,235	816.5	8,789	408.0	4,392	1,224.5	13,180
	BLDG A Floor 2	20	1,255.5	13,514	147.3	1,586	1,402.8	15,100			1,402.8	15,100
	BLDG A Floor 3	22	1,411.5	15,194	102.4	1,102	1,513.9	16,296			1,513.9	16,296
	BLDG A Floor 4	22	1,411.5	15,194	102.4	1,102	1,513.9	16,296			1,513.9	16,296
	BLDG A Floor 5	22	1,411.5	15,194	102.4	1,102	1,513.9	16,296			1,513.9	16,296
	BLDG A Floor 6	22	1,411.5	15,194	102.4	1,102	1,513.9	16,296			1,513.9	16,296
	BLDG A Floor 7	20	1,230.3	13,243	97.1	1,045	1,327.4	14,288			1,327.4	14,288
	BLDG A Floor 8	20	1,230.3	13,243	97.1	1,045	1,327.4	14,288			1,327.4	14,288
	BLDG A Floor 9	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A Floor 10	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A Floor 11	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A Floor 12	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A Floor 13	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A Floor 14	17	1,072.5	11,545	94.9	1,021	1,167.4	12,566			1,167.4	12,566
	BLDG A M.P.H.											
	TOTAL	**256**	**16,220.552**	**174,596.646**	**1,713.739**	**18,446.546**	**17,934.292**	**193,043.192**	**407.995**	**4,391.621**	**18,342.286**	**197,434.813**
	TOTAL (ROUNDED)	**256**	**16,220.6**	**174,597**	**1,713.7**	**18,447**	**17,934.3**	**193,043**	**408.0**	**4,392**	**18,342.3**	**197,435**

Last Updated: Friday, 23 August 2024 16:23:07 PM

AMENITY AREA BREAKDOWN

FLOOR	OUTDOOR AMENITY		INDOOR AMENITY	
	m²	ft²	m²	ft²
BLDG A Floor 1			333.3	3,588
BLDG A Floor 2				
BLDG A Floor 3				
BLDG A Floor 4				
BLDG A Floor 5				
BLDG A Floor 6				
BLDG A Floor 7				
BLDG A Floor 8				
BLDG A Floor 9				
BLDG A Floor 10				
BLDG A Floor 11				
BLDG A Floor 12				
BLDG A Floor 13				
BLDG A Floor 14				
BLDG A M.P.H.				
TOTAL			**333.313**	**3,587.750**
TOTAL (ROUNDED)			**333.3**	**3,588**

TOTAL FLOOR AREA BREAKDOWN

FLOOR	AREA EXCLUSIONS		TOTAL FLOOR AREA (GFA+INDOOR AMENITY+EXCL.)	
	m²	ft²	m²	ft²
BLDG A Floor 1	355.9	3,831	1,913.7	20,599
BLDG A Floor 2	47.4	510	1,450.2	15,610
BLDG A Floor 3	47.3	510	1,561.3	16,805
BLDG A Floor 4	47.4	510	1,561.3	16,805
BLDG A Floor 5	47.4	510	1,561.3	16,805
BLDG A Floor 6	47.4	510	1,561.3	16,805
BLDG A Floor 7	47.4	510	1,374.8	14,798
BLDG A Floor 8	47.4	510	1,374.8	14,798
BLDG A Floor 9	47.4	510	1,214.8	13,076
BLDG A Floor 10	47.4	510	1,214.8	13,076
BLDG A Floor 11	47.4	510	1,214.8	13,076
BLDG A Floor 12	47.4	510	1,214.8	13,076
BLDG A Floor 13	47.4	510	1,214.8	13,076
BLDG A Floor 14	47.4	510	1,214.8	13,076
BLDG A M.P.H.	266.2	2,865	266.2	2,865
TOTAL	**1,237.777**	**13,323.330**	**19,913.377**	**214,345.894**
TOTAL (ROUNDED)	**1,237.8**	**13,323**	**19,913.4**	**214,346**

Last Updated: Tuesday, 06 August 2024 16:42:27 PM

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE			
			m²	ft²	m²	ft²	m²	ft²
BLDG B	BLDG B Floor 1	9	528.8	5,692	479.3	5,159	1,008.1	10,851
	BLDG B Mezz		326.9	3,519			326.9	3,519
	BLDG B Floor 2	24	1,522.6	16,389	254.7	2,741	1,777.2	19,130
	BLDG B Floor 3	27	1,718.0	18,493	172.3	1,855	1,890.4	20,348
	BLDG B Floor 4	14	989.3	10,649	127.6	1,373	1,116.9	12,023
	BLDG B M.P.H.							
	TOTAL	**74**	**5,085.672**	**54,741.740**	**1,033.879**	**11,128.584**	**6,119.551**	**65,870.324**
	TOTAL (ROUNDED)	**74**	**5,085.7**	**54,742**	**1,033.9**	**11,129**	**6,119.6**	**65,870**

Last Updated: Friday, 23 August 2024 16:24:25 PM

AMENITY AREA BREAKDOWN

FLOOR	OUTDOOR AMENITY		INDOOR AMENITY	
	m²	ft²	m²	ft²
BLDG B Floor 1			463.4	4,988
BLDG B Mezz				
BLDG B Floor 2				
BLDG B Floor 3				
BLDG B Floor 4				
BLDG B M.P.H.				
TOTAL			**463.392**	**4,987.917**
TOTAL (ROUNDED)			**463.4**	**4,988**

TOTAL FLOOR AREA BREAKDOWN

FLOOR	AREA EXCLUSIONS		TOTAL FLOOR AREA (GFA+INDOOR AMENITY+EXCL.)	
	m²	ft²	m²	ft²
BLDG B Floor 1	544.3	5,859	2,015.7	21,697
BLDG B Mezz			326.9	3,519
BLDG B Floor 2	61.5	662	1,839.2	19,797
BLDG B Floor 3	63.8	686	1,954.6	21,039
BLDG B Floor 4	46.3	498	1,163.2	12,521
BLDG B M.P.H.	462.9	4,982	462.9	4,982
TOTAL	**1,178.670**	**12,687.102**	**7,762.509**	**83,554.986**
TOTAL (ROUNDED)	**1,178.7**	**12,687**	**7,762.5**	**83,555**

Last Updated: Tuesday, 06 August 2024 16:42:45 PM

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE			
			m²	ft²	m²	ft²	m²	ft²
BLDG C	BLDG C Floor 1				147.7	1,590	147.7	1,590
	BLDG C Floor 2	13	932.6	10,039	123.7	1,332	1,056.3	11,370
	BLDG C Floor 3	15	1,093.9	11,774	88.3	950	1,182.1	12,724
	BLDG C Floor 4	15	1,093.9	11,774	88.3	950	1,182.1	12,724
	BLDG C Floor 5	15	1,093.9	11,774	88.3	950	1,182.1	12,724
	BLDG C Floor 6	12	905.0	9,741	88.3	950	993.2	10,691
	BLDG C Floor 7	12	835.6	8,995	88.3	950	923.9	9,945
	BLDG C M.P.H.							
	TOTAL	**82**	**5,954.783**	**64,096.774**	**712.745**	**7,671.925**	**6,667.528**	**71,768.700**
	TOTAL (ROUNDED)	**82**	**5,954.8**	**64,097**	**712.7**	**7,672**	**6,667.5**	**71,769**

Last Updated: Friday, 23 August 2024 16:24:57 PM

AMENITY AREA BREAKDOWN

FLOOR	OUTDOOR AMENITY		INDOOR AMENITY	
	m²	ft²	m²	ft²
BLDG C Floor 1			454.8	4,896
BLDG C Floor 2				
BLDG C Floor 3				
BLDG C Floor 4				
BLDG C Floor 5				
BLDG C Floor 6				
BLDG C Floor 7				
BLDG C M.P.H.				
TOTAL			**454.824**	**4,895.685**
TOTAL (ROUNDED)			**454.8**	**4,896**

TOTAL FLOOR AREA BREAKDOWN

FLOOR	AREA EXCLUSIONS		TOTAL FLOOR AREA (GFA+INDOOR AMENITY+EXCL.)	
	m²	ft²	m²	ft²
BLDG C Floor 1	328.5	3,536	931.0	10,022
BLDG C Floor 2	47.8	514	1,104.1	11,885
BLDG C Floor 3	44.9	484	1,227.1	13,208
BLDG C Floor 4	44.9	484	1,227.1	13,208
BLDG C Floor 5	44.9	484	1,227.1	13,208
BLDG C Floor 6	44.9	484	1,038.2	11,175
BLDG C Floor 7	44.9	484	968.8	10,428
BLDG C M.P.H.	386.4	4,159	386.4	4,159
TOTAL	**987.320**	**10,627.431**	**8,109.672**	**87,291.816**
TOTAL (ROUNDED)	**987.3**	**10,627**	**8,109.7**	**87,292**

Last Updated: Tuesday, 06 August 2024 16:42:55 PM

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL RESIDENTIAL		RETAIL		TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE				RETAIL			
			m²	ft²	m²	ft²	m²	ft²	m²	ft²	m²	ft²
BLDG D	BLDG D Floor 1				206.3	2,220	206.3	2,220	381.7	4,108	588.0	6,329
	BLDG D Floor 2	11	823.6	8,865	123.5	1,330	947.1	10,195			947.1	10,195
	BLDG D Floor 3	15	980.1	10,550	64.1	690	1,044.3	11,241			1,044.3	11,241
	BLDG D Floor 4	15	980.1	10,550	64.1	690	1,044.3	11,241			1,044.3	11,241
	BLDG D Floor 5	15	980.1	10,550	64.1	690	1,044.3	11,241			1,044.3	11,241
	BLDG D Floor 6	15	980.1	10,550	64.1	690	1,044.3	11,241			1,044.3	11,241
	BLDG D Floor 7	11	772.4	8,314	56.8	611	829.1	8,925			829.1	8,925
	BLDG D Floor 8	11	733.4	7,894	56.8	611	790.2	8,505			790.2	8,505
	BLDG D MPH											
	TOTAL	**93**	**6,249.840**	**67,272.744**	**699.974**	**7,534.456**	**6,949.813**	**74,807.200**	**381.683**	**4,108.407**	**7,331.497**	**78,915.607**
	TOTAL (ROUNDED)	**93**	**6,249.8**	**67,273**	**700.0**	**7,534**	**6,949.8**	**74,807**	**381.7**	**4,108**	**7,331.5**	**78,916**

Last Updated: Friday, 23 August 2024 16:25:35 PM

AMENITY AREA BREAKDOWN

FLOOR	OUTDOOR AMENITY		INDOOR AMENITY	
	m²	ft²	m²	ft²
BLDG D Floor 1			267.8	2,883
BLDG D Floor 2				
BLDG D Floor 3				
BLDG D Floor 4				
BLDG D Floor 5				
BLDG D Floor 6				
BLDG D Floor 7				
BLDG D Floor 8				
BLDG D MPH				
TOTAL			**267.808**	**2,882.660**
TOTAL (ROUNDED)			**267.8**	**2,883**

TOTAL FLOOR AREA BREAKDOWN

FLOOR	AREA EXCLUSIONS		TOTAL FLOOR AREA (GFA+INDOOR AMENITY+EXCL.)	
	m²	ft²	m²	ft²
BLDG D Floor 1	494.1	5,319	1,349.9	14,530
BLDG D Floor 2	47.7	514	994.9	10,709
BLDG D Floor 3	45.0	485	1,089.3	11,725
BLDG D Floor 4	45.0	485	1,089.3	11,725
BLDG D Floor 5	45.0	485	1,089.3	11,725
BLDG D Floor 6	45.0	485	1,089.3	11,725
BLDG D Floor 7	45.0	485	874.2	9,410
BLDG D Floor 8	45.0	485	835.2	8,990
BLDG D MPH	345.8	3,722	345.8	3,722
TOTAL	**1,157.873**	**12,463.242**	**8,757.177**	**94,261.509**
TOTAL (ROUNDED)	**1,157.9**	**12,463**	**8,757.2**	**94,262**

Last Updated: Tuesday, 06 August 2024 16:43:06 PM

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE			
			m²	ft²	m²	ft²	m²	ft²
BLDG E	BLDG E Floor 1	5	354.3	3,813	342.4	3,686	696.7	7,499
	BLDG E Mezz		206.6	2,224			206.6	2,224
	BLDG E Floor 2	14	976.0	10,505	72.2	777	1,048.2	11,282
	BLDG E Floor 3	16	1,096.3	11,800	72.2	777	1,168.5	12,578
	BLDG E Floor 4	16	1,096.3	11,800	72.2	777	1,168.5	12,578
	BLDG E Floor 5	16	1,096.3	11,800	72.2	777	1,168.5	12,578
	BLDG E Floor 6	13	869.7	9,362	64.9	698	934.6	10,060
	BLDG E Floor 7	12	789.0	8,493	66.0	710	855.0	9,203
	BLDG E M.P.H.							
	TOTAL	**92**	**6,484.589**	**69,799.561**	**762.074**	**8,202.898**	**7,246.662**	**78,002.459**
	TOTAL (ROUNDED)	**92**	**6,484.6**	**69,800**	**762.1**	**8,203**	**7,246.7**	**78,002**

Last Updated: Friday, 23 August 2024 16:26:29 PM

AMENITY AREA BREAKDOWN

FLOOR	OUTDOOR AMENITY		INDOOR AMENITY	
	m²	ft²	m²	ft²
BLDG E Floor 1			271.1	2,918
BLDG E Mezz				
BLDG E Floor 2				
BLDG E Floor 3				
BLDG E Floor 4				
BLDG E Floor 5				
BLDG E Floor 6				
BLDG E Floor 7				
BLDG E M.P.H.				
TOTAL			**271.056**	**2,917.623**
TOTAL (ROUNDED)			**271.1**	**2,918**

TOTAL FLOOR AREA BREAKDOWN

FLOOR	AREA EXCLUSIONS		TOTAL FLOOR AREA (GFA+INDOOR AMENITY+EXCL.)	
	m²	ft²	m²	ft²
BLDG E Floor 1	329.1	3,542	1,296.8	13,959
BLDG E Mezz	14.8	160	221.5	2,384
BLDG E Floor 2	44.9	484	1,093.1	11,766
BLDG E Floor 3	44.9	484	1,213.4	13,061
BLDG E Floor 4	44.9	484	1,213.4	13,061
BLDG E Floor 5	44.9	484	1,213.4	13,061
BLDG E Floor 6	44.9	484	979.5	10,544
BLDG E Floor 7	44.9	484	899.9	9,687
BLDG E M.P.H.	294.2	3,167	294.2	3,167
TOTAL	**907.676**	**9,770.145**	**8,425.394**	**90,690.227**
TOTAL (ROUNDED)	**907.7**	**9,770**	**8,425.4**	**90,690**

Last Updated: Tuesday, 06 August 2024 16:43:19 PM

TURNER FLEISCHER

67 Lesmill Road
Toronto, ON, M3B 2T8
T 416 425 2222
turnerfleischer.com

#	DATE	DESCRIPTION	BY
1	2022-08-22	OFFICIAL PLAN AND REZONING SUBMISSION	AYU

QUEENSCORP

PROJECT
4099 Erin Mills Parkway, Mississauga, ON

DRAWING
STATISTICS AREA BREAKDOWN

PROJECT NO.
19.001

PROJECT DATE
2024-09-06

DRAWN BY
JMS

CHECKED BY
AYU

SCALE
1 : 1

DRAWING NO.
SPA002b

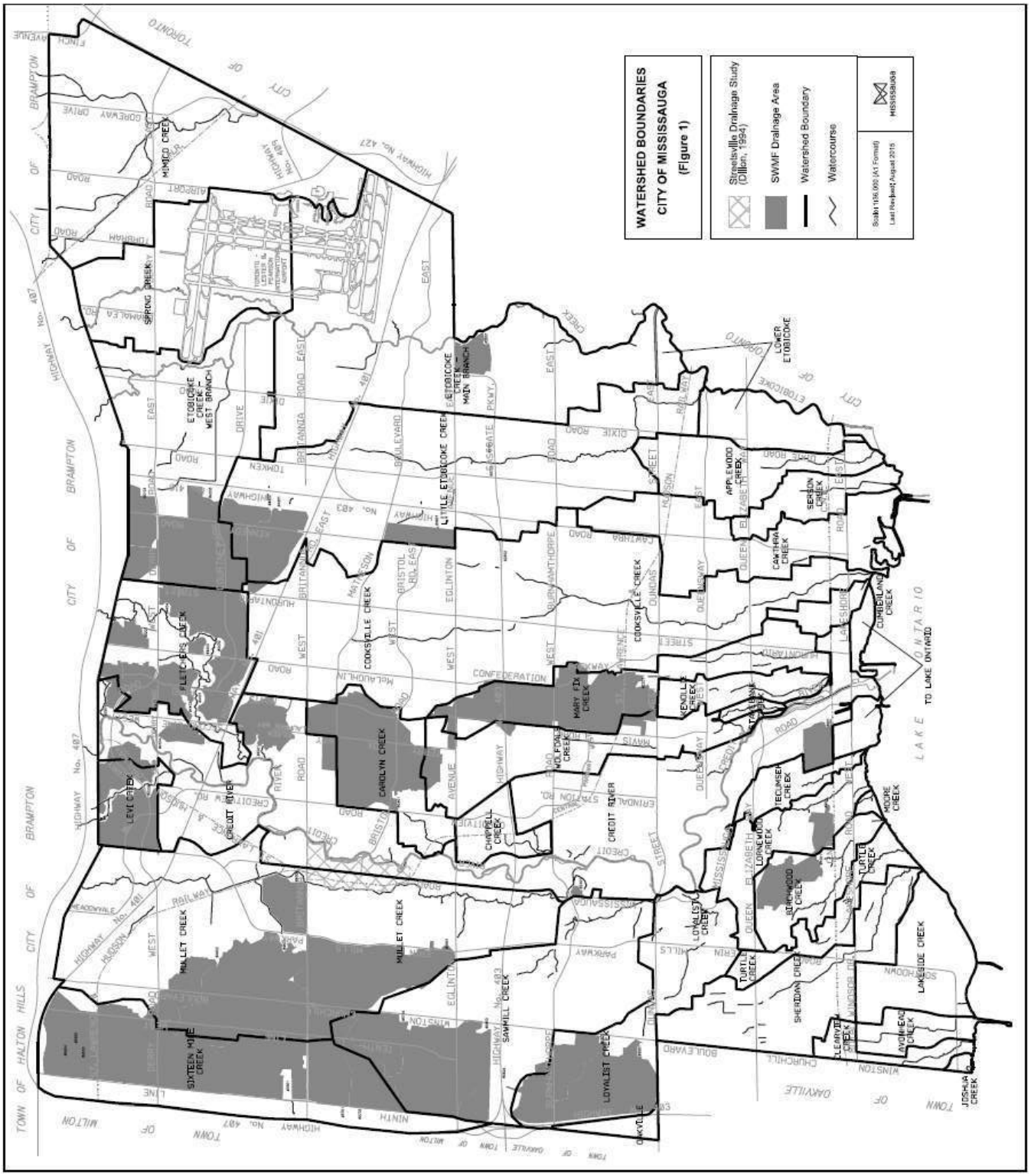
REV.
1

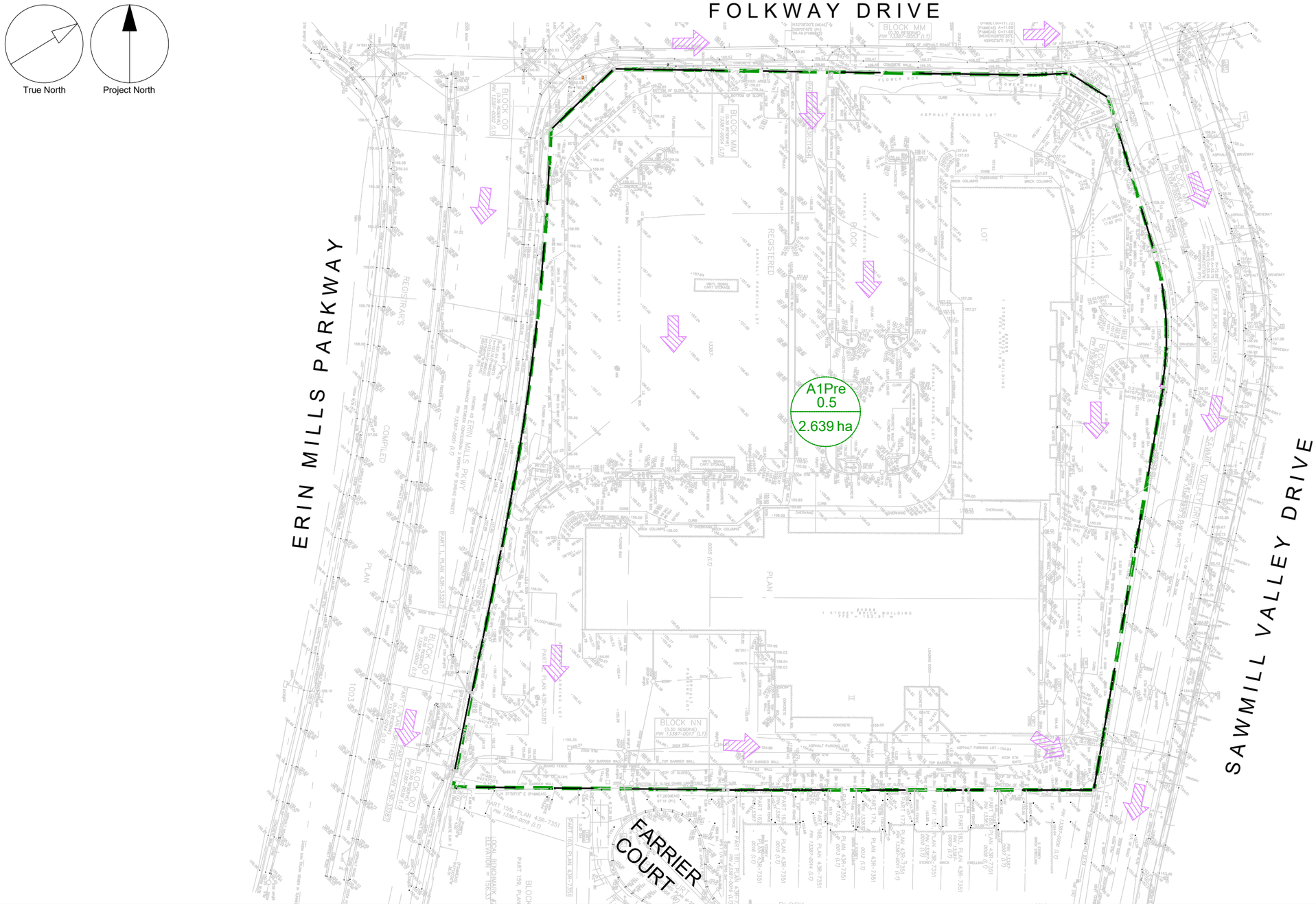
2024-09-06 3:21:39 PM

Appendix B

Stormwater Data Analysis

Appendix 1: Watershed Boundaries





LEGEND

EXISTING EXTERNAL STORM DRAINAGE AREA

EXISTING OVERLAND FLOW DIRECTION

101 — AREA ID
0.25
1.36 ha — DRAINAGE AREA

PROJECT NAME
RESIDENTIAL DEVELOPMENT
4099 ERIN MILLS PARKWAY
MISSISSAUGA, ONTARIO

ARCADIS

SCALE: 1:1000	DATE: JUL 2022
PROJECT ENG: N.D.	DRAWN BY: N.D.
CHECKED BY: N.G.	APPROVED BY: N.D.
PROJECT NO: 137429	

FIGURE NAME: PRE DEVELOPMENT STORM DRAINAGE PLAN
FIGURE NO.: DAP-01
REVISION:

SCALE CHECK 1 in 10mm

File Location: J:\137429_4099ErinMills\7.0_Production\7.03_Design\04_Civil\Sheets\Figures\137429-SHT-DAP-01-02 (11x17)dwg.dwg Last Saved: June 27, 2024, by shazia.nishat Plotted: Thursday, June 27, 2024 3:17:44 PM by Shazia Nishat

4099 Erin Mills Parkway

Residential Townhouse/Condo

ARCADIS

Runoff Coefficients

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

A1Post - Controlled Site Areas				
Conventional Roof	9,488	38.3%	0.90	0.34
Green Roof	0	0.0%	0.50	0.00
Landscape	913	3.7%	0.25	0.009
Landscape over P1	4,959	20.0%	0.45	0.09
Permeable Pavers	0	0.0%	0.55	0.00
Impervious	9,429	38.0%	0.90	0.34
Total Area	**24,789**	100%		**0.79**

A2Post - Uncontrolled Areas to Folkway and Sawmill Valley Dr				
Conventional Roof	0	0.0%	0.90	0.00
Green Roof	0	0.0%	0.50	0.00
Landscape	321	20.0%	0.25	0.05
Landscape over P1	660	41.2%	0.45	0.19
Permeable Pavers	0	0.0%	0.55	0.00
Impervious	621	38.8%	0.90	0.35
Total Area	**1,602**	100.0%		**0.58**

EXT1 - South External Area				
Conventional Roof	365	28.6%	0.90	0.26
Green Roof	0	0.0%	0.50	0.00
Landscape	909	71.4%	0.25	0.18
Landscape over P1	0	0.0%	0.45	0.00
Permeable Pavers	0	0.0%	0.55	0.00
Impervious	0	0.0%	0.90	0.00
Total Area	**1,274**	100%		**0.44**

Total Site Area				
Conventional Roof	9,488	36.0%	0.90	0.32
Green Roof	0	0.0%	0.50	0.00
Landscape	1,234	4.7%	0.25	0.01
Landscape over P1	5,619	21.3%	0.45	0.10
Permeable Pavers	0	0.0%	0.55	0.00
Impervious	10,050	38.1%	0.90	0.34
Total Area	**26,391**	100%		**0.77**

4099 Erin Mills Parkway
Residential Townhouse/Condo

ARCADIS

IDF Curve Equations: City of Mississauga

$I_{2\text{-year}} = \frac{610}{(T+4.6)^{0.78}}$

$I_{5\text{-year}} = \frac{820}{(T+4.6)^{0.78}}$

$I_{10\text{-year}} = \frac{1010}{(T+4.6)^{0.78}}$

$I_{25\text{-year}} = \frac{1160}{(T+4.6)^{0.78}}$

$I_{50\text{-year}} = \frac{1300}{(T+4.7)^{0.78}}$

$I_{100\text{-year}} = \frac{1450}{(T+4.9)^{0.78}}$

Adjustment Factors	
10-yr	1.00
25-yr	1.10
50-yr	1.20
100-yr	1.25

ALLOWABLE RELEASE RATE AND STORM SERVICE DESIGN

2-100 -YEAR STORM SEWER DESIGN SHEET

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

	From MH	To MH	DESIGN FLOW CALCULATIONS A (ha)	R	A x R	Accum. A x R	T_c (min)	I (mm/hr)	Q_{act} (l/s)	SEWER DESIGN & ANALYSIS Size of Pipe (mm)	Slope (%)	Nominal Capacity Q_{cap} (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)	Length (m)	Time in Section (min)	Total Time (min)	Percent of Full Flow (%)	Notes
PRE-DEVELOPMENT FLOWS																			
TARGET RELEASE RATES																			
2-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	59.89	**219.5**										
5-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	80.51	**295.1**										
10-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	99.17	**363.5**										
25-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	113.89	**417.5**										
50-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	127.13	**466.0**										
100-Yr Allowable Release Rate			2.6391	0.50	1.320	1.320	15.0	140.69	**515.7**										
Regional Storm (Hurricane Hazel)			Refer to Visual OTTHYMO Model						**375.0**										
POST DEVELOPMENT FLOWS																			
2-YR POST-DEV FLOWS																			
2-Yr Controlled Flow			2.4789	0.79					**177.0**	525	1.10%	451.1	2.1	1.9	25.80	0.2	10.2	39%	
2-Yr Un-Controlled Flow (A2)			0.1602	0.58	0.094	0.094	15.0	59.89	**15.6**										
2-Yr Total Post-Dev Discharge									**192.6**										
5-YR POST-DEV FLOWS																			
5-Yr Controlled Flow			2.4789	0.79					**215.8**	525	1.10%	451.1	2.1	2.0	25.80	0.2	10.2	48%	
5-Yr Uncontrolled Flow (A2)			0.1602	0.58	0.094	0.094	15.0	80.51	**20.9**										
5-Yr Total Post-Dev Discharge									**236.7**										
10-YR POST-DEV FLOWS																			
10-Yr Controlled Flow			2.4789	0.79					**247.2**	525	1.10%	451.1	2.1	2.1	25.80	0.2	10.2	55%	
10-Yr Uncontrolled Flow (A2)			0.1602	0.58	0.094	0.094	15.0	99.17	**25.8**										
10-Yr Total Post-Dev Discharge									**273.0**										
25-YR POST-DEV FLOWS																			
25-Yr Controlled Flow			2.4789	0.79					**286.8**	525	1.10%	451.1	2.1	2.2	25.80	0.2	10.2	64%	
25-Yr Uncontrolled Flow (A2)			0.1602	0.64	0.103	0.103	15.0	113.89	**32.6**										
25-Yr Total Post-Dev Discharge									**319.4**										
50-YR POST-DEV FLOWS																			
50-Yr Controlled Flow			2.4789	0.79					**324.3**	525	1.10%	451.1	2.1	2.3	25.80	0.2	10.2	72%	
50-Yr Uncontrolled Flow (A2)			0.1602	0.70	0.112	0.112	15.0	127.13	**39.7**										
50-Yr Total Post-Dev Discharge									**364.0**										
100-YR POST-DEV FLOWS																			
100-Yr Controlled Flow			2.4789	0.79					**353.9**	525	1.10%	451.1	2.1	2.3	25.80	0.2	10.2	78%	
100-Yr Uncontrolled Flow (A2)			0.1602	0.73	0.117	0.117	15.0	140.69	**45.7**										
100-Yr Total Post-Dev Discharge									**399.7**										
REGIONAL STORM (HURRICANE HAZEL) POST-DEV FLOWS																			
Regional Storm Controlled Flow			Refer to Visual OTTHYMO Model						**320.0**	525	1.10%	451.1	2.1	2.3	25.80	0.2	10.2	71%	
Regional Storm Uncontrolled Flow (A2)			Refer to Visual OTTHYMO Model						**23.0**										
Regional Storm Total Discharge			Refer to Visual OTTHYMO Model						**340.0**										
ORIFICE AND SERVICE DESIGN				k	Orif.(mm)	Area (m2)	depth (m)	head (m)	Q (L/s)										
Orifice and Storm Service	Tank	Cntrl.MH		k=0.8	300	0.07069	2.15	2.00	**353.9**										
Storm Service	Cntrl.MH	CSS.MH							**353.9**	525	0	451.1	2.1	2.3	25.8	0.2	10.2	78%	

True North

Project North

FOLKWAY DRIVE

ERIN MILLS PARKWAY

SAWMILL VALLEY DRIVE

FARRIER COURT

A1Post
0.79
2.479 ha

A2Post
0.58
0.160 ha

EXT1
0.44
0.127 ha

LEGEND

PROPOSED STORM DRAINAGE AREA

PROPOSED OVERLAND FLOW DIRECTION

EXISTING OVERLAND FLOW DIRECTION

A1Post
0.95
1.36 ha

AREA ID

FRACTION IMPERVIOUS

DRAINAGE AREA

PROJECT NAME
RESIDENTIAL DEVELOPMENT
4099 ERIN MILLS PARKWAY
MISSISSAUGA, ONTARIO

ARCADIS

SCALE: 1:1000	DATE: June 2024
PROJECT ENG: N.D.	DRAWN BY: N.D.
CHECKED BY: N.G.	APPROVED BY: N.D.
PROJECT NO: 137429	

FIGURE NAME
POST DEVELOPMENT STORM DRAINAGE PLAN

FIGURE NO. DAP-02

REVISION

SCALE CHECK 1 in 10mm

File Location: J:\137429_4099ErinMills\7.0_Production\7.03_Design\04_Civil\Sheets\Figures\137429-SHT-DAP-01-02 (11x17).dwg Last Saved: June 27, 2024, by shazia.nishat Plotted: Thursday, June 27, 2024 12:44:28 AM by Shazia Nishat

4099 Erin Mills Parkway **Rational Method - 2 Year Storm**

Residential Townhouse/Condo

ARCADIS

$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{610}{(T+4.6)^{0.78}} = 59.89 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.77
Date:	September 2024	Orifice Discharge (L/s) =	177.0

Time (min)	Intensity (mm/hr)	Q-2 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	59.9	333.415	156.385	140.746
20	50.2	279.265	102.234	122.681
25	43.4	241.734	64.704	97.055
30	38.4	214.026	36.995	66.591
35	34.6	192.639	15.608	32.777
40	31.5	175.576	0.000	0.000
45	29.0	161.611	0.000	0.000
50	26.9	149.946	0.000	0.000
55	25.2	140.040	0.000	0.000
60	23.6	131.512	0.000	0.000
65	22.3	124.082	0.000	0.000
70	21.1	117.546	0.000	0.000
75	20.1	111.746	0.000	0.000
80	19.1	106.561	0.000	0.000
85	18.3	101.893	0.000	0.000
90	17.5	97.668	0.000	0.000
95	16.9	93.822	0.000	0.000
100	16.2	90.305	0.000	0.000
105	15.6	87.075	0.000	0.000
110	15.1	84.097	0.000	0.000
115	14.6	81.342	0.000	0.000
120	14.2	78.785	0.000	0.000
125	13.7	76.404	0.000	0.000
130	13.3	74.181	0.000	0.000
135	13.0	72.100	0.000	0.000
140	12.6	70.148	0.000	0.000
145	12.3	68.312	0.000	0.000
150	12.0	66.583	0.000	0.000
155	11.7	64.950	0.000	0.000
160	11.4	63.406	0.000	0.000
165	11.1	61.943	0.000	0.000
170	10.9	60.555	0.000	0.000
175	10.6	59.236	0.000	0.000
180	10.4	57.981	0.000	0.000
185	10.2	56.785	0.000	0.000
190	10.0	55.643	0.000	0.000

HGL Depth (m) =	**0.5**
Orifice Diameter (mm) =	**300**
Storage Volume Required (cu.m) =	**140.7**
Storage Volume Provided (cu.m) =	**140.7**

4099 Erin Mills Parkway **Rational Method - 5 Year Storm**

Residential Townhouse/Condo

ARCADIS

$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{820}{(T+4.6)^{0.78}} = 80.51 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.77
Date:	October 2024	Orifice Discharge (L/s) =	215.8

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	80.5	448.198	232.393	209.153
20	67.4	375.405	159.600	191.520
25	58.4	324.954	109.149	163.723
30	51.7	287.707	71.902	129.423
35	46.5	258.957	43.152	90.618
40	42.4	236.020	20.215	48.515
45	39.0	217.247	1.442	3.893
50	36.2	201.567	0.000	0.000
55	33.8	188.251	0.000	0.000
60	31.8	176.786	0.000	0.000
65	30.0	166.799	0.000	0.000
70	28.4	158.013	0.000	0.000
75	27.0	150.216	0.000	0.000
80	25.7	143.245	0.000	0.000
85	24.6	136.971	0.000	0.000
90	23.6	131.291	0.000	0.000
95	22.7	126.121	0.000	0.000
100	21.8	121.393	0.000	0.000
105	21.0	117.052	0.000	0.000
110	20.3	113.049	0.000	0.000
115	19.6	109.345	0.000	0.000
120	19.0	105.907	0.000	0.000
125	18.4	102.706	0.000	0.000
130	17.9	99.718	0.000	0.000
135	17.4	96.921	0.000	0.000
140	16.9	94.297	0.000	0.000
145	16.5	91.830	0.000	0.000
150	16.1	89.505	0.000	0.000
155	15.7	87.310	0.000	0.000
160	15.3	85.234	0.000	0.000
165	15.0	83.268	0.000	0.000
170	14.6	81.402	0.000	0.000
175	14.3	79.629	0.000	0.000
180	14.0	77.941	0.000	0.000
185	13.7	76.334	0.000	0.000
190	13.4	74.799	0.000	0.000

HGL Depth (m) =	**0.7**
Orifice Diameter (mm) =	**300**
Storage Volume Required (cu.m) =	**209.2**
Storage Volume Provided (cu.m) =	**209.2**

4099 Erin Mills Parkway **Rational Method - 10 Year Storm**

Residential Townhouse/Condo

ARCADIS

$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{1010}{(T+4.6)^{0.78}} = 99.17 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.77
Date:	October 2024	Orifice Discharge (L/s) =	247.2

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	99.2	552.048	304.871	274.384
20	83.1	462.389	215.212	258.254
25	71.9	400.248	153.071	229.606
30	63.7	354.371	107.193	192.948
35	57.3	318.959	71.782	150.741
40	52.2	290.707	43.530	104.472
45	48.1	267.585	20.407	55.100
50	44.6	248.271	1.094	3.282
55	41.7	231.870	0.000	0.000
60	39.1	217.749	0.000	0.000
65	36.9	205.448	0.000	0.000
70	35.0	194.626	0.000	0.000
75	33.2	185.023	0.000	0.000
80	31.7	176.436	0.000	0.000
85	30.3	168.708	0.000	0.000
90	29.0	161.712	0.000	0.000
95	27.9	155.344	0.000	0.000
100	26.9	149.521	0.000	0.000
105	25.9	144.173	0.000	0.000
110	25.0	139.243	0.000	0.000
115	24.2	134.681	0.000	0.000
120	23.4	130.447	0.000	0.000
125	22.7	126.504	0.000	0.000
130	22.1	122.824	0.000	0.000
135	21.4	119.379	0.000	0.000
140	20.9	116.146	0.000	0.000
145	20.3	113.107	0.000	0.000
150	19.8	110.244	0.000	0.000
155	19.3	107.540	0.000	0.000
160	18.9	104.984	0.000	0.000
165	18.4	102.562	0.000	0.000
170	18.0	100.263	0.000	0.000
175	17.6	98.079	0.000	0.000
180	17.2	96.001	0.000	0.000
185	16.9	94.021	0.000	0.000
190	16.5	92.131	0.000	0.000

HGL Depth (m) =	**1.0**
Orifice Diameter (mm) =	**300**
Storage Volume Required (cu.m) =	**274.4**
Storage Volume Provided (cu.m) =	**274.4**

4099 Erin Mills Parkway **Rational Method - 25 Year Storm**

Residential Townhouse/Condo

ARCADIS

$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{1160}{(T+4.6)^{0.78}} = 113.89 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.85
Date:	September 2024	Orifice Discharge (L/s) =	286.8

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	113.9	697.439	410.590	369.531
20	95.4	584.167	297.317	356.780
25	82.6	505.660	218.810	328.216
30	73.1	447.700	160.850	289.530
35	65.8	402.962	116.112	243.835
40	60.0	367.270	80.420	193.008
45	55.2	338.057	51.208	138.261
50	51.2	313.658	26.808	80.424
55	47.8	292.937	6.087	20.088
60	44.9	275.096	0.000	0.000
65	42.4	259.556	0.000	0.000
70	40.2	245.884	0.000	0.000
75	38.2	233.751	0.000	0.000
80	36.4	222.904	0.000	0.000
85	34.8	213.140	0.000	0.000
90	33.4	204.301	0.000	0.000
95	32.0	196.256	0.000	0.000
100	30.8	188.900	0.000	0.000
105	29.7	182.144	0.000	0.000
110	28.7	175.915	0.000	0.000
115	27.8	170.152	0.000	0.000
120	26.9	164.802	0.000	0.000
125	26.1	159.821	0.000	0.000
130	25.3	155.171	0.000	0.000
135	24.6	150.819	0.000	0.000
140	24.0	146.735	0.000	0.000
145	23.3	142.896	0.000	0.000
150	22.7	139.278	0.000	0.000
155	22.2	135.863	0.000	0.000
160	21.7	132.633	0.000	0.000
165	21.2	129.573	0.000	0.000
170	20.7	126.669	0.000	0.000
175	20.2	123.910	0.000	0.000
180	19.8	121.285	0.000	0.000
185	19.4	118.782	0.000	0.000
190	19.0	116.395	0.000	0.000

HGL Depth (m) =	**1.3**
Orifice Diameter (mm) =	**300**
Storage Volume Required (cu.m) =	**369.5**
Storage Volume Provided (cu.m) =	**369.5**

4099 Erin Mills Parkway **Rational Method - 50 Year Storm**

Residential Townhouse/Condo

ARCADIS

$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{1300}{(T+4.7)^{0.78}} = 127.13 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.92
Date:	September 2024	Orifice Discharge (L/s) =	324.3

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	127.1	849.291	524.946	472.451
20	106.6	711.929	387.583	465.100
25	92.3	616.581	292.236	438.353
30	81.7	546.114	221.769	399.183
35	73.6	491.681	167.336	351.405
40	67.1	448.229	123.884	297.322
45	61.8	412.650	88.305	238.423
50	57.3	382.922	58.576	175.729
55	53.5	357.668	33.323	109.965
60	50.3	335.919	11.574	41.666
65	47.4	316.970	0.000	0.000
70	45.0	300.296	0.000	0.000
75	42.7	285.498	0.000	0.000
80	40.8	272.265	0.000	0.000
85	39.0	260.353	0.000	0.000
90	37.4	249.567	0.000	0.000
95	35.9	239.750	0.000	0.000
100	34.5	230.771	0.000	0.000
105	33.3	222.525	0.000	0.000
110	32.2	214.922	0.000	0.000
115	31.1	207.887	0.000	0.000
120	30.1	201.356	0.000	0.000
125	29.2	195.275	0.000	0.000
130	28.4	189.598	0.000	0.000
135	27.6	184.284	0.000	0.000
140	26.8	179.298	0.000	0.000
145	26.1	174.609	0.000	0.000
150	25.5	170.191	0.000	0.000
155	24.9	166.021	0.000	0.000
160	24.3	162.076	0.000	0.000
165	23.7	158.339	0.000	0.000
170	23.2	154.793	0.000	0.000
175	22.7	151.423	0.000	0.000
180	22.2	148.216	0.000	0.000
185	21.7	145.160	0.000	0.000
190	21.3	142.244	0.000	0.000

HGL Depth (m) =	**1.7**
Orifice Diameter (mm) =	**300**
Storage Volume Required (cu.m) =	**472.5**
Storage Volume Provided (cu.m) =	**472.5**

4099 Erin Mills Parkway **Rational Method - 100 Year Storm**

Residential Townhouse/Condo

ARCADIS

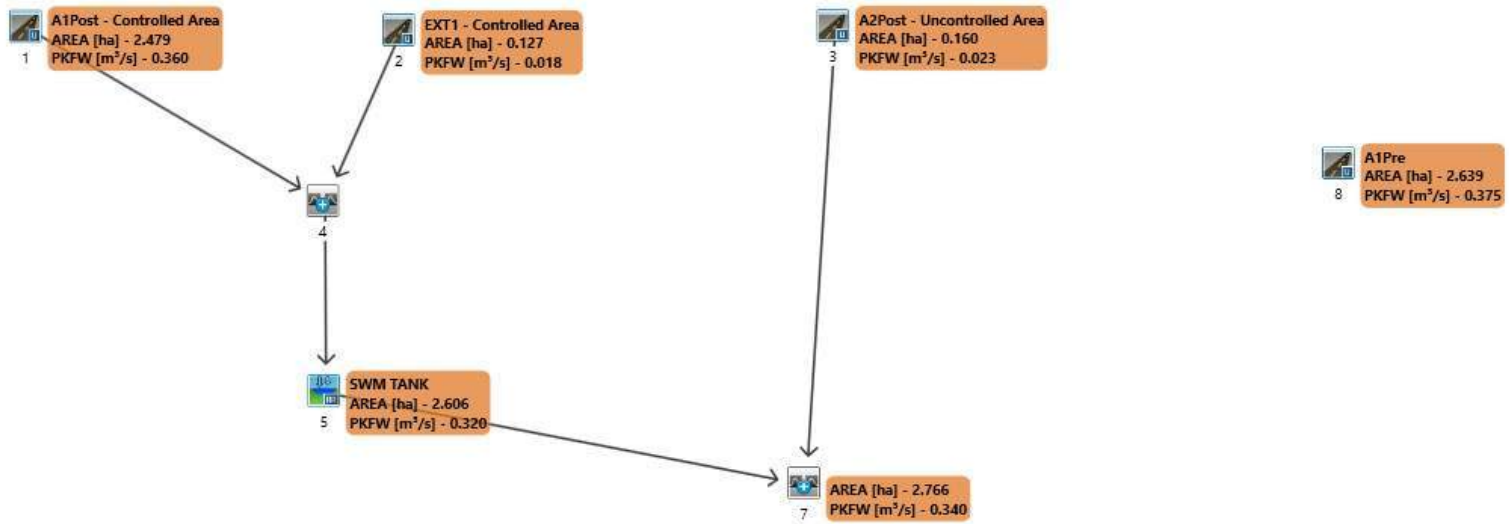
$$Q = C \times A \times \sqrt{2 \times g \times h}$$

$$I_{100\text{-year}} = \frac{1450}{(T+4.9)^{0.78}} = 140.69 \text{ mm/hr}$$

Project Name:	4099 Erin Mills Parkway	Controlled Area =	2.61
Project Number:	137429	Weighed Runoff Coefficient =	0.96
Date:	September 2024	Orifice Discharge (L/s) =	353.9

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m^3)
0	0.0	0.000	0.000	0.000
15	140.7	979.012	625.081	562.573
20	118.1	821.974	468.043	561.652
25	102.4	712.640	358.709	538.063
30	90.8	631.669	277.738	499.929
35	81.8	569.029	215.098	451.707
40	74.6	518.969	165.038	396.091
45	68.7	477.942	124.011	334.829
50	63.8	443.636	89.705	269.116
55	59.6	414.477	60.546	199.802
60	56.0	389.352	35.421	127.516
65	52.8	367.453	13.522	52.734
70	50.0	348.175	0.000	0.000
75	47.6	331.060	0.000	0.000
80	45.4	315.752	0.000	0.000
85	43.4	301.968	0.000	0.000
90	41.6	289.485	0.000	0.000
95	40.0	278.120	0.000	0.000
100	38.5	267.725	0.000	0.000
105	37.1	258.176	0.000	0.000
110	35.8	249.370	0.000	0.000
115	34.7	241.221	0.000	0.000
120	33.6	233.655	0.000	0.000
125	32.6	226.610	0.000	0.000
130	31.6	220.031	0.000	0.000
135	30.7	213.873	0.000	0.000
140	29.9	208.094	0.000	0.000
145	29.1	202.660	0.000	0.000
150	28.4	197.539	0.000	0.000
155	27.7	192.704	0.000	0.000
160	27.0	188.131	0.000	0.000
165	26.4	183.799	0.000	0.000
170	25.8	179.687	0.000	0.000
175	25.3	175.780	0.000	0.000
180	24.7	172.061	0.000	0.000
185	24.2	168.517	0.000	0.000
190	23.7	165.135	0.000	0.000

HGL Depth (m) =	**2.0**
Orifice Diameter (mm) =	**300**
Orifice Invert (m) =	**151.1**
Storage Volume Required (cu.m) =	**562.6**
Storage Volume Provided (cu.m) =	**562.6**


A1Post - Controlled Area
AREA [ha] - 2.479
PKFW [m³/s] - 0.360
1
EXT1 - Controlled Area
AREA [ha] - 0.127
PKFW [m³/s] - 0.018
2
A2Post - Uncontrolled Area
AREA [ha] - 0.160
PKFW [m³/s] - 0.023
3
4
SWM TANK
AREA [ha] - 2.606
PKFW [m³/s] - 0.320
5
AREA [ha] - 2.766
PKFW [m³/s] - 0.340
7
A1Pre
AREA [ha] - 2.639
PKFW [m³/s] - 0.375
8

```
================================================================================
========================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2015)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.


                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat

  Output  filename:
C:\Users\kroessa7641\AppData\Local\Civica\VH5\1eeed1b8-7f20-4b6a-bcd2-f3cedfa38989\
f8be2ddf-8b3d-4d9a-9618-fb768f13bef2\
  Summary filename:
C:\Users\kroessa7641\AppData\Local\Civica\VH5\1eeed1b8-7f20-4b6a-bcd2-f3cedfa38989\
f8be2ddf-8b3d-4d9a-9618-fb768f13bef2\


DATE: 06/27/2024                          TIME: 01:24:02

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
------------------------
  **********************************************
  ** SIMULATION : Hazel                        **
  **********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\kroessa7641\AppD
|                  |              ata\Local\Temp\
```

| | 000d4cba-5164-491d-8b5a-aa1480037b73\5f0323be
| Ptotal=212.00 mm | Comments: Hazel

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.00	3.00	13.00	6.00	23.00	9.00	53.00
1.00	4.00	4.00	17.00	7.00	13.00	10.00	38.00
2.00	6.00	5.00	13.00	8.00	13.00	11.00	13.00

| CALIB |
| STANDHYD (0001) | Area (ha)= 2.48
|ID= 1 DT= 5.0 min | Total Imp(%)= 79.00 Dir. Conn.(%)= 79.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.96	0.52
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	128.56	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00

1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.83 (ii)	13.12 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.25	0.08	
			TOTALS
PEAK FLOW (cms)=	0.29	0.07	0.360 (iii)
TIME TO PEAK (hrs)=	10.00	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	173.55	203.13
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.82	0.96

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0002)
ID= 1 DT= 5.0 min

Area (ha)= 0.13
Total Imp(%)= 44.00 Dir. Conn.(%)= 44.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.06	0.07
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	29.10	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33	
over (min)	5.00	15.00	
Storage Coeff. (min)=	1.57 (ii)	10.86 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.33	0.09	
			TOTALS
PEAK FLOW (cms)=	0.01	0.01	0.018 (iii)
TIME TO PEAK (hrs)=	9.42	10.00	10.00

```
     RUNOFF VOLUME    (mm)=     211.00       173.55         189.98
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.82           0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):     2.48   0.360    10.00   203.13
      + ID2= 2 (  0002):     0.13   0.018    10.00   189.98
        ================================================
        ID = 3 (  0004):     2.61   0.378    10.00   202.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0005)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.2800      0.0360
                          0.0560     0.0050   |   0.3020      0.0410
                          0.1250     0.0100   |   0.3220      0.0470
                          0.1680     0.0160   |   0.3410      0.0520
                          0.2020     0.0210   |   0.3590      0.0570
                          0.2310     0.0260   |   0.3760      0.0620
                          0.2570     0.0310   |   0.3920      0.0670

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0004)      2.606      0.378     10.00     202.49
   OUTFLOW: ID= 1 (  0005)      2.606      0.320     10.08     202.48

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 84.75
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0465

--------------------------------------------------------------------------------
--------------------
| CALIB            |
```

| STANDHYD (0003)| Area (ha)= 0.16
|ID= 1 DT= 5.0 min | Total Imp(%)= 58.00 Dir. Conn.(%)= 58.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.09	0.07
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	32.66	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00

```
               2.917    6.00 | 5.917   13.00 | 8.917   13.00 | 11.92   13.00
               3.000    6.00 | 6.000   13.00 | 9.000   13.00 | 12.00   13.00

     Max.Eff.Inten.(mm/hr)=      53.00        50.33
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.68 (ii)   10.97 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.32         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.01          0.023 (iii)
     TIME TO PEAK    (hrs)=       9.42        10.00          10.00
     RUNOFF VOLUME    (mm)=     211.00       173.55         195.23
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.82           0.92

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0003):     0.16   0.023    10.00   195.23
      + ID2= 2 (  0005):     2.61   0.320    10.08   202.48
        ================================================
        ID = 3 (  0007):     2.77   0.340    10.00   202.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0008)|   Area    (ha)=   2.64
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  50.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.32         1.32
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     132.64        40.00
     Mannings n           =      0.013        0.250

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.90 (ii)	13.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.25	0.08	
			TOTALS
PEAK FLOW (cms)=	0.19	0.18	0.375 (iii)
TIME TO PEAK (hrs)=	10.00	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	173.55	192.27

```
     TOTAL RAINFALL   (mm)=     212.00       212.00         212.00
     RUNOFF COEFFICIENT   =       1.00         0.82           0.91

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

 FINISH
================================================================================
========================
```

4099 Erin Mills Parkway
Residential Townhouse/Condo

ARCADIS

Water Balance Calculations

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Total Volume to be Retained	
Required Water Balance (mm):	5.0
Recall Site Area (m^2):	26,391
Total Water Balance to be Retained (m^3):	**132.0**

Volume Achieved Through Initial Abstraction				
Surface	**Area (m^2)**		**I.A.**	**Vol. (m^3)**
Conventional Roof	9,488		1	9.5
Green Roof	0		5	0.0
Landscape	1,234		5	6.2
Landscape over P1	5,619		5	28.1
Permeable Pavers	0		5	0.0
Impervious	10,050		0	0.0
Total Area:	**26,391**			**43.8**

Water Balance Summary	**Vol. (m^3)**
Total Water Balance to be Retained (m^3):	132.0
Recall Initial Abstraction (see above):	43.8
Water Balance Vol. to be re-used via Mechanical/Irrigation:	**88.2**

Check Tank Capacity to Capture Re-Use Volume	
Area of SWM Tank (m^2):	281.8
Sump Depth Provided (m):	0.6
Float Switch Operating Range (m):	0.35
Total Water Balance Achieved:	**98.6**

SWM Tank has sufficient capacity for Re-Use Volumes

4099 Erin Mills Parkway

Residential Townhouse/Condo

Water Quality Calculations

ARCADIS

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: October 2024
Designed By: SN

TSS Removal (Treated)

Surface	Area (m^2)	% Area of Site	Inherent TSS Removal	StormFilter TSS Removal	Overall TSS Removal
Conventional Roof	9,853	36%	80%	80%	35%
Green Roof	0	0%	80%	80%	0%
Landscape	1,823	7%	80%	80%	6%
Landscape over P1	4,959	18%	80%	80%	17%
Permeable Pavers	0	0%	50%	80%	0%
Impervious	9,429	34%	0%	80%	28%
Sub-Total		95%			**86%**
Uncontrolled Hardscaped	0	0%	80%	0%	0%
Uncontrolled Softscaped	1,274	5%	80%	0%	4%
Total Site + EXT:	**27,338**	100%			**90%**

Site Meets 80% TSS Removal

Determining Number of Cartridges for Flow Based Systems

Date	**12/07/2022**	**Black Cells =**	**Calculation**

Site Information

Project Name	**4099 Erin Mills Parkway**		
Project Location	**Toronto, ON**		
OGS ID	**OGS**		
Drainage Area, Ad	**6.26**	ac	(2.533 ha)
Impervious Area, Ai	**5.00**	ac	
Pervious Area, Ap	**1.26**		
% Impervious	**80%**		
Runoff Coefficient, Rc	**0.77**		
Treatment storm flow rate, Q_{treat}	**2.48**	cfs	(70.3 L/s)
Peak storm flow rate, Q_{peak}	**TBD**	cfs	

Filter System

Filtration brand	**StormFilter**	
Cartridge height	**27**	in
Specific Flow Rate	**2.00**	gpm/ft^2
Flow rate per cartridge	**22.50**	gpm

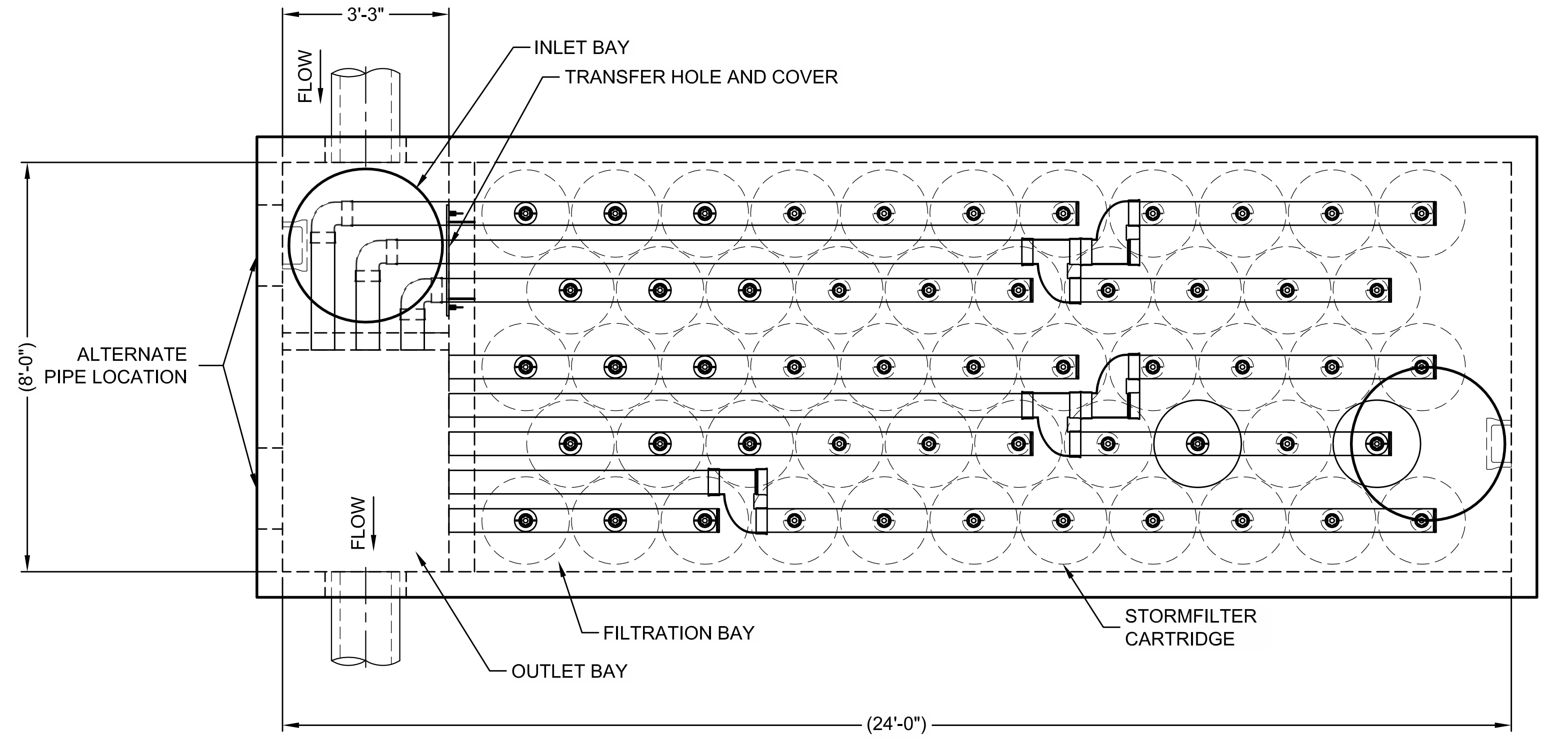
SUMMARY

Number of Cartridges	59
Media Type	Perlite

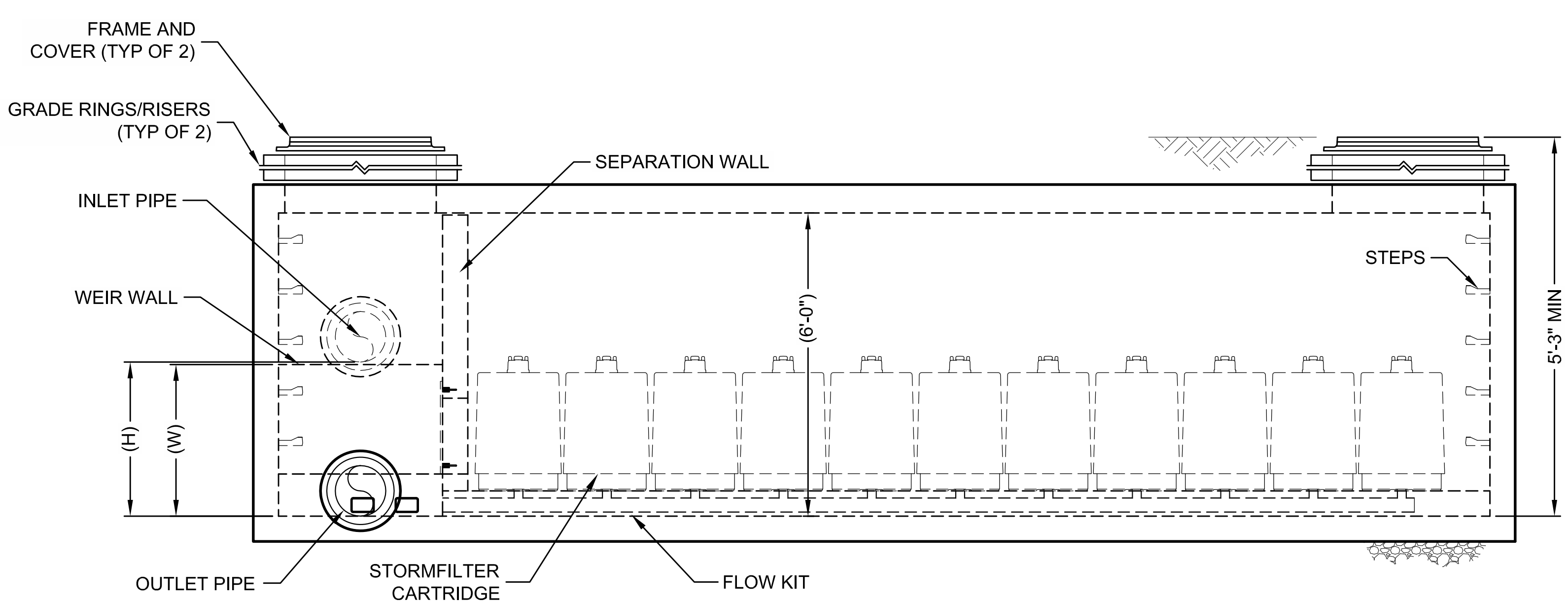
Event Mean Concentration (EMC)	**150**	mg/L
Annual TSS Removal	**80%**	
Percent Runoff Capture	**90%**	

Recommend SF0824 vault installed in with Diversion & Junction structure or CIP

200 Enterprise Drive
Scarborough, ME 04074
Phone 877-907-8676
Fax 207-885-9825



PLAN

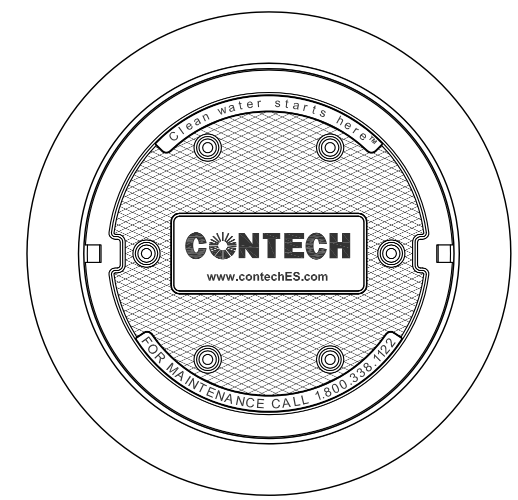


ELEVATION

STORMFILTER DESIGN TABLE

- THE 8' x 24' PEAK DIVERSION STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.
- THE PEAK DIVERSION STORMFILTER IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR RIGHT INLET CONFIGURATION.
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE HEIGHT	27"		18"		LOW DROP	
SYSTEM HYDRAULIC DROP (H - REQ'D. MIN.)	3.05'		2.3'		1.8'	
HEIGHT OF WEIR (W)	3.00'		2.25'		1.75'	
TREATMENT BY MEDIA SURFACE AREA	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	10	5



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (CSF, PERLITE, ZPG)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE	*	*	*
OUTLET PIPE	*	*	*

INLET BAY RIM ELEVATION	*
FILTER BAY RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

PERFORMANCE SPECIFICATION
FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. **RADIAL MEDIA DEPTH SHALL BE 7-INCHES**. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST **37 SECONDS**.
SPECIFIC FLOW RATE SHALL BE **2 GPM/SF (MAXIMUM)**. SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF). MEDIA VOLUMETRIC FLOW RATE SHALL BE **6 GPM/CF OF MEDIA (MAXIMUM).**

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

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 STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
F. CONTRACTOR TO REMOVE THE TRANSFER HOLE COVER WHEN THE SYSTEM IS BROUGHT ONLINE.

The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,524,576; 5,707,527; 5,985,157; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CONTECH®
ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

THE STORMWATER MANAGEMENT STORMFILTER
8' x 24' PEAK DIVERSION STORMFILTER
STANDARD DETAIL

◆ Verification Statement ◆ Verification Statement ◆ Verification Statement ◆

VERIFICATION STATEMENT

GLOBE Performance Solutions

Verifies the performance of

The Stormwater Management StormFilter®

Developed by CONTECH Engineered Solutions LLC
Scarborough, Maine, USA

Registration: GPS-ETV_2020-06-15_NJDEP

In accordance with

ISO 14034:2016

Environmental Management —
Environmental Technology Verification (ETV)

John D. Wiebe, PhD
Executive Chairman
GLOBE Performance Solutions

June 15, 2020
Vancouver, BC, Canada

Verification Body
GLOBE Performance Solutions
404 – 999 Canada Place | Vancouver, B.C | Canada |V6C 3E2

Verification Overview

This Environmental Technology Verification (ETV) of The Stormwater Management StormFilter® (StormFilter) is the first part of a two-part verification process and entails the verification of performance claims (#1 & 2) based on laboratory testing in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device (January, 2013)*. This verification complements the subsequent verification of field testing data, collected in accordance with The Washington State Department of Ecology emerging stormwater treatment technologies, in accordance with guidelines identified by Ecology (2011) in the Technology Assessment Protocol – Ecology (TAPE).

Technology description and application

The Stormwater Management StormFilter® (StormFilter) is a manufactured treatment device that is provided by Contech Engineered Solutins LLC (Contech). The StormFilter improves the quality of stormwater runoff before it enters receiving waterways through the use of its customizable filter media, which removes non-point source pollutants. As illustrated in **Figure 1,** the StormFilter is typically comprised of a vault or manhole structure that houses rechargeable, media-filled filter cartridges. Stormwater entering the system percolates through these media-filled cartridges, which trap particulates and remove pollutants. Once filtered through the media, the treated stormwater is discharged through an outlet pipe to a storm sewer system or receiving water.

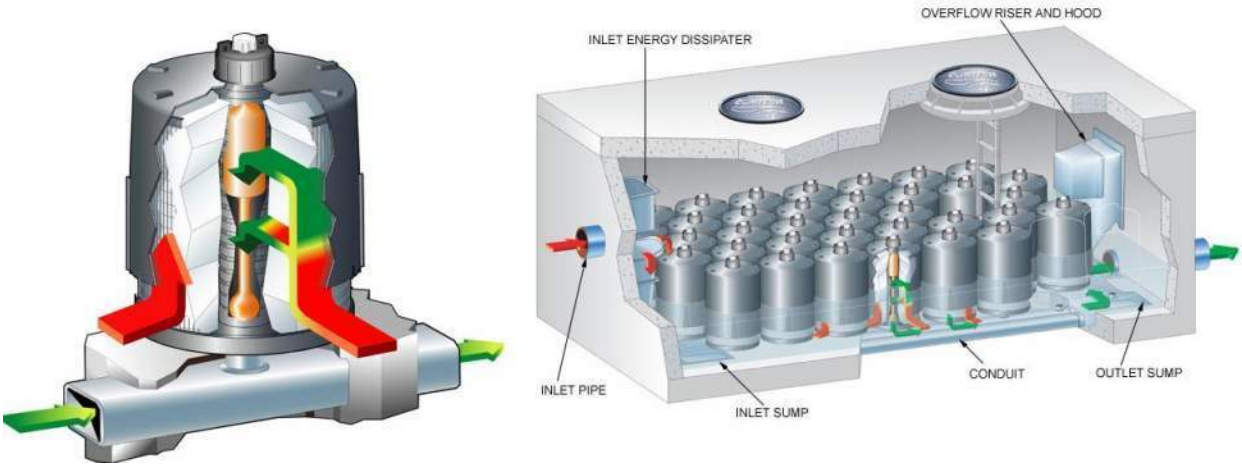


Figure 1 Individual StormFilter Cartridge (Left) and Typical Vault StormFilter Installation (Right)

Depending on the treatment requirements and expected pollutant characteristics at an individual site, the per cartridge filtration flow rate and driving head can be adjusted. The flow rate is individually controlled for each cartridge by a restrictor disc located at the connection point between the cartridge and the underdrain manifold. Driving head is managed by positioning of the inlet, outlet, and overflow elevations. The StormFilter is typically designed so that the restrictor disc passes the design treatment rate once the water surface reaches the shoulder of the cartridge which is equivalent to the cartridge height. Since the StormFilter uses a restrictor disc to restrict treatment flows below the hydraulic capacity of the media

the system typically operates under consistent driving head for the useful life of the media. Site specific head constraints are also addressed by three different cartridge heights (low drop (effective height of 12 inches), 18, and 27 inches) which operate on the same principal and surface area specific loading rates. The StormFilter requires a minimum of 1.8 ft, 2.3 ft and 3.05 ft of drop between inlet invert and outlet invert to accommodate the low drop, 18 and 27 inch cartridges, respectively, without backing up flow into the upstream piping during operation. When site conditions limit the amount of drop available across the StormFilter then flow is typically backed up into the upstream piping during operation to ensure sufficient driving head is provided. If desirable the StormFilter can be designed to operate under additional driving head.

The StormFilter is offered in multiple configurations including plastic, steel, and concrete catch basins; and precast concrete manholes, and vaults. Other configurations include panel vaults, CON/SPAN®, box culverts, and curb inlets. The filter cartridges operate consistently and act independently regardless of housing which enables linear scaling.

The StormFilter cartridge can house different types of media including perlite, zeolite, granular activated carbon (GAC), CSF® leaf media, MetalRx™, PhosphoSorb® or various media blends such as ZPG™ (perlite, zeolite and GAC). All of the media use processes associated with depth filtration to remove solids. Some media configurations also provide additional treatment mechanisms such as cation exchange, and/or adsorption, chelation, and precipitation. This verification is specific to a laboratory evaluation of the StormFilter using perlite media.

Performance conditions

The data and results published in this Verification Statement were obtained from the laboratory testing conducted on The Stormwater Management StormFilter® device, in accordance with the New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device (January, 2013) (NJDEP Filtration Protocol). Prior to starting the performance testing program, a quality assurance project plan (QAPP) was submitted to and approved by the New Jersey Corporation for Advanced Technology (NJCAT).

Performance claim(s)

Performance Claim 1 (NJCAT)

The Stormwater Management StormFilter®, with perlite media, demonstrated at least 80% removal of total suspended solids at a design hydraulic loading rate of 1.44 l/s/m^2 (2.12 gpm/ft^2) of media surface area and at a constant influent test sediment concentration of 200 mg/L in laboratory testing conducted under the 2013 NJDEP Protocol (removal efficiency test). This performance claim was verified at a 95% level of confidence.

Performance Claim 2 (NJCAT)

During the load testing (mass sediment load capacity) conducted under the 2013 NJDEP Protocol, The Stormwater Management StormFilter®, with perlite media, maintained at least 80% removal of total suspended solids at a design hydraulic loading rate of 1.44 l/s/m^2 (2.12 gpm/ft^2) of media surface area to a cumulative mass sediment load of 54.3 lbs by a single 45.72 cm tall and 18in cartridge. This performance claim was verified statistically at a 95% level of confidence.

Performance results

Performance Claim 1 (NJCAT):
Raw data summarizing the percent removal of influent total suspended solids (TSS) by The Stormwater Management StormFilter®, at a concentration of 200 mg/L and a loading rate of 2.12 gpm/sq. ft. of media surface area.

Run #	Average Influent TSS Concentration (mg/L)	Background (mg/L)	Adjusted Effluent (mg/L)	TSS Removed (%)
1	203	2.11	37.7	81.8
2	210	1.83	35.4	83.7
3	207	2.84	40.5	81.2
4	213	2.04	36.8	83.3
5	212	2.17	35.8	83.7
6	208	2.34	38.0	82.3
7	212	2.08	38.4	82.5
8	203	2.42	35.8	83.0
9	206	2.86	35.2	83.5
10	207	3.16	35.6	83.3

Sum	823
N (COUNT)	10
Mean (AVG)	82.3
STDEV.s	0.871
VAR.s	0.758
Z (alpha)	1.65
Z (beta)	1.29
Hypothesized mean	80.0

Performance Claim 2 (NJCAT):
Raw data summarizing the percent removal of influent total suspended solids (TSS) and its capture by The Stormwater Management StormFilter®, at 200 mg/L (Run 1-45) and 400mg/L (Run 46-66).

Run #	Average Influent TSS Concentration (mg/L)	Background (mg/L)	Adjusted Effluent (mg/L)	Mass Captured (lbs)	TSS Removed (%)
1	203	2.11	37.7	0.640	81.8
2	210	1.83	35.4	1.32	83.7
3	207	2.84	40.5	1.96	81.2
4	213	2.04	36.8	2.65	83.3
5	212	2.17	35.8	3.33	83.7
6	208	2.34	38.0	3.99	82.3
7	212	2.08	38.4	4.67	82.5
8	203	2.42	35.8	5.32	83.0
9	206	2.86	35.2	5.98	83.5
10	207	3.16	35.6	6.65	83.3
11	200	1.78	37.4	7.29	81.8
12	209	1.55	36.0	7.96	83.4
13	211	2.29	40.9	8.62	81.3
14	206	1.96	37.7	9.21	*excluded*
15	209	2.32	36.2	9.87	83.2
16	202	2.07	36.5	10.5	82.6
17	206	1.97	39.9	11.2	81.3
18	203	3.13	35.1	11.8	83.2
19	204	2.57	37.2	12.5	82.4
20	210	2.64	35.6	13.1	83.6
21	199	3.17	39.8	13.8	80.7
22	206	3.07	40.5	14.4	80.9
23	203	3.32	37.1	15.1	82.3
24	206	2.91	38.5	15.7	81.8
25	203	3.44	37.4	16.3	82.1
26	204	2.77	40.4	17.0	80.8
27	208	2.85	29.4	17.6	*excluded*
28	199	2.46	37.7	18.2	81.5
29	199	3.72	37.6	18.8	81.6
30	202	3.66	37.6	19.5	82.0
31	200	3.41	42.4	20.1	79.3
32	202	3.17	43.4	20.7	79.1
33	204	4.52	42.5	21.3	79.8
34	200	5.11	40.0	22.0	80.6
35	198	4.11	44.4	22.5	78.1
36	204	3.90	43.1	23.2	79.5
37	203	4.55	43.1	23.8	79.4
38	202	4.84	41.4	24.4	80.0
39	203	5.55	34.8	25.1	83.3
40	203	6.34	39.9	25.7	80.9
41	199	3.53	43.3	26.3	78.7
42	199	3.21	45.1	26.9	77.9
43	200	3.21	40.9	27.5	80.1

44	203	3.41	40.0	28.2	80.9
45	202	3.61	46.6	28.8	77.4
46	401	1.78	79.2	30.0	80.8
47	402	1.91	81.6	31.3	80.2
48	401	2.38	85.6	32.5	79.2
49	396	2.83	87.0	33.7	78.5
50	412	1.62	85.5	35.0	79.6
51	396	3.66	87.6	36.2	78.3
52	396	4.12	90.1	37.3	77.6
53	403	4.05	92.4	38.5	77.4
54	403	4.85	89.9	39.8	78.1
55	400	3.59	86.3	41.0	78.8
56	400	1.85	89.0	42.2	78.2
57	403	2.33	88.7	43.4	78.5
58	407	3.25	89.6	44.6	78.2
59	395	3.22	92.5	45.8	76.9
60	404	3.01	88.2	47.0	78.5
61	410	1.82	90.7	48.2	*excluded*
62	398	2.15	86.6	49.4	78.6
63	401	2.60	88.1	50.6	78.3
64	402	2.75	91.5	51.9	77.6
65	403	4.10	89.1	53.1	78.2
66	402	3.65	89.5	54.3	77.8
Sum	5069				
N (COUNT)	63				
Median	80.7				
STDEV.s	2.03				
VAR.s	4.12				
Z (alpha)	1.65				
Z (beta)	1.29				
Hypothesized median	80.0				

Performance Claims were statistically analyzed and verified using the *mean* percent removal values for Claim #1, which utilized normally distributed data. The data set for Claims #2 was not normally distributed, which required the use of the *median* of the data as a surrogate for the mean, in order to be verified statistically at a 95% level of confidence.

Verification

This verification was completed by the Verification Expert, the Centre for Advancement of Water and Wastewater Technologies ("CAWT"), contracted by GLOBE Performance Solutions, applying the International Standard ***ISO 14034:2016 Environmental management -- Environmental technology verification (ETV)***. Data and information provided by Contech Engineered Solutions LLC to support the performance claim included the following:

- Performance test report "NJCAT TECHNOLOGY VERIFICATION, Stormwater Management StormFilter® (StormFilter) With Perlite Media" prepared by Contech Engineered Solutions, November 2016. This report is based on a test program was conducted at Contech's Portland, Oregon laboratory under the direct supervision of *Scott A. Wells, Ph.D. and Associates* in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device (January, 2013)* and in compliance with the requirements of ISO/IEC 17025.

What is ISO14034:2016 Environmental management – Environmental technology verification (ETV)?

ISO 14034:2016 specifies principles, procedures and requirements for environmental technology verification (ETV) and was developed and published by the International Organization for Standardization (ISO). The objective of ETV is to provide credible, reliable and independent verification of the performance of environmental technologies. An environmental technology is a technology that either results in an environmental added value or measures parameters that indicate an environmental impact. Such technologies have an increasingly important role in addressing environmental challenges and achieving sustainable development.

For more information on the The Stormwater Management StormFilter® please contact:

CONTECH Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME
04074 USA
Tel: 207-885-9830
info@conteches.com
www.conteches.com

For more information on ISO 14034:2016 / ETV please contact:

GLOBE Performance Solutions
404 – 999 Canada Place
Vancouver, BC
V6C 3E2 Canada
Tel: 604-695-5018 / Toll Free: 1-855-695-5018
etv@globeperformance.com
www.globeperformance.com

Appendix C

Sanitary Data Analysis

4099 Erin Mills Parkway
Residential Development

ARCADIS

Peel Region Design Criteria for Sanitary Sewers

Domestic Flow =	302.8	L/cap/day
Population Density =	50	pp/ha
Infiltration=	0.20	L/s/ha
Mannings=	0.013	
Minimum Velocity =	0.75	m/s
Maximum Velocity =	3.50	m/s

All information below is based on Region of Peel Sanitary Sewer Design Criteria Section 2.1 and Std. Dwg. 2-9-2

Sanitary Sewer Design Sheet
Existing Condition

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Prepared By: SN

	From	To	DESIGN FLOW CALCULATIONS								SEWER DESIGN & ANALYSIS							Notes
			Area (ha)	Commercial Density (pp/ha)	Population	Peaking Factor	Sewage Flow (L/s) *(1)*	Infiltration Flow (L/s) *(2)*	Ground Water (L/s) *(3)*	Total Flow, Qd (L/s) *(1) thru (3)*	Nominal Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Full Flow Capacity, Qf (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)	Percent of Full Flow (%)	
Existing Condition	**Services**																	
Ex. Commercial Plaza	Ctrl. MH	Ex. Sewer	2.64	50	132	4.21	1.9	0.5	0.0	**2.5**	250	0.9%	11.2	58.9	1.16	0.57	4%	Ex. San. Service

4099 Erin Mills Parkway

Residential Development

ARCADIS

Peel Region Design Criteria for Sanitary Sewers

Domestic Flow =	302.8	L/cap/day
Population Density =	as noted	ppu/pp/ha
Infiltration=	0.20	L/s/ha
Mannings=	0.013	
Minimum Velocity =	0.75	m/s
Maximum Velocity =	3.50	m/s

All information below is based on Region of Peel Sanitary Sewer Design Criteria Section 2.1 and Std. Dwg. 2-9-2

Sanitary Sewer Design Sheet

Proposed Full Buildout

Project Name: 4099 Erin Mills Parkway

Project Number: 137429

Date: September 2024

Prepared By: SN

	From	To	DESIGN FLOW CALCULATIONS												SEWER DESIGN & ANALYSIS							Notes
			Area (ha)	No. of Residential Units	Retail GFA (ha)	Apartment Population 1.6/unit (ppu)	Townhouse Population 3.4/unit (ppu)	Comm. Density 50/ha (pp/ha)	Population	Peaking Factor	Sewage Flow (L/s) *(1)*	Infiltration Flow (L/s) *(2)*	Ground Water (L/s) *(3)*	Total Flow, Qd (L/s) *(1) thru (3)*	Nominal Diameter (mm)	Pipe Slope (%)	Pipe Length (m)	Full Flow Capacity, Qf (L/s)	Full Flow Velocity (m/s)	Actual Velocity (m/s)	Percent of Full Flow (%)	
Proposed Full Buildout	**Services**																					
Apartment Buildings			1.43	597	0.0790	955		4	959	3.81	12.8	0.3	0.0	**13.1**								
B-B Stacked Townhouses			1.21	112			381		381	4.03	5.4	0.2	0.0	**5.6**								
TOTAL	Ctrl. MH	Ex. Sewer	2.64	709	0.0790				1340			0.5	0.0	**18.7**	250	0.50%	27.0	43.9	0.87	0.83	43%	San. Service

Appendix D

Water Demand Analysis

4099 Erin Mills Parkway
Residential Development

DOMESTIC WATER DEMAND CALCULATIONS

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

1. ADD = 280 L/cap/day per Region of Peel standards for Residential
1. ADD = 300 L/cap/day per Region of Peel standards for ICI
3. Population Densities per Region of Peel standards
4. Peaking factors per Region of Peel standards

Peaking Factors		
Land Use	Peak Hour	Maximum Day
Residential	3.00	2.00
ICI	3.00	1.40

Building A

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	256	1.6 ppu	410	1.3	4.0	2.7
Commercial/Retail	.0408 ha	50 pp/ha	3	0.01	0.03	0.01
		Totals	**410**	**1.3**	**4.0**	**2.7**

Building B

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	74	1.6 ppu	119	0.4	1.2	0.8
Commercial/Retail		50 pp/ha	0	0.00	0.00	0.00
		Totals	**119**	**0.4**	**1.2**	**0.8**

Building C

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	82	1.6 ppu	132	0.4	1.3	0.9
Commercial/Retail		50 pp/ha	0	0.00	0.00	0.00
		Totals	**132**	**0.4**	**1.3**	**0.9**

Building D

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	93	1.6 ppu	149	0.5	1.4	1.0
Commercial/Retail	.0382 ha	50 pp/ha	2	0.01	0.02	0.01
		Totals	**149**	**0.5**	**1.5**	**1.0**

Building E

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	92	1.6 ppu	148	0.5	1.4	1.0
Commercial/Retail		50 pp/ha	**0**	0.00	0.00	0.00
		Totals	**148**	**0.5**	**1.4**	**1.0**

Stacked Townhouses

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Townhouses	112	3.4 ppu	381	1.2	3.7	2.5
Commercial/Retail		50 pp/ha	**0**	0.00	0.00	0.00
		Totals	**381**	**1.2**	**3.7**	**2.5**

Site

	Units / Area	Density	Population	ADD (L/s)	*(ADDxP.F.)* PHD (L/s)	*(ADDxP.F.)* MDD (L/s)
Apartment Buildings	597	1.6 ppu	956	3.1	9.3	6.2
B-B Stacked Townhouses	112	3.4 ppu	381	1.2	3.7	2.5
Commercial/Retail	.0790 ha	50 pp/ha	4	0.01	0.04	0.02
		Totals	**1,341**	**4.3**	**13.0**	**8.7**

4099 Erin Mills Parkway
Residential Development

FIRE FLOW DEMAND CALCULATIONS
Building A

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Based on the Water Supply for Public Fire Protecetion Manual, 2020 by the Fire Underwriters Survey

Step 1: Calculate Fire Flow (based on area)

Construction Coefficient =	1.0	
Largest Floor Area =	1,412	m^2
Floor Above =	1,412	m^2
Floor Below =	1,412	m^2
Area =	2,117	m^2
Fire Flow (F) =	**10,000**	L/min

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

F = required fire flow (L/min)
C = coefficient related to type of construction
0.6 for fire resistive (fully protected, 3-hr ratings)
0.8 for non combustable (i.e. unprotected metal buildings)
1.0 for ordinary construction
1.5 for wood frame construction
A = total floor area excluding basements 50% below grade

** If vertical openings are inadequately protected, consider two largest two largest adjoining floors plus 50% of each of any floors above up to*
** If vertical openings are adequately protected (one hour rating), consider largest floor area + 25% of two immediately floors.*

Step 2: Adjustment for Building Occupancy (shall not be less than 2000 L/s)

Occupancy Adjustment =	0.00	
F_1 = Fire Flow x Adjustment =	**10,000**	L/min

Non-Combust.	-25%	Free Burning	15%
mited Comb.	-15%	Rapid Burning	25%
Combustable	No change		

Step 3: Adjust F1 for Fire Supression System

Sprinkler Adjustment =	30%	
$F_2 = F_1$ x Adjustment =	**3,000**	L/min

Automatic Sprinklers (monitored)	-50%
Adequatly Designed System	-30%

Step 4: Adjust F1 for Exposure / Proximity (shall not exceed 75%)

Proximity Adjustment =	25%	(max 75%)
$F_3 = F_1$ x Factor =	**2,500**	L/min

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

Step 5: Calculate Adjusted Fire Flow (shall not be less than 2000 L/min or greater than 45,000 L/min)

F_1 =	10,000	L/min
- F_2 =	3,000	L/min
+ F3 =	2,500	L/min
Fire Flow =	10,000	L/min
Fire Flow =	**166.7**	L/s
Total Demand (Fire Flow + MDD) =	**169.3**	L/s

$$\text{Fire Flow} = F_1 - F_2 + F_3$$

Checks:
Fire Flow greater than 2000 L/min
Fire Flow less than 45,000 L/min

4099 Erin Mills Parkway
Residential Development

FIRE FLOW DEMAND CALCULATIONS
Building B

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Based on the Water Supply for Public Fire Protecetion Manual, 1999 by the Fire Underwriters Survey

Step 1: Calculate Fire Flow (based on area)

Construction Coefficient =	1.0	
Largest Floor Area =	1,718	m^2
Floor Above =	989	m^2
Floor Below =	1,523	m^2
Area =	2,346	m^2
Fire Flow (F) =	**11,000**	L/min

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

F = required fire flow (L/min)
C = coefficient related to type of construction
0.6 for fire resistive (fully protected, 3-hr ratings)
0.8 for non combustable (i.e. unprotected metal buildings)
1.0 for ordinary construction
1.5 for wood frame construction
A = total floor area excluding basements 50% below grade

** If vertical openings are inadequately protected, consider two largest two largest adjoining floors plus 50% of each of any floors above up to*
** If vertical openings are adequately protected (one hour rating), consider largest floor area + 25% of two immediately floors.*

Step 2: Adjustment for Building Occupancy (shall not be less than 2000 L/s)

Occupancy Adjustment =	0.00	
F_1 = Fire Flow x Adjustment =	**11,000**	L/min

Non-Combust.	-25%	Free Burning	15%
mited Comb.	-15%	Rapid Burning	25%
Combustable	No change		

Step 3: Adjust F1 for Fire Supression System

Sprinkler Adjustment =	30%	
$F_2 = F_1$ x Adjustment =	**3,300**	L/min

Automatic Sprinklers (monitored)	-50%
Adequatly Designed System	-30%

Step 4: Adjust F1 for Exposure / Proximity (shall not exceed 75%)

Proximity Adjustment =	30%	(max 75%)
$F_3 = F_1$ x Factor =	**3,300**	L/min

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

Step 5: Calculate Adjusted Fire Flow (shall not be less than 2000 L/min or greater than 45,000 L/min)

F_1 =	11,000	L/min
- F_2 =	3,300	L/min
+ F3 =	3,300	L/min
Fire Flow =	11,000	L/min
Fire Flow =	**183.3**	L/s
Total Demand (Fire Flow + MDD) =	**184.1**	L/s

$$\text{Fire Flow} = F_1 - F_2 + F_3$$

Checks:
Fire Flow greater than 2000 L/min
Fire Flow less than 45,000 L/min

4099 Erin Mills Parkway
Residential Development

FIRE FLOW DEMAND CALCULATIONS
Building C

ARCADIS

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Based on the Water Supply for Public Fire Protecetion Manual, 1999 by the Fire Underwriters Survey

Step 1: Calculate Fire Flow (based on area)

Construction Coefficient =	1.0	
Largest Floor Area =	1,094	m^2
Floor Above =	1,094	m^2
Floor Below =	1,094	m^2
Area =	1,641	m^2
Fire Flow (F) =	**9,000**	L/min

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

F = required fire flow (L/min)
C = coefficient related to type of construction
0.6 for fire resistive (fully protected, 3-hr ratings)
0.8 for non combustable (i.e. unprotected metal buildings)
1.0 for ordinary construction
1.5 for wood frame construction
A = total floor area excluding basements 50% below grade

** If vertical openings are inadequately protected, consider two largest two largest adjoining floors plus 50% of each of any floors above up to*
** If vertical openings are adequately protected (one hour rating), consider largest floor area + 25% of two immediately floors.*

Step 2: Adjustment for Building Occupancy (shall not be less than 2000 L/s)

Occupancy Adjustment =	0.00	
F_1 = Fire Flow x Adjustment =	**9,000**	L/min

Non-Combust.	-25%	Free Burning	15%
mited Comb.	-15%	Rapid Burning	25%
Combustable	No change		

Step 3: Adjust F1 for Fire Supression System

Sprinkler Adjustment =	30%	
$F_2 = F_1$ x Adjustment =	**2,700**	L/min

Automatic Sprinklers (monitored)	-50%
Adequatly Designed System	-30%

Step 4: Adjust F1 for Exposure / Proximity (shall not exceed 75%)

Proximity Adjustment =	50%	(max 75%)
$F_3 = F_1$ x Factor =	**4,500**	L/min

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

Step 5: Calculate Adjusted Fire Flow (shall not be less than 2000 L/min or greater than 45,000 L/min)

F_1 =	9,000	L/min
- F_2 =	2,700	L/min
+ F3 =	4,500	L/min
Fire Flow =	11,000	L/min
Fire Flow =	**183.3**	L/s
Total Demand (Fire Flow + MDD) =	**184.2**	L/s

$$\text{Fire Flow} = F_1 - F_2 + F_3$$

Checks:
Fire Flow greater than 2000 L/min
Fire Flow less than 45,000 L/min

4099 Erin Mills Parkway
Residential Development

FIRE FLOW DEMAND CALCULATIONS
Building D

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Based on the Water Supply for Public Fire Protecetion Manual, 1999 by the Fire Underwriters Survey

Step 1: Calculate Fire Flow (based on area)

Construction Coefficient =	1.0	
Largest Floor Area =	980	m^2
Floor Above =	980	m^2
Floor Below =	980	m^2
Area =	1,470	m^2
Fire Flow (F) =	**8,000**	L/min

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

F = required fire flow (L/min)
C = coefficient related to type of construction
0.6 for fire resistive (fully protected, 3-hr ratings)
0.8 for non combustable (i.e. unprotected metal buildings)
1.0 for ordinary construction
1.5 for wood frame construction
A = total floor area excluding basements 50% below grade

** If vertical openings are inadequately protected, consider two largest two largest adjoining floors plus 50% of each of any floors above up to*
** If vertical openings are adequately protected (one hour rating), consider largest floor area + 25% of two immediately floors.*

Step 2: Adjustment for Building Occupancy (shall not be less than 2000 L/s)

Occupancy Adjustment =	0.00	
F_1 = Fire Flow x Adjustment =	**8,000**	L/min

Non-Combust.	-25%	Free Burning	15%
mited Comb.	-15%	Rapid Burning	25%
Combustable	No change		

Step 3: Adjust F1 for Fire Supression System

Sprinkler Adjustment =	30%	
$F_2 = F_1$ x Adjustment =	**2,400**	L/min

Automatic Sprinklers (monitored)	-50%
Adequatly Designed System	-30%

Step 4: Adjust F1 for Exposure / Proximity (shall not exceed 75%)

Proximity Adjustment =	40%	(max 75%)
$F_3 = F_1$ x Factor =	**3,200**	L/min

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

Step 5: Calculate Adjusted Fire Flow (shall not be less than 2000 L/min or greater than 45,000 L/min)

F_1 =	8,000	L/min
- F_2 =	2,400	L/min
+ F3 =	3,200	L/min
Fire Flow =	9,000	L/min
Fire Flow =	**150.0**	L/s
Total Demand (Fire Flow + MDD) =	**151.0**	L/s

$$\text{Fire Flow} = F_1 - F_2 + F_3$$

Checks:
Fire Flow greater than 2000 L/min
Fire Flow less than 45,000 L/min

4099 Erin Mills Parkway
Residential Development

FIRE FLOW DEMAND CALCULATIONS
Building E

ARCADIS

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Based on the Water Supply for Public Fire Protecetion Manual, 1999 by the Fire Underwriters Survey

Step 1: Calculate Fire Flow (based on area)

Construction Coefficient =	1.0	
Largest Floor Area =	1,096	m^2
Floor Above =	1,096	m^2
Floor Below =	1,096	m^2
Area =	1,644	m^2
Fire Flow (F) =	**9,000**	L/min

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

F = required fire flow (L/min)
C = coefficient related to type of construction
0.6 for fire resistive (fully protected, 3-hr ratings)
0.8 for non combustable (i.e. unprotected metal buildings)
1.0 for ordinary construction
1.5 for wood frame construction
A = total floor area excluding basements 50% below grade

** If vertical openings are inadequately protected, consider two largest two largest adjoining floors plus 50% of each of any floors above up to*
** If vertical openings are adequately protected (one hour rating), consider largest floor area + 25% of two immediately floors.*

Step 2: Adjustment for Building Occupancy (shall not be less than 2000 L/s)

Occupancy Adjustment =	0.00	
F_1 = Fire Flow x Adjustment =	**9,000**	L/min

Non-Combust.	-25%	Free Burning	15%
mited Comb.	-15%	Rapid Burning	25%
Combustable	No change		

Step 3: Adjust F1 for Fire Supression System

Sprinkler Adjustment =	30%	
$F_2 = F_1$ x Adjustment =	**2,700**	L/min

Automatic Sprinklers (monitored)	-50%
Adequatly Designed System	-30%

Step 4: Adjust F1 for Exposure / Proximity (shall not exceed 75%)

Proximity Adjustment =	45%	(max 75%)
$F_3 = F_1$ x Factor =	**4,050**	L/min

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

Step 5: Calculate Adjusted Fire Flow (shall not be less than 2000 L/min or greater than 45,000 L/min)

F_1 =	9,000	L/min
- F_2 =	2,700	L/min
+ F3 =	4,050	L/min
Fire Flow =	10,000	L/min
Fire Flow =	**166.7**	L/s
Total Demand (Fire Flow + MDD) =	**169.1**	L/s

$$\text{Fire Flow} = F_1 - F_2 + F_3$$

Checks:
Fire Flow greater than 2000 L/min
Fire Flow less than 45,000 L/min

4099 Erin Mills Parkway
Residential Development

HEAD LOSS CALCULATIONS

Project Name: 4099 Erin Mills Parkway
Project Number: 137429
Date: September 2024
Designed By: SN

Hydrant Flow Test - Erin Mills Parkway

Flow (gpm)	Flow (L/s)	Flow (L/min)	Pressure (psi)	Pressure (kPa)
0	0.0	0	66	**455**
1,186	74.8	4,490	64	**441**
2,201	138.9	8,332	63	**434**

Residual Pressure at Main

Source: Walski, Thomas M. (2007): Advanced Water Distribution Modeling and Management

$$Q_R = Q_F \times \frac{hr^{0.54}}{hf^{0.54}}$$

where: Q_R = flow predicted at desired residual pressure
Q_F = total flow measured during test
h_r = pressure drop to desired residual pressure
h_f = pressure drop to measured during test

	Flow (gpm)	Flow (L/s)	Flow (L/min)	Residual Pressure @ Main (psi)	Residual Pressure @ Main (kPa)	
Domestic (PHD)	207	13.0	782	**66**	**455**	
Fire Flow (Fire+MDD)	2,918	184.1	11,046	**61**	**420**	Projecting Curve to Fire Flow
To 20 psi	9,613	606.5	36,390	**20**	**138**	Projecting Curve to 20 psi

(1 gal = 3.785 L) *(Goal Seek)*

Residual Pressure at Building

$$h_L = \frac{10.675 * L * Q^{1.85}}{C^{1.85} * D^{4.8655}}$$

where: h_L = Pressure Drop (m)
L = Length of Service (m)
Q = Flow Rate (m^3/s)
D = Pipe Diameter (m)
C = Roughness Coefficient

PHD Conditions

	Domestic	
L=	50.0	m
Q=	0.013	m^3/s
D=	200	mm
C=	110	
h_L=	**0.1**	m
h_L=	**2.9**	in
h_L=	**0.1**	psi
h_L=	**0.7**	kPa

Fire + MDD Conditions

	Fire Service	
L=	70.0	m
Q=	0.184	m^3/s
D=	250	mm
C=	110	
h_L=	**4.6**	m
h_L=	**182.7**	in
h_L=	**6.6**	psi
h_L=	**45.5**	kPa

	Flow (gpm)	Flow (L/s)	Flow (L/min)	Residual Pressure @ Bldg. (psi)	Residual Pressure @ Bldg. (kPa)
Domestic	207	13.0	782	**66**	**454**
Fire	2,918	184.1	11,046	**54**	**375**

Residual Pressure (DOMESTIC) at building is greater than 40 psi (275 kPa).
Residual Pressure (FIRE) at building is greater than 20 psi (140 kPa).

HYDRANT FLOW TESTING

NOTE:Hydrants tested according to NFPA 291: Recommended Practice for Fire Flow Testing and Marking of Hydrants

GENERAL INFORMATION

General Information

Date of Testing	4-May-22
Project Number:	137429
Site Location / Address:	4099 Erin Mills Parkway
Region / Municipality	Peel Region
Hydrants Opened By:	Peel Region
Tested by:	Daniel S Val V

HYDRANT TEST INFORMATION

Hydrant Test Location - Residual Hydrant=R, Flow Hydrant=F (North at Top)

.

Test Data

Time of Test	11:07 AM
Pipe Size (mm)	200
Flow Hydrant Test Location (description)	On Sawmill Valley Drive
Residual Hydrant Test Location (description)	NE corner of Erin Mills and Folkway Dr
Static Pressure(PSIG)	66

Q1 Test Data (1 Orifice)

# OUTLETS	ORIFICE SIZE(IN)	PITOT PRESSURE(PSIG)	FLOW(USGPM)	RESIDUAL PRESSURE(PSIG)
1	2.5	58	1278	65

QT Test Data (2 Orifices)

# OUTLETS	ORIFICE SIZE(IN)	PITOT PRESSURE(PSIG)	FLOW(USGPM)	RESIDUAL PRESSURE(PSIG)
2	2.5	40	2122	64

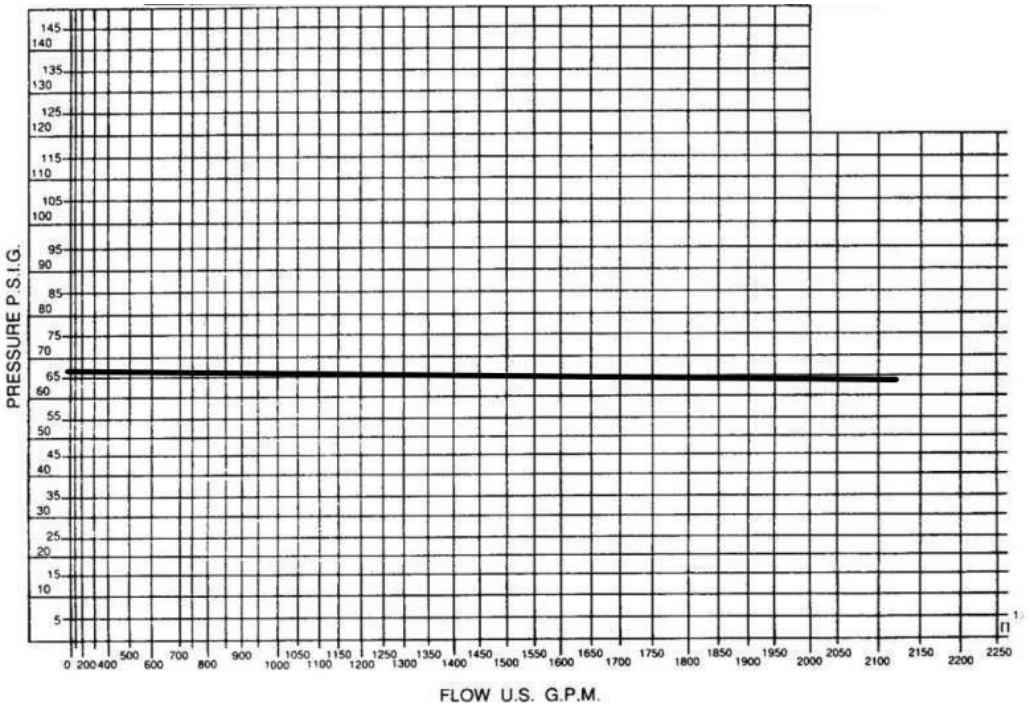
Calculations

FORMULA: Q= 29.83 cd^2√p.....Where: c- coefficient of discharge (1 in smooth pipe)
..... d- pipe diameter (inches)
.....p- pitot reading (psig)

Q1 - 1 Orifice(s)	Q1= (29.83)(0.9)(2.5)^2 √58=1278
QT - 2 Orifice(s)	QT= 2(29.83)(0.9)(2.5)^2 √40=2122
Static Pressure(PSIG)	66

Test Results - Plot

Plot



HYDRANT FLOW TESTING

NOTE:Hydrants tested according to NFPA 291: Recommended Practice for Fire Flow Testing and Marking of Hydrants

GENERAL INFORMATION

General Information

Date of Testing	4-May-22
Project Number:	137429
Site Location / Address:	4099 Erin Mills Parkway
Region / Municipality	Peel Region
Hydrants Opened By:	Peel Region
Tested by:	Daniel S Val V

HYDRANT TEST INFORMATION

Hydrant Test Location - Residual Hydrant=R, Flow Hydrant=F (North at Top)

.

Test Data

Time of Test	11:28 AM
Pipe Size (mm)	200
Flow Hydrant Test Location (description)	second hydrant down Erin mills, east
Residual Hydrant Test Location (description)	NE corner of Erin mills and folkway
Static Pressure(PSIG)	66

Q1 Test Data (1 Orifice)

# OUTLETS	ORIFICE SIZE(IN)	PITOT PRESSURE(PSIG)	FLOW(USGPM)	RESIDUAL PRESSURE(PSIG)
1	2.5	50	1186	64

QT Test Data (2 Orifices)

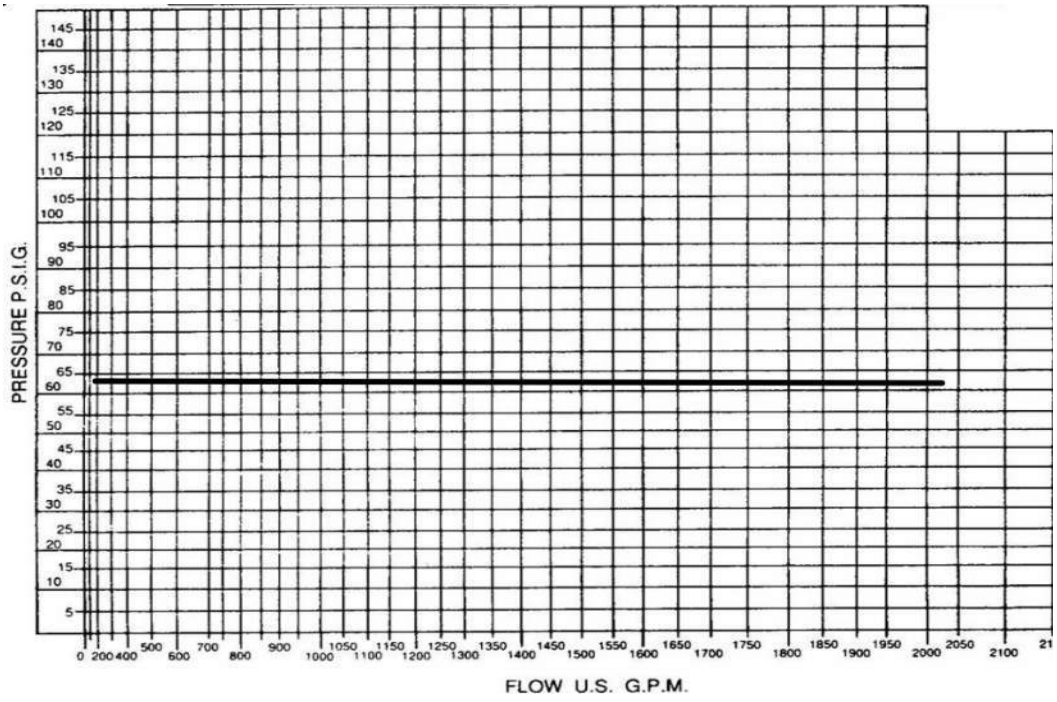
# OUTLETS	ORIFICE SIZE(IN)	PITOT PRESSURE(PSIG)	FLOW(USGPM)	RESIDUAL PRESSURE(PSIG)
2	2.5	43	2201	63

Calculations

FORMULA: Q= 29.83 cd^2√p.....Where: c- coefficient of discharge (1 in smooth pipe)
..... d- pipe diameter (inches)
.....p- pitot reading (psig)

Q1 - 1 Orifice(s)	Q1= (29.83)(0.9)(2.5)^2 √50=1186
QT - 2 Orifice(s)	QT= 2(29.83)(0.9)(2.5)^2 √43=2201
Static Pressure(PSIG)	66

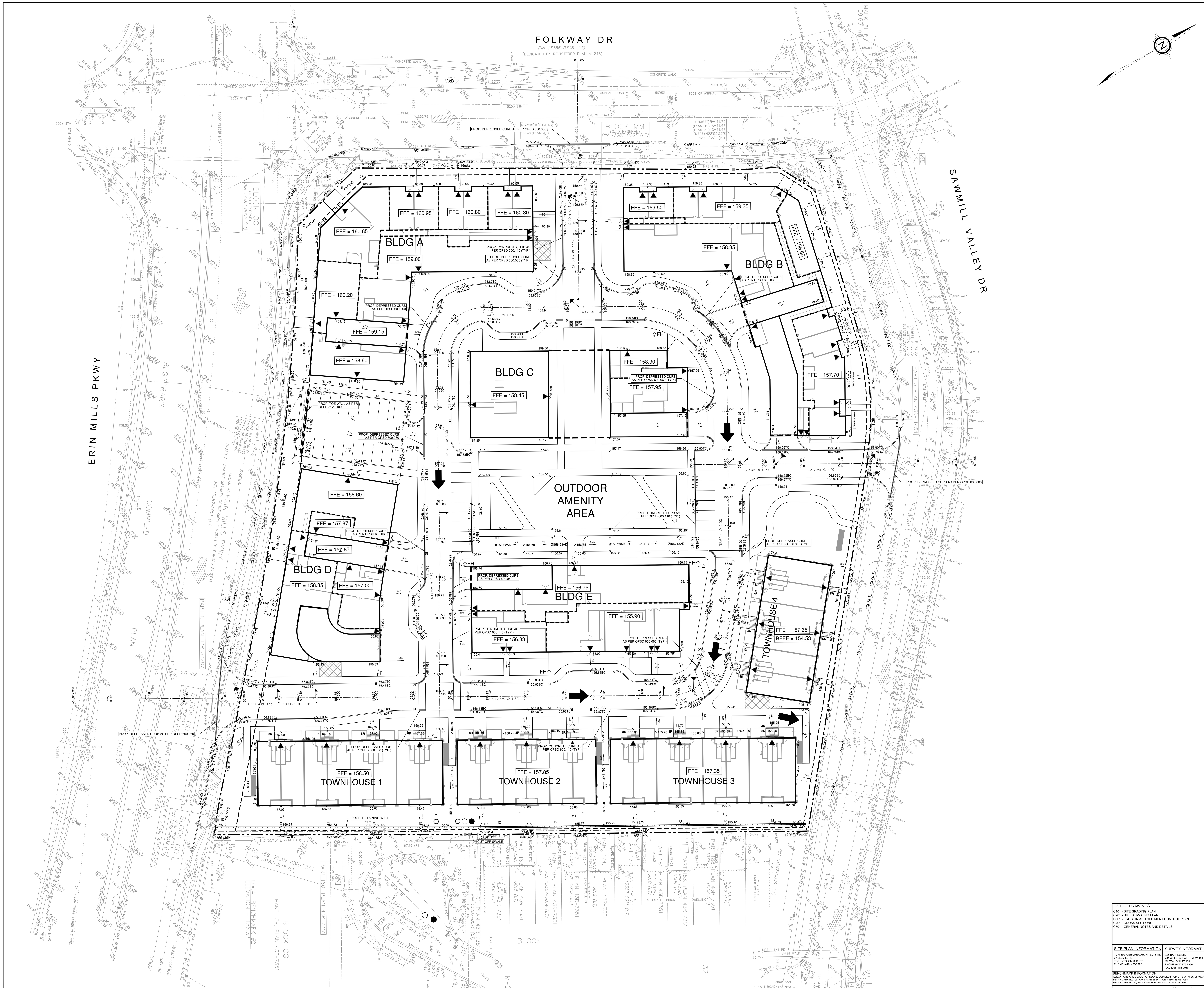
Test Results - Plot



Appendix E

Engineering Plans

C101 - Site Grading Plan
C201 - Site Servicing Plan
C301 - Erosion and Sediment Control Plan
C401 - Cross Sections
C501 - General Notes and Details



CLIENT

QUEENCORP ERIN MILLS L.P.

-

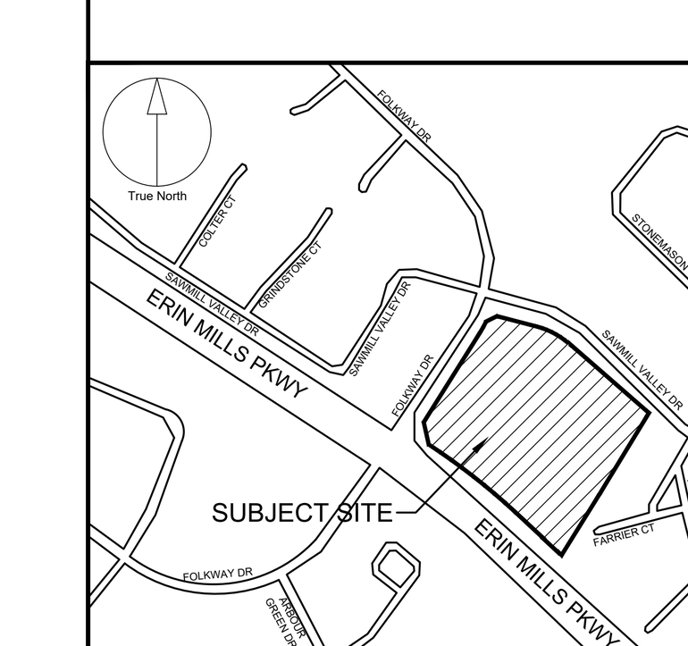
COPYRIGHT

ISSUES

No.	DESCRIPTION	DATE
1.	ISSUED FOR ZBA	JULY 22, 2022
2.	ISSUED FOR ZBA (PARTIAL RE-SUBMISSION)	SEP 11, 2024
3.		
4.		

LEGEND

PROPERTY LINE	
OUTLINE OF BUILDING AT GROUND LEVEL	
OUTLINE OF UNDERGROUND LEVEL	
OUTLINE OF ABOVEGROUND LEVEL	
PROP. DEPRESSED CURB	
PROP. DOOR / OVERHEAD DOOR	▼/▽
EX. ELEVATION	×165.50EX
PROP. ELEVATION	×149.50
PROP. TOP OF CURB ELEVATION	×137.52TC
PROP. BOTTOM OF CURB ELEVATION	×137.52BC
PROP. SWALE ELEVATION	×137.52SW
PROP. TOP OF WALL ELEVATION	×137.29TW
PROP. BOTTOM OF WALL ELEVATION	×135.85BW
PROP. SWALE	
PROP. OVERLAND FLOW ROUTE	
EX. OVERLAND FLOW ROUTE	
PROP. RETAINING WALL	
PROP. STORM MAINTENANCE HOLE	
PROP. STORM CATCHBASIN MAINTENANCE HOLE	
PROP. OIL-GRIT SEPARATOR	
PROP. SANITARY MAINTENANCE HOLE	
PROP. CATCHBASIN / DOUBLE CATCHBASIN	
PROP. AREA DRAIN	AD
EX. STORM MANHOLE	
EX. SANITARY MANHOLE	
EX. CATCHBASIN / DOUBLE CATCHBASIN	
PROP. VALVE AND BOX	V&B
PROP. FIRE HYDRANT AND VALVE	FH
PROP. SIAMESE CONNECTION	
PROP. WATER METER	M
PROP. BACKFLOW PREVENTER	B
PROP. DOUBLE CHECK DETECTOR	D
PROP. RAMP	



KEY PLAN

LICENSED PROFESSIONAL ENGINEER
S. NISHAT
100156223
PROVINCE OF ONTARIO

ARCADIS

PROJECT

4099 ERIN MILL PKWY
CITY OF MISSISSAUGA

LIST OF DRAWINGS

C101 - SITE GRADING PLAN
C201 - SITE SERVICING PLAN
C301 - EROSION AND SEDIMENT CONTROL PLAN
C401 - CROSS SECTIONS
C501 - GENERAL NOTES AND DETAILS

PROJECT NO: 137429	
DRAWN BY: **RJ**	CHECKED BY: **NDS**
PROJECT MGR: **NG**	APPROVED BY: **NG**

SITE PLAN INFORMATION

TURNER FLEISCHER ARCHITECTS INC.
67 LESMILL RD
TORONTO, ON M3B 2T8
PHONE: (416) 425-2222

SURVEY INFORMATION

J.D. BARNES LTD
401 WHEELABRATOR WAY, SUITE A
MILTON, ON L9T 3C1
PHONE: (905) 875-9956
FAX: (905) 785-9956

BENCHMARK INFORMATION:

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 799, HAVING AN ELEVATION = 160.866 METRES.
BENCHMARK No. 30, HAVING AN ELEVATION = 150.781 METRES.

SCALE: 1:300 (5.0 0 5.0m 10.0m)

1:300

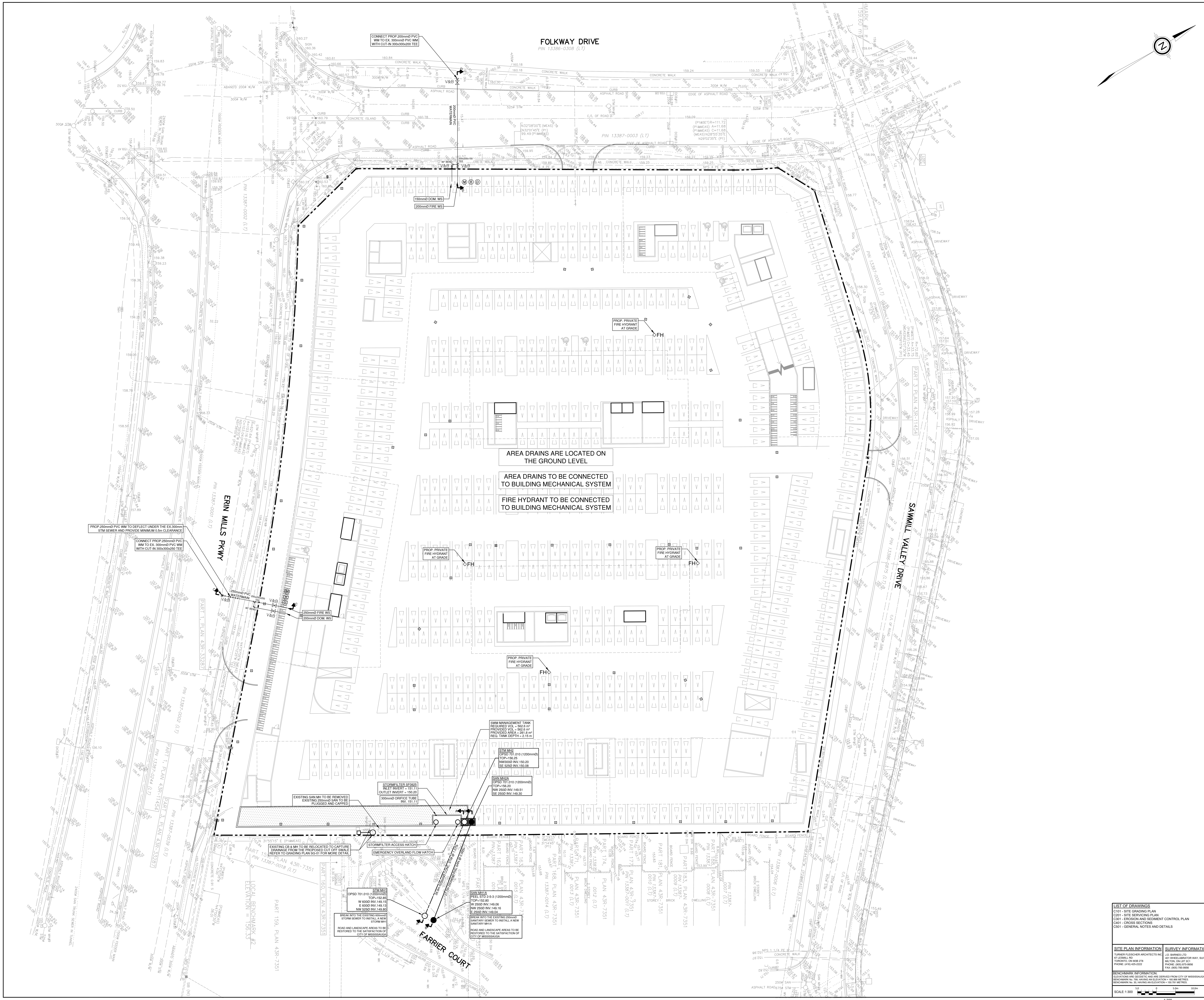
SHEET TITLE

SITE GRADING PLAN

SHEET NUMBER: C101

ISSUE: 02

SCALE CHECK 10mm 1 in

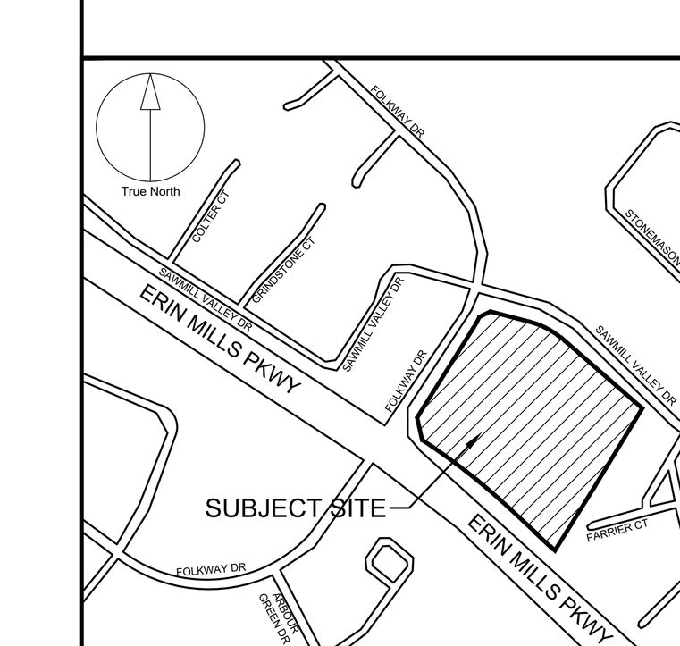


ISSUES

No.	DESCRIPTION	DATE
1.	ISSUED FOR ZBA	JULY 22, 2022
2.	ISSUED FOR ZBA (PARTIAL RE-SUBMISSION)	SEP 11, 2024
3.		
4.		

LEGEND

PROPERTY LINE
LIMIT OF UNDERGROUND LEVEL
PROP. DEPRESSED CURB
PROP. FLUSH CURB
PROP. DOOR / OVERHEAD DOOR
PROP. STORM MAINTENANCE HOLE
PROP. STORM CATCHBASIN MAINTENANCE HOLE
PROP. OIL-GRIT SEPARATOR
PROP. SANITARY MAINTENANCE HOLE
PROP. CATCHBASIN / DOUBLE CATCHBASIN
PROP. AREA DRAIN — AD
EX. STORM MANHOLE
EX. SANITARY MANHOLE
EX. CATCHBASIN / DOUBLE CATCHBASIN
PROP. STORM SEWER
PROP. SANITARY SEWER
PROP. WATERMAIN
EX. STORM SEWER
EX. SANITARY SEWER
EX. WATERMAIN
EX. FIRE HYDRANT — H
PROP. VALVE AND BOX — V&B
PROP. FIRE HYDRANT AND VALVE — FH&V
PROP. SIAMESE CONNECTION
PROP. WATER METER — M
PROP. BACKFLOW PREVENTER — B
PROP. DOUBLE CHECK DETECTOR — D



KEY PLAN

ARCADIS

PROJECT
4099 ERIN MILL PKWY
CITY OF MISSISSAUGA

LIST OF DRAWINGS
C101 - SITE GRADING PLAN
C201 - SITE SERVICING PLAN
C301 - EROSION AND SEDIMENT CONTROL PLAN
C401 - CROSS SECTIONS
C501 - GENERAL NOTES AND DETAILS

SITE PLAN INFORMATION
TURNER FLEISCHER ARCHITECTS INC.
67 LESMILL RD
TORONTO, ON M3B 2T8
PHONE: (416) 425-2222

SURVEY INFORMATION
J.D. BARNES LTD
401 WHEELABRATOR WAY, SUITE A
MILTON, ON L9T 3C1
PHONE: (905) 875-9956
FAX: (905) 785-9956

BENCHMARK INFORMATION:
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 799, HAVING AN ELEVATION = 160.866 METRES.
BENCHMARK No. 30, HAVING AN ELEVATION = 150.781 METRES.

SCALE: 1:300

PROJECT NO: 137429
DRAWN BY: **ST**
CHECKED BY: **NDS**
PROJECT MGR: **NG**
APPROVED BY: **NG**

SHEET TITLE
SITE SERVICING PLAN

SHEET NUMBER C201
ISSUE 02

1:300

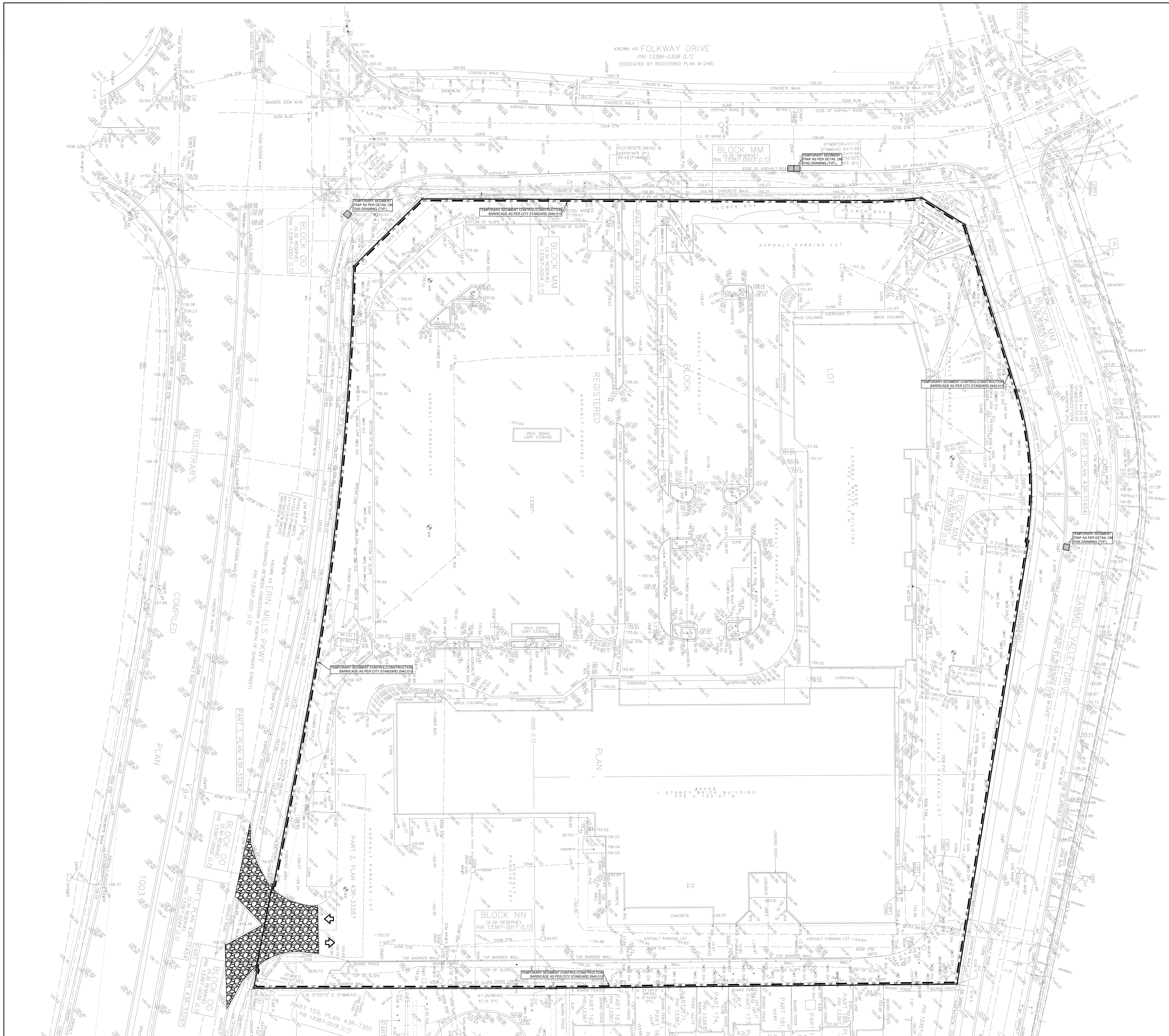
CLIENT
QUEENCORP ERIN MILLS L.P.
-

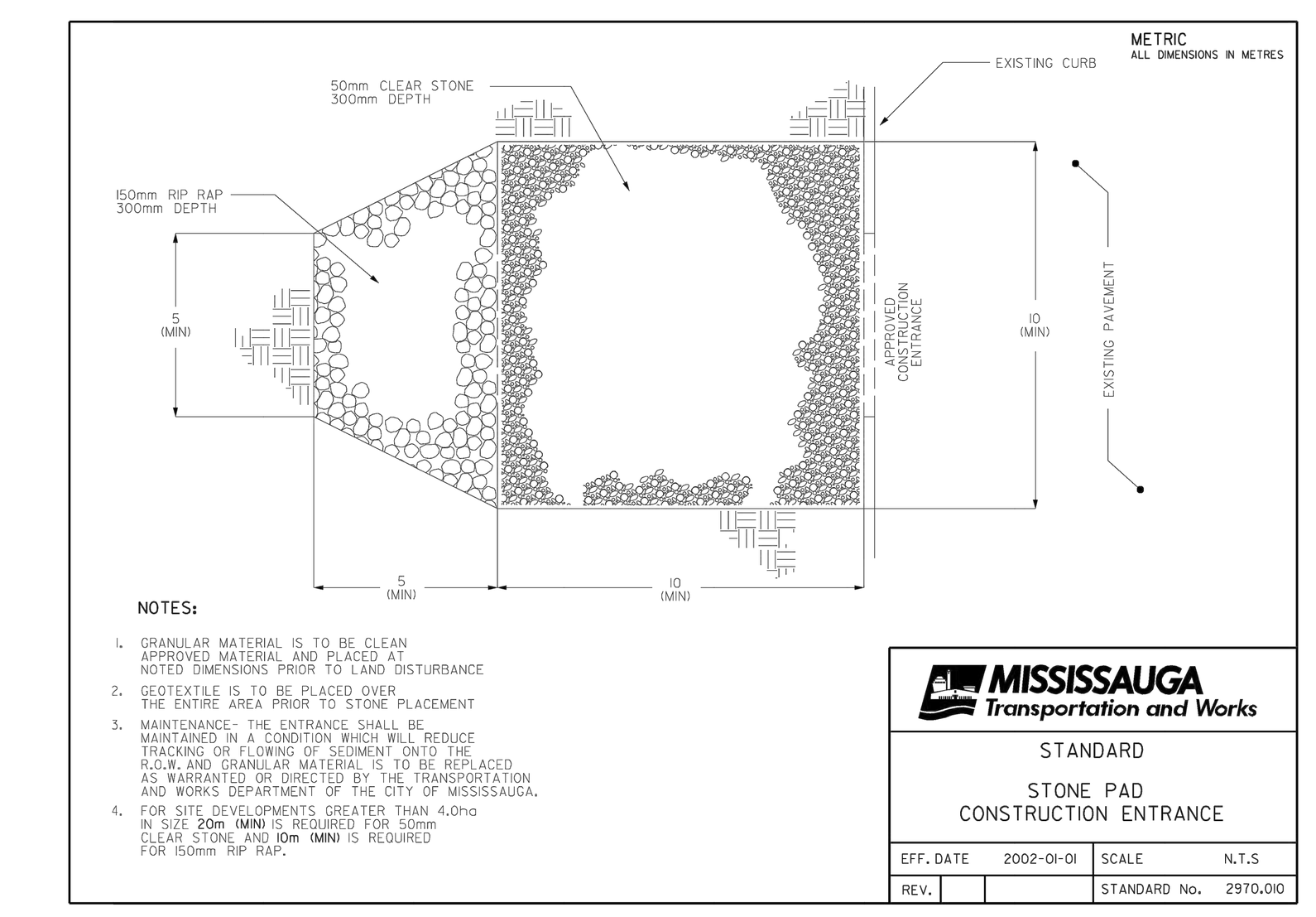
ISSUES

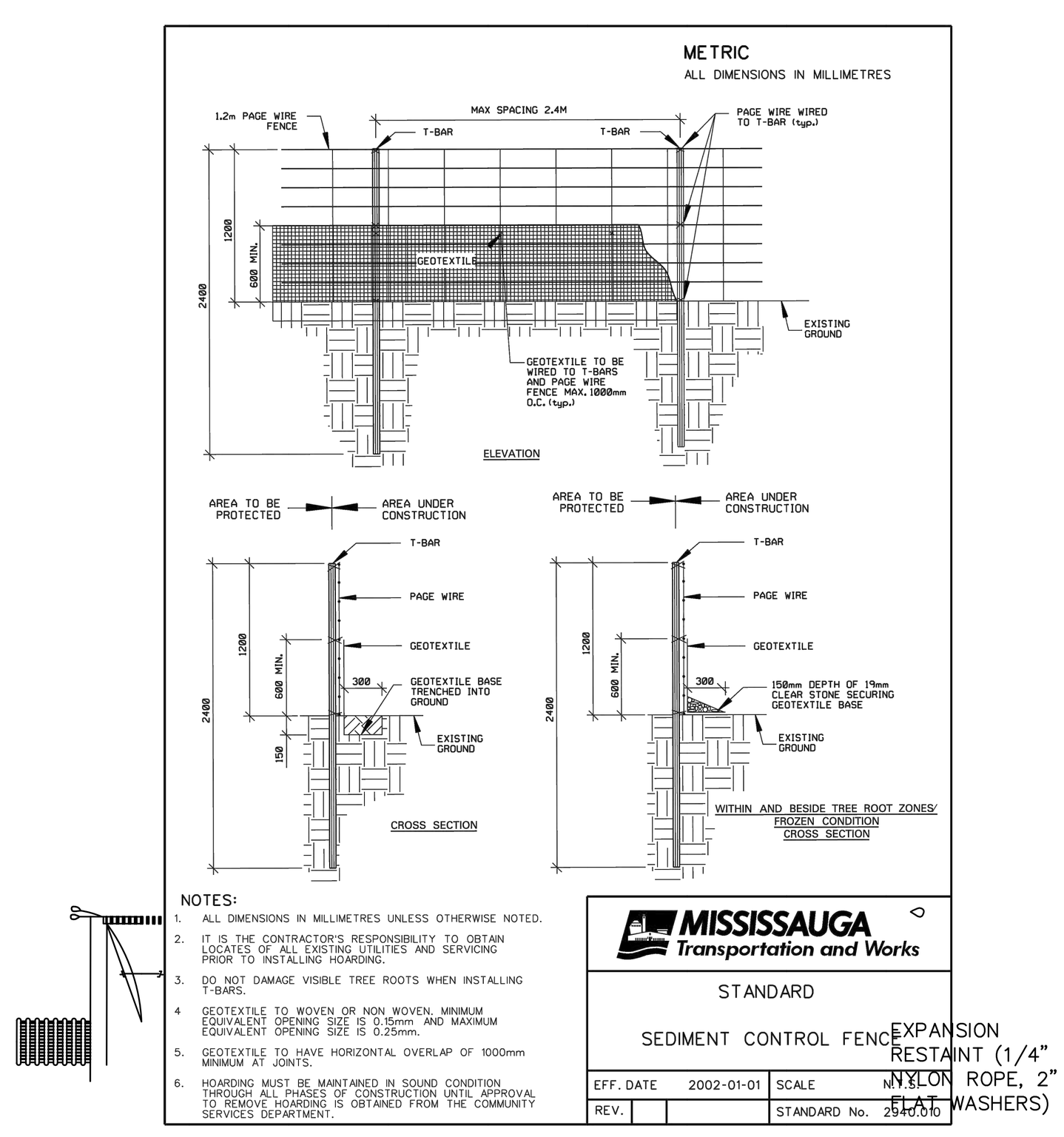
No.	DESCRIPTION	DATE
1.	ISSUED FOR ZBA	JULY 22, 2022
2.	ISSUED FOR ZBA (PARTIAL RE-SUBMISSION)	SEP 11, 2024
3.		
4.		

LEGEND

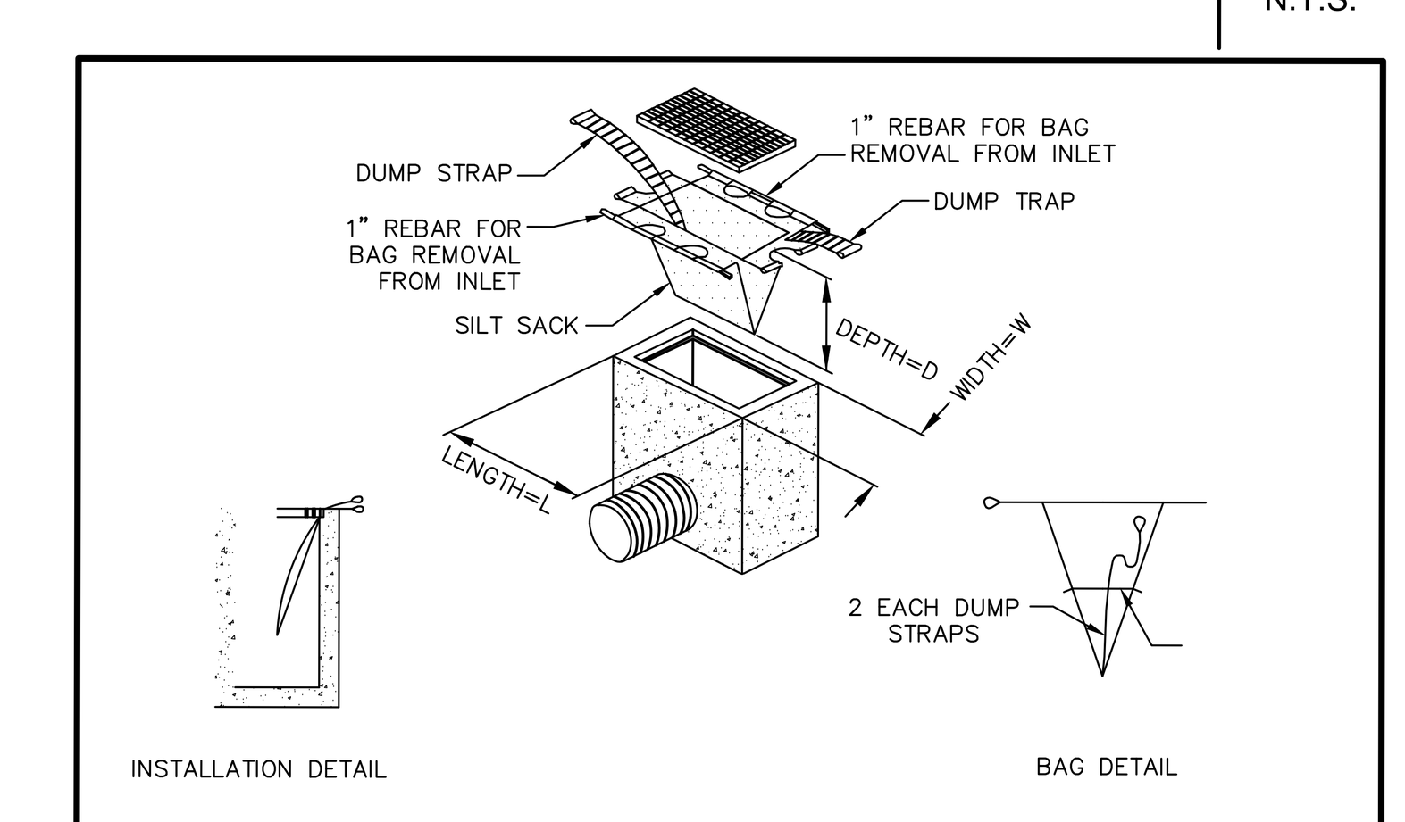
- PROPERTY LINE
- CONTROL FENCE TEMPORARY (SF)
- TEMPORARY SEDIMENT TRAP
- CONSTRUCTION ACCESS TEMPORARY
- TEMPORARY GRAVEL MUD MAT



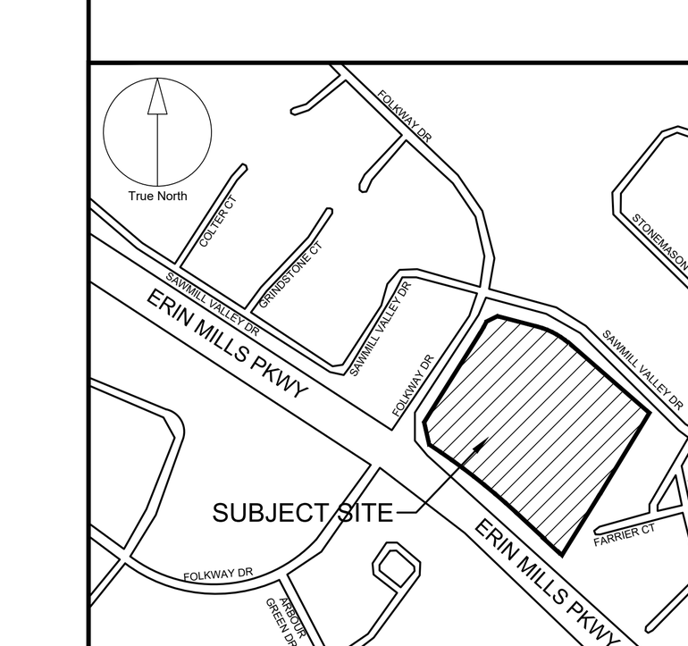




N.T.S.



TEMPORARY SEDIMENT TRAP



KEY PLAN

EROSION AND SEDIMENT CONTROL / GENERAL NOTES:

1. SEDIMENT BARRIER AND TEMPORARY CONSTRUCTION ACCESS TO BE INSTALLED PRIOR TO THE BEGINNING OF THE CONSTRUCTION.
2. ALL SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL THE AREA IS STABILIZED.
3. IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE.
4. THE SITE WILL BE WET DOWN IF NECESSARY TO CONTROL DUST.
5. ALL CONSTRUCTION EQUIPMENT MUST BE PARKED ON-SITE.
6. WILL COMPLY WITH CITY OF TORONTO NOISE BY-LAW.
7. SEDIMENT CONTROL FENCE TO BE AS PER CITY OF TORONTO STANDARD T-219-130-1 AND TO BE INSTALLED AROUND THE ENTIRE SITE.
8. ALL CONSTRUCTION VEHICLES TO ENTER AND EXIT SITE FROM TEMPORARY CONSTRUCTION ACCESS.
9. ALL TOPSOIL STOCKPILES TO BE SURROUNDED WITH SEDIMENT CONTROL FENCING. STOCKPILED MATERIALS WHICH WILL NOT BE USED WITHIN TWO WEEKS MUST BE STABILIZED USING ONE OR MORE OF THE FOLLOWING METHODS: TEMPORARY SEEDING (1 YEAR OR LESS), TRAP OR OTHER DURABLE COVERING, OR ANCHORED STRAW OR MULCH
10. FILTER FABRIC TO BE PLACED UNDER GRATES ON ALL CATCHBASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND THE BOULEVARDS ARE SODDED OR BACKYARDS GRADED AND SODDED. FILTER FABRIC FOR SILT CONTROL TO BE TERRAFIX 270R OR APPROVED EQUIVALENT.
11. FILTER CLOTH WILL BE PLACED ON THE CATCHBASINS ON (PUBLIC STREET) ACROSS THE PROPERTY'S FRONTAGE.
12. STREET SWEEPING, CATCHBASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE DEVELOPER AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE CITY.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR KEEPING THE MUNICIPAL ROADWAY CLEAN AND WILL WASH AND SWEEP THE ROADWAY AS REQUIRED.
14. FILTER CLOTH AND 150mm OF 19mm CRUSHED STONE WILL BE PLACED ON THE ON-SITE CATCHBASINS FOR SEDIMENT PROTECTION DURING CONSTRUCTION. FILTER CLOTH WILL BE PLACED ON THE CATCHBASINS ON THE PUBLIC STREETS ACROSS THE PROPERTY'S FRONTAGE
15. THE SILT FENCE WILL BE INSTALLED IN ACCORDANCE WITH CITY REQUIREMENTS FOR AN EROSION CONTROL FENCE.
16. IN THE CASE OF ANY CONFLICT WITH ANOTHER PLAN, THIS PLAN PREVAILS ONLY IN RESPECT TO CONSTRUCTION MEASURES AND ACTIVITIES SUCH AS THE CONSTRUCTION ACCESS, SILT FENCE, SECURITY FENCE, SEDIMENT CONTROL AND MUD MATS.

NOTES:

1. INSTALL TEMPORARY CATCHBASIN SEDIMENT TRAP ON EX. CATCHBASINS

LIST OF DRAWINGS

SITE PLAN INFORMATION

TURNER FLEISCHER ARCHITECTS INC.
67 LESMILL RD
TORONTO, ON M3B 2T8
PHONE: (416) 425-2222

SURVEY INFORMATION

J.D. BARNES LTD
401 WHEELABRATOR WAY, SUITE A
MILTON, ON L9T 3C1
PHONE: (905) 875-9956
FAX: (905) 785-9956

BENCHMARK INFORMATION:
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 799, HAVING AN ELEVATION = 160.866 METRES.
BENCHMARK No. 30, HAVING AN ELEVATION = 150.781 METRES.

SCALE: 1:300

1:300

ARCADIS

PROJECT
4099 ERIN MILL PKWY
CITY OF MISSISSAUGA

PROJECT NO: 137429	
DRAWN BY: **ST**	CHECKED BY: **NDS**
PROJECT MGR: **NG**	APPROVED BY: **NG**

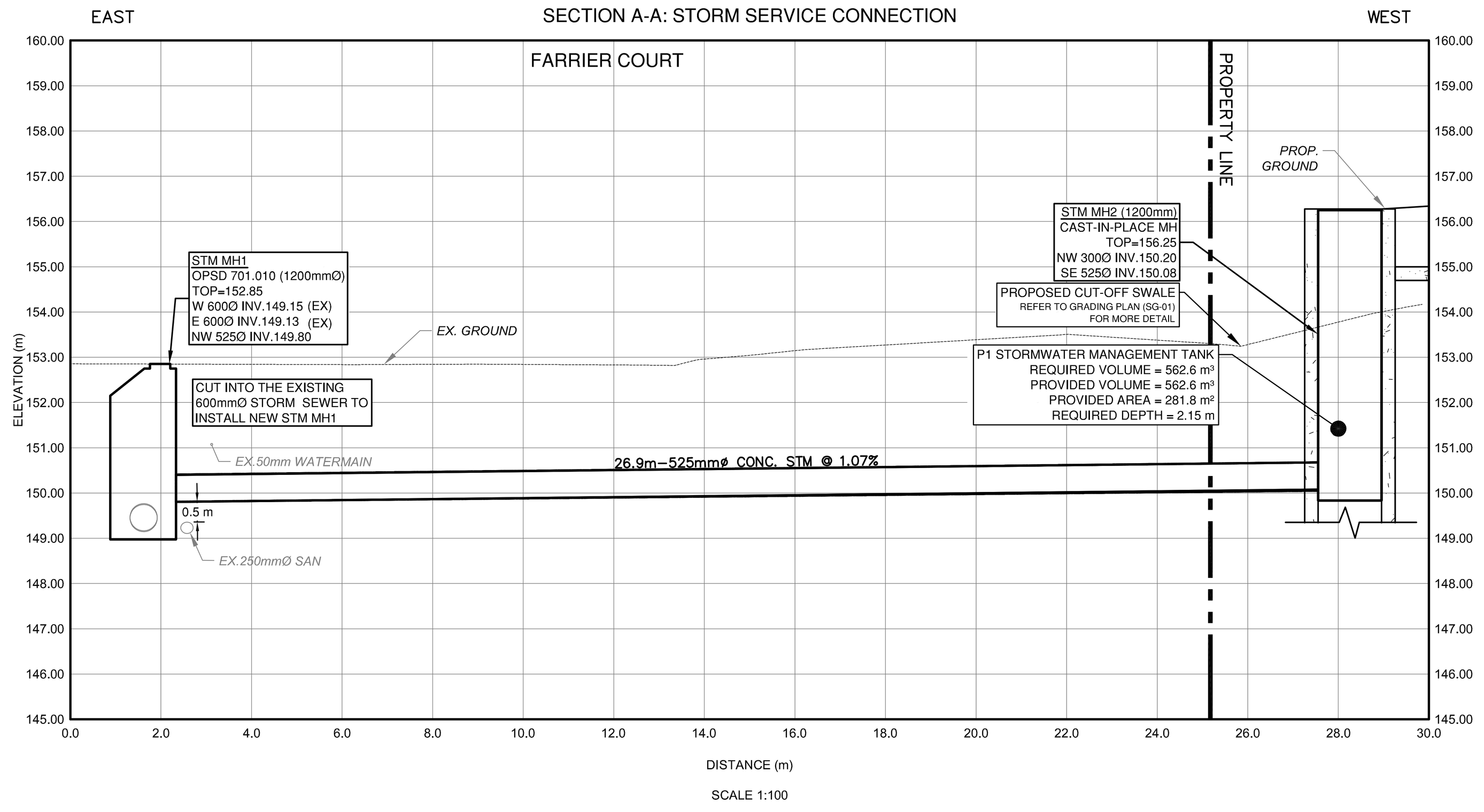
SHEET TITLE
EROSION AND SEDIMENT CONTROL PLAN

SHEET NUMBER C301 | ISSUE 02

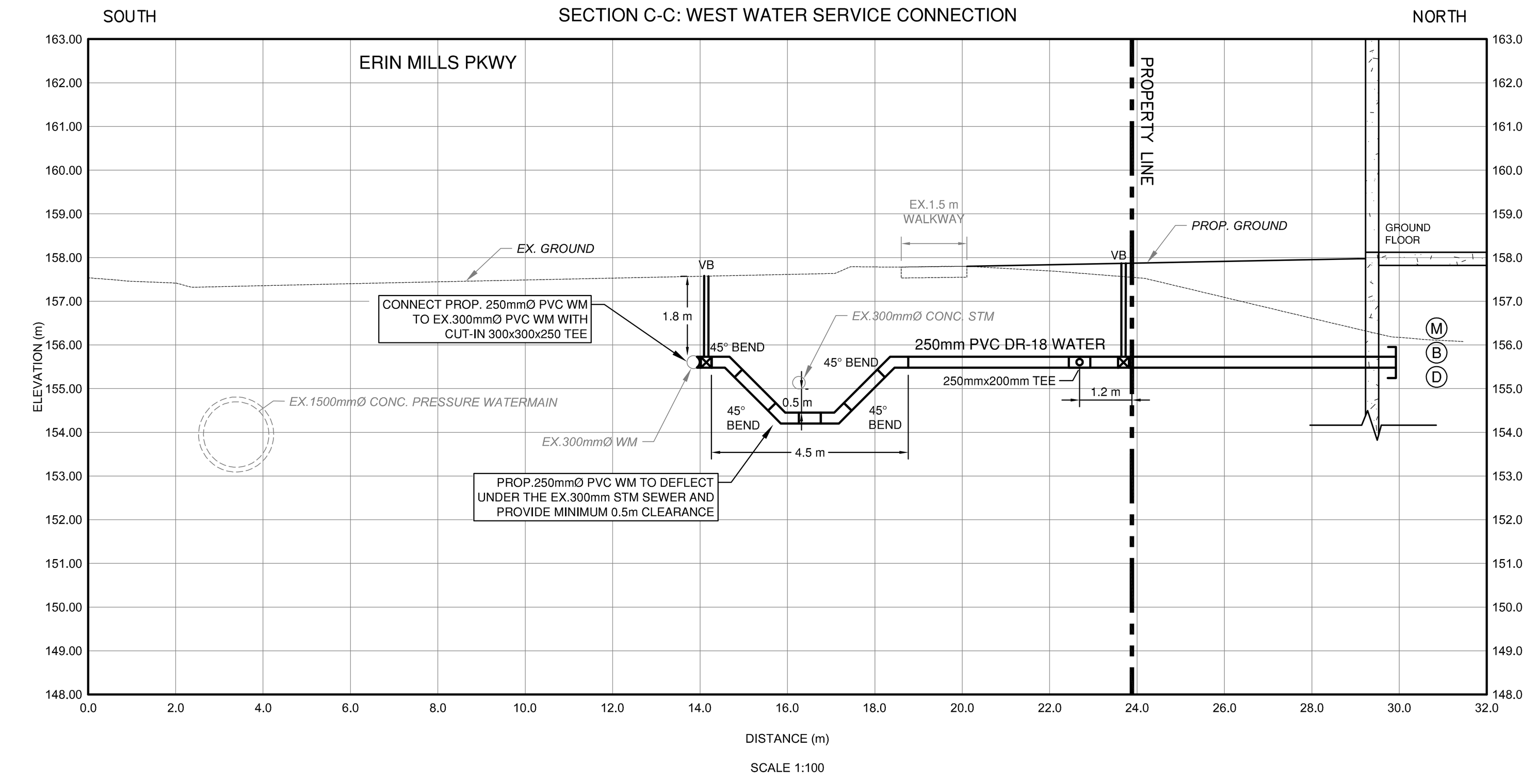
SCALE CHECK 10mm 1 in

File Location: \\caneast.ibigroup.com\J\TO\137429_4099ErinMills\7.0_Production\7.03_Design\04_Civil\Sheets\1

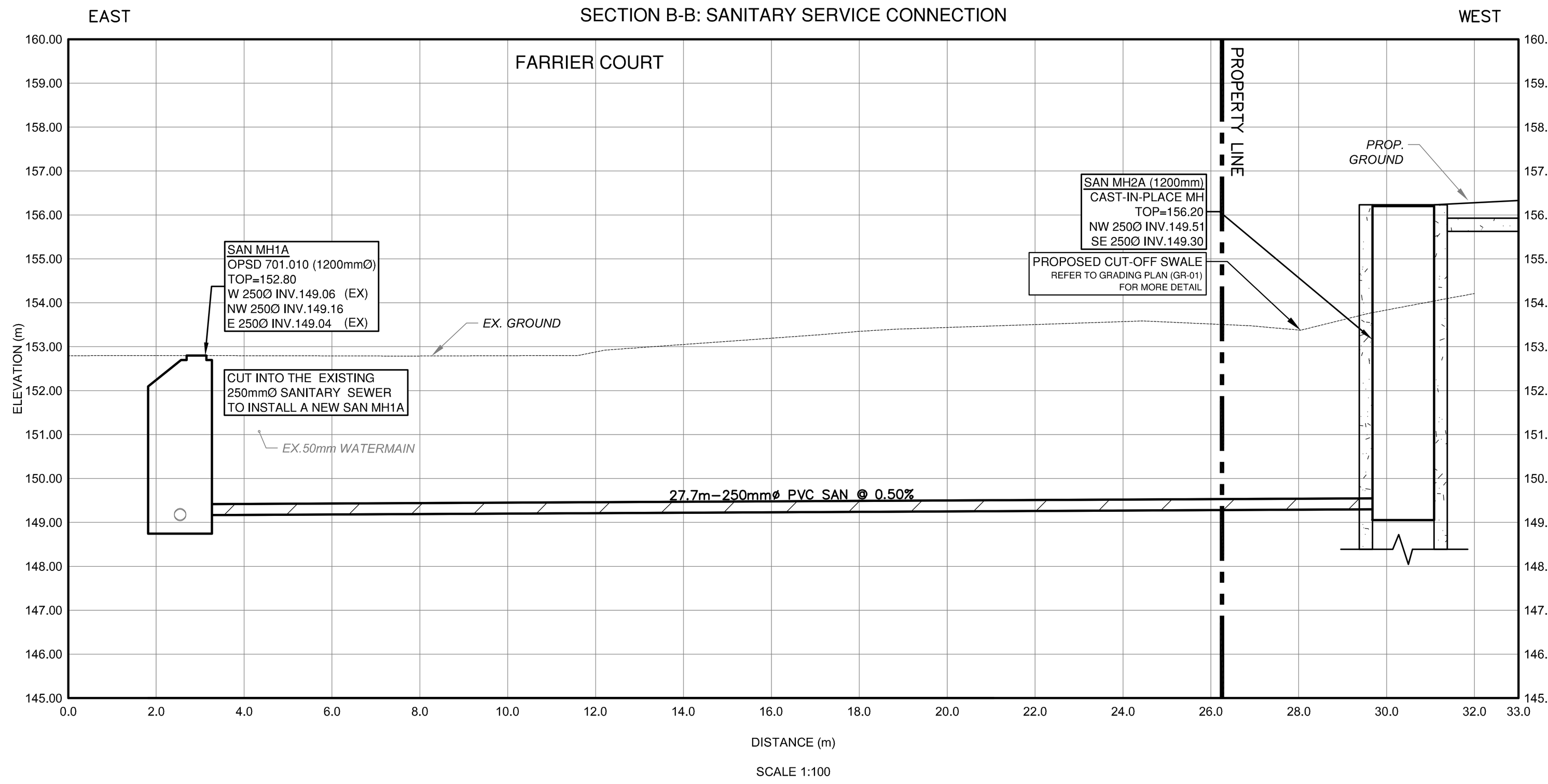
SECTION A-A: STORM SERVICE CONNECTION



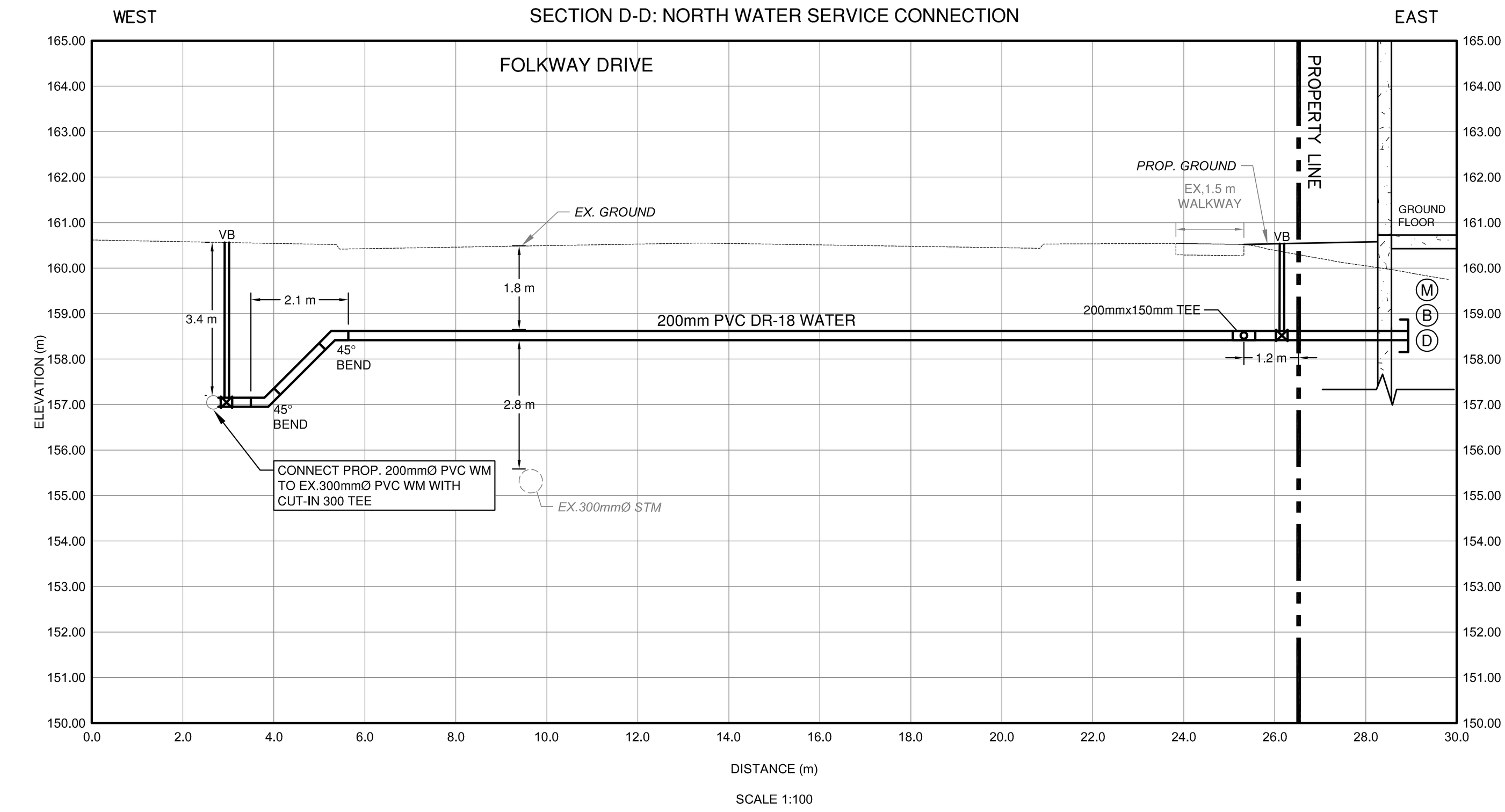
SECTION C-C: WEST WATER SERVICE CONNECTION



SECTION B-B: SANITARY SERVICE CONNECTION



SECTION D-D: NORTH WATER SERVICE CONNECTION



CLIENT

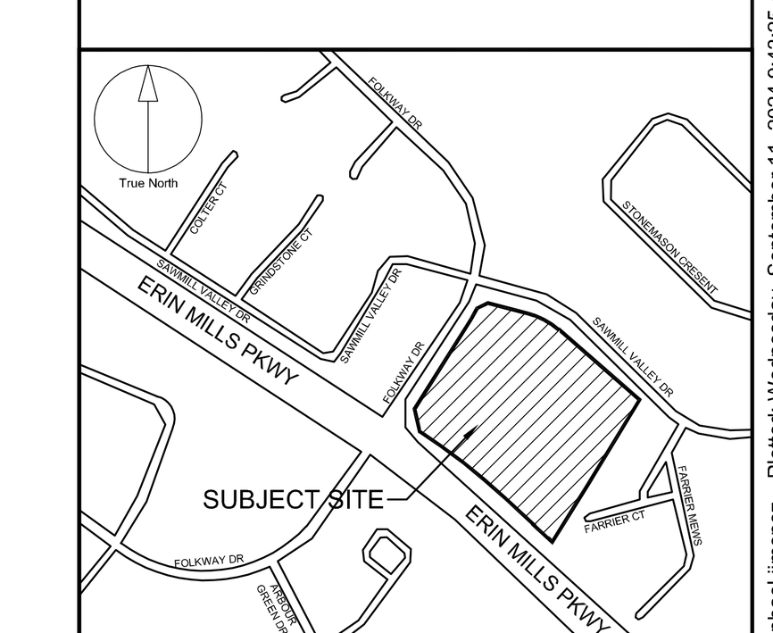
QUEENCORP ERIN MILLS L.P.

-

ISSUES

No.	DESCRIPTION	DATE
1.	ISSUED FOR ZBA	JULY 22, 2022
2.	ISSUED FOR ZBA (PARTIAL RE-SUBMISSION)	SEP 11, 2024
3.		
4.		

LEGEND



KEY PLAN

ARCADIS

PROJECT

4099 ERIN MILL PKWY
CITY OF MISSISSAUGA

LIST OF DRAWINGS
C101 - SITE GRADING PLAN
C201 - SITE SERVICING PLAN
C301 - EROSION AND SEDIMENT CONTROL PLAN
C401 - CROSS SECTIONS
C501 - GENERAL NOTES AND DETAILS

SITE PLAN INFORMATION
TURNER FLEISCHER ARCHITECTS INC.
67 LESMILL RD
TORONTO, ON M3B 2T8
PHONE: (416) 425-2222

SURVEY INFORMATION
J.D. BARNES LTD
401 WHEELABRATOR WAY, SUITE A
MILTON, ON L9T 3C1
PHONE: (905) 875-9956
FAX: (905) 785-9956

BENCHMARK INFORMATION:
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 799, HAVING AN ELEVATION = 160.866 METRES.
BENCHMARK No. 30, HAVING AN ELEVATION = 150.781 METRES.

SCALE: 1:100

1:100

PROJECT NO: 137429

DRAWN BY: ST	CHECKED BY: NDS
PROJECT MGR: NG	APPROVED BY: NG

SHEET TITLE

CROSS SECTIONS

SHEET NUMBER C401

ISSUE 02

SERVICING NOTES

UNLESS OTHERWISE NOTED ON THE DRAWINGS, THE FOLLOWING REQUIREMENTS SHALL APPLY TO THIS PROJECT:

A. GENERAL

1. FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE STANDARD DRAWINGS REFERRED TO ON THESE DRAWINGS.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR FOR ACCURACY PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
3. ALL CONSTRUCTION INDICATED THUS ---- IS BY OTHERS UNLESS OTHERWISE NOTED.
4. ALL TIES ARE TO BE TAKEN TO THE CENTRE OF MANHOLES.
5. ALL TRENCHING TO BE DONE IN ACCORDANCE WITH "THE OCCUPATIONAL HEALTH & SAFETY ACT".
6. ALL RECONSTRUCTION, RESTORATION AND RELOCATION TO BE TO THE SATISFACTION OF THE COMMISSIONER OF PUBLIC WORKS, OR DIRECTOR OF INFRASTRUCTURE THROUGHOUT.
7. FOR STORM SEWERS, CLASS B SEWER TRENCH BEDDING IS TO BE USED AS PER CITY STANDARD 2112.080. SEWER BEDDING AND COVER MATERIAL SHALL CONFORM WITH CITY STANDARD 2112.090 AND 2112.100 RESPECTIVELY. IF WATER IS PRESENT IN THE TRENCH EXCAVATION, THEN 19mm CLEAR STONE OR 6mm WASHED CRUSHED GRAVEL IS TO BE USED FOR BEDDING IN ACCORDANCE WITH CITY STANDARDS 2112.110, RESPECTIVELY.
8. WHERE WET OF SOFT TRENCH SUB-GRADE CONDITIONS ARE ENCOUNTERED, FURTHER ON-SITE GEOTECHNICAL ASSESSMENT MAY BE REQUIRED TO DETERMINE OR RE-EXAMINE THE APPROPRIATE BEDDING IN ORDER TO STABILIZE THE SUB-GRADE FOR SEWER CONSTRUCTION (ie: INCREASE IN BEDDING THICKNESS; STONE IMMERSION TECHNIQUES; LEAK PROOFING OR WRAPPING OF SEWER PIPE JOINTS; CLASS A BEDDING; ETC.).
9. TRENCH BACKFILLING SHALL COMPLY WITH THE CITY'S ENGINEERING POLICY STATEMENT. WHERE THE EXCAVATED INORGANIC NATIVE SUBSOIL IS USED FOR TRENCH BACKFILLING, THE BACKFILL SHOULD BE PLACED IN MAXIMUM 200mm THICK LAYERS, AND COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 2% OF OPTIMUM MOISTURE CONTENT.

   THE TOP 1000mm OF THE SUB-GRADE IS TO BE COMPACTED TO A MINIMUM OF 98% OF STANDARD PROCTOR DENSITY 2 TO 3% DRIER THAN OPTIMUM MOISTURE CONTENT.
10. SAND BACKFILL IS REQUIRED ADJACENT TO MANHOLES, CATCHBASINS AND SERVICE CONNECTIONS.
11. CONTRACTOR TO REMAIN ON SPECIFIED TRUCK ROUTE DURING CONSTRUCTION. THIS ROUTE IS TO BE VERIFIED WITH THE ENGINEER BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
12. PROVIDE PROTECTION TO CONTROL MONUMENTS.
13. DESIGN AND INSPECT SHORING, BRACING, AND UNDERPINNING REQUIRED FOR WORK.
14. REMOVAL OF EXISTING PIPE, STRUCTURE AND APPURTENANCES SHALL INCLUDE OFF SITE DISPOSAL.
15. CONTRACTOR TO SUPPLY ENGINEER WITH ALL UNDERGROUND STORM, SANITARY AND WATERMAIN "AS-BUILT" INFORMATION INCLUDING TOP OF APPURTENANCES.
16. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
17. ALL SURFACE DRAINAGE WILL BE SELF CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
18. THE PORTIONS OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD WILL BE PAVED BY THE APPLICANT.
19. AT THE ENTRANCE TO THE SITE, THE MUNICIPAL CURB AND SIDEWALK BE CONTINUOUS THROUGH THE DRIVEWAY AND A CURB DEPRESSION WILL BE PROVIDED FOR EACH ENTRANCE.
20. ALL PROPOSED CURBING WITHIN THE MUNICIPAL BOULEVARD AREA FOR THE SITE IS TO SUIT AS FOLLOWS:

   A) FOR ALL SINGLE FAMILY RESIDENTIAL PROPERTIES INCLUDING ON STREET TOWNHOUSES, ALL CURBING IS TO STOP AT THE PROPERTY LIMIT OR THE BACK OF THE MUNICIPAL SIDEWALK, WHICHEVER IS APPLICABLE, OR,

   B) FOR ALL OTHER PROPOSALS INCLUDING INDUSTRIAL, COMMERCIAL AND CONDOMINIUM DEVELOPMENTS, ALL ENTRANCE TO THE SITE ARE TO BE IN ACCORDANCE WITH O.PS.D. 350.010.
21. ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE SITE.
22. THE APPLICANT WILL BE RESPONSIBLE FOR THE COST OF ANY UTILITY RELOCATIONS NECESSITATED BY THE SITE PLAN.

B. STORM SEWERS (CITY)

1. ALL STORM SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF MISSISSAUGA SPECIFICATIONS AND DETAILS FOR STORM SEWERS.
2. ALL CONCRETE SEWER PIPE UP TO AND INCLUDING 375 mm DIAMETER SHALL BE EQUAL TO C.S.A. SPECIFICATION A251.1, CLASS 3, OR LATEST AMENDMENT.
3. ALL CONCRETE SEWER PIPE 450 mm TO 600 mm DIAMETER SHALL BE EQUAL TO C.S.A. SPECIFICATION A257.2, CLASS 65, OR LATEST AMENDMENT.
4. ALL CONCRETE SEWER PIPE 675 mm DIAMETER AND OVER SHALL BE EQUAL TO C.S.A. SPECIFICATION A257.2, CLASS 50, OR LATEST AMENDMENT OR AS SPECIFIED ON DRAWINGS.
5. ALL ROYAL KOR-FLO RIBBED SEWER PIPE SHALL BE EQUAL TO C.S.A. SPECIFICATION B-182.1-02 AND A.S.T.M. SPECIFICATIONS D-3034-00 AND D-3212-96A(2003) OR LATEST AMENDMENT, UNLESS OTHERWISE NOTED.
6. ALL CATCHBASIN LEADS SHALL BE FITTED WITH APPROVED RUBBER GASKET JOINTS.
7. ALL BACKFILL FOR SEWERS, WATERMAINS AND UTILITIES WITHIN THE ROAD ALLOWANCE MUST BE MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY.
8. ALL STORM SEWERS SHALL BE CONSTRUCTED WITH BEDDING IN ACCORDANCE WITH CITY STD. 2112.080 CLASS 'B', UNLESS OTHERWISE NOTED.
9. IF THE ACTUAL TRENCH WIDTH EXCEEDS THE DESIGN WIDTH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED TO SUPPLY ADDITIONAL BEDDING AND/OR HIGHER CLASS PIPE INCLUDING ALSO THE CONSULTANT COSTS TO REDESIGN AND OBTAIN MUNICIPAL APPROVAL.
10. ALL SEWERS WITH GRADES OF 0.60% OR LESS TO BE CONSTRUCTED WITH LASER AND INSTRUMENT CHECKED PRIOR TO BACKFILLING.
11. WHERE CATCHBASINS ARE LOCATED ON BACKFILLED MATERIAL DUE TO SEWER CONSTRUCTION, SUCH MATERIAL TO BE REPLACED WITH 15 MPa CONCRETE TO SOLID GROUND.
12. SINGLE STREET CATCHBASINS TO BE OPSD 705.010 WITH OPSD. FRAME AND GRATE AS PER OPSD. 704.010. LEAD TO BE 250mm DIA. OR AS SPECIFIED.
13. DOUBLE STREET CATCHBASINS TO BE OPSD 705.020 WITH OPSD. FRAME AND GRATE AS PER OPSD. 704.010. LEAD TO BE 300mm DIA. OR AS SPECIFIED.
14. ALL STORM MANHOLES TO BE AS PER OPSD 701.010, 701.011, 701.012 AND 701.013.
15. ALL MANHOLES TO BE BENCHED THROUGHOUT TO THE OBVERT OF ALL PIPES ON A VERTICAL PROJECTION FROM SPRINGLINE, EXCEPT AS OTHERWISE NOTED.
16. ALL STORM MANHOLES TO HAVE OPSD. 401.010 COVERS.
17. HALF BULKHEADS TO BE INSTALLED IN STORM SEWER OUTLET MANHOLES PRIOR TO CONSTRUCTION AND MAINTAINED TO THE SATISFACTION OF THE CITY OF MISSISSAUGA.

GENERAL NOTES FOR GRADING

A. GENERAL

1. THE ORIGINAL TOPOGRAPHY AND GROUND ELEVATIONS, SERVICING AND SURVEY INFORMATION SHOWN ON THIS PLAN ARE SUPPLIED FOR INFORMATION ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE ACCURACY OF ALL INFORMATION OBTAINED FROM THIS PLAN, ENGINEERING PLANS OR ELSEWHERE.
2. FOR EXACT LOCATION OF SERVICE CONNECTIONS, STREET APPURTENANCES, DRIVEWAY LOCATIONS AND CATCHBASINS AND LEADS, CONTRACTOR TO REFER TO ENGINEERING PLANS.
3. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCHBASIN OUTLETS ARE PROVIDED.
4. "EX" INDICATES THE FINAL GRADE AT A LOCATION TO BE THE SAME AS THE EXISTING GRADE.

   (AT BOUNDARY POINTS THE EXISTING GRADE IS TAKEN TO BE IMMEDIATELY ADJOINING THE DEVELOPMENT LANDS)
5. FINAL PERIMETER GRADES FOR THE SITE WHERE NOT OTHERWISE SHOWN HEREON SHALL BE COINCIDENT WITH THE ADJOINING PERIMETER GRADES OF AN ADJACENT LOT OR BLOCK WHICH SHALL HAVE BEEN PREVIOUSLY ESTABLISHED BY, OR CONSTRUCTED IN ACCORDANCE WITH A MUNICIPAL SITE PLAN APPROVAL OR DEVELOPER GRADING APPROVAL.
6. EMBANKMENTS FORMED DURING THE GRADING SHALL HAVE THE FOLLOWING MAXIMUM GRADES:

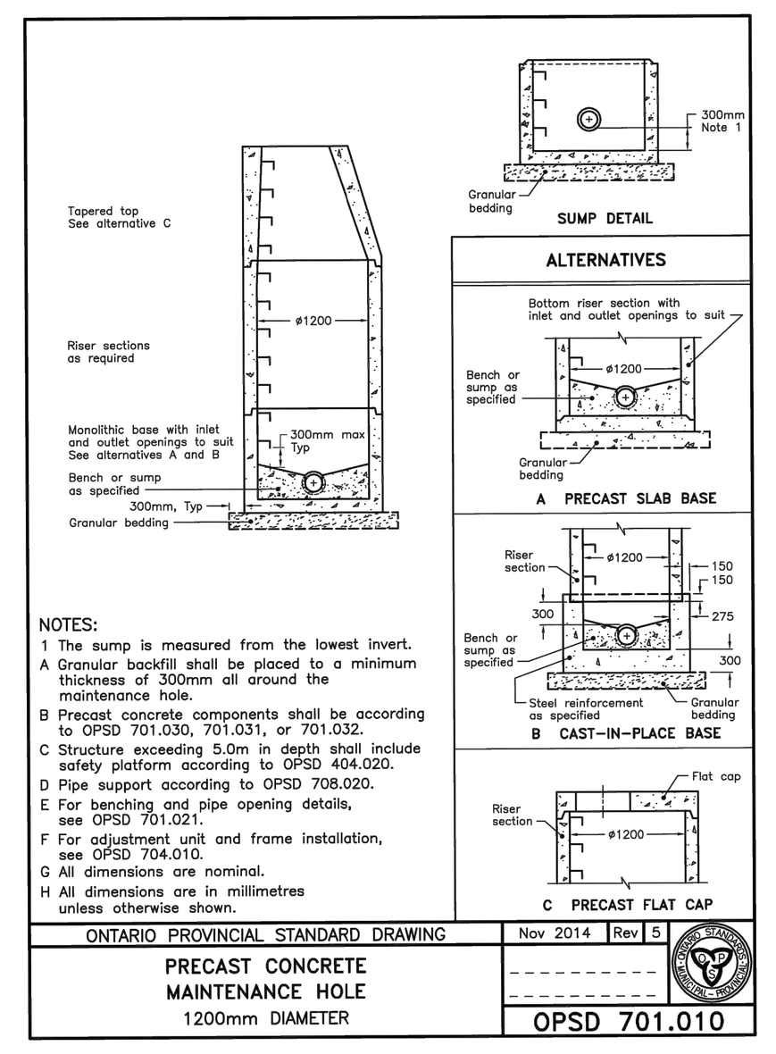
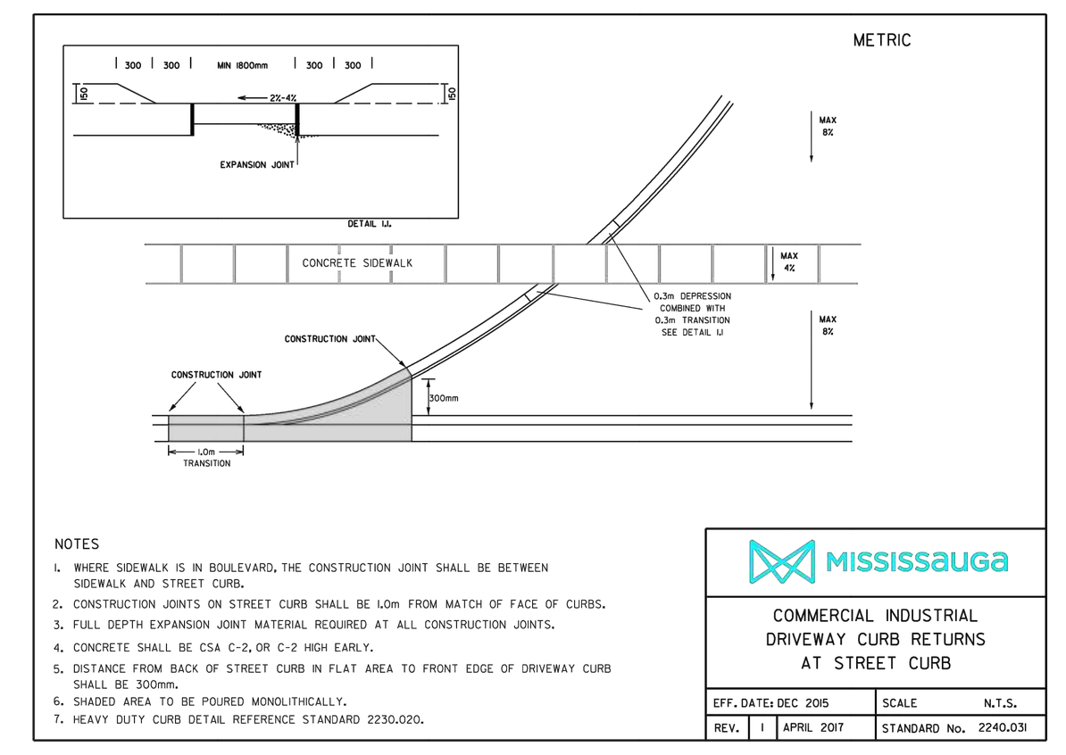
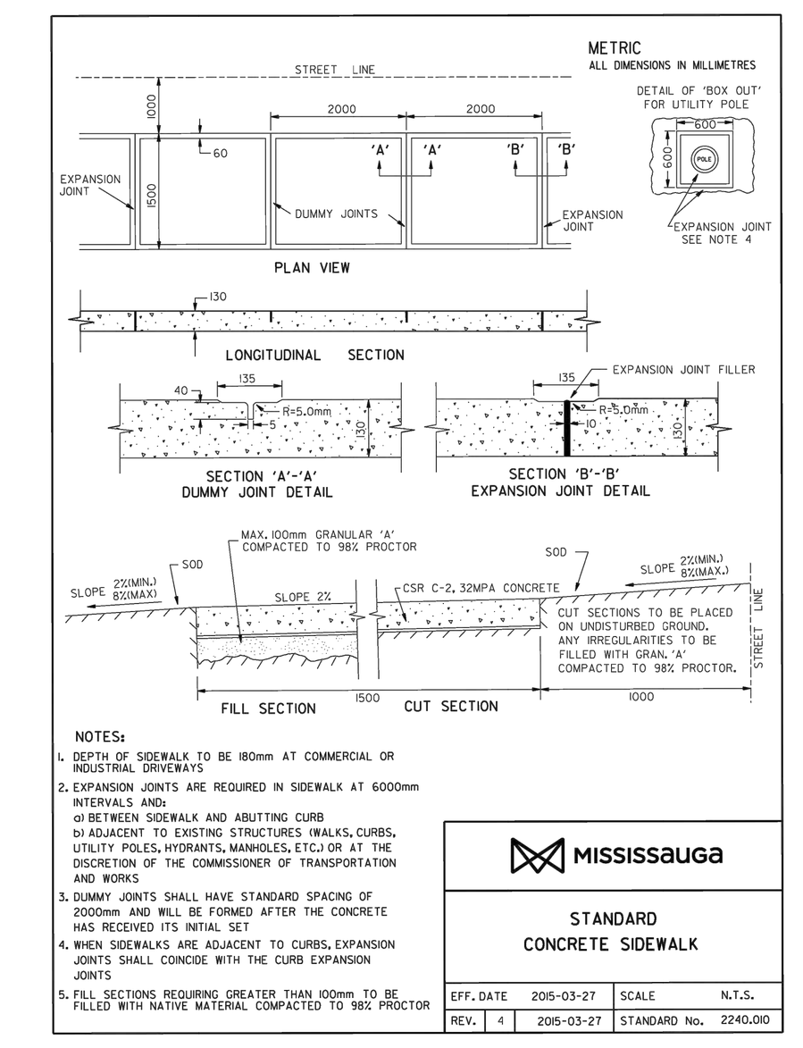
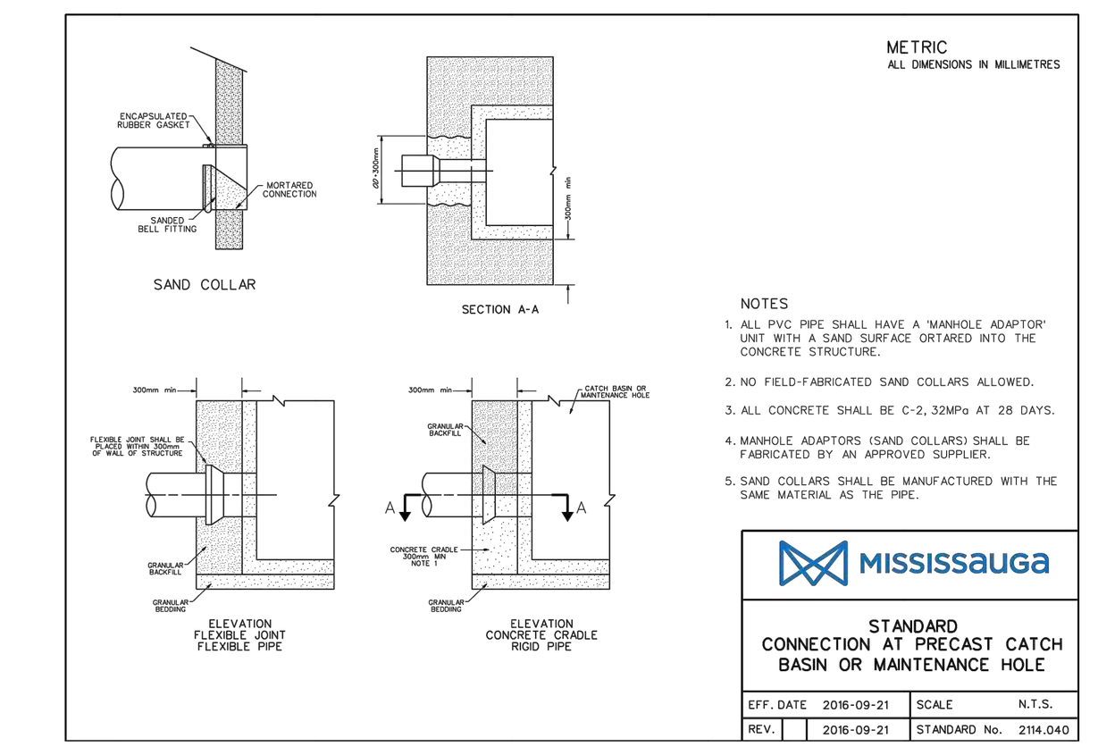
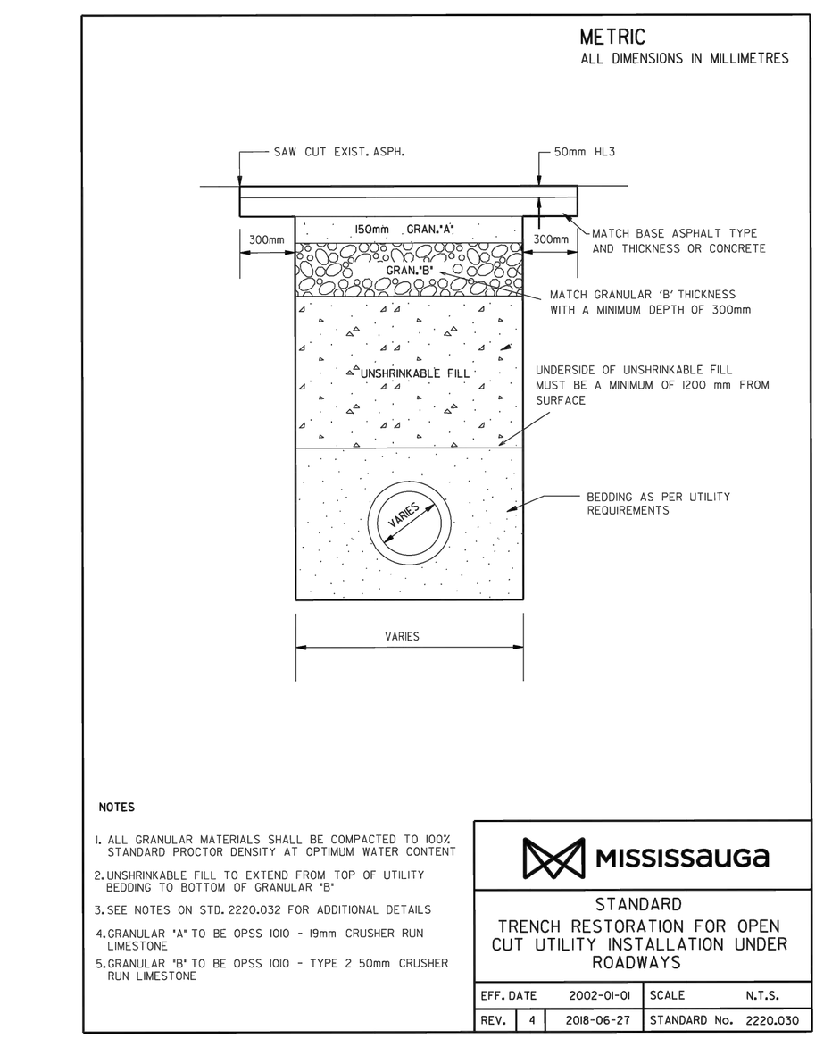
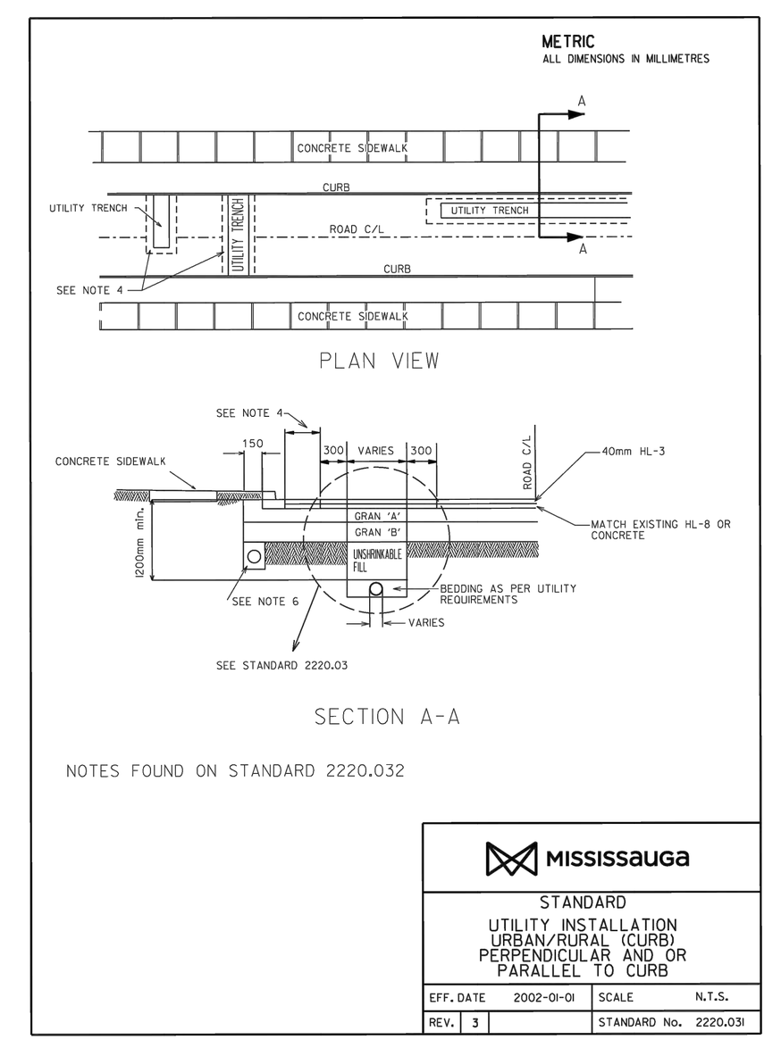
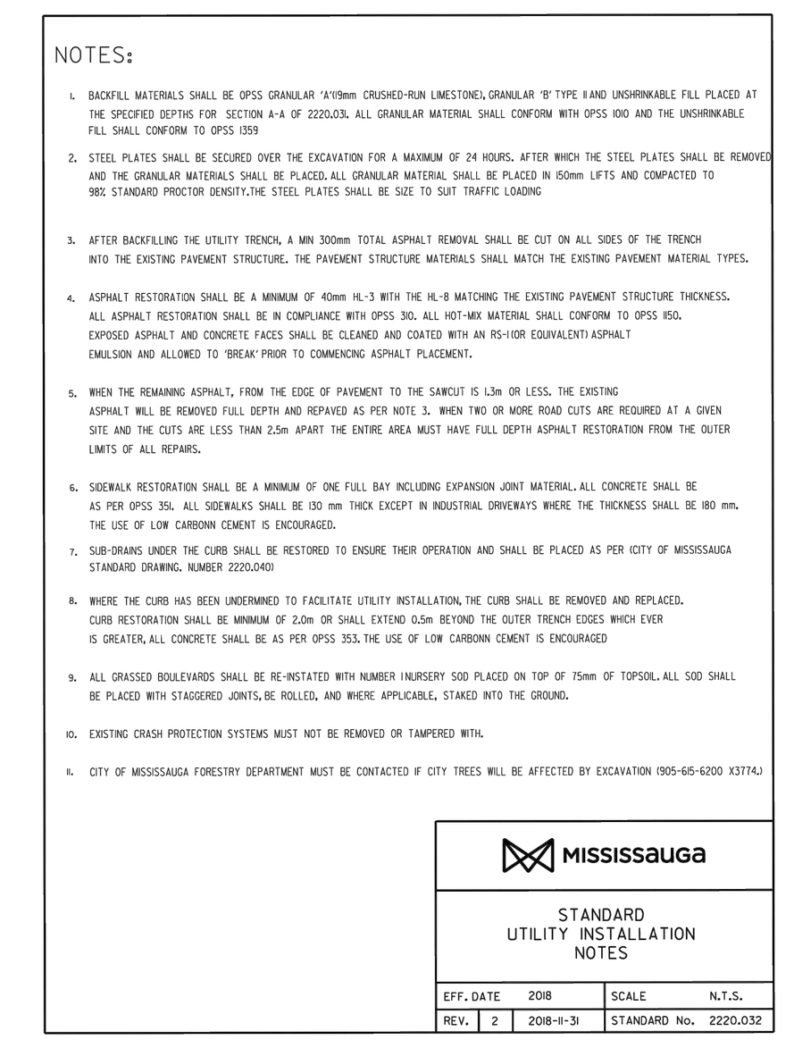
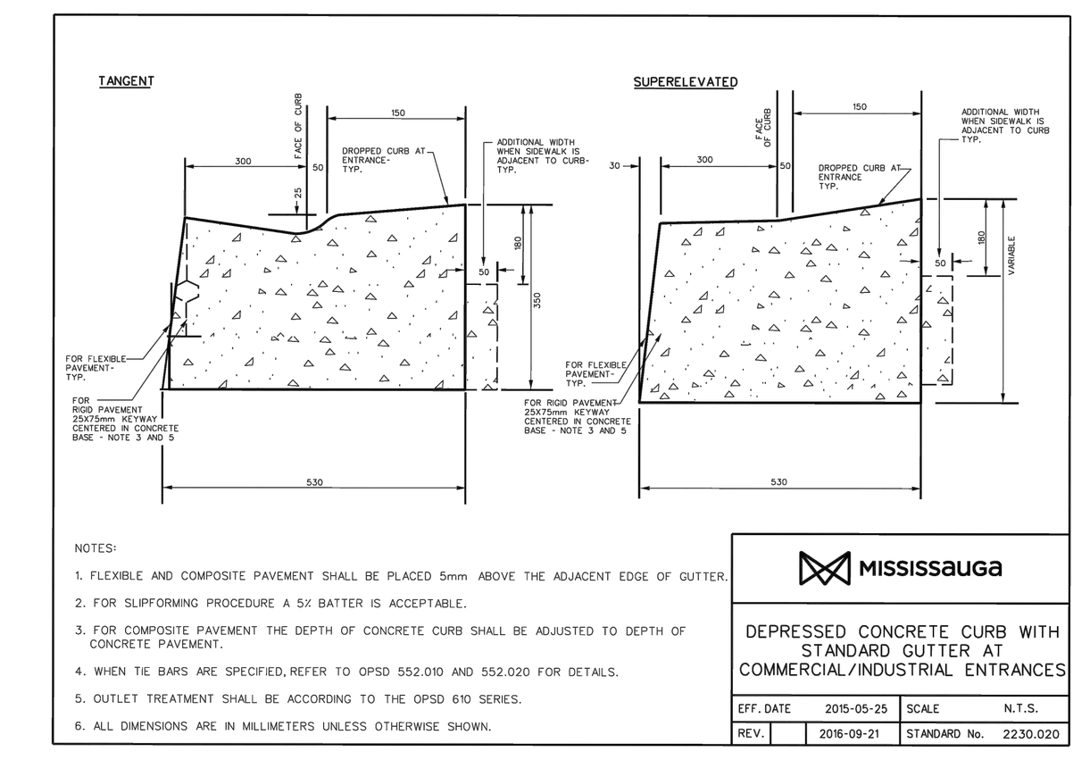
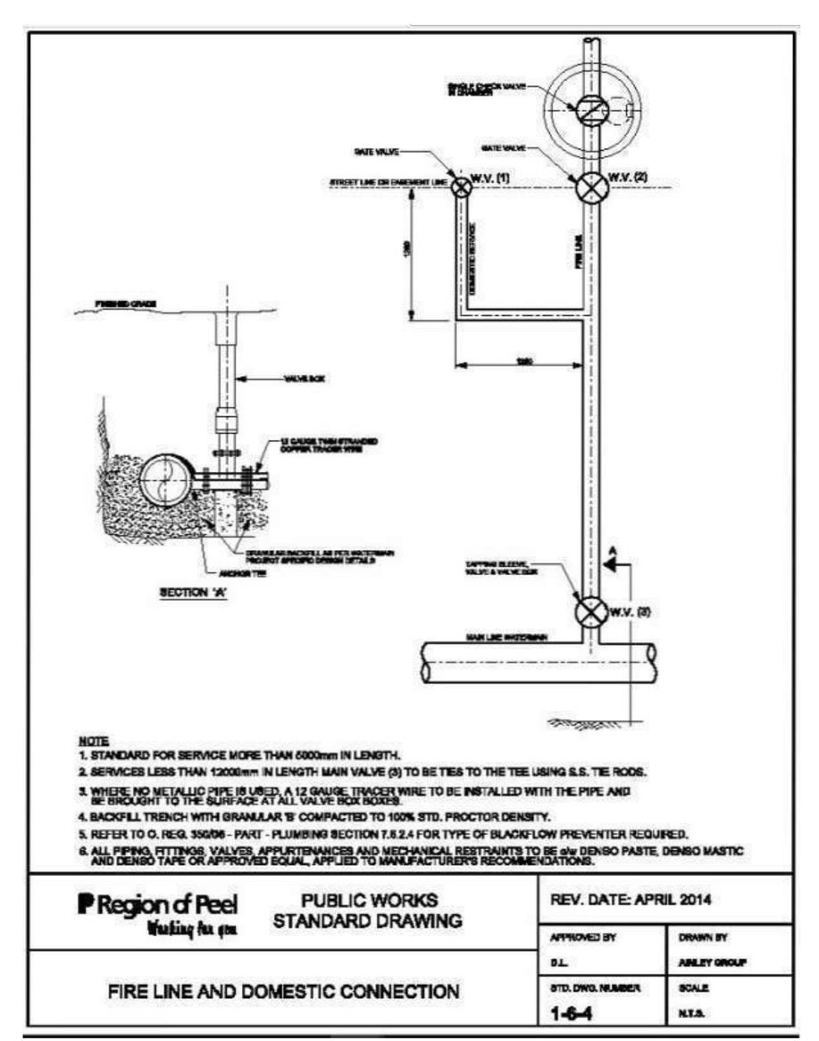
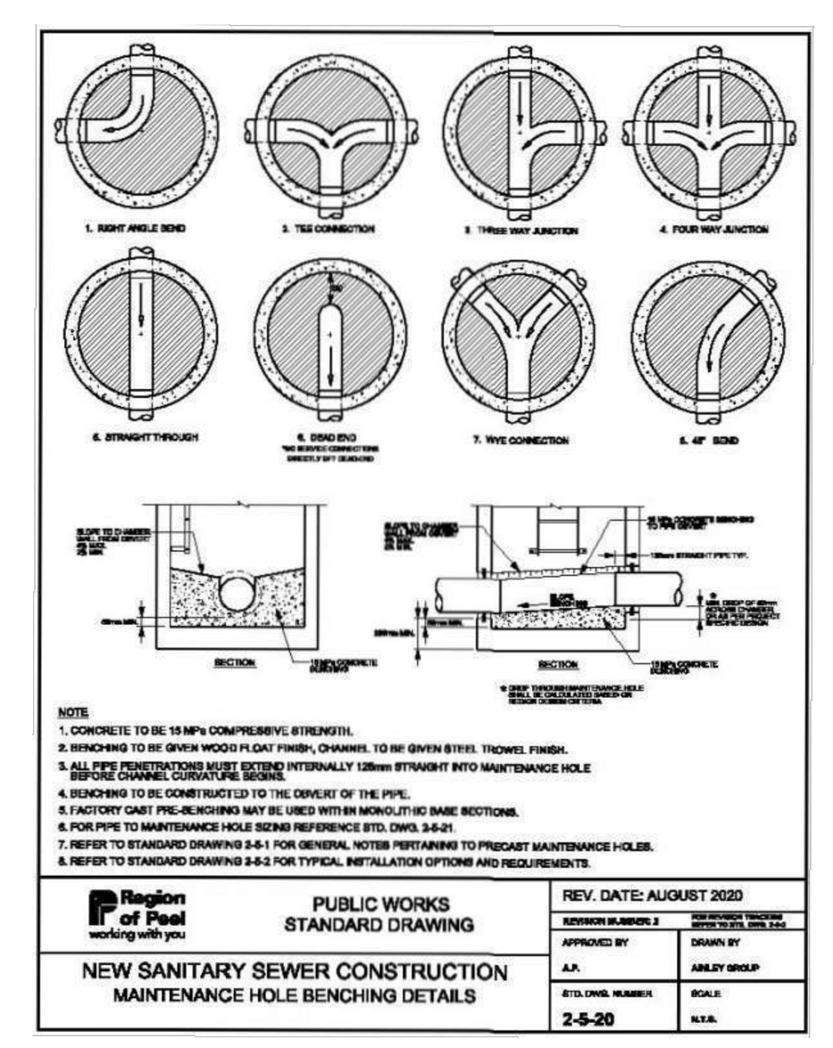
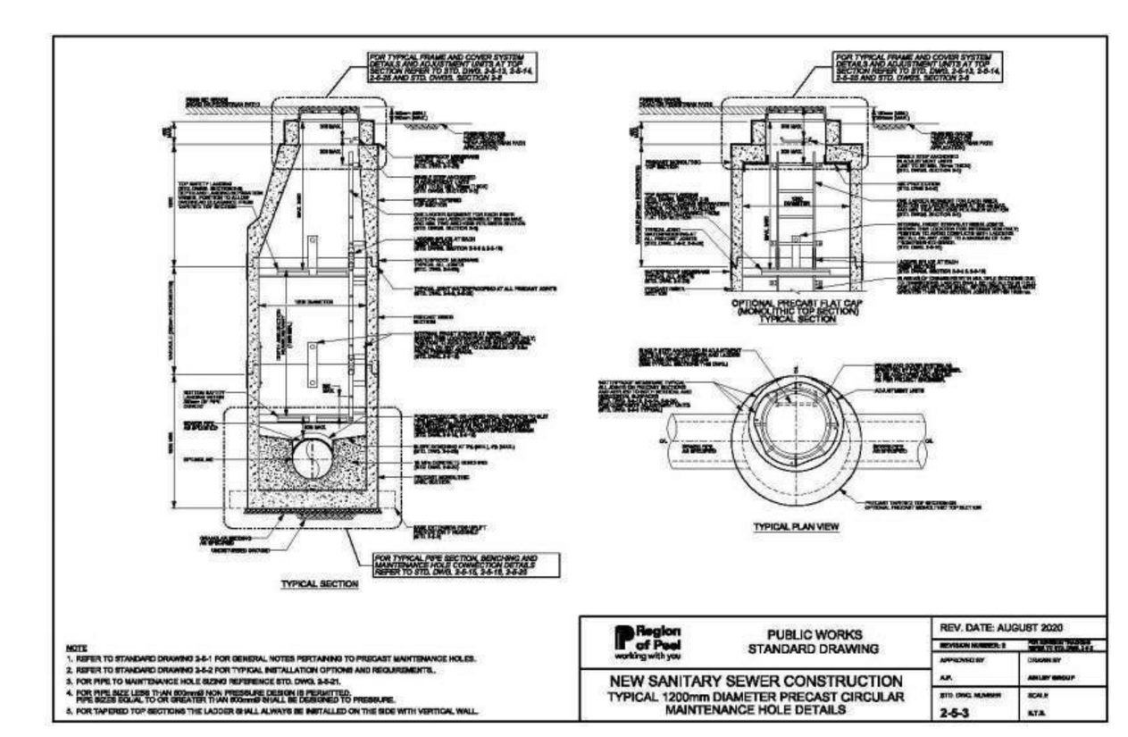
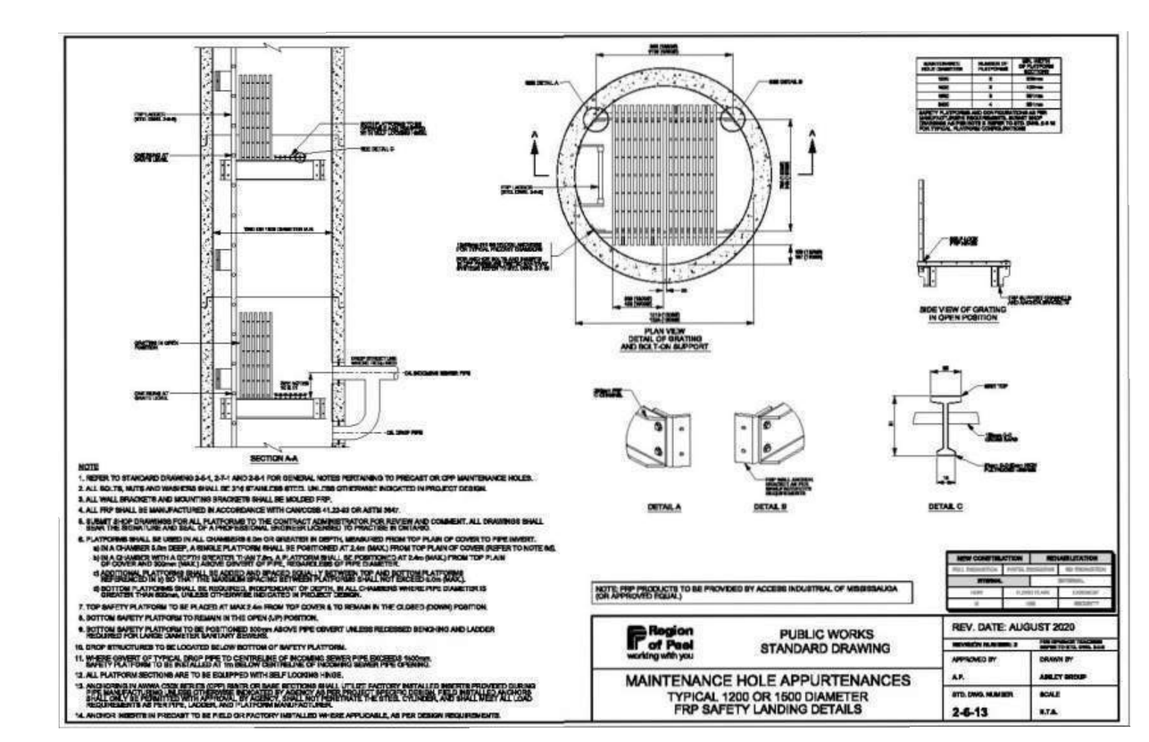
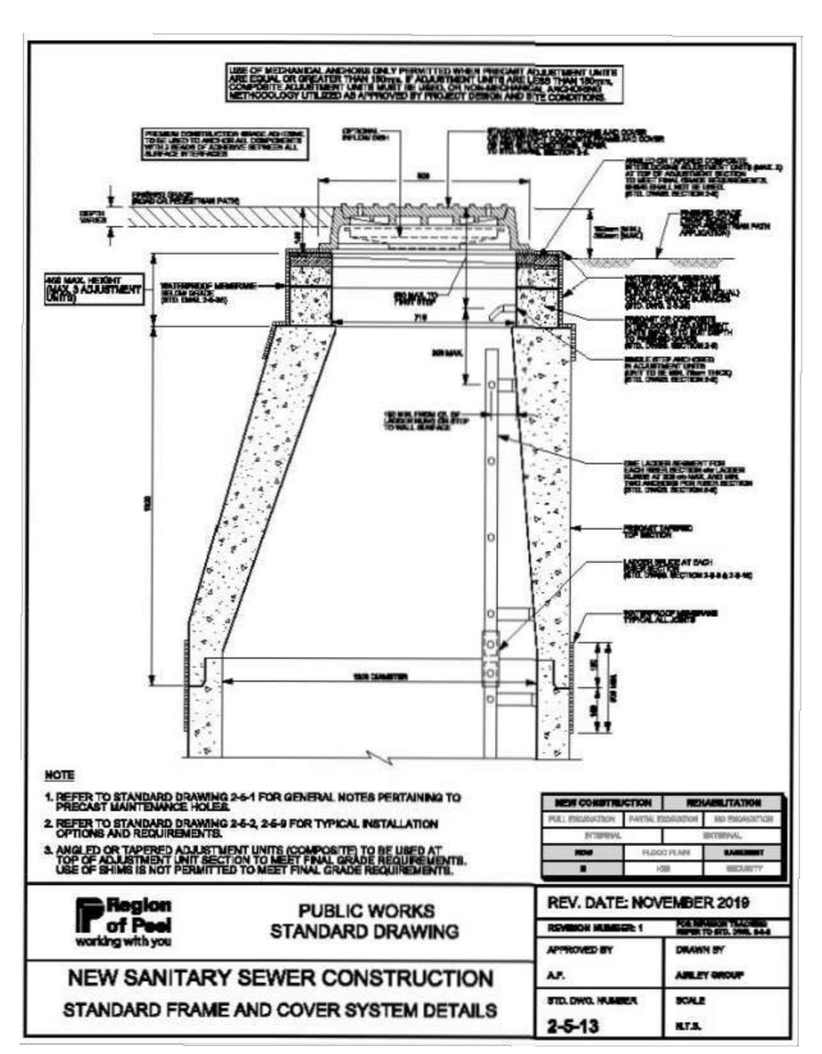
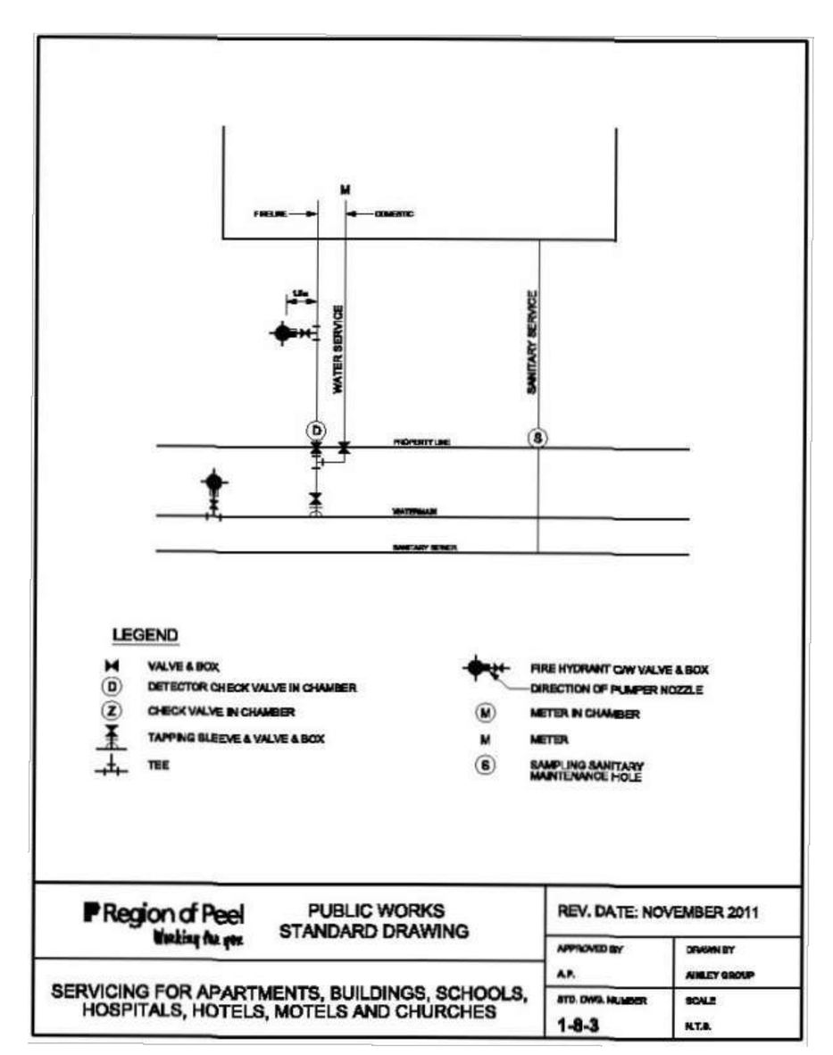
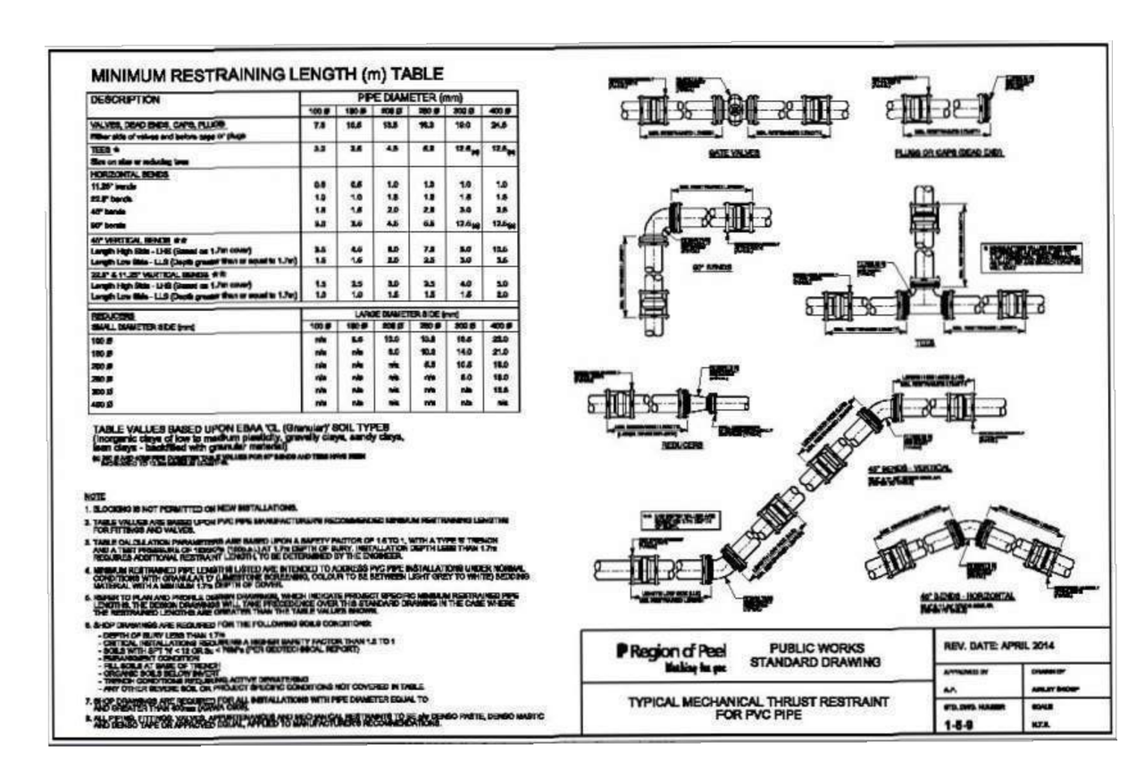
   (A) ADJACENT TO DRIVEWAYS, AND SWALE SIDESLOPES - 3:1 MAXIMUM SLOPE;

   (B) BETWEEN STRUCTURES IN ANY DIRECTION - 3:1 MAXIMUM SLOPE.
7. MAXIMUM DRIVEWAY AND PARKING AREA PAVEMENT GRADES TO BE 5.0%.
8. GRADING AND SODDING OF ADJACENT ROADWAY BOULEVARDS WILL BE PERFORMED IN ACCORDANCE WITH MUNICIPAL SPECIFICATIONS. ALL WATER BOXES, MANHOLE AND CHAMBER COVERS TO BE SET FLUSH WITH FINISHED SOD SURFACE.
9. DRIVEWAY APRON CONSTRUCTION BETWEEN CURB AND STREET LINE TO BE BY CONTRACTOR IN ACCORDANCE WITH MUNICIPAL SPECIFICATIONS.
10. THE BUILDER WILL CONFORM WITH THE CURB CUT LOCATION POLICIES OF THE MUNICIPALITY AND BE RESPONSIBLE FOR ALL RECTIFICATIONS WHICH MAY BE REQUIRED DUE TO DISCREPANCY.
11. ANY TOPSOIL OR ORGANIC MATERIAL CAPABLE OF PRODUCING METHANE WILL BE REMOVED FROM THE SITE OR STOCKPILED FOR LANDSCAPING PURPOSES ONLY.

C. NOTES FOR REGION OF PEEL

GENERAL NOTES

1. LOCATION OF ALL EXISTING UTILITIES IN THE FIELD TO BE ESTABLISHED BY THE CONTRACTOR.
2. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE FOR LOCATES, EXPOSING, SUPPORTING AND PROTECTING OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STRUCTURES EXISTING AT THE TIME OF CONSTRUCTION IN THE AREA OF HIS WORK. WHETHER SHOWN ON THE PLANS OR NOT, AND FOR ALL REPAIRS AND CONSEQUENCES RESULTING FROM DAMAGE TO SAME.
3. THE CONTRACTOR(S) SHALL BE SOLELY RESPONSIBLE TO GIVE 72 HOURS WRITTEN NOTICE TO UTILITIES PRIOR TO CROSSING SUCH UTILITIES, FOR THE PURPOSE OF INSPECTION BY THE CONCERNED UTILITY. THIS INSPECTION WILL BE FOR THE DURATION OF THE CONSTRUCTION, WITH THE CONTRACTOR RESPONSIBLE FOR ALL COSTS ARISING FROM SUCH INSPECTION.
4. ALL MATERIALS AND CONSTRUCTION METHODS MUST CORRESPOND TO THE CURRENT PEEL PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
5. WATERMAIN AND / OR WATER SERVICE MATERIALS 100 mm (4") AND LARGER MUST BE PVC DR18 (AWWA C900) SIZE 50 mm (2") AND SMALLER MUST BE TYPE K SOFT COPPER (ASTM B88-49)
6. WATERMAINS AND / OR WATER SERVICES ARE TO HAVE A MINIMUM COVER OF 1.7 M (5'6") WITH A MINIMUM HORIZONTAL SPACING OF 1.2 M (4') FROM THEMSELVES AND ALL OTHER UTILITIES.
7. PROVISIONS FOR FLUSHING WATER LINE PRIOR TO TESTING, ETC. MUST BE PROVIDED WITH AT LEAST A 50 mm (2") OUTLET ON 100 mm (4") AND LARGER LINES. COPPER LINES ARE TO HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. THEY MUST ALSO BE HOSED OR PIPED TO ALLOW THE WATER TO DRAIN ONTO A PARKING LOT OR DOWN A DRAIN. ON FIRE LINES, FLUSHING OUTLET TO BE 100 mm (4") DIAMETER MINIMUM ON A HYDRANT.
8. ALL CURB STOPS TO BE 3.0 M (10') OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED.
9. HYDRANT AND VALVE SET TO REGION STANDARD 1 - 6 - 1 DIMENSION A AND B, 0.7 M (2') AND 0.9 M (3') AND TO HAVE PUMPER NOZZLE.
10. WATERMAINS TO BE INSTALLED TO GRADES AS SHOWN ON APPROVED SITE PLAN. COPY OF GRADE SHEET MUST BE SUPPLIED TO INSPECTOR PRIOR TO COMMENCEMENT OF WORK, WHERE REQUESTED BY INSPECTOR.
11. WATERMAINS MUST HAVE A MINIMUM VERTICAL CLEARANCE OF 0.3 M (12") OVER / 0.5 M (20") UNDER SEWERS AND ALL OTHER UTILITIES WHEN CROSSING.
12. ALL PROPOSED WATER PIPING MUST BE ISOLATED FROM EXISTING LINES IN ORDER TO ALLOW INDEPENDENT PRESSURE TESTING AND CHLORINATING FROM EXISTING SYSTEMS.
13. ALL LIVE TAPPING AND OPERATION OF REGION WATER VALVES SHALL BE ARRANGED THROUGH THE REGIONAL INSPECTOR ASSIGNED OR BY CONTACTING THE OPERATIONS AND MAINTENANCE DIVISION
14. ALL PROPOSED WATER PIPING MUST BE ISOLATED THROUGH A TEMPORARY CONNECTION THAT SHALL INCLUDE AN APPROPRIATE CROSS-CONNECTION CONTROL DEVICE, CONSISTENT WITH THE DEGREE OF HAZARD, FOR BACKFLOW PREVENTION OF THE ACTIVE DISTRIBUTION SYSTEM, CONFORMING TO REGION OF PEEL STANDARDS 1-7-7 OR 1-7-8.

CLIENT

QUEENCORP ERIN MILLS L.P.

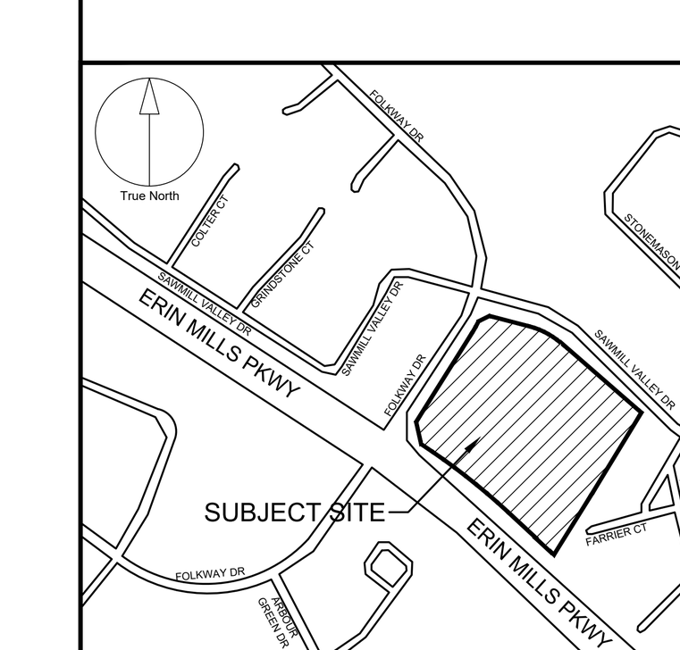
-

COPYRIGHT

ISSUES

No.	DESCRIPTION	DATE
1.	ISSUED FOR ZBA	JULY 22, 2022
2.	ISSUED FOR ZBA (PARTIAL RE-SUBMISSION)	SEP 11, 2024
3.		
4.		

LEGEND



KEY PLAN

ARCADIS

PROJECT

4099 ERIN MILL PKWY
CITY OF MISSISSAUGA

LIST OF DRAWINGS

SITE PLAN INFORMATION

TURNER FLEISCHER ARCHITECTS INC.
67 LESMILL RD
TORONTO, ON M3B 2T8
PHONE: (416) 425-2222

SURVEY INFORMATION

J.D. BARNES LTD
401 WHEELABRATOR WAY, SUITE A
MILTON, ON L9T 3C1
PHONE: (905) 875-9956
FAX: (905) 785-9956

BENCHMARK INFORMATION:
ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM CITY OF MISSISSAUGA BENCHMARK No. 799, HAVING AN ELEVATION = 160.866 METRES.
BENCHMARK No. 30, HAVING AN ELEVATION = 150.781 METRES.

SCALE:

PROJECT NO:
137429

DRAWN BY:	CHECKED BY:
ST	**NDS**
PROJECT MGR:	APPROVED BY:
NG	**NG**

SHEET TITLE

GENERAL NOTES AND DETAILS

SHEET NUMBER: C501

ISSUE: 02

SCALE CHECK 1 in 10mm

File Location: \\caneast.ibigroup.com\J\TO\137429_4099ErinMills\7.0_Production\7.03_Design\04_Civil\Sheets

Arcadis Professional Services (Canada) Inc.
8133 Warden Ave, Unit 300
Markham, ON L6G 1B3
Canada
Phone: 1 905 763 2322
www.arcadis.com