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Reply to: Charlotte Patterson, P. Eng.
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Date: October 10, 2024
Our Ref: 141003

Subject: **Response to City Comments**
Zoning By-Law Amendment Application No. 23 124848 STE 04 OZ
Applicant: Fora Developments Inc.
Location: 2400 Dundas Street West **Ward: 4**

Dear Charlotte,

Arcadis Professional Services (Canada) Inc. is in receipt of the City of Toronto (the "City")'s engineering submission comments prepared for the above-noted project. We have reviewed your comments and provide the following responses itemized as per your **July 19, 2024**, circulation comments. For ease of reference, the City comments have been reiterated in *italics*, with Arcadis Professional Services (Canada) Inc.'s responses in **bold** below.

#	Comment	Response
3.1	*Revise the Functional Servicing and Stormwater Management Report as per the comments in Attachment 1.*	**The FS+SWM report has been updated per comments received.**
3.2	*Revise the Servicing Report and Groundwater Summary form as per the comments in Attachment 2.*	**The Servicing Report & Groundwater Summary form has been updated per comments received.**

Hamid Mazaheri, M.SC., P. Eng., PMP
2400 Dundas Street West
October 10, 2024

We trust that this letter provides you with the additional information which you required at this time. Should you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

ARCADIS PROFESSIONAL SERVICES (CANADA) INC.

Jason Jenkins, P.Eng., P.E.
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Fora Developments

2400 – 2440 Dundas St. West City of Toronto

Functional Servicing and Stormwater Management Report (FSR/SWM)

October 10, 2024

2400 – 2440 Dundas St. West

Functional Servicing and Stormwater Management Report (FSR/SWM)

October 10, 2024

Prepared By:
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_____

Jason Jenkins, P.Eng., P.E.
Associate Principal, Practice Lead
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Version Control

Issue	Rev No.	Date Issued	Description	Reviewed By
ZBA	1	May 2023	Final Report	JJ
ZBA	2	October 10, 2024	Final Report	JJ
ZBA	3	October 10, 2024	Final Report	JJ

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1 Introduction

1.1 Background

Arcadis Professional Services (Canada) Inc. (Arcadis) has been retained by Fora Developments (the "Owner") to prepare a Functional Servicing Report to support the Zoning By-Law Amendment (ZBA) process for a proposed mixed-use development located at 2400 - 2440 Dundas Street West (the "Subject Site"), in the City of Toronto (the "City"). The purpose of this report is to develop a municipal site servicing strategy (stormwater, sanitary discharge, and water supply), and to identify any potential constraints within the existing municipal infrastructure. More specifically, the report will present the following:

- Calculate allowable and proposed runoff rates for the development;
- Evaluate suitable methods for attenuation and treatment of stormwater runoff;
- Develop on-site control measures and examine theoretical performance to satisfy the City's Wet Weather Flow Management Guidelines (WWFMG);
- Evaluate groundwater quantity and quality parameters from the hydrogeological report and develop a strategy to manage groundwater under both short- and long-term conditions to comply with the City of Toronto's Discharge By-Law criteria;
- Develop a Stormwater Management (SWM) plan that complies with the City's Wet Weather Flow Management Guidelines (WWFMG);
- Identify sanitary servicing opportunities and constraints and evaluate the capacity of the receiving municipal sewer; and,
- Identify water servicing opportunities and constraints, calculate the proposed domestic water and firefighting supply needs; and evaluate the capacity of the municipal infrastructure.

The following documents have been obtained from various sources:

- City of Toronto plan and profile drawings for Dundas Street West;
- City of Toronto DMOG Mapping of water and sewer networks;
- Topographic Survey prepared by KRCMAR Surveyors Ltd., dated May 2022; and,
- Architectural plans and site statistics prepared by GPA Architects

1.2 Existing Site Description

Located in the City of Toronto, the 11,143 m^2 (1.11 ha) subject site is bounded by Dundas Street West to the west, railroad tracks to the east, a single storey retail space to the north, and a mixed-use high rise building to the south. Please see **Figure 1** following the report for an aerial view of the site.

The site currently hosts (1) one-story and (1) two-storey commercial buildings and an asphalt parking surface which are to be removed. The site slopes to the south with ground surface elevations ranging from 115.14 m to 113.83 m and is self-contained with no external drainage areas to consider.

The subject site is located within Basement Flooding Study Area (BFA) #44 which is slated to be completed in 2024, therefore, the no Infoworks model was available.

1.3 Site Proposal

The proposed development includes the phased construction of the following:

- Phase 1 (Block A): A 37-storey tower (Tower A) with residential and retail space.
- Phase 2 (Block B): A 42-storey residential tower (Tower B1) and a 25-storey residential tower (Tower B2) with a shared mixed-use podium containing residential and commercial space.
- Parkland Dedication: A 1,044 m^2 parkland dedication fronting Dundas Street West.

The buildings will be connected via a shared underground level which will contain parking, storage, and utility rooms. Sample architectural drawings can be found in **Appendix A** for reference.

1.4 Service Connections

Per the City's servicing requirements for point tower developments, separate storm sewer connections and SWM facilities are required for each point tower and the shared podium, or the buildings may share a SWM facility and storm connection if the internal mechanical piping for each building is separated with sampling ports for each system upstream of the connection point to the SWM facility.

Per the City's servicing requirements, individual sanitary and domestic services are required for each built form. Accordingly, each tower and the podium shall be serviced independently for sanitary and domestic services.

Per the Ontario Building Code (OBC), two fire service connections separated by an isolation valve are required for any building above 84 m in height. As the proposed towers will exceed this threshold, a secondary fire line will be required to service each building. Furthermore, per the City's design Criteria for Sewers and Watermains, if a building exceeds 84 m and two separate watermains are available to service the development from a fire flow perspective, the applicant must connect to each of them. As there is only one watermain available, the fire service connections will be separated by an isolation valve.

Accordingly, service connections and SWM facilities shall be provided as follows:

Phase 1/Block A:

- (1) SWM facility and storm service connection
- (1) sanitary service connection
- (2) fire service connections
- (1) domestic water connection

Phase 2/Block B:

- (1) shared SWM facility and storm service connection for the podium and point towers, with (3) individual sampling ports upstream
- (3) sanitary service connections
- (2) fire service connections
- (3) domestic water connections

Parkland Dedication:

- (1) SWM facility and storm service connection
- (1) sanitary service connection
- (1) domestic water connection

Specific site servicing details will be further discussed in subsequent sections.

2 Terms of Reference and Methodology

2.1 Terms of Reference

The terms of reference used for the scope of this report have been based on the City of Toronto Design Criteria for Sewers and Watermains, dated January 2021, and the City of Toronto Wet Weather Flow Management Guidelines, dated November 2006. The City's Sewer Capacity Assessment Guidelines (July 2021) were referenced to assess the capacity of the existing sanitary sewers.

2.2 Methodology: Stormwater Management

As the proposed development has a total site area less than 5.0 ha (Table 7, Section 2, WWFMG), the following SWM criteria shall apply:

Quantity Control

The allowable release rate to the municipal storm sewer system from the development site during a 2- year design storm event must not exceed the peak runoff rate from the site under pre-development conditions during the same storm event, or existing capacity of the receiving storm sewer, whichever is less.

A maximum runoff coefficient of 0.50 shall be used in calculating the pre-development peak runoff. An overland flow route (major system) shall be provided within the developed site to direct runoff in excess of the 100-year storm to an approved overland flow outlet.

Quality Control

Long-term average removal of 80% of the total suspended solids (TSS) on an annual loading basis must be achieved. TSS removal efficiency is to be based on 100% of the runoff leaving the site from all storm events that occurs in an average year.

Water Balance

As the proposed development aims to qualify for Tier 1 of the Toronto Green Standard (TGS), controls should be in place, such that the runoff resulting from a 5 mm rainfall event must be retained on-site for rainwater re-use, infiltration, and evapotranspiration.

2.3 Methodology: Sanitary Discharge

Pre- and post-development peak sewer flows will be calculated based on the following City design criteria:

Table 2-1 Sanitary Design Parameters

DESIGN FLOWS		POPULATION DENSITIES	
Residential Flow	240 L/c/day		
ICI Flow	250 L/c/day		
Infiltration Allowance	0.26 L/s/ha	1 Bedroom Units	1.4 people / unit
Peaking Factor	Harmon Equation	2 Bedroom Units	2.1 people / unit
SANITARY SERVICE CONNECTION SIZING		3 Bedroom Units	3.1 people / unit
Population Flow	450 L/c/day	Retail Space	1.1 people/100m^2
Infiltration Allowance	0.26 L/s/ha	Office Space	3.3 people/100m^2
Peaking Factor	Harmon Equation		

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

2.4 Methodology: Water Supply

The domestic water usage will be calculated based on the following City of Toronto and Ontario Building Code design criteria:

Table 2-2 Water Design Parameters

Average Daily Demand (ADD)		Peaking Factors		
		Land Use	Peak Hour	Max Day
Single Family	310 L/c-day	Residential	2.25	1.50
Multi-Unit	190 L/c-day	Commercial	1.20	1.10

Pressure and flow testing to determine the adequacy of the existing watermain to support the development with fire suppression in accordance with the Fire Underwriters Survey (FUS) Guidelines will be discussed in the subsequent sections.

3 Foundation Drainage

3.1 Groundwater Quality

A hydrogeological assessment was carried out by Groundwater Environmental Management Services (GEMS), dated June 7, 2024, to assess existing groundwater conditions. Per the assessment, the groundwater quality was found to be below the City's limits for discharge to sanitary sewers but exceed the City's limits for discharge to storm sewers for both Total Suspended Solids (TSS) and Total Manganese (Mn). The results are summarized as follows:

Table 3-1 Groundwater Quality Exceedances

Parameter	Storm By-Law Criteria	Sanitary By-Law Criteria	Measured Reading
Total Suspended Solids (TSS)	15 mg/L	350 mg/L	41 mg/L
Total Manganese (Mn)	50 ug/L	5000 ug/L	170 mg/L

Therefore, it is proposed that all dewatering activities will be discharged to the combined sewer without pre-treatment. Please see **Appendix B** for an excerpt copy of the hydrogeological assessment.

3.2 Short-Term Groundwater Discharge

The anticipated short-term groundwater discharge has been estimated by GEMS to be 597,730 L/day (6.9 L/s). At the time of this report, a dewatering plan was not made available. It is therefore assumed that groundwater pumping will operate for 12 hours per day.

The peak post-development sanitary design flow has been estimated to be 21.5 L/s (please see Section 5) which exceeds the anticipated short-term pumping rate. Therefore, the long-term rate governs and will be used to assess downstream sewer capacity and compliance with MECP Procedure F-5-5 which will be discussed in subsequent sections.

Furthermore, compliance with MECP procedure F-5-5 will require an off-site catchbasin disconnection, which is further discussed in subsequent sections of this report. It should be noted that the off-site disconnection must be completed before short-term groundwater can be discharged to the combined sewer so that at no point will the flow into the combined sewer system be more than existing. Phasing will not adversely impact the short-term discharge because the post-development is greater than the estimated interim groundwater discharge. Underground structure construction is yet to be determined if it will be phased or at once.

The following table summarizes the recommendations for groundwater discharge during construction. It should be noted that a Permit to Take Water (PTTW) application must be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if dewatering rates exceed 50 m^3/day.

Table 3-2 Short-Term Groundwater Discharge Summary

Average Discharge	Average Discharge	Hours Of Pumping	Peak Discharge	Connection Outlet	Treatment Required
597 m^3/Day	6.9 L/s	12 Hours	13.8 L/s	Combined	No

3.3 Long-Term Groundwater Discharge

As the site is seeking an exemption to the City's Foundation Drainage Policy, a Private Water Drainage System (PWDS) with perimeter weeping tile is proposed below the basement slab, which shall discharge to the sanitary control manhole. Please refer to the Hydrogeological Investigation by GEMS for additional details related to the policy exemption.

Underground structure construction is yet to be determined if it will be phased or at once, however a single discharge

The following table shows the anticipated long-term discharge as estimated by GEMS, and corresponding pumping rates as established by the mechanical consultant, MCW Consultants Ltd. The pumping rate has been used to determine the post-development sewer flow, downstream sewer capacity, and compliance with MECP Procedure F-5-5 which will be further discussed in **Section 5**.

Table 3-3 Long-Term Groundwater Discharge

Average Discharge	Average Discharge	Hours Of Pumping	Peak Discharge	Connection Outlet	Treatment Required
6,868 L/Day	0.08 L/s	12 Hours	0.16 L/s	Dundas Combined	No

Please refer to **Drawing SS-01** for the location of the groundwater Sampling Access Port (SAP), and **Appendix B** for a copy of the Servicing Report Groundwater Summary Form.

4 Stormwater Management

4.1 Pre-Development Conditions

There is one dedicated storm sewer within Dundas Street West ranging in size from 450 mm to 600 mm fronting the site. This storm sewer conveys flows south to Bloor Street West and eventually to High Park. Storm drainage within the site is conveyed to the 450 mm storm sewer through an existing storm service connection. Please refer to dye testing in **Appendix A** which confirms existing storm drainage.

As previously mentioned, the site currently hosts two existing buildings and an asphalt parking lot resulting in a pre-development runoff coefficient of 0.90, however, the allowable release rate will be calculated using 0.50 per the City's WWFMG.

4.2 Grading

Under pre-development conditions, no external drainage enters the site and all drainage within the site is conveyed to Dundas Street West. Proposed grades and existing drainage patterns will be maintained along property lines to the extent practical. Emergency overland flow route in excess of a 100-year storm event will continue to be directed Dundas Street West matching pre-development conditions.

4.3 Allowable Release Rates

Using the City's IDF data for a 2-year storm event and a time of concentration of 10 minutes, the gross allowable release rate for the subject site is calculated as follows:

Phase 1 (Block A)

$$Q_{Allowable} = \frac{(A \times R) * I_2}{360} = \frac{(0.4384\ ha \times 0.50) \times 88.2\ mm/hr}{360} \times \left(\frac{1000\ L}{m^3}\right) = \mathbf{53.7\ L/s}$$

Phase 2 (Block B)

$$Q_{Allowable} = \frac{(A \times R) * I_2}{360} = \frac{(0.5715\ ha \times 0.50) \times 88.2\ mm/hr}{360} \times \left(\frac{1000\ L}{m^3}\right) = \mathbf{70.0\ L/s}$$

Parkland Dedication

$$Q_{Allowable} = \frac{(A \times R) * I_2}{360} = \frac{(0.1044\ ha \times 0.50) \times 88.2\ mm/hr}{360} \times \left(\frac{1000\ L}{m^3}\right) = \mathbf{12.8\ L/s}$$

As shown above, the gross allowable release rate from the subject site shall be limited to a maximum of **53.7 L/s** for Phase 1, **70.0 L/s** for Phase 2, and **12.8** L/s for the park. The associated pre-development drainage area plan is shown on **Figure DAP-1** which can be found in **Appendix C** for reference.

4.4 Uncontrolled Flows

Due to grading constraints, a small portion of the site will be released uncontrolled. Using the City's IDF data for a 100-year storm event and a time of concentration of 10 minutes, the un-controlled discharge is summarized as follows:

Table 4-1 100-Year Uncontrolled Storm Flow

Phase/Block	Receiving Street Name	Drainage Area (ha)	Runoff Coefficient	Time Of Concentration	Intensity (mm/hr)	Flow (L/s)
Phase 1/Block A	Dundas St.W.	0.0046	0.90	10 min	250.3	2.9
Phase 2/Block B	Dundas St.W.	0.0096	0.90	10 min	250.3	6.0

The site will require on-site storage which will be further discussed in the following section. The net allowable release from the storage element will be reduced by the un-controlled flow calculated above. Please see **Appendix C** for the detailed design sheet.

4.5 Quantity Control

As previously mentioned, the allowable release rate for the subject site shall be limited to the 2-year target flow calculated in **Section 4.3**.

To attenuate flows per the City's WWFMG, each phase and the parkland dedication will require underground stormwater storage and an orifice control. Storage details are summarized as follows:

Phase 1/Block A

Block A will require a stormwater management tank with a minimum storage area of 135 m^2 and an orifice tube consisting of a 5" (128mm) Schedule 40 PVC pipe. Setting the 100-year storage depth at 0.83 m, the orifice discharge is calculated as follows:

$$Q_{Orifice} = (0.82) * \frac{\pi * (0.128)^2}{4} * \sqrt{2 * 9.81 * (0.83\text{-}0.128/2)} \times \frac{1000\ L}{1\ m^3} = \mathbf{41.0\ L/s}$$

Phase 2/Block B

Block B will require a stormwater management tank with a minimum storage area of 100 m^2 and an orifice tube consisting of a 5" (128mm) Schedule 40 PVC pipe. Setting the 100-year storage depth at 1.76 m, the orifice discharge is calculated as follows:

$$Q_{Orifice} = (0.82) * \frac{\pi * (0.128)^2}{4} * \sqrt{2 * 9.81 * (1.76\text{-}0.128/2)} \times \frac{1000\ L}{1\ m^3} = \mathbf{60.9\ L/s}$$

Parkland Dedication

The park will require a 35 m length of 750 mm diameter oversize pipe and a 75 mm orifice plate. Setting the 100-year storage depth at 0.92 m, the orifice discharge is calculated as follows:

$$Q_{Orifice} = (0.63) * \frac{\pi * (0.075)^2}{4} * \sqrt{2 * 9.81 * (0.92\text{-}0.0.75/2)} \times \frac{1000\ L}{1\ m^3} = \mathbf{11.6\ L/s}$$

The following provides a summary of the stormwater management parameters pertaining to quantity control:

Table 4-2 Discharge Summary

Phase / Block	Storage Req'd (m^3)	Storage Provided (m^3)	Allowable Release Rate (L/s)	Orifice Release Rate (L/s)	Uncontrolled Flow (L/s)	Total Release Rate (L/s)
Phase 1 / Block A	112.7	141.8	53.7	41.0	2.9	43.9
Phase 2 / Block B	160.2	176.9	70.0	60.9	6.0	66.9
Parkland Dedication	14.8	31.0	12.8	11.6	0.0	11.6

As shown above, the site discharge (orifice + un-controlled) is less than the allowable site release rate for each block. By providing on-site storage and an orifice control for each block, the City's objectives for quantity control have been met. Please see detailed calculations which can be found in **Appendix C**. It should be noted that regular inspection and maintenance of any storage element and orifice control should be conducted on a regular basis to ensure that the system is functioning as designed.

4.6 Quality Control

As previously mentioned, 80% TSS removal is required in order to meet the City's WWFMG. Based on the proposed site conditions and surface treatment, the following summarizes the inferred TSS removal rate of each site:

Phase 1/Block A

Table 4.3 TSS Performance: Phase 1

Surface Type	Area (m^2)	Effective TSS	Overall TSS
Conv. Roof	1,764	80	32.2
Extensive Green Roof	1,270	80	23.2
Intensive Green Roof	0	80	0.0
Landscape	163	80	3.0
Landscape Over P1	0	80	0.0
Pavers	0	80	0.0
Impervious (Dirty)	1,141	0	0.0
Impervious (Clean)	46	80	0.8
Total	4,384		59.2

Left untreated, the site will not achieve the City's requirement for 80% TSS removal. Therefore, it is proposed that a Stormfilter© system complete with (6) media cartridges be installed. All "dirty" areas within the drive aisle shall first be directed to the Contech chamber, whereas all other areas can be considered clean and routed directly to the stormwater management tank. Please refer to the Contech Sizing Report which can be found in **Appendix C**.

The Stormfilter© system is accepted as a standalone off-line treatment unit and meets the City of Toronto's criteria for 80% TSS per the WWMFG's. Any proposed substitutions will require approval from both the engineer of record and the City of Toronto.

It is recommended that the Stormfilter© system be inspected on a regular basis to ensure proper operation. Per Contech's recommendations, inspection and maintenance should be carried out at a minimal interval of 12 months with inspections prior to each winter season with filter replacements as required.

By adding this stormwater quality treatment unit, the City requirements for quality control (i.e. minimum 80% TSS removal) have been satisfied for the Phase 1 site.

Phase 2/Block B

Table 4.4 TSS Performance: Phase 2

Surface Type	Area (m^2)	Effective TSS	Overall TSS
Conv. Roof	2,537	80	35.5
Extensive Green Roof	480	80	6.7
Intensive Green Roof	0	80	0.0
Landscape	231	80	3.2
Landscape Over P1	0	80	0.0
Pavers	0	80	0.0
Impervious (Dirty)	1,180	0	0.0
Impervious (Clean)	1,287	80	18.0
Total	5,715		63.5

Left untreated, the site will not achieve the City's requirement for 80% TSS removal. Therefore, it is proposed that a Stormfilter© system complete with (7) media cartridges be installed. All “dirty” areas within the drive aisle shall first be directed to the Contech chamber, whereas all other areas can be considered clean and routed directly to the stormwater management tank. Please refer to the Contech Sizing Report which can be found in **Appendix C**.

The Stormfilter© system is accepted as a standalone off-line treatment unit and meets the City of Toronto's criteria for 80% TSS per the WWMFG's. Any proposed substitutions will require approval from both the engineer of record and the City of Toronto.

It is recommended that the Stormfilter© system be inspected on a regular basis to ensure proper operation. Per Contech's recommendations, inspection and maintenance should be carried out at a minimal interval of 12 months with inspections prior to each winter season with filter replacements as required.

By adding this stormwater quality treatment unit, the City requirements for quality control (i.e. minimum 80% TSS removal) have been satisfied for the Phase 2 site.

Parkland Dedication

While the detailed design of the park will be performed by others at a later date, it is anticipated that the park will be comprised of pedestrian and landscape areas which are considered inherently clean, and therefore the park will provide an overall TSS removal which will satisfy the City’s criteria for quality control without the need for additional quality treatment devices.

4.7 Water Balance

As required by the City's WWFMG, controls should be in place such that 50 % of average annual rainfall volume is retained on-site, which can be achieved by retaining all runoff from a 5 mm rainfall event. In order to achieve the required volume, a combination of initial abstraction and water re-use will be incorporated. The following discusses the water balance targets for each phase.

Phase 1/Block A

With an area of 4,384 m^2, the corresponding water balance volume to be retained on-site is calculated to be 21.9 m^3. Based on initial abstraction values for each surface type, the total abstraction is calculated as follows:

Table 4-5 Initial Abstraction

Area Type	Area (m^2)	Initial Abstraction	Vol. Retained (m^3)
Conv. Roof	1,762	1	1.8
Extensive Green Roof	1,270	5	6.4
Intensive Green Roof	0	7	0.0
Landscape	165	5	0.8
Landscape Over P1	0	5	0.0
Pavers	0	5	0.0
Impervious (Dirty)	1,141	1	1.1
Impervious (Clean)	46	1	0.0
Total	4,384		10.1

As shown above, 10.1 m^3 is retained on-site through initial abstraction. The balance of 11.8 m^3 will be retained through water re-use purposes such as landscape irrigation and / or toilet flushing. Confirmation from the irrigation and mechanical consultants shall be provided at the SPA stage. The following is a summary of the water balance summary for Phase 1:

Table 4-6 Water Balance Summary

Strategy	Vol. Retained (m^3)
Initial Abstraction	10.1
Water Re-Use	11.8
Total	21.9

As indicated above it is expected that Phase 1 will meet the City's water balance target through a combination of initial abstraction and water re-use within a 72-hour period. An adequate sump within the stormwater management tank will be provided within the P1 level to retain the total water re-use volume. Please see **Appendix C** for the detailed design sheet and **Appendix F** for the Site Servicing Exhibit **SS-01**.

Phase 2/Block B

With an area of 5,715 m^2, the corresponding water balance volume to be retained on-site is calculated to be 28.6 m^3. Based on initial abstraction values for each surface type, the total abstraction is calculated as follows:

Table 4-7 Initial Abstraction

Area Type	Area (m^2)	Initial Abstraction	Vol. Retained (m^3)
Conv. Roof	2,585	1	2.6
Extensive Green Roof	480	5	2.4
Intensive Green Roof	0	7	0.0
Landscape	183	5	0.9
Landscape Over P1	0	5	0.0
Pavers	0	5	0.0
Impervious (Dirty)	1,180	1	1.2
Impervious (Clean)	1,287	1	1.3
Total	5,715		8.4

As shown above, 8.6 m^3 is retained on-site through initial abstraction. The balance of 20.2 m^3 will be retained through water re-use purposes such as landscape irrigation and / or toilet flushing. Confirmation from the irrigation and mechanical consultants shall be provided at the SPA stage. The following is a summary of the water balance summary for Phase 2:

Table 4-8 Water Balance Summary

Strategy	Vol. Retained (m^3)
Initial Abstraction	8.4
Water Re-Use	20.2
Total	28.6

As indicated above it is expected that Phase 2 will meet the City's water balance target through a combination of initial abstraction and water re-use within a 72-hour period. An adequate sump within the stormwater management tank will be provided within the P1 level to retain the total water re-use volume. Please see **Appendix C** for the detailed design sheet and **Appendix F** for the Site Servicing Exhibit **SS-01**.

Parkland Dedication

While the detailed design of the park will be performed by others a later date, it is anticipated that the park will be required to meet the City's 5 mm water balance target, which will likely be achieved through initial abstraction. Additionally, water re-use (irrigation) can also be considered if needed.

4.8 Storm Service Connection

It is proposed that each phase be connected to the existing municipal storm sewer within Dundas Street West with a PVC storm service. New control manholes for each of the phases and the park are to be installed entirely within each site and orifice controls shall be located upstream of the control manholes. Furthermore, as Towers B1 and B2 are to share a stormwater management tank and storm connection, the internal mechanical piping for each point tower shall be separated with sampling ports for each system upstream of the connection point to the stormwater management tank. Please refer to the Site Servicing Exhibit **SS-01** which can be found in **Appendix F**.

The following table illustrates the peak flow and corresponding capacity of each service:

Table 4.9 Storm Service Performance

From	To	Pipe Size (mm)	Pipe Slope	Peak Flow (L/s)	Capacity (L/s)	Percent Of Full Flow
MH1	450mm STM	250	2.0%	41.0	84.1	49%
MH2	600mm STM	250	2.0%	60.9	84.1	72%
MH3	450mm STM	200	2.0%	11.6	46.4	25%

As shown above, each storm service can convey the controlled discharge while operating at 72% (or less) of full flow capacity. Please refer to the detailed design calculations which can be found in **Appendix C**, and the Site Servicing Exhibit **SS-01** which can be found in **Appendix F**.

4.9 Emergency Overflow

It is recommended that rooftop scuppers be installed to ensure emergency overflow from roof areas should rooftop drains become plugged.

- All areas at grade level have been designed with positive drainage (away from the building).
- The stormwater management tanks shall be designed with a catchbasin lid (open grate) to allow storm flows to spill to the adjacent municipal right-of-way in an emergency situation.
- Maximum ponding within the development site shall not exceed City requirements of 0.30 m.

4.10 Erosion and Sediment Control

It is recommended that a sediment control fence per T-219.130-1 be installed along the perimeter of the site as required during demolition activities. All existing and proposed catch basins within close proximity of the subject site shall be protected with a geotextile fabric. A mud mat shall be installed as required to minimize distribution of mud into the public realm.

5 Sanitary Drainage System

5.1 Existing Sanitary Infrastructure

The existing sanitary infrastructure servicing the proposed development site at 2400 - 2440 Dundas Street West consists of circular and egg-shaped sewers ranging from 675x1050 mm to 1200 mm. These sewers carry flows southwards along Dundas St W and eastwards along Bloor St W, ultimately discharging to a combined sewer overflow (CSO) at Bartlett Ave & Bloor St W. The current site, encompassing 1.11 hectares and primarily commercial, generates a pre-development peak sanitary flow of **0.39 L/s**. Detailed calculations are included in the sanitary capacity analysis report in **Appendix D.**

5.2 Post-Development Sanitary Flows

The proposed development site comprised of residential units has a sanitary discharge of 21.53 L/s, which results in an increase of **21.14 L/s** (21.53 L/s-0.39 L/s) under dry weather conditions. All construction is assumed to be conducted following the Ontario Building Code and therefore no elevated infiltration rate is expected to occur during extreme wet weather scenarios.

5.3 Downstream Analysis & MECP F-5-5

To ensure compliance with the City of Toronto's Sewer Assessment Guidelines (July 2021) and Design Criteria for Sewers and Watermains (Jan 2021), three main criteria were assessed:

1. Design Function (Criterion 1):

- **Requirement:** Under existing and proposed design flow conditions and contributing peak stormwater flows (2-year design storm event), there should be no surcharge in the sewer systems.
- **Outcome:** The BFA 42-44-62 *InfoWorks ICM* was used to simulate pre and post development scenarios under the 2-year design storm event. The model confirmed that all downstream combined sewers operate under free flow conditions in all scenarios.

2. WWF Mitigation (Criterion 3):

- **Requirement:** Mitigation measures should offset two times the proposed increase from on-site discharges during a 2-year design storm event, ensuring no increase in peak overflow rate at the CSO point.
- **Mitigation Measure/Outcome:** One (1) catchbasin (CB3517408760) on Randolph Ave currently connected to the combined system will be redirected to the storm system on Perth Ave via a proposed storm sewer extension. This will remove 47.77 L/s (under a 2-year storm event) of storm runoff from the combined system. Since the proposed disconnection flow exceeds the proposed site increase by more than double, the site complies with MECP F-5-5 and the City of Toronto Sanitary Capacity Guidelines (July 2021).

3. Adequate Storm Sewer Capacity from MECP F-5-5 measures:

- **Requirement:** Under existing and proposed design flow conditions and contributing peak stormwater flows (2-year design storm event), there should be no surcharge in the sewer systems.
- **Outcome:** The BFA 42-44-62 *InfoWorks ICM* was used to simulate pre and post development scenarios under the 2-year design storm event. The assessed storm sewers include all downstream storm sewers from the catchbasin reconnection point along Randolph Ave up until the point in the storm system where the hydraulic

gradeline is no longer affected by the additional storm flow generated from the catchbasin reconnection (SL1446302). The model confirmed that the assessed storm sewers operate under free flow conditions in all scenarios under the 2-year design storm.

The downstream capacity analysis confirms that the proposed development at 2400 - 2440 Dundas Street West meets both design function and WWF mitigation criteria set by the City of Toronto Sewer Assessment Guidelines.

For a comprehensive review of the downstream capacity assessment, including detailed calculations, modeling methodology, and assumptions, please refer to the supporting document in **Appendix D**.

5.4 Sanitary Service Connections

It is proposed that (1) new sanitary service be installed for Phase 1/Block A, (3) new sanitary services be installed for Phase 2/Block B, and (1) new sanitary service be installed for the park. Each service connection will be installed at a 2.0% slope and will be connected to the existing combined sewer within Dundas Street West. A new control manhole will be provided at the property line, entirely within the site for each new service.

Using a design flow of 450 L/cd for the service connections, the following table illustrates the peak flow and corresponding capacity of each service:

Table 5.1 Sanitary Service Performance

Building	From	To	Pipe Size (mm)	Pipe Slope	Peak Flow (L/s)	Capacity (L/s)	Percent Of Full Flow
Tower A1	MH1A	COMB.	200	2.0%	16.4	48.4	34%
Tower B1	MH2A	COMB.	200	2.0%	17.4	48.4	36%
Tower B2	MH3A	COMB.	200	2.0%	9.6	48.4	20%
Podium	MH4A	COMB.	200	2.0%	2.5	48.4	5%
Park	MH5A	COMB.	150	2.0%	0.1	22.5	0%

As shown above, the sanitary services have ample capacity to convey their respective post-development peak sanitary flow while operating at 36% (or less) of full flow capacity. Please see the detailed design sheet which can be found in **Appendix D**, and the Site Servicing Exhibit **SS-01** which can be found in **Appendix F**.

6 Water Supply System

6.1 Existing Water Infrastructure

Per the City's record information, local water infrastructure consists of a 300 mm watermain within Dundas Street West. In order to evaluate the municipal water supply network's ability to support the subject site, a hydrant flow test was conducted in accordance with NFPA 291 on June 8, 2023 and is summarized as follows:

Table 6-1 Hydrant Response Curve

Dundas Street West (300 mm)			
Flow (Gpm)	Flow (L/S)	Pressure (Psi)	Pressure (Kpa)
0	0	53	365
888	56.0	50	345
1300	82.0	48	331
Projecting to 20 psi			
3,602	227.2	20	138

As shown above, static pressure within the system is expected to be approximately 53 psi, and it is estimated that a flow of 227 L/s is available at 20 psi. A copy of the hydrant flow test can be found in **Appendix E** for reference.

6.2 Domestic Water Supply Demands

Using the criteria set in **Section 2.4** and the site statistics provided by the architect, the Average Day Demand (ADD), Peak Hour Demand (PHD), and Max Day Demand (MDD) have been calculated, and are summarized as follows:

Table 6-2 Domestic Water Demands

Building	Population	ADD (L/S)	PHD (L/S)	MDD (L/S)
Tower A	801	1.69	4.22	2.19
Tower B1	861	1.89	4.74	2.46
Tower B2	456	1.00	2.50	1.30
Podium	106	0.23	0.28	0.26
Parkland	1	0.00	0.00	0.00
Total	2,225	4.8	11.7	6.2

The domestic supply line for each building will be designed based on PHD while maintaining a minimum available pressure of 40 psi (275 kPa) at the face of the building. Please see **Appendix E** for the detailed calculations.

6.3 Fire Supply Demands

The recommended fire flow demand for the subject site has been calculated using the design criteria outlined in the Water Supply for Public Fire Protection Manual, 1999 by the Fire Underwriters Survey (FUS).

Phase 1/Block A

As the buildings will be constructed using fire resistive materials, the effective floor area is taken as the largest floor area plus 25 % of the two adjacent floors.

- Effective Floor Area = Largest Floor Area + 25% (two adjoining floors)
- Effective Floor Area = 3,852 m^2 + 25% (2,608 m^2 + 0 m2)
- Effective Floor Area = 4,504 m^2

The following FUS factors will be applied to the water demand calculations:

Table 6-3 Fire Underwriters Survey Factors

Construction Coefficient	Building Occupancy	Sprinkler Adjustment	Proximity Factor
0.6 (Resistive)	- 15 % (Limited)	- 50 %	+ 45 %

Using the effective floor area for each building and the appropriate FUS factors, the required fire flow for the building is calculated as follows:

Table 6-4 Fire Demand Calculations – Building A

FIRE FLOW (F) CALCULATION	APPLYING FUS FACTORS	ADJUSTED FIRE FLOW	TOTAL DEMAND (TD)
$F = 220 \cdot 0.6 \sqrt{Area}$	$F_1 = F \cdot 0.85$ = 7,650 L/min	Fire Flow = $F_1 - F_2 + F_3$	Td= FF + MDD
$F = 220 \cdot 0.6 \sqrt{3,628\ m^2}$	$F_2 = F_1 \cdot 0.50$ = 3,825 L/min	FF= 7,000 L/Min (Rnd'd)	TD= 116.7 L/s + 6.2 L/s
F = 8,000 L/Min (Rnd'd)	$F_3 = F_1 \cdot 0.45$ = 3,443 L/min	FF = 116.7 L/s	TD= 122.9 L/s

The fire supply line for the building will be designed based on Total Demand (Fire Flow + MDD) while maintaining a minimum available pressure of 20 psi (140 kPa) at the face of the building. Please see **Appendix E** for the detailed calculations.

Phase 2/Block B

As the building will be constructed using fire resistive materials, the effective floor area is taken as the largest floor area plus 25 % of the two adjacent floors.

- Effective Floor Area = Largest Floor Area + 25% (two adjoining floors)
- Effective Floor Area = 4,044 m^2 + 25% (3,035 m^2 + 0 m2)
- Effective Floor Area = 4,803 m^2

The following FUS factors will be applied to the water demand calculations:

Table 6-5 Fire Underwriters Survey Factors

Construction Coefficient	Building Occupancy	Sprinkler Adjustment	Proximity Factor
0.6 (Resistive)	- 15 % (Limited)	- 50 %	+ 45 %

Using the effective floor area for each building and the appropriate FUS factors, the required fire flow for each building is calculated as follows:

Table 6-6 Fire Demands Calculations – Building B

FIRE FLOW (F) CALCULATION	APPLYING FUS FACTORS	ADJUSTED FIRE FLOW	TOTAL DEMAND (TD)
$F = 220 \cdot 0.6 \sqrt{Area}$	$F_1=F \cdot 0.85$ = 7,650 L/min	Fire Flow = $F_1 - F_2 + F_3$	Td= FF + MDD
$F = 220 \cdot 0.6 \sqrt{4,080\ m^2}$	$F_2=F_1 \cdot 0.50$ = 3,825 L/min	FF= 7,000 L/Min (Rnd'd)	TD= 116.7 L/s + 6.2 L/s
F = 8,000 L/Min (Rnd'd)	$F_3=F_1 \cdot 0.45$ = 3,443 L/min	FF = 116.7 L/s	TD= 122.9 L/s

The fire supply line for the building will be designed based on Total Demand (Fire Flow + MDD) while maintaining a minimum available pressure of 20 psi (140 kPa) at the face of the building. Please see **Appendix E** for the detailed calculations.

6.4 System Pressure Under Normal Operation

As previously mentioned, the domestic services shall be sized to convey domestic demands under normal system operating conditions (PHD) while maintaining a minimum available pressure of 40 psi (275 kPa). The residual pressure at the building is calculated by first interpolating the PHD residual pressure within the existing watermain, and then subtracting head losses within the system using the Hazen-Williams formula. The following table summarizes the residual pressure for each proposed domestic service:

Table 6-7 Residual Pressure Under PHD Conditions

Building	PHD (L/s)	Domestic Service (mm)	Residual Pressure @ Main		Residual Pressure @ Bldg.	
			(psi)	(kPa)	(psi)	(kPa)
Tower A1	4.2	150	53	364	53	364
Tower B1	4.7	150	53	364	53	364
Tower B2	2.5	150	53	364	53	364
Podium	0.3	150	53	364	53	364
Parkland	0.0	50	53	364	53	364

As shown above, there is no appreciable head loss within the system, and the residual pressure at the building face is above the minimum acceptable pressure of 40 psi (275 kPa) under PHD conditions. Please see **Appendix E** for the detailed design calculations.

6.5 System Pressure Under Fire Flow

The fire services shall be sized to convey the total fire demand (Fire + MDD) while maintaining a minimum available pressure of 20 psi (140 kPa). The residual pressure at the building is calculated by first interpolating the residual pressure within the existing watermain, and then subtracting head losses within the system using the Hazen-Williams formula.

The following table summarizes the residual pressure for each proposed fire service:

Table 6.8 Residual Pressure Under Fire + MDD Conditions

Building	FF+MDD (L/s)	Fire Service (mm)	Residual Pressure @ Main		Residual Pressure @ Bldg.	
			(psi)	(kPa)	(psi)	(kPa)
Tower A	122.9	200	45	310	40	277
B1, B2, Podium	122.9	200	45	310	40	277

As shown above, the residual pressure at the building face for each fire service is above the minimum acceptable pressure of 20 psi (140 kPa) under fire demand conditions (Fire + MDD). Furthermore, as the Fire + MDD flow of 106.2 L/s is less than the available flow at 20 psi (227 L/s), it can be concluded that there is adequate pressure within the municipal water system without any upgrades to the system. Please see **Appendix E** for the detailed design calculations.

6.6 Water Service Connection

To service Tower A, a new 200 mm fire line shall be connected to the existing 300 mm watermain within Dundas Street West with a tapping sleeve and valve. A separate 150 mm domestic service will tee off from the fire line within the municipal right of way. As Tower A is over 84 m in height, a secondary fire line shall be connected to the 300 mm watermain within Dundas Street West with a tapping sleeve and valve. An isolation valve shall be provided between the two fire service connections.

To service Towers B1, B2, and the shared podium, two new 200 mm fire lines shall be connected to the existing 300 mm watermain within Dundas Street West with a tapping sleeve and valve. An existing watermain valve shall serve to isolate the two fire service connections. Three 150 mm domestic services will be provided for Towers B1, B2, and the shared podium. Two of the domestic services will tee off from each fire line within the municipal right of way, while the third will be connected to the 300 mm watermain within Dundas Street West with a tapping sleeve and valve.

A new valve and box shall be installed at the property line for each incoming service, and all required water meters, backflow preventers, and double check valves shall be located inside mechanical rooms within the P1 level.

The National Fire Protection Association (NFPA) considers any building over 23 m in height to be classified as a high-rise building and thus requires a remotely located secondary siamese connection for each zone. Accordingly, a second siamese connection has been provided.

To service the park, a new 50 mm copper water service shall be connected to the 300 mm watermain within Dundas Street West with a tapping sleeve and valve. A new curb stop shall be installed at the property line for the incoming service, and the required water meter chamber shall be located just inside the property line.

6.7 Hydrant Coverage

Existing municipal hydrants are located on Dundas Street West and provide the required 45 m of coverage for all proposed siamese connections to satisfy OBC requirements. An existing private hydrant which will be disturbed during building construction shall be replaced in the same location to provide additional coverage. Please see **Drawing SS-01** for the location of all existing and proposed water infrastructure.

7 Conclusions and Recommendations

Storm Sewer and Stormwater Management

The objectives of the City's WWFMG's can be met by implementing on-site measures. Storm flows shall be attenuated on-site and released to the municipal storm sewer at an appropriate discharge rate thus meeting the City's target for quantity control. As a Stormfilter system is proposed, the site will meet the City's target for quality control. Through initial abstraction and irrigation, the site will meet the City's target for water balance, details for which shall be provided at the SPA stage.

Sanitary Sewer

The results of the downstream sanitary sewer capacity analysis indicates that the receiving sewers downstream of the development site meet Criterion 1 ("Design Function") and Criterion 3 ("WWF Mitigation") of the Sewer Assessment Guidelines (July 2021). Criterion 1 is met as all existing combined sewers operate under free flow conditions.

Criterion 3 is met by a proposed disconnection of one catchbasin on Randolph Ave from the combined system, which will be redirected to the storm system on Perth Ave via a proposed storm sewer extension. The catchbasins generate a peak runoff of 47.77 L/s under a two-year storm event. Since the proposed disconnection flow exceeds the proposed site increase by more than double, the site complies with MECP F-5-5 and the City of Toronto Sanitary Capacity Guidelines (July 2021). Adequete storm sewer capacity was confirmed as all downstream storm sewers from the catchbasin reconnection point along Randolph Ave up until pipe SL1446302 operate under free flow conditions in all scenarios. A detailed design pertaining to the off-site improvement will be submitted as part of a future Site Plan Application.

Water Supply

The existing water supply network has sufficient capacity to support the proposed fire and domestic water demands for the proposed development without improvements to the system.

In summary, it can be concluded that the Zoning By-Law Amendment can be supported from a municipal site servicing and stormwater management perspective.

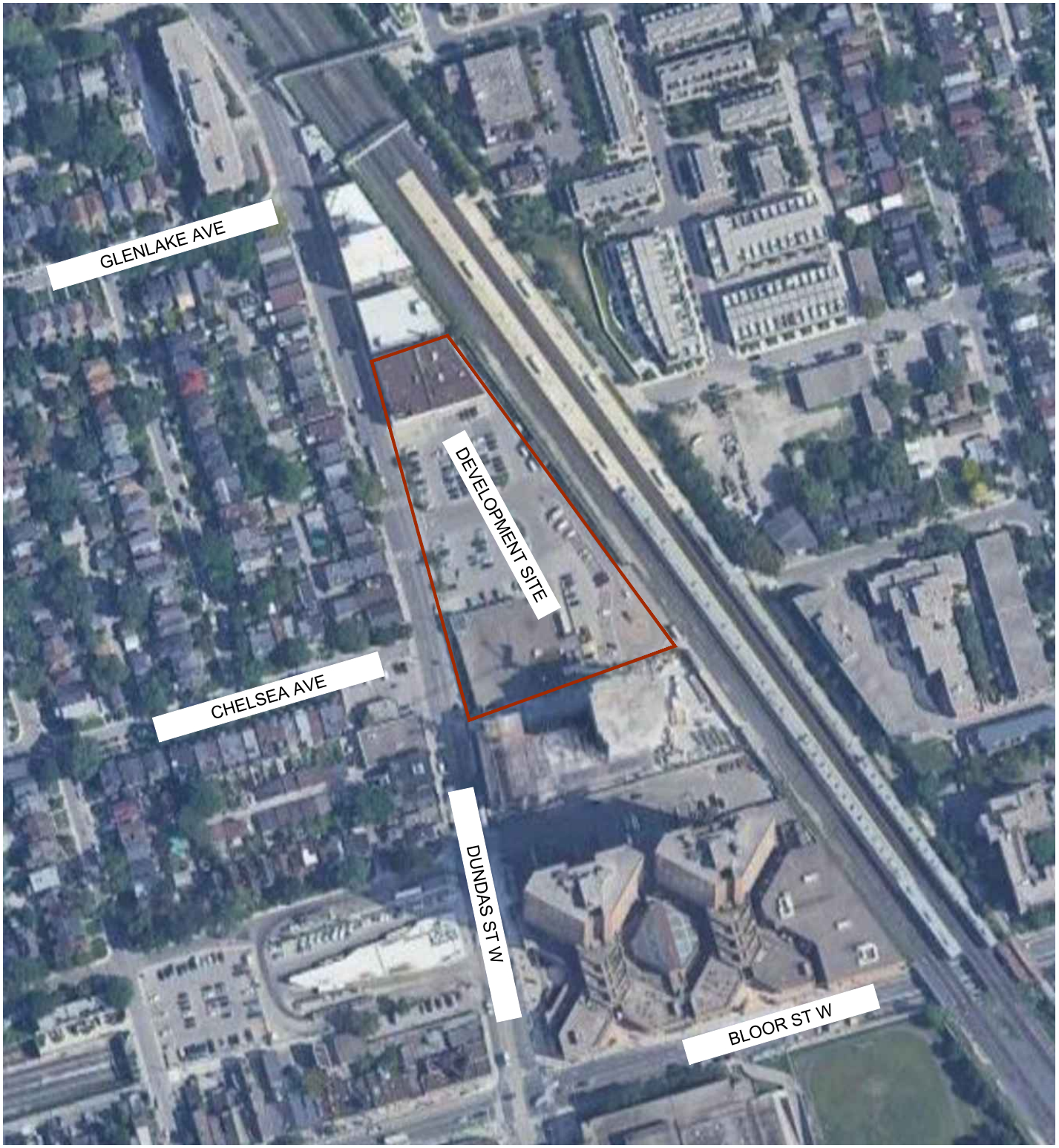
Appendix A
Background Information

Aerial Exhibit

Topographic Survey (KRCMAR)

Site Plan and Statistics (GPA Architects)

Dye Testing (Aquaflow Technologies)



CLIENT DUNDAS LI PROPERTIES INC 1840 EGLINTON AVE WEST, SUITE 202, TORONTO, ON, M6E 5B2	PROJECT NAME 2400 DUNDAS STREET WEST		ARCADIS		
	SCALE: NTS	DATE: 2022-11-16	FIGURE NAME AERIAL PLAN	FIGURE NO. FIG.1	REVISION 1
	PROJECT ENG: JMJ	DRAWN BY: CG			
	CHECKED BY: JMJ	APPROVED BY: JMJ			
	PROJECT NO: 141003				

PLAN OF SURVEY
SHOWING TOPOGRAPHICAL INFORMATION OF
LOTS 6 TO 14 (INCLUSIVE), AND LOTS 16 TO 22 (INCLUSIVE)
AND
PART OF LOT 15
AND
PART OF SOHO STREET
(KNOWN AS CHELSEA AVENUE)
(CLOSED BY BY-LAW No. 8302, INST. WH7880)
REGISTERED PLAN 776
CITY OF TORONTO

SCALE 1: 200

5 0 5 10 15 20m

KRCMAR SURVEYORS LTD. 2022

METRIC: DISTANCES AND COORDINATES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BEARING

BEARINGS SHOWN HEREON ARE GRID DERIVED FROM GPS OBSERVATIONS OF OBSERVED REFERENCE POINTS 'A' AND 'B', USING THE LEICA SMARTNET RTK NETWORK AND ARE REFERRED TO THE 3° MTM COORDINATE SYSTEM, ZONE 10, CENTRAL MERIDIAN 79°30' WEST LONGITUDE. (3° MODIFIED TRANSVERSE MERCATOR PROJECTION, NAD 83 (CSRS)(2010)).

DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99989.

INTEGRATION DATA

3° MTM ZONE 10 COORDINATES
NAD 83 (CSRS)(2010)(CENTRAL MERIDIAN 79°30' WEST LONGITUDE)
THE MTM COORDINATES LISTED BELOW ARE TO URBAN ACCURACY AND COMPLY WITH SUBSECTION 14(2) OF ONTARIO REGULATION 216/10 FILED UNDER THE SURVEYORS ACT.

OBSERVED REFERENCE POINTS

MONUMENT ID.	NORTHING	EASTING
(A) CP(OU)	4 835 340.156	308 591.607
(B) CC(OU)	4 835 563.407	308 543.033

REFERENCE POINTS

POINT	NORTHING	EASTING
1	4 835 327.71	308 612.77
2	4 835 382.12	308 601.99
3	4 835 484.00	308 570.39
4	4 835 496.27	308 609.30
5	4 835 391.48	308 683.40
6	4 835 347.80	308 682.65

COORDINATE VALUES SHOWN ARE FOR GEOGRAPHIC INFORMATION SYSTEM INTEGRATION ONLY. COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

ELEVATION

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE RELATED TO CITY OF TORONTO BENCH MARK No. CT218, HAVING AN ELEVATION OF 114.759 METRES.

NOTE

ELEVATIONS SHOWN THUS x123.45 DERIVED FROM PLAN SHOWING PARTIAL TOPOGRAPHY BY KRCMAR SURVEYORS LTD., O.L.S., DATED AUGUST 20, 2022, UPDATED SEPTEMBER 3, 2022 (DRAWING No. 11-D19TD1).

EASEMENT

(C) SUBJECT TO EASEMENT IN GROSS AS IN INST. AT4994084
(E) SUBJECT TO EASEMENT AS IN INST. AT5373161
(G) SUBJECT TO EASEMENT AS IN INST. AT5717695
(W) SUBJECT TO EASEMENT AS IN INST. AT3576186

LEGEND

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT PLANTED
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
CP	DENOTES CONCRETE PIN
CC	DENOTES CUT CROSS
(M)	DENOTES MEASURED
(S)	DENOTES SET
(WIT)	DENOTES WITNESS
(N1)	DENOTES FIELD NOTES BY CITY OF TORONTO SURVEYS (SURVEY TO CHECK ENCROACHMENTS OF No. 2454 DUNDAS STREET WEST) DATED JULY 8, 1941
(P2)	DENOTES PLAN OF SURVEY BY J.D. BARNES LIMITED, O.L.S., DATED JANUARY 3, 1986
(P4)	DENOTES PLAN 64R-15496
(P7)	DENOTES PLAN OF SURVEY BY GUIDO PAPA SURVEYING LTD., O.L.S., DATED AUGUST 30, 2001
(P10)	DENOTES PLAN 66R-30390
(P11)	DENOTES EXPROPRIATION PLAN AT3576186
(P12)	DENOTES SURVEYOR'S REAL PROPERTY REPORT BY KRCMAR SURVEYORS LTD., O.L.S., DATED JULY 5, 2021
(P13)	DENOTES PLAN 66R-27192
(P14)	DENOTES PLAN 66R-31362
(P15)	DENOTES PLAN BY SPEIGHT, VAN NOSTRAND, WARD & ANDERSON, O.L.S. DATED MARCH 17, 1939
(P17)	DENOTES PLAN OF SURVEY BY E.W. PETZOLD LIMITED, O.L.S., DATED JULY 4, 1984 (PLAN L-11D-104)
(P18)	DENOTES PLAN OF SURVEY BY E.W. PETZOLD LIMITED, O.L.S., DATED JULY 4, 1984 (PLAN L-11D-103)
(P19)	DENOTES PLAN OF JOHN C. BEATSON, O.L.S., DATED MARCH 11, 1974
(P20)	DENOTES PLAN OF SURVEY BY JAMES, S.M. HWANG, O.L.S., DATED JULY 26, 1982
(P21)	DENOTES REGISTERED PLAN 776
(978)	DENOTES JOHN C. BEATSON, O.L.S.
(JDB)	DENOTES J.D. BARNES LIMITED, O.L.S.
(HJV)	DENOTES HOLDING JONES VANDERVEEN INC., O.L.S.
(OU)	DENOTES ORIGIN UNKNOWN
(BR)	DENOTES TIES TO BRICK
(CBK)	DENOTES TIES TO CONCRETE BLOCK
(CF)	DENOTES TIES TO CONCRETE FOUNDATION
(CONC)	DENOTES TIES TO CONCRETE
(ST)	DENOTES TIES TO STONE
(STU)	DENOTES TIES TO STUCCO
CLF	DENOTES CHAIN LINK FENCE
COL	DENOTES COLUMN
CONC	DENOTES CONCRETE
CW	DENOTES CONCRETE WALL
DSE	DENOTES DOOR SILL ELEVATION
GRL	DENOTES GUARD RAIL
HP	DENOTES HORIZONTAL PLANE
LL	DENOTES LOWER LIMITATION IN METRES
NUL	DENOTES NO UPPER LIMITATIONS
UL	DENOTES UPPER LIMITATION IN METRES
NLL	DENOTES NO LOWER LIMITATIONS
(Bc)	DENOTES BOTTOM OF CURB
(Tc)	DENOTES TOP OF CURB
(Tw)	DENOTES TOP OF WALL
	DENOTES FENCE
	DENOTES GUARD RAIL
x123.45	DENOTES EXISTING GRADE ELEVATION
BH	DENOTES BOREHOLE
BMH	DENOTES BELL MANHOLE
BBOX	DENOTES BELL BOX
BK	DENOTES BIKE PARKING
BOL	DENOTES BOLLARD
CB	DENOTES CATCH BASIN
0.1ø	DENOTES CONIFEROUS TREE WITH TRUNK DIAMETER
0.1ø	DENOTES DECIDUOUS TREE WITH TRUNK DIAMETER
	DENOTES DOWN GUY ANCHOR
FH	DENOTES FIRE HYDRANT
GM	DENOTES GAS METER
GV	DENOTES GAS VALVE
HW	DENOTES HYDRO HAND WELL
HMH	DENOTES HYDRO MANHOLE
HP/LS	DENOTES HYDRO POLE WITH LAMP STANDARD
HP/LS/TL	DENOTES HYDRO POLE WITH LAMP STANDARD AND TRAFFIC LIGHT
LS	DENOTES LAMP STANDARD
MH	DENOTES MANHOLE
POST	DENOTES POST
SIAMESE	DENOTES SIAMESE CONNECTION
SN	DENOTES SIGN
TEL	DENOTES TELEPHONE BOOTH
UBOX	DENOTES UTILITY BOX
TL	DENOTES TRAFFIC LIGHT
WV	DENOTES WATER VALVE

SURVEY REPORT

1. THE RE-ESTABLISHMENT OF THE SUBJECT PROPERTY BOUNDARIES IS BASED ON INFORMATION CONTAINED IN THE RELEVANT TITLE DOCUMENTS, REGISTERED PLANS AND ON THE EVIDENCE OF PRIOR SURVEYS FOUND DURING THE COURSE OF PREPARING THE SUBJECT SURVEY.
2. THE TYPE AND LOCATION OF THE EXISTING BUILDINGS AND OTHER IMPROVEMENTS, FENCES ETC., ON OR NEAR THE SUBJECT PROPERTY ARE AS SHOWN ON THE SURVEY PLAN.
3. COMPLIANCE WITH MUNICIPAL ZONING REQUIREMENTS IS NOT CERTIFIED BY THIS REPORT.
4. SUBJECT LAND COMPRISES ALL OF PIN 21328-0519(LT).
5. SUBJECT TO EASEMENT OVER PART 2, EXPROPRIATION PLAN AT3576186 AS IN INST. AT3476186.

TOTAL SITE AREA = 1.0374 ha

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 11th DAY OF MAY, 2022

DATE MAY 12, 2022

S.N. RAMSAMOOJ
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-26173

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR in accordance with Regulation 1026, Section 29(3).

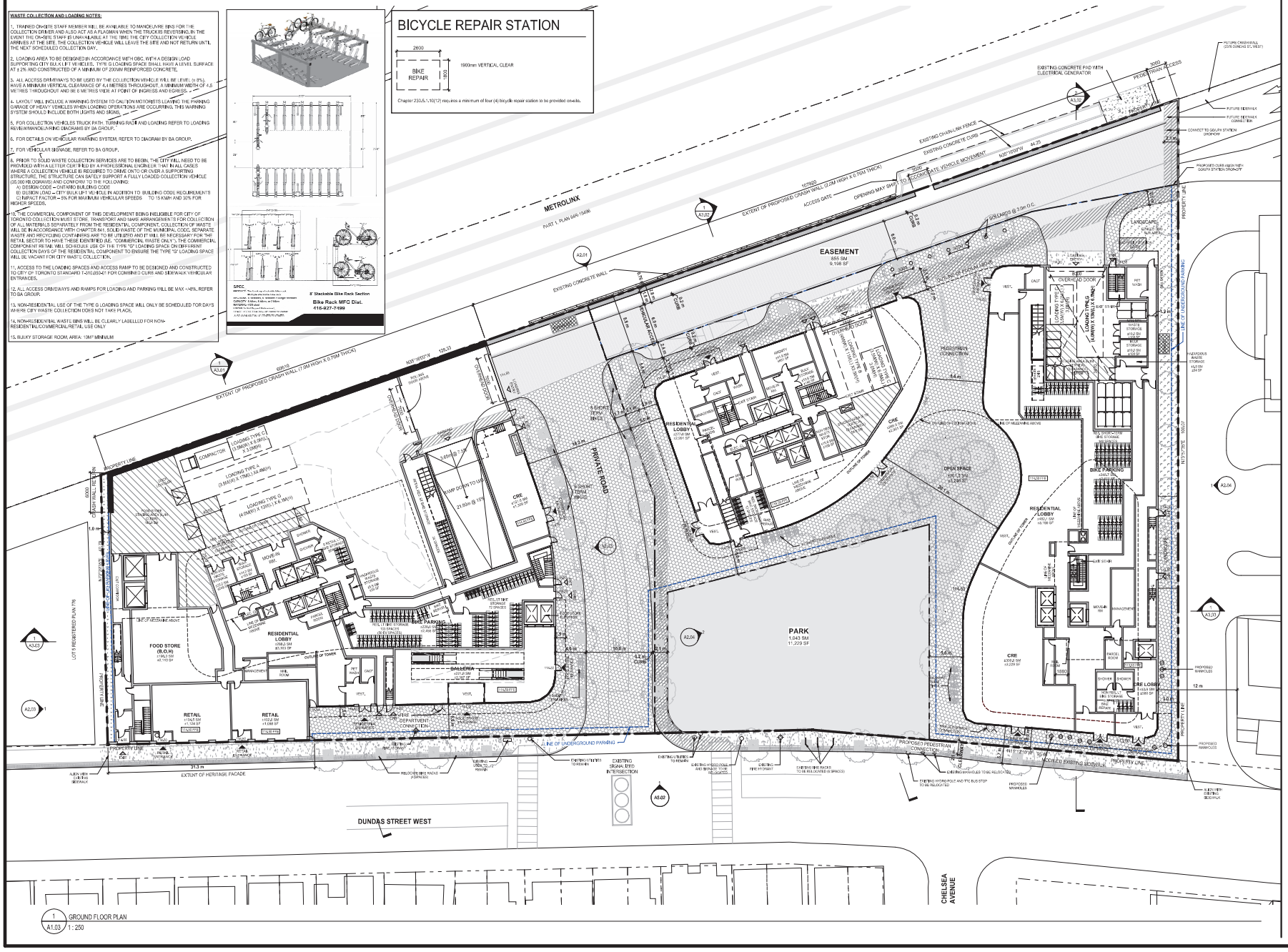
MUNICIPAL ADDRESS: No. 2400 DUNDAS STREET WEST, TORONTO

FIELD:	D.L./L.D.	DRAWN:	C.L.	CHECKED:	S.N.R.	JOB NO:	11-019
DWG NAME:	11-019BT02	PLOT INFO:	09:31 12/May/2022			WORK ORDER NO:	36266

1137 Centre Street Thornhill ON L4J 3M6 905.738.0053 F 905.738.9221 www.krcmar.ca

PLAN AVAILABLE AT www.ProtectYourBoundaries.ca

KRCMAR



Revision	Date

NOT FOR CONSTRUCTION

Revision	Date
5 RE-ISSUED FOR ZBA	24-10-11
4 ISSUED FOR COORDINATION	24-10-04
RE-ISSUED FOR ZBA	24-07-25
3 ISSUED FOR ZBA	24-06-07
2 ISSUED FOR COORDINATION	24-03-12
1 ISSUED FOR ZBA	23-09-12

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2400-2440 DUNDAS STREET WEST
TORONTO, ONTARIO, CANADA

SHEET TITLE

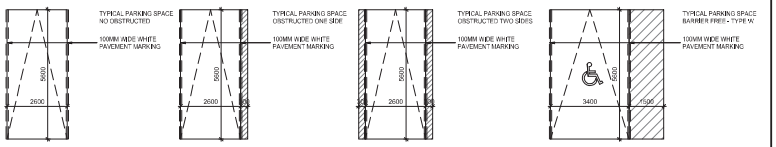
GROUND FLOOR PLAN

DRAWN BY:	GPAA
CHECKED BY:	GPAA
PROJECT START DATE:	22-01-28
PROJECT NO.:	21115
SHEET NUMBER	

A1.03

PLOT DATE: 2024-10-04 2:58:49 PM

PARKING LEGEND



NOTE:
- ALL PARKING SPACES MEET THESE DIMENSIONS UNLESS NOTED AS COMPACT
- PROVIDE 300MM CLEARANCE IF OBSTRUCTED

NOTE:
- ALL PARKING SPACES MARKED WITH BARRIER FREE SYMBOL MEET THE ABOVE DIMENSION.
- PROVIDE 300MM CLEARANCE IF OBSTRUCTED

EV ELECTRIC VEHICLE INFRASTRUCTURE

ROUGHED-IN CONDUIT WILL BE PROVIDED FOR THE REMAINING SPACES

C COMMERCIAL PARKING SPACES

CS CAR SHARE

V RESIDENTIAL VISITOR PARKING SPACES

R RESIDENTIAL PARKING SPACES

NOTE
1. ALL RESIDENTIAL PARKING SPACES PROVIDED FOR DWELLING UNITS LOCATED IN AN APARTMENT BUILDING, MIXED USE BUILDING, MULTIPLE DWELLING UNIT BUILDING, EXCLUDING VISITOR PARKING SPACES, WILL INCLUDE AN ENERGIZED OUTLET CAPABLE OF PROVIDING LEVEL 2 CHARGING OR HIGHER TO THE PARKING SPACE. THE DISTRIBUTION STRATEGY (I.E. DEDICATED ELECTRICAL OUTLET, ETC.) WILL BE DETERMINED AT SPA STAGE.
2. LEVEL 2 CHARGING MEANS A LEVEL 2 ELECTRIC VEHICLE CHARGING LEVEL AS DEFINED BY SAE INTERNATIONAL 'S J1772 STANDARD', AS AMENDED (208V TO 240V SINGLE-PHASE POWER, WITH MAXIMUM CURRENT OF 80A).
3. 25% OF ALL VISITOR RESIDENTIAL SPACES AND NON-RESIDENTIAL PARKING SPACES IN A BUILDING MUST INCLUDE AN ENERGIZED OUTLET CAPABLE OF PROVIDING LEVEL 2 CHARGING OR HIGHER.
4. ENERGIZED OUTLET MEANS A CONNECTED POINT IN AN ELECTRICAL WIRING INSTALLATION AT WHICH CURRENT IS TAKEN TO SUPPLY UTILIZATION EQUIPMENT FOR ELECTRIC VEHICLE CHARGING.

1 PARKING LEVEL 1 PLAN
A1.02 1 : 250

Revision Date

NOT FOR CONSTRUCTION

Revision	Date
5 ISSUED FOR COORDINATION	24-10-04
4 RE-ISSUED FOR ZBA	24-07-25
3 ISSUED FOR ZBA	24-06-27
2 ISSUED FOR COORDINATION	24-03-12
1 ISSUED FOR ZBA	23-03-10

giannone petricone associates
Giannone Petricone Associates Inc. Architects
96 Spadina Avenue, Toronto, Canada M5V 2J6
T 416.591.7788 F 416.591.1253 E mail@gpaa.com

FORA
Fora Developments
200 - 2440 Dundas St. W., Toronto, ON, M6P 1W9
T 416.536.9600 info@foradevelopments.com

2400-2440 DUNDAS STREET WEST
TORONTO, ONTARIO, CANADA

SHEET TITLE

PARKING LEVEL 1 PLAN

DRAWN BY:	GPAA
CHECKED BY:	GPAA
PROJECT START DATE:	22-01-28
PROJECT NO.:	21115
SHEET NUMBER	

A1.02

PLOT DATE: 2024-10-04 9:49:29 AM

AQUAFLOW TECHNOLOGY INC

226 WILKINSON ROAD, BRAMPTON, ONTARIO L6T 4N7
(905) 792-8169

COMBINED & STORM SEWER INVESTIGATION REPORT
DYE TEST

700x1050 MM COMBINED SEWER
&
100 MM - 600 MM DIAMETER STORM SEWER

FOR

2400 DUNDAS STREET WEST

CITY OF TORONTO

CONSULTING ENGINEER: IBI
CONSULTING ENGINEER'S REPRESENTATIVE: JASON JENKINS
CONSULTING ENGINEER'S REPRESENTATIVE: CASSIDY GOETZ
OWNER: FORA DEVELOPMENTS
OWNER'S REPRESENTATIVE: LYLE LEVINE

FRIDAY, NOVEMBER 11TH, 2022

INDEX:

SEWER CLEANING, VIDEO INSPECTION, INSITU REPAIRS &
MUNICIPAL ENGINEERING SERVICES

2. SUMMARY REPORT AND CONCLUSIONS:

The investigation of the combined & storm sewers at 2400 Dundas Street West was carried out by Steven Lostracco, P.Eng. of Aquaflow Technology, and was authorized by Jason Jenkins of IBI Group. The investigation was carried out on Friday November, 11th, 2022.

The purpose of this report was to determine which municipal sewer the storm drains connect to.

1. Shoppers Drugmart. All roof drains discharge through the side of the building to the parking lot which drains to the CB next to MH STM-3, which then drains to the 450 mm storm sewer on Dundas Street West.

2. All parking lot drainage flows into the CB's which outlets to the 450 mm storm sewer on Dundas Street West.
.
3. Freshco. All roof drains discharge into CBMH-2 which drains to the 450 mm storm sewer on Dundas Street West.

1. Shoppers Drugmart

2. Shoppers Drugmart


3. Shoppers Drugmart
Roof drainage discharges to the parking lot surface

4. Freshco

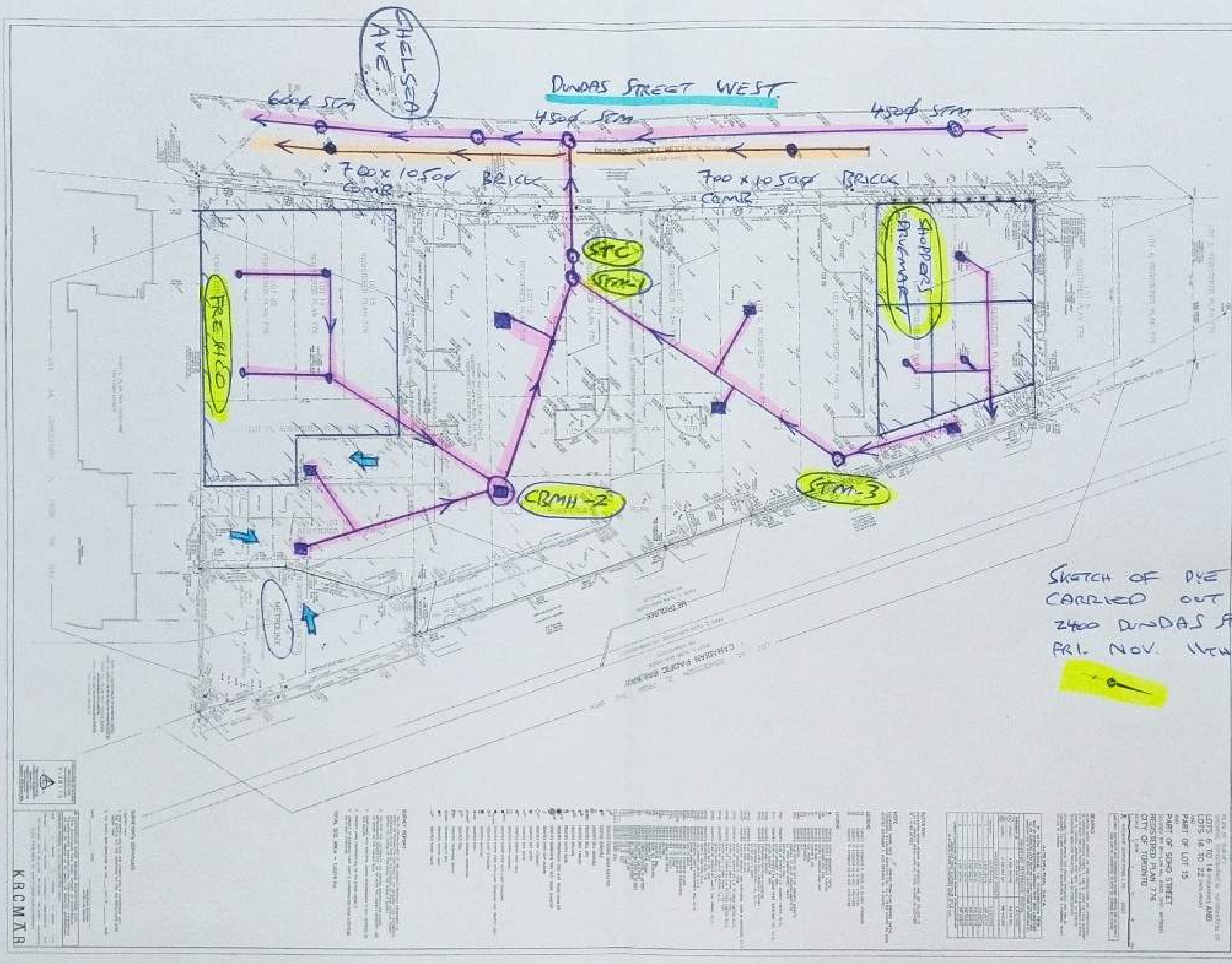

5. Freshco


6. Freshco


7. Freshco

Report Prepared by:

Steven Lostracco, P. Eng.


DUNDAS STREET WEST.
CHELSEA AVE
600φ STM
450φ STM
450φ STM
700 x 1050φ BRICK COMB.
700 x 1050φ BRICK COMB.
SHOPPERS DRUGMART
FRESHCO
STC
STM-1
CBMH-2
STM-3
METROLINX
SKETCH OF DYE TEST
CARRIED OUT AT.
2400 DUNDAS ST. WEST.
FRI. NOV. 11TH. 2022
LOTS 6 TO 14 AND
LOTS 16 TO 22
PART OF LOT 15
PART OF SOHO STREET
REGISTERED PLAN 776
CITY OF TORONTO
CANADIAN PACIFIC RAILWAY
KRCMAR

Appendix B
Foundation Drainage

Excerpt Hydrogeological Report (GEMS)

Hydrogeological Summary Form (GEMS)

Servicing Report Groundwater Summary

GEMS®

Groundwater Environmental Management Services

Hydrogeological Report

2400 – 2440 Dundas Street West, Toronto, Ontario

M6P 1W9

Project: 22-1465

October 10, 2024

Prepared For:
Fora Developments
2440 Dundas Street West
Toronto, ON, M6P 1W9

Prepared By:
Groundwater Environmental Management Services Inc.
150 Rivermede Road, Unit 9
Concord, ON, L4K 3M8

Table 4.4: Hydraulic Conductivity Results from Single Well Response Tests

Well ID	Screened Unit	Screen Interval (masl)	SWRT	Hydraulic Conductivity (m/s)	Geometric Mean (m/s)
MW102D	Sandy Silt, Silt and Silty Sand	108.7 – 105.7	1	1.9×10^{-6}	1.3×10^{-6}
			2	2.1×10^{-6}	
			3	2.2×10^{-6}	
MW104D	Silty Sand	109.1 – 106.1	1	1.8×10^{-6}	1.8×10^{-6}
			2	1.8×10^{-6}	
			3	1.9×10^{-6}	
MW105	Silty Sand and Sandy Silt	111.7 – 108.7	1	3.1×10^{-6}	3.2×10^{-6}
			2	3.2×10^{-6}	
			3	3.5×10^{-6}	
Geometric Mean Hydraulic Conductivity (m/s) for all SWRTs					2.3×10^{-6}
Highest Hydraulic Conductivity (m/s) for all SWRTs					3.5×10^{-6}

The hydraulic conductivity results ranged from 1.8×10^{-6} m/s to 3.5×10^{-6} m/s, with an overall geometric mean of 2.3×10^{-6} m/s.

The borehole records (**Appendix B**) indicate that all tested wells are screened across the same water-bearing unit (Thorncliffe Formation) in materials, including silty sand, sandy silt, and silt. The geometric mean of hydraulic conductivity estimates observed is approximately 10^{-6} m/s and is within the textbook range for silty sand materials denoted by Freeze & Cherry (1979).

As a conservative estimate, GEMS recommends using the highest hydraulic conductivity result of 3.5×10^{-6} m/s to forecast the overburden dewatering rate.

4.5 Groundwater Quality

The water quality discharged by the dewatering system during construction is expected to be similar to in-situ groundwater quality.

On 2 September 2022, a groundwater sample was collected from borehole MW102D to characterize the in-situ groundwater quality at the Site. An updated groundwater sample was collected on 18 September 2024 from borehole MW102D. The water quality analysis results are included in **Appendix E**.

Water quality results were compared to the following criteria:

- City of Toronto Storm Sewer Discharge Use By-Law
- City of Toronto Sanitary and Combined Sewers Discharge Guidelines

Both water quality samples collected met the City of Toronto Sanitary and Combined Sewers Discharge Guidelines for all parameters. The water quality sample collected on 2 September 2022 exceeded the City of Toronto Storm Sewer Discharge Use By-law criteria for Total Suspended Solids (TSS) and Total

Manganese (Mn). The updated groundwater sample collected on 18 September 2024 has exceedances for the City of Toronto Storm Sewer Discharge Use By-Law criteria for Total Manganese (Mn).

Exceedances to these criteria from the 2 September 2022 and the 18 September 2024 samples were identified and are summarized in **Table 4.5a** and **Table 4.5b** respectively**,** with the criteria exceeded in bold.

Table 4.5a: Water Quality Results Exceeding Discharge Criteria, 2 September 2022

Water Quality Parameters	Units	MW102D Results	Storm Criteria	Sanitary Criteria
Total Suspended Solids (TSS)	mg/L	41	**15**	350
Total Manganese (Mn)	ug/L	170	**50**	5000

Table 4.5b: Water Quality Results Exceeding Discharge Criteria, 18 September 2024

Water Quality Parameters	Units	MW102D Results	Storm Criteria	Sanitary Criteria
Total Manganese (Mn)	ug/L	410	**50**	5000

Groundwater quality should be expected to change over time during active construction dewatering. A dewatering contractor should assess the groundwater quality before any water-taking and discharging activities.

5.0 Short-Term Discharge Rates

5.1 Short-Term Construction Dewatering

A construction dewatering system design may include well points, several sump pumps, and a network of gravity drains. Implementing a dewatering system is the responsibility of the property owner, and a qualified dewatering contractor with experience in construction dewatering should be retained to design and outline the methodology of the dewatering system.

Construction will require that the groundwater level be lowered to a depth of at least 1.0 m below the excavation invert.

Table 5.1: Dewatering Estimate Assumptions

Input Parameter	Value	Notes
Ground Surface Elevation	114.0 masl	Highest surface elevation based on provided geotechnical borehole logs (**Appendix B**).
Finished Floor Elevation (FFE)	110.0 masl	The lowest finished floor elevation was based on the depth of the P1 underground as presented in the provided building cross sections (**Appendix A**).
Excavation Invert	109.0 masl	Assumed 1 metre below FFE for raft slab.
Dewatering Target Elevation	108.0 masl	Assumed to be 1.0 metre below the excavation invert.

Table 5.1: Dewatering Estimate Assumptions

Input Parameter	Value	Notes
Excavation Area	85 m x 128 m	Simplified "rectangular" dimensions of the excavation, with an area equal to the proposed dimensions.
Max. Anticipated Groundwater Elevation	112.63 masl	Highest measured groundwater elevation at the Site 111.33 masl (MW104S 05/15/2024) + 1.3 m fluctuation allowance based on the City of Toronto Foundation Drainage guidelines.
Base of Aquifer	52.0 masl	Bedrock depth based on borehole logs (**Appendix B**).
Hydraulic Conductivity (K)	3.5×10^{-6} m/s	Highest K value estimated from SWRT tests (MW105).

Dewatering estimates have been calculated assuming an excavation invert of 109.0 masl. On-Site water level measurements show the water table ranges between approximately 109.8 and 111.33 masl. The maximum anticipated groundwater level was 111.33, based on the highest measured water levels throughout the monitoring period (MW104S, 05/15/2024) plus a 1.3 m fluctuation allowance.

The maximum anticipated groundwater elevation is 4.63 meters above the assumed excavation invert, and therefore, short-term construction dewatering is anticipated.

A conceptual well-point dewatering model has been used to forecast the dewatering rates. As such, a greater drawdown would be required at the pumping wells themselves to achieve the target level in the central area of the base of the excavation. For calculations, the bottom tips of dewatering wells have been assumed to be located 3.0 m deeper than the excavation invert, with water levels in those dewatering wells 2.0 m below the excavation invert.

$$Q = \frac{\pi \cdot K \left(H^2 - h^2\right)}{\ln\left(\frac{R_o}{r_w}\right)}$$

Where the symbols and input values are as follows:

- Q = Discharge flow (L/min)
- K = Hydraulic conductivity = 3.5 x 10^{-6} m/s
- H = Pre-construction static water level = 112.63 masl
- h = Target water level = 108.0 masl
- R_o = Radius of influence
- r_w = Effective well radius of open excavation

The simplified shape of the excavation used for the pumping rate calculations is assumed to account for the full dimensions of the underground structure, as displayed in **Figure 4**.

5.4 Construction Dewatering Rates

Assuming the dewatering wells are installed to elevations of 106.0 masl, the estimated maximum dewatering rate for initial drawdown (7 days) is 289,687 L/day (201 L/min), and during steady-state drawdown (40 days) is 132,206 L/day (92 L/min). The dewatering calculations are provided in **Appendix E.**

For the purpose of permitting applications for dewatering, GEMS recommends using the forecasted 7-day pumping rate with the application of a 1.5 safety factor. The resulting pumping rate after applying the safety factor is 434,530 L/day (302 L/min). This forecasted dewatering pumping rate will allow for uncertainties and variability in the range of hydraulic conductivity.

Additionally, it is necessary to account for contributions to the dewatering volume from significant precipitation events. Assuming a rectangular excavation with dimensions of 85 m x 128 m for underground parking, the total surface area of the excavation will be 10,880 m^2. Anticipating a 15 mm daily rainfall event, the volume of rainwater contributed to this area would be 163,200 L.

After applying the safety factor, adding the rainfall contribution to the dewatering rate brings the forecast maximum pumping rate to 597,730 L/day (415 L/min).

A dewatering contractor should be retained to evaluate the dewatering methods. If dewatering wells deeper than 3.0 m below the assumed excavation invert depth are required, the discharge rates should be re-evaluated by GEMS.

A summary of the construction dewatering rates is outlined in **Table 5.3.**

Schedule:	Minimum of daily recording by on-Site personnel, with values reported to the Project supervisor weekly for submission to the City, Region and/or MECP.
Trigger:	Discharge volume exceeds the maximum rate of dewatering specified in the discharge agreement and/or the EASR.
Mitigation:	Immediately reduce the pumping rate so that discharge is within permitted limit.
Reporting:	Values reported to the Project supervisor weekly for submission to the City, Region and/or MECP.

Additional Fieldwork

Well decommissioning is required before construction. A licensed well contractor should decommission any inactive wells within the Site, according to Ontario Regulation 903. This regulation applies to any existing monitoring wells.

7.0 Conclusion

Based on the above analysis, the following conclusions and recommendations are offered for the proposed reconstruction of 2400-2440 Dundas Avenue West, Toronto, Ontario:

- The geology at the Site is composed of coarse to fine-textured glaciolacustrine deposits of sand to clayey silt. Excavation and dewatering activities will occur in predominately Silty Sand and Sandy Silt materials.
- Hydraulic conductivity tests for the water-bearing unit ranges from 1.8. x 10^{-6} m/s to 3.5 x 10^{-6} m/s, with a geometric mean of 2.3 x 10^{-6} m/s.
- The groundwater elevation at the Site ranged between 94.98 – 111.33 masl over the monitoring period (September to May 2024). Groundwater elevations taken from MW101D reflect that the piezometric head in the underlying Thorncliffe formation is not representative of the water table at the Site.
- The water quality met the City of Toronto Sanitary and Combined Sewers Discharge Guidelines for all parameters. It exceeded the City of Toronto Storm Sewer Discharge Use By-law criteria for:
    - Total Suspended Solids (TSS)
    - Total Manganese (Mn)
- The maximum construction dewatering rate to maintain water levels below the estimated maximum depth of excavation is 434,530 L/day (302 L/min), including a safety factor of 1.5.
- The estimated maximum dewatering rate for 15 mm rainfall event is 163,200 L/day (113.3 L/min).
- With the application of a safety factor of 1.5, the total maximum forecasted dewatering rate is 597,730 L/day (415 L/min) for groundwater and precipitation entering the excavation area.
- The zone of influence for construction dewatering is estimated to extend 93 metres from the edge of the excavation area.
- As the proposed development will be constructed water-tight, no long-term discharge is anticipated.
- Well decommissioning will be required before construction. A licensed well contractor should decommission any inactive wells within the Site, according to Ontario Regulations.

TORONTO

October 2017

SERVICING REPORT GROUNDWATER SUMMARY

The form is to be completed by the Professional that prepared the Servicing Report.
Use of the form by the City of Toronto is not to be construed as verification of engineering/hydrological content.

For City Staff Use Only:	
Name of ECS Case Manager (please print)	
Date Review Summary provided to to TW	

A. SITE INFORMAITON		**Included in SR (reference page number)**	**Report Includes this information City staff (Check)**
Date Servicing Report was prepared:	Oct. 2024	Cover Page	
Title of Servicing Report:	Functional Servicing & Stormwater Management	Cover Page	
Name of Consulting Firm that prepared Servicing Report:	Arcadis	Cover Page	
Site Address	2400- 2440 DUNDAS STREET WEST Toronto, Ontario	Page 1	
Postal Code	M6P 1W9	N/A	
Property Owner (identified on planning request for comments memo)	Fora Developments	Cover Page	
Proposed description of the project (ex. number of point towers, number of podiums, etc.)	The proposed development will be three point towers (36, 35 and 18 storeys with one underground levels	Page 2	
Land Use (ex. commercial, residential, mixed, industrial, institutional) as defined by the Planning Act	Mixed use	Page 2	
Number of below grade levels	1 Level of Underground Parking	Page 2	

TORONTO

October 2017

SERVICING REPORT GROUNDWATER SUMMARY

Does the SR include a private water drainage system (PWDS)? **PWDS: Private Water Drainage System:** A subsurface drainage system which may consist of but is not limited to weeping tile(s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection or drainage system for disposal in a municipal sewer.	If **Yes** continue completing Section B (Information Relating to Groundwater) **ONLY** **If Yes, Number of PWDS?** 0 *(Each of these PWDS may require a separate Toronto Water agreement)* If **No** skip to Sections C (On-site Groundwater Containment) and/or D (Water Tight Requirements) as applicable	☐ YES ☉ NO	
B. INFORMATION RELATING TO GROUNDWATER		**Included in SR (reference page number)**	**Report Includes this information City Staff (Check)**
A copy of the pump schedule(s) for **ALL** groundwater sump pump(s) for the development site has been included in the FSR **or** A letter written by a Mechanical Consultant (signed and stamped by a Professional Engineer of Ontario) shall be attached to the SR stating the peak flow rate of the groundwater discharge for the development site for all groundwater sump pump(s). This peak flow rate must be based on the pump schedule(s) that have been designed by the Mechanical Consultant. A template of this letter is attached in Schedule A.			

October 2017

SERVICING REPORT GROUNDWATER SUMMARY

****If there is more than one sump they must ALL be included in the letters along with a combined flow****			
Is it proposed that the groundwater from the development site will be discharged to the sanitary, combined or storm sewer?	☐ Sanitary Sewer ☐ Combined Sewer ☐ Storm Sewer		
Will the proposed PWDS discharge from the site go to the Western Beaches Tunnel (WBT)? *Reference attached WBT drainage map*	☐ YES ☐ NO **If Yes, private water discharge fees will apply and site requires a sanitary discharge agreement.**		
What is the street name where the receiving sewer is located?			
What is the diameter of the receiving sewer?			
Is there capacity in the proposed local sewer system? ☐ YES ☐ NO	Are there any improvements required to the sewer system? If yes, identify them below and refer to the section and page number of the FSR where this information can be found. If a sewer upgrade is required, the owner is required to enter into an Agreement with the City to improve the infrastructure? ☐ YES		
Total allowable peak flow rate during a 100 year storm event (L/sec) to storm sewer When groundwater is to be discharged to the storm sewer the total groundwater and stormwater discharge shall not exceed the permissible peak flow rate during a 2 year pre development storm event, as per the City's	136.5 L/sec	Page 7	

SERVICING REPORT GROUNDWATER SUMMARY

Wet Weather Flow Management Guidelines, dated 2006			
Short-Term Groundwater Discharge Provide proposed total flow rate to the sanitary/combined sewer in post-development scenario Total Flow (L/sec) = sanitary flow + peak short-term groundwater flow rate	12 hours of pumping 13.8 L/sec	Page 5	
Long-Tem Groundwater Discharge Provide proposed total flow rate to the sanitary/combined sewer in post-development scenario Total Flow (L/sec) = sanitary flow + peak long-term groundwater flow rate	0 L/sec No long-term groundwater discharge to the sanitary sewer	Page 7 & App. D	
Does the water quality meet the receiving sewer Bylaw limits? ☉ YES ☐ NO	If the water quality does not meet the applicable receiving sewer Bylaw limits and the applicant is proposing a treatment system the applicant will need to include a letter stating that a treatment system will be installed and the details of the treatment system will be included in the private water discharge application that will be submitted to TW EM&P.	page 6	
C. ON-SITE GROUNDWATER CONTAINMENT		**Included in SR (reference page number)**	**Report Includes this information City Staff (Check)**
How is the site proposing to manage the groundwater discharge on site?	Watertight foundation	Page 5	

October 2017

SERVICING REPORT GROUNDWATER SUMMARY

Has the above proposal been approved by:	◯ TW-WIM And ◯ TW-EM&P And ◯ ECS		
If the site is proposing a groundwater infiltration gallery, has it been stated that the groundwater infiltration gallery will not be connected to the municipal sewer? A connection between the infiltration gallery/dry well and the municipal sewer is not permitted Please be advised if an infiltration gallery/dry well on site is not connected to the municipal sewer, the site **must** submit two letters using the templates in Schedule B and Schedule C.	☐ YES ☑ NO	n/a	
Confirm that the infiltration gallery can infiltrate 100% of the expected peak groundwater flow year round, ensure that the top of the infiltration trench is below the frost line (1.8m depth), not less than 5 m from the building foundation, bottom of the trench 1m above the seasonally high water table, and located so that the drainage is away from the building.	N/A	n/a	
D. WATER TIGHT REQUIREMENTS		**Included in SR (reference page number)**	**Report Includes this information City Staff**

SERVICING REPORT GROUNDWATER SUMMARY

		(Check)
If the site is proposing a water tight structure: 1. The owner must submit a letter using the template in Schedule D. 2. A Professional Engineer (Structural), licensed to practice in Ontario and qualified in the subject must submit a letter using the template in Schedule E.	Page 5	

Provide a copy of the approved SR to Toronto Water Environmental Monitoring & Protection Unit at pwapplication@toronto.ca.

Consulting Firm that prepared Servicing Report: IBI Group

Professional Engineer who completed the report summary: Jason Jenkins, PE, P.Eng.

Print Name

Oct. 2024

Professional Engineer who completed the report summary: _____

Signature Date & Stamp

FOUNDATION DRAINAGE SUMMARY FORM

General Information
Applicant Name: FORA Developments
Development Address: 2400 Dundas Street West
Development Application #: 23 124848 STE 04 OZ
Available Sewer Servicing: ■ Storm Sewers ■ Combined Sewers □ Sanitary Sewers
Groundwater Level Assessment
GW Monitoring Approach: ■ 1. Flexible Year-Round □ 2. Peak Season □ 3. Alternate (Attach Justification)
Monitoring Length [weeks]: 8 weeks
Monitoring Months: □ Jan □ Feb □ Mar □ Apr ■ May □ Jun □ Jul □ Aug ■ Sept ■ Oct ■ Nov □ Dec
# of Measurements: 15
Peak Observed GWL [masl]: 111.33
Estimated Maximum Anticipated GWL [masl]: 111.01
Lowest Elevation of Proposed Structure [masl]: 109.0
Proposed Condition and Measures *(Complete all)*
On-site Management Provided? ■ Yes (Describe) □ No (Provide Rationale)
Infrastructure Required for Future Emergency Repair? ■ Yes □ No
Foundation Drainage Expected to Contain Only Infiltrated Stormwater? □ Yes ■ No
Site Condition: ■ Non-Brownfield with no RSC □ Brownfield with RSC + Risk Management □ Other (Describe)
Proposed Foundation Drainage Management *(Select one)*
■ **On-site Management** (no long-term discharge to sewers)
□ **On-site Management with Infrastructure for Future Emergency Repair** (in accordance with *Policy 4.4*)
□ **Long-term Discharge to Storm or Combined Sewers** (in accordance with *Policy Statement 4.3*)
□ Request for Exemption of Policy to apply for Long-Term Discharge Agreement (in accordance with *Policy Sec 5.0*)
Description/Attachments in Foundation Drainage Technical Brief *(Select all that apply)*
□ On-site Management Description/Rationale for Technological Infeasibility
□ GWL Monitoring Well Plan, including Monitoring Methodology and Justification (where alternate is proposed)
■ GWL Monitoring and Peak Flow Estimation Results, Analysis & Interpretation
□ Building Elevation Plan
□ Site Condition Supporting Documentation (e.g., Brownfield/RSC Status, Soil Quality)
□ Exemption Rationale and Documentation for Technical Infeasibility and/or Extenuating Circumstances. Describe physical and design constraints to substantiate that a technical solution was not feasible; include documentation to substantiate that there are extenuating circumstances (e.g., application submission timeline and milestones) that may warrant an exemption, where applicable.
□ Other Documentation; *Specify* -
Qualified Professional Sign-Off
Name: Jason Jenkins — Designation: P.Eng.
Signature: — Date: Oct. 2024

Form to accompany *Foundation Drainage Technical Brief* document prepared in accordance with the *Foundation Drainage Policy* and *Guidelines*.

November 1, 2021

DUNDAS LI PROPERTIES INC.
202-1840 Eglinton Ave W
Toronto, Ontario M6E 0A3

October 7, 2024

Attention: Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering
Toronto City Hall 24th fl. E., 100 Queen St. W Toronto ON M5H 2N2

cc: General Manager, Toronto Water
c/o Manager, Environmental Monitoring & Protection Unit
2126 Kipling Avenue Etobicoke, ON M9W 4K5

Dear Sir or Madam,

I, Paolo Rovazzi , confirm that all buildings on the subject lands 2400-2440 Dundas Street West will be constructed completely water-tight below grade in a manner that will resist hydrostatic pressure. However, as per good engineering practice, the Mechanical Engineering Firm has designed a drainage system for only the sub-floor in the event of any minor leaks or damage to the waterproofing system, which cannot be repaired after installation. The drainage system will not have any connections to the foundation wall and the water infiltration is expected to be null. The sub-floor drainage system designed by the Mechanical Engineer will comply with the current City requirements for groundwater, so any water collected will be monitored and discharged under a Sanitary Discharge Agreement with the City of Toronto.

Name (printed) and Title: Paolo Rovazzi, ASO
Email: provazzi@li-limited.com

Paolo (Oct 7, 2024 12:20 EDT)
Signature

I, Paolo Rovazzi, have the authority to bind the corporation.

I have attached the following documents, confirming that I have ownership to bind the corporation:

Corporation Profile Report obtained within 30 days
AND
Parcel Register obtained within 30 days

2024.10.07_2400 Dundas_Water-tight with PWDS - Letter by Owner_

Final Audit Report 2024-10-07

Created:	2024-10-07
By:	Lyle Levine (lyle@foradevelopments.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAdpcjmTUPWs_7tx0qSbe0iCw8xAXum53i

"2024.10.07_2400 Dundas_Water-tight with PWDS - Letter by Owner_" History

Document created by Lyle Levine (lyle@foradevelopments.com)
2024-10-07 - 4:15:42 PM GMT

Document emailed to Paolo (provazzi@li-limited.com) for signature
2024-10-07 - 4:15:48 PM GMT

Email viewed by Paolo (provazzi@li-limited.com)
2024-10-07 - 4:20:35 PM GMT

Document e-signed by Paolo (provazzi@li-limited.com)
Signature Date: 2024-10-07 - 4:20:48 PM GMT - Time Source: server

Agreement completed.
2024-10-07 - 4:20:48 PM GMT

JABLONSKY, AST AND PARTNERS
Consulting Engineers

400 - 3 Concorde Gate
Toronto, ON M3C 3N7
Telephone (416) 447-7405
www.astint.on.ca
Email jap@astint.on.ca

October 7, 2024

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

cc: General Manager, Toronto Water
c/o Manager, Environmental Monitoring and Protection Unit
2126 Kipling Avenue, Etobicoke, ON M9W 4K5

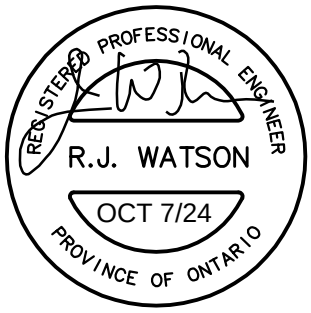
Re: 2400-2440 Dundas Street West
Raft Foundation – Water-tight Design
Our Project No. 22336

Dear Sir or Madam,

I, Jeff Watson, P.Eng., confirm that all buildings on the subject lands of 2400-2440 Dundas Street West, will be structurally designed to be completely water-tight below grade in a manner that will resist hydrostatic pressure. However, as per good engineering practice, it is our understanding that the Mechanical Engineering Firm has designed a drainage system for only the sub-floor in the event of any minor leaks or damage to the waterproofing system, which cannot be repaired after installation. It is our understanding that the drainage system will not have any connections to the foundation wall and the water infiltration is expected to be null. It is our understanding that the sub-floor drainage system designed by the Mechanical Engineer will comply with the current City requirements for groundwater, so any water collected will be monitored and discharged under a Sanitary Discharge Agreement with the City of Toronto.

Yours very truly,

JABLONSKY, AST AND PARTNERS
CONSULTING ENGINEERS



Jeff Watson, P. Eng.
Partner
jwatson@astint.on.ca

MCW Consultants Ltd.

Queen's Quay Terminal
207 Queen's Quay West,
Suite 615
Toronto, Ontario M5J 1A7

Phone (416) 598-2920
Fax (416) 598-5394
Internet: www.mcw.com

October 8th, 2024

Attention: Executive Director, Engineering and Construction Services

c/o Manager, Development Engineering

cc: General Manager, Toronto Water
c/o Manager, Environmental Monitoring & Protection Unit
2400-2440 Dundas Street West – Toronto, Ontario
FORA Developments

Dear Sir or Madam,

I Agustin Olt, confirm that all buildings on the subject lands at 2400-2440 Dundas Street West in Toronto, ON will be designed and constructed by others to be completely water-tight below grade in a manner that will resist hydrostatic pressure. However, as per good engineering practice, I have designed a drainage system for only the sub-floor in the event of any minor leaks or damage to the waterproofing system, which cannot be repaired after installation. The drainage system will not have any connections to the foundation wall and the water infiltration is expected to be null.

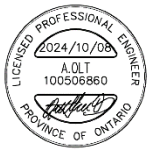
The back-up groundwater sump pumps will be sized at 0 L/sec (groundwater peak flow rate) and are expected to run approximately 0 hours per day.

This peak flow rate will be used for assessing capacity for the peak discharge flow into the City's sanitary sewer system.

The sub-floor drainage system will comply with the current City requirements for groundwater, so any water collected will be monitored and discharged under a Sanitary Discharge Agreement with the City of Toronto.

Yours truly,

MCW Consultants Ltd.



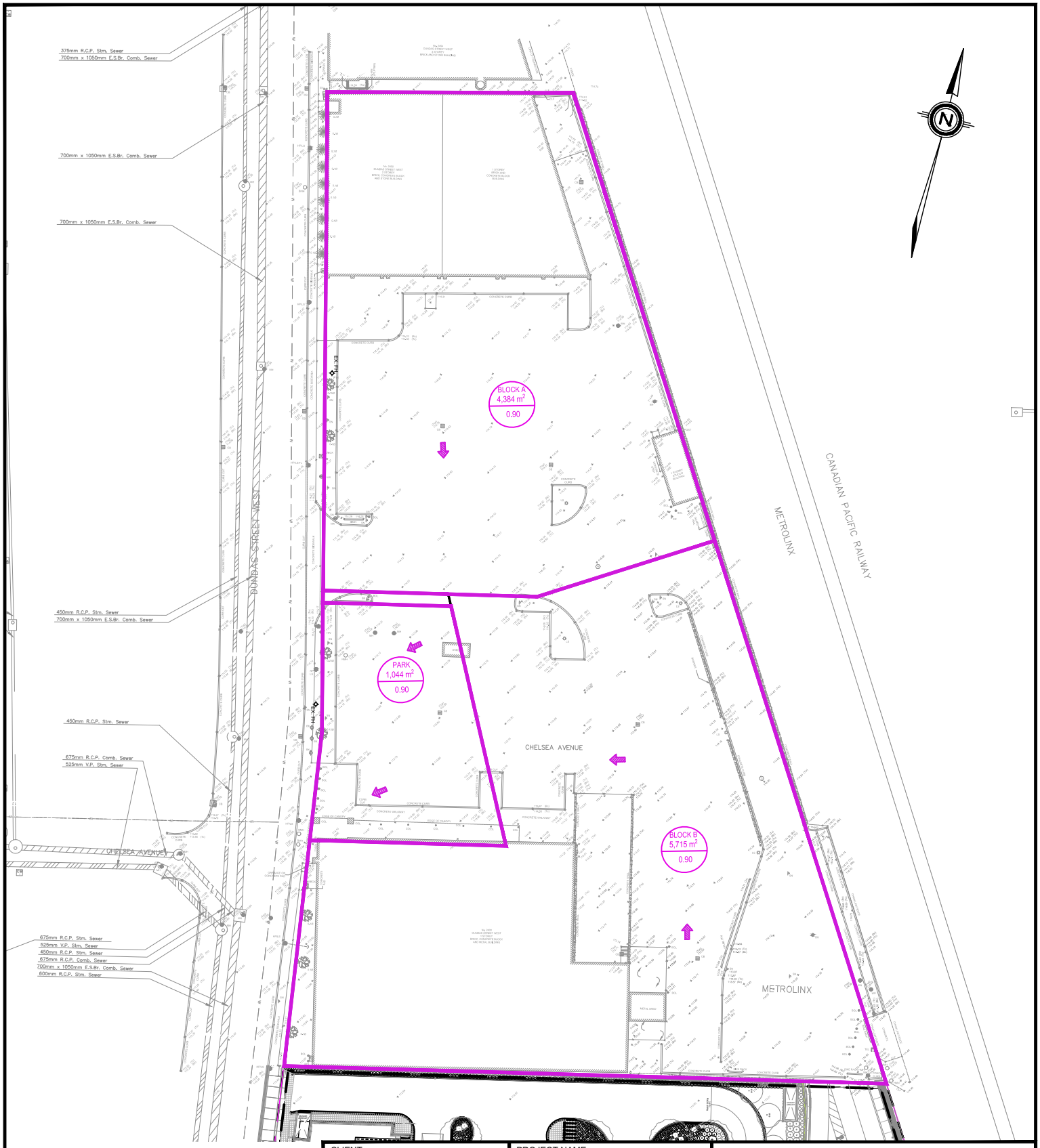
Agustin Olt, P. Eng
Partner

Appendix C
Storm Sewer

Pre- and Post-Development Drainage Area Maps

Stormwater Design Calculations

Stormfilter Sizing and Sample Drawing (Contech)



LEGEND

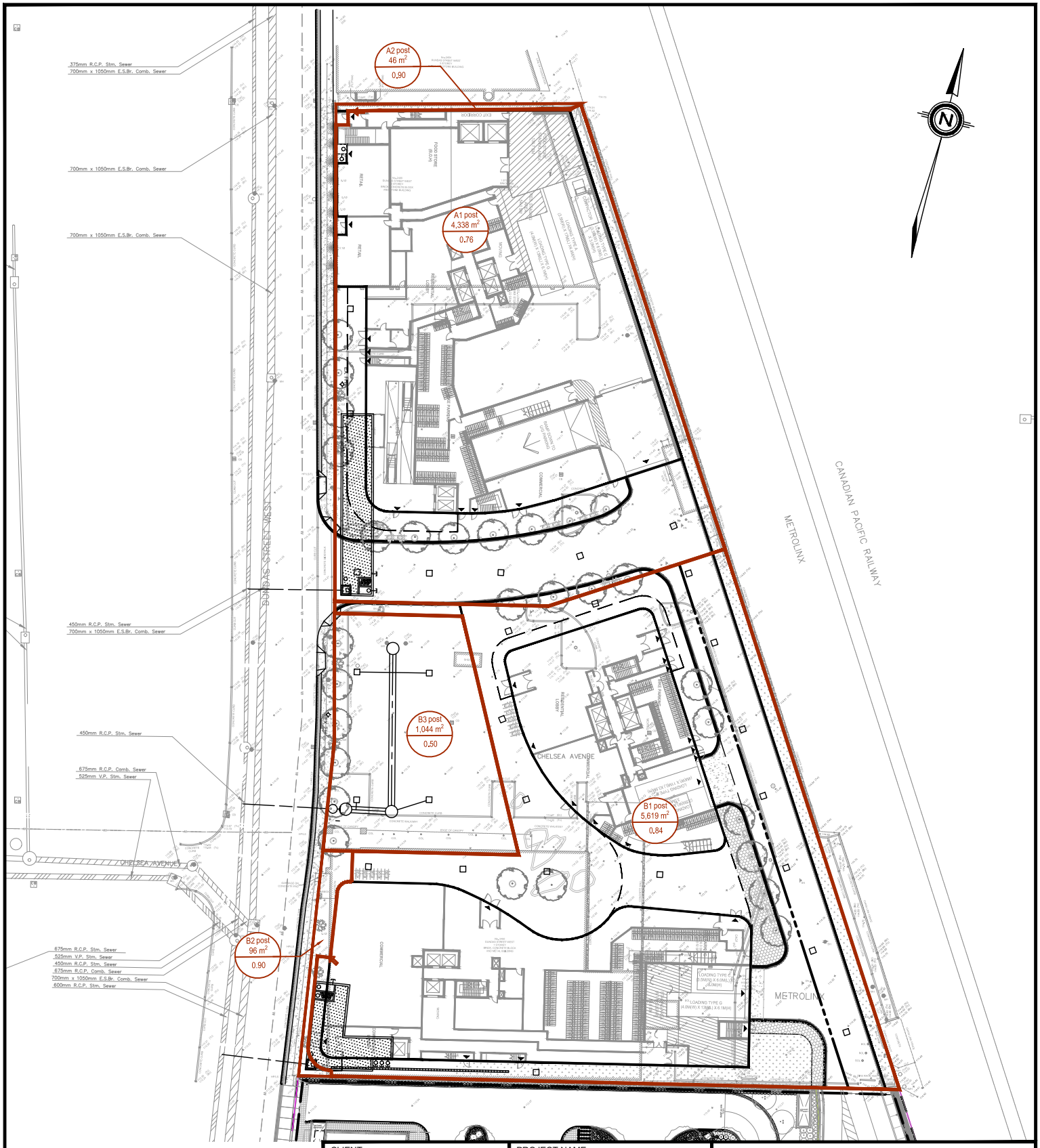
- PROPERTY LINE
- DRAINAGE BOUNDARY
- OVERLAND FLOW DIRECTION

CLIENT	DUNDAS LI PROPERTIES INC
	1840 EGLINTON AVE WEST, SUITE 202, TORONTO, ON, M6E 5B2
PROJECT NAME	2400 DUNDAS STREET WEST
SCALE:	NTS
DATE:	2024-06-06
PROJECT ENG:	JMJ
DRAWN BY:	SB
CHECKED BY:	JMJ
APPROVED BY:	JMJ
PROJECT NO:	141003
FIGURE NAME	PRE-DEVELOPMENT STORM DRAINAGE PLAN
FIGURE NO.	DAP-1
REVISION	1

ARCADIS

SCALE CHECK
1 in
10mm

File Location: J:\141003_2400Dundas\7.0_Production\7.03_Design\04_CivilSheets\Figures\SWM DAPs.dwg Last Saved: June 6, 2024, by shirley.beaudoin Plotted: Thursday, June 6, 2024 10:07:46 AM by Shirley Beaudoin



LEGEND

- PROPERTY LINE
- DRAINAGE BOUNDARY
- OVERLAND FLOW DIRECTION

CLIENT: DUNDAS LI PROPERTIES INC 1840 EGLINTON AVE WEST, SUITE 202, TORONTO, ON, M6E 5B2	PROJECT NAME: 2400 DUNDAS STREET WEST		
	SCALE: NTS	DATE: 2024-06-06	FIGURE NAME: POST-DEVELOPMENT STORM DRAINAGE PLAN
	PROJECT ENG: JMJ	DRAWN BY: SB	FIGURE NO.: DAP-2
	CHECKED BY: JMJ	APPROVED BY: JMJ	REVISION: 1
	PROJECT NO: 141003		

ARCADIS

SCALE CHECK 1 in 10mm

File Location: J:\141003_2400Dundas\7.0_Production\7.03_Design\04_CivilSheets\Figures\SWM DAPs.dwg Last Saved: June 6, 2024, by shirley.beaudoin Plotted: Thursday, June 6, 2024 10:07:58 AM by Shirley Beaudoin

2400 Dundas Street West

Mixed Use Development

ARCADIS

Pre-Development Runoff Coefficients

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 October 2024
Calc By: SS

Block A (Phase 1)				
Conventional Roof	1,650	37.6%	0.90	0.34
Landscape	0	0.0%	0.25	0.00
Impervious	2,734	62.4%	0.90	0.56
Total Area	**4,384**	100%		**0.90**

Block B (Phase 2)				
Conventional Roof	1,831	32.0%	0.90	0.29
Landscape	0	0.0%	0.25	0.00
Impervious	3,884	68.0%	0.90	0.61
Total Area	**5,715**	100%		**0.90**

Parkland Dedication				
Conventional Roof	0	0.0%	0.90	0.00
Landscape	0	0.0%	0.25	0.00
Impervious	1,044	100.0%	0.90	0.90
Total Area	**1,044**	100%		**0.90**

Pre-Development Total				
Conventional Roof	3,481	31.2%	0.90	0.28
Landscape	0	0.0%	0.25	0.00
Impervious	7,662	68.8%	0.90	0.62
Total Area	**11,143**	100%		**0.90**

2400 Dundas Street West
Mixed Use Development

ARCADIS

Post-Development Runoff Coefficients

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

A1 Post: Block A (Phase 1) - Controlled				
Conventional Roof	1,762	40.6%	0.90	0.37
Extensive Green Roof	1,270	29.3%	0.50	0.15
Intensive Green Roof		0.0%	0.50	0.00
Landscape	165	3.8%	0.25	0.01
Landscape over P1		0.0%	0.45	0.00
Permeable Pavers		0.0%	0.55	0.00
Impervious (Dirty)	1,141	26.3%	0.90	0.24
Impervious (Clean)		0.0%	0.90	0.00
Total Area	**4,338**	100%		**0.76**

B1 Post: Block B (Phase 2) - Controlled				
Conventional Roof	2,585	46.0%	0.90	0.41
Extensive Green Roof	480	8.5%	0.50	0.04
Intensive Green Roof		0.0%	0.50	0.00
Landscape	183	3.3%	0.25	0.01
Landscape over P1		0.0%	0.45	0.00
Permeable Pavers		0.0%	0.55	0.00
Impervious (Dirty)	1,180	21.0%	0.90	0.19
Impervious (Clean)	1,191	21.2%	0.90	0.19
Total Area	**5,619**	100%		**0.84**

A2 Post: Block A (Phase 1) - Uncontrolled to Dundas				
Conventional Roof		0.0%	0.90	0.00
Extensive Green Roof		0.0%	0.50	0.00
Intensive Green Roof		0.0%	0.50	0.00
Landscape		0.0%	0.25	0.00
Landscape over P1		0.0%	0.45	0.00
Permeable Pavers		0.0%	0.55	0.00
Impervious (Dirty)		0.0%	0.90	0.00
Impervious (Clean)	46	100.0%	0.90	0.90
Total Area	**46**	100%		**0.90**

B2 Post: Block B (Phase 2) - Uncontrolled to Dundas				
Conventional Roof		0.0%	0.90	0.00
Extensive Green Roof		0.0%	0.50	0.00
Intensive Green Roof		0.0%	0.50	0.00
Landscape		0.0%	0.25	0.00
Landscape over P1		0.0%	0.45	0.00
Permeable Pavers		0.0%	0.55	0.00
Impervious (Dirty)		0.0%	0.90	0.00
Impervious (Clean)	96	100.0%	0.90	0.90
Total Area	**96**	100%		**0.90**

Block A Total				
Conventional Roof	1,762	40.2%	0.90	0.36
Extensive Green Roof	1,270	29.0%	0.50	0.14
Intensive Green Roof	0	0.0%	0.50	0.00
Landscape	165	3.8%	0.25	0.01
Landscape over P1	0	0.0%	0.45	0.00
Permeable Pavers	0	0.0%	0.55	0.00
Impervious (Dirty)	1,141	26.0%	0.90	0.23
Impervious (Clean)	46	1.0%	0.90	0.01
Total Area	**4,384**	100%		**0.76**

Block B Total				
Conventional Roof	2,585	45.2%	0.90	0.41
Extensive Green Roof	480	8.4%	0.50	0.04
Intensive Green Roof	0	0.0%	0.50	0.00
Landscape	183	3.2%	0.25	0.01
Landscape over P1	0	0.0%	0.45	0.00
Permeable Pavers	0	0.0%	0.55	0.00
Impervious (Dirty)	1,180	20.6%	0.90	0.19
Impervious (Clean)	1,287	22.5%	0.90	0.20
Total Area	**5,715**	100%		**0.85**

B3 Post: Parkland Dedication				
Conventional Roof	0	0.0%	0.90	0.00
Extensive Green Roof	0	0.0%	0.50	0.00
Intensive Green Roof	0	0.0%	0.50	0.00
Landscape	642	61.5%	0.25	0.15
Landscape over P1	0	0.0%	0.45	0.00
Permeable Pavers	0	0.0%	0.55	0.00
Impervious (Dirty)	0	0.0%	0.90	0.00
Impervious (Clean)	402	38.5%	0.90	0.35
Total Area	**1,044**	100%		**0.50**

Note: the detailed design of the park is by others at a later date. A runoff coefficient of 0.50 has been used to estimate the required stormwater controls at this stage.

Post Development Total				
Conventional Roof	4,347	39.0%	0.90	0.35
Extensive Green Roof	1,750	15.7%	0.50	0.08
Intensive Green Roof	0	0.0%	0.50	0.00
Landscape	990	8.9%	0.25	0.02
Landscape over P1	0	0.0%	0.45	0.00
Permeable Pavers	0	0.0%	0.55	0.00
Impervious (Dirty)	2,321	20.8%	0.90	0.19
Impervious (Clean)	1,735	15.6%	0.90	0.14
Total Area	**11,143**	100%		**0.78**

2400 Dundas Street West

Mixed Use Development

ARCADIS

ALLOWABLE RELEASE RATE AND STORM SERVICE DESIGN

2 / 100 -YEAR STORM SEWER DESIGN SHEET

$I_{2\text{-year}} = \frac{21.8}{(T)^{0.78}} = 88.19$ mm/hr

$I_{100\text{-year}} = \frac{59.7}{(T)^{0.80}} = 250.32$ mm/hr

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

	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 Sect. (min)	Total Time (min)	Percent of Full Flow (%)	Notes
ALLOWABLE RELEASE RATE																			
Allowable Release Rate (Block A/Phase 1)			0.4384	0.50	0.219	0.219	10.0	88.2	**53.7**										
Allowable Release Rate (Block B/Phase 2)			0.5715	0.50	0.286	0.286	10.0	88.2	**70.0**										
Allowable Release Rate (Park)			0.1044	0.50	0.052	0.052	10.0	88.2	**12.8**										
Allowable Release Rate (Total Site)			1.1143	0.50	0.557	0.557	10.0	88.2	**136.5**										
UNCONTROLLED FLOW																			
A2 Post: Phase 1 uncontrolled to Dundas			0.0046	0.90	0.004	0.004	10.0	250.3	**2.9**										
B2 Post: Phase 2 uncontrolled to Dundas			0.0096	0.90	0.009	0.009	10.0	250.3	**6.0**										
NET ALLOWABLE RELEASE RATE																			
Allowable Release Rate (Phase 1)			0.4384	0.50	0.219	0.219	10.0	88.2	**53.7**										
Phase 1 Uncontrolled Flow									**2.9**										
Net Allowable Release Rate									**50.8**										
Allowable Release Rate (Phase 2)			0.5715	0.50	0.286	0.286	10.0	88.2	**70.0**										
Phase 2 Uncontrolled Flow									**6.0**										
Net Allowable Release Rate									**64.0**										
Allowable Release Rate (Park)			0.1044	0.50	0.052	0.052	10.0	88.2	**12.8**										
Park Uncontrolled Flow									**0.0**										
Net Allowable Release Rate									**12.8**										
STORMFILTER / JELLYFISH SIZING: BLOCK A																			
2-year			0.1141	0.90	0.103	0.103	10.0	88.2	**25.2**										
5-year			0.1141	0.90	0.103	0.103	10.0	131.8	**37.6**										
100-year			0.1141	0.90	0.103	0.103	10.0	250.3	**71.4**										
STORMFILTER / JELLYFISH SIZING: BLOCK B																			
2-year			0.1180	0.90	0.106	0.106	10.0	88.2	**26.0**										
5-year			0.1180	0.90	0.106	0.106	10.0	131.8	**38.9**										
100-year			0.1180	0.90	0.106	0.106	10.0	250.3	**73.8**										
ORIFICE AND SERVICE DESIGN				k	Orif.(mm)	Area (m2)	depth (m)	head (m)	Q (L/s)										
Phase 1	MH1 (Cntrl MH)	450mm Storm		k=0.8	128	0.01287	0.83	0.77	**41.0**	250	2.00%	84.1	1.7	1.7	15.6	0.2	10.2	49%	
Phase 2	MH2 (Cntrl MH)	600mm Storm		k=0.8	128	0.01287	1.76	1.70	**60.9**	250	2.00%	84.1	1.7	1.9	14.8	0.1	10.1	72%	
Park	MH3 (Cntrl MH)	450mm Storm		k=0.6	75	0.00442	0.92	0.88	**11.6**	200	2.00%	46.4	1.5	1.2	14.9	0.2	10.2	25%	

2400 Dundas Street West | **Rational Method - 100 Year Storm**

Mixed Use Development | **Phase 1**

ARCADIS

$$I_{100\text{-year}} = \frac{59.7}{(10)^{0.80}} = 250.32 \text{ mm/hr}$$

Project Name:	2400 Dundas Street West	Controlled Area =	0.4338
Project Number:	141003	Weighed Runoff Coefficient =	0.76
Date:	10 Oct 2024	Orifice Discharge (L/s) =	41.0

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m³)
0	0.0	0.000	0.000	0.000
10	250.3	228.692	187.666	112.600
20	143.8	131.349	90.323	108.388
30	103.9	94.963	53.937	97.087
40	82.6	75.440	34.415	82.595
50	69.1	63.107	22.081	66.244
60	59.7	54.542	13.516	48.659
70	52.8	48.214	7.189	30.192
80	47.4	43.329	2.304	11.057
90	43.2	39.433	0.000	0.000
100	39.7	36.245	0.000	0.000
110	36.8	33.584	0.000	0.000
120	34.3	31.326	0.000	0.000
130	32.2	29.383	0.000	0.000
140	30.3	27.692	0.000	0.000
150	28.7	26.205	0.000	0.000
160	27.2	24.886	0.000	0.000
170	25.9	23.708	0.000	0.000
180	24.8	22.648	0.000	0.000
190	23.7	21.689	0.000	0.000
200	22.8	20.817	0.000	0.000
210	21.9	20.020	0.000	0.000
220	21.1	19.289	0.000	0.000
230	20.4	18.615	0.000	0.000
240	19.7	17.992	0.000	0.000
250	19.1	17.414	0.000	0.000
260	18.5	16.876	0.000	0.000
270	17.9	16.374	0.000	0.000
280	17.4	15.905	0.000	0.000
290	16.9	15.464	0.000	0.000
300	16.5	15.051	0.000	0.000
310	16.0	14.661	0.000	0.000
320	15.6	14.293	0.000	0.000
330	15.3	13.946	0.000	0.000
340	14.9	13.617	0.000	0.000
350	14.6	13.304	0.000	0.000
360	14.2	13.008	0.000	0.000

Storage Volume Required (cu.m) =	**112.6**
Storage Volume Provided (cu.m) =	**141.8**
HGL Depth (m) =	0.8
Orifice Diameter (mm) =	128

2400 Dundas Street West — **Rational Method - 100 Year Storm**

Mixed Use Development — **Phase 2**

ARCADIS

$$I_{100\text{-year}} = \frac{59.7}{(10)^{0.80}} = 250.32 \text{ mm/hr}$$

Project Name:	2400 Dundas Street West	Controlled Area =	0.5619
Project Number:	141003	Weighed Runoff Coefficient =	0.84
Date:	10 Oct 2024	Orifice Discharge (L/s) =	60.9

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m³)
0	0.0	0.000	0.000	0.000
10	250.3	330.015	269.148	161.489
20	143.8	189.544	128.677	154.412
30	103.9	137.037	76.169	137.105
40	82.6	108.865	47.997	115.193
50	69.1	91.066	30.199	90.597
60	59.7	78.707	17.839	64.222
70	52.8	69.575	8.708	36.573
80	47.4	62.526	1.659	7.962
90	43.2	56.904	0.000	0.000
100	39.7	52.304	0.000	0.000
110	36.8	48.464	0.000	0.000
120	34.3	45.205	0.000	0.000
130	32.2	42.401	0.000	0.000
140	30.3	39.961	0.000	0.000
150	28.7	37.815	0.000	0.000
160	27.2	35.912	0.000	0.000
170	25.9	34.212	0.000	0.000
180	24.8	32.683	0.000	0.000
190	23.7	31.299	0.000	0.000
200	22.8	30.041	0.000	0.000
210	21.9	28.891	0.000	0.000
220	21.1	27.835	0.000	0.000
230	20.4	26.863	0.000	0.000
240	19.7	25.964	0.000	0.000
250	19.1	25.129	0.000	0.000
260	18.5	24.353	0.000	0.000
270	17.9	23.629	0.000	0.000
280	17.4	22.951	0.000	0.000
290	16.9	22.316	0.000	0.000
300	16.5	21.719	0.000	0.000
310	16.0	21.157	0.000	0.000
320	15.6	20.626	0.000	0.000
330	15.3	20.124	0.000	0.000
340	14.9	19.649	0.000	0.000
350	14.6	19.199	0.000	0.000
360	14.2	18.771	0.000	0.000

Storage Volume Required (cu.m) =	**161.5**
Storage Volume Provided (cu.m) =	**176.9**
HGL Depth (m) =	1.8
Orifice Diameter (mm) =	128

2400 Dundas Street West | **Rational Method - 100 Year Storm**

Mixed Use Development | **Park**

ARCADIS

$$I_{100\text{-year}} = \frac{59.7}{(10)^{0.80}} = 250.32 \text{ mm/hr}$$

Project Name:	2400 Dundas Street West	Controlled Area =	0.1044
Project Number:	141003	Weighed Runoff Coefficient =	0.50
Date:	10 Oct 2024	Orifice Discharge (L/s) =	11.6

Time (min)	Intensity (mm/hr)	Q-100 (L/s)	Q-stored (L/s)	Storage Volume (m³)
0	0.0	0.000	0.000	0.000
10	250.3	36.296	24.715	14.829
20	143.8	20.847	9.265	11.119
30	103.9	15.072	3.490	6.283
40	82.6	11.973	0.392	0.941
50	69.1	10.016	0.000	0.000
60	59.7	8.657	0.000	0.000
70	52.8	7.652	0.000	0.000
80	47.4	6.877	0.000	0.000
90	43.2	6.258	0.000	0.000
100	39.7	5.753	0.000	0.000
110	36.8	5.330	0.000	0.000
120	34.3	4.972	0.000	0.000
130	32.2	4.663	0.000	0.000
140	30.3	4.395	0.000	0.000
150	28.7	4.159	0.000	0.000
160	27.2	3.950	0.000	0.000
170	25.9	3.763	0.000	0.000
180	24.8	3.595	0.000	0.000
190	23.7	3.442	0.000	0.000
200	22.8	3.304	0.000	0.000
210	21.9	3.178	0.000	0.000
220	21.1	3.061	0.000	0.000
230	20.4	2.954	0.000	0.000
240	19.7	2.856	0.000	0.000
250	19.1	2.764	0.000	0.000
260	18.5	2.678	0.000	0.000
270	17.9	2.599	0.000	0.000
280	17.4	2.524	0.000	0.000
290	16.9	2.454	0.000	0.000
300	16.5	2.389	0.000	0.000
310	16.0	2.327	0.000	0.000
320	15.6	2.269	0.000	0.000
330	15.3	2.213	0.000	0.000
340	14.9	2.161	0.000	0.000
350	14.6	2.112	0.000	0.000
360	14.2	2.065	0.000	0.000

Storage Volume Required (cu.m) =	**14.8**
Storage Volume Provided (cu.m) =	**31.0**
HGL Depth (m) =	0.9
Orifice Diameter (mm) =	75

2400 Dundas Street West
Mixed Use Development

ARCADIS

Water Quality Calculations
Phase 1

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

TSS Removal (Un-treated)

Surface	Area (m^2)		Effective TSS Removal	Overall TSS Removal
Conventional Roof	1,762	40%	80	32.2
Extensive Green Roof	1,270	29%	80	23.2
Intensive Green Roof	0	0%	80	0.0
Landscape	165	4%	80	3.0
Landscape over P1	0	0%	80	0.0
Permeable Pavers	0	0%	80	0.0
Impervious (Dirty)	1,141	26%	0	0.0
Impervious (Clean)	46	1%	80	0.8
Total Area:	**4,384**	100%		**59.2**

Treatment Required

TSS Removal (With Treatment)

Surface	Area (m^2)		Effective TSS Removal	Overall TSS Removal
Conventional Roof	1,762	40%	80	32.2
Extensive Green Roof	1,270	29%	80	23.2
Intensive Green Roof	0	0%	80	0.0
Landscape	165	4%	80	3.0
Landscape over P1	0	0%	80	0.0
Permeable Pavers	0	0%	80	0.0
Impervious (Dirty)	1,141	26%	80	20.8
Impervious (Clean)	46	1%	80	0.8
Total Area:	**4,384**	100%		**80.0**

Site Meets 80% TSS Removal

2400 Dundas Street West
Mixed Use Development

ARCADIS

Water Quality Calculations
Phase 2

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

TSS Removal (Un-treated)

Surface	Area (m^2)		Effective TSS Removal	Overall TSS Removal
Conventional Roof	2,585	45%	80	36.2
Extensive Green Roof	480	8%	80	6.7
Intensive Green Roof	0	0%	80	0.0
Landscape	183	3%	80	2.6
Landscape over P1	0	0%	80	0.0
Permeable Pavers	0	0%	80	0.0
Impervious (Dirty)	1,180	21%	0	0.0
Impervious (Clean)	1,287	23%	80	18.0
Total Area:	**5,715**	100%		**63.5**

Treatment Required

TSS Removal (With Treatment)

Surface	Area (m^2)		Effective TSS Removal	Overall TSS Removal
	2,585	45%	80	36.2
Extensive Green Roof	480	8%	80	6.7
Intensive Green Roof	0	0%	80	0.0
Landscape	183	3%	80	2.6
Landscape over P1	0	0%	80	0.0
Permeable Pavers	0	0%	80	0.0
Impervious (Dirty)	1,180	21%	80	16.5
Impervious (Clean)	1,287	23%	80	18.0
Total Area:	**5,715**	100%		**80.0**

Site Meets 80% TSS Removal

2400 Dundas Street West

Mixed Use Development

ARCADIS

Water Balance Calculations

Phase 1

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

Total Volume to be Retained	
Required Water Balance (mm):	5.0
Recall Site Area (m^2):	4,384
Total Water Balance to be Retained (m^3):	**21.9**

Volume Achieved Through Initial Abstraction				
Surface	**Area (m^2)**		**I.A.**	**Vol. (m^3)**
Conventional Roof	1,762		1	1.8
Extensive Green Roof	1,270		5	6.4
Intensive Green Roof	0		7	0.0
Landscape	165		5	0.8
Landscape over P1	0		5	0.0
Permeable Pavers	0		5	0.0
Impervious (Dirty)	1,141		1	1.1
Impervious (Clean)	46		1	0.0
Total Area:	**4,384**			**10.1**

Water Balance Summary	**Vol. (m^3)**
Recall Initial Abstraction (see above):	10.1
Water Re-Use (Irrigation):	11.8
Water Re-Use (Toilet Flushing):	0.0
Total Water Balance Achieved:	**21.9**

Site Meets City's Water Balance Criteria

Check Tank Capacity to Capture Re-Use Volume	
Area of SWM Tank (m^2):	100.0
Float Switch Operating Range (m):	0.12
Total Water Balance Achieved:	**11.8**

SWM Tank has sufficient capacity for Re-Use Volumes

2400 Dundas Street West

Mixed Use Development

ARCADIS

Water Balance Calculations

Phase 2

Project Name: 2400 Dundas Street West
Project Number: 141003
Date: 10 Oct 2024
Calc By: SS

Total Volume to be Retained	
Required Water Balance (mm):	5.0
Recall Site Area (m^2):	5,715
Total Water Balance to be Retained (m^3):	**28.6**

Volume Achieved Through Initial Abstraction				
Surface	**Area (m^2)**		**I.A.**	**Vol. (m^3)**
Conventional Roof	2,585		1	2.6
Extensive Green Roof	480		5	2.4
Intensive Green Roof	0		7	0.0
Landscape	183		5	0.9
Landscape over P1	0		5	0.0
Permeable Pavers	0		5	0.0
Impervious (Dirty)	1,180		1	1.2
Impervious (Clean)	1,287		1	1.3
Total Area:	**5,715**			**8.4**

Water Balance Summary	**Vol. (m^3)**
Recall Initial Abstraction (see above):	8.4
Water Re-Use (Irrigation):	20.2
Water Re-Use (Toilet Flushing):	0.0
Total Water Balance Achieved:	**28.6**

Site Meets City's Water Balance Criteria

Check Tank Capacity to Capture Re-Use Volume	
Area of SWM Tank (m^2):	100.0
Float Switch Operating Range (m):	0.20
Total Retention Volume Provided:	**20.2**

SWM Tank has sufficient capacity for Re-Use Volumes

Determining Number of Cartridges for Flow Based Systems

Date	**5/30/2024**	**Black Cells =**	**Calculation**

Site Information

Project Name	**2400 Dundas St W**		
Project Location	**Toronto, ON**		
OGS ID	**OGS - Tank B**		
Drainage Area, Ad	**0.29**	ac	(0.118 ha)
Impervious Area, Ai	**0.29**	ac	
Pervious Area, Ap	**0.00**		
% Impervious	**100%**		
Runoff Coefficient, Rc	**0.90**		
Treatment storm flow rate, Q_{treat}	**0.21**	cfs	(5.9 L/s)
Peak storm flow rate, Q_{peak}	**2.61**	cfs	(73.8 L/s)

Filter System

Filtration brand	**StormFilter**	
Cartridge height	**18**	in
Specific Flow Rate	**2.00**	gpm/ft²
Flow rate per cartridge	**15.00**	gpm

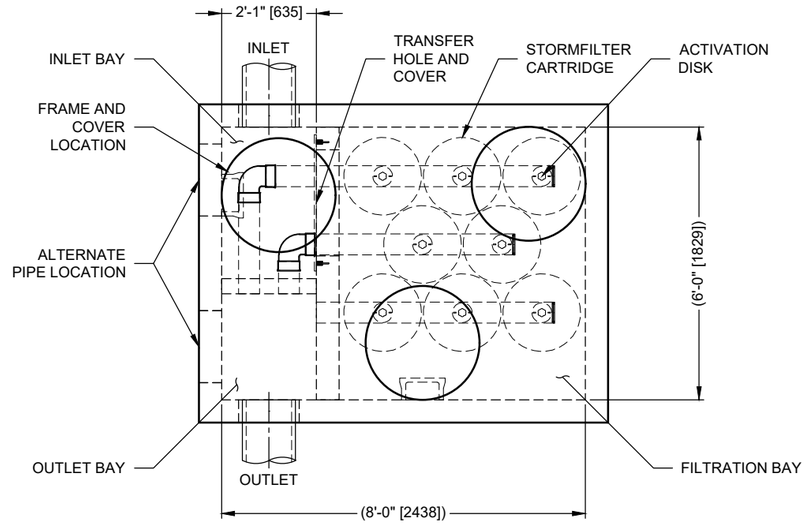
SUMMARY

Number of Cartridges	7
Media Type	Perlite

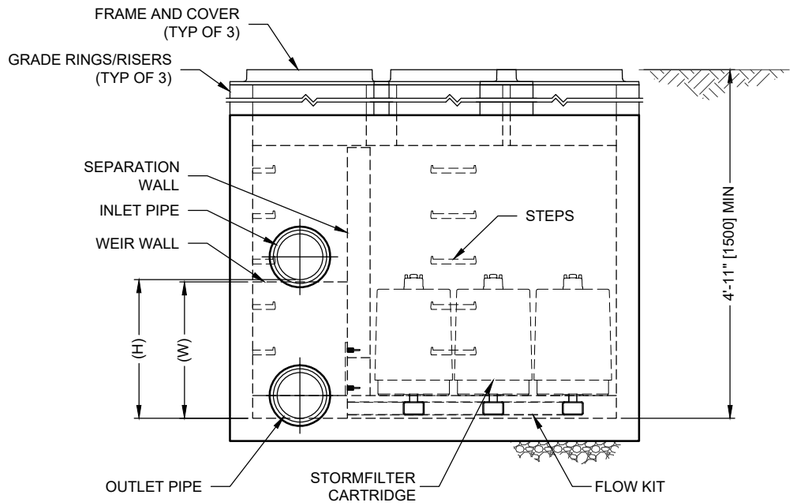
Event Mean Concentration (EMC)	**150**	mg/L
Annual TSS Removal	**80%**	
Percent Runoff Capture	**90%**	

Recommend SFPD0608 vault or CIP

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



PLAN



ELEVATION

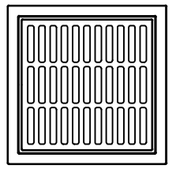
The Stormwater Management StormFilter®

STORMFILTER DESIGN NOTES

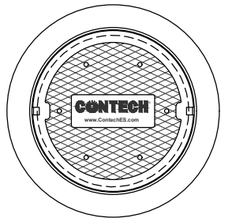
- STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
- A 6' x 8' [1829 x 2438] PEAK DIVERSION STYLE STORMFILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (8) AND IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR A RIGHT INLET CONFIGURATION
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS NOTED OTHERWISE

CARTRIDGE SIZE (in. [mm])	27 [686]			18 [457]			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H) (ft. [mm])	3.05 [930]			2.3 [701]			1.8 [549]		
HEIGHT OF WEIR (W) (ft. [mm])	3.00 [914]			2.25 [686]			1.75 [533]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m^2])	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.47]	10 [0.63]	8.35 [0.53]	5 [0.32]

* 1.67 gpm/sf [1.13 L/s/m^2] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



FRAME AND GRATE
(24" SQUARE)
(NOT TO SCALE)



FRAME AND COVER
(30" ROUND)
(NOT TO SCALE)

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	
PEAK FLOW RATE (cfs [L/s])	
RETURN PERIOD OF PEAK FLOW (yrs)	
CARTRIDGE FLOW RATE	
CARTRIDGE SIZE (27, 18, LOW DROP (LD))	
MEDIA TYPE (PERLITE, ZPG, PSORB)	
NUMBER OF CARTRIDGES REQUIRED	
INLET BAY RIM ELEVATION	
FILTER BAY RIM ELEVATION	

PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

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" [178].** FILTER MEDIA CONTACT TIME SHALL BE AT LEAST **37 SECONDS**. SPECIFIC FLOW RATE SHALL BE **2 GPM/SF [1.36 L/s/m^2] (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 [13.39 L/s/m^3] 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. ALTERNATE DIMENSIONS ARE IN MILLIMETERS [mm] UNLESS NOTED OTHERWISE.
4. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.ContechES.com
5. 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.
6. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 10' [3048] 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.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
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E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
F. CONTRACTOR TO REMOVE THE TRANSFER OPENING COVER WHEN THE SYSTEM IS BROUGHT ONLINE.

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

SFPD0608 (6' x 8')
PEAK DIVERSION STORMFILTER
STANDARD DETAIL

Determining Number of Cartridges for Flow Based Systems

Date	**5/30/2024**	**Black Cells =**	**Calculation**

Site Information

Project Name	**2400 Dundas St W**		
Project Location	**Toronto, ON**		
OGS ID	**OGS - Tank A**		
Drainage Area, Ad	**0.28**	ac	(0.1141 ha)
Impervious Area, Ai	**0.28**	ac	
Pervious Area, Ap	**0.00**		
% Impervious	**100%**		
Runoff Coefficient, Rc	**0.90**		
Treatment storm flow rate, Q_{treat}	**0.20**	cfs	(5.7 L/s)
Peak storm flow rate, Q_{peak}	**2.52**	cfs	(71.4 L/s)

Filter System

Filtration brand	**StormFilter**	
Cartridge height	**18**	in
Specific Flow Rate	**2.00**	gpm/ft²
Flow rate per cartridge	**15.00**	gpm

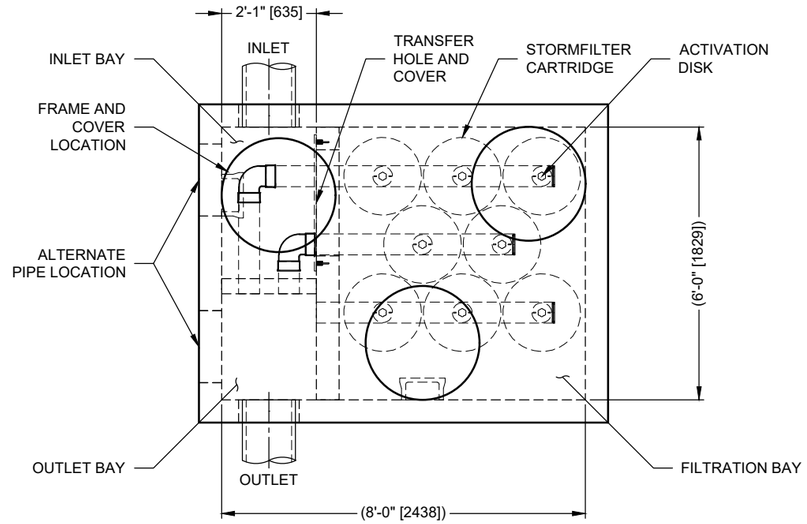
SUMMARY

Number of Cartridges	6
Media Type	Perlite

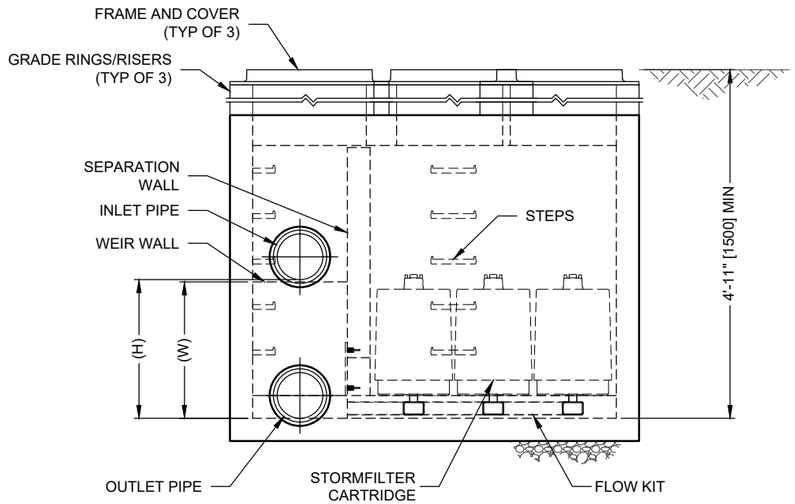
Event Mean Concentration (EMC)	**150**	mg/L
Annual TSS Removal	**80%**	
Percent Runoff Capture	**90%**	

Recommend SFPD0608 vault or CIP

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



PLAN



ELEVATION

The Stormwater Management StormFilter®

STORMFILTER DESIGN NOTES

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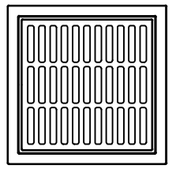

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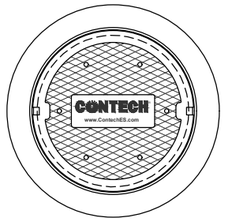

FRAME AND COVER
(30" ROUND)
(NOT TO SCALE)

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
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PEAK FLOW RATE (cfs [L/s])	
RETURN PERIOD OF PEAK FLOW (yrs)	
CARTRIDGE FLOW RATE	
CARTRIDGE SIZE (27, 18, LOW DROP (LD))	
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FILTER BAY RIM ELEVATION	

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