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Functional Servicing & Stormwater Management Report

Proposed Mixed-Use Development
2451-2495 Danforth Avenue,
Toronto, Ontario

Prepared for:

First Capital REIT

Rev. No.	*Date*	*Description*
0	November 11, 2024	Issued for Official Plan Amendment and Rezoning (ZBA) Application

Project No.: 22-010

Executive Summary

Prospective Development Site

- The subject Site is located in the *Toronto & East York* District of Toronto, Ontario.
- The site's area is approximately 0.77 Ha and presently comprises a one-storey grocery store building with paved asphalt parking lot areas.
- The Owner is proposing to develop the Site as a mixed-use development comprising one tower and one midrise building, sharing a common podium.

Watermains & Water Servicing

- There are existing 150mm-dia. And 300mm-dia. Watermains within Danforth Ave., adjacent to the site's frontage.
- It has been determined that the existing 150mm watermain is sufficient to service the development and domestic/fire service connections are proposed to that main.

Sanitary Servicing & Combined Sewers

- There are existing parallel 300mm-dia. and 450mm-dia. combined sewers within Danforth Ave., adjacent to the Site's frontage.
- The Site is preliminarily serviceable to the combined sewers in the adjacent municipal R.O.W.
- Sanitary sewer connections are proposed to connect to the existing 300mm combined sewer.
- Combined sewer capacity & Procedure F-5-5 are addressed acceptably in the development of the site.

Storm Servicing, Storm Sewers & Stormwater Management

- There are no separated storm sewers within the municipal R.O.W. adjacent to the Site.
- It is proposed to service the Development to the existing combined sewers, to which the subject site presently (pre-development) drains.
- Stormwater management quality, quantity and retention criteria are satisfied.

Foundation Drainage & Groundwater

- The proposed building will be constructed in a watertight manner, without drained foundations.

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- Architectural Site Plan by Superkül Architects
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- City Engineering Records – City of Toronto Drawing No. D-110-1

1. Introduction & Background

a. Introduction

civilGo Engineering Inc. was retained by First Capital REIT on behalf of FCHT Holdings (Ontario) Corporation, to prepare a ***Functional Servicing and Stormwater Management Report*** for submission to the City of Toronto in support of an Official Plan Amendment and Zoning Bylaw Amendment Submission. The proposed Development for which the Submission is being made comprises two Buildings (A & B) within the subject lands, 2451-2495 Danforth Avenue, in Toronto, Ontario. The following report has accordingly been prepared to provide discussion and engineering analysis pertaining to the site servicing, grading and stormwater management for the proposed Development.

b. Subject Lands Description

The subject Site has municipal addresses 2451-2495 Danforth Avenue, Toronto, Ontario and postal code M4C 1L1. The Site's area is 0.77 Ha.

Presently, site comprises an existing one-storey commercial building ('Sobeys' food store), which occupies approximately the middle of the site, as well as adjacent ground-level asphalt parking lots. Refer to the *Existing Site Summary Figure* on the following page for the existing subject lands and adjacent infrastructure.

The site is bounded by Danforth Avenue to the north, Westlake Avenue to the west, detached houses to the south and existing commercial buildings to the east.

c. Proposed Development Description

It is proposed to demolish the existing one-storey commercial building ('Sobeys' food store) and adjacent ground-level asphalt parking lots. It is proposed to construct in their place a Development comprising two mixed-use Buildings (A & B), Building A comprising 35-storeys and Building B comprising 13-storeys, sharing a two-storey podium. The Development will comprise a two-level below-grade parking structure. A 0.0354 Ha P.O.P.S. (Privately-Owned Public Space) is proposed at the Site's eastern area.

Refer to the architectural Site Plan and Statistics by Superkül Architects in Appendix A for the proposed Development layout and specifics as referenced herein.

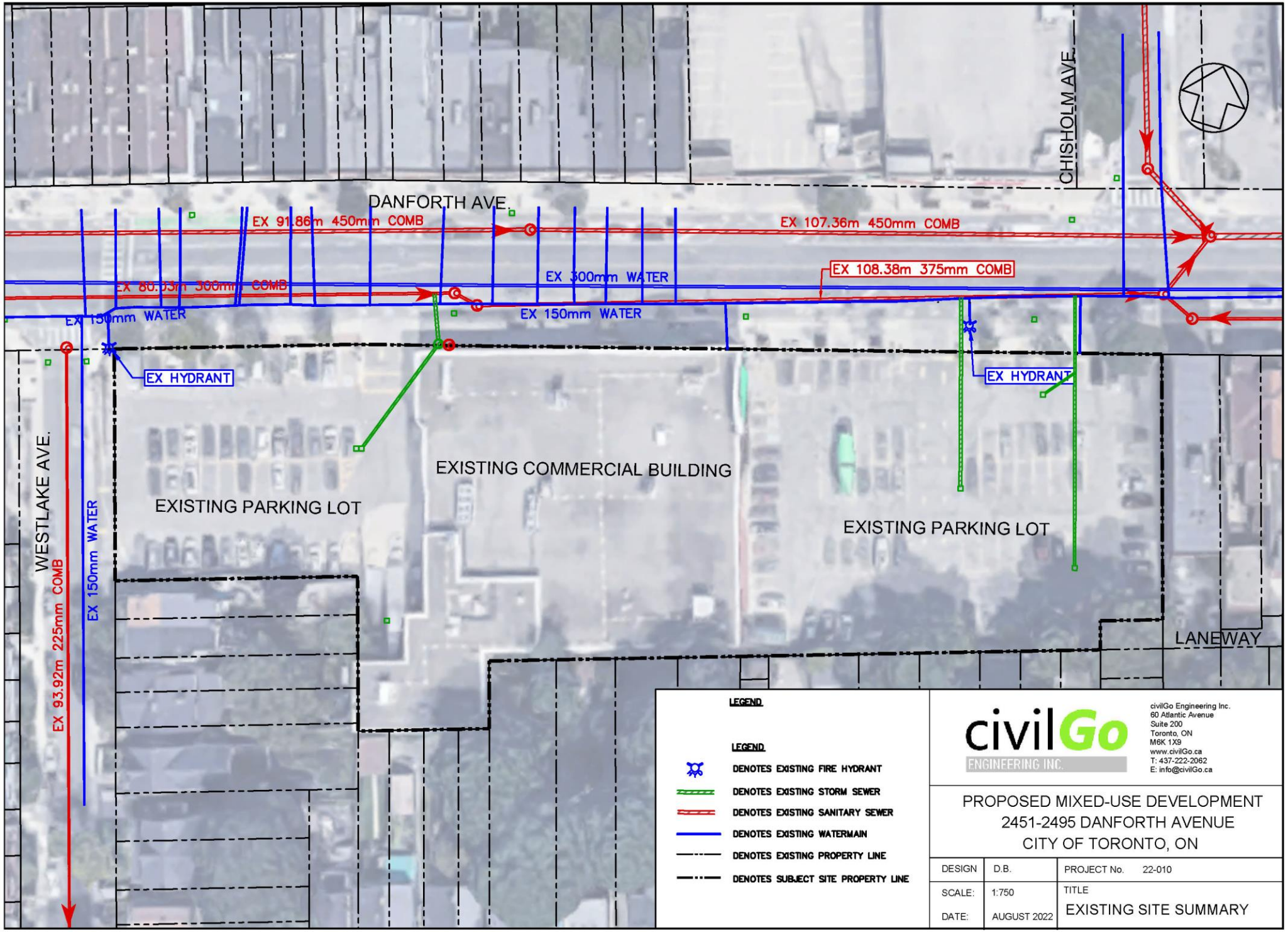
d. Report Scope and Terms of Reference

The scope of this Report is outlined below. The scope has been reviewed for compliance with the Terms of Reference for both Servicing Reports and Stormwater Management Reports as given in the City of Toronto's Website *Application Support Material: Terms of Reference*.

This report has, further, been prepared in accordance with the Terms of Reference given by the City of Toronto's *Design Criteria for Sewers and Watermains* (January 2021) as well as the City of Toronto's *Wet Weather Flow Management Guidelines* (November 2006).

The scope of this report, in general, comprises the following.

- Obtaining the most recent engineering records (Plan & Profile Drawings) as well as Digital Mapping Owners' Group (DMOG) drawing from the City of Toronto.
- Providing support to the Owner in undertaking a Subsurface Utility Engineering (SUE) Investigation to verify existing infrastructure.
- Reviewing all background information pertaining to existing water infrastructure, topography and related characteristics of the subject Lands.
- Evaluating the capacity of existing sewer and water mains to support the proposed Development of the subject Site.
- Provide stormwater management analysis and designs whereby the stormwater quality and quantity objectives given by the *Wet Weather Flow Management Guidelines* are addressed.



LEGEND

LEGEND

- DENOTES EXISTING FIRE HYDRANT
- DENOTES EXISTING STORM SEWER
- DENOTES EXISTING SANITARY SEWER
- DENOTES EXISTING WATERMAIN
- DENOTES EXISTING PROPERTY LINE
- DENOTES SUBJECT SITE PROPERTY LINE

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PROPOSED MIXED-USE DEVELOPMENT
2451-2495 DANFORTH AVENUE
CITY OF TORONTO, ON

DESIGN	D.B.	PROJECT No.	22-010
SCALE:	1:750	TITLE	EXISTING SITE SUMMARY
DATE:	AUGUST 2022		

2. Watermains & Water Servicing

a. Water Servicing Criteria

The City of Toronto's site servicing policy typically requires all buildings/podiums/towers on a development to have separate respective water service connections to the street to which that component of the development fronts.

Design criteria pertaining to water servicing is given in Chapter 4 of the City of Toronto's *Design Criteria for Sewers and Watermains* (January 2021). The criteria that are observed herein is as follows.

- Per-capita average domestic water demand (multi-unit development): 190 L/cap/day
- Peaking Factors:
  - Peak Hour: 2.50 x average day demand
  - Maximum Day: 1.30 x average day demand
- Fire Flow Demand: is given by the calculation as per the manual *Water Supply for Public Fire Protection* by the *Fire Underwriters' Survey* (1999).
- Minimum residual pressure in maximum demand scenario (Fire Flow Demand + Max. Day) is 140 kPa.

Combined domestic water and fire service connections are to be installed as per City-standard drawings, including T-1104.02-3.

b. Existing Water Mains

The existing Streets adjacent to the Site are presently understood to comprise the following watermains, adjacent to the Site's frontage.

- Danforth Avenue: 150mm watermain (within the south side of the R.O.W., south of the following 300mm watermain).
- Danforth Avenue: 300mm watermain (within the south side of the R.O.W., north of the above 150mm watermain).
- Westlake Avenue: 150mm watermain (within the east side of the R.O.W.).

There are two existing Fire Hydrants at the Site's frontage to Danforth Avenue, both connected to the 150mm watermain.

A hydrant flow test was conducted on the 150mm watermain and the test report is provided in the following pages. The testing was completed in accordance with *NFPA 291: Recommended practice for Fire Flow Testing and Marking of Hydrants*.

c. Proposed Water Servicing

It is proposed to service each of the two buildings (Building A and Building B) with separate respective domestic water service connections and fire service connections. Each of Building A and Building B is proposed to be serviced by a 200mm fire service connection with branch 150mm domestic water connection. Building A, which is greater-than 84m in height, additionally has a second 200mm fire service connection to the second watermain within Danforth Ave., in accordance with OBC 3.2.9.7. (4). The Commercial Component in the Podium, further, will have a separate respective 100mm-dia. domestic water connection. Refer to the Functional Servicing Plan for proposed domestic water and fire service connections.

d. Water Demand & Existing System Adequacy

The domestic water demand (using average-day, peak-hour and max.-day peaking factors) as well as fire flow demand, are summarized as follows.

It is evident, as per the below hydrant flow test reports, that the available flow at the minimum residual pressure of 140 kPa in the Danforth Ave. watermain is **3056** USGM, which is greater than the maximum demand, **2956.6** USGM (Fire Flow + Max. Day Demand), therefore the existing Danforth Ave. 150mm watermain is sufficient to service the proposed Development. No watermain infrastructure improvements are required.

Table 1 - Water Demand Summary

	Average Day Demand (ADD) (Pop'n* x 190 L/c/d)	Max. Day Demand (MDD) (1.3x ADD)	Peak Hour Demand (PHD) (2.5xADD)	Fire Flow Demand	Required Water Demand (Fire Flow Demand + MDD)
Prop Building A	1.45 L/s 22.98 USGM	1.89 L/s 29.95 USGM	3.63 L/s 57.53 USGM		
Prop Building B	0.93 L/s 14.74 USGM	1.20 L/s 19.02 USGM	2.32 L/s 36.77 USGM		
Prop Commercial Building	0.08 L/s 1.27 USGM	0.10 L/s 1.43 USGM	0.19 L/s 2.85 USGM		
Total	2.45 L/s 39.00 USGM	3.19 L/s 50.56 USGM	6.14 L/s 97.32 USGM	183.3 L/s 2906 USGM	186.5 L/s 2956.6 USGM

**Population is given in Table 2, below*

The fire flow demand calculation is provided on the following page. The following assumptions were made in the Fire Flow Demand calculation.

- The proposed buildings are of reinforced concrete construction.
- The proposed buildings will be sprinklered and the sprinklers will be fully monitored according to NFPA 13.
- The proposed buildings' contents (residences and retail) will be non-combustible in nature.
- Proposed building floor areas are as given in the architectural statistics in Appendix A

Domestic Water Demand Flow Calculation Sheet

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Project: 2451-2495 Danforth Avenue, Toronto, ON - Proposed Mixed-use Development

Project No.: 22-010
Date: Oct 2024
By: MP

	Proposed Residential Water Flows					Prop. Non-Residential Water Flows				Total Flows		
Development Component	1 BR + Studio Unit	2BR Unit	3BR Unit	4BR Unit	Total Residential Population	Instit'l Floor Area GFA	Commercial/ Retail Floor Area GFA	Non-Residential Population	Total Proposed Population	Average Day Demand (ADD)	Max. Day Demand (MDD) (1.3ADD)	Peak Hour Demand (PHD) (2.5ADD)
	(Units)	(Units)	(Units)	(Units)	(Persons)	(m^2)	(m^2)	(Persons)		(L/s)	(L/s)	(L/s)
Prop Apt Bldg A	246	96	37	0	661		0.0	0.0	661	1.45	1.89	3.63
Prop Apt Bldg B	159	56	25	1	421		0.0	0.0	421	0.93	1.20	2.32
Prop Comm'l	0	0	0	0	0		3197.3	35.2	35	0.08	0.10	0.19

Reference Sanitary Flows as per *Design Criteria for Sewers and Watermains* (City of Toronto, January 2021)

Residential Unit Population:
1BR = 1.4 person/unit
2BR = 2.1 person/unit
3BR = 3.1 person/unit
4BR = 3.7 person/unit

Non-Residential Unit Population:
Office = 3.3 person/100m^2 GFA
Commercial/Retail = 1.1 person/100m^2 GFA
Institutional = GFA(m2) x 1 bed/30m2 x 1 person/bed

Unit Water Demand = 190 L/cap/day

Fire Flow Demand Calculation

as per *Water Supply for Public Fire Protection, 1999 (Fire Underwriters' Survey)*

Project:	2451-2495 Danforth Avenue, Toronto, ON
Project No.:	22-010
Date:	Oct 2024

Fire Flow is given by the following calculation:

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

where
F = the required fire flow in litres per minute.
C = coefficient related to the type of construction.
= 1.5 for wood frame construction (structure essentially all combustible).
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior).
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls).
= 0.6 for fire-resistive construction (fully protected frame, floors, roof).

Step 1:

$F = 220C\sqrt{A}$ = ***15,830 L/Min***
F = 4181.73 USGPM

Where:

Type of Construction Factor, 'C' =	**0.6**
Wood Frame Construction:	1.5
Ordinary Construction:	1.0
Non-Combustible Construction:	0.8
Fire Resistive Construction:	0.6

Vertical Openings & Exterior Vertical Connections Adequately Protected?: No

Building Area, 'A' =	
1	3987.9 m²
2	1476.8 m²
3	2425.8 m²
4	2245.3 m²
5	2193.6 m²
6	2193.6 m²
7	2193.6 m²
8	2193.6 m²
9	2193.6 m²
10	2193.6 m²
'A'=	**14381.05 m²**

Step 2:

Occupancy Hazard Reduction = -15 %

F reduction = -15% x 15,830 L/min = -2,374 L/min
Therefore, F = 13,455 L/min

Where % Reduction =	
Non-Combustible	-25%
Limited Combusible	-15%
Combustible	0%
Free Burning	+15%
Rapid Burning	+25%

Step 3:

Complete Automatic Sprinkler Protection Deduction = 50 %, Where:

Credit for adequately designed system conforming to NFPA 13: 30% Reduction
Credit for Standard Water Supply: 10% Reduction
Credit for Fully Supervised System: 10% Reduction

F reduction = 50% x 13,455 L/min = 6,728 L/min
Therefore, F = 6,728 L/min

Step 4:

Exposure Charge:

	Distance:	**Exposure Charge:**
Exposure to North	27.8 m =	10%
Exposure to East	11.1 m =	15%
Exposure to South	47.3 m =	0%
Exposure to West	20.4 m =	10%
	Total Exposure Charge =	**35%**

F increase = 35% x 13,455 L/min = 4,709 L/min
Therefore, F = 11,437 L/min

Exposure Charge:	
0-3m	25%
3.1-10m	20%
10.1-20m	15%
20.1-30m	10%
30.1-45m	5%
>45m	0%

Therefore:

F = 11,437 L/min
F = 11,000 L/min (Rounded to nearest 1,000 L/min)
F = 183.3 L/s
F = 2906 USGPM

BA Fire Safety

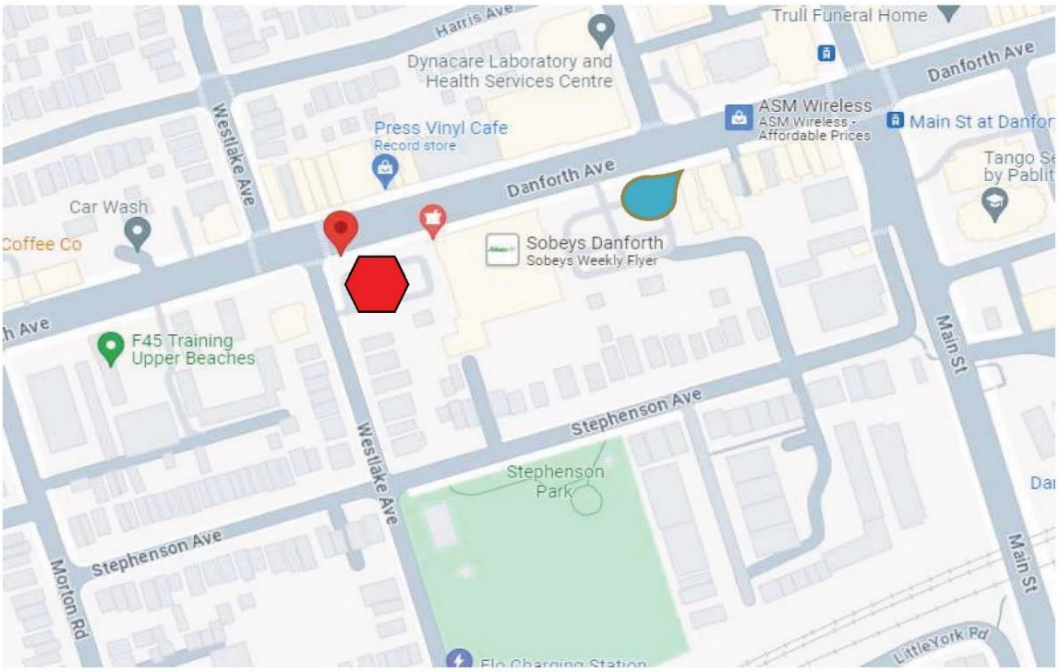
GENERAL INFORMATION:

PROJECT ID	**2451 Danforth Ave**	TESTED B' AA	
PROJECT NAME	**Daniel Bancroft**	DATE	**2024-04-24**
BUILDING ADDRESS	**2451 Danforth Ave**	TIME	**12:30:00 PM**
	Tornto, Ontario		

WATER MAIN INFORMATION:

MAIN SIZE / MATERIAL	
CONFIGURATION	**Looped**

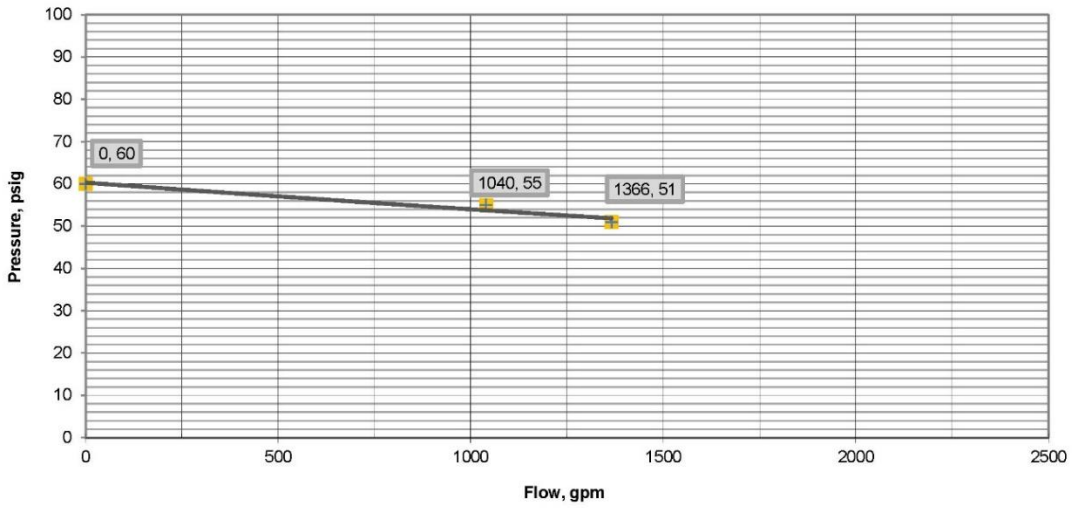
HYDRANT LOCATION:



LEGEND: STATIC HYDRANT RESIDUAL HYDRANT

FINAL RESULTS:

Test #	Number of Outlets	Orifice Size (in)	Pitot Reading (psig)	EquivInt Flow (usgpm)	Total Flow (usgpm)	Projected flow at 20psi (usgpm)	Gauge Pressure	Discharge Coef'nt
Static	N/A	N/A	N/A	N/A	**0**	N/A	**60**	N/A
1	1	2.47	51	1040	**1040**	3196	**55**	0.8
2	2	2.47	22	683	**1366**	3056	**51**	0.8



3. Sanitary & Combined Sewers

a. Criteria & Terms of Reference

The City of Toronto's site servicing policy typically requires all buildings/podiums/towers on a development to have separate respective sanitary service connections to a municipal sewer in the street to which that component of the development fronts.

Sanitary servicing criteria is given in Chapter 2 of the City of Toronto's *Design Criteria for Sewers and Watermains* manual (January 2021). The following sanitary sewage flow-calculation criteria are applied in this report as given in the City's manual.

- Per-capita average sanitary sewage flow: 450 L/cap/day (for the design of new sewers & sewer connections)
- Per-capita average sanitary sewage flow, for the analysis of existing sewer systems:
    - Residential population: 240 L/cap/day
    - Non-Residential population: 250 L/cap/day
- Unit population (Residential) – Bachelor & 1-B Units = 1.4 person/unit; 2-B Units = 2.1 person/unit; 3-B Units = 3.1 person/unit; 4-B Units = 3.7 person/unit; single-family = 3.5 person/unit; townhouse = 2.7person/unit.
- Unit population (Non-residential) – Office = 3.3 person/100m^2 GFA; Commercial/Retail = 1.1 person/100m^2 GFA
- Inflow & Infiltration Flows (I&I) Originating from Subject Site = 0.26 L/s/Ha
- Peaking Factor – given by Harman Equation

Where a development project is in an area serviced by Combined sewers (rather than separated sanitary sewers) – design criteria is given by the foregoing City manual and the Province of Ontario's *Procedure F-5-5 – Determination of Treatment Requirements for Municipal and Private Combined Sewers*. These criteria generally require development projects in such sewer sheds not to compound or increase the risk of Combined Sewer Overflow events by a proposed development.

b. Existing Sanitary & Combined Sewers

There are no separated sanitary sewer mains in the area of the subject site.

The existing Streets adjacent to the Site are presently understood to comprise the following combined sewers, adjacent to the Site's frontage. Refer to the Functional Servicing Plan.

- Within Danforth Avenue, beneath the south side of the street, there is a 300mm-diameter (increasing to 375mm-diameter) vitrified pipe combined sewer flowing easterly. This sewer outlets into a 700mm x 1050mm combined sewer, discussed below.
- Within Danforth Avenue, beneath the north side of the street, there is a 450mm-diameter vitrified pipe combined sewer flowing easterly. This sewer outlets into the same 700mm x 1050mm combined sewer, discussed below.
- Within Danforth Avenue, near the site's northeast corner, a 700mm x 1050mm brick combined sewer commences and flows easterly. Both of the foregoing sewer's discharge into this sewer.

- Within Westlake Avenue, adjacent to the site's west frontage, there is a 225mm-diameter combined sewer which flows southerly.

c. Basement Flooding Environmental Assessment (BFEA) – Combined Sewers Discussion

The City of Toronto has undertaken a *Basement Flooding Protection Program* to help reduce the risk of flooding by making improvements to the sewer system and overland drainage routes. The intent and scope of the program is to undertake analysis of the City's drainage systems (municipal storm, sanitary and combined sewers) in order to identify system deficiencies and thereby recommend infrastructure improvements.

The program divides the City into 67 different Study Areas for which Basement Flooding Environmental Assessments (EA) have been or will be individually undertaken. Many of the study areas have been completed presently as given in the City of Toronto's *Basement Flooding Protection Program Map*.

The City's criteria typically requires Functional Servicing Reports prepared in support of Development applications to review and address the conclusions and recommendations of the Basement Flooding EA, where complete, with respect to the proposed Development's drainage.

The subject proposed Development of 2451-2495 Danforth Avenue falls within BFEA Study Area 32, which is complete. The completed EA Report is titled *Investigation of Chronic Basement Flooding (Eastern Beaches Area 32)* by Genivar and dated May 2012.

The following comments are provided with respect to the conclusions of the EA Report, pertaining to combined sewers and sanitary drainage. Refer to Section 4., below, for comments pertaining to storm sewers.

- The EA Report identifies the performance of the combined sewer system in the various design storm events. The Report shows that the combined sewer system presently operates acceptably and does not recommend improvements to the combined sewers adjacent to the site.
- Figure 6.6.a., *2-Year Design Storm Combined and Sanitary Sewer System*, in the EA Report shows that the combined sewer segments adjacent to the site's frontages are flowing with no surcharge in the pipes (with one exception) (in the 2-year storm) and that the freeboard (or depth from grade to surcharge water elevation) is greater than 1.8m below-grade in all Combined Sewer Maintenance Holes adjacent to the Site's frontage.
- Figure 9.1, *Preferred Solutions, Cluster 1*, in the EA Report does not recommend any improvements within the combined or storm sewers near the subject Site.

Given the above discussion, no sanitary/combined sewer infrastructure improvements are required as part of this development on account of the Basement Flooding EA's recommendations.

d. Proposed Sanitary Servicing & Sanitary Flows

It is proposed to service each of the two proposed Buildings (Building A and Building B) and the Commercial Podium with a separate respective 200mm sanitary sewer connection to the existing combined sewer within Danforth Avenue. Refer to the Functional Servicing Plan for the proposed services.

The proposed Development's sanitary flows are summarized as follows. Detailed sanitary flow calculations are provided on the following page.

Table 2 - Proposed Sanitary Flows Summary

	Total Proposed Population	Residential Sanitary Flows	Non-Residential Sanitary Flows	Inflow & Infiltration (I&I) Flows	Total Proposed Sanitary Flows
Prop Building A	661	13.5 L/s	-	0.061 Ha	13.47 L/s
Prop Building B	421	8.80 L/s	-	0.124 Ha	8.84 L/s
Prop Commercial	35	-	0.8 L/s	0.585 Ha	0.95 L/s
Total	1117	22.3 L/s	0.8 L/s	0.770 Ha	23.25 L/s

The proposed sanitary flows as outlined above will discharge into municipal sewers by three 200mm @ 2.0% sanitary service connections. Each of the Buildings (A & B) and the Podium has separate proposed sanitary connections to the existing combined sewer within Danforth Avenue. Each of the three sanitary sewer connections has a capacity of 46 L/s, which is greater than the sanitary flows from each component of the development as above, therefore the proposed sanitary sewer connections are adequately designed.

Proposed Sanitary Flows Calculation Sheet (Using 450 L/c/d)

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Project: 2451-2495 Danforth Avenue, Toronto, ON - Proposed Mixed-Use Develeopment
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	Proposed Residential Sanitary Flows							Proposed Non-Residential Sanitary Flows					Prop. I&I Flows & Groundwater			
Development Component	1 BR Unit + Studio	2BR Unit	3BR Unit	4BR Unit	Residential Population	Peaking Factor	Peak Residential Sanitary Flow	Inst'l Floor Area GFA	Commercial / Retail Floor Area GFA	Non-Residential Population	Peaking Factor	Peak Non-Residential Sanitary Flow	Inflow & Infiltration Area	Site I&I Flow	Groundwater Flows	**Peak Sanitary Flows**
	(Units)	(Units)	(Units)	(Units)	(Persons)	M	(L/s)	(m^2)	(m^2)	(Persons)	M	(L/s)	(Ha)	(L/s)	(L/s)	(L/s)
Prop Bldg A	246	96	37	0	661	3.9	13.5						0.061	0.02	0.0	13.47
Prop Bldg B	159	56	25	1	421	4.0	8.80						0.124	0.03	0.0	8.84
Total of Prop Bldg (A+B)	405	152	62	1	1082	7.9	22.3	0.0	0.0	0.0	4.5	0.0	0.185	0.05	0.0	22.30
Prop Comm'l	0	0	0	0	0	4.5	0.0	0.0	3197.3	35.2	4.3	0.8	0.585	0.15	0.0	0.95
Total (Prop Bldg A + Prop Bldg B + Prop Comm'l)													**0.770**			**23.25**

Reference Sanitary Flows as per *Design Criteria for Sewers and Watermains* (City of Toronto, January 2021)

Residential Unit Population:
1BR = 1.4 person/unit
2BR = 2.1 person/unit
3BR = 3.1 person/unit
4BR = 3.7 person/unit

Non-Residential Unit Population:
Office = 3.3 person/100m² GFA
Commercial/Retail = 1.1 person/100m² GFA
Institutional = GFA(m2) x 1 bed/30m2 x 1 person/bed

Unit I&I Flow = 0.26 L/s/Ha

Unit Sanitary Flow = 450 L/c/d (for design of new sewers)

Peaking Factor, $M = 1 + 14/(4 + P/1000)^2$

Peak Sanitary Flow, Q(D) (L/s) = P * Q * M / 86,400

e. Receiving Combined Sewer Capacity & F-5-5 Compliance

It is demonstrated as follows that the existing municipal combined sewers, to which it is proposed to connect the development, will be operating under the reduced conditions pre-development as in post-development conditions. There will therefore be no adverse impacts on the capacity of the municipal combined sewer by the proposed development. The development is, further, in compliance with the Province of Ontario's *Procedure F-5-5*.

The pre-development and post-development flows which drain to the combined sewer are summarized in the following table.

Existing sewer outlets and sewer connections were identified in a Dye Test and CCTV Investigation, which is provided here in Appendix B. The dye test investigation informed the *Pre-Development Drainage Plan*, which is provided on the following page.

It is shown as follows that there is a reduction of 60.1 L/s in flows draining to the combined sewers from the Pre-Development Scenario to the Post-Development Scenario. No combined sewer infrastructure improvements are therefore required to accommodate the proposed development.

Table 3 - Comparison of Flows Draining into Combined Sewer, Pre-Development to Post-Development

	Sanitary Flow (DWF) (@ 240 L/c/d)*	**Storm Flow (WWF) (2-Year Storm)****	**Groundwater Flows**	**Total Flows Draining into Combined Sewer**
Pre-Development Scenario	1.21L/s (Existing Building)	Ex-A + Ex-B + Ex-C + Ex-D+ Ex-E = 2.78CiA =2.78*0.88*88.2*0.77 =166.14 L/s	-	167.35 L/s
Post-Development Scenario	23.25 L/s*	84 L/s**	-	107.25 L/s
Change from Pre-Development to Post-Development	+22.04 L/s	-82.14L/s	-	-60.1 L/s

**As per Table 2, above.*

***Storm flows are calculated using the Rational Method formula ($Q_{2\text{-}Y}$=2.78CiA), where the catchment area is given on the* Pre-Development Drainage Plan*, in reference to the Dye Test Investigation (Appendix B)*

Existing Sanitary Flows Calculation Sheet (Using 240 L/c/d & 250 L/c/d)

civilGo ENGINEERING INC.

Project: 2451-2495 Danforth Avenue, Toronto, ON - Proposed Mixed-Use Develeopment
Project No.: 22-010
Date: Oct 2024
By: MP

	Residential Sanitary Flows						Non-Residential Sanitary Flows					I&I Flows & Groundwater			
Development Component	1 BR Unit + Studio	2BR Unit	DTH House	Residential Population	Peaking Factor	Peak Residential Sanitary Flow	Ind'l Floor Area GFA	Commercial / Retail Floor Area GFA	Non-Residential Population	Peaking Factor	Peak Non-Residential Sanitary Flow	Inflow & Infiltration Area	Segment I&I Flow	Groundwater Flows	**Peak Sanitary Flows**
	(Units)	(Units)	(Units)	(Persons)	M	(L/s)	(m^2)	(m^2)	(Persons)	M	(L/s)	(Ha)	(L/s)	(L/s)	**(L/s)**
Ex. Bldg	0	0	0	0	4.5	0.0	0.0	2483.5	82.0	4.3	1.01	0.772	0.20	0.0	**1.21**

Reference Sanitary Flows as per *Design Criteria for Sewers and Watermains* (City of Toronto, January 2021)

Residential Unit Population:
1BR = 1.4 person/unit
2BR = 2.1 person/unit
3BR = 3.1 person/unit
DTH = 3.5 person/unit

Non-Residential Unit Population:
Office = 3.3 person/100m^2 GFA
Commercial/Retail = 1.1 person/100m^2 GFA
Institutional = GFA(m2) x 1 bed/30m2 x 1 person/bed
Industrial = GFA (m^2) x 0.0272 persons/m^2

Unit I&I Flow = 0.26 L/s/Ha
Unit Non-Residential Sanitary Flow = 250 L/c/d (for analysis of existing sewers)
Unit Residential Sanitary Flow = 240 L/c/d (for analysis of existing sewers)

Peaking Factor, $M = 1 + 14/(4 + P/1000)^2$

Peak Sanitary Flow, Q(D) (L/s) = P * Q * M / 86,400

4. Storm Drainage & Stormwater Management

a. Criteria & Terms of Reference

The City of Toronto's site servicing policy typically requires all buildings/podiums/towers on a development to have separate respective storm service connections to a municipal sewer in the street to which that component of the development fronts. Alternatively, it is typically permissible to drain more than one building on a single Site into a common stormwater management facility, provided that sampling facilities (sampling ports, etc.) are provided for each prospective building.

Storm servicing criteria is given in Chapter 3 of the City of Toronto's *Design Criteria for Sewers and Watermains* manual (January 2021).

Stormwater Management criteria is given in the City of Toronto's *Wet Weather Flow Management Guidelines* (WWFMG) manual (2006). Table 7 provides stormwater management criteria therein. Table 7 states that the allowable release rate shall be given by the pre-development 2-year storm flow rate, utilizing the lesser of the actual pre-development runoff coefficient, or a runoff coefficient of 0.5. Table 7 therein allows for the use of the Rational Method for calculation of allowable flows, where site area is less than 5.0 Ha.

The following IDF curves represent the City of Toronto's storms which will be analyzed herein, as per the above manuals.

$$I_{2-Year} = 21.8 * T^{-0.78}$$

$$I_{100-Year} = 59.7 * T^{-0.80}$$

Where:

I = intensity (mm/hr)
T = Time of Concentration in hours

The *Toronto Green Standard* (TGS) provides criteria for stormwater retention/water balance. TGS Version 4, Tier 1, *WQ 1.1 Water Balance, Quality and Quantity* requires the proponent to address the following criteria.

- Water Balance: Retain a minimum of 50% of average annual rainfall volume (or equivalent 5mm each rainfall event).
- Water Quality: Provide long-term average removal of 80% Total Suspended Solids (TSS).
- Water Quantity: Peak flow control in accordance with WWFMG, above.

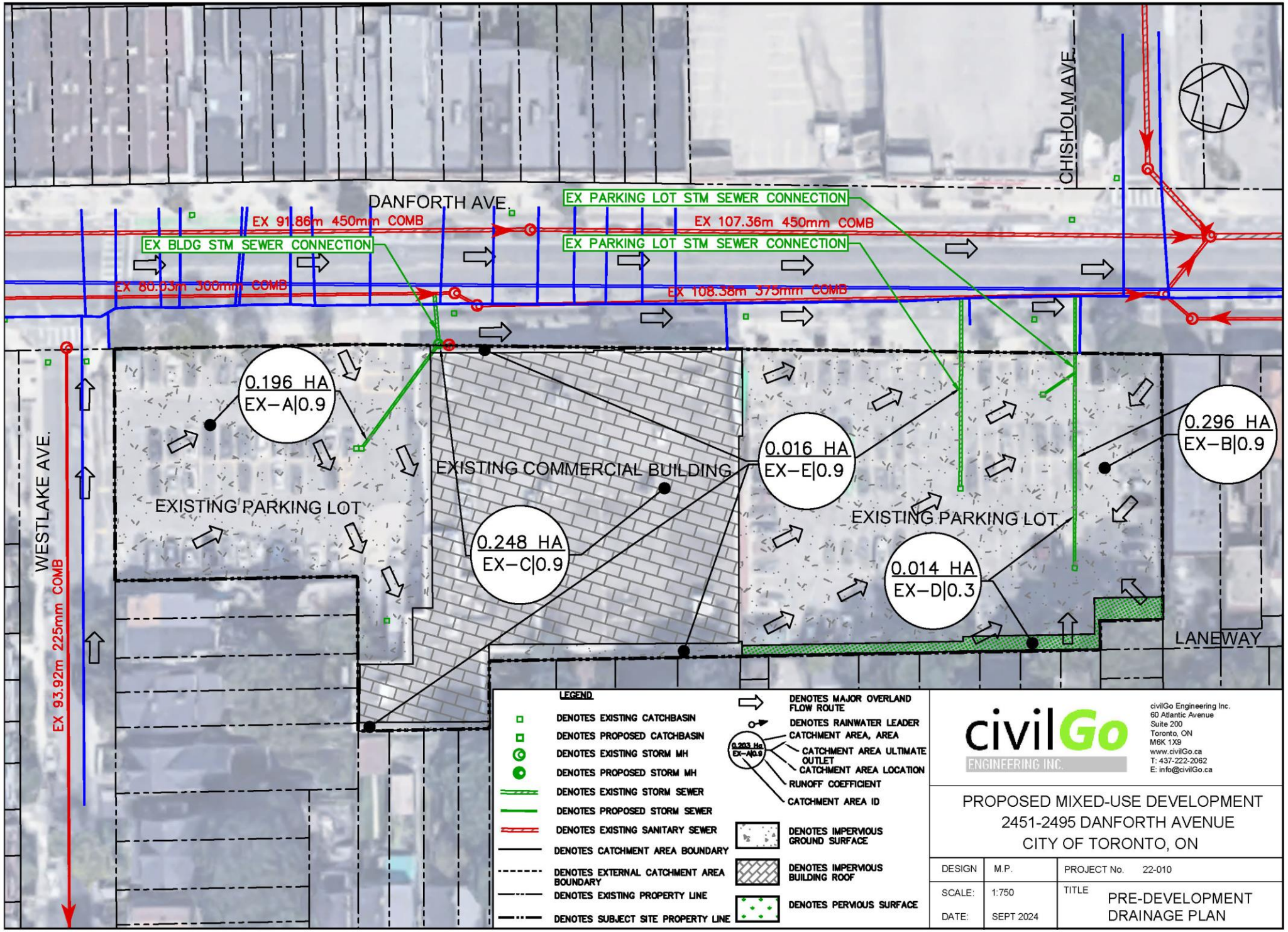
b. Existing Storm Sewers & Drainage

There are no existing storm sewers within the municipal R.O.W. to which the site fronts. The adjacent streets (Danforth Avenue and Westlake Avenue) presently drain by catch basins which are connected to the combined sewers therein – discussed in Section 4.0 a., above.

The existing site presently drains by a total of three existing storm sewer connections which are connected to the Danforth Avenue combined sewers. Refer to the *Pre-Development Storm Drainage Plan* on the following page for pre-development (existing) storm drainage patterns and outlets.

The Site's pre-development drainage patterns are described as follows:

- Catchment Ex-A: is a 0196 Ha catchment area that comprises the impervious surfaces such as the existing parking lot to the west of the existing commercial building. The existing parking lot drain is connected by the existing building storm sewer connection; the existing storm sewer is connected into the Danforth Avenue combined sewer.
- Catchment Ex-B: is a 0.296 Ha catchment area that comprises the impervious surfaces such as the existing parking lot to the east of the existing commercial building. The existing parking lot drain is connected by the existing parking lot storm sewer connection; the existing storm sewer is connected into the Danforth Avenue combined sewer.
- Catchment Ex-C: is a 0.248 Ha catchment area that comprises the impervious surfaces such as the roof of the existing commercial building on the Site. The roof is connected by roof drains, and into the Danforth Avenue combined sewer.
- Catchment Ex-D: is a 0.014 Ha catchment area that comprises the existing pervious softscape surfaces within the Site, which drain by overland flow towards the east side existing parking lot storm sewer connections into the Danforth Avenue combined sewer.
- Catchment Ex-E: is a 0.016 Ha catchment area that comprises the impervious surfaces such as the front and the back existing ground surface of the existing commercial building within the Site, which drain by overland flow towards the east side existing parking lot storm sewer connections into the Danforth Avenue combined sewer.



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PROPOSED MIXED-USE DEVELOPMENT
2451-2495 DANFORTH AVENUE
CITY OF TORONTO, ON

DESIGN	M.P.	PROJECT No.	22-010
SCALE:	1:750	TITLE	PRE-DEVELOPMENT DRAINAGE PLAN
DATE:	SEPT 2024		

c. Basement Flooding Environmental Assessment (BFEA) – Storm Sewers Discussion

A Basement Flooding Environmental Assessment (BFEA) has been undertaken for this area, as discussed in Section 3. c., above. Refer to Section 3. c. for overall discussion pertaining to the context for the EA and for discussion pertaining to sanitary and combined sewers.

The following comments are provided with respect to the conclusions of the EA Report, pertaining to storm sewers and storm drainage.

- There are no separated storm sewers within the Streets adjacent to the site, therefore the EA's conclusions regarding storm sewer performance do not apply to this development.
- The EA Report identifies the performance of the combined sewer system in the various design storm events. The Report shows that the combined sewer system presently operates acceptably and does not recommend improvements to the combined sewers adjacent to the site.
- Figure 6.6.a., *2-Year Design Storm Combined and Sanitary Sewer System*, in the EA Report shows that the combined sewer segments adjacent to the site's frontages are flowing with no surcharge in the pipes (with one exception) (in the 2-year storm) and that the freeboard (or depth from grade to surcharge water elevation) is greater than 1.8m below-grade in all Combined Sewer Maintenance Holes adjacent to the Site's frontage.
- Figure 6.6.d., *100-Year Design Storm Combined and Sanitary Sewer System*, in the EA Report shows that the combined sewer segments adjacent to the site's frontages are surcharged (in the 100-year storm). This figure shows that the freeboard is greater than 1.80m below-grade in the combined sewers on the north side of Danforth Ave. and both sides of the street near the northeast corner, but that the HGL is less than 1.80m below-grade in the MH's at the NW corner.
- Figure 9.1, *Preferred Solutions, Cluster 1*, in the EA Report does not recommend any improvements within the combined or storm sewers near the subject Site.

Given the above discussion, no sanitary/combined sewer infrastructure improvements are required as part of this development on account of the Basement Flooding EA's recommendations.

d. Allowable Storm Release Rate

Stormwater quantity/detention controls are required to satisfy the criteria given in Table 7 of the WWFMG, as outlined above. The allowable release rate to municipal infrastructure is calculated as follows.

It is proposed to drain storm flows from the proposed Development to the Danforth Avenue storm sewer.

The allowable release rate is calculated using the Rational Method formula, as follows. It is calculated based on the areas which drained to Danforth Ave. in the existing condition (Catchment Areas Ex-A, Ex-B, Ex-C, Ex-D, and Ex-E – refer to the *Pre-Development Drainage Plan*) minus the areas that will flow uncontrolled into the Danforth Ave. combined sewer in the post-development condition (Catchment Area H – refer to the *Post-Development Drainage Plan*). The allowable discharge flow rate is determined as follows to be 42 L/s for each of Building A and B (or 84 L/s for the Development as a whole).

Table 4 - Allowable Release Rate

Discharge Outlet	**Site Area (A) (Ha)**	**Runoff Coefficient* ($C_{Pre-Dev}$) (unitless)**	**2-Year Storm Rainfall Intensity (I) (mm/hr)**	**Allowable Discharge Flow Rate (=2.78CIA)**
Danforth Ave. 375mm dia. Combined Sewer	Ex-A + Ex-B + Ex-C + Ex-D+ Ex-E = 0.77 Ha	0.50	88.2 *(2-year storm)*	***94 L/s***
Deduction from Uncontrolled Runoff to Danforth Ave. 375mm dia. Combined Sewer (Catchment – H)	H = 0.017 Ha	0.90	250.3 *(100-year storm)*	***10 L/s***
		Remaining Allowable Release Rate = 94 L/s – 10 L/s =		***84 L/s***
		Allowable Release Rate for each-of Building A & B		***42 L/s***

$* C_{Pre-Dev} = \frac{C*A}{A} = \frac{(0.9*0.196)+(0.9*0.296)+(0.9*0.248)+(0.3*0.014)+(0.9*0.016)}{0.196+0.296+0.248+0.014+0.016} = 0.88$; greater-than 0.50, therefore $C_{Pre-Dev}$ taken-as $= 0.5$

e. Proposed Storm Drainage, Servicing & Stormwater Management

It is proposed to service the proposed development with 200mm @ 2.00% storm sewer connections, for each of Building A and B, to the existing 375mm-dia. combined sewer within Danforth Avenue. Refer to the Functional Servicing Plan.

The Proposed Development's storm drainage conveyances are described as follows.

- Rainwater falling on the proposed building's roofs and ground-level surfaces will drain uncontrolled into storm area drains & roof drains (to be designed by the mechanical engineer). The storm roof drains will drain uncontrolled by mechanical storm drainage piping, into the site's proposed below-grade 100-year storm water detention tank(s). The tanks will be of cast-in-place concrete construction and constructed in the below-grade basement levels, adjacent-to the Danforth Avenue. Refer to the Functional Servicing Plan for the location of the tanks.
    - Aside: storm events up-to 5mm-depth will drain-into and fill the stormwater retention tank, which will spill into the stormwater detention tank. Refer to Section 4. f. for discussion.
- Note: detailed design of the orifice device and stormwater management tank are to be undertaken at the SPA-stage.

The Site's post-development storm catchment areas are outlined on the *Post-Development Drainage Plan*, below, and summarized in Table 5.

Table 5 - Post-Development Catchment Area Parameters

Catchment Area ID	**Catchment Area (Ha)**	**Hydrology/Volume Method**	**Runoff Coefficient, C**
Building A			
Catchment B (Pervious Surfaces – Green roof)	0.0610	Modified Rational Method	0.30
Catchment C (Pervious Softscape Surfaces)	0.031	Modified Rational Method	0.30
Catchment D (Impervious Regular Roof)	0.1839	Modified Rational Method	0.90
Catchment G (Impervious Ground-Level (Surfaces)	0.016	Modified Rational Method	0.90

Building B

Catchment A (Pervious Softscape Surfaces)	0.0074	Modified Rational Method	0.30
Catchment E (Impervious Regular Roof)	0.0543	Modified Rational Method	0.90
Catchment F (Impervious Surfaces)	0.002	Modified Rational Method	0.90
Catchment H (Impervious Surfaces)	0.017	Rational Method (Uncontrolled)	0.90
Catchment I (Pervious Surfaces – Green roof)	0.124	Modified Rational Method	0.30
Catchment J (Impervious Driveway Surfaces)	0.264	Modified Rational Method	0.90
Total	0.76		6.6

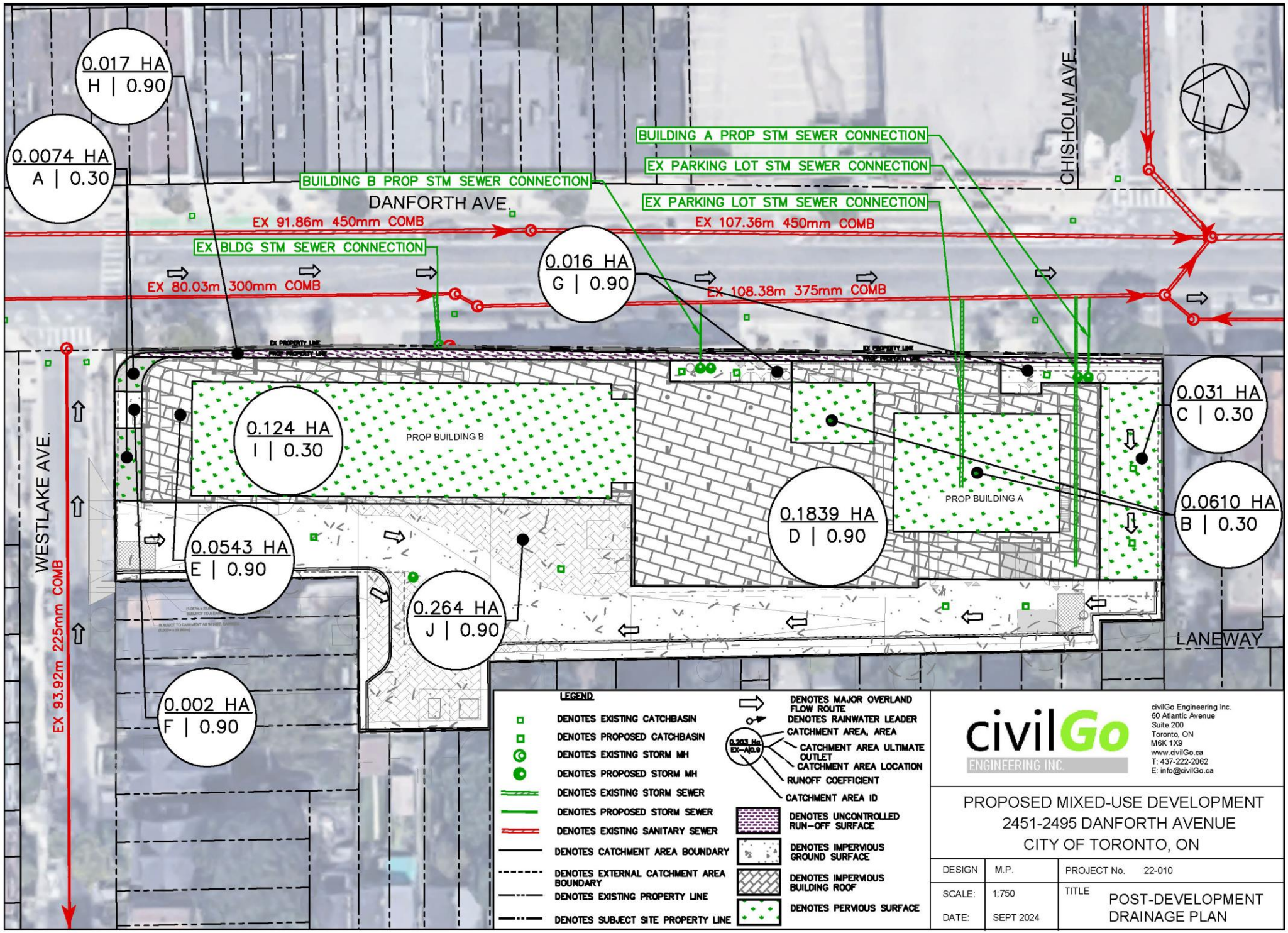
The required volume of stormwater detention was determined utilizing the *Modified Rational Method*. The required volume of stormwater storage is summarized in Table 6, as follows. Modified Rationale Method calculation sheets for the 1-in-2-year storm and 1-in-100-year storm are provided on the following pages, below.

It is evident in Table 6 that the proposed controlled release rate in the 100-year storm (42 L/s), is no-more-than the allowable release rate (42 L/s) for each of Building A and B, therefore the City's allowable release rate criteria is addressed. Further, the required volume of stormwater storage in Building A in a 1-in-100-year storm (61.44m^3) will be accommodated in the proposed 150m^3 below-grade stormwater detention tank, and the required volume of stormwater storage in Building B in a 1-in-100-year storm (118.29m^3) will be accommodated in the proposed 150m^3 below-grade stormwater detention tank. Therefore, the stormwater detention criteria with respect to the 1-in-100-year storm is addressed. Refer to the Functional Servicing Plan (Drawing No. CV-101) for the design of the stormwater detention tank whereby this criterion is addressed.

Table 6 - Stormwater Quantity Control (Detention) Results Summary

Storm Event	Allowable Release Rate (Q_{all})	Max Controlled Flows (Q_C)	Uncontrolled Flows (Q_{UC})	Total Release Rate from Site ($Q_T=Q_C+Q_{UC}$)	Required Detention Storage Volume	Provided Detention Storage Volume
Building A						
2-Year Storm	42 L/s *(Table 4)*	42 L/s	N/A	42 L/s	5.32 m^3 *(below*)*	150 m^3
100-Year Storm	42 L/s *(Table 4)*	42 L/s	N/A	42 L/s	61.44 m^3 *(below*)*	150 m^3
Building B						
2-Year Storm	42 L/s *(Table 4)*	42 L/s	N/A	42 L/s	25.25 m^3 *(below*)*	150 m^3
100-Year Storm	42 L/s *(Table 4)*	42 L/s	N/A	42 L/s	118.29 m^3 *(below*)*	150 m^3

**Refer to Modified Rational Method – Stormwater Storage Volume Calculation Sheets, below*



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PROPOSED MIXED-USE DEVELOPMENT
2451-2495 DANFORTH AVENUE
CITY OF TORONTO, ON

DESIGN	M.P.	PROJECT No.	22-010
SCALE:	1:750	TITLE	POST-DEVELOPMENT DRAINAGE PLAN
DATE:	SEPT 2024		

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Modified Rational Method - Stormwater Storage Volume Calculation	**100-Year Storm**

Project Name:	Proposed Mixed-Use Develeopment - BLDG B
Project Address:	2451-2495 Danforth Avenue, Toronto, ON
civilGo Project No.:	22-010
Date:	Sep 2024
Rev. No:	0
Ref. Drawing:	Servicing Plan
By:	MP

Stormwater Quantity Control Criteria:

Control 1-in-100-Year Post-Development Storm Flow to 1-in-2-Year Pre-Development Storm Flow

Q_a = Allowable Release Rate =	42	L/s (see FSR Table 5)
Q_c = Controlled Release Rate =	42	L/s (Max outflow from Orifice)

Post-Development Catchment Area Parameters:

Catchment Areas:	A, E, F, H, I, J	*See* Post Development Catchment Plan
C_{post} =	0.73	*Post-Development Composite Runoff Coefficient (unitless)*
A_{post} =	0.47	*Site Area, Post-Development (Ha)*
T_c =	10	*Initial Time of Concentration (minutes)*

Rainfall Intensity for Storm Even 100-Year

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

Where:			
	i =	*rainfall intensity (mm/hr)*	
	A =	59.7	City of Toronto 100-Year Storm IDF
	B =	0	
	C =	0.8	
	T_d =	*Tc* + storm duration	

Post-Development Runoff Flow Rate, Q_P

$$Q_P = 2.78 * C_{Post} * i * A_{Post}$$

Required Storage Volume, S_R

$$S_R = Q_P * T_d - Q_c * T_d$$

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)	
10	250.3	238.7	118.01	
11	231.9	221.2	118.25	
12	216.3	206.3	118.29	***>Max***
13	202.9	193.5	118.17	
14	191.2	182.4	117.90	
15	181.0	172.6	117.51	
16	171.9	163.9	117.00	
17	163.7	156.1	116.40	
18	156.4	149.1	115.71	
19	149.8	142.8	114.95	
20	143.8	137.1	114.10	
21	138.3	131.8	113.20	
22	133.2	127.0	112.23	
23	128.6	122.6	111.21	
24	124.3	118.5	110.13	
25	120.3	114.7	109.01	
26	116.6	111.1	107.85	
27	113.1	107.8	106.64	
28	109.8	104.7	105.40	
29	106.8	101.8	104.12	
30	103.9	99.1	102.80	
31	101.3	96.5	101.45	
32	98.7	94.1	100.08	
33	96.3	91.8	98.67	
34	94.0	89.7	97.24	
35	91.9	87.6	95.79	

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)
36	89.8	85.7	94.31
37	87.9	83.8	92.80
38	86.0	82.0	91.28
39	84.3	80.3	89.73
40	82.6	78.7	88.17
41	81.0	77.2	86.58
42	79.4	75.7	84.98
43	77.9	74.3	83.36
44	76.5	73.0	81.72
45	75.1	71.7	80.07
46	73.8	70.4	78.40
47	72.6	69.2	76.72
48	71.4	68.1	75.02
49	70.2	66.9	73.31
50	69.1	65.9	71.59
51	68.0	64.8	69.85
52	66.9	63.8	68.11
53	65.9	62.9	66.35
54	65.0	61.9	64.58
55	64.0	61.0	62.79
56	63.1	60.2	61.00
57	62.2	59.3	59.20
58	61.3	58.5	57.38
59	60.5	57.7	55.56
60	59.7	56.9	53.73
61	58.9	56.2	51.89

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Modified Rational Method - Stormwater Storage Volume Calculation	**100-Year Storm**

Project Name:	Proposed Mixed-Use Develeopment - BLDG A
Project Address:	2451-2495 Danforth Avenue, Toronto, ON
civilGo Project No.:	22-010
Date:	Sep 2024
Rev. No:	0
Ref. Drawing:	Servicing Plan
By:	MP

Stormwater Quantity Control Criteria:

Control 1-in-100-Year Post-Development Storm Flow to 1-in-2-Year Pre-Development Storm Flow

Q_a = Allowable Release Rate =	42	L/s (see FSR Table 5)
Q_c = Controlled Release Rate =	42	L/s (Max outflow from Orifice)

Post-Development Catchment Area Parameters:

Catchment Areas:	B, C, D, G	*See* Post Development Catchment Plan
C_{post} =	0.71	*Post-Development Composite Runoff Coefficient (unitless)*
A_{post} =	0.29	*Site Area, Post-Development (Ha)*
T_c =	10	*Initial Time of Concentration (minutes)*

Rainfall Intensity for Storm Even | 100-Year

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

Where:			
	i =	*rainfall intensity (mm/hr)*	
	A =	59.7	City of Toronto 100-Year Storm IDF
	B =	0	
	C =	0.8	
	T_d =	*Tc* + storm duration	

Post-Development Runoff Flow Rate, Q_P

$$Q_P = 2.78 * C_{Post} * i * A_{Post}$$

Required Storage Volume, S_R

$$S_R = Q_P * T_d - Q_c{*}T_d$$

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)	
10	250.3	144.4	61.44	***>Max***
11	231.9	133.8	60.59	
12	216.3	124.8	59.62	
13	202.9	117.1	58.55	
14	191.2	110.3	57.39	
15	181.0	104.4	56.16	
16	171.9	99.1	54.86	
17	163.7	94.5	53.50	
18	156.4	90.2	52.09	
19	149.8	86.4	50.63	
20	143.8	82.9	49.13	
21	138.3	79.8	47.58	
22	133.2	76.8	46.00	
23	128.6	74.2	44.39	
24	124.3	71.7	42.74	
25	120.3	69.4	41.07	
26	116.6	67.2	39.37	
27	113.1	65.2	37.64	
28	109.8	63.4	35.89	
29	106.8	61.6	34.12	
30	103.9	60.0	32.33	
31	101.3	58.4	30.52	
32	98.7	56.9	28.70	
33	96.3	55.6	26.85	
34	94.0	54.2	24.99	
35	91.9	53.0	23.11	

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)
36	89.8	51.8	21.22
37	87.9	50.7	19.32
38	86.0	49.6	17.40
39	84.3	48.6	15.47
40	82.6	47.6	13.53
41	81.0	46.7	11.57
42	79.4	45.8	9.61
43	77.9	45.0	7.63
44	76.5	44.1	5.65
45	75.1	43.4	3.65
46	73.8	42.6	1.65
47	72.6	41.9	-0.37
48	71.4	41.2	-2.39
49	70.2	40.5	-4.42
50	69.1	39.8	-6.46
51	68.0	39.2	-8.50
52	66.9	38.6	-10.56
53	65.9	38.0	-12.62
54	65.0	37.5	-14.68
55	64.0	36.9	-16.76
56	63.1	36.4	-18.84
57	62.2	35.9	-20.92
58	61.3	35.4	-23.02
59	60.5	34.9	-25.11
60	59.7	34.4	-27.22
70	52.8	30.4	-48.54

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Modified Rational Method - Stormwater Storage Volume Calculation	**2-Year Storm**

Project Name:	Proposed Mixed-Use Develeopment -BLDG B
Project Address:	2451-2455 Danforth Avenue, Toronto, ON
civilGo Project No.:	22-010
Date:	Sep 2024
Rev. No:	0
Ref. Drawing:	Servicing Plan
By:	MP

Stormwater Quantity Control Criteria:

Control 1-in-100-Year Post-Development Storm Flow to 1-in-2-Year Pre-Development Storm Flow

Q_a = Allowable Release Rate =	42	L/s (see FSR Table 5)
Q_c = Controlled Release Rate =	42	L/s (Max outflow from Orifice)

Post-Development Catchment Area Parameters:

Catchment Areas:	A, E, F, H, I, J	*See* Post Development Catchment Plan
C_{post} =	0.73	*Post-Development Composite Runoff Coefficient (unitless)*
A_{post} =	0.4687	*Site Area, Post-Development (Ha)*
T_c =	10	*Initial Time of Concentration (minutes)*

Rainfall Intensity for Storm Even 2-Year

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

Where:			
	i =	*rainfall intensity (mm/hr)*	
	A =	21.8	City of Toronto 100-Year Storm IDF
	B =	0	
	C =	0.78	
	T_d =	*Tc* + storm duration	

Post-Development Runoff Flow Rate, Q_P

$$Q_P = 2.78 * C_{Post} * i * A_{Post}$$

Required Storage Volume, S_R

$$S_R = Q_P * T_d - Q_c * T_d$$

T_d (min)	i (mm/hr)	Q_P (L/s)	S_R (m3)	
10	88.2	84.1	25.25	**>Max**
11	81.9	78.1	23.80	
12	76.5	72.9	22.28	
13	71.9	68.5	20.69	
14	67.8	64.7	19.05	
15	64.3	61.3	17.36	
16	61.1	58.3	15.63	
17	58.3	55.6	13.86	
18	55.8	53.2	12.06	
19	53.5	51.0	10.23	
20	51.4	49.0	8.36	
21	49.4	47.1	6.48	
22	47.7	45.5	4.57	
23	46.1	43.9	2.64	
24	44.6	42.5	0.69	
25	43.2	41.1	-1.28	
26	41.9	39.9	-3.26	
27	40.6	38.8	-5.26	
28	39.5	37.7	-7.28	
29	38.4	36.6	-9.31	
30	37.4	35.7	-11.35	
31	36.5	34.8	-13.41	
32	35.6	33.9	-15.47	
33	34.8	33.1	-17.55	
34	34.0	32.4	-19.64	
35	33.2	31.6	-21.74	

T_d (min)	i (mm/hr)	Q_P (L/s)	S_R (m3)
36	32.5	31.0	-23.84
37	31.8	30.3	-25.96
38	31.1	29.7	-28.08
39	30.5	29.1	-30.21
40	29.9	28.5	-32.35
41	29.3	28.0	-34.50
42	28.8	27.5	-36.66
43	28.3	27.0	-38.82
44	27.8	26.5	-40.98
45	27.3	26.0	-43.16
46	26.8	25.6	-45.34
47	26.4	25.1	-47.52
48	25.9	24.7	-49.71
49	25.5	24.3	-51.91
50	25.1	24.0	-54.11
51	24.7	23.6	-56.32
52	24.4	23.2	-58.53
53	24.0	22.9	-60.74
54	23.7	22.6	-62.96
55	23.3	22.2	-65.19
56	23.0	21.9	-67.42
57	22.7	21.6	-69.65
58	22.4	21.3	-71.88
59	22.1	21.1	-74.12
60	21.8	20.8	-76.37
61	21.5	20.5	-78.62

civilGo ENGINEERING INC.

civilGo Engineering Inc.
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T: 437-222-2062
E: info@civilGo.ca

Modified Rational Method - Stormwater Storage Volume Calculation	**100-Year Storm**

Project Name:	Proposed Mixed-Use Develeopment - BLDG B
Project Address:	2451-2455 Danforth Avenue, Toronto, ON
civilGo Project No.:	22-010
Date:	Sep 2024
Rev. No:	0
Ref. Drawing:	Servicing Plan
By:	MP

Stormwater Quantity Control Criteria:

Control 1-in-100-Year Post-Development Storm Flow to 1-in-2-Year Pre-Development Storm Flow

Q_a = Allowable Release Rate =	42	L/s (see FSR Table 5)
Q_c = Controlled Release Rate =	42	L/s (Max outflow from Orifice)

Post-Development Catchment Area Parameters:

Catchment Areas:	A, E, F, H, I, J	*See* Post Development Catchment Plan
C_{post} =	0.73	*Post-Development Composite Runoff Coefficient (unitless)*
A_{post} =	0.47	*Site Area, Post-Development (Ha)*
T_c =	10	*Initial Time of Concentration (minutes)*

Rainfall Intensity for Storm Even 100-Year

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

Where:			
	i =	*rainfall intensity (mm/hr)*	
	A =	59.7	City of Toronto 100-Year Storm IDF
	B =	0	
	C =	0.8	
	T_d =	*Tc* + storm duration	

Post-Development Runoff Flow Rate, Q_P

$$Q_P = 2.78 * C_{Post} * i * A_{Post}$$

Required Storage Volume, S_R

$$S_R = Q_P * T_d - Q_c * T_d$$

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)	
10	250.3	238.7	118.01	
11	231.9	221.2	118.25	
12	216.3	206.3	118.29	***>Max***
13	202.9	193.5	118.17	
14	191.2	182.4	117.90	
15	181.0	172.6	117.51	
16	171.9	163.9	117.00	
17	163.7	156.1	116.40	
18	156.4	149.1	115.71	
19	149.8	142.8	114.95	
20	143.8	137.1	114.10	
21	138.3	131.8	113.20	
22	133.2	127.0	112.23	
23	128.6	122.6	111.21	
24	124.3	118.5	110.13	
25	120.3	114.7	109.01	
26	116.6	111.1	107.85	
27	113.1	107.8	106.64	
28	109.8	104.7	105.40	
29	106.8	101.8	104.12	
30	103.9	99.1	102.80	
31	101.3	96.5	101.45	
32	98.7	94.1	100.08	
33	96.3	91.8	98.67	
34	94.0	89.7	97.24	
35	91.9	87.6	95.79	

T_d (min)	i (mm/hr)	Q_p (L/s)	S_R (m3)
36	89.8	85.7	94.31
37	87.9	83.8	92.80
38	86.0	82.0	91.28
39	84.3	80.3	89.73
40	82.6	78.7	88.17
41	81.0	77.2	86.58
42	79.4	75.7	84.98
43	77.9	74.3	83.36
44	76.5	73.0	81.72
45	75.1	71.7	80.07
46	73.8	70.4	78.40
47	72.6	69.2	76.72
48	71.4	68.1	75.02
49	70.2	66.9	73.31
50	69.1	65.9	71.59
51	68.0	64.8	69.85
52	66.9	63.8	68.11
53	65.9	62.9	66.35
54	65.0	61.9	64.58
55	64.0	61.0	62.79
56	63.1	60.2	61.00
57	62.2	59.3	59.20
58	61.3	58.5	57.38
59	60.5	57.7	55.56
60	59.7	56.9	53.73
61	58.9	56.2	51.89

f. Stormwater Retention & 'Water Balance'

Criteria for stormwater retention, or 'Water Balance/Reuse', is given by the City of Toronto's *Wet Weather Flow Management Guidelines (WWFMG)* and *Toronto Green Standard (TGS)*. TGS *WQ 1.1 Water Balance, Quality and Quantity* requires the proponent to address the following criteria.

- Water Balance: Retain a minimum of 50% of average annual rainfall volume (or equivalent 5mm each rainfall event).

The WWFMG and Toronto Water's criteria typically requires that retained stormwater is reused on-site within 72-hours of the 5mm storm.

It is shown, as follows, that the required retention volume to satisfy the TGS and WWFMG criteria is 38.1m^3/72-Hours and that this volume of stormwater may be retained on-site by a combination of initial abstractions and storage in a retention cistern (for subsequent greywater and irrigation reuse), providing a total retention volume of 38.2m^3/72-Hour.

Table 7 - 'Water Balance', or Stormwater Retention and Reuse, Summary

Catchment Area	**Surface Description**	**Catchment Area (m^2)**	**Initial Abstraction (mm)**	**Retention Volume (m^3)**
Target Volume	N/A	7620 m^2	5mm	***38.10 m^3***
	Stormwater Retention by Initial Abstraction, as Follows:			
Building A				
Green roof (Catchment B)	Pervious Surfaces	610 m^2	5 mm	3.05 m^3
Softscape Surfaces (Catchment C)	Pervious Surfaces	1300 m^2	5 mm	6.5 m^3
Regular Roof (Catchment D)	Impervious Surfaces	1839 m^2	1 mm	1.83 m^3
Ground-Level Surfaces (Catchment G)	Impervious Surfaces	160 m^2	1 mm	0.16 m^3
Building B				
Softscape Surfaces (Catchment A)	Pervious Surfaces	74 m^2	5 mm	0.37 m^3
Regular Roof (Catchment E)	Impervious Surfaces	543 m^2	1 mm	0.543 m^3
Ground-Level Surfaces (Catchment F)	Impervious Surfaces	20 m^2	1 mm	0.02 m^3

Ground-Level Surfaces (Catchment H)	Impervious Surfaces	170 m^2	1 mm	0.17 m^3
Green roof (Catchment I)	Pervious Surfaces	1240 m^2	5 mm	6.2 m^3
Driveway Surface (Catchment J)	Impervious Surfaces	2640 m^2	1 mm	2.64m^3
Total Stormwater Retention by Initial Abstractions:				21.5 m^3
Retention in Cistern (for Greywater Reuse & Irrigation):				16.7 m^3
Total On-Site Stormwater Retention Capacity:				**38.2 m^3**

As shown above, water balance retention of 21.5 m^3 is provided by surface initial abstractions. There remains a deficit of 16.7 m^3/72-hour, which is addressed by retention in a below-grade stormwater retention cistern and thereafter dispersed on-site by irrigation and greywater reuse. 'Clean' stormwater runoff from the building's roof will drain into a stormwater retention cistern to be designed at the SPA stage.

g. Stormwater Quality

Criteria for stormwater quality is given by the City of Toronto's *Wet Weather Flow Management Guidelines (WWFMG)* and *Toronto Green Standard (TGS)*. TGS Version 4, Tier 1, *WQ 1.1 Water Balance, Quality and Quantity* requires the proponent to address the following criteria.

- Water Quality: Provide long-term average removal of 80% Total Suspended Solids (TSS).

There is an open-to-above driveway area at the Site's rear, fronting the laneway, which will be subject to winter maintenance and will require stormwater quality treatment. A stormwater filter device will be specified at the SPA stage, to provide 80% TSS Removal. Preliminarily, a *Jellyfish Filter* by Imbrium Systems will be specified. The Jellyfish Filter has Canadian Environmental Technology Verification (ETV) and NJDEP certification for 80% TSS Removal.

5. Foundation Drainage & Groundwater

a. Criteria

The City of Toronto enacted a foundation drainage policy applying to new development applications made after January 1, 2022, providing criteria for consideration of foundation drainage. The policy applies to new development applications made after January 1, 2022. The policy effectively categories below-grade construction into the following scenarios.

- 'Scenario 1': Below-grade construction extends below the stable groundwater table elevation (or within 1.0m of it) – in which case the foundations must be constructed in a watertight or 'bathtubbed' manner.
- 'Scenario 2': Below-grade construction does not extend below the stable groundwater table, and stops 1.0m higher-than the stable groundwater table elevation. The policy offers two solutions in this scenario:
    - 'Scenario 2A': If the project is in a storm or sanitary sewer-shed – the foundations may be constructed in a 'drained' manner and the resulting foundation drainage water discharged to the storm or sanitary sewer (subject to satisfying the applicable City criteria with respect to water quality and the sewer having capacity).
    - 'Scenario 2B': If the project is in a combined sewer-shed – the foundations must be constructed in a watertight or 'bathtubbed' manner.

The policy also allows the collection and discharge of foundation drainage on-site, into an infiltration gallery or such solution, provided the quality of the water is acceptable.

b. Hydrogeological Investigation Results

The hydrogeological investigation informs which scenario, above, applies to this development.

A Hydrogeological Investigation was prepared by WSP, dated November 2024, to qualitatively and quantitatively characterize the groundwater at the Site with respect to the City's criteria. The conclusions of the report are generally as follows.

The seasonally high groundwater table, considering the required vertical freeboard contingencies, is higher-than the proposed building's foundation drains. The 'Scenario 1' discussion form the City's foundation drainage policy, as outlined, above applies. The proposed building will be constructed in a watertight manner and the hydro-geological manner states so accordingly.

In the short-term, construction-stage, scenario, the daily volume of water entering the excavation (thus requiring discharge) is 353m^3/day (which equates to 4.1 L/s).

c. Long-Term Scenario

In the long-term scenario, the proposed building will be constructed in a watertight manner, therefore there will be no long-term discharge of foundation drainage water. A letter has been provided by each of the owner, mechanical engineer and structural engineer, accordingly, on the following pages.

d. Short-Term 'Construction-Stage' Scenario

It is proposed, in the short-term scenario, to collect the water in the excavation for the proposed development and discharge it into the site's existing sanitary sewer connection.

The flow rate of short-term groundwater is 353m^3/day (which equates to 4.1 L/s). This flow rate is less than the future development's post-development sanitary flow rate (as per Table 3), therefore it follows that the receiving combined sewers have available capacity for the temporary groundwater discharge.

TMP
A MEMBER OF BPA
200 KING STREET WEST, SUITE 310
TORONTO, ON CANADA M5H 3T4
TMP@TMPTORONTO.COM
P: 416-499-8000
tmptoronto.com

November 5, 2024

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

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

RE: 2451-2494 DANFORTH AVENUE

Dear Sir or Madam,

I Steve Orchard, confirm that all building(s) on the subject lands 2451-2494 Danforth Ave will be designed and constructed in a manner without Private Water Drainage System (subsurface drainage system) consisting of but not limited to weeping tile(s), foundation drain(s), private water collections sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer. Underground structure(s) of the proposed building(s) will be built completely watertight without any direct or indirect connection to the city sewer for the discharge of groundwater (from a PWDS or floor drain or other infrastructure).

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

Yours very truly,
THE MITCHELL PARTNERSHIP INC.

Steve Orchard, P.Eng
Partner

ENTUITIVE

Entuitive Corporation
200 University Avenue, 7th Floor
Toronto, ON M5H 3C6 Canada

T. 416.477.5832

November 7th, 2024

Attention: Executive Director, Engineering and Construction Services
c/o Manager, Development Engineering
5100 Yonge Street, 4th Floor, Toronto, ON M2N 5V7

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

Re: Watertight Below-Grade Structure, 2451 Danforth Avenue, Toronto, ON
Our Project No. EN024-01874

Dear Sir or Madam,

I, Robin Djuita, confirm that all buildings on the subject lands at 2451 Danforth Avenue can be constructed completely water-tight below grade in a manner that will resist hydrostatic pressure without any necessity for Private Water Drainage System (subsurface drainage system) consisting of but not limited to weeping tile(s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer.

Note: For structural design only to resist hydrostatic pressure. Entuitive is not responsible for waterproofing, construction and active or passive drainage systems as referenced above.

Sincerely,
Entuitive

Robin Djuita, P.Eng.
Associate
robin.djuita@entuitive.com
D: 416 305 2860

entuitive.com

FIRST CAPITAL

November 11, 2024

Corporate Headquarters
85 Hanna Ave, Suite 400
Toronto, ON M6K 3S3

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

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

Dear Sir or Madam,

I, Joshua Butcher, confirm and undertake that I will construct and maintain the new buildings to be constructed on the subject lands at 2451-2495 in a manner which shall be completely water-tight below grade and resistant to hydrostatic pressure without any necessity for Private Water Drainage System (subsurface drainage system) consisting of but not limited t weeping tile (s), foundation drain(s), private water collection sump(s), private water pump or any combination thereof for the disposal of private water on the surface of the ground or to a private sewer connection directly or indirectly or drainage system for disposal directly or indirectly in a municipal sewer.

FCHT Holdings (Ontario) Corp.

Joshua Butcher
Senior Director, Development

I, Joshua Butcher, have the authority to bind the corporation.

85 Hanna Avenue, Suite 400 Toronto, Ontario M6K 3S3 fcr.ca

6. Grading & Topography

The Site is generally level and no significant grade changes warranting retaining walls etc. are required.

The proposed development fronts on two sides to existing municipal Rights of Way. It is proposed to re-construct the existing municipal sidewalks on those two frontages, according to City standards.

7. Erosion & Sediment Control

Erosion and sediment control practices will be employed during the construct phase to mitigate sediment transport, in accordance with TRCA and City of Toronto requirements. Refer to the *Erosion and Sediment Control Plan* for the proposed measures.

8. Conclusions

This report has outlined the manner in which the proposed development will be serviced and by which the stormwater management criteria will be satisfied.

Please contact the undersigned with any questions.

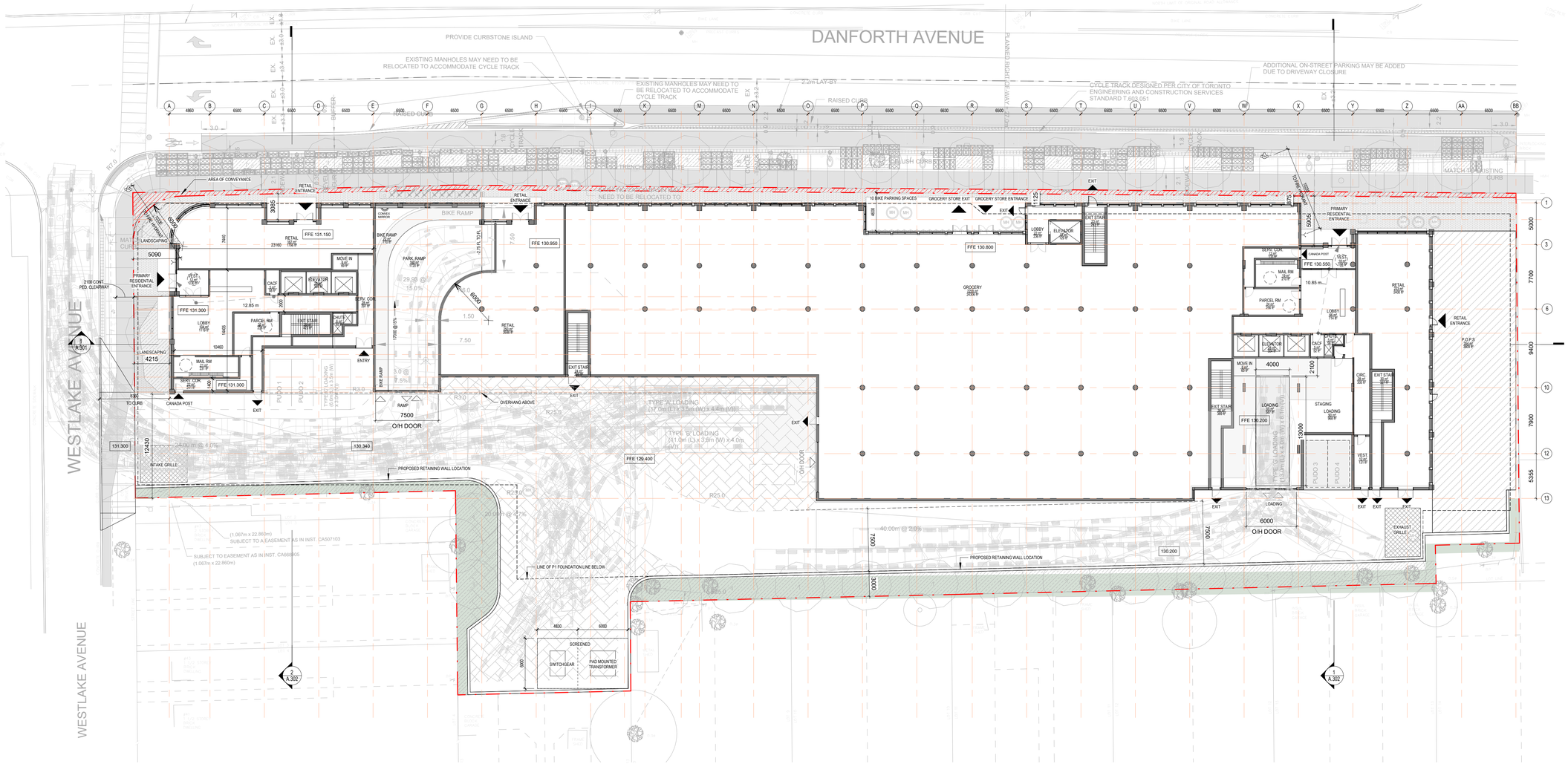
Respectfully submitted,

Daniel Bancroft, P.Eng.,
civilGo Engineering Inc.

Miti Patel, M.Eng., E.I.T.,
civilGo Engineering Inc.

APPENDIX A

- Architectural Site Plan by Superkül Architects
- Architectural Statistics by Superkül Architects



1 Site Plan - Ground Floor
1 : 250

superkul
101 - 35 Golden Avenue
Toronto, ON M6R 2J5
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f> 416.533.6986
www.superkul.ca

- PRINCIPAL ENTRY
- ENTRY/ EXIT
- VEHICULAR ENTRY/ EXIT
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- MANHOLE COVER
- CATCH BASIN
- HYDRO POLE
- ELECTRICAL STAND
- EXTENT OF BELOW GRADE
- BUILDING ELEMENT ABOVE
- OPEN TO BELOW
- EXTENT OF GROUND FLOOR
- 123.45 GEODETIC ELEVATION
- HT: 12.30 m ELEVATION FROM EXTABLISHED GRADE
- 78.20 EXISTING GRADE ELEVATION FH
- BARRIER FREE TURNING RADIUS
- EXISTING BUILDING
- PROPERTY CONVEYANCE
- PROPERTY LINE

FFE	FINISHED FLOOR ELEVATION
TOP	TOP OF PARAPET
TOR	TOP OF ROOF
TOS	TOP OF STRUCTURE
TGS	TORONTO GREEN STANDARDS
TPZ	TREE PROTECTION ZONE

NOTE:

SURVEY INFORMATION TAKEN FROM "LOT 1 AND PART OF LOT 2 REGISTERED PLAN 614 YORK AND PART OF LOT 13 SOUTH SIDE OF DANFORTH AVENUE REGISTERED PLAN 90 YORK AND PART OF LOTS 3,4,5,6,7 AND 8 REGISTERED PLAN 580 YORK CITY OF TORONTO"
BY KRCMAR SURVEYORS LTD.
DATED JULY, 27 2022.

No.	Date	Issue/Revision
1	OCT 28, 2024	Issued for OPA and ZBA

ONTARIO ASSOCIATION OF ARCHITECTS
ANDRE D'ELIA
LICENCE
5525

2451-2495 Danforth

2451-2495 Danforth
Avenue, Toronto, ON
M6R 2J5

Title:
FLOOR PLAN - GROUND FLOOR

Project No. 2216	Scale As indicated

Drawing No.
A.103

2024-10-28 11:08 PM

Statistics Template – Toronto Green Standard Version 4.0

City Agency, Corporation & Division-Owned Facilities

The Toronto Green Standard Version 4.0 Statistics Template is submitted with Site Plan Control Applications and stand-alone Zoning Bylaw Amendment applications. Complete the table and copy it directly onto the Site Plan submitted as part of the application.

For Zoning Bylaw Amendment applications: complete General Project Description and Section 1.
For Site Plan Control applications: complete General Project Description, Section 1 and Section 2.
For further information, please visit www.toronto.ca/greendevelopment

General Project Description	Proposed
Total Gross Floor Area	*41251.7 m²* *444029.5 ft²*
Breakdown of project components (m²):	
Retail **GROCERY GFA:**	*2258.1 m²* *24306.3 ft²*
Commercial **TOTAL RETAIL GFA:**	*939.2 m²* *10109.6 ft²* *(EXCLUDING GROCERY)*
Industrial	
Institutional/Other	
Total number of residential units	*620*

Section 1: For Stand Alone Zoning Bylaw Amendment Applications and Site Plan Control Applications

Low Emissions Transportation	Required	Proposed	Proposed %
Number of Parking Spaces	7	278	>100%
Number of EV Parking Spaces (Residential)	190	190	100%
Number of EV Parking Spaces (Non - Residential)	22	22	100%

Cycling Infrastructure	Required	Proposed	Proposed %
Number of long-term bicycle parking spaces (all-uses)	564	568	>100%
Number of long-term bicycle parking located on:			
a) first storey of building			
b) second storey of building			
c) first level below-ground		568	100%
d) second level below-ground			
e) other levels below-ground			
Number of short-term bicycle parking spaces	146	146	100%
Number of shower and change facilities	N/A	N/A	

Statistics Template – Toronto Green Standard Version 4.0

City Agency, Corporation & Division-Owned Facilities

Tree Canopy	Required	Proposed	Proposed %
Total Soil Volume (40% of the site area ÷ 66 m² x 30 m³)	1374 m3	1156 m3	84%
Soil volume provided within the site area (m³)		644 m3	
Soil Volume provided within the public boulevard (m³)		512 m3	

GCA AND GFA BREAKDOWN

ABOVE GROUND	*GROSS CONSTRUCTION AREA*		*ZBL 569-2013 EXCLUSIONS*		*CITY WIDE BY-LAW 569-2013 GROSS FLOOR AREA*	
Level	GCA, m2	GCA, sf	GFA Exclusion, m2	GFA Exclusion, sf	GFA, m2	GFA, sf
Ground Floor	3987.9 m²	42925.9 ft²	518.1 m²	5577.2 ft²	3469.8 m²	37348.6 ft²
Level02	1476.8 m²	15895.7 ft²	145.0 m²	1560.6 ft²	1331.8 m²	14335.1 ft²
Level03	2425.8 m²	26110.8 ft²	1580.2 m²	17009.2 ft²	845.6 m²	9101.6 ft²
Level04	2245.3 m²	24168.1 ft²	147.3 m²	1585.3 ft²	2098.0 m²	22582.8 ft²
Level05	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level06	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level07	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level08	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level09	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level10	2193.6 m²	23612.2 ft²	142.2 m²	1530.4 ft²	2051.5 m²	22081.8 ft²
Level11	1984.1 m²	21356.9 ft²	142.2 m²	1531.0 ft²	1841.9 m²	19825.9 ft²
Level12	1984.1 m²	21356.9 ft²	142.2 m²	1531.0 ft²	1841.9 m²	19825.9 ft²
Level13	1984.1 m²	21356.9 ft²	142.2 m²	1531.0 ft²	1841.9 m²	19825.9 ft²
Level14/MPH	1086.9 m²	11699.1 ft²	368.1 m²	3962.3 ft²	718.8 m²	7736.8 ft²
Level15	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level16	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level17	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level18	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level19	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level20	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level21	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level22	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level23	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level24	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level25	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level26	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level27	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level28	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level29	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level30	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level31	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level32	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level33	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level34	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
Level35	778.1 m²	8374.9 ft²	68.1 m²	732.8 ft²	710.0 m²	7642.2 ft²
MPH	503.5 m²	5419.6 ft²	459.8 m²	4948.7 ft²	43.7 m²	470.9 ft²
Grand total	47179.6 m²	507837.0 ft²	5927.9 m²	63807.5 ft²	41251.7 m²	444029.5 ft²

DEFINITIONS

From the City of Toronto ZBL 569-2013:
In the Residential Zone category, the **Gross Floor Area** of an apartment building is reduced by the area in the building used for:
(A) parking, loading and bicycle parking below established grade;
(B) required loading spaces and required bicycle parking spaces at or above established grade;
(C) storage rooms, washrooms, electrical, utility, mechanical and ventilation rooms in the basement;
(D) shower and change facilities and bicycle maintenance facilities required by this By-law for required bicycle parking spaces; [By-law: 839-2022]
(E) indoor amenity space required by this By-law;
(F) elevator shafts;
(G) garbage shafts;
(H) mechanical penthouse; and
(I) exit stairwells in the building.

Floor Space Index Calculation
In the Residential Zone category, the floor space index:
(A) for a non-residential building, is the result of the gross floor area of a building divided by the area of the lot;
(B) for a residential building, other than an apartment building, is the result of the gross floor area, plus the area of an attic described in regulation 10.5.40.40(1) and subject to regulation 10.5.40.40(2) minus the areas listed in regulation 10.5.40.40(3), divided by the area of the lot; and
(C) for an apartment building, is the result of the gross floor area, minus the areas of an apartment building listed in regulation 10.5.40.40(4), divided by the area of the lot.

Green Roof Statistics

	Proposed
Gross Floor Area, *as defined in Green Roof Bylaw* (m²)	46879.5 m²
Total Roof Area (m²)	4231.57 m²
Area of Residential Private Terraces (m²)	390.04 m²
Rooftop Outdoor Amenity Space, *if in a Residential Building* (m²)	1376.17 m²
Area of Renewable Energy Devices (m²)	0 m²
Tower (s)Roof Area with floor plate less than 750 m²	N/A
Total Available Roof Space (m²)	2455.36 m²
Green Roof Coverage	**Required** **Proposed**
Coverage of Available Roof Space (m²)	1479.22 m² 1990 m²
Coverage of Available Roof Space (%)	60 % 80.7 %

Number of Affordable Units:

3.2. Unit Mix, Size and Location

3.2.1. 40% of all housing units should contain one bedroom and should be no less than 525 sq ft (48.7 sq m) in area. The average of all one bedroom affordable units will be no less than 590 square feet (55 sq m) (+/- 5%). Bachelor units are not acceptable.

3.2.2. 40% of all units should contain two bedrooms and should be no less than 650 sq ft (60 sq m) in area. The average size of all two bedroom units should be 725 square feet (+/- 5%).

3.2.3. 15% of all units should contain three bedrooms and should be no less than 900 sq ft (84 sq m) in area. The average size of three bedroom units should be 1000 square feet (+/- 5%).

3.2.4. 5% of all units should contain four bedrooms and should be no less than 1100 sq ft (102 sq m) in area. The average size of all four bedroom units shall be 1175 sq ft (+/- 5%)

3.2.5. Family Units:
a. Larger family units are preferred either on the ground floor with direct access to a street with front outdoor space; or
b. In building types that don't permit this configuration, family units can also function well on upper floors (above grade) with an outdoor terrace.
c. Family units should have proportionately larger living, dining and storage areas.
d. Outdoor private amenity spaces such as patios, balconies and terraces are key features for family suites.

3.2.6. Bedrooms should be a minimum of 100 sq ft (9.3 sq m) with a minimum dimension of 9 ft and include operable windows to the exterior.

AFFORDABLE HOUSING UNIT MIX

AFFORDABLE HOUSING UNITS PROVIDED:

Name	Count	Unit Mix	Average Area, m2	Average Area, sf
UNIT 1BD	7	54%	58.1 m²	625.9 ft²
UNIT 2BD	3	23%	73.1 m²	786.4 ft²
UNIT 3 BD	1	8%	122.7 m²	1321.0 ft²
UNIT 4 BD	1	8%	126.9 m²	1366.1 ft²
UNIT STUDIO	1	8%	43.2 m²	465.3 ft²
	13		424.1 m²	4564.8 ft²

*AFFORDABLE HOUSING UNITS INCLUDED IN UNIT MIX AND UNIT TOAL.

*REFER TO FLOOR PLANS FOR AFFORDABLE HOUSING UNIT LOCATIONS. SEE 'AHU' TAG ON PLANS.

CAR PARKING

Level	Visitor Parking Provided	Visitor Parking Required	Car-Share Provided
P1	86	33	2

*required visitor parking = 2 + (0.05 per unit)

Level	Residential Parking Provided
P2	162
P1	28
	190

Total Parking Provided
278

LOADING PROVISIONS

1x TYPE 'A' LOADING SPACE
1x TYPE 'B' LOADING SPACE
1x TYPE 'C' LOADING SPACES
1x TYPE 'G' LOADING SPACE
4x PUDO PARKING SPACES

*REFER TO FLOOR PLANS FOR LOCATIONS

AMENITY

Level	Name	Indoor Amenity Provided	Indoor Amenity Required
Level03	AMENITY	1265.9 m²	1240 m²

*required area (2sm per unit) = 1240m².

Level	Name	Outdoor Amenity Provided	Outdoor Amenity Required
Level03	OUTDOOR AMENITY	1574.2 m²	1240 m²

*required area (2sm per unit) = 1240m².

BIKE PARKING*

*EXCLUDES ENSITING BIKE SHARE PARKING ON SITE

REQUIRED BIKE PARKING SPACES:

Land Use	Units / GFA	Short Term	Long Term*	Spaces Required
Residential	620 Units	0.2 per unit = 124	0.9 per unit = 558	682 Spaces
Retail / Grocery	3,197.1 m²	3 + 0.3 per 100 m² = 13	0.2 per 100 m² = 7	20 Spaces
At Grade	N/A	10 Spaces		10 Spaces
Totals:		147 Spaces	565 Spaces	712 Spaces

**10% OF REQUIRED LONG-TERM RESIDENTIAL BICYCLE PARKING SPACES TO BE PROVIDED WITH EV CHARGING AS PER TGS V4 AC2.3.

PROVIDED BIKE PARKING SPACES:

Land Use	Short Term	Long Term**	Spaces Provided
Residential	124 Spaces	560 Spaces	684 Spaces
Retail / Grocery	13 Spaces	7 Spaces	20 Spaces
At Grade	10 Spaces		10 Spaces
Totals:	147 Spaces	567 Spaces	714 Spaces

**5% LONG-TERM RESIDENTIAL BIKE PARKING SPACES TO BE EQUIPPED FOR EV CHARGING

BIKE PARKING LOCATIONS:

Level	Count
P1	176 x 4 = 704*
Ground Floor	10
Total:	714

*REFER TO P1 PLAN FOR DERO DECKER SYSTEM

PROJECT STATISTICS SUMMARY

NUMBER OF FLOORS:	13/35	**FSI (GFA/LOT AREA):**	5.54
GROSS CONSTRUCTION AREA (GCA) ABOVE GRADE:		*47179.6 m²*	*507837.0 ft²*
TOTAL GROSS FLOOR AREA (GFA): *as defined in ZBL 569-2013		*41251.7 m²*	*444029.5 ft²*
RESIDENTIAL GFA:		*38054.4 m²*	*409613.6 ft²*
RETAIL GFA:		*939.2 m²*	*10109.6 ft²*
GROCERY STORE GFA:		*2258.1 m²*	*24306.3 ft²*
POPS AREA:		*353.9 m²*	*3809.4 ft²*
LOT AREA:		*7,724 m²*	
CONVEYANCES AREA:		*168m²*	
ADJUSTED LOT AREA:		*7,556m²*	
TOTAL EFFICIENCY	Total Salable / above ground GCA	*80.7%*	
NUMBER OF RESIDENTIAL UNITS		*620*	
NUMBER OF AFFORDABLE UNITS		*13 (2%)*	

UNIT COUNT AND MIX

BUILDING A*: *SEE UNIT MIX DIAGRAM GREY AREA

Level	Residential GFA, m2	Residential GFA, sf	Count
Level04	659.8 m²	7102.2 ft²	11
Level05	659.8 m²	7102.2 ft²	11
Level06	659.8 m²	7102.2 ft²	11
Level07	659.8 m²	7102.2 ft²	11
Level08	659.8 m²	7102.2 ft²	11
Level09	659.8 m²	7102.2 ft²	12
Level10	659.8 m²	7102.2 ft²	12
Level11	659.8 m²	7102.2 ft²	12
Level12	659.8 m²	7102.2 ft²	12
Level13	659.8 m²	7102.2 ft²	12
Level14/MPH	659.8 m²	7102.2 ft²	12
Level15	659.8 m²	7102.2 ft²	12
Level16	659.8 m²	7102.2 ft²	12
Level17	659.8 m²	7102.2 ft²	12
Level18	659.8 m²	7102.2 ft²	12
Level19	659.8 m²	7102.2 ft²	12
Level20	659.8 m²	7102.2 ft²	12
Level21	659.8 m²	7102.2 ft²	12
Level22	659.8 m²	7102.2 ft²	12
Level23	659.8 m²	7102.2 ft²	12
Level24	659.8 m²	7102.2 ft²	12
Level25	659.8 m²	7102.2 ft²	12
Level26	659.8 m²	7102.2 ft²	12
Level27	659.8 m²	7102.2 ft²	12
Level28	659.8 m²	7102.2 ft²	12
Level29	659.8 m²	7102.2 ft²	12
Level30	659.8 m²	7102.2 ft²	12
Level31	659.8 m²	7102.2 ft²	12
Level32	659.8 m²	7102.2 ft²	12
Level33	659.8 m²	7102.2 ft²	12
Level34	659.8 m²	7102.2 ft²	12
Level35	659.8 m²	7102.2 ft²	12
	21114.1 m²	227270.5 ft²	379

BUILDING A UNIT MIX:

Name	Count	Unit Mix	Average Area, m2	Average Area, sf
UNIT 1BD	155	41%	55.6 m²	598.2 ft²
UNIT 2BD	96	25%	69.1 m²	744.0 ft²
UNIT 3 BD	37	10%	81.7 m²	879.4 ft²
UNIT STUDIO	91	24%	31.2 m²	336.2 ft²
	379		237.6 m²	2557.8 ft²

BUILDING B*: *SEE UNIT MIX DIAGRAM HATCHED AREA

Level	Residential GFA, m2	Residential GFA, sf	Count
Level02	963.7 m²	10373.4 ft²	14
Level03	715.7 m²	7704.2 ft²	11
Level04	1285.5 m²	13837.3 ft²	24
Level05	1239.0 m²	13336.3 ft²	23
Level06	1239.0 m²	13336.3 ft²	23
Level07	1239.0 m²	13336.3 ft²	23
Level08	1239.0 m²	13336.3 ft²	23
Level09	1239.0 m²	13336.3 ft²	23
Level10	1239.0 m²	13336.3 ft²	23
Level11	1032.2 m²	11110.9 ft²	18
Level12	1032.2 m²	11110.9 ft²	18
Level13	1032.2 m²	11110.9 ft²	18
	13495.6 m²	145265.4 ft²	241

BUILDING B UNIT MIX:

Name	Count	Unit Mix	Average Area, m2	Average Area, sf
UNIT 1BD	111	46%	51.7 m²	556.8 ft²
UNIT 2BD	56	23%	64.6 m²	695.4 ft²
UNIT 3 BD	25	10%	92.1 m²	991.8 ft²
UNIT 4 BD	1	0%	126.9 m²	1366.1 ft²
UNIT STUDIO	48	20%	35.5 m²	382.3 ft²
	241		370.9 m²	3992.5 ft²

BUILDING A & B UNIT MIX:

Name	Count	Unit Mix	Average Area, m2	Average Area, sf
UNIT 1BD	266	43%	54.0 m²	580.9 ft²
UNIT 2BD	152	25%	67.5 m²	726.1 ft²
UNIT 3 BD	62	10%	85.9 m²	924.8 ft²
UNIT 4 BD	1	0%	126.9 m²	1366.1 ft²
UNIT STUDIO	139	22%	32.7 m²	352.1 ft²
	620		367.0 m²	3950.0 ft²

superkul
101 - 35 Golden Avenue
Toronto, ON M6R 2J5
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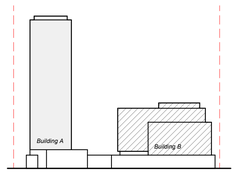


UNIT MIX DIAGRAM

No.	Date	Issue/Revision
1	OCT 28, 2024	Issued for OPA and ZBA

ONTARIO ASSOCIATION OF ARCHITECTS
ANDRÉ D'ELIA
LICENCE
5525

2451-2495 Danforth
2451-2495 Danforth Avenue, Toronto, ON M6R 2J5

Title:
PROJECT STATISTICS

Project No. 2216 | Scale 1 : 1

Drawing No.
A.001

2024-11-27 9:10:40 PM

APPENDIX B

- Dye Test Investigation by Aquaflow Technologies

AQUAFLOW TECHNOLOGY INC

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

COMBINED SEWER INVESTIGATION REPORT
DYE TEST

100 MM - 450 MM DIAMETER COMBINED SEWERS

FOR

2451 - 2495 DANFORTH AVENUE

CITY OF TORONTO

CONSULTING ENGINEER: CIVIL GO ENG. INC.
CONSULTING ENGINEER'S REPRESENTATIVE:
DANIEL BANCROFT
OWNER: FIRST CAPITAL
OWNER'S REPRESENTATIVE: MADELEINE BRADSHAW

WEDNESDAY, AUGUST 9TH, 2023

INDEX:

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

2. SUMMARY REPORT AND CONCLUSIONS:

The investigation of the combined sewers at 2451 - 2495 Danforth Avenue was carried out by Steven Lostracco, P.Eng. of Aquaflow Technology, and was authorized by Daniel Bancroft of Civil Go Eng. Inc. The investigation was carried out on Wednesday August, 9th, 2023.

The purpose of this report was to determine which municipal sewer the building storm and sanitary drains connect to. Dye testing was carried out to confirm which sewer the building connects to.

1. All drains on site connect to the Danforth Avenue 300 mm / 375 mm combined sewer (sewer on the south side of Danforth Avenue). DCB-1, CB-2, CB-3, CB-4, CB-5, all roof drains and the sanitary drains all connect to the combined sewer system.

2. Note, all storm drains on the west side of the site connect to the property line STM-MH, then connect to the combined sewer. All sanitary sewers for the site connect to the property line SAN-MH, then connect to the combined sewer.

1. 2451-2495 Danforth Ave

2. Property line STM + SAN MH's


3. Dye observed in 300 mm / 375 mm comb. swr

4. DCB-1

5. CB-3

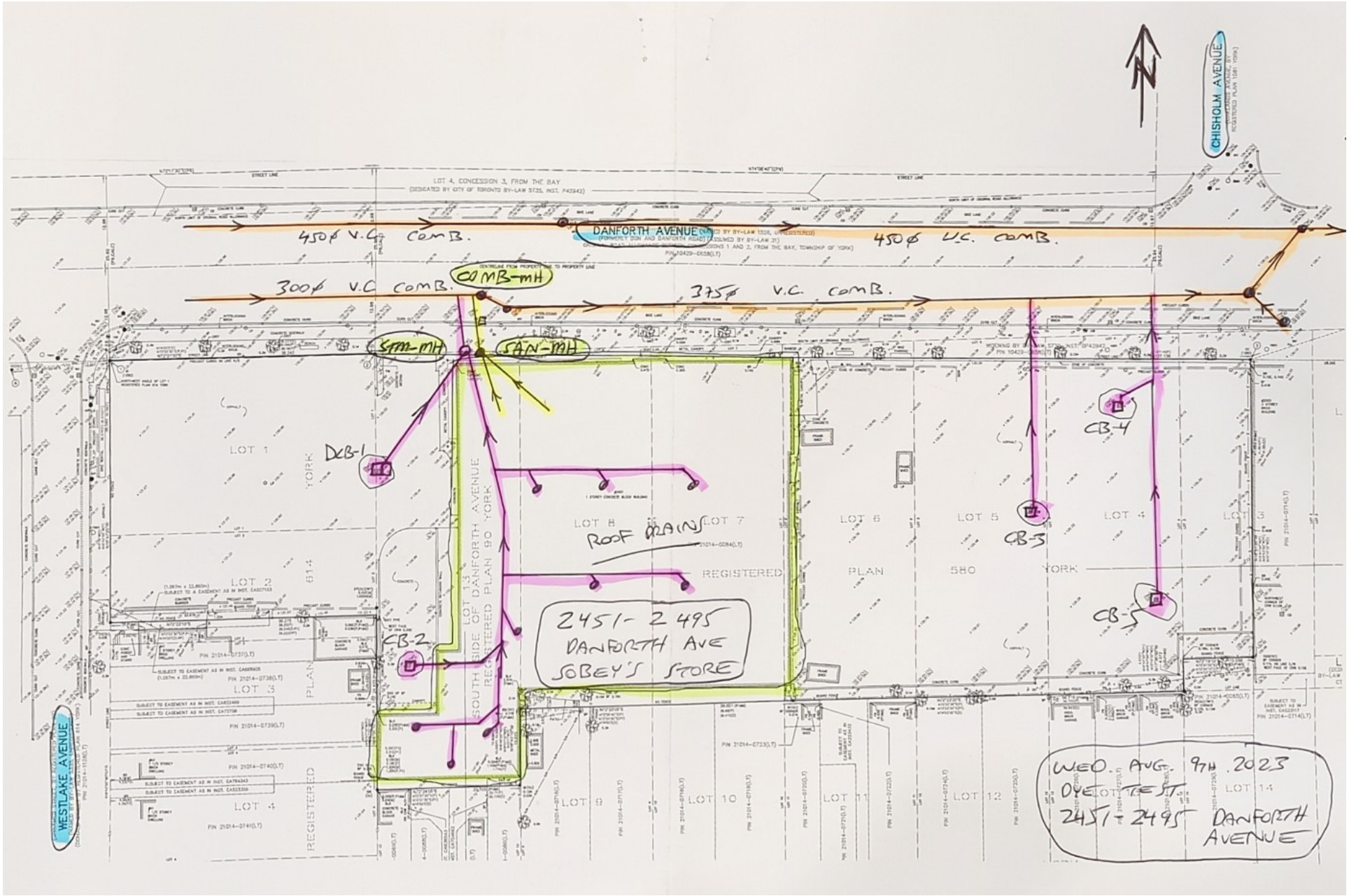
6. Roof drains

7. Roof drains

8. Flush truck + video van for dye testing

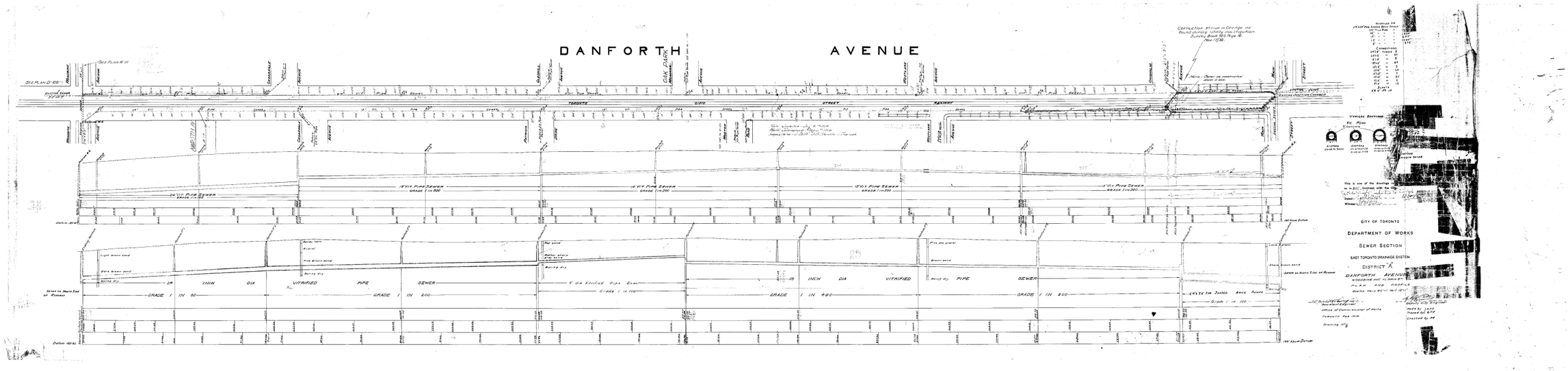
Report Prepared by:

Steven Lostracco, P. Eng.


DANFORTH AVENUE
CHISHOLM AVENUE
WESTLAKE AVENUE
450ϕ V.C. comB.
450ϕ V.C. comB.
300ϕ V.C. comB.
375ϕ V.C. comB.
COMB-mH
STM-MH
SAN-MH
DCB-1
CB-2
CB-3
CB-4
CB-5
ROOF DRAINS
2451-2495 DANFORTH AVE SOBEY'S STORE
WED. AUG. 9TH. 2023 DYE TEST 2451-2495 DANFORTH AVENUE
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
REGISTERED PLAN 814 YORK
REGISTERED PLAN 580 YORK
SOUTH SIDE OF DANFORTH AVENUE REGISTERED PLAN 90 YORK

APPENDIX C

- City Engineering Records – City of Toronto Drawing No. D-110-1


DANFORTH AVENUE
TORONTO STREET RAILWAY
CITY OF TORONTO
DEPARTMENT OF WORKS
SEWER SECTION
EAST TORONTO DRAINAGE SYSTEM
DISTRICT A
DANFORTH AVENUE
PLAN AND PROFILE