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PROPOSED 10-STOREY MIDRISE
914 BATHURST STREET
CITY OF TORONTO

PROJECT No.: 22221

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

Prepared For:

STAFFORD BATHURST INC.

Prepared By:

The Odan/Detech Group Inc.

Original: August 2nd, 2022 Issued for ZBA/SPA

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1.0 INTRODUCTION

The subject of this report is a 0.157 Ha (0.388 acre) parcel of land bound by the following.

- To the east: There is Bathurst Street
- To the south: There is Barton Avenue
- To the west: There is a municipal laneway “Old Crookshank’s Lane” and existing residential properties
- To the north: There is an existing commercial building (Centre for Culture, Arts, Media and Education)

Presently the site is occupied by an existing 7-storey (Vermont Square) Long Term Care Home building with above grade parking lot on the west side.

The site has municipal address 914 Bathurst Street and postal code M5R 3G5.

Refer to the Key Plan in Appendix A for the site’s layout and adjacent properties.

It is proposed to construct a 10-Storey (plus mechanical penthouse) residential building. A four-level below-grade parking structure is proposed beneath. The Development has frontage to Bathurst Street and the municipal Lane to the west. Driveway access to the below-grade parking structure is from the municipal Laneway.

Refer to the architectural site plan in Appendix A for the proposed development’s layout.

For detailed topography of the existing site conditions, as of April 2017, refer to the topographic survey prepared by Speight, Van Nostrand & Gibson Limited.

This report evaluates the serviceability of the site with respect to sanitary waste water, water and storm water management (SWM) and will implement the City of Toronto’s SWM requirements and Wet Weather Flow Management Guidelines (WWFMG).

2.0 SCOPE OF WORK

THE ODAN/DETECH GROUP INC. was retained by **Stafford Bathurst Inc.** to review the Site, collect data, evaluate the Site for the proposed use and present the findings in a Functional Servicing and Storm Water Management Report in support of a Rezoning application. The scope of work in brief involves the following:

a) Collecting existing servicing drawings from the CITY in order to establish availability and feasibility of Site servicing;
b) Meetings/conversations with CITY Engineers and Design Team.
c) Evaluation of the data and presentation of the findings in a Functional Servicing and Storm Water Management Report in support of the ZBA/SPA application.

3.0 WATER DISTRIBUTION ASSESSMENT

i) Existing Infrastructure

The following watermains presently exist beneath the streets bordering the site. Refer to the Functional Servicing Plan.

- Bathurst Street: existing 300mm watermain, abandoned 900mm watermain, and abandoned 300mm watermain.
- Barton Avenue: existing 150mm watermain, and existing 900mm watermain.

ii) Existing Water Servicing

The existing buildings on the site are serviced by a 150mm which is connected on Bathurst Street from the 300mm watermain, based on the DMOG (Digital Map Owners Group) map.

iii) Design Criteria

The City of Toronto's *Notice to Applicants* policy (2016) states, in regards to point tower developments, *every point tower shall have its own independent service connection to the municipal potable water and sewer services.*

The water and fire service connection will be an 'h' connection in accordance with City standards.

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure in line were established from the City Design Manual Standards. The pressures and volumes must be sufficient for peak hour conditions and under fire conditions as established by the Ontario Building Code 2006. The minimal residual pressure under fire conditions is 140 kpa. (or 20.3 psi).

iv) Proposed Servicing

The proposed mid-rise will be serviced by a 200mm fire service connection from the 300mm watermain within Bathurst Street with branch 150mm domestic water service. Refer to the Functional Servicing Plan.

The building will not be greater than 84m in height, therefore a second fire service is not required (as per OBC 2006 3.2.9.7 (4)).

Refer to the Functional Servicing Plan for proposed service connections.

The water demand for the proposed building is as follows.

a)	Average Day domestic demand -	using 191L/cap/day (229 persons – Table 2)	0.5 L/sec
b)	Peak day demand -	1.3 x daily demand	0.6 L/sec
c)	Peak hour demand -	2.5 x daily demand	1.2 L/sec
d)	Fire flow as per FUS 1999 manual		167 L/sec

TABLE 1 – Total Water Demand for Proposed Building

	L/sec	USGM
Peak Day Demand	0.6	9
Fire Flow Demand	167	2647
Total Water Demand	168	2663
Available Flow at 20 PSI (Bathurst St. 300mm WM)	***244***	***3868***

The following assumptions are made in the following Fire Underwriters' Survey fire flow calculation.

- The proposed building is of fire-resistive construction (reinforced concrete)
- The building will be sprinklered for fire protection and the sprinklers will be fully monitored according to NFPA 13
- The building's contents (residences) will be limited-combustible in nature
- The building's areas in the calculation are as per the architectural floor areas provided in Appendix A

The available flow at 20 psi in the Bathurst St. 300mm watermain (3868 USGM) is greater than the proposed development's total water demand (2663 USGM), therefore the existing watermain infrastructure is sufficient to service the proposed development and no watermain infrastructure upgrades are required.

WATER SUPPLY FOR PUBLIC FIRE PROTECTION , FIRE UNDERWRITERS SURVEY
GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOWS

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

Where:

F = required fire flow in liters per minute
C= Coefficient related to the type of construction
A = the total floor area in square meters (excluding basements) in the building considered

Coefficient related to type of construction	
1.5	Wood Frame
1	Ordinary
0.8	Non combustible
0.6	Fire Resistive

LOCATION: 914 Bathurst St.
OBC OCCUPANCY: Residential
BUILDING FOOT PRINT (m2): 1407
OF STOREYS: 10

PROJECT: 914 Bathurst St.
PROJECT No 22221

Contents	Charge
Non-Combustible	-25%
limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Buring	25%

CONSTRUCTION CLASS: Fire Resistive

AUTOMATED SPRINKLER PROTECTION

		Credit	Total
NFPA 13 sprinkler standard	yes	10%	
Standard Water Supply	yes	30%	50%
Fully Supervised System	yes	10%	
		50%	

CONTENTS FACTOR: limited combustible — CHARGE: -15%

EXPOSURE 1 (south) Ex. Residential	Distance to Exposure Building (m)	19.1	15%
	Length - Height		
EXPOSURE 2 (east) Ex. Residential	Distance to Exposure Building (m)	23.57	10%
	Length - Height		
EXPOSURE 3 (west) Ex. Residential	Distance to Exposure Building (m)	16.47	15%
	Length - Height		
EXPOSURE 4 (north) Ex. Commercial	Distance to Exposure Building (m)	0.68	25%
	Length - Height		
		Total:	65%

no more than 75%

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

ARE BUILDINGS CONTIGUOUS: NO

FIRE RESISTANT BUILDING Are vertical openings and exterior vertical communications protected with a minimum one (1) h — No

CALCULATIONS

	C =	0.6		
	A =	5399	m2	(2 largest floors + 50% floors above)
	F =	9699	L/min	
Round to Nearest 1000 L/min	F =	10000	L/min	must be > 2000 L/min

CORRECTION FACTORS:

OCCUPANCY	-1500	L/min	
FIRE FLOW ADJUSTED FOR OCCUPANCY	8500	L/min	
REDUCTION FOR SPRINKLER	-4250	L/min	
EXPOSURE CHARGE	5525	L/min	

REQUIRED FIRE FLOW F = 9775 L/min

Round to Nearest 1000 L/min F = 10000 L/min 2642 usgm
F = 167 L/sec

STOREY AREAS m2	
1332.1	L3
1332.1	L4
1214.8	L5
1214.8	L6
817.2	L7
715.3	L8
634.6	L9
634.6	L10
237.4	L11

Test 1 – Bathurst Street 300mm Watermain

FLOWMETRIX
INDU-TECH
PROCESS

Fire Flow Testing Report

Residual Hydrant #	**HY1358694**
NFPA Colour Code	**BLUE**

DATE	May 16, 2022
TIME	9:30 AM
ADDRESS	891 Bathurst St
	Toronto, ON
	M5R 3G4
SIZE-Inches/mm	12 300
MATERIAL	CI

RESIDUAL HYDRANT INFO.

HYDRANT #	HY1358694	
N.F.P.A. COLOUR CODE	BLUE	
STATIC PRESSURE	47.3	psi
RESIDUAL PRESSURE - ONE PORT OPEN	45.7	psi
RESIDUAL PRESSURE - TWO PORTS OPEN	43.7	psi
PRESSURE DROP	3.6	psi
% PRESSURE DROP	7.6	% psi
Flow at Test Hydrant @ 20 psi	3868	USGPM

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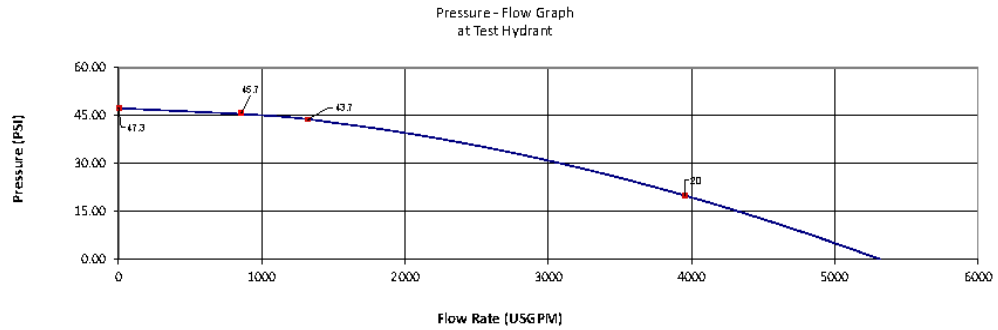
FLOW HYDRANT(S) INFO.

HYDRANT ASSET ID	HYD. # PORTS	OUTLET DIAMETER (INCHES)	NOZZLE COEFFICIENT	DIFFUSER TYPE	DIFFUSER COEFFICIENT	PITOT READING (psi)	PITOT FLOW (USGPM)	FLOW METER (USGPM)
HY1358693	1	2.5	Round	LPD250	0.90	31.3	845	0
								0
HY1358693	2	2.5	Round	LPD250	0.90	19.2	1297	0
		2.5	Round	LPD250	0.90	17.7		0

FIRE FLOW CHART



COMMENTS

OPERATOR	FMX	Jordan Whitlock
OPERATOR	FMX	
OPERATOR		City of Toronto

"If we don't measure it, how do you manage it?"

4.0 SANITARY SEWERS

i) Existing Infrastructure & Drainage

The following sanitary sewers are located within the streets bordering the subject site. Refer to the Pre-Development Drainage Plan on the following page, and the Functional Servicing Plan, for the layout of the existing sanitary sewers adjacent to the subject site.

- Bathurst Street: There is an existing 600mm x 900mm combined sewer within the east side of the street, which flows southerly. This sewer splits into two on the intersection of Bathurst St. and Barton Avenue, which continue flows southerly along Bathurst St. and westerly towards Barton Avenue and ultimately discharge into the 1350mm x 1700mm concrete culvert combined sewer along Barton Ave.
- Barton Avenue: There is a 300mm V.P. Comb which flows easterly and eventually discharge onto the 1350mm x 1700mm conc. culvert comb flowing westerly along Barton Avenue.

Existing drainage patterns are identified on the Pre-Development Drainage Plan on the following page. Presently storm runoff from the site (Catchment Ex-A) drains southerly to Barton Ave. by overland flow and thereby drains to the 300mm combined sewer. The existing sanitary service and the storm service is assumed to be connected to the 300mm combined which eventually drains to the 1350mm x 1700mm conc. culvert combined sewer beneath Barton Ave.

The subject site falls within the City of Toronto's Basement Flooding EA Study Area 44. At the time this report was prepared, the city's website stated that the EAs for those areas had been commenced but not yet completed, therefore no conclusions or analysis can be drawn from the EA.

ii) Changes to Land Use and Population

Table 2, as follows, summarizes the existing and proposed development statistics, as used to determine pre and post-development sanitary flows. Refer to the Project Statistics by Turner Fleischer Architects for the pre and post-development land use breakdown, in Appendix A.

Table 2 - Summary of Land Use - Existing vs. Proposed for Sanitary Flow Calculations

Land Use	Existing		Proposed	
	Floor Area (m^2)	Units	Floor Area (m^2)	Units
Residential	-	130	-	125
Commercial/Retail	410	-	-	-
Office		-	-	-

For calculating the population increases for the site the following city standards for population densities and flow rates will be used.

Residential

- 1.4 persons/unit for bachelor and one-bedroom units
- 2.1 persons/unit for two-bedroom units
- 3.1 persons/unit for three-bedroom units
- The per capita flow rate is 450 L/person/day (for proposed services)
- The per capita flow rate is 240/250 L/person/day (for existing services

Commercial and Public

- 1.1 persons per 100 m^2 of retail use
- 3.3 persons per 100 m^2 of public/institutional use/indoor amenity space/office space
- Commercial average flow rate is 180,000 L/floor ha/day used

Inflow/Infiltration

- 0.26 L/s/ha

The existing site's sanitary flow, converging at Barton Ave. 300mm combined sewer is 0.47L/s, as calculated on the following page.

SANITARY FLOW CALCULATIONS				**SCENARIO:**		Pre-Development @ 240/250L/cap/D		
This program calculates the sanitary discharge from various land use								
As per the City of Toronto Guidelines					FILL IN COLOURED CELLS AS REQUIRED			
RESIDENTIAL SITE AREA (ha) =	0.157							
COMMERCIAL SITE AREA (ha) =	0							
TOTAL SITE AREA (ha) =	0.157							
LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0	0	0.00		
RESIDENTIAL Density 2, using 2.7 persons/unit (TH)				0	0	0.00	4.50	0.00
RESIDENTIAL Density 3, using 270 persons/site area				0	0	0.00		
RESIDENTIAL Density 4, using 400person/site area				0	0	0.00		
RESIDENTIAL Density 5, using 1.4 persons/unit (1BD)				0	0	0.00	4.50	0.00
RESIDENTIAL Density 6, using 2.1 persons/unit (2BD)				0	0	0.00	4.50	0.00
RESIDENTIAL Density 7, using 3.1 persons/unit (3BD)				0	0	0.00	4.50	0.00
Total Residential	0			0	0	0.00	4.50	0.00
COMMERCIAL, Using 100 persons/ha				0	0	0.00	1.00	0.00
RETAIL, Using 1.1 persons/100 m2			410	5	1128	0.02	1.00	0.01
ICI, Using 180,000 L/Fl Ha/d					0	0.00	1.00	0.00
INSTITUTIONAL, Using 1.1 persons/unit	130			143	35750	0.41	1.00	0.41
OFFICES/COMMERCIAL, Using, 3.3 persons/100m2				0	0	0.00	1.00	0.00
TOTAL		**0.000**		V1=	36878		Q1=	0.00
							Q2=	0.43
Q = (MqP/86400) + A * I (L/sec)							Qinfil	0.04
			where :	P is population			Qtot	0.47
Q1= total flow from Residential Land Use (L/sec)				q = 450 L/cap/day				
Q2= total flow from Commercial Land Use (L/sec)				q = 450 L/cap/day				
Qinfil = total flow from infiltration (L/sec)								
Qtot = total flow (Land use + infiltration)				A = gross site area				
				i = 0.26 L/sec/ha (infiltration rate)				
V1= Total Volume from Land Use in liters				Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]				

iii) Proposed Servicing

It is proposed to service the proposed 10-storey midrise building using a 200mm sanitary service connection at 2.0% to the 300mm combined sewer which eventually drain to the 1350mm x 1700mm conc. culvert combine sewer beneath Barton Ave.

The proposed sanitary flow at the proposed 10-storey midrise outlet is as follows (q=450L/cap/day)

TABLE 3 – Post-Development Sanitary Flow (@ 450 L/c/d)

Component	Population (P)	Sanitary Flow (l/s)	Inflow & Infiltration (l/s)	Total Flow (l/s)
Residential	229	4.88	0.04	4.92
Total	229	4.88		4.92

The 4.92 L/s total sanitary flow for the proposed building will be conveyed to the existing 300mm sanitary sewer flowing easterly within Barton Ave. by a proposed 200mm at 2.0% (42 L/s capacity) sewer connection. The sewer connection is adequately sized to convey the above flow. The connection is deliberately oversized anticipating that the OBC criteria will require a larger-size pipe than municipal criteria would require.

The proposed sanitary flow at the proposed 10-storey midrise outlet is as follows (q=240/250L/cap/day)

TABLE 4 – Post-Development Sanitary Flow (@ 240/250 L/c/d)

Component	Population (P)	Sanitary Flow (l/s)	Inflow & Infiltration (l/s)	Total Flow (l/s)
Residential	229	2.60	0.04	2.65
Total	229	2.60		2.65

The proposed development results in an increase of sanitary flow to the 300mm combined sewer beneath Barton Ave., from 0.47 L/s (Page 9) to 2.65 L/s. The net increase is 2.18 L/s.

Detailed post sanitary flow calculations for 450 L/c/d and 240/250 L/c/d can be found on the following pages. The calculations are based on the site statistics from Appendix A.

SANITARY FLOW CALCULATIONS				**SCENARIO:**		Proposed Site @ 450L/cap/D		
This program calculates the sanitary discharge from various land use								
As per the City of Toronto Guidelines					FILL IN COLOURED CELLS AS REQUIRED			
RESIDENTIAL SITE AREA (ha) =	0.157							
COMMERCIAL SITE AREA (ha) =	0							
TOTAL SITE AREA (ha) =	0.157							
LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0	0	0.00		
RESIDENTIAL Density 2, using 2.7 persons/unit (TH)	6			16	7290	0.08	4.39	0.37
RESIDENTIAL Density 3, using 270 persons/site area				0	0	0.00		
RESIDENTIAL Density 4, using 400person/site area				0	0	0.00		
RESIDENTIAL Density 5, using 1.4 persons/unit (1BD)	74			104	46620	0.54	4.24	2.29
RESIDENTIAL Density 6, using 2.1 persons/unit (2BD)	29			61	27405	0.32	4.30	1.36
RESIDENTIAL Density 7, using 3.1 persons/unit (3BD)	15			47	20925	0.24	4.32	1.05
Total Residential	124			227	102240	1.18	4.13	4.88
COMMERCIAL, Using 100 persons/ha				0	0	0.00	1.00	0.00
RETAIL, Using 1.1 persons/100 m2				0	0	0.00	1.00	0.00
ICI, Using 180,000 L/Fl Ha/d					0	0.00	1.00	0.00
INSTITUTIONAL, Using 1.1 persons/unit				0	0	0.00	1.00	0.00
OFFICES/COMMERCIAL, Using, 3.3 persons/100m2				0	0	0.00	1.00	0.00
TOTAL		**0.000**		V1=	102240		Q1=	4.88
							Q2=	0.00
Q = (MqP/86400) + A * I (L/sec)							Qinfil	0.04
			where :	P is population			Qtot	4.92
Q1= total flow from Residential Land Use (L/sec)				q = 450 L/cap/day				
Q2= total flow from Commercial Land Use (L/sec)				q = 450 L/cap/day				
Qinfil = total flow from infiltration (L/sec)								
Qtot = total flow (Land use + infiltration)				A = gross site area				
				i = 0.26 L/sec/ha (infiltration rate)				
V1= Total Volume from Land Use in liters				Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]				

SANITARY FLOW CALCULATIONS				**SCENARIO:**		Proposed Site @ 240/250L/cap/D		
This program calculates the sanitary discharge from various land use								
As per the City of Toronto Guidelines					FILL IN COLOURED CELLS AS REQUIRED			
RESIDENTIAL SITE AREA (ha) =	0.157							
COMMERCIAL SITE AREA (ha) =	0							
TOTAL SITE AREA (ha) =	0.157							
LAND USE	NUMBER OF UNITS	SITE AREA, (ha)	GROSS FLOOR AREA, m2	TOTAL POPULATION	TOTAL DAILY FLOW (LITERS)	AVERAGE DAILY FLOW l/sec	PEAKING FACTOR, M	TOTAL FLOW FROM LAND USE, l/sec
RESIDENTIAL Density 1, using 86 person/site area				0	0	0.00		
RESIDENTIAL Density 2, using 2.7 persons/unit (TH)	6			16	3888	0.05	4.39	0.20
RESIDENTIAL Density 3, using 270 persons/site area				0	0	0.00		
RESIDENTIAL Density 4, using 400person/site area				0	0	0.00		
RESIDENTIAL Density 5, using 1.4 persons/unit (1BD)	74			104	24864	0.29	4.24	1.22
RESIDENTIAL Density 6, using 2.1 persons/unit (2BD)	29			61	14616	0.17	4.30	0.73
RESIDENTIAL Density 7, using 3.1 persons/unit (3BD)	15			47	11160	0.13	4.32	0.56
Total Residential	124			227	54528	0.63	4.13	2.60
COMMERCIAL, Using 100 persons/ha				0	0	0.00	1.00	0.00
RETAIL, Using 1.1 persons/100 m2				0	0	0.00	1.00	0.00
ICI, Using 180,000 L/Fl Ha/d					0	0.00	1.00	0.00
INSTITUTIONAL, Using 1.1 persons/unit				0	0	0.00	1.00	0.00
OFFICES/COMMERCIAL, Using, 3.3 persons/100m2				0	0	0.00	1.00	0.00
TOTAL		**0.000**		V1=	54528		Q1=	2.60
							Q2=	0.00
Q = (MqP/86400) + A * I (L/sec)							Qinfil	0.04
			where :	P is population			Qtot	2.65
Q1= total flow from Residential Land Use (L/sec)				q = 450 L/cap/day				
Q2= total flow from Commercial Land Use (L/sec)				q = 450 L/cap/day				
Qinfil = total flow from infiltration (L/sec)								
Qtot = total flow (Land use + infiltration)				A = gross site area				
				i = 0.26 L/sec/ha (infiltration rate)				
V1= Total Volume from Land Use in liters				Peaking Factor M = 1 + [14 / (4 + (P/1000,1/2))]				

iv) Receiving Combined Sewer Capacity & Procedure F-5-5 Compliance

Downstream combined sewer capacity is addressed herein on a relative pre-development to post-development basis, showing that the proposed development will pose no additional impact on the downstream combined sewer in the critical 2-year storm event. It follows that no downstream combined sewer infrastructure upgrades are required such that the proposed development is in compliance with City criteria and Procedure F-5-5.

The pre-development impact on the receiving combined sewer infrastructure is as follows.

In pre-development (existing) conditions, storm runoff from the existing building on the site drained to the combined sewers adjacent to the site by existing sanitary and storm sewer connections. Those existing catchment areas appear on the pre-development drainage plan (page 18).

In post-development conditions, the storm runoff will be drained to the same combined sewer beneath Barton Ave. via proposed sanitary and storm connections. The storm flow will be controlled according to the City of Toronto Wet Weather Flow Management Guideline (WWFMG) criteria for quantity control, thereby realizing a reduction in the impact on the combined sewers.

As discussed above, the existing Vermont Square has a sanitary flow of 0.47 L/s to the 300mm combined sewer beneath Barton St.

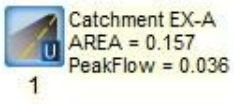
Pre-development storm tributary areas contributing runoff to the combined sewer are as follows. Refer to the Visual OTTHYMO Model below (Fig. 1) showing controlled flows and the VO2 output in Appendix B.

Table 5 – Pre-Development Storm Runoff to Combined Sewer (2-year Storm)

Location	Run-off Coefficient	Rainfall Intensity (mm/hr)	Catchment Area (ha)	Storm Runoff (Q=2.78CiA) (L/s)
Barton Avenue 300mm combined (Catchment EX-A)	*Visual OTTHYMO Model: 90% Impervious*			36
Allowable flow to Downstream 300mm Combined Sewer (Barton Avenue)				**36**

Table 6 – Pre-Development Visual OTTHYMO Parameters		
	Area (ha)	Imperviousness (%)
Catchment Ex-A	0.157	90

Figure 1 - Pre-Development Visual OTTHYMO Model (showing 2-Year Storm Flows)



The Pre-Development and Post-Development relative impact on the combined sewer is summarized as follows, given the foregoing discussion.

The Post-Development Storm Drainage Plan can be found in page 21.

Table 7 – Pre-Development vs. Post-Development 2-Year Storm Impact on Combined Sewer		
	Pre-Development	Post-Development
Barton Avenue 300mm combined	36 L/s	10 L/s (Table 10)
Total Flows to Downstream 900mm Combined Sewer (Barton)	**36 L/s**	**10 L/s**

Table 8 – Pre-Development vs. Post-Development Combined Sewer Impact			
	Scenario	Pre-Development	Post-Development
Total Flow to Downstream 300mm Combined Sewer (Barton Ave.)	Sanitary Flow (DWF)	0.47 L/s	2.65 L/s (Table 4) (@ 240 L/c/d)
	2-Year Storm Flow (WWF)	36 L/s (Table 7)	10L/s (Table 7)
	Total Flows	***36.47 L/s***	***12.65 L/s***

As shown in Table 6, the proposed development represents a reduction in impact on the downstream 300mm Barton Ave. combined sewer of23.82 L/s, from 36.47 L/s to 12.65 L/s in the critical 2-year storm. It follows that the proposed development is in compliance with Procedure F-5-5 and no downstream combined sewer infrastructure upgrades are required to accommodate the proposed development.

Table 9 – Post-Development Visual OTTHYMO Parameters

	Area (ha)	Imperviousness (%)
Catchment Ex-A	0.157	98

Figure 2 - Post-Development Visual OTTHYMO Model (showing 2-Year Storm Flows)

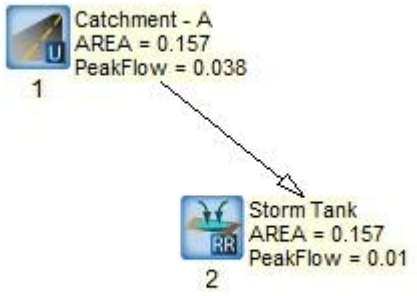


Table 10 – Summary of Post-Development 2-Year Storm Flows

	Flow Rate (L/s)
Catchment A To Barton Ave.	10 L/s

5.0 STORM WATER MANAGEMENT

i) Existing Infrastructure & Drainage

The site fronts onto Bathurst St. served for storm drainage by combined sewers.

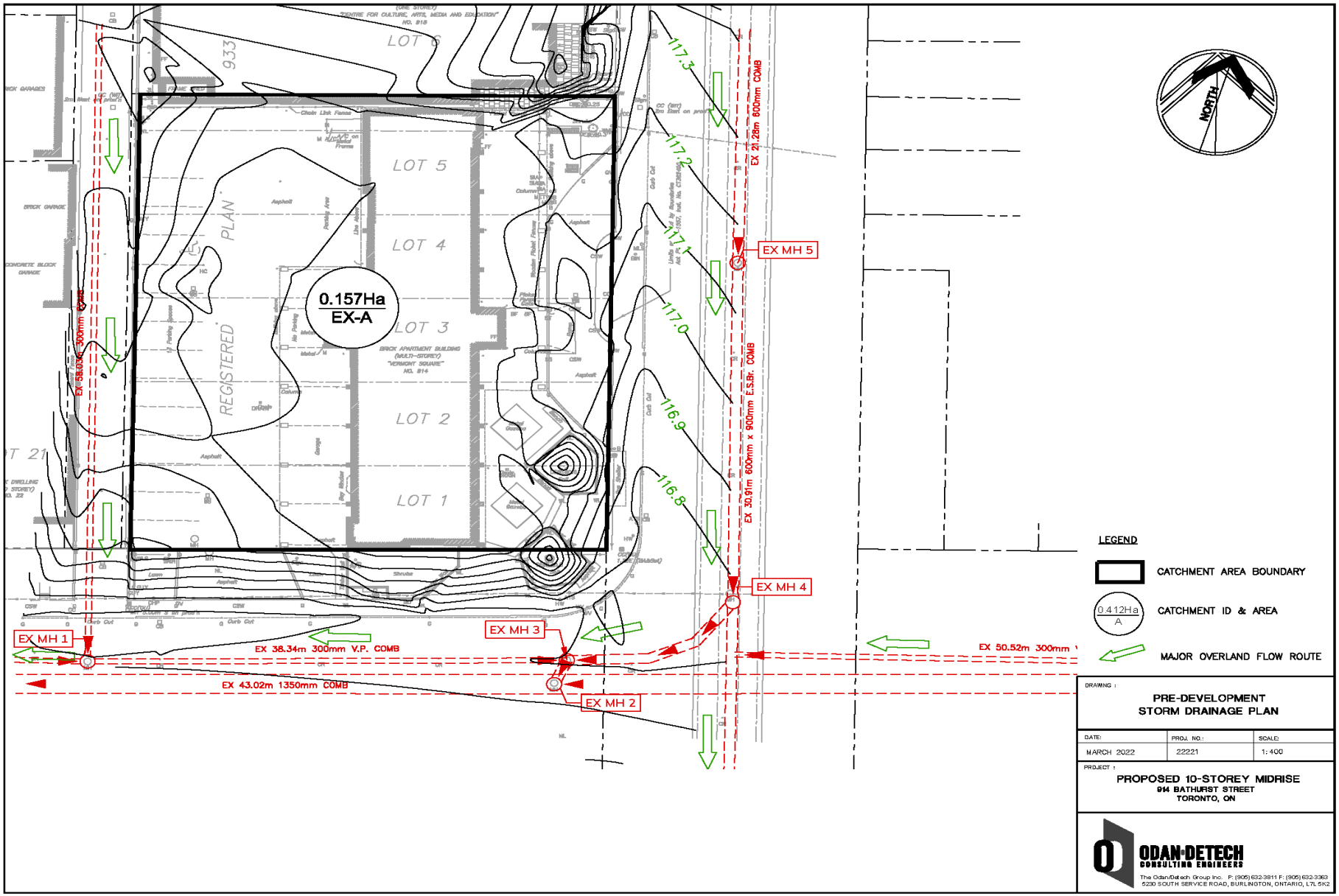
The following sewers are located within the streets bordering the subject site. Refer to the Pre-Development Drainage Plan for the layout of the existing combined sewers adjacent to the subject site.

- Bathurst Street: There is a 600mm x 900mm E.S.Br. combined sewer flowing southerly.
- Barton Avenue: There is a 300mm V.P. combined sewer flowing easterly, and eventually discharge to the 1350mm x 1700mm Culvert combined sewer which flowing westerly.
- Old Crookshank's Lane: There is a 300mm combined sewer flowing southerly and drains to the 300mm V.P. combined sewer flowing easterly on Barton Ave.

Existing drainage patterns are identified on the Pre-Development Drainage Plan on the following page. Presently the site comprises existing long term home building with related asphalt parking areas, etc. Overland flow routes are identified on the Pre-Development Drainage Plan.

Pre-development storm drainage patterns are described as follows.

- Catchment Ex-A: comprises paved ground-level areas and roofs of the existing building which drain to Barton Ave. and thereby drain to the 300mm combined sewer within the north side of the street and eventually drain to the 1350mm x 1700mm Culvert combined sewer on the south side of the street.


LOT 6
LOT 5
LOT 4
LOT 3
LOT 2
LOT 1
PLAN
REGISTERED
933
0.157Ha
EX-A
117.3
117.2
117.1
117.0
116.9
116.8
EX 21.28m 600mm COMB
EX 30.91m 600mm x 900mm E.S.Br. COMB
EX 58.03m 300mm COMB
EX MH 1
EX MH 2
EX MH 3
EX MH 4
EX MH 5
EX 38.34m 300mm V.P. COMB
EX 43.02m 1350mm COMB
EX 50.52m 300mm
NORTH
LEGEND
CATCHMENT AREA BOUNDARY
0.412Ha
A
CATCHMENT ID & AREA
MAJOR OVERLAND FLOW ROUTE
DRAWING :
PRE-DEVELOPMENT
STORM DRAINAGE PLAN
DATE:
MARCH 2022
PROJ. NO.:
22221
SCALE:
1: 400
PROJECT :
PROPOSED 10-STOREY MIDRISE
914 BATHURST STREET
TORONTO, ON
ODAN•DETECH
CONSULTING ENGINEERS
The Odan/Detech Group Inc. P: (905) 632-3811 F: (905) 632-3363
5230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 5K2

ii) Design Criteria

Storm water management for the proposed development will follow the storm water criteria as set out by the City of Toronto's Wet Weather Flow Management Guidelines for quantity control.

The site falls under Classification 2. in Table 7 of the Wet Weather Flow Management Guidelines. The quantity control criteria is therefore to control the 100-year storm (post-development) to the 2-year storm based on a C-value of 0.5, or pre-development flow, whatever is the lesser flow rate.

Design storm data for the City of Toronto 2 year and 100 year storms are shown below. These storms will be used to show that the storm drainage and total storage volume up to the 100 year event will be accommodated on-site.

2 Year Storm: $I_2 = 21.8 / (T)^{(0.780)}$
100 Year Storm: $I_{100} = 57.7 / (T)^{(0.800)}$
where: I = intensity (mm/hr)
T= time of concentration (hours)

$I_2 = ((21.8) \times (1/60)^{(-0.780)}) / (T)^{(0.780)}$
$I_2 = 531.9 / (T)^{(0.780)}$

$I_{100} = ((59.7) \times (1/60)^{(-0.800)}) / (T)^{(0.800)}$
$I_{100} = 1579.4 / (T)^{(0.800)}$

iii) Allowable Discharge Flow Rate

Allowable discharge from the site will be determined by calculating the pre-development flow for the 2-year design storms using the rational method. The WWFM Guidelines state that the allowable release rate shall be calculated based on a C-value which is the lesser of 0.5 and the pre-development C-value. The site comprised almost entirely impervious surfaces pre-development, therefore a runoff coefficient, C, of 0.5 is applied.

The allowable release rate is therefore taken as 19 L/s, as follows.

TABLE 11 – Allowable Flows

Area	Run-off Coefficient	Rainfall Intensity (mm/hr)	Area of Development (ha)	Site Allowable Flow (L/s)
Site Area less Road Widening	0.50	88.2	0.157	**19**

iv) Post Development Flow Analysis

The proposed development will control the post development flows to the allowable flow rate calculated above and in compliance for guidelines F-5-5; on-site storage will be required.

The adjacent properties have self-contained storm drainage and runoff from the adjacent properties do not enter the subject development based on pre-development drainage patterns. Refer to the Pre-Development Drainage Plan for pre-development drainage patterns.

- ***To the West:*** There is Municipal laneway which drains internally to the 300mm combined sewer underneath.
- ***To the East:*** There is Bathurst St. which drains internally to the 600mm x 900mm E.S.Br. combined sewer underneath.
- ***To the North:*** There is the existing building which drains internally.
- ***To the South:*** There is Barton Avenue which drains internally to the two combined sewer 300mm and 1350mm x 1700mm Culvert.

The site's storm drainage and stormwater quantity controls will be provided as follows:

- Storm runoff from all above-grade open-to-above surfaces will drain uncontrolled by mechanical storm drains to the 100-year storm tank located in the P1 level.

- The following is a summary of the quantity controls: Orifice Device (75mm orifice tube) provides attenuation in the 100-Y Storm Detention tank

- Controlled discharge will thereafter drain by a proposed 250mm @ 2.0% storm sewer connection to the Barton Avenue 1350mm x 1700mm Culvert combined sewer.

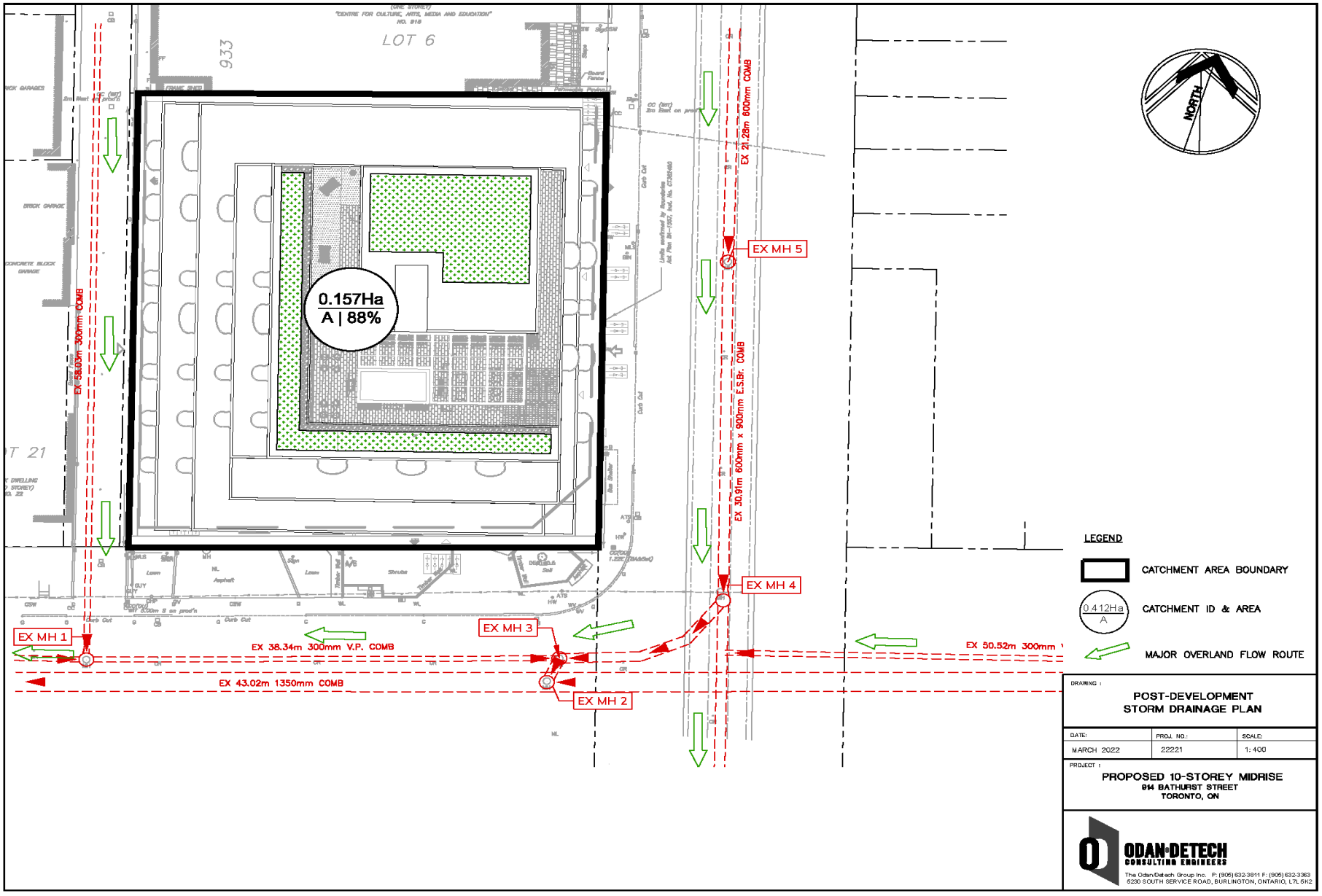
Visual OTTHYMO 2.3.2. will be used to model and determine the detention volume required. For drainage areas with significant imperviousness the calculation of effective rainfall in Visual OTTHYMO is accomplished using the "Standhyd" method. This method is used in urban watersheds to simulate runoff by combining two parallel standard unit hydrographs resulting from the effective rainfall intensity over the pervious and impervious surfaces. For pervious surfaces, losses are calculated using the SCS modified CN method.

The following table summarizes the parameters used in Visual OTTHYMO to characterize the post development catchment areas. Refer to the Post-Development Visual OTTHYMO Model in Fig. 3, below, and the output in Appendix B.

Post-Development catchment areas appear in the Post-Development Catchment plan, below.

TABLE 12 - Catchment Characteristics for the site Post-Development

Area I.D.	Area (ha)	Hydrograph Method	% impervious	imperviousness directly connected %	Loss Method for Pervious Area	CN for Pervious Area	Initial Abstraction for Pervious (mm)	Time to peak (T_p)
Catchment A – Roof and Paved Areas	0.157	StandHYD	88	88	SCS	80	5	-


LOT 6
933
0.157Ha
A | 88%
EX MH 1
EX MH 2
EX MH 3
EX MH 4
EX MH 5
EX 58.03m 300mm COMB
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EX 43.02m 1350mm COMB
EX 30.91m 600mm x 900mm E.S.Br. COMB
EX 21.28m 600mm COMB
EX 50.52m 300mm
NORTH
LEGEND
CATCHMENT AREA BOUNDARY
0.412Ha A
CATCHMENT ID & AREA
MAJOR OVERLAND FLOW ROUTE
DRAWING :
POST-DEVELOPMENT
STORM DRAINAGE PLAN
DATE: MARCH 2022
PROJ. NO.: 22221
SCALE: 1:400
PROJECT :
PROPOSED 10-STOREY MIDRISE
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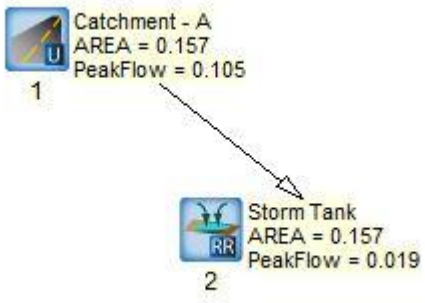
5230 SOUTH SERVICE ROAD, BURLINGTON, ONTARIO, L7L 5K2

Figure 3 - Visual OTTHYMO Model (Showing Flows in 100-Year Storm)



As shown above, the 100-year storm flows are controlled to 19 L/s. The post-development flows are summarized as follows.

TABLE 13 - Summary of Flows from Site

	2 Yr. Storm (L/s)	**100 Yr. Storm** (L/s)
Total Controlled Flow	***10***	***19***
Allowable Flow Rate		***19***

The stormwater storage that occurs in 2-year and 100-year storms is as follows. Refer to the Visual OTTHYMO Output in Appendix B for the storage volume calculation

TABLE 14 - Stormwater Storage

	2 Yr. Storm (m^3)	**100 Yr. Storm** (m^3)
Required Storage Volume	22	63
Provided Volume (100-Y Storm tank)		140

The proposed stormwater quantity control is such that the controlled discharge in a 100-year storm is equal-to the allowable release rate. The stormwater storage is provided such that the volume provided is greater than the required 100-year storm volume and the same time satisfy procedure F-5-5.

Refer to the Functional Servicing Plan for the location of the storm tank, storm connection and control manhole.

v) Water Balance

The primary objective of the Water Balance Targets/Criteria is to capture and manage annual rainfall on the development site itself to preserve the pre-development hydrology (or "water balance", which typically consists of three components: runoff, infiltration, and evapotranspiration) through a combination of infiltration, evapotranspiration, landscaping, rainwater reuse and/or other low impact development practices.

Criteria

In most cases, the minimum on-site runoff retention requires the proponent to retain all runoff from a small design rainfall event – typically 5mm (In Toronto, storms with 24-hour volumes of 5mm or less contribute about 50% of the total average annual rainfall volume) through infiltration, evapotranspiration and rainwater reuse. This is the TGS Tier 1 Criteria.

The proposed development is categorized as Category 2 in Table 7 of the WWFM Guideline - Small New Developments (residential & non-residential) with total site area < 5.0 ha. Thus, Water Balance criteria applies.

The water balance target volume is as follows.

TABLE 15 – Water Balance Summary

	Initial Abstraction (mm)	Area (m^2)	Volume (m^3)
Target Volume given by Site Area	5	1570	7.9
Less Green Roof & Planters	5	186	0.93
Less Impervious Surfaces	1	1570	1.6
Required Cistern (Retention) Volume			***5.37***
Storage in a below-grade cistern for reuse by irrigation			6

A cistern of minimum volume 5.37m^3 is designed at a storage of 6m^3. The cistern will function such that in minor storm events, runoff draining from the site's mechanical drains will first drain into the cistern for storage and reuse.

In storm events greater than 5mm, the cistern will fill-up and stormwater will occupy the larger storage area allocated for 100-year storm storage before draining via the site's quantity controls. Refer to the Servicing Plan and cross-sections.

Various alternatives are considered by which the foregoing water balance target might be achieved on this site, as follows.

1) ***Infiltration Gallery (Percolation)***: The proposed development is entirely comprised of the proposed below-grade parking structure. Infiltration is not feasible because the design criteria – *MOE Stormwater Management Planning & Design* Manual, 2003, as well as the OBC – requires such an infiltration gallery to be located with a minimum 4.00m horizontal separation from proposed buildings. There is no such location on this site in which to locate an infiltration gallery.

2) ***Irrigation***: There are ground-level trees and planting which will require irrigation and are proposed to be irrigated with stored rainwater from the water balance cistern. An irrigation calculation has been provided by the Landscape Architect (provided in Appendix B) showing that 4.28m^3/72-hours of water may be dispersed onto the landscaping by irrigation.

Given the foregoing strategy, the required volume of stormwater will be reused on site.

vi) Water Quality

(a) The wet weather flow (WWF) water quality target is the long term-average removal of 80% of the Total Suspended Solids (TSS) on an annual loading basis from all runoff leaving the proposed development site based on the post-development level of imperviousness.

The site was divided according to surface conditions and the effective TSS removal for each surface condition was considered based on the treatment it would receive. The general basis of the effective TSS removal rates are as follows:

1. Rooftop areas are subject only to airborne particles and insignificant amounts of sediment transported by foot traffic. As such, an effective removal efficiency of 80% is utilized on a conventional roof to reflect the inherent runoff quality from a conventional roof.

2. Balconies and sodded areas are subject to insignificant amounts of sediment transport by foot traffic. An effective removal rate of 80% is used as it is the City limit for roofs.

3. Driving and ground-level pedestrian surfaces which are open-to-above would be subject to winter maintenance, therefore they would have an effective removal efficiency of 0% and filtration is thus required.

The proposed development has an effective TSS removal efficiency of 80% because the buildings roof covers the majority of the property, with landscaping covering the remainder.

6.0 GROUNDWATER

i) Introduction

Groundwater from the proposed building will be discharged to municipal 1350mm x 1700mm Culvert combined sewer along Barton Avenue on a temporary basis, during construction.

A Hydrogeological Assessment Report (April 2022) has been prepared for this development by B.I.G. Consulting Inc. to qualitatively and quantitatively characterize the groundwater with respect to City of Toronto guidelines.

The report concludes that the short-term construction dewatering volume will be 102,000 L/day (1.18 L/s).

h) Based on the assumptions outlined in this report, the estimated peak construction dewatering flow rate including rainfall for the proposed construction activity is 102,000 L/day;

The report concludes that the short-term groundwater quality meets the criteria for discharge to the City combined sewers, no treatment of the groundwater will be require..

l) The Site is located within the combined sewer service area, if the groundwater encountered during the construction dewatering is discharged to the City of Toronto combined sewer, no treatment of the groundwater will be required; and,

ii) Long-Term Foundation Drainage

The proposed building will be built as water-tight with the raft slab, therefore, no long-term groundwater discharges will be required.

i) It is our understanding that the below grade structure at the Site will be built as water-tight with the raft slab, therefore, no long-term groundwater discharges will be required;

iii) Short-Term (Construction) Groundwater

Water collected from the excavation will be discharged on a short-term basis to the existing 1350mm x 1700mm Culvert combined sewer along Barton Avenue by the proposed 200mm sanitary connection.

The short-term groundwater flow rate identified by the Hydrogeological Assessment 102,000 L/day (1.18 L/s), above. This temporary groundwater flow rate is less than the post-development sanitary discharge rate (Table 3), therefore given that Section 4.0 concludes that the receiving sanitary sewers will have capacity for the proposed flows, when the improvements discussed above have been installed.

Applications will be made to Toronto Water for this Short-Term private water discharge in the future.

7.0 CONCLUSIONS

From the foregoing investigation, the site is serviceable utilizing existing combined sewer and watermain infrastructure adjacent to the site. Storm water management can be accommodated with on-site storage as described in this report.

The following table summarizes the SWM and Servicing components of the proposed development.

Table 16 - Summary

	Proposed Building
Peak Sanitary Discharge(L/s)	4.92
Proposed Sanitary Service	200mm @ 2.0%
Receiving Combined Sewer	Barton Avenue 300mm combined sewer
Development Water Demand (Fire + Domestic)	2663 USGM
Available Flow Rate	3868 USGM
Proposed Fire Service	200mm + 150mm
Proposed Domestic Service	Branch 150mm
Allowable release rate from Proposed Condominium(L/s) [based on F-5-5]	19 L/s
Proposed release rate from site (L/s) (100-year storm)	19 L/s
Quantity Control	75mm Dia. Orifice Tube
Required Water Re-Use (m^3)	5.37 m^3
Provided Water Re-Use (m^3)	6 m^3

8.0 REFERENCES

1. City of Toronto **"Wet Weather Flow Management Guidelines"**, November 2006.

2. Storm water Management Planning and Design Manual, Ontario Ministry of the Environment, March 2003.

3. New Jersey Storm Water Best Management Practices Manual, April 2004.

4. Visual OTTHYMO v2.0 Reference Manual, July 2002

Respectfully Submitted;
The Odan Detech Group Inc.

August 02, 2022

John Krpan, M.S.C.E. P.Eng.
(Civil)

Harold Ortal, E.I.T.

APPENDIX A

Existing Site	Aerial view of Site and surrounding area
Site Plan & Statistics	by Turner Fleischer Architects


BATHURST STREET
OLD CROOKSHANK LN
MARKHAM ST.
BARTON AVENUE
BATHURST STREET
LEGEND
CATCHMENT AREA BOUNDARY
KEY PLAN
PROPOSED 30-STOREY MIXED-USE
ODAN-DETECH

PROJECT SITE AREA

SITE AREA	m²	ft²
TOTAL NET SITE AREA	1,532.6	16,497.0
TOTAL PROPOSED GFA	9,543.5	102,725.0
F.S.I OF PROPOSED DEVELOPMENT	6.22 x SITE AREA	

PROJECT INFORMATION

	REQUIRED	PROVIDED
BUILDING HEIGHT		31.85 M
BUILDING SETBACKS		
NORTH SETBACK		0.60 M
SOUTH SETBACK		0.00 M
EAST SETBACK		1.90 M
WEST SETBACK		2.10 M
LANDSCAPE BUFFER		
LOADING SPACE		1 TYPE 'G' LOADING SPACE
ESTABLISHED GRADE	117.14 M	

GROSS FLOOR AREA DEFINITION

CITY OF TORONTO ZONING BY-LAW NO.569-2013

Apartment Buildings:

(4) Gross Floor Area Calculations for an Apartment Building
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 required by this By-law for required bicycle parking spaces;
(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.

BUILDING HEIGHT DEFINITION

CITY OF TORONTO ZONING BY-LAW NO.569-2013

In the Residential Zone category, the height of a building is the distance between the established grade and the elevation of the highest point of the building.

Height of Elements for Functional Operation of a Building:

In the Residential Zone category, the following equipment and structures on the roof of a building may exceed the permitted maximum height for that building by 5.0 metres, subject to regulation 10.5.40.10(4):

(A)equipment used for the functional operation of the building, such as electrical, utility, mechanical and ventilation equipment, except that skylights may only exceed the height by 1.0 metres; [By-law: PL130592 Mar_2018]

(B)structures or parts of the building used for the functional operation of the building, such as enclosed stairwells, roof access, maintenance equipment storage, elevator shafts, chimneys, vents, and water supply facilities; and

(C)structures that enclose, screen or cover the elements listed in (A) and (B) above, if the building has a height greater than 15.0 metres.

ESTABLISHED GRADE DEFINITION

CITY OF TORONTO ZONING BY-LAW NO.569-2013

Means the average elevation of the ground measured at the two points where the projection of the required minimum front yard setback line is 0.01 metres past each side lot line.

GROSS FLOOR AREA SUMMARY

BLDG	USE		GFA		FSI
			m²	ft²	
BLDG A	RESIDENTIAL	124 UNITS	9,543.5	102,725	6.22
	SUBTOTAL RESIDENTIAL		9,543.5	102,725	6.22
	SUB TOTAL		**9,543.5**	**102,725**	**6.22**
	TOTAL		**9,543.5**	**102,725**	**6.22**

AMENITY AREAS REQUIRED & PROVIDED

	TYPE	REQUIRED			PROVIDED		
		RATIO	m²	ft²	RATIO	m²	ft²
BLDG A	INDOOR AMENITY	2.00 m²/UNIT	248.00	2,669	1.72 m²/UNIT	213.50	2,298
	OUTDOOR AMENITY	2.00 m²/UNIT	248.00	2,669	2.30 m²/UNIT	286.39	3,083
	TOTAL AMENITY	**4.00 m²/UNIT**	**496.00**	**5,339**	**4.03 m²/UNIT**	**499.90**	**5,381**

GROSS FLOOR AREA BREAKDOWN

	FLOOR	# OF UNITS	RESIDENTIAL				TOTAL GFA (TFA - EXCLUSIONS)	
			SALEABLE		NON-SALEABLE			
			m²	ft²	m²	ft²	m²	ft²
BLDG A	U/G 4				54.3	585	54.3	585
	U/G 3				54.1	582	54.1	582
	U/G 2				53.6	576	53.6	576
	U/G 1				42.4	456	42.4	456
	FLOOR 1	6	325.7	3,506	274.3	2,953	600.1	6,459
	FLOOR 2	8	953.0	10,258	204.4	2,201	1,157.5	12,459
	FLOOR 3	17	1,072.0	11,539	213.3	2,296	1,285.3	13,835
	FLOOR 4	17	1,072.0	11,539	213.3	2,296	1,285.3	13,835
	FLOOR 5	17	954.8	10,277	213.3	2,296	1,168.0	12,573
	FLOOR 6	17	954.8	10,277	213.3	2,296	1,168.0	12,573
	FLOOR 7	12	715.5	7,701	60.7	653	776.2	8,355
	FLOOR 8	10	617.8	6,650	56.5	609	674.3	7,258
	FLOOR 9	10	541.8	5,832	51.7	557	593.6	6,389
	FLOOR 10	10	541.8	5,832	51.7	557	593.6	6,389
	MPH				37.3	401	37.3	401
							EXCESS INDOOR AMENITY (INCLUDED IN GFA)	
							0.0	0
	TOTAL	**124**	**7,749.3**	**83,412**	**1,794.2**	**19,313**	**9,543.5**	**102,725**

AMENITY AREA BREAKDOWN

OUTDOOR AMENITY		INDOOR AMENITY	
m²	ft²	m²	ft²
40.9	441	203.1	2,186
245.5	2,642	10.4	112
286.4	**3,083**	**213.5**	**2,298**

TOTAL FLOOR AREA

AREA EXCLUSIONS		TOTAL FLOOR AREA GFA+INDOOR AMENITY+EXCL.	
m²	ft²	m²	ft²
981.4	10,564	1,035.7	11,148
1,342.9	14,454	1,397.0	15,037
1,343.4	14,460	1,397.0	15,037
1,354.6	14,581	1,397.0	15,037
338.9	3,648	1,142.0	12,293
49.6	534	1,207.0	12,993
40.9	440	1,326.2	14,275
40.9	440	1,326.2	14,275
40.9	440	1,208.9	13,013
40.9	440	1,208.9	13,013
40.9	440	817.1	8,795
40.9	440	715.2	7,698
41.0	441	634.5	6,830
41.0	441	634.5	6,830
169.4	1,823	217.1	2,337
5,907.4	**63,587**	**15,664.4**	**168,610**

SALEABLE UNIT MIX PROVIDED

BLDG	FLOOR						TOTAL	AVG. UNIT SIZE	
		1B	2B	2B+D	3B	TH*		m²	ft²
BLDG A	FLOOR 1					6	6	124.1	1,336
	FLOOR 2	6	1		1		8	66.8	719
	FLOOR 3	10	4	1	2		17	63.1	679
	FLOOR 4	10	4	1	2		17	63.1	679
	FLOOR 5	11	3	1	2		17	56.2	605
	FLOOR 6	11	3	1	2		17	56.2	605
	FLOOR 7	9	1		2		12	59.6	642
	FLOOR 8	5	3		2		10	61.8	665
	FLOOR 9	6	3		1		10	54.2	583
	FLOOR 10	6	3		1		10	54.2	583
	SUBTOTAL	74	25	4	15	6	124	62.5	673
	TOTAL UNITS	**74**	**29**		**15**	**6**			
	UNIT MIX	59.7%	20.2%	3.2%	12.1%	4.8%	100.0%		
	UNIT MIX TOTAL	59.7%	23.4%		12.1%	4.8%	100.0%		
	AVG UNIT SIZE	51.7	62.4	82.7	85.7	124.1	m²		
	AVG UNIT SIZE TOTAL	51.7	65.2		85.7	124.1	m²		

- ALL TH UNITS AT GRADE ARE TO BE DESIGNED AS 2B+D UNITS

BICYCLE PARKING - MINIMUM REQUIRED

	USE	RESIDENTIAL		TOTAL
		RATIO	SPACES	
	SHORT TERM	0.10 / UNIT	13	**13**
	LONG TERM	0.90 / UNIT	112	**112**
	TOTAL		125	**125**

VEHICULAR PARKING PROVIDED

	FLOOR	USE	TOTAL
		RESIDENTIAL	
BLDG A	U/G 1-A	7	7
	U/G 2	10	10
	U/G 2-A	19	19
	U/G 3	11	11
	U/G 3-A	19	19
	U/G 4	13	13
	TOTAL	**79**	**79**

- All RESIDENTIAL VEHICULAR PARKING PROVIDED INCLUDE AN ENERGIZED OUTLET

VEHICULAR PARKING - EFFECTIVE PARKING SPACES

	USE	RATIO (MIN.)	UNITS / GFA (m²)	SPACES (MIN.)
	VISITOR	0.10 / UNIT	124	12
	VISITOR - TOWNHOUSE	0.10 / UNIT	6	0
	1B & 1B+D UNITS	0.50 / UNIT	74	37
	2B & 2B+D UNITS	0.80 / UNIT	29	23
	3B & 3B+D UNITS	1.00 / UNIT	15	15
	TOWNHOUSE UNITS	0.80 / UNIT	6	4
	TOTAL			**91**

ACCESSIBLE PARKING REQUIRED BASED ON EFFECTIVE PARKING RATES

	USE	RATIO (MIN.)	B/F SPACES (MIN)
	ACCESS. PARKING	1 PER 25 THEREAFTER	4
	TOTAL ACCESSIBLE PARKING SPACES REQUIRED		**4**

BICYCLE PARKING - PROVIDED

	FLOOR	RESIDENTIAL				TOTAL
		PUBLICLY ACCESSIBLE	SHORT TERM	LONG TERM	SUB TOTAL	
	FLOOR 1	10	13		13	23
	U/G 1			128	128	128
	TOTAL		**13**	**128**	**141**	**151**
	% OF HORIZONTAL = 9.2%					
	15% OF LONG TERM EQUIPPED WITH ENERGIZED OUTLET =20					
	NET FLOOR AREA OCCUPIED BY BICYCLE PARKING =98.87 M²					

ACCESSIBLE PARKING PROVIDED

	FLOOR	USE	TOTAL
		RESIDENTIAL	
	U/G 2	2	2
	U/G 3	2	2
	U/G 4	2	2
	TOTAL	**6**	**6**

TURNER FLEISCHER

Turner Fleischer Architects Inc.

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

#	DATE	DESCRIPTION	BY
1	2022-07-31	SPA SUBMISSION REVISION 1	

Stafford

PROJECT
914 Bathurst Street
914 Bathurst St, Toronto, ON

DRAWING
STATISTICS

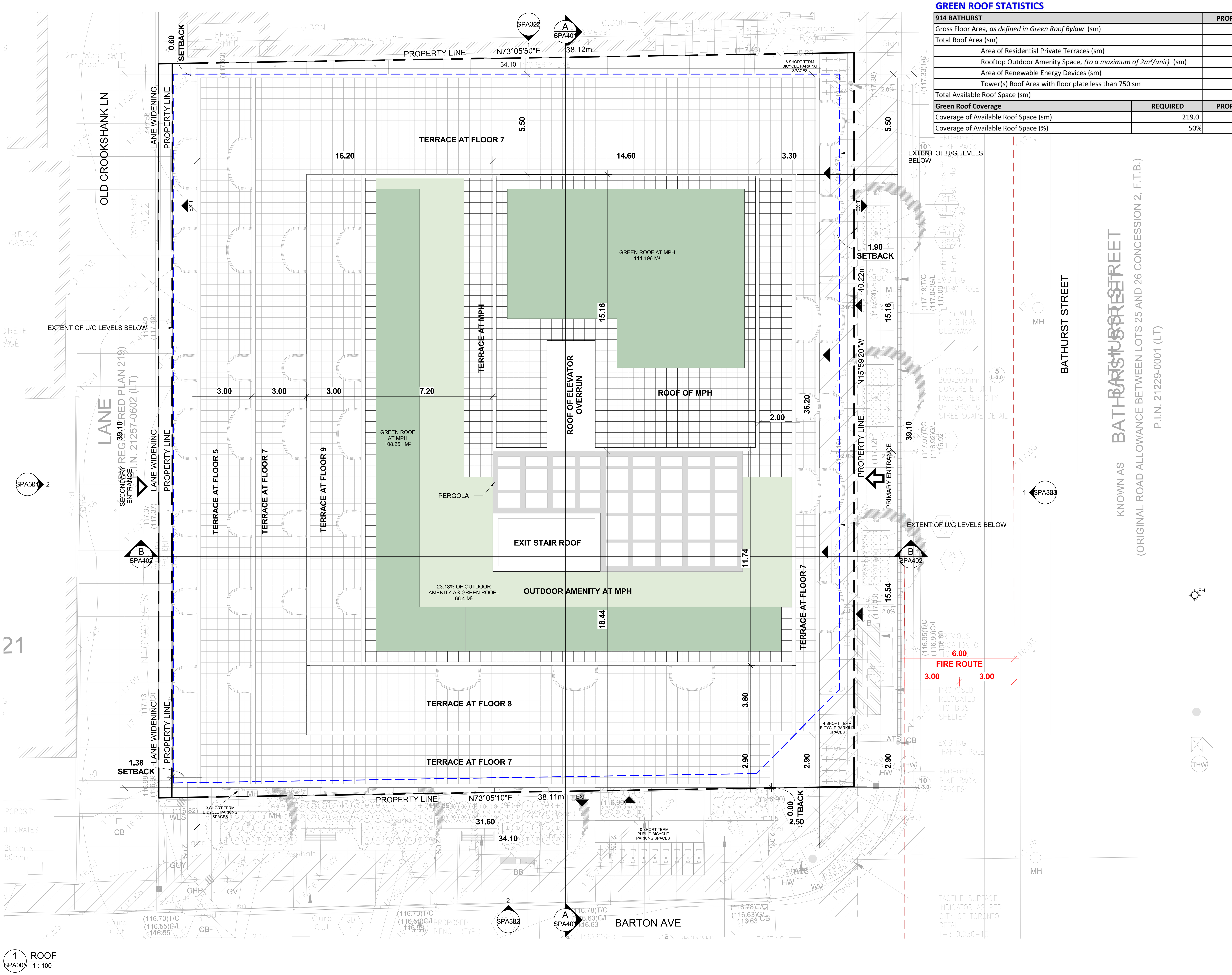
PROJECT NO. 22.010CS
PROJECT DATE 2022-07-28
DRAWN BY EHS
CHECKED BY AYU
SCALE 1 : 1

DRAWING NO. SPA002
REV. 1

2022-07-30 7:04:33 PM

GREEN ROOF STATISTICS

914 BATHURST		PROPOSED
Gross Floor Area, *as defined in Green Roof Bylaw* (sm)		15,668.6
Total Roof Area (sm)		1,326.2
Area of Residential Private Terraces (sm)		640.3
Rooftop Outdoor Amenity Space, *(to a maximum of $2m^2$/unit)* (sm)		248.0
Area of Renewable Energy Devices (sm)		-
Tower(s) Roof Area with floor plate less than 750 sm		-
Total Available Roof Space (sm)		438.0
Green Roof Coverage	**REQUIRED**	**PROPOSED**
Coverage of Available Roof Space (sm)	219.0	219.4
Coverage of Available Roof Space (%)	50%	50%



LEGEND

- PRIMARY RESIDENTIAL ENTRANCE
- SECONDARY RESIDENTIAL ENTRANCE
- RETAIL ENTRANCE
- EXIT
- FIRE HYDRANT
- SIAMESE CONNECTION
- CONVEX MIRROR
- TRANSFORMER WITH CLEARANCES
- FIRE ROUTE SIGN
- 000.00 SPOT ELEVATION
- GAS/HYDRO METER

TURNER FLEISCHER

Turner Fleischer Architects Inc.

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

#	DATE	DESCRIPTION	BY
1	2022-07-31	SPA SUBMISSION REVISION 1	

Stafford

PROJECT

914 Bathurst Street

914 Bathurst St, Toronto, ON

DRAWING

SITE PLAN / ROOF PLAN

PROJECT NO. 22.010CS
PROJECT DATE 2022-07-28
DRAWN BY EHS
CHECKED BY AYU
SCALE As indicated

DRAWING NO. SPA005
REV. 1

2022-07-30 7:04:34 PM

APPENDIX B

Visual OTTHYMO Model Output – (2-Year & 100-Year storms)

Irrigation design report by MEP Design Inc.

Visual OTTHYMO Output (2-year & 100-year storm)

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

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 2.3.3\voin.dat
  Output  filename: \\server\F\Autocad\public\2022\22221\Design and Reports\FSR Report\SET A\OTTHYMO\POST
DEV.out
  Summary filename: \\server\F\Autocad\public\2022\22221\Design and Reports\FSR Report\SET A\OTTHYMO\POST
DEV.sum


DATE: 8/2/2022                            TIME: 11:29:10 AM

USER:


COMMENTS: _____________________________________________________________


----------------------------------------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 531.900
| Ptotal= 29.59 mm |                          B=    .000
--------------------                          C=    .780
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =   .33

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                 .17    1.84 |  1.17   10.49 |  2.17    3.94 |  3.17    2.16
                 .33    2.08 |  1.33   88.27 |  2.33    3.43 |  3.33    2.02
                 .50    2.42 |  1.50   13.15 |  2.50    3.05 |  3.50    1.90
                 .67    2.90 |  1.67    7.84 |  2.67    2.75 |  3.67    1.79
                 .83    3.68 |  1.83    5.80 |  2.83    2.52 |  3.83    1.70
                1.00    5.23 |  2.00    4.67 |  3.00    2.32 |  4.00    1.62


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0001) |   Area    (ha)=    .16
|ID= 1 DT= 5.0 min |   Total Imp(%)=  88.00   Dir. Conn.(%)=  88.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .14          .02
     Dep. Storage     (mm)=       1.00         1.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.40        40.00
```

```
     Mannings n          =       .013         .250

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .083    1.84 | 1.083   10.49 | 2.083    3.94 |  3.08    2.16
                .167    1.84 | 1.167   10.49 | 2.167    3.94 |  3.17    2.16
                .250    2.08 | 1.250   88.27 | 2.250    3.43 |  3.25    2.02
                .333    2.08 | 1.333   88.27 | 2.333    3.43 |  3.33    2.02
                .417    2.42 | 1.417   13.15 | 2.417    3.05 |  3.42    1.90
                .500    2.42 | 1.500   13.15 | 2.500    3.05 |  3.50    1.90
                .583    2.90 | 1.583    7.84 | 2.583    2.75 |  3.58    1.79
                .667    2.90 | 1.667    7.84 | 2.667    2.75 |  3.67    1.79
                .750    3.68 | 1.750    5.80 | 2.750    2.52 |  3.75    1.70
                .833    3.68 | 1.833    5.80 | 2.833    2.52 |  3.83    1.70
                .917    5.23 | 1.917    4.67 | 2.917    2.32 |  3.92    1.62
               1.000    5.23 | 2.000    4.67 | 3.000    2.32 |  4.00    1.62

     Max.Eff.Inten.(mm/hr)=      88.27        30.63
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.37 (ii)    4.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=        .33          .22
                                                      *TOTALS*
     PEAK FLOW       (cms)=        .03          .00          .035 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      28.59        11.14         26.49
     TOTAL RAINFALL   (mm)=      29.59        29.59         29.59
     RUNOFF COEFFICIENT   =        .97          .38           .90

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

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

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000   |    .0197       .0068
                           .0113      .0023   |    .0227       .0091
                           .0160      .0046   |    .0000       .0000

                                 AREA      QPEAK       TPEAK       R.V.
                                 (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0001)       .157       .035        1.33       26.49
     OUTFLOW: ID= 1 (0002)       .157       .010        1.42       26.22

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.23
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=   .0021

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1579.400
| Ptotal= 78.75 mm |                          B=    .000
--------------------                          C=    .800
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    = 10.00 min
                       Time to peak ratio =   .33

                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .17     4.47 |  1.17   26.65 |  2.17    9.75 |  3.17    5.26
                .33     5.08 |  1.33  250.32 |  2.33    8.46 |  3.33    4.91
                .50     5.91 |  1.50   33.57 |  2.50    7.50 |  3.50    4.61
```

```
                  .67    7.12 |  1.67   19.76 |  2.67    6.75 |  3.67    4.34
                  .83    9.10 |  1.83   14.49 |  2.83    6.16 |  3.83    4.11
                 1.00   13.03 |  2.00   11.60 |  3.00    5.67 |  4.00    3.91


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0001) |   Area    (ha)=    .16
|ID= 1 DT= 5.0 min |   Total Imp(%)=  88.00   Dir. Conn.(%)=  88.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=        .14          .02
     Dep. Storage     (mm)=       1.00         1.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      32.40        40.00
     Mannings n             =     .013         .250

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


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr |   hrs   mm/hr
                .083    4.47 | 1.083   26.65 | 2.083    9.75 |  3.08    5.26
                .167    4.47 | 1.167   26.65 | 2.167    9.75 |  3.17    5.26
                .250    5.08 | 1.250  250.32 | 2.250    8.46 |  3.25    4.91
                .333    5.08 | 1.333  250.32 | 2.333    8.46 |  3.33    4.91
                .417    5.91 | 1.417   33.57 | 2.417    7.50 |  3.42    4.61
                .500    5.91 | 1.500   33.57 | 2.500    7.50 |  3.50    4.61
                .583    7.12 | 1.583   19.76 | 2.583    6.75 |  3.58    4.34
                .667    7.12 | 1.667   19.76 | 2.667    6.75 |  3.67    4.34
                .750    9.10 | 1.750   14.49 | 2.750    6.16 |  3.75    4.11
                .833    9.10 | 1.833   14.49 | 2.833    6.16 |  3.83    4.11
                .917   13.03 | 1.917   11.60 | 2.917    5.67 |  3.92    3.91
               1.000   13.03 | 2.000   11.60 | 3.000    5.67 |  4.00    3.91

     Max.Eff.Inten.(mm/hr)=     250.32       157.67
                 over (min)        5.00         5.00
     Storage Coeff.  (min)=         .90 (ii)     3.10 (ii)
     Unit Hyd. Tpeak (min)=        5.00         5.00
     Unit Hyd. peak  (cms)=         .34          .27
                                                      *TOTALS*
     PEAK FLOW       (cms)=         .10          .01          .105 (iii)
     TIME TO PEAK    (hrs)=        1.33         1.33         1.33
     RUNOFF VOLUME    (mm)=       77.75        49.32        74.33
     TOTAL RAINFALL   (mm)=       78.75        78.75        78.75
     RUNOFF COEFFICIENT   =         .99          .63          .94

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

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

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                           .0000      .0000    |    .0197       .0068
                           .0113      .0023    |    .0227       .0091
                           .0160      .0046    |    .0000       .0000

                                AREA      QPEAK       TPEAK       R.V.
                                (ha)      (cms)       (hrs)       (mm)
     INFLOW : ID= 2 (0001)       .157       .105        1.33       74.33
     OUTFLOW: ID= 1 (0002)       .157       .019        1.42       74.06

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 17.91
                  TIME SHIFT OF PEAK FLOW         (min)=  5.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=   .0063

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

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

MEPDESIGN 20 Years of Excellence 1999-2019
LANDSCAPE ARCHITECTS

29 July 2022

Kevin Osinga
The Odan/Detech Group Inc..
5230 South Service Road, Unit 107
Burlington, Ontario L7L 5K2

RE: ***914 Bathurst Street - Proposed Residential Development***
Reuse of Collected Storm Water for Landscape Maintenance Purposes

Dear Mr. Osinga,

We are writing to confirm that we have fully coordinated our drawings with The Odan/Detech Group Inc. and as a result have designated an Irrigation System to be hose bib and water supply line for landscape maintenance and watering of the landscape plant material proposed to be installed throughout the site.

The water supply will be pumped from the water storage cistern located in the underground parking garage. The hose bid and water supply line will be located on an exterior wall to facilitate the future condominium maintenance staff and irrigation requirements.

The calculations, based on the proposed Landscape Plan, for water supply as part of a future landscape watering program are as follows:

Total landscape area requiring daily watering:	219.5 square meters (Green Roof)
Total landscape area requiring daily watering:	16.2 square meters (Rooftop amenity Planting)
Total landscape area requiring daily watering:	50.3 square meters (Ground Floor Planting)

Green Roof - Volume of irrigation required per 72 Hour Period (5mm):	3.29 cubic M
Rooftop amenity Planting - Volume of irrigation required per day (5mm):	0.24 cubic M
Ground Floor Planting - Volume of irrigation required per day (5mm):	0.75 cubic M
Total water required in a 72 Hour Period:	**4.28 cubic M**

Respectfully,

Michael E. Presutti, OALA CSLA
Principal, MEP Design Inc.

MEP DESIGN INC.
1060 Sheppard Ave. West, Suite 100
Toronto, ON M3J 0G7
studio@mepdesign.com
+1 416.781.9205
mepdesign.com

August 3, 2022

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

Re: **914 Bathurst Street – Sprinkler System**

We would like to confirm the new sprinkler system for the proposed 10-storey building will be designed in accordance with NFPA 13 and other applicable standard.

Please contact us if there are any further queries.

Sincerely,

Novatrend Engineering Group Ltd.

Eric Pun, P. Eng.

54 West Beaver Creek Road, Unit 200
Richmond Hill, Ontario L4B 1G5
Tel: 905-882-5445
www.novatrend.ca

Turner Fleischer Architects Inc.

67 Lesmill Road
Toronto ON, M3B 2T8
T 416 425 2222
F 416 425 6717
info@turnerfleischer.com
turnerfleischer.com

TURNER FLEISCHER

August 3rd, 2022

File: 22.010CS

Gary Goldman, President
Stafford Bathurst inc.
55 St. Clair Avenue West, Suite 200
Toronto ON, M4V 2Y7

Attn: Gary Goldman, President

Re: 914 Bathurst St.
M5R3G5, Toronto, Ontario

We are providing this letter in support of the Fire Resistive Classification of our building. As the architect for this building, we confirm that structural elements and floor slabs will be designed as per the Fire Underwriters Survey (FUS) definition of Fire Resistive Construction. We also confirm that vertical openings and exterior vertical communications will be properly protected with a 1HR rating.

We trust that this letter meets your needs. If you have any questions, please contact the undersigned.

Sincerely,

Russell Fleischer
Principal
OAA, MAA, AANB, NSAA, AAPEI, ARCHITECT AIBC, AAA, SAA, MRAIC, NWTAA, LEED AP