1010 Somerset Street - Adequacy of Services

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Stantec

Prepared for:
City of Ottawa Housing Solutions and Investment Services

Prepared by:
Warren Johnson

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Prepared by

Signature

Warren Johnson

Printed Name

Reviewed by

Signature

Jennifer Bursey

Printed Name

Approved by

Signature

Peter Moroz

Printed Name

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1 Introduction

1.1 Project Information

This report is prepared to demonstrate the Adequacy of Public Services in support of a Zoning By-law Amendment (ZBLA) application for the proposed development by the City of Ottawa located at 1010 Somerset Street. The site is approximately 3.2 ha in size and current zoning is Mixed-Use Centre Zone F (1.5).

The site contains an existing abandoned building and associated parking areas. The site is bound by Somerset Street to the north, Plouffe Park and the Plant Recreation Centre to the east, Oak Street to the south, and the Trillium Pathway to the west. The site location is illustrated in **Figure 1.1** below.

Figure 1.1: Key Plan of Site

A copy of the Concept Plan (dated May 2025) prepared by Hobin Architecture Inc. is provided in **Appendix A.1**. The proposed development consists of a Recreation and Cultural Facility, school, mid-rise building (6 floors and 60 units), high-density towers (max. 25 floors and total 480 units), a park, and an

expansion to the existing Plant Recreation Centre. The existing abandoned building is to be removed to accommodate the proposed works.

The Future School block is currently going through a separate Site Plan Approval process as part of the 45 Oak Street development (project 160401837 prepared by Stantec Consulting Ltd.). This rezoning report has been revised to reflect the design of the Future School block as of the time of writing.

The assumed preliminary unit type breakdown for the future mid-rise building and high-density towers is listed in **Table 1.1** below.

Table 1.1: Unit Type Breakdown

Unit Type	Quantity
Residential Apartment Units (ea.) - Total	540
60 % One-bedroom	324
35% Two-bedroom	189
5% Three-bedroom	27

1.2 Regulatory Framework

The development of the 1010 Somerset Street site is governed by the City of Ottawa's current Official Plan and applicable development application requirements.

The pre-application consultation process with the City of Ottawa establishes the initial design criteria associated with demonstrating the adequacy of servicing for the site.

1.2.1 Supporting Information

Supporting documents referenced in support of this report include:

- *City of Ottawa Sewer Design Guidelines* (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins
- *City of Ottawa Design Guidelines – Water Distribution*, City of Ottawa, July 2010, including all subsequent technical bulletins
- *Design Guidelines for Drinking Water Systems*, Ministry of the Environment, Conservation, and Parks (MECP), 2008
- *Fire Protection Water Supply Guideline* for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020
- *Water Supply for Public Fire Protection*, Fire Underwriters Survey (FUS), 2020
- *Fire Code*, National Fire Protection Agency, 2012

- Pre-Application Consultation meeting notes and related correspondence with City of Ottawa staff, June 7, 2024 (see **Appendix B.1**).
- Details of the existing infrastructure located within the adjacent public roads are obtained from available City of Ottawa as-built records and GeoOttawa.

1.3 Objective

This Adequacy of Public Services report assesses and identifies preliminary servicing and stormwater management (SWM) conditions which are generally consistent with City of Ottawa Design Guidelines and considers related pre-consultation advice provided by City of Ottawa staff.

Preliminary general and applicable site-specific objectives considered are summarized below. Specific technical design criteria details are described in the associated servicing sections of this report.

Potable Water Servicing

- Develop a preliminary assessment of the potable water and fire flow demand for the site.
- Identify that the City of Ottawa water distribution system can supply adequate water pressure to the site for typical operational and emergency conditions.

Wastewater (Sanitary Sewer) Servicing

- Develop a preliminary assessment of the wastewater flow projected for the site.
- Identify that the City of Ottawa sanitary sewer system can support the project wastewater flow from the site.

Storm Sewer Servicing and Stormwater Management

- Identify allowable flow contributions from the site to the City of Ottawa storm sewer (minor) and adjacent surface (major) drainage systems.
- Identify applicable water quality control and water balance control targets.
- Develop a preliminary assessment of the SWM system for the site to achieve applicable water quantity (minor and major system) control, water quality control, and water balance control targets.

Site Grading Plan

- Prepare a preliminary grading plan to support the servicing assessments and identify compatibility with surrounding existing ground conditions.

The accompanying figures and drawings illustrate the key components of the preliminary servicing assessments.

2 Potable Water Servicing

2.1 Background

The site is within Pressure Zone '1W' of the City of Ottawa water distribution system.

The existing watermains along the boundaries of the site consist of a 300 mm diameter PVC watermain within Somerset Street, 150-200 mm diameter PVC watermains within Oak Street, and a 400 mm diameter cast iron watermain within Champagne Avenue.

Several existing fire hydrants are located throughout Somerset Street, Oak Street, and Champagne Avenue.

The following design criteria are applied to the assessment of the potable water and fire protection servicing for the site.

2.1.1 Water Demand and Allowable Pressure

Preliminary potable water demand and allowable water pressure are assessed using the City of Ottawa Water Distribution Guidelines (2010) as amended, the ISTB 2021-03 Technical Bulletin, and Appendix 4A of the City of Ottawa Sewer Design Guidelines (2012).

Residential Apartment Population Rate	
1 Bedroom	1.4 persons / unit
2 Bedroom	2.1 persons / unit
3 Bedroom	3.1 persons / unit

Residential Apartment Demand	
Average Daily (AVDY)	280 L/cap/day
Maximum Daily (MXDY)	2.5 x AVDY
Peak Hour (PKHR)	2.2 x MXDY

Industrial, Commercial, and Institutional Demand	
Commercial and Institutional	28,000 L/ha/day
Light Industrial	35,000 L/ha/day
Maximum Daily (MXDY)	1.5 x AVDY
Peak Hour (PKHR)	1.8 x MXDY

Future School Demand	
Day School with cafeteria, gym, and showers	90 L/person/day
Maximum Allowable for Occupied Area	552 kPa (80 psi)

2.1.2 Fire Flow and Hydrant Capacity

Preliminary fire flow requirements are assessed using the Fire Underwriters Survey (FUS) methodology (2020). Site specific criteria considered are noted in **Section 2.2.2.**

Fire hydrant capacity is assessed based on Table 18.5.4.3 of the National Fire Protection Agency (NFPA) Fire Code document. A hydrant situated less than 76 m away from a building can supply a maximum capacity of 5,678 L/min, and a hydrant 76 to less than 152 m away can supply a maximum capacity of 3,785 L/min.

2.2 Water Demand

2.2.1 Domestic Water Demand

The domestic water demand is assessed based on the proposed development conditions described in **Table 1.1** and the design criteria described in **Section 2.1**.

The assessed domestic water demand for the site is summarized in **Table 2.1**. Supporting calculations are provided in **Appendix C.1**.

Table 2.1: Estimated Domestic Water Demands

Demand Type	Population	Area (ha)	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Future School	1035	-	1.1	1.6	2.9
Total to Oak Street Connection	**1035**	**-**	**1.1**	**1.6**	**2.9**
Future High-Density Block	830	-	2.7	6.7	14.8
Conceptual Mid-Rise	104	-	0.3	0.8	1.9
Recreation and Cultural Facility	-	1.02	0.3	0.5	0.9
Tower A+B Commercial Podium	-	0.23	0.1	0.1	0.2
Parkland	-	1.00	0.3	0.5	0.9
Total to Somerset Street/Champagne Avenue Connection	**934**	**2.25**	**3.8**	**8.7**	**18.6**
Grand Total	**1969**	**2.25**	**4.8**	**10.3**	**21.5**

2.2.2 Fire Flow Demand

The fire flow demand is assessed based on:

- Type II – Non-combustible Construction / Type IV-A - Mass Timber Construction (i.e., building construction materials with a 1-hour fire resistance rating).
- Total effective building area is the gross floor area of the largest floor plus 25% of the floor area for each of the two immediately adjoining floors.
- Vertical openings are protected.
- Occupancy and contents factor considering limited combustible materials.
- A not fully supervised automatic sprinkler system that conforms to the NFPA 13 standard.
- Exposure distances to existing adjacent structures assumed to have Type V (no fire resistance rating) construction with no firewall or sprinkler systems where no information was available.
- Confirmation of the assumed building criteria to be coordinated with the architect during subsequent submissions.

The maximum fire flow is assessed to be approximately 11,000 L/min (183.3 L/s) for the worst-case location (Recreation and Cultural Facility). Supporting calculations per the FUS methodology are provided in **Appendix C.2**.

2.3 Available Level of Service

2.3.1 Boundary Conditions

The assessed domestic water and fire flow demands are used to confirm the level of servicing available to the proposed development from the adjacent municipal watermain and hydrants. The associated hydraulic grade line (HGL) elevation boundary conditions provided by the City of Ottawa for the 1010 Somerset Street development on January 14, 2025 and the 45 Oak Street development (refer to project 160401837 prepared by Stantec Consulting Ltd.) on April 14, 2025 (see **Appendix C.3 and C.4** for correspondence) are summarized in

Table 2.2. The revised concept plan with the school being serviced through Oak Street presents a decrease in proposed domestic demands at the Somerset Street/Champagne Avenue connection so revised boundary conditions for the 1010 Somerset Street development were not deemed necessary.

Table 2.2: Boundary Conditions

1010 Somerset Street	
HGL Condition	**Elevation (m)**
Minimum HGL	107.7
Maximum HGL	115.3
Max. Day + Fire Flow (183.3 L/s) HGL Connection 1	109.0
Max. Day + Fire Flow (183.3 L/s) HGL Connection 2	108.2
45 Oak Street (Future School)	
HGL Condition	**Elevation (m)**
Minimum HGL	107.3
Maximum HGL	114.9
Max. Day + Fire Flow (83.3 L/s) HGL	106.3

2.3.2 Allowable Domestic Pressure

The anticipated lowest finished floor elevation on the first floor of the Recreation and Cultural Facility at 58.05 m, serves as the reference elevation for the calculation of residual pressures at ground level for the 1010 Somerset Street development. From the boundary condition HGL elevations, the pressures at the first-floor level are expected to range from 486.8 kPa to 561.2 kPa (70.6 psi to 81.4 psi) under normal operating conditions. The maximum pressure is expected to be above the serviceable limit of 80 psi (552 kPa) and therefore buildings will require pressure reducing valves.

The anticipated lowest finished floor elevation on the first floor of the Future School at 59.50 m, serves as the reference elevation for the calculation of residual pressures at ground level for the Future School block (45 Oak Street development). From the boundary condition HGL elevations, the pressures at the first-floor level are expected to range from 469.5 kPa to 543.3 kPa (68.1 psi to 78.8 psi) under normal operating conditions. This pressure value is within the guidelines of 50-80 psi specified in the City of Ottawa Design Guidelines for Water Distribution.

To ensure adequate water pressure above the first-floor elevation, booster pump requirements are to be confirmed by the mechanical engineering consultant during subsequent stages of the development application process.

2.3.3 Allowable Fire Flow Pressure

From the boundary condition HGL elevations, the existing watermains can provide the required fire flow while maintaining the minimum residual pressure of 138 kPa (20 psi).

2.3.4 Fire Hydrant Coverage

The buildings are to be sprinklered and Siamese (fire department) connections provided. The Siamese connections are anticipated to within 45 m of a proposed or existing fire hydrant.

The existing hydrants near the site are anticipated to be within 76 m of the proposed buildings. Additional detail illustrating the hydrant coverage and requirement for proposed fire hydrants will be provided with subsequent stages of the development application process.

2.4 Proposed Water Servicing

The 1010 Somerset Street development is to be serviced with connections to the existing watermains on Somerset Street and Champagne Avenue. The Future School block (45 Oak Street development) is to be serviced with connections to the existing watermain on Oak Street. The proposed water servicing is shown on **Drawing SSP-1**. Connections and service requirements are to be consistent with City of Ottawa guidelines and specifications.

A portion of the existing 300 mm diameter watermain between Champagne Avenue and Somerset Street conflicts with the conceptual mid-rise building. A new connection between Champagne Avenue and Somerset Street shall be installed prior to the removal of the conflicting infrastructure as shown on **Drawing SSP-1.** Further detail will be provided during subsequent development stages.

Prior to installation of potable water servicing infrastructure, applicable existing water service laterals are to be blanked at the main by the City of Ottawa.

The mechanical engineering consultant is responsible to confirm the service sizes required and that the water pressure within each building is adequate to meet building code requirements. This confirmation is to occur during subsequent stages of the development application process.

No change to the existing Plant Recreation Centre building service is considered. It is anticipated that there will be an increased water demand from the future addition to the Plant Recreation Centre. The demand is not known at this stage and will be investigated during subsequent development stages to determine if the existing building services have adequate capacity to support the increased demand.

3 Wastewater Servicing

3.1 Background

The existing sanitary sewers adjacent to the site consist of a 1500 mm diameter concrete combined sewer intersecting the site within Champagne Avenue, a 375 mm diameter PVC combined sewer within Somerset Street, a 375 mm diameter PVC combined sewer within Oak Street, and a 2100 mm diameter concrete combined sewer within Preston Street.

3.2 Design Criteria

Preliminary wastewater servicing is assessed using the City of Ottawa Sewer Design Guidelines (2012) as amended, and the MECP Design Guidelines for Sewage Works. The following design criteria are applied to the assessment of wastewater servicing for the site.

Residential Wastewater Flow	
Average Flow Generation	280 L/cap/day
Peaking Factor	Harmon Equation (max. residential = 4.0)
Harmon Correction Factor	0.80
Infiltration Allowance	0.33 L/s/ha

Industrial, Commercial, and Institutional Demand	
Commercial and Institutional	28,000 L/ha/day
Light Industrial	35,000 L/ha/day
Industrial Peaking Factor	2.4
ICI Peaking Factor (ICI>20%)	1.5

Future School Demand	
Day School with cafeteria, gym, and showers	90 L/person/day

3.3 Wastewater Generation and Servicing Design

The peak wastewater flow is assessed based on the proposed development conditions described in **Table 1.1** and the design criteria described in **Section 3.2**.

The assessed peak wastewater flow for the site is summarized in **Table 3.1**. Supporting calculations are provided in **Appendix D.1**.

Table 3.1: Estimated Peak Wastewater Flow

Peak Residential Wastewater Flow			Peak ICI Wastewater Flow		Infiltration Flow (L/s)	Total Peak Flow (L/s)
Population	**Peak Factor**	**Peak Flow (L/s)**	**Population**	**Peak Flow (L/s)**		
	Champagne Avenue (1010 Somerset Development)					
934	3.26	9.85	0	0.35	0.85	11.05
	Oak Street (Future School – 45 Oak Street Development)					
0	-	0	1035	1.62	0.13	1.75
	Total					
934	-	9.85	1035	1.97	0.98	12.80

The anticipated peak wastewater flows for the proposed development were provided to the City of Ottawa staff to evaluate the adequacy of the receiving municipal sanitary sewer system in the vicinity of the site and downstream network. Refer to **Appendix D.2** for City correspondence dated January 22, 2025, confirming available capacity in the downstream sewer in Champagne Avenue for the 1010 Somerset Street development. See **Appendix D.3** for the confirmation of the capacity in the downstream sewer on Oak Street which was coordinated as part of the 45 Oak Street development application for the Future School block (refer to project 160401837 prepared by Stantec Consulting Ltd.). The revised concept plan with the school being serviced through Oak Street presents a decrease in proposed sanitary demands at the Champagne Avenue connection so revised capacity confirmations for the 1010 Somerset Street development were not deemed necessary.

Since the proposed sanitary sewers for the 1010 Somerset Street development will be connecting to a combined trunk sewer, City of Ottawa Asset Management's permission is required for the connection. At the time of writing this report coordination with the City is ongoing, although, given that similar recent developments in the area have connected to this trunk sewer no issues are anticipated. Confirmation will be provided in subsequent submissions.

The current anticipated population and area is anticipated to have a negligible impact on the municipal sanitary sewer capacity condition and final design details can be confirmed during subsequent stages of the development application process.

3.4 Proposed Sanitary Servicing

The 1010 Somerset Street development is to be serviced with a connection to the existing 1500 mm diameter combined sewer in Champagne Ave. The Future School block (45 Oak Street development) is to be serviced with a connection to the existing 375 mm diameter sanitary sewer in Oak Street. The proposed sanitary servicing is shown on **drawing SA-1**. Connections and service requirements are to be consistent with City of Ottawa guidelines and specifications.

The mechanical engineering consultant is responsible to confirm the service sizes required and that the appropriate backwater valve requirements are satisfied. This confirmation is to occur during subsequent stages of the development application process.

No change to the existing Plant Recreation Centre service is considered. It is anticipated that there will be an increased sanitary demand from the future addition to the Plant Recreation Centre. The demand is not known at this stage and will be investigated during subsequent development stages to determine if the existing building services have adequate capacity to support the increased demand.

4 Stormwater Management and Servicing

4.1 Background

The existing storm drainage system along the boundaries of the site consists of curb and catch basins as part of a typical urban roadway section. Catch basins are connected to an associated storm sewer system. The existing storm sewers along the boundaries of the site consist of a 1650 mm diameter concrete sewer within the existing sewer easement along the western boundary of the site, a 600 mm diameter concrete sewer within Somerset Street, a 1050 mm diameter concrete sewer within Preston Street, and 300 mm to 375 mm diameter PVC sewers within Oak Street.

4.2 Design Criteria

Preliminary stormwater management (SWM) and storm sewer servicing is assessed using the City of Ottawa Sewer Design Guidelines (2012) as amended. The following design criteria are applied to the assessment of SWM and storm sewer servicing for the site.

- Water Quality Control: provide enhanced levels of protection of 80% for total suspended solids removal.
- Water Quantity Control: control post-development runoff from the subject site, up to and including the 100-year storm event, to a 2-year pre-development level.
- The pre-development runoff coefficient to be determined as per existing conditions but in no case more than 0.5.
- The time of concentration (Tc) used to determine the pre-development condition should be calculated. Tc should not be less than 10 min.
- Tc of 10 minutes shall be used for all post-development calculations.
- Any storm events greater than the established 2-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. For events greater than 100 years, spillage must be directed to a public ROW and not to neighboring private property.
- 100-year spill elevation must be 300 mm lower than any building opening or ramp.
- The stress test spill elevation (100-year +20% event) shall not spill onto any permanent structures.
- The maximum permissible ponding depth for the 100-year storm event is 0.35 m. No spilling to adjacent sites.
- There shall be no surface ponding on private parking areas during the 2-year storm rainfall event.

4.3 Existing Conditions

The site area currently consists of an existing abandoned building, open space, and parking areas. Runoff from the site is currently captured by a network of catch basins directing stormwater to the combined sewer within Champagne Avenue or the storm sewer within Preston Street. A portion of the site sheet drains uncontrolled to Somerset Street, City Centre Avenue, and Plouffe Park. The major system for the site is directed to the adjacent public roadways (Somerset Street and City Centre Avenue) and ultimately to the Plouffe Park stormwater relief area. Based on available topographic mapping, it is anticipated that there is no external drainage area draining into this property. The current pre-development drainage pattern is illustrated on **Drawing EXSD-1**.

The overall existing condition rational method runoff coefficient is assessed at C = 0.74.

4.4 Stormwater Management Design

Based on the concept plan, drainage area boundaries are defined as illustrated on **Drawing SD-1**. Conceptual runoff coefficient values for modified rational method calculations are assigned to each drainage area based on the expected land use. A summary of drainage areas and assumed runoff coefficients are provided in **Table 4.1**.

Table 4.1: Summary of Post-Development Drainage Areas

Land Use	Drainage Areas	Area (ha)	Runoff Coefficient, C	Outlet
High-density Res.	L102A	0.37	0.85	Storm Sewer
High-density Res. Roof	R102B	0.08	0.90	Roof Drain
High-density Res. Roof	R102C	0.12	0.90	Roof Drain
High-density Res. Roof	R102D	0.11	0.90	Roof Drain
Mid-rise Res.	L103A	0.12	0.85	Storm Sewer
Mid-rise Res. Roof	R103B	0.10	0.90	Roof Drain
Rec. and Cultural Facility	L104A	0.20	0.85	Storm Sewer
Park	L104B	0.86	0.40	Storm Sewer
Rec. and Cultural Facility Roof	R104C	0.48	0.90	Roof Drain
School Roof	R203A	0.16	0.90	Roof Drain
School Yard	L203B	0.17	0.77	Storm Sewer
School Access	L205A	0.18	0.82	Storm Sewer
Plant Rec. Centre Parking	EX-2	0.28	0.85	Storm Sewer
Plant Rec. Centre Yard	EX-4	0.18	0.62	Storm Sewer

4.4.1 Allowable Release Rate

The rational method equation (Q = 2.78 CiA) is used to assess the allowable pre-development release rate from the site. The following parameters are used to assess the allowable release rate.

- Based on the overall calculated C value of 0.74 for the applicable existing site condition a runoff coefficient of 0.50 is used to establish the allowable release rate.
- Rainfall intensity is for the City of Ottawa 2-year design storm. A calculated Time of Concentration of 10 minutes has been applied to the site. The resultant intensity is 76.81 mm/hr. Supporting calculations are provided in **Appendix E**.
- The existing drainage patterns to the network of catch basins within the Plant Recreation Centre parking lot and yard are to be retained with minor modifications as required to support the future addition. The pre-development to post-development drainage for these areas will be analyzed separately through an area by runoff coefficient (AxC) comparison so they have been discounted from the overall area contributing to the allowable release rate.

An overall target release rate of **314.9 L/s** from the entire site was obtained based on the rational method equation shown below.

$$\boldsymbol{Q} = \mathbf{2.78}\,(\boldsymbol{C})(\boldsymbol{I})(\boldsymbol{A})$$

Where:

$\boldsymbol{Q} = peak\ flow\ rate, L/s$

$\boldsymbol{C} = site\ runoff\ coefficient$

$\boldsymbol{I}$ = *rainfall intensity corresponding to the 10 min storm duration mm/hr (per City of Ottawa 2-year IDF curves*

$\boldsymbol{A} = drainage\ area, ha$

$$Intensity\ (mm/hr) = \frac{732.951}{(10 + 6.199)^{0.81}} = \mathbf{76.81\ mm/hr}$$

$$Q = 2.78(0.5)(76.81 mm/hr)(2.95\ ha) = \mathbf{314.9\ L/s}$$

The overall site target release rate was divided by the total site area to determine the target release rate per hectare (**106.8 L/s/ha**). Target release rates for the site are summarized in

Table 4.2 below:

Table 4.2: Site Target Release Rates

Land Use	Area ID	Subcatchment Area (ha)	Target Flow Rate to Storm Sewer (L/s)[1]	Pre-Development Target (L/s/ha)
Future High-Density Residential	L102A (R102B, R102C and R102D roof areas)	0.68	72.6	**106.8**
Conceptual Mid-Rise	L103A (R103B roof area)	0.22	23.5	
Park	L104B	0.86	91.8	
Recreation and Cultural Facility	L104A (R104C roof area)	0.68	72.6	
Future School	L203B, L205A (R203B roof area)	0.51	54.7	
Total		**2.95**	**315**	

1. Target flow rate (L/s) from each block/street is the product of the allowable pre-development target rate (L/s/ha) and the subcatchment area (ha)

For the proposed development, the target allowable release rate is used to assess water quantity control measures to be applied.

4.4.2 Quantity Control

Based on the proposed change to the site condition, quantity control measures are needed to manage stormwater runoff to the allowable 2-year pre-development runoff flow rate. Post-development peak flows up to the 100-year storm from the proposed blocks will be restricted to the allowable release rates using a combination of surface storage, inlet control devices (ICD's), rooftop storage, underground cisterns, and pipe storage. The majority of major system overflows will be directed overland to Somerset Street and ultimately to the Plouffe Park storm relief area. A portion of the sites major system overflows will be directed to City Centre Avenue as per existing conditions.

Rooftop storage is expected to be provided on the school, recreation and cultural facility, conceptual mid-rise, and future high-density residential site blocks. The storage shall not exceed 150 mm depth with conservative assumptions adopted for the usable roof area and number of drains. Stormwater will first be detained on the roofs via roof drains, then it is assumed to be controlled by underground storage tanks/cisterns before discharging to the downstream sewer. **Appendix E** contains the functional storm sewer design sheet and the preliminary modified rational method calculations.

Roof storage calculations assume the roofs will be equipped with standard Watts Model R1100 Accuflow Single Notch Roof Drains (50% open) and that 80% of the roof areas are usable. **Table 4.3** summarizes the conceptual 100-year roof release rates and storage requirements.

Table 4.3: 100-Year Summary of Roof Controls

Land Use	Area ID	Usable Roof Area (m^2)	Discharge (L/s)	Maximum Depth (m)	Required Storage Volume (m^3)	Available Storage Volume (m^3)
Future High-Density Residential[1]	R102B	640	3.8	0.15	31.4	32.0
Future High-Density Residential[1]	R102C	960	6.2	0.15	45.4	48.0
Future High-Density Residential[1]	R102D	880	5.0	0.15	43.6	44.0
Conceptual Mid-Rise	R103B	800	5.0	0.15	38.4	40.0
Recreation and Cultural Facility	R104C	3840	21.4	0.15	191.7	192.0
Future School	R203A	1280	7.5	0.15	62.8	64.0
				Total Roof Storage (m^3):	**413.2**	**420.0**

1. High-density residential building roof areas assume podium roof area is available for storage.

Additional storage is required within most blocks to restrict post-development peak flows up to the 100-year storm to the target release rates. It is assumed that uncontrolled surface areas within the proposed private blocks will be equipped with catch basins/drains that will either direct runoff to underground parking cisterns or to oversized pipes for storage. **Table 4.4** demonstrates that the target release rates can be achieved for the proposed site and shows the resultant minimum stormwater storage requirements for each block.

Table 4.4: 100-Year Storage Requirements and Release Rates

Land Use	Area ID	Area (ha)	100-Year Volume Requirements (m^3)		100-Year Release Rate (L/s)
			Cistern	Surface and/or Underground Storage	
Future High-Density Residential	L102A (R102B, R102C and R102D roof areas)	0.68	80.0	-	72.6

Land Use	Area ID	Area (ha)	100-Year Volume Requirements (m^3)		100-Year Release Rate (L/s)
			Cistern	Surface and/or Underground Storage	
Conceptual Mid-Rise	L103A (R103B roof area)	0.22	30.0	-	23.5
Park	L104B	0.86	-	75.0	91.8
Recreation and Cultural Facility	L104A (R104C roof area)	0.68	30.0	-	72.6
Future School	L203B, L205A (R203A roof area)	0.51	109.2	-	54.7
Totals:		**2.95**	**249.2**	**75.0**	**315**
Total Target Release Rate:					**315**

A detailed hydraulic analysis will be completed at the detailed design stage.

4.4.3 Quality Control

Enhanced level of quality control equivalent to 80% total suspended solids (TSS) removal will be provided within each block to treat runoff from all above-ground parking areas and access roads through oil/grit separators or approved equivalent that will be sized at the detailed design stage.

4.4.4 Plant Recreation Centre External Area

The existing drainage patterns to the network of catch basins within the Plant Recreation Centre parking lot and yard are intended to be retained with minor modifications as required to support the future addition. An AxC comparison of the pre-development to post-development drainage has been included in **Appendix E.4,** is illustrated on drawings **EXSD-1** and **SD-1** and summarized in **Table 4.5** below.

This comparison demonstrates an overall reduction in drainage being directed to the existing storm sewer networks to remain in the adjacent Plant Recreation Centre areas.

Table 4.5: Pre-development to Pose-development Interim External Area Comparison

Outlet	ID	Pre-development AxC	Post-development AxC	Pre to Post AxC Difference (%)
Preston Street	EX-2	0.389	0.238	-38.8
	EX-4	0.112	0.112	0.0
Total		0.500	0.35	-30.1

4.5 Proposed Stormwater Servicing

The 1010 Somerset Street development is to be serviced with a connection to the existing 1650 mm diameter storm sewer within the existing sewer easement along the western boundary of the site. The Future School block (45 Oak Street development) is to be serviced with a connection to the existing storm sewers within Oak Street. A portion of the existing Oak Street storm sewer shall be upsized to accommodate the proposed peak flows from the Future School block. The proposed storm servicing is shown on **drawing SD-1**. Connections and service requirements are to be consistent with City of Ottawa guidelines and specifications.

A portion of the existing 1650 mm diameter storm sewer within the Future High Density Residential Site conflicts with the conceptual buildings. Given the conceptual nature of the Concept Plan, it is anticipated that during subsequent design stages the building envelopes will be modified to eliminate the conflict with the storm sewer (to be determined by the architect). If this is not feasible, the storm sewer will be relocated as shown on **drawing SD-1.** The exact location of the existing 1650 mm diameter storm sewer should be confirmed during subsequent development stages.

The mechanical engineering consultant is responsible to confirm the service size required, that the appropriate backwater valve requirements are satisfied, the nature of the foundation drainage system, and that any roof drainage systems (including internal storage systems, roof drains, scuppers, and applicable green roof conditions) are adequate for accommodating the design storm conditions.

No change to the existing Plant Recreation Centre building service or drainage pattern is considered. It is anticipated that the future addition to the Plant Recreation Centre will tie into the foundation drainage and stormwater system of the existing building. The demand is not known at this stage and will be investigated during subsequent development stages to determine if the existing building services have adequate capacity to support the proposed addition. Minor modifications may be required to the existing catch basin network within the Plant Recreation Centre parking lot to support the future addition and will be determined during subsequent development stages.

5 Site Grading

Conceptual grading for the proposed site has been provided as shown on **Drawing GP-1.** Grading design has been based on the existing topography and the requirement to route overland flows from the proposed development to the adjacent ROW's. Given the current topography, site grading will be designed to match the existing boundaries of the site as well as the existing Plant Recreation Centre building. The majority of major system flows from the development will be directed to Somerset Street and ultimately the Plouffe Park storm relief area with a portion of the major system being directed to City Centre Avenue and Oak Street as per existing conditions.

Preliminary building finished floor elevations are indicated based on ensuring suitable elevation ties to the surrounding existing conditions, the relative maximum allowable elevation change between the access roads and building entrances to ensure appropriate accessibility conditions are achieved, and that positive drainage away from the building face is achieved. The finished floor elevations may be adjusted during subsequent stages of the development application process.

Building footing elevations will be assessed at time of detailed design to ensure proper interaction with anticipated groundwater levels.

6 Other Considerations

6.1 Geotechnical

A preliminary geotechnical investigation report was prepared by Stantec Consulting Ltd. in February 2025 to assess the subsurface conditions found at borehole locations. Seven (7) boreholes numbered BH24-1 to BH24-7, were advanced to depths ranging from about 6.9 to 10.6 metres below the existing ground surface. The information obtained from the field investigation will guide the conceptual design of the site and identify development constraints.

Based on the field investigation for the proposed development area, the subsurface conditions at the site consisted of asphalt or topsoil over fill material that is underlain by a Champlain Sea clay deposit followed by till materials containing cobbles and boulders over shaly limestone bedrock. The field work for this investigation was carried out between October to November 2024. The geotechnical investigation details the methodology adopted, analysis of subsurface conditions, and a chemical analysis of the groundwater to examine the corrosion potential of the subsurface soils.

The fill is layer is 1.5 m to 3.3 m thick and is not suitable for supporting foundation and construction of slab-on-grade so it should be removed from the building footprints. The clay layer extends from 4.6 m to 8.4 m below existing grade and has limited capacity to support new loads. It is recommended that deep foundations be incorporated into the design to support multi-storey buildings. City of Ottawa guidelines for tree planting in sensitive marine clay should be followed. If any grade raises greater than 1 m are planned, the final loading configuration should be reviewed by the geotechnical consultant.

Auger refusal was encountered in boreholes BH24-2 and BH24-3 at depths of 10.6 m and 6.9 m below existing grade. Upon encountering auger refusal at borehole BH24-2, the borehole was subsequently advanced into the bedrock via rotary diamond drilling techniques for an additional 7.5 metres while retrieving HQ sized core samples.

Groundwater levels were measured from monitoring wells within boreholes BH24-2 and BH24-5 on October 28, 2024. The groundwater level was inferred to be at depths of approximately 2.3 m to 6.6m below existing grade, however, these inferred water levels do not represent the stabilized water level at the site and groundwater levels are subject seasonal fluctuations with higher groundwater levels anticipated during wet seasonal periods. Two soil samples were analyzed by an accredited laboratory institute for basic chemical analysis where it was determined that the effect of sulphates would not need to be considered, the pH was within the normal range for soil, and the resistivity of the tested clay and till samples suggest a moderate to severe corrosive environment.

6.2 Utilities

Utility infrastructure exists within the Somerset Street ROW at the north property boundary and within the Oak Street ROW at the south property boundary of the proposed site. It is anticipated that existing infrastructure will be sufficient to provide a means of distribution for the proposed site. The exact size, location, and routing of utilities is to be finalized during subsequent stages of the development application process.

Coordination with the appropriate governing bodies will be required to relocate or remove the existing utility poles and infrastructure within the proposed site and will be explored in the detailed design stage.

6.3 Erosion and Sediment Control During Construction

To protect downstream water quality and prevent sediment build-up in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. Erosion and sediment control (ESC) measures are the responsibility of the contractor. Refer to **drawing EC-1** for conceptual erosion control measures. Recommendations for ESC implementation will be included with subsequent submissions through the development application process.

6.4 Regulatory Approvals

Information on anticipated regulatory approvals associated with the site will be provided with subsequent submissions through the development application process.

7 Closing

The water, wastewater, and storm water servicing conditions assessed in this report indicate that the existing public services immediately adjacent to the project site are adequate to support the proposed development.

The mechanical engineering consultant is responsible to confirm:

- The water service sizes required and that the water pressure within each building is adequate to meet building code requirements.
- The sanitary sewer services size required and that the appropriate backwater valve requirements are satisfied.
- The storm sewer service sizes required, that the appropriate backwater valve requirements are satisfied, the nature of the foundation drainage system, and that any roof drainage systems (including internal storage systems, roof drains, scuppers, and applicable green roof conditions) are adequate for accommodating the design storm conditions.

The confirmations from the mechanical engineering consultant are to occur during subsequent stages of the development application process.

No change to the existing Plant Recreation Centre services or drainage pattern is considered. However, it is anticipated that there will be an increased demands from the future addition. The demands are not known at this stage and will be investigated during subsequent development stages to determine if the existing building services have adequate capacity to support the increased demand.

Appendices

Appendix A

A.1 Concept Plan

SOMERSET STREET

PRESTON STREET

OAK STREET

LRT TRILLIUM LINE

MUP

MUP

NEW MUP PEDESTRIAN CONNECTION TO SOMERSET

BLDG A MAIN ENTRANCE

FUTURE RESIDENTIAL PEDESTRIAN ACCESS

BLDG B MAIN ENTRANCE

FUTURE RESIDENTIAL PEDESTRIAN STAIR ACCESS

BLDG D MAIN ENTRANCE

RECREATION AND CULTURAL FACILITY MAIN ENTRANCE

FUTURE HIGHRISE BLDG A

FUTURE HIGHRISE BLDG B

FUTURE MIDRISE BLDG D

FUTURE HIGHRISE BLDG C

ACCESS TO BELOW GRADE PARKING

PRIVATELY OWNED PUBLIC SPACE

BLDG C MAIN ENTRANCE

EXTENT OF PARKING GARAGE BELOW GRADE

FUTURE RECREATION AND CULTURAL FACILITY

ACCESS TO BELOW GRADE PARKING

EXTENT OF PARKING GARAGE BELOW GRADE

PRIVATE PROPERTIES

EXISTING 1000 & 1002 SOMERSET STREET

FUTURE LINK (2ND FLOOR)

FUTURE ADDITION

EXISTING CITY OF OTTAWA PLANT RECREATION CENTRE

FUTURE LINK (THIRD FLOOR)

ÉÉP LOUISE ARBOUR SCHOOL
4 STOREYS
BUILDING FOOTPRINT: 1,198.09m²
FFE: +/-59.50

3 STOREY BLOCK (LEVEL 2-4)

LOT AREA =
3,205 m² / 34,503 ft²

ENTRANCE B
(BUS DROP-OFF ENTRANCE)

ENTRANCE C
(ON GROUND LEVEL)

ENTRANCE A
(MAIN ENTRANCE)

BUS DROP-OFF

OEUVRES/ GARAGE

FUTURE ACTIVE MOBILITY LINKS
(PARK DESIGN BY OTHERS)

FUTURE ACTIVE MOBILITY LINKS
(PARK DESIGN BY OTHERS)

NEW PARK AREA =
10,000m² / 1 Hectare

EXISTING PLOUFFE PARK

GLADSTONE VILLAGE PHASE 1

FUTURE TOWNHOMES

FUTURE TOWNHOMES

PROPOSED SURFACE EASEMENT FOR CIRCULATION

PROPOSED NON BUILDABLE EASEMENT TO PERMIT LIMITING DISTANCE AGREEMENTS FOR UNPROTECTED OPENINGS

FUTURE PARK
LOT AREA = 10,000 m2 - 1 hectare

1010 SOMERSET LANDS
LOT AREA = 46,661 m2 - 4.66 hectares

45 OAK STREET - LOUISE ARBOUR SCHOOL
LOT AREA = 3,183 m2 - .32 hectare

EXTENT OF PARKING GARAGE BELOW GRADE

HOBIN

1010 SOMERSET ST.

OTTAWA, ON

CONCEPT PLAN

SCALE 1 : 1000

MAY 21, 2025

Appendix B

B.1 Pre-application Consultation

File No.: PC2024-0206

June 7, 2024

Aditi Mane
Stantec
Via email: Aditi.Mane@stantec.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Zoning By-law Amendment Application – 930 and 1010 Somerset Street

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on May 28, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☒	**4** ☐	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 3 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

3. Please note, if your development proposal changes significantly in scope, design, or density before the Phase 3 pre-consultation, you may be required to complete or repeat the Phase 2 pre-consultation process.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

2. This pre-application consultation is regarding a potential Official Plan Amendment and Zoning By-law Amendment. Further pre-application consultation will be required for the Site Plan Control applications associated with the individual development blocks.

3. Official Plan designation: Downtown Core, Corso Italia Protected Major Transit Station Area.

   Secondary Plan: West Downtown Core Corso Italia Station District, Main Street Corridor and Park designation. west_downtown_core_op_sec_plan_en.pdf (ottawa.ca)

   Secondary Plan components including focus on active transportation, quality public spaces, density along O-Train corridor, nurture the arts, alternative renewable energy solution have been incorporated.

4. The submitted Official Plan Amendment should include a planning rationale that includes items referenced in 12.3 of the Official Plan. Official Plan: Section 12. Local Plans (ottawa.ca)

5. Staff review has identified a number of Official Plan Amendments required to the West Downtown Core Secondary Plan:
   - Chapter 3, Section 4, 22) requires building heights along Somerset be mid-rise. The new community centre will require an amendment for a 3 storey massing there.
   - Schedule M – amendment to locate a school in area currently designated as park, and shift to include additional park block north of current
   - Chapter 3, Section 4, 20) maximum FSI of 1.5 - not clear whether current plan would exceed this

6. Staff are pleased that concept plan now includes buildings and no new surface parking along Somerset Street.

7. It appears that City Centre Underpass Pathway is to act as a pedestrian and cycling corridor as envisioned by the Secondary Plan – great.

8. Is the 1010 Somerset site been shifted into the lands associated with the MUP next to the Trillium Line? If so – additional OPAs required.

9. Need to control traffic somehow from Somerset to Oak so it's just private – not a public street with cut through traffic.

10. As the landowner in this case is the City of Ottawa, there is no requirement to apply for part-lot control to subdivide and convey land because of s. 50 (3) (c) Planning Act, R.S.O. 1990, c. P.13 (ontario.ca). We would not require a Plan of Subdivision as no new roads are being created or new engineering infrastructure. The next steps for land conveyance anticipated are the drafting of an R plan to delineate parcels so they can be described and working with City real estate and legal staff to convey.

Urban Design

Comments:

Submission Requirements

11. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation of the submission.
    a. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.
12. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of reference (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies.

Urban Design Review Panel Review and Report

13. The site is located within a Design Priority Area and is subject to review by the Urban Design Review Panel. UDRP review occurs within the Preconsultation stage. To proceed with a UDRP review, please contact udrp@ottawa.ca.
14. The submission of a UDRP report is a requirement for deeming an application complete. Please follow the instructions provided in the Terms of Reference available here: Urban Design Review Panel Report (ottawa.ca).
15. In spite of the above, the visit to the UDRP can occur after an application for an OPA is deemed complete if multiple applications run concurrently.

Comments on Preliminary Design

1. The following elements of the preliminary design are appreciated:
    a. Providing built form fronting Somerset Street.
    b. Separation of the blocks into reasonable development parcels.
    c. Limiting vehicular access points off Somerset.
2. The following elements of the preliminary design are of concern:
    a. Indication of the district energy plant in a stand-alone structure/location.
    b. Conflict between the mixed-use/residential block and the western MUP.

Recommendations

1. Provide design development and illustration of how the design has changed in the design brief.
2. Provide a response to the previous UDRP recommendations in the design brief, especially regarding connectivity and possibility for sustainable approach including the consideration of how to treat the Recreation Facility roof.

Other Comments:

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

Feel free to contact Christropher Moise, Urban Designer, for follow-up questions.

Engineering

Comments:

1. The Stormwater Management Criteria, for the subject site, is to be based on the following:

    a. Water Quality Control: provide enhanced levels of protection of 80% for total suspended solids removal.

    b. Water Quantity Control: In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the 100-year storm event, to a 2-year pre-development level.

        i. The pre-development runoff coefficient will need to be determined as per existing conditions but in no case more than 0.5. (If discharging to a combined sewer, max runoff coefficient is to be 0.4). If 0.5 (or 0.4 for combined sewer discharge) applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is of greater magnitude.

        ii. The time of concentration (Tc) used to determine the pre-development condition should be calculated. Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10

min; Tc of 10 minutes shall be used for all post-development calculations.

iii. Any storm events greater than the established 2-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. For events greater than 100 years, spillage must be directed to a public ROW and not to neighboring private

c. Ponding Notes:

i. 100-year spill elevation must be 300mm lower than any building opening or ramp.

ii. Demonstrate that the stress test spill elevation (100-year +20% event) does not spill onto any permanent structures.

iii. The maximum permissible ponding depth for the 100-year storm event is 350mm. No spilling to adjacent sites.

iv. Please note that as per Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14) there shall be no surface ponding on private parking areas during the 2-year storm rainfall event.

d. If rooftop control and storage is proposed as part of the SWM solutions, sufficient details (Cl. 8.3.8.4) shall be discussed and documented in the report.

2. General Servicing

a. Connections to trunk sewers, easement sewers and backbone watermains are only allowed on a case-by-case basis.

b. If severance is planned, this needs to be addressed in servicing to satisfy severance requirements. Where a large parcel with multiple buildings is planned, City will require an ultimate servicing plan so as to appropriately understand how severance requirements are being met. This includes any parcel to be conveyed to the city.

3. Storm Sewer

a. A 1500 mm dia. concrete combined sewer (1939) is available within the 1010 Somerset parcel.

b. A 1650mm dia. concrete storm sewer (1962/2024) is available within western and southern portion of the site.

c. There is a conflict with the proposed future residential development conceptual building footprint and the existing 1650mm storm trunk sewer (Nepean Bay Storm). This is one of the city's critical piece of

infrastructure which can't be easily relocated. I encourage you to explore how this conflict will be resolved immediately as this issue may affect impact the entire site redevelopment.

4. Sanitary Sewer

    a. A 1500 mm dia. concrete combined sewer (1939) is available within the 1010 Somerset parcel.

    b. A 375 mm dia. PVC combined sewer (1999) is available within Somerset Avenue for eastern portion of the site.

    c. A 250 mm dia. PVC sanitary/combined sewer (2022) is available within Oak Street.

    d. Please provide the new Sanitary sewer discharge and we will confirm if sanitary sewer main has the capacity.

    e. Include correspondence from the Architect within the Appendix of the report confirming the number of residential units per building and a unit type breakdown for each of the buildings to support the calculated building populations.

    f. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

5. Water:

    a. A 300 mm dia. PVC watermain (1997) is available within Somerset Avenue for eastern portion of the site.

    b. A 200mm and 400 mm dia. UCI watermain (1916) is available within the 1010 Somerset parcel.

    c. A 200 mm dia. PVC watermain (2004/2023) is available within Oak Street.

    d. **There is a conflict with the proposed future mid-rise building footprint and the existing 300mm watemain on Somerset Avenue which cut through the site. This watermain is located next the Somerset bridge abutment and relocation of this infrastructure may be difficult. I encourage you to explore how this conflict will be resolved immediately as this issue may affect impact the entire site redevelopment**.

    e. Existing watermain within the site that will not be reused are to be decommissioned.

    f. Water Supply Redundancy: As per ISTB-2021-03, Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/day and residential areas serving 50 or more dwellings shall be connected with

a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, each their own meter and separated by an isolation valve, to avoid the creation of a vulnerable service area.

g. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

    i. Plan showing the proposed location of service(s).

    ii. Type of development and the amount of fire flow required (L/min). Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used. Fire flow demand requirements are to be based on ISTB-2021-03. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).

    iii. Average daily demand: __L/s.

    iv. Maximum daily demand: __L/s.

    v. Maximum hourly daily demand: __L/s.

    vi. Note: Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons.

h. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.

i. Hydraulic modelling will have to be provided to the city for review if any watermains are proposed on site.

6. Environmental

    a. A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.

b. The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.

c. Official Plan: Section 10. Protection of Health and Safety (ottawa.ca)

7. Record of Site Condition (RSC)

   a. An RSC is required to be filled with the MECP for any property where there is a proposed changes in land use to a more sensitive land use. An RSC will be required for the 1010 Somerset Avenue parcel of this application.

   b. A memorandum prepared by an environmental consultant confirming that no potential contaminating activities have taken place within the RSC area since the filling of the RSC, may also be required.

   c. Submitting a record of site condition | Ontario.ca

8. Geotechnical

   a. A Geotechnical Study/Investigation shall be prepared in support of this development proposal.

   b. The geotechnical report shall address concerns with excavations in close proximity the Somerset Bridge abutments.

   c. Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications. Geotechnical Investigation and Reporting (ottawa.ca)

   d. If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City. Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines (ottawa.ca)

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guide outlines the

requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Feel free to contact Vincent Duquette, Infrastructure Project Manager, for follow-up questions.

Noise

Comments:

9. Noise Study Requirements

    a. A Transportation Noise Assessment is required as the subject development is located within 100m proximity of the following arterial roads: Somerset St. West and Preston St. and within 500 m of Hwy #417.

    b. A Transportation Noise and Vibration Assessment is required as the subject development is located within 75m proximity of the Trillium LRT line.

    c. 2013_05_29_Guidelines_NewDevelopment_E CPCS Report Appendix_F.pdf

    d. A Stationary Noise Assessment is required in order to assess the noise impact of the lands zoned industrial located within 100m of the subject site. (Lands east of Breezehill Ave. as well as City Centre).

    e. https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Feel free to contact Vincent Duquette, Infrastructure Project Manager, for follow-up questions.

Transportation

Comments:

    a. See Schedule C16 of the Official Plan.

    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

10. The Screening Form has indicated that the TIA Triggers have been met. Please proceed with the TIA Step 2 – Scoping report.

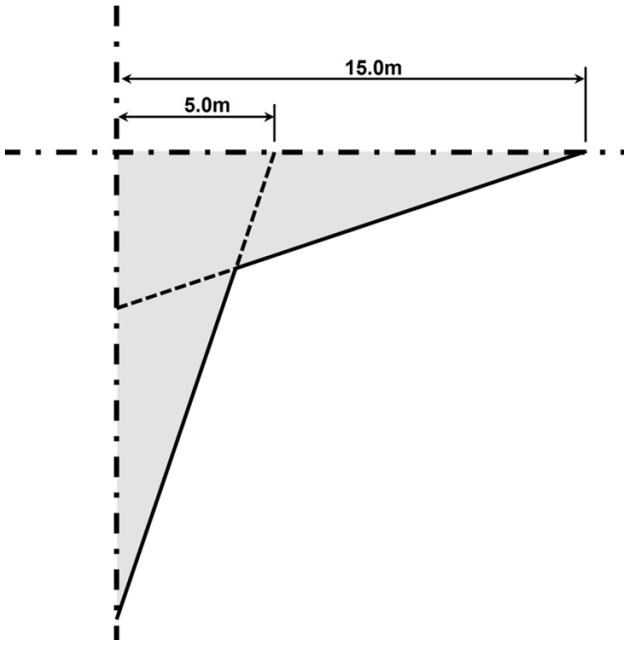
11. Somerset Street is designated as an Arterial Road within the City's Official Plan with a ROW protection limit of 20.0 metres between Breezehill Avenue N and Preston Street. The ROW protection limit and the offset distance (10.0 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

12. Preston Street is designated as an Arterial Road within the City's Official Plan with a ROW protection limit of 23.0 metres between Albert Street and Carling Avenue. The ROW protection limit and the offset distance (11.5 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

13. ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the city. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

14. Two 5.0 metres x 15.0 metres corner triangles are required at the intersection of Somerset Street W and Preston Avenue based on Schedule C16 of the Official Plan. The 5.0 metres x 15.0 metres corner triangles area should be conveyed to the city ROW. The corner triangle dimensions are to be measured from the ROW protected limits. The development proponent should protect the corner triangle to accommodate protected intersections per Schedule C16 policies 2.1.1 (e) & (f). The shape of the triangle should consist of two overlapping 5 metres x 15 metres. This is illustrated in the image below.

Corner Triangle



15. Please keep in mind that on street parking is not a viable option for tenants. Ensure that potential tenants are aware that there is no provision for parking.

16. The consultant should review the sight distance to the access and any obstructions that may hinder the view of the driver.

17. The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb, and boulevard to City standards.

18. Private accesses to Roads should comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process.

19. Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be in safe, secure places near main entrances and preferably protected from the weather.

20. Should the property Owner wish to use a portion of the City's Road allowance for construction staging, prior to obtaining a building permit, the property Owner must obtain an approved Traffic Management Plan from the Manager, Traffic Management, Transportation Services Department. The city has the right for any reason to deny use of the Road Allowance and to amend the approved Traffic Management Plan as required.

21. From Emmett – The alignment of the active transportation paths may not be adhered to. There is an desire line from Gladstone Village through the potential sports fields and north through the underpass to City Centre – should be given some thought.

22. From Emmett – Tranportation department only takes on the cost of maintaining warranted intersections. The one proposed may not be warranted, so who is paying for this needs to be determined.

Feel free to contact Wally Dubyk, Transportation Project Manager, for follow-up questions.

Environment

23. Bird-safe Design Please review and incorporate bird safe design elements. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf
24. Urban Heat Island - Please add features that reduce the urban heat island effect (see OP 10.3.3) produced by the parking lot and a building footprint. For example, this impact can be reduced by adding large canopy trees, green roofs or vegetation walls, or constructing the parking lot or building differently.

25. Intake Zone - GeoOttawa indicates that a portion of the site is in the Intake Protection Zone, area of land that provides overland flow and this should be considered with stormwater management – however staff have reviewed and concluded proposed development does not include any significant drinking water threat activities, so this comment is for information only.

26. There is no trigger for an environmental impact study.

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

27. Existing Trees

    a. Please provide an inventory plan documenting species, diameter and health condition

    b. If information on potential retention or removal status is known at this time, please provide it

28. Future Tree Planting

a. Please provide a conceptual landscape plan that shows potential planting locations

b. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. Please show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.

29. Tree information in the Planning Rational

a. Please provide a planned approach to tree retention and planting citing OP policies wherever possible

b. Ensure that minimum soil volume requirements are mentioned

Feel free to contact Mark Richardson, Forester, (mark.ricahrdson@Ottawa.ca) for follow-up questions.

Parkland

Parks staff were not in attendance or provided comments but have been involved in the process to date.

Heritage

Comments:

30. A Heritage Impact Assessment will be required as part of the zoning by-law amendment as per section 4.5.2.2 of the OP. We would mostly be looking to evaluate the impact of the proposed development, if any, on Plant Bath (designated under Part IV of the OHA). It would be helpful if the Impact Assessment contain a reference to 951 Gladstone (the former Standard Bread building) as a nearby heritage resource. The guidelines for preparing an HIA can be found here.

31. For a project of this scale, we sometimes also ask for a conservation plan to allow us to secure needed conservation works on a heritage resource as part of the development process. Given that Plant Bath is generally in good condition though and that the City is the steward, we will not be asking for one for this project.

32. A Heritage Permit will be required following the planning processes.

Feel free to contact Ashley Kotarba, Heritage Planner, for follow-up questions.

Community issues

Comments:

Dalhousie Community Association

North-South Road Through Site -Problems

1. Safety of people and kids moving along central east-west connection from Plouffe Park play structure area to New Park.
2. Car drop off proposed in north half of road but no turn-around space shown. Would be unsafe to do so in area of east-west path.
3. Location of south half of road is shown crossing the western end of the existing Plouffe Park. This is over the flood basin, one soccer field, the only mature treed portion of the entire site. The 1010 team assured us the road would actually be west of the west end of Plouffe Park. So, the location of the road is incorrectly shown. (The road will therefore have to jog at the east-west central path)
4. Only 3 buses (plus 1 para-bus) serve LA (which is what is shown on dwg.) There is room for them on Oak. Parent drop of at LA only 5 cars at any one time. Room for that also.
    a. students must cross bus lane to get to Plouffe Park. Risky
    b. entire length of bus lane flanking school not required as fire lane. If fire lane needed it could be dead end.
5. Accessible parking for new Rec. Facility can be accommodated within surface lot in front of Plant Red Centre. Why is there a line of parking (some new) along west side of Plant Rec.? Any talk of lifting 'no-surface-parking' prohibition premature.

Park Configuration

6. New park is sort of hidden away behind buildings.
7. The existing long ramp/green corridor (shown as MUP on CISP) connecting from Somerset has disappeared. This is the critical public access from the west to the Trillium path and to the new park.
8. Between the new park and Somerset is wall of buildings with only 2 narrow sidewalks beside busy driveways. This needs to be opened up.
    a. "*Parks should be of a shape and configuration that provides appropriate access and visibility*" (OP 4.4)
    b. "*min. 50% of park perimeter shall be continuous frontage on abutting streets*" OP. 4.4.6.E
9. Provide a swath of parkland into new park from Somerset. This could be done by relocating "mid-rise" building

Height Change at Mid-Rise

10. - CISP shows 3 towers along Somerset of 30, 25 and 18 storeys. Proposed Mid-rise building is roughly where the 18-storey tower is shown. Didn't know an OP change to put a 9-storeys instead of 18 was needed.

Future Residential Development Site

11. -an additional tower is being squeezed in at the expense of providing sufficient new park and at the expense of the existing MUP ramp.

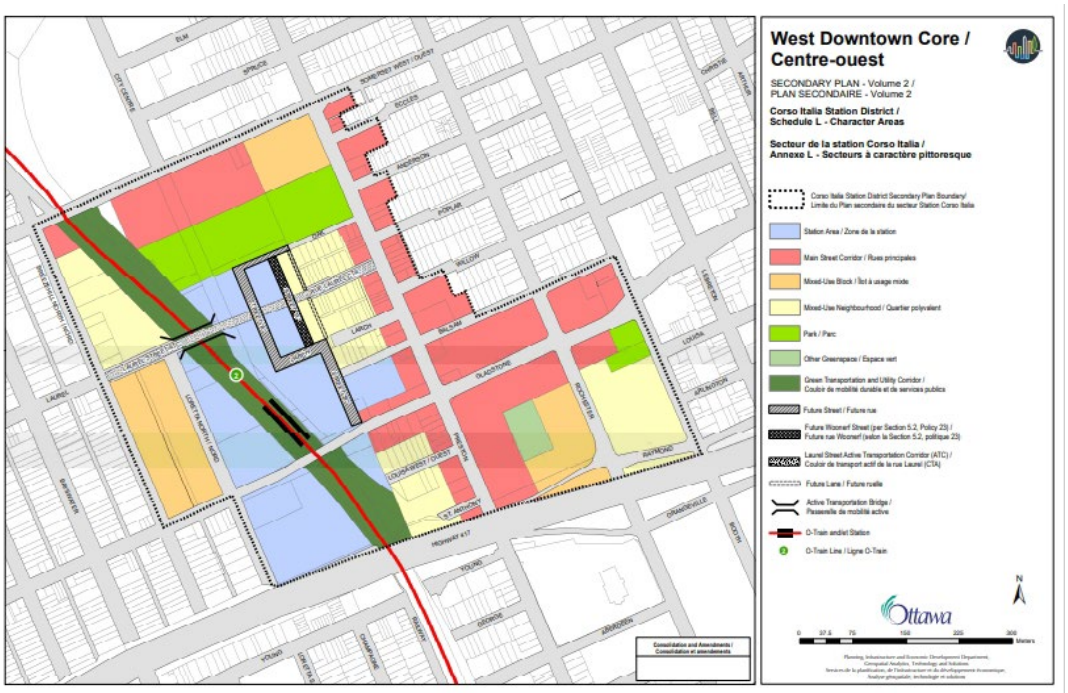
Park Size

1. -the new park shown is actually smaller than the 1 Ha noted.
    a. Cannot claim that the Heating Plant is parkland
    b. the bus road being incorrectly located on the drawing on top of Plouffe Park, will, when corrected, push the school westward and reduce new park area.
    c. front lawn along Oak in front of school cannot be claimed to be park. that leaves only 0.84 Ha of new parkland.

2. The OP targets 4 Ha/1000 and recommends the existing average of 2.0 Ha.
3. But downtown transect is only 0.5 Ha/1000
4. CISP anticipates 14,000 new folks. Over 3,000 new DU already in various planning stages. Just to keep status quo we need 7 Ha.
5. CISP shows 1.5Ha
6. Prov. Policy. Statement calls for the provision of "*equitable*" distribution of parks (1.5.1.b). Obviously the quantity of park in this area is not equitable.
7. the OP states that "*the acquisition of large parks in the Downtown Core and inner Urban area will be prioritised where opportunities arise". (4.4.3)*
8. This is an opportunity; but we are throwing it away if we put buildings as the higher priority; so
    - why has the area of the "Future Residential Development Zone" increased? and,
    - why is the footprint of the proposed Rec. Facility so large? and
    - why is the "Mid-Rise Building not on top of the new Rec. Facility?
9. The total building footprint on site needs to be reduced

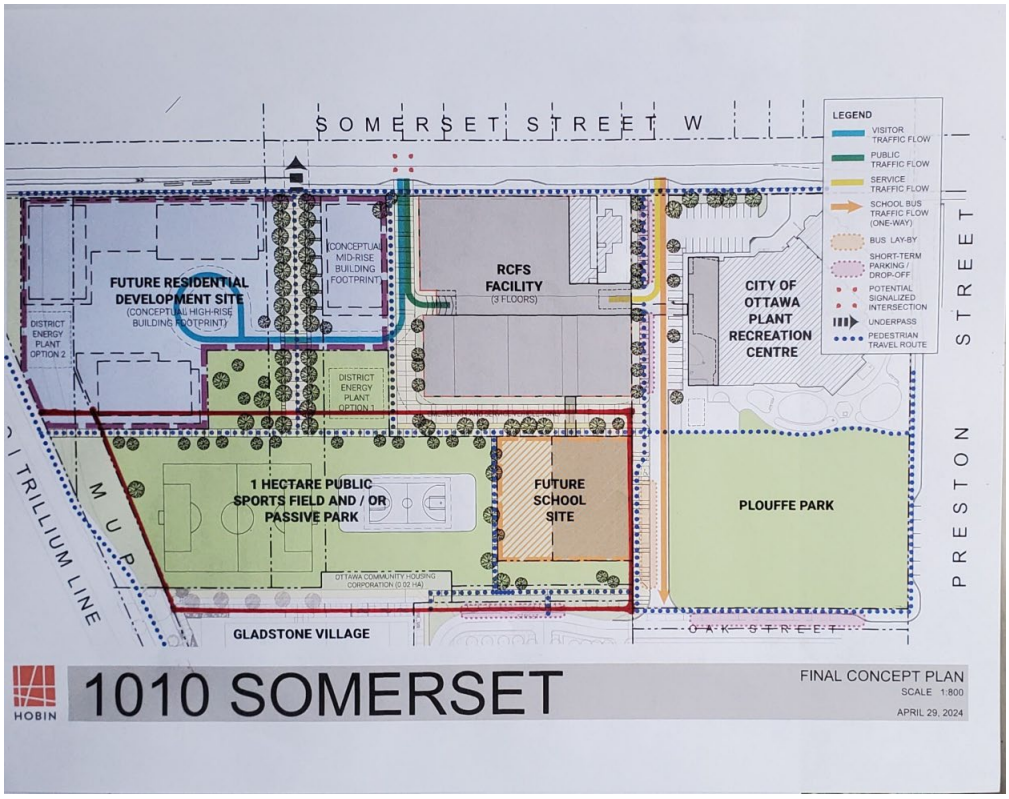
10. Schedule "L" shows 1.5 Ha of new parkland. That's what the public saw;
11. a green swath, half the width of the Oak-to-Somerset block running, unbroken from Plouffe Park to the MUP.

    OP Schedule L and Concept Plans below:

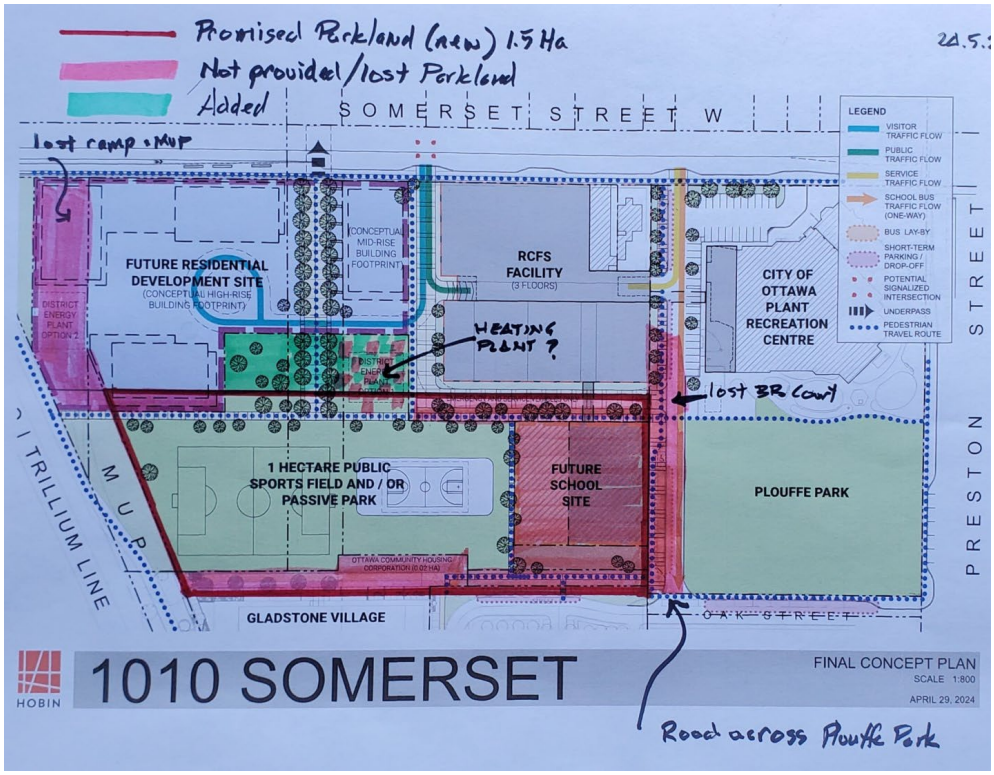


CIDSP Schedule "L"

Schedule L Blow-up



Outline of New Parkland from Schedule L overlaid onto May 2024 Concept Plan



Areas of Lost Parkland

Other Comments or Concerns:

12. If the new parkland must be separated from Plouffe Park, at least
    - open it up to Somerset instead and
    - provide the full 1.5 Ha shown, and
    - relocate the heating plant out of the park, and
    - keep the Future Residential Development Zone close by Somerset

13. **Mud:** Ever since Plouffe Park was reconstructed as a storm drainage basin, the playing surface has been terrible. Aeration, seeding, top dressing, use abstinence have all failed to rectify how the peculiarities of the soil, sub-grade and special drainage infrastructure conspire against a proper playing surface.
    a. The daily addition of 450 kids will create a mud bath!

14. Reconstruction will need to be complete prior to the new school opening.

15. PPS: There is no pedestrian crossing on Somerset between Preston and Bayswater. So the proposed signalization shown is beneficial to pedestrians and cyclists wishing to access site.

We should be able to accept the discontinuity of the new park once the other issues we have raised have been resolved.

16. In its present iteration, this "Final" Concept Plan has too many unresolved issues, is too vague, and is too inaccurate to be the basis of any OPA or Zoning determination.

Submission Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
2. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,

Erin O’Connell

Encl. Study and Plan Identification List

Terms of Reference for Urban Design Brief

c.c.
Vincent Duquette
Natassia Pratt
Wally Dubyk
Emmett Proulx
Mark Richardson
Mike Russett
Kevin Wherry
Jennifer Shepherd
Christopher Moise
Taavi Siitam
Matthew Hayley
Amy MacPherson
Edith Tam
Ashley Kotarba
David Seaborn
Catherine Boucher

Appendix C Potable Water Analysis

C.1 Domestic Water Demand

1010 Somerset Street Adequacy of Services - Domestic Water Demand Estimates

Based on 1010 Somerset Street Concept Plan and site statistics provided by Hobin dated May 21, 2025 and November 19, 2024 respectively. Future School based on 45 Oak Street site plan provided by Hobin on April 9, 2025.

Project No. 160402067 Designed by: WAJ
Date: 6/3/2025 Checked by:
Revision: 02

Population densities per Table 4.1 City of Ottawa Water Design Guidelines:		
1 Bedroom Apt.	1.4	ppu
2 Bedroom Apt.	2.1	ppu
3 Bedroom Apt.	3.1	ppu
Demand conversion factors per Table 4.2 of the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03:		
Residential	280	L/cap/day
Commercial and Institutional	28000	L/ha/day
Light Industrial	35000	L/ha/day
Future School population densities per Appendix 4A of the City of Ottawa Sewer Design Guidelines:		
Day School with cafeteria, gym, and showers	90.0	l/person/day

Building ID	Area (ha)	No. of Units	Population	Avg Day Demand		Max Day Demand [1,2]		Peak Hour Demand [1,2]	
				(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Oak Street Connection									
Future School (847 Students, 88 Daycare, 100 Staff)			1035	64.7	1.1	97.0	1.6	174.7	2.9
Somerset Street/Champagne Avenue Connection									
Future High Density Block (total 480 units)									
1 Bedroom (60% assumed)		288	403	78.4	1.3	196.0	3.3	431.2	7.2
2 Bedroom (35% assumed)		168	353	68.6	1.1	171.5	2.9	377.3	6.3
3 Bedroom (5% assumed)		24	74	14.5	0.2	36.2	0.6	79.6	1.3
Subtotal		**480**	**830**	**161.5**	**2.7**	**403.7**	**6.7**	**888.1**	**14.8**
Conceptual Mid-Rise (total 60 units)									
1 Bedroom (60% assumed)		36	50	9.8	0.2	24.5	0.4	53.9	0.9
2 Bedroom (35% assumed)		21	44	8.6	0.1	21.4	0.4	47.2	0.8
3 Bedroom (5% assumed)		3	9	1.8	0.0	4.5	0.1	9.9	0.2
Subtotal		**60**	**104**	**20.2**	**0.3**	**50.5**	**0.8**	**111.0**	**1.9**
Residential Subtotal		**540**	**934**	**181.7**	**3.0**	**454.1**	**7.6**	**999.1**	**16.7**
Institutional, Commercial, and Industrial									
Recreation and Cultural Facility Block	1.02			19.9	0.3	29.8	0.5	53.7	0.9
Tower A+B Commercial Podium	0.23			4.5	0.1	6.8	0.1	12.2	0.2
Subtotal	**1.25**			**24.4**	**0.4**	**36.6**	**0.6**	**65.9**	**1.1**
Parkland[3]									
Sportsfield and/or passive park	1.00			19.4	0.3	29.2	0.5	52.5	0.9
Non-Residential Subtotal	**2.25**			**43.8**	**0.7**	**65.8**	**1.1**	**118.4**	**2.0**
Somerset Street/ Champagne Avenue Total :	**2.25**	**540**	**934**	**225.5**	**3.8**	**519.9**	**8.7**	**1117.4**	**18.6**
Grand Total Site :	**2.25**	**540**	**1969**	**290.2**	**4.8**	**616.9**	**10.3**	**1292.1**	**21.5**

1 The City of Ottawa water demand criteria used to estimate peak demand rates for residential areas are as follows:
maximum day demand rate = 2.5 x average day demand rate
peak hour demand rate = 2.2 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

2 Water demand criteria used to estimate peak demand rates for commercial and institutional areas are as follows:
maximum daily demand rate = 1.5 x average day demand rate
peak hour demand rate = 1.8 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

3 Parkland assumed to be institutional demands

C.2 Fire Flow Demand (2020 FUS)

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 1
Description: Recreation and Cultural Facility (3 floors)

Notes: Assumed worst-case with firewall proposed facing 1000 Somerset

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		4678	4678	4678								7017	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	15000
4	Determine Occupancy Charge	Limited Combustible										-15%	12750
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3825
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	0 to 3	26	2	41-60	Type V	YES				0%	765
		East	0 to 3	32	2	61-80	Type V	YES				0%	
		South	10.1 to 20	76	3	> 100	Type I-II - Protected Openings	NO				3%	
		West	10.1 to 20	72.5	3	> 100	Type I-II - Protected Openings	NO				3%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											10000
		Total Required Fire Flow in L/s											166.7
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											1200

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 2
Description: Recreation and Cultural Facility (3 floors)

Notes: Assumed worst-case separation to 973 Somerset and Plant Bath Recreation Center.

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		4678	4678	4678								7017	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	15000
4	Determine Occupancy Charge	Limited Combustible										-15%	12750
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-3825
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	20.1 to 30	50	2	81-100	Type V	NO				8%	2295
		East	20.1 to 30	40.5	1	41-60	Type V	NO				4%	
		South	10.1 to 20	76	2	> 100	Type I-II - Protected Openings	NO				3%	
		West	10.1 to 20	72.5	3	> 100	Type I-II - Protected Openings	NO				3%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											11000
		Total Required Fire Flow in L/s											183.3
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											1320

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 3
Description: Conceptual Mid-Rise (6 floors)

Notes:

Step	Task	Notes									Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction									0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?				YES	-
		996	996	996							1494	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min									-	7000
4	Determine Occupancy Charge	Limited Combustible									-15%	5950
5	Determine Sprinkler Reduction	Conforms to NFPA 13									-30%	-1785
		Non-Standard Water Supply or N/A									0%	
		Not Fully Supervised or N/A									0%	
		% Coverage of Sprinkler System									100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?		-	-
		North	20.1 to 30	24	2	41-60	Type V		NO		4%	417
		East	10.1 to 20	41.5	3	> 100	Type I-II - Protected Openings		NO		3%	
		South	> 30	24	2	41-60	Type I-II - Protected Openings		NO		0%	
		West	20.1 to 30	41.5	6	> 100	Type I-II - Protected Openings		NO		0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**										**5000**
		Total Required Fire Flow in L/s										**83.3**
		Required Duration of Fire Flow (hrs)										**1.75**
		Required Volume of Fire Flow (m^3)										**525**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 4
Description: Future School (4 floors + 2 floor expansion)

Notes:

Step	Task	Notes									Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction									0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?				YES	-
		1590	1590	1590							2385	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min									-	9000
4	Determine Occupancy Charge	Limited Combustible									-15%	7650
5	Determine Sprinkler Reduction	Conforms to NFPA 13									-30%	-2295
		Non-Standard Water Supply or N/A									0%	
		Not Fully Supervised or N/A									0%	
		% Coverage of Sprinkler System									100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?			-	-
		North	10.1 to 20	50.8	3	> 100	Type I-II - Protected Openings	YES			0%	0
		East	> 30	46.8	3	> 100	Type V	NO			0%	
		South	> 30	23.1	3	61-80	Type V	NO			0%	
		West	> 30	46.8	3	> 100	Type V	NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min										5000
		Total Required Fire Flow in L/s										83.3
		Required Duration of Fire Flow (hrs)										1.75
		Required Volume of Fire Flow (m^3)										525

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 5
Description: Future High Density Tower A (25 floors)

Notes:

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		1184	1184	1184								1776	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	7000
4	Determine Occupancy Charge	Limited Combustible										-15%	5950
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-1785
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	> 30	28	1	21-49	Type V	NO				0%	357
		East	10.1 to 20	43	20	> 100	Type I-II - Protected Openings	NO				3%	
		South	10.1 to 20	24	15	> 100	Type I-II - Protected Openings	NO				3%	
		West	> 30	38	2	61-80	Type V	NO				0%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**5000**
		Total Required Fire Flow in L/s											**83.3**
		Required Duration of Fire Flow (hrs)											**1.75**
		Required Volume of Fire Flow (m^3)											**525**

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 6
Description: Future High Density Tower B (20 floors)

Notes:

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		836	836	836								1254	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	6000
4	Determine Occupancy Charge	Limited Combustible										-15%	5100
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-1530
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	> 30	42	1	41-60	Type V	NO				0%	153
		East	20.1 to 30	18	6	> 100	Type I-II - Protected Openings	NO				0%	
		South	> 30	40	15	> 100	Type I-II - Protected Openings	NO				0%	
		West	10.1 to 20	20	20	> 100	Type I-II - Protected Openings	NO				3%	
7	Determine Final Required Fire Flow	**Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min**											**4000**
		Total Required Fire Flow in L/s											**66.7**
		Required Duration of Fire Flow (hrs)											**1.50**
		Required Volume of Fire Flow (m^3)											**360**

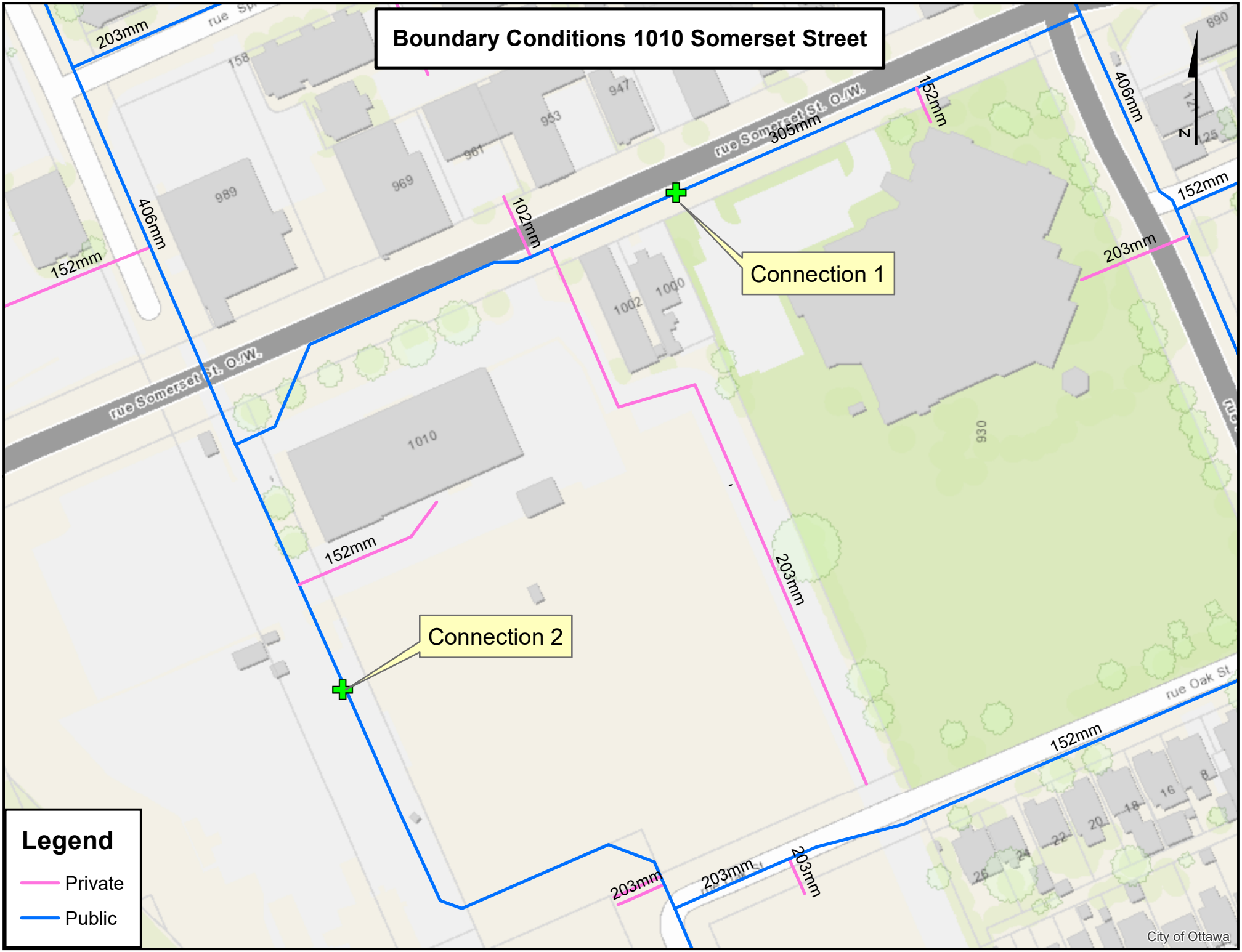
FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160402067
Project Name: 1010 Somerset Street
Date: 6/5/2025
Fire Flow Calculation #: 7
Description: Future High Density Tower C (15 floors)

Notes:

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction										0.8	-
2	Determine Effective Floor Area	Sum of Largest Floor + 25% of Two Additional Floors					Vertical Openings Protected?					YES	-
		1070	1070	1070								1605	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	7000
4	Determine Occupancy Charge	Limited Combustible										-15%	5950
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-1785
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										100%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall	Firewall / Sprinklered ?				-	-
		North	10.1 to 20	47.6	15	> 100	Type I-II - Protected Openings	NO				3%	179
		East	> 30	24	3	61-80	Type I-II - Protected Openings	NO				0%	
		South	> 30	41.6	15	> 100	Type V	NO				0%	
		West	> 30	24	2	41-60	Type V	NO				0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											4000
		Total Required Fire Flow in L/s											66.7
		Required Duration of Fire Flow (hrs)											1.50
		Required Volume of Fire Flow (m^3)											360

C.3 Boundary Conditions 1010 Somerset Street (City of Ottawa)


Boundary Conditions 1010 Somerset Street
Connection 1
Connection 2
rue Somerset St. O./W.
rue Somerset St. O./W.
rue Oak St
203mm
406mm
152mm
102mm
305mm
152mm
406mm
152mm
203mm
152mm
203mm
203mm
203mm
203mm
152mm
158
989
969
961
953
947
1002
1000
1010
930
890
N
Legend
Private
Public
City of Ottawa

Johnson, Warren

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, January 14, 2025 12:22 PM
To: Johnson, Warren
Cc: Tam, Edith
Subject: RE: 1010 Somerset Street Boundary Conditions
Attachments: 1010 Somerset Street January 2025.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Warren,

The following are boundary conditions, HGL, for hydraulic analysis at 1010 Somerset Street (zone 1W) assumed to be connected via two connections to the 300mm watermain on Somerset Street AND 400mm watermain (see attached PDF for location).

Both Connections:
Minimum HGL = 107.7 m
Maximum HGL = 115.3 m
Max Day + Fire Flow (183.3 L/s) = 109.0 m (Connection 1), and 108.2 m (Connection 2)

The maximum pressure is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Duquette, Vincent
Sent: January 06, 2025 11:22 AM
To: Johnson, Warren <Warren.Johnson@stantec.com>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Warren,

Boundary condition request has been submitted to our water resource group using the latest revised demands.
I will keep you posted when I get the results. Result typically take 3-4 week to obtain.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: December 20, 2024 1:49 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Vincent,

Apologies, I noticed a minor typo in the water demand calculations. See attached corrected calculation sheet with the revised demands summarized here:

- Average Day Demand: 4.1 L/s (243.2 L/min)
- Maximum Day Demand: 9.1 L/s (546.4 L/min)
- Peak Hour Demand: 19.4 L/s (1165.2 L/min)

Thanks, and have a great holiday!

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

From: Johnson, Warren
Sent: Friday, December 20, 2024 11:31 AM
To: vincent.duquette@ottawa.ca
Cc: Moroz, Peter <peter.moroz@stantec.com>; Thiffault, Dustin <Dustin.Thiffault@stantec.com>; Bays, Eric <Eric.Bays@stantec.com>
Subject: 1010 Somerset Street Boundary Conditions

Hi Vincent,

We would like to request boundary conditions for the City of Ottawa development on 1010 Somerset Street. The proposed development consists of a Recreation and Cultural Facility, school, district energy plant, mid-rise (6 floors and 60 units), high density towers (max 25 floors and total 480 units), and a sports field/passive park.

The proposed site is expected to be serviced via connections to the existing 400 mm diameter watermain in Champagne Avenue and the 300 mm diameter watermain in Somerset Street which are highlighted on the attached conceptual site servicing plan.

Estimated domestic demands based on the City of Ottawa guidelines and fire flow requirements for the site are as follows:

- Total domestic demands:
  - Average Day Demand: 5.0 L/s (301.4 L/min)
  - Maximum Day Demand: 11.5 L/s (692.0 L/min)
  - Peak Hour Demand: 24.8 L/s (1485.4 L/min)
- Maximum Fire Flow Demand per FUS methodology: 183.3 L/s (11,000 L/min)

Attached is a conceptual site servicing plan, site plan, water demand, and fire flow calculations.
Please let me know if you have any questions or need additional information.

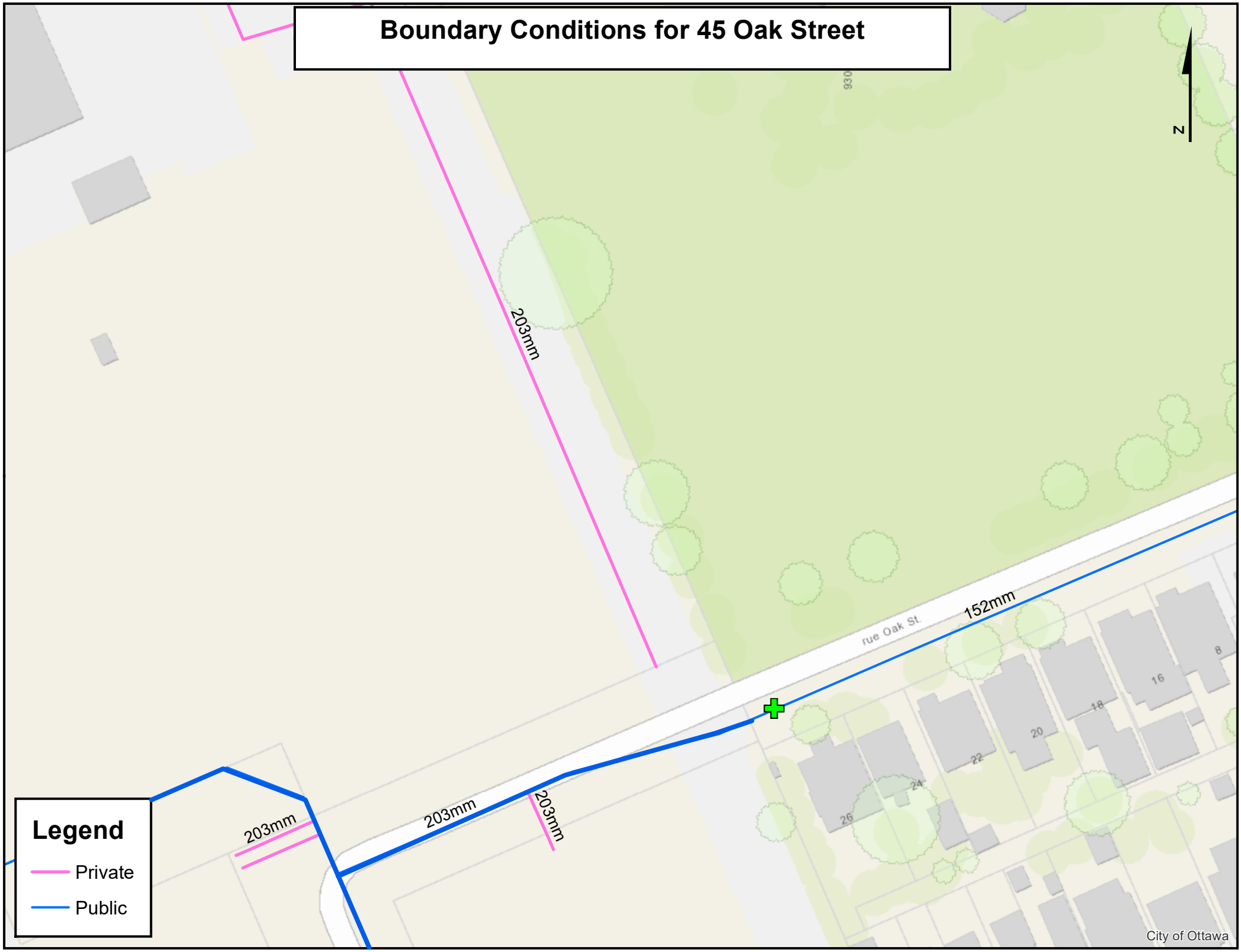
Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

C.4 Boundary Conditions 45 Oak Street (City of Ottawa)


Boundary Conditions for 45 Oak Street
N
203mm
rue Oak St.
152mm
203mm
203mm
203mm
Legend
Private
Public
City of Ottawa

From: Duquette, Vincent
To: Moroz, Peter
Cc: Abdulkarim, Yasser; Rheal Labelle; Johnson, Warren; Melanie Lamontagne; Mottalib, Abdul; Tam, Edith
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions
Date: Monday, April 14, 2025 10:10:06 AM
Attachments: image001.png
45 Oak Street April 2025.pdf

Hi Peter,

The following are boundary conditions, HGL, for hydraulic analysis at 45 Oak Street (zone 1W) assumed to be connected via dual connection to the 152mm watermain on Oak Street (see attached PDF for location).

Minimum HGL = 107.3 m
Maximum HGL = 114.9 m
Max Day + Fire Flow (83.3 L/s) = 106.3 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Moroz, Peter <peter.moroz@stantec.com>
Sent: April 11, 2025 1:04 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>; Tam, Edith <Edith.Tam@ottawa.ca>
Cc: Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>; Rheal Labelle <rlabelle@hobinarc.com>; Johnson, Warren <Warren.Johnson@stantec.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Vincent, any updates on the boundary conditions? My understanding is that CEPEO wants to make a submission as soon as possible, and we need this information to finalize the civil package.

thx

Peter

Peter Moroz P.Eng., MBA
Business Center Practice Lead - Community Development (Atlantic & Ontario East)
Stantec
300 - 1331 Clyde Avenue Ottawa ON K2C 3G4
Cell: (613) 294-2851

peter.moroz@stantec.com

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Wednesday, April 2, 2025 6:34 PM
To: Moroz, Peter <peter.moroz@stantec.com>; Tam, Edith <Edith.Tam@ottawa.ca>
Cc: Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>; Rheal Labelle <rlabelle@hobinarc.com>; Johnson, Warren <Warren.Johnson@stantec.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Peter,

Thanks for the info about the phases. I will let you know when I receive the boundary conditions.

@Tam, Edith the ownership structure for this site and the entire 1010 Somerset parcel has not been communicated to us and will impact how we review the servicing. If you could share any information you have regarding this subject that would be greatly appreciated.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Moroz, Peter <peter.moroz@stantec.com>
Sent: April 02, 2025 9:20 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>; Rheal Labelle <rlabelle@hobinarc.com>; Johnson, Warren <Warren.Johnson@stantec.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Tam, Edith <Edith.Tam@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Vincent, my understanding is that we are going with 4 storey building, but there are plans to add 2 more storeys in the future subject to funding. The timing of that is unknown. At this stage we want to make sure we check for both conditions in case there are some service upgrades that can be done at this stage that will accommodate future addition of the 2 storeys or highlight any potential issues.

The ROW agreements will be discussed on Thursday between Robin, Edith and CEPEO, and they can provide you with more information on this topic.

Peter

Peter Moroz P.Eng., MBA
Business Center Practice Lead - Community Development (Atlantic & Ontario East)
Stantec
300 - 1331 Clyde Avenue Ottawa ON K2C 3G4
Cell: (613) 294-2851

peter.moroz@stantec.com

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, April 1, 2025 8:20 PM
To: Johnson, Warren <Warren.Johnson@stantec.com>; Moroz, Peter <peter.moroz@stantec.com>
Cc: Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>; Rheal Labelle <rlabelle@hobinarc.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Tam, Edith <Edith.Tam@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Warren,

I am ok using the 70 L/day per student demand.
However I need to know more about the building phasing plan before I can comment on the phased water servicing approach. Will the upcoming SPC application be for both phases or only phase 1? How long will it be in between each phase being built?

I will request boundary conditions based on the 90 L/day per student demand with two connections on Oak St. Domestic demands will most likely not govern, it should be fireflow. If the boundary conditions come back too low, we can revise the domestic demand numbers accordingly to see if they work with 70 L/day per student.

Please attached the marked up servicing cross section with my comments and questions. Can you also please confirm if the proposed bus laneway will be privately owned or become city ROW? Please note that any non-standard ROW cross-sections must go through the deviation process.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: March 18, 2025 2:31 PM
To: Moroz, Peter <peter.moroz@stantec.com>; Duquette, Vincent <Vincent.Duquette@ottawa.ca>

Cc: Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>; Rheal Labelle <rlabelle@hobinarc.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Tam, Edith <Edith.Tam@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Vincent,

We confirmed with the architect that there will be no showers in the school so a lower demand rate could be used (see attached 70Lpd demand calculations). The intent is to phase the building (4 storeys in Phase 1 and the remaining 2 storeys in Phase 2). In Phase 1 the demand is less than the 50m3/day threshold for dual services so a phased approach to the water servicing could be utilized. However, in Phase 2 the 50m3/day threshold is exceeded so the dual service would be needed at that stage.

Since the dual services will be required in the ultimate condition regardless, it would likely be best to install them both off Oak Street during Phase 1 to avoid having multiple water meters in the building. See attached conceptual section for the 6m access lane showing how the dual watermains could fit (a superelevated lane with one CB would be required). If this is acceptable to the City we would like to proceed with the previously submitted 90 L/person/day demands (attached) for the boundary conditions for conservatism.

If you would like to discuss let me know.

Thanks,

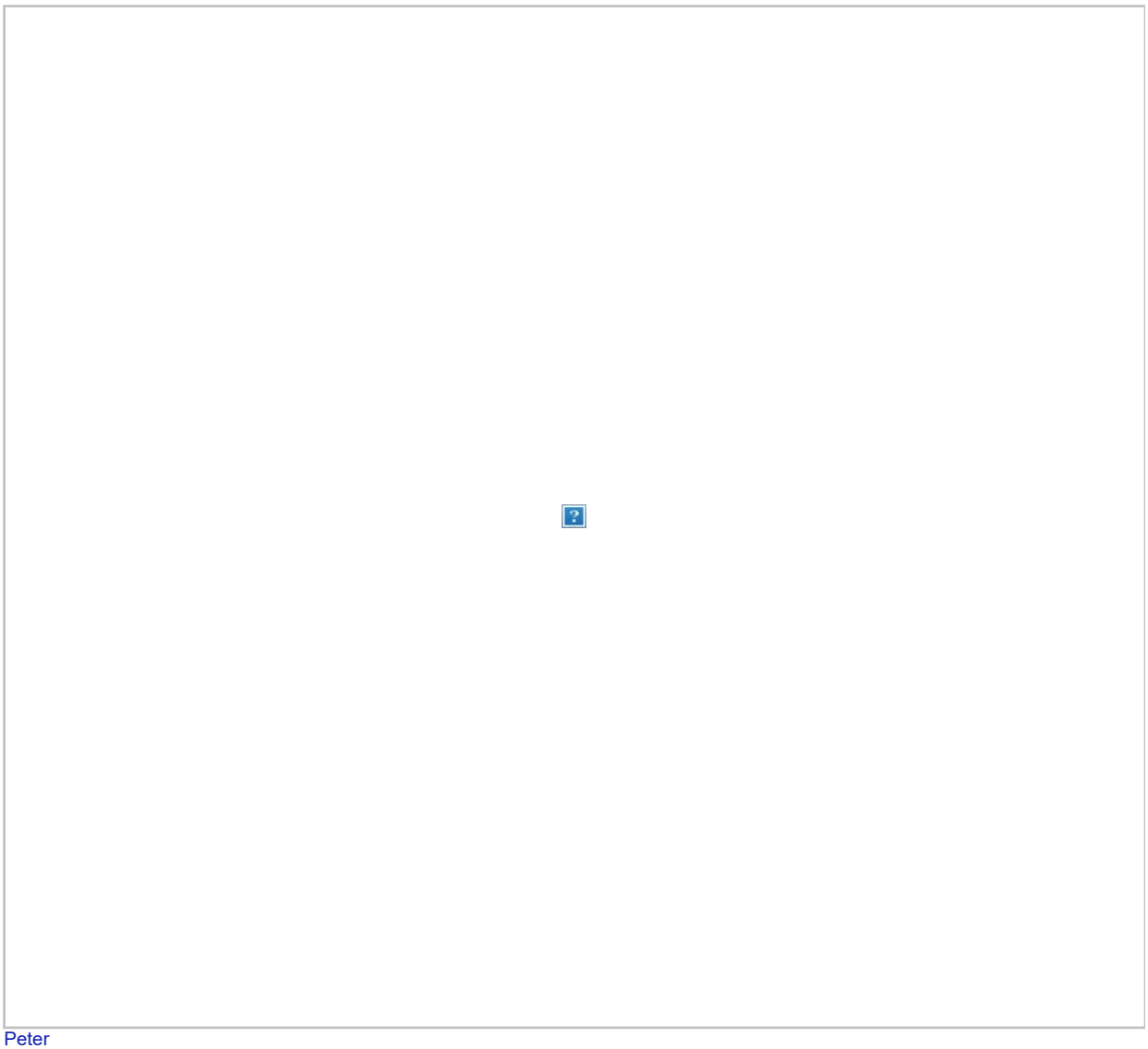
Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

From: Moroz, Peter peter.moroz@stantec.com
Sent: Tuesday, March 18, 2025 12:06 PM
To: Duquette, Vincent Vincent.Duquette@ottawa.ca
Cc: Abdulkarim, Yasser yasser.abdulkarim@ottawa.ca; Rheal Labelle rlabelle@hobinarc.com; Johnson, Warren <Warren.Johnson@stantec.com>; Melanie Lamontagne <melaniel@hobinarc.com>; Tam, Edith <Edith.Tam@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Vincent, the double watermain in 6m easement will be difficult to accomplish. We will have to confirm whether we can fit all these service pipes in this narrow corridor. With regards to storm, unfortunately, the existing 300mm dia and 375mm dia. storm pipes on Oak which were installed by OCH subdivision do not have sufficient capacity for the school. If the City and School want to connect to Oak with storm, we will need to provide a secondary storm pipe along the north boulevard of Oak street as per my sketch, or upgrade the already installed pipe which will further escalate costs given that these would be remove and replace costs. The other alternative to Oak connection for storm would be to construct the ultimate storm connection as highlighted in green, or part of the ultimate storm with temporary connection through the field per clip below, however, I am under the impression the City is not prepared to run any services through the main complex at this time. We will need direction on this from the City/School as it changes the storm design significantly. thx



Peter

Peter Moroz P.Eng., MBA
Business Center Practice Lead - Community Development (Atlantic & Ontario East)
Stantec
300 - 1331 Clyde Avenue Ottawa ON K2C 3G4
Cell: (613) 294-2851

peter.moroz@stantec.com

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, March 18, 2025 11:46 AM
To: Johnson, Warren <Warren.Johnson@stantec.com>
Cc: Moroz, Peter <peter.moroz@stantec.com>; Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Warren,

Thanks for clarifying the distance between buildings is more than 30m. FUS calculations are ok.
Option 1 does not meet the independent redundant servicing criteria. Option 2 would meet that criteria. Would you like me to request boundary conditions for Option 2?

I also wanted to ask what is the planned outlet for the storm flows generated from the site? There is limited capacity

within the segments of the storm sewer on Oak St.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: March 18, 2025 11:02 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Moroz, Peter <peter.moroz@stantec.com>; Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Vincent,

The scale of 1:350 noted on the architects site plan is incorrect and should read 1:500. There is roughly 34m from the school to the future townhomes to the south.

See attached conceptual sketches showing where the dual water services may be located. Option 1 is preferable as the access lane is only 6m wide and will not allow for storm, sanitary, dual watermains, and catch basins. If this is unacceptable, option 2 may require the building to be shifted to allow for a wider access lane. Both options would be serviced from the existing 150mm diameter watermain on Oak Street so it should not impact the boundary condition request. Let me know your thoughts.

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, March 18, 2025 10:21 AM
To: Johnson, Warren <Warren.Johnson@stantec.com>
Cc: Moroz, Peter <peter.moroz@stantec.com>; Abdulkarim, Yasser <yasser.abdulkarim@ottawa.ca>
Subject: RE: 45 Oak Street School - Watermain Boundary Conditions

Hi Warren,

Domestic demands look good. For the FUS calculations, shouldn't there be an exposure increase to south? Looks like the proposed townhomes are less than 30m away.
I also wanted to point out that the average day demand exceeds 0.58 L/s (50 m^3/day) which triggers the need for dual service. Please update to the sketch to show the second connection location.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: March 18, 2025 8:40 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Moroz, Peter <peter.moroz@stantec.com>
Subject: 45 Oak Street School - Watermain Boundary Conditions

Hi Vincent,

We would like to request boundary conditions for the development on 45 Oak Street. The proposed development consists of a 6-storey school and associated access road. The school is anticipated to house 847 students, 88 daycares, and 100 staff as confirmed by the architect.

The proposed site is expected to be serviced via a connection to the existing 150 mm diameter watermain in Oak Street as shown on the attached watermain location sketch.

Estimated domestic demands based on the City of Ottawa guidelines and fire flow requirements for the site are as follows:

- Total domestic demands:
  - Average Day Demand: 1.1 L/s (64.7 L/min)
  - Maximum Day Demand: 1.6 L/s (97.0 L/min)
  - Peak Hour Demand: 2.9 L/s (174.7 L/min)
- Maximum Fire Flow Demand per FUS methodology: 83.3 L/s (5,000 L/min)
- Please also provide the maximum available fire flow in the main at 20 psi

Attached is a watermain location sketch, site plan, water demand, and fire flow calculations. Please let me know if you have any questions or need additional information.

I will follow up with a separate email for the sanitary capacity request.

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist
Direct: 613 784-2272

Warren.Johnson@stantec.com

Stantec

'

'

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

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Appendix D Sanitary Analysis

D.1 Sanitary Sewer Design Sheet

Stantec

SUBDIVISION:

1010 Somerset Street

DATE: 6/6/2025
REVISION: 2
DESIGNED BY: WAJ
CHECKED BY: -

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160402067

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / APARTMENT	1.8	SCHOOL	90 l/person/day		

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL				GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	SINGLE	UNITS TOWN	APT	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	POP.	ACCU. POP.	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)	VEL. (ACT.)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)			(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)	(m/s)
I11A	11	10	0.00	0	0	0	0	0.00	0	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1035	1035	0.40	0.40	1.62	0.40	0.40	0.13	1.75	32.4	250	PVC	SDR 35	0.50	42.9	**4.08%**	0.86	0.35
Ex. Sanitary Sewer (Oak Street)	10	10A	0.00	0	0	0	0	0.00	0	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	1035	0.00	0.40	1.62	0.00	0.40	0.13	1.75	5.5	250	PVC	SDR 35	1.00	60.6	**2.88%**	1.22	0.44
																														250							
R3A, G3B, I3C	3	3A	0.25	0	0	0	104	0.25	104	3.59	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.72	0	0	0.89	0.89	0.35	1.86	1.86	0.61	2.18	35.4	250	PVC	SDR 35	0.50	42.9	**5.08%**	0.86	0.38
	3A	1B	0.00	0	0	0	0	0.25	104	3.59	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0	0	0.00	0.89	0.35	0.00	1.86	0.61	2.18	8.7	250	PVC	SDR 35	0.50	42.9	**5.08%**	0.86	0.38
R2A	2	1B	0.71	0	0	0	830	0.71	830	3.28	8.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.71	0.71	0.23	9.06	10.7	250	PVC	SDR 35	0.50	42.9	**21.13%**	0.86	0.57
Ex. Combined Sewer (Champane Avenue)	1B	1A	0.00	0	0	0	0	0.96	934	3.26	9.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0	0	0.00	0.89	0.35	0.00	2.57	0.85	11.05	85.1	1500	CONCRETE	SDR 35	0.35	4409.2	**0.25%**	2.42	0.38
									934		9.85										1035			1.97			0.98	12.80		1500							

D.2 Downstream Sewer Capacity Confirmation 1010 Somerset Street (City of Ottawa)

From: Duquette, Vincent
To: Johnson, Warren
Cc: Moroz, Peter
Subject: RE: 1010 Somerset Street Boundary Conditions
Date: Wednesday, January 22, 2025 11:49:12 AM

Hi Warren,

There is no capacity concerns with sending 11.8 L/s of sanitary flows to the existing 1500 mm diameter combined sewer in Champagne Avenue.
However, seeing as this is a trunk sewer, we require asset management's permission to connect to it. I am still waiting for them to confirm the proposed connection is permitted.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: January 22, 2025 10:55 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Moroz, Peter <peter.moroz@stantec.com>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Vincent,

I am following up to see if you have heard back regarding the sanitary capacity confirmation. If you need any more information, please let me know.

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist
Direct: 613 784-2272

Warren.Johnson@stantec.com

Stantec

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, January 6, 2025 6:53 PM
To: Johnson, Warren <Warren.Johnson@stantec.com>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Warren,

The sanitary demands have been circulated to confirm capacity. I should have an answer for within two weeks.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: January 06, 2025 11:40 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 1010 Somerset Street Boundary Conditions

Thanks Vincent, hopefully you had a great holiday.
Per the pre-consultation with the City, I would also like to confirm the capacity of the downstream sanitary sewer network. The proposed site is expected to be serviced via a connection to the existing 1500 mm diameter combined sewer in Champagne Avenue as indicated on the attached conceptual sanitary

drainage area plan. The total estimated peak flow for the site is 11.8 L/s (detailed breakdown in the attached sewer design sheet).

Please let me know if you have any questions or need additional information.
Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, January 6, 2025 11:22 AM
To: Johnson, Warren <Warren.Johnson@stantec.com>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Warren,

Boundary condition request has been submitted to our water resource group using the latest revised demands.
I will keep you posted when I get the results. Result typically take 3-4 week to obtain.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: December 20, 2024 1:49 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 1010 Somerset Street Boundary Conditions

Hi Vincent,

Apologies, I noticed a minor typo in the water demand calculations. See attached corrected calculation sheet with the revised demands summarized here:

- Average Day Demand: 4.1 L/s (243.2 L/min)
- Maximum Day Demand: 9.1 L/s (546.4 L/min)
- Peak Hour Demand: 19.4 L/s (1165.2 L/min)

Thanks, and have a great holiday!

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

From: Johnson, Warren
Sent: Friday, December 20, 2024 11:31 AM
To: vincent.duquette@ottawa.ca
Cc: Moroz, Peter <peter.moroz@stantec.com>; Thiffault, Dustin <Dustin.Thiffault@stantec.com>; Bays, Eric <Eric.Bays@stantec.com>
Subject: 1010 Somerset Street Boundary Conditions

Hi Vincent,

We would like to request boundary conditions for the City of Ottawa development on 1010 Somerset Street. The proposed development consists of a Recreation and Cultural Facility, school, district energy plant, mid-rise (6 floors and 60 units), high density towers (max 25 floors and total 480 units), and a sports field/passive park.

The proposed site is expected to be serviced via connections to the existing 400 mm diameter watermain in Champagne Avenue and the 300 mm diameter watermain in Somerset Street which are highlighted on the attached conceptual site servicing plan.

Estimated domestic demands based on the City of Ottawa guidelines and fire flow requirements for the site are as follows:

- Total domestic demands:
  - Average Day Demand: 5.0 L/s (301.4 L/min)
  - Maximum Day Demand: 11.5 L/s (692.0 L/min)

    Peak Hour Demand: 24.8 L/s (1485.4 L/min)

- Maximum Fire Flow Demand per FUS methodology: 183.3 L/s (11,000 L/min)

Attached is a conceptual site servicing plan, site plan, water demand, and fire flow calculations. Please let me know if you have any questions or need additional information.

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

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D.3 Downstream Sewer Capacity Confirmation 45 Oak Street (City of Ottawa)

From: Duquette, Vincent
To: Johnson, Warren
Cc: Moroz, Peter; Mottalib, Abdul; Abdulkarim, Yasser
Subject: RE: 45 Oak Street School - Sanitary Capacity
Date: Tuesday, March 18, 2025 9:22:18 AM

Hi Warren,

There is no capacity concerns with sending 1.7L/s of sanitary flows to either of the 250mm sanitary sewer or the 375mm combined sewer segments on Oak St.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals | Gestionnaire de projet, Projets d'infrastructure
Development Review – All Ward | Direction de l'examen des projets d'aménagement - Tous les quartiers
Planning, Development and Building Services Department (PDBS)| Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West | 110 avenue Laurier Ouest
Ottawa, ON K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: March 18, 2025 8:51 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Moroz, Peter <peter.moroz@stantec.com>
Subject: 45 Oak Street School - Sanitary Capacity

Hi Vincent,

We would like to confirm the sanitary sewer capacity for the development on 45 Oak Street. The proposed development consists of a 6-storey school and associated access road. The school is anticipated to house 847 students, 88 daycares, and 100 staff as confirmed by the architect.

The proposed site is expected to be serviced via a connection to the existing 375 mm diameter combined sewer in Oak Street as shown on the attached sewer location sketch. The total estimated peak flow for the site is 1.7 L/s (see detailed breakdown in the attached sewer design sheet).

Please let me know if you have any questions or need additional information.

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

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Appendix E Storm Analysis

E.1 Storm Sewer Design Sheet

Stantec

1010 Somerset Street

DATE: 2025-06-05
REVISION: 2
DESIGNED BY: WAJ
CHECKED BY: -

FILE NUMBER: 160402067

STORM SEWER DESIGN SHEET
(City of Ottawa)

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr
a =	732.951	998.071	1174.184	1735.688
b =	6.199	6.053	6.014	6.014
c =	0.810	0.814	0.816	0.820

MANNING'S n = 0.013 BEDDING CLASS = B
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min

LOCATION			DRAINAGE AREA																						PIPE SELECTION											
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETEI (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
L104A, R104C, L104B	104	101	1.06	0.00	0.00	0.00	0.48	0.49	0.00	0.00	0.00	0.516	0.516	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	21.4	21.4	131.6	67.0	525	525	CIRCULAR	CONCRETE	-	0.30	245.7	**53.56%**	1.10	0.96	1.17
																				11.17																		
R103B, L103A	103	102	0.12	0.00	0.00	0.00	0.10	0.85	0.00	0.00	0.00	0.102	0.102	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	5.0	5.0	26.8	44.8	300	300	CIRCULAR	PVC	-	0.40	60.8	**44.11%**	0.86	0.71	1.05
R102D, R102C, R102B, L102A	102	101	0.37	0.00	0.00	0.00	0.31	0.85	0.00	0.00	0.00	0.317	0.419	0.000	0.000	0.000	0.000	0.000	0.000	11.05	72.99	98.94	115.96	169.48	15.0	20.0	105.0	36.2	450	450	CIRCULAR	CONCRETE	-	0.25	148.7	**70.62%**	0.91	0.86	0.70
																				11.75																		
	101	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.936	0.000	0.000	0.000	0.000	0.000	0.000	11.75	70.67	95.76	112.21	163.98	0.0	41.4	225.1	51.3	675	675	CIRCULAR	CONCRETE	-	0.20	392.2	**57.41%**	1.06	0.95	0.90
Ex. Storm Sewer	100	100A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.936	0.000	0.000	0.000	0.000	0.000	0.000	13.93	64.41	87.18	102.11	149.15	0.0	41.4	2713.8	6.7	1650	1650	CIRCULAR	CONCRETE	-	0.37	5783.5	**46.92%**	2.62	2.20	0.05
																				13.98									1650	1650								
L203B, R203A	203	202	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	38.0	38.0	38.0	20.0	300	300	CIRCULAR	PVC	-	0.40	60.8	**62.49%**	0.86	0.79	0.42
																				10.42																		
L205A	205	204	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	16.7	16.7	16.7	27.1	300	300	CIRCULAR	PVC	-	0.50	68.0	**24.62%**	0.97	0.67	0.68
Ex. Storm Sewer	204	202A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.68	74.30	100.75	118.09	172.61	0.0	16.7	25.5	27.1	300	300	CIRCULAR	PVC	-	0.44	63.8	**40.04%**	0.91	0.72	0.63
Ex. Storm Sewer	202A	202	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.30	72.14	97.78	114.59	167.47	0.0	16.7	92.6	29.5	375	375	CIRCULAR	PVC	-	0.33	94.7	**97.83%**	0.90	0.94	0.52
																				11.83																		
Ex. Storm Sewer to be upsized	202	201	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.83	70.44	95.44	111.84	163.42	0.0	54.7	130.6	11.9	450	450	CIRCULAR	CONCRETE	-	0.40	188.1	**69.45%**	1.15	1.08	0.18
Ex. Storm Sewer	201	200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	13.24	66.26	89.71	105.09	153.52	0.0	54.7	2504.9	9.5	1650	1650	CIRCULAR	CONCRETE	-	0.42	6162.2	**40.65%**	2.79	2.25	0.07
																				13.31									1650	1650								

E.2 Modified Rational Method

Stormwater Management Calculations

File No: **160402067**
Project: **1010 Somerset Street**
Date: **05-Jun-25**

SWM Approach:
Post-development to Pre-development flows

Post-Development Site Conditions:

Overall Runoff Coefficient for Site and Sub-Catchment Areas

Runoff Coefficient Table

Catchment Type	Sub-catchment Area ID / Description		Area (ha) "A"		Runoff Coefficient "C"	"A x C"		Overall Runoff Coefficient
Controlled - Tributary	L205A	Hard	0.159		0.9	0.143		
		Soft	0.021		0.2	0.004		
	Subtotal			0.18			0.1476	0.820
Roof	R203A	Hard	0.160		0.9	0.144		
		Soft	0.000		0.2	0.000		
	Subtotal			0.16			0.144	0.900
Controlled - Tributary	L203B	Hard	0.138		0.9	0.125		
		Soft	0.032		0.2	0.006		
	Subtotal			0.17			0.1309	0.770
Roof	R104C	Hard	0.480		0.9	0.432		
		Soft	0.000		0.2	0.000		
	Subtotal			0.48			0.432	0.900
Controlled - Tributary	L104B	Hard	0.246		0.9	0.221		
		Soft	0.614		0.2	0.123		
	Subtotal			0.86			0.344	0.400
Controlled - Tributary	L104A	Hard	0.186		0.9	0.167		
		Soft	0.014		0.2	0.003		
	Subtotal			0.2			0.17	0.850
Roof	R103B	Hard	0.100		0.9	0.090		
		Soft	0.000		0.2	0.000		
	Subtotal			0.1			0.09	0.900
Controlled - Tributary	L103A	Hard	0.111		0.9	0.100		
		Soft	0.009		0.2	0.002		
	Subtotal			0.12			0.102	0.850
Roof	R102D	Hard	0.110		0.9	0.099		
		Soft	0.000		0.2	0.000		
	Subtotal			0.11			0.099	0.900
Roof	R102C	Hard	0.120		0.9	0.108		
		Soft	0.000		0.2	0.000		
	Subtotal			0.12			0.108	0.900
Roof	R102B	Hard	0.080		0.9	0.072		
		Soft	0.000		0.2	0.000		
	Subtotal			0.08			0.072	0.900
Controlled - Tributary	L102A	Hard	0.344		0.9	0.309		
		Soft	0.026		0.2	0.005		
	Subtotal			0.37			0.3145	0.850
Total				**2.950**			**2.154**	
Overall Runoff Coefficient= C:								**0.73**

Total Roof Areas	**1.050 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**1.900 ha**
Total Tributary Area to Outlet	**2.950 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.000 ha**
Total Site	**2.950 ha**

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 1
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0009	0	0.025	18	0	0	0.025
0.050	0.0006	0.0019	1	0.050	71	1	1	0.050
0.075	0.0008	0.0024	4	0.075	160	3	4	0.075
0.100	0.0009	0.0028	9	0.100	284	5	9	0.100
0.125	0.0011	0.0033	19	0.125	444	9	19	0.125
0.150	0.0013	0.0038	32	0.150	640	13	32	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.0	547.9	1.0	0.1522
3.9	1189.8	2.8	0.48268
9.3	1930.7	5.5	1.019
18.4	2728.4	9.0	1.77688
31.9	3561.4	13.5	2.76617

Rooftop Storage Summary

Total Building Area (sq.m)		800
Assume Available Roof Area (sq.	80%	640
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		3
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		32
Estimated 100 Year Drawdown Time (h)		2.7

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.003	0.004	-
Depth (m)	0.099	0.149	0.150
Volume (cu.m)	9.3	31.4	32.0
Draintime (hrs)	1.0	2.7	

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 2
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0016	0	0.025	27	0	0	0.025
0.050	0.0006	0.0032	2	0.050	107	2	2	0.050
0.075	0.0008	0.0039	6	0.075	240	4	6	0.075
0.100	0.0009	0.0047	14	0.100	427	8	14	0.100
0.125	0.0011	0.0055	28	0.125	667	14	28	0.125
0.150	0.0013	0.0063	48	0.150	960	20	48	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.6	493.1	1.6	0.13698
5.8	1070.8	4.2	0.43442
14.0	1737.7	8.2	0.9171
27.6	2455.5	13.6	1.5992
47.8	3205.3	20.2	2.48955

Rooftop Storage Summary

Total Building Area (sq.m)		1200
Assume Available Roof Area (sq.	80%	960
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		5
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		48
Estimated 100 Year Drawdown Time (h)		2.4

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.005	0.006	-
Depth (m)	0.097	0.147	0.150
Volume (cu.m)	13.3	45.4	48.0
Draintime (hrs)	0.9	2.4	

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 3
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0013	0	0.025	24	0	0	0.025
0.050	0.0006	0.0025	2	0.050	98	1	2	0.050
0.075	0.0008	0.0032	6	0.075	220	4	6	0.075
0.100	0.0009	0.0038	13	0.100	391	8	13	0.100
0.125	0.0011	0.0044	25	0.125	611	12	25	0.125
0.150	0.0013	0.0050	44	0.150	880	19	44	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.4	565.0	1.4	0.15695
5.3	1226.9	3.9	0.49777
12.8	1991.1	7.5	1.05084
25.3	2813.6	12.4	1.83241
43.8	3672.7	18.5	2.85261

Rooftop Storage Summary

Total Building Area (sq.m)		1100
Assume Available Roof Area (sq.	80%	880
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		4
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		44
Estimated 100 Year Drawdown Time (h)		2.8

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.004	0.005	-
Depth (m)	0.100	0.149	0.150
Volume (cu.m)	13.0	43.6	44.0
Draintime (hrs)	1.1	2.8	

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 4
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0013	0	0.025	22	0	0	0.025
0.050	0.0006	0.0025	1	0.050	89	1	1	0.050
0.075	0.0008	0.0032	5	0.075	200	4	5	0.075
0.100	0.0009	0.0038	12	0.100	356	7	12	0.100
0.125	0.0011	0.0044	23	0.125	556	11	23	0.125
0.150	0.0013	0.0050	40	0.150	800	17	40	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
1.3	513.7	1.3	0.14269
4.8	1115.4	3.5	0.45252
11.7	1810.1	6.9	0.95531
23.0	2557.9	11.3	1.66583
39.8	3338.8	16.9	2.59329

Rooftop Storage Summary

Total Building Area (sq.m)		1000
Assume Available Roof Area (sq.	80%	800
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		4
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		40
Estimated 100 Year Drawdown Time (h)		2.5

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

* Note: Number of drains can be reduced if multiple-notch drain used.

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.004	0.005	-
Depth (m)	0.098	0.148	0.150
Volume (cu.m)	11.3	38.4	40.0
Draintime (hrs)	0.9	2.5	

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 5
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0054	1	0.025	107	1	1	0.025
0.050	0.0006	0.0107	7	0.050	427	6	7	0.050
0.075	0.0008	0.0134	24	0.075	960	17	24	0.075
0.100	0.0009	0.0161	57	0.100	1707	33	57	0.100
0.125	0.0011	0.0188	111	0.125	2667	54	111	0.125
0.150	0.0013	0.0215	192	0.150	3840	81	192	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
6.2	580.1	6.2	0.16115
23.1	1259.7	16.9	0.51108
56.0	2044.3	32.9	1.07894
110.2	2888.9	54.2	1.88141
191.1	3770.9	80.9	2.92889

Rooftop Storage Summary

Total Building Area (sq.m)		4800
Assume Available Roof Area (sq.	80%	3840
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		17
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		192
Estimated 100 Year Drawdown Time (h)		2.9

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

* Note: Number of drains can be reduced if multiple-notch drain used.

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.016	0.021	-
Depth (m)	0.100	0.150	0.150
Volume (cu.m)	57.5	191.7	192.0
Draintime (hrs)	1.1	2.9	

Project #160402067, 1010 Somerset Street
Roof Drain Design Sheet, Area 6
Standard Watts Model R1100 Accuflow Roof Drain

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0019	0	0.025	36	0	0	0.025
0.050	0.0006	0.0038	2	0.050	142	2	2	0.050
0.075	0.0008	0.0047	8	0.075	320	6	8	0.075
0.100	0.0009	0.0057	19	0.100	569	11	19	0.100
0.125	0.0011	0.0066	37	0.125	889	18	37	0.125
0.150	0.0013	0.0076	64	0.150	1280	27	64	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
2.1	547.9	2.1	0.1522
7.7	1189.8	5.6	0.48268
18.7	1930.7	11.0	1.019
36.7	2728.4	18.1	1.77688
63.7	3561.4	27.0	2.76617

Rooftop Storage Summary

Total Building Area (sq.m)		1600
Assume Available Roof Area (sq.	80%	1280
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		6
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		64
Estimated 100 Year Drawdown Time (h)		2.7

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

* Note: Number of drains can be reduced if multiple-notch drain used.

From Watts Drain Catalogue

Head (m)	L/s Open	75%	**50%**	25%	Closed
0.025	0.3155	0.31545	**0.31545**	0.31545	0.31545
0.050	0.6309	0.6309	**0.6309**	0.6309	0.6309
0.075	0.9464	0.86749	**0.78863**	0.70976	0.6309
0.100	1.2618	1.10408	**0.94635**	0.78863	0.6309
0.125	1.5773	1.34067	**1.10408**	0.86749	0.6309
0.150	1.8927	1.57726	**1.2618**	0.94635	0.6309

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.006	0.008	-
Depth (m)	0.099	0.149	0.150
Volume (cu.m)	18.7	62.8	64.0
Draintime (hrs)	1.0	2.7	

Stormwater Management Calculations

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

2 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	732.951
b =	6.199
c =	0.81

t (min)	I (mm/hr)
10	76.81
20	52.03
30	40.04
40	32.86
50	28.04
60	24.56
70	21.91
80	19.83
90	18.14
100	16.75
110	15.57
120	14.56

2 YEAR Modified Rational Method for Entire Site

Subdrainage Area: L205A — Controlled - Tributary
Area (ha): 0.18
C: 0.82

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	31.52	8.02	23.49	14.10
20	52.03	21.35	8.43	12.92	**15.50**
30	40.04	16.43	8.22	8.21	14.78
40	32.86	13.49	7.85	5.63	13.52
50	28.04	11.51	7.44	4.06	12.19
60	24.56	10.08	7.04	3.04	10.94
70	21.91	8.99	6.66	2.33	9.80
80	19.83	8.14	6.30	1.83	8.80
90	18.14	7.44	5.98	1.47	7.93
100	16.75	6.87	5.68	1.19	7.16
110	15.57	6.39	5.40	0.98	6.49
120	14.56	5.98	5.15	0.82	5.91

Storage: Underground Storage

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 92.00 mm
Invert Elevation 56.63 m
Obvert Elevation: 57.83 m
Max Storage Depth 0.22 m
Downstream W/L 56.55 m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	56.85	0.22	8.43	15.50	76.66	OK

Subdrainage Area: R203A — Roof
Area (ha): 0.16 — Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	30.75	5.36	25.39	15.23	91.5	0.00
20	52.03	20.83	5.62	15.21	18.25	98.4	0.00
30	40.04	16.03	5.65	10.38	**18.68**	99.4	0.00
40	32.86	13.16	5.61	7.55	18.12	98.1	0.00
50	28.04	11.23	5.52	5.71	17.12	95.8	0.00
60	24.56	9.83	5.41	4.42	15.90	93.0	0.00
70	21.91	8.77	5.30	3.47	14.58	90.0	0.00
80	19.83	7.94	5.18	2.76	13.23	86.9	0.00
90	18.14	7.26	5.07	2.20	11.87	83.8	0.00
100	16.75	6.70	4.95	1.75	10.52	80.8	0.00
110	15.57	6.23	4.84	1.40	9.21	77.8	0.00
120	14.56	5.83	4.72	1.11	7.96	74.8	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	99.35	0.10	5.65	18.68	64.00	0.00

Subdrainage Area: L203B — Controlled - Tributary
Area (ha): 0.17
C: 0.77

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	27.95	14.47	13.48	**8.09**
20	52.03	18.93	13.24	5.70	6.84
30	40.04	14.57	11.62	2.95	5.31
40	32.86	11.96	10.23	1.72	4.14
50	28.04	10.20	9.11	1.10	3.29
60	24.56	8.94	8.20	0.74	2.67
70	21.91	7.97	7.45	0.52	2.20
80	19.83	7.22	6.83	0.39	1.85
90	18.14	6.60	6.31	0.29	1.58
100	16.75	6.09	5.87	0.23	1.37
110	15.57	5.67	5.48	0.18	1.20
120	14.56	5.30	5.15	0.15	1.06

Storage: Underground Storage

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 126.00 mm
Invert Elevation 55.84 m
Obvert Elevation: 56.04 m
Max Storage Depth 0.18 m
Downstream W/L 56.49 m

Stage	Head	Discharge	Vreq	Vavail	Volume

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

100 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	1735.688
b =	6.014
c =	0.820

t (min)	I (mm/hr)
10	178.56
20	119.95
30	91.87
40	75.15
50	63.95
60	55.89
70	49.79
80	44.99
90	41.11
100	37.90
110	35.20
120	32.89

100 Year Target Release Rate

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 2.9500
C: 0.50

Calculated Time of Concentration (refer to Appendix E)

tc (min)	I (2 yr) (mm/hr)	Q2yr (L/s)	Q2yr (L/s/ha)
10	76.81	**314.9**	**106.8**

School Block Controlled Drainage as per project 160401837 prepared by Stantec (R203A, L203B, L205A)

Area (ha)	Q100yr (L/s)
0.51	**54.7**

Remaining Allowable Release Rate for other Blocks (L102A, R102B, R102C, R102D, L103A, L103B, R104A, L104B, R104C)

Area (ha)	Q100yr (L/s)	Q100yr (L/s/ha)
2.44	**260.2**	**106.8**

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: L205A — Controlled - Tributary
Area (ha): 0.18
C: 1.00
(Refer to project 160401837 - 45 Oak Street prepared by Stantec Consulting Ltd.)

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	89.35	15.51	73.84	44.31
20	119.95	60.02	16.66	43.37	52.04
30	91.87	45.97	16.74	29.23	**52.61**
40	75.15	37.60	16.46	21.14	50.74
50	63.95	32.00	16.04	15.96	47.89
60	55.89	27.97	15.56	12.41	44.67
70	49.79	24.91	15.07	9.85	41.36
80	44.99	22.51	14.57	7.94	38.12
90	41.11	20.57	14.09	6.48	35.02
100	37.90	18.97	13.43	5.54	33.21
110	35.20	17.62	12.83	4.79	31.61
120	32.89	16.46	12.30	4.16	29.93

Storage: Underground Storage

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 92.00 mm — 8.80
Invert Elevation 56.63 m — Conceptual Max Volume in
Obvert Elevation: 57.83 m — structures at max storage depth
Max Storage Depth 0.87 m — Capacity of Oak Street Sewer = 95.3 L/s
Downstream W/L 56.55 m — Existing Flow to Oak Street Sewer = 75.9 L/s
Available capacity in Oak Street Sewer = 19.4 L/s

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	57.50	0.87	16.74	52.61	76.66	OK
					24.04	

Subdrainage Area: R203A — Roof
Area (ha): 0.16 — Maximum Storage Depth: 150 mm
C: 1.00
(Refer to project 160401837 - 45 Oak Street prepared by Stantec Consulting Ltd.)

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	79.42	6.85	72.57	43.54	131.0	0.00
20	119.95	53.35	7.27	46.09	55.31	141.9	0.00
30	91.87	40.86	7.44	33.43	60.17	146.4	0.00
40	75.15	33.42	7.51	25.92	62.20	148.3	0.00
50	63.95	28.45	7.53	20.92	**62.76**	148.8	0.00
60	55.89	24.86	7.52	17.35	62.44	148.6	0.00
70	49.79	22.15	7.49	14.66	61.58	147.8	0.00
80	44.99	20.01	7.44	12.57	60.33	146.6	0.00
90	41.11	18.29	7.39	10.90	58.84	145.2	0.00
100	37.90	16.86	7.33	9.53	57.17	143.7	0.00
110	35.20	15.66	7.27	8.39	55.37	142.0	0.00
120	32.89	14.63	7.20	7.43	53.49	140.3	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	148.85	0.15	7.53	62.76	64.00	0.00

Subdrainage Area: L203B — Controlled - Tributary
Area (ha): 0.17
C: 0.96
(Refer to project 160401837 - 45 Oak Street prepared by Stantec Consulting Ltd.)

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	81.22	30.45	50.77	**30.46**
20	119.95	54.56	29.89	24.68	29.61
30	91.87	41.79	27.60	14.19	25.54
40	75.15	34.18	25.36	8.82	21.17
50	63.95	29.09	23.33	5.76	17.29
60	55.89	25.43	21.21	4.22	15.19
70	49.79	22.65	19.43	3.22	13.52
80	44.99	20.47	17.98	2.49	11.94
90	41.11	18.70	16.74	1.96	10.57
100	37.90	17.24	15.68	1.56	9.39
110	35.20	16.01	14.74	1.27	8.38
120	32.89	14.96	13.92	1.04	7.52

Storage: Underground Storage

Orifice Equation: $Q = CdA(2gh)^{0.5}$ Where C = 0.61
Orifice Diameter: 126.00 mm
Invert Elevation 55.84 m
Obvert Elevation: 56.04 m — Conceptual Max Volume in structures at max storage depth — 0.59
Max Storage Depth 0.82 m
Downstream W/L 56.49 m

Stage	Head	Discharge	Vreq	Vavail	Volume

Stormwater Management Calculations

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

		(m)	(L/s)	(cu. m)	(cu. m)	Check
2-year Water Level	56.02	0.18	14.47	8.09	32.52	OK

Subdrainage Area: R104C
Area (ha): 0.48
C: 0.90

Roof
Maximum Storage Depth: 150 mm

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	92.24	15.22	77.02	46.21	91.9	0.00
20	52.03	62.49	16.00	46.49	55.79	99.2	0.00
30	40.04	48.09	16.12	31.97	**57.55**	100.3	0.00
40	32.86	39.47	16.04	23.43	56.24	99.5	0.00
50	28.04	33.68	15.82	17.86	53.58	97.5	0.00
60	24.56	29.49	15.54	13.95	50.22	94.9	0.00
70	21.91	26.32	15.24	11.07	46.51	92.1	0.00
80	19.83	23.81	14.93	8.89	42.66	89.2	0.00
90	18.14	21.79	14.61	7.18	38.76	86.2	0.00
100	16.75	20.11	14.30	5.82	34.90	83.3	0.00
110	15.57	18.70	13.99	4.71	31.10	80.4	0.00
120	14.56	17.49	13.68	3.80	27.40	77.6	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	100.30	0.10	16.12	57.55	192.00	0.00

Subdrainage Area: L104B
Area (ha): 0.86
C: 0.40

Controlled - Tributary

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	73.45	73.45	0.00	**0.00**
20	52.03	49.76	49.76	0.00	**0.00**
30	40.04	38.29	38.29	0.00	**0.00**
40	32.86	31.43	31.43	0.00	**0.00**
50	28.04	26.82	26.82	0.00	**0.00**
60	24.56	23.48	23.48	0.00	**0.00**
70	21.91	20.96	20.96	0.00	**0.00**
80	19.83	18.96	18.96	0.00	**0.00**
90	18.14	17.35	17.35	0.00	**0.00**
100	16.75	16.01	16.01	0.00	**0.00**
110	15.57	14.89	14.89	0.00	**0.00**
120	14.56	13.93	13.93	0.00	**0.00**

Storage: Surface Storage and/or underground storage

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	29.15%	73.45	0.00	75.00	OK

Subdrainage Area: L104A
Area (ha): 0.20
C: 0.85

Controlled - Tributary

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	52.42	52.42	0.00	**0.00**
20	52.03	40.71	40.71	0.00	**0.00**
30	40.04	35.04	35.04	0.00	**0.00**
40	32.86	31.65	31.65	0.00	**0.00**
50	28.04	29.37	29.37	0.00	**0.00**
60	24.56	27.73	27.73	0.00	**0.00**
70	21.91	26.48	26.48	0.00	**0.00**
80	19.83	25.49	25.49	0.00	**0.00**
90	18.14	24.69	24.69	0.00	**0.00**
100	16.75	24.03	24.03	0.00	**0.00**
110	15.57	23.48	23.48	0.00	**0.00**
120	14.56	23.00	23.00	0.00	**0.00**

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof area R104C to outlet to cistern

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	23.05%	52.42	0.00	30.00	OK

Subdrainage Area: R103B
Area (ha): 0.10
C: 0.90

Roof
Maximum Storage Depth: 150 mm

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	19.22	3.56	15.66	9.39	91.0	0.00
20	52.03	13.02	3.72	9.30	11.16	97.5	0.00
30	40.04	10.02	3.74	6.28	**11.31**	98.0	0.00
40	32.86	8.22	3.69	4.53	10.87	96.4	0.00
50	28.04	7.02	3.63	3.39	10.16	93.8	0.00
60	24.56	6.14	3.55	2.59	9.33	90.8	0.00
70	21.91	5.48	3.47	2.01	8.45	87.6	0.00
80	19.83	4.96	3.39	1.57	7.55	84.3	0.00
90	18.14	4.54	3.31	1.23	6.66	81.0	0.00
100	16.75	4.19	3.23	0.96	5.78	77.8	0.00
110	15.57	3.90	3.15	0.75	4.95	74.6	0.00
120	14.56	3.64	3.04	0.60	4.35	70.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	98.02	0.10	3.74	11.31	40.00	0.00

Subdrainage Area: L103A
Area (ha): 0.12
C: 0.85

Controlled - Tributary

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	21.78	21.78	0.00	**0.00**
20	52.03	14.75	14.75	0.00	**0.00**
30	40.04	11.35	11.35	0.00	**0.00**
40	32.86	9.32	9.32	0.00	**0.00**
50	28.04	7.95	7.95	0.00	**0.00**
60	24.56	6.96	6.96	0.00	**0.00**
70	21.91	6.21	6.21	0.00	**0.00**
80	19.83	5.62	5.62	0.00	**0.00**
90	18.14	5.14	5.14	0.00	**0.00**
100	16.75	4.75	4.75	0.00	**0.00**
110	15.57	4.41	4.41	0.00	**0.00**
120	14.56	4.13	4.13	0.00	**0.00**

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof area R103B to outlet to cistern

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

		(m)	(L/s)	(cu. m)	(cu. m)	Check
100-year Water Level	56.66	0.82	30.45	30.46	32.52	OK
					2.06	

Subdrainage Area: R104C
Area (ha): 0.48
C: 1.00

Roof
Maximum Storage Depth: 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	238.27	19.44	218.83	131.30	131.2	0.00
20	119.95	160.06	20.63	139.43	167.32	142.4	0.00
30	91.87	122.59	21.14	101.45	182.61	147.1	0.00
40	75.15	100.27	21.36	78.91	189.38	149.2	0.00
50	63.95	85.34	21.44	63.90	**191.70**	149.9	0.00
60	55.89	74.59	21.43	53.16	191.36	149.8	0.00
70	49.79	66.44	21.36	45.08	189.32	149.2	0.00
80	44.99	60.04	21.26	38.78	186.14	148.2	0.00
90	41.11	54.86	21.12	33.73	182.16	147.0	0.00
100	37.90	50.58	20.97	29.60	177.62	145.6	0.00
110	35.20	46.97	20.81	26.16	172.68	144.0	0.00
120	32.89	43.89	20.64	23.26	167.46	142.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	149.91	0.15	21.44	191.70	192.00	0.00

Subdrainage Area: L104B
Area (ha): 0.86
C: 0.50

Controlled - Tributary

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	213.45	91.81	121.64	**72.98**
20	119.95	143.39	91.81	51.58	61.89
30	91.87	109.82	91.81	18.01	32.42
40	75.15	89.83	89.83	0.00	0.00
50	63.95	76.45	76.45	0.00	0.00
60	55.89	66.82	66.82	0.00	0.00
70	49.79	59.52	59.52	0.00	0.00
80	44.99	53.78	53.78	0.00	0.00
90	41.11	49.14	49.14	0.00	0.00
100	37.90	45.31	45.31	0.00	0.00
110	35.20	42.08	42.08	0.00	0.00
120	32.89	39.32	39.32	0.00	0.00

Storage: Surface Storage and/or underground storage

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	29.15%	91.81	72.98	75.00	OK
				2.02	

Subdrainage Area: L104A
Area (ha): 0.20
C: 1.00

Controlled - Tributary

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	120.72	72.59	48.13	**28.88**
20	119.95	88.13	72.59	15.54	18.65
30	91.87	72.52	72.52	0.00	0.00
40	75.15	63.22	63.22	0.00	0.00
50	63.95	57.00	57.00	0.00	0.00
60	55.89	52.52	52.52	0.00	0.00
70	49.79	49.12	49.12	0.00	0.00
80	44.99	46.46	46.46	0.00	0.00
90	41.11	44.30	44.30	0.00	0.00
100	37.90	42.51	42.51	0.00	0.00
110	35.20	41.01	41.01	0.00	0.00
120	32.89	39.73	39.73	0.00	0.00

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof area R104C to outlet to cistern

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	23.05%	72.59	28.88	30.00	OK
				1.12	

Subdrainage Area: R103B
Area (ha): 0.10
C: 1.00

Roof
Maximum Storage Depth: 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	49.64	4.56	45.08	27.05	130.8	0.00
20	119.95	33.35	4.83	28.52	34.22	141.4	0.00
30	91.87	25.54	4.94	20.60	37.08	145.7	0.00
40	75.15	20.89	4.98	15.91	38.19	147.3	0.00
50	63.95	17.78	4.99	12.79	**38.38**	147.6	0.00
60	55.89	15.54	4.97	10.57	38.03	147.1	0.00
70	49.79	13.84	4.95	8.89	37.35	146.1	0.00
80	44.99	12.51	4.91	7.59	36.45	144.7	0.00
90	41.11	11.43	4.87	6.55	35.39	143.2	0.00
100	37.90	10.54	4.83	5.71	34.23	141.4	0.00
110	35.20	9.79	4.79	5.00	33.01	139.6	0.00
120	32.89	9.14	4.74	4.41	31.73	137.7	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	147.59	0.15	4.99	38.38	40.00	0.00

Subdrainage Area: L103A
Area (ha): 0.12
C: 1.00

Controlled - Tributary

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	64.55	23.49	41.07	24.64
20	119.95	45.00	23.49	21.52	**25.82**
30	91.87	35.63	23.49	12.15	21.87
40	75.15	30.05	23.49	6.57	15.76
50	63.95	26.32	23.49	2.84	8.51
60	55.89	23.63	23.49	0.15	0.53
70	49.79	21.60	21.60	0.00	0.00
80	44.99	20.00	20.00	0.00	0.00
90	41.11	18.70	18.70	0.00	0.00
100	37.90	17.63	17.63	0.00	0.00
110	35.20	16.73	16.73	0.00	0.00
120	32.89	15.96	15.96	0.00	0.00

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof area R103B to outlet to cistern

Stormwater Management Calculations

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	7.46%	21.78	0.00	30.00	OK

Subdrainage Area: R102D
Area (ha): 0.11
C: 0.90

Maximum Storage Depth: Roof 150 mm

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	21.14	3.58	17.56	10.54	91.7	0.00
20	52.03	14.32	3.76	10.56	12.68	98.8	0.00
30	40.04	11.02	3.78	7.24	**13.03**	100.0	0.00
40	32.86	9.04	3.76	5.29	12.69	98.9	0.00
50	28.04	7.72	3.70	4.02	12.05	96.7	0.00
60	24.56	6.76	3.64	3.12	11.24	94.1	0.00
70	21.91	6.03	3.56	2.47	10.37	91.1	0.00
80	19.83	5.46	3.49	1.97	9.46	88.1	0.00
90	18.14	4.99	3.41	1.58	8.55	85.1	0.00
100	16.75	4.61	3.33	1.27	7.65	82.1	0.00
110	15.57	4.28	3.26	1.02	6.76	79.2	0.00
120	14.56	4.01	3.19	0.82	5.90	76.3	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	99.96	0.10	3.78	13.03	44.00	0.00

Subdrainage Area: R102C
Area (ha): 0.12
C: 0.90

Maximum Storage Depth: Roof 150 mm

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	23.06	4.44	18.62	11.17	90.7	0.00
20	52.03	15.62	4.63	10.99	13.19	96.9	0.00
30	40.04	12.02	4.64	7.38	**13.29**	97.2	0.00
40	32.86	9.87	4.58	5.28	12.68	95.3	0.00
50	28.04	8.42	4.50	3.92	11.77	92.5	0.00
60	24.56	7.37	4.40	2.98	10.72	89.3	0.00
70	21.91	6.58	4.29	2.29	9.61	86.0	0.00
80	19.83	5.95	4.18	1.77	8.50	82.6	0.00
90	18.14	5.45	4.08	1.37	7.40	79.3	0.00
100	16.75	5.03	3.97	1.05	6.32	76.0	0.00
110	15.57	4.67	3.84	0.83	5.47	71.9	0.00
120	14.56	4.37	3.71	0.66	4.76	67.6	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	97.15	0.10	4.64	13.29	48.00	0.00

Subdrainage Area: R102B
Area (ha): 0.08
C: 0.90

Maximum Storage Depth: Roof 150 mm

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	15.37	2.68	12.70	7.62	91.5	0.00
20	52.03	10.41	2.81	7.61	9.13	98.4	0.00
30	40.04	8.02	2.83	5.19	**9.34**	99.4	0.00
40	32.86	6.58	2.80	3.78	9.06	98.1	0.00
50	28.04	5.61	2.76	2.85	8.56	95.8	0.00
60	24.56	4.92	2.71	2.21	7.95	93.0	0.00
70	21.91	4.39	2.65	1.74	7.29	90.0	0.00
80	19.83	3.97	2.59	1.38	6.61	86.9	0.00
90	18.14	3.63	2.53	1.10	5.93	83.8	0.00
100	16.75	3.35	2.47	0.88	5.26	80.8	0.00
110	15.57	3.12	2.42	0.70	4.61	77.8	0.00
120	14.56	2.91	2.36	0.55	3.98	74.8	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	99.35	0.10	2.83	9.34	32.00	0.00

Subdrainage Area: L102A
Area (ha): 0.37
C: 0.85

Controlled - Tributary

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	78.40	72.59	5.81	**3.49**
20	52.03	56.74	56.74	0.00	0.00
30	40.04	46.26	46.26	0.00	0.00
40	32.86	39.99	39.99	0.00	0.00
50	28.04	35.77	35.77	0.00	0.00
60	24.56	32.72	32.72	0.00	0.00
70	21.91	30.41	30.41	0.00	0.00
80	19.83	28.59	28.59	0.00	0.00
90	18.14	27.12	27.12	0.00	0.00
100	16.75	25.89	25.89	0.00	0.00
110	15.57	24.87	24.87	0.00	0.00
120	14.56	23.98	23.98	0.00	0.00

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof areas R102B, R102C, and R102D to outlet to cistern

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	23.05%	72.59	3.49	80.00	OK

SUMMARY TO OUTLET

		Vrequired	Vavailable*	
Tributary Area	2.950 ha			
Total 2yr Flow to Sewer	249 L/s	150	744 m^3	Ok
Non-Tributary Area	0.000 ha			
Total 2yr Flow Uncontrolled	0 L/s			
Total Area	2.950 ha			
Total 2yr Flow	249 L/s			
Target	315 L/s			

Project #160402067, 1010 Somerset Street
Modified Rational Method Calculatons for Storage

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	7.46%	23.49	25.82	30.00	OK
				4.18	

Subdrainage Area: R102D
Area (ha): 0.11
C: 1.00

Maximum Storage Depth: Roof 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	54.60	4.57	50.03	30.02	131.1	0.00
20	119.95	36.68	4.85	31.83	38.20	142.2	0.00
30	91.87	28.09	4.97	23.13	41.63	146.8	0.00
40	75.15	22.98	5.02	17.96	43.11	148.8	0.00
50	63.95	19.56	5.03	14.52	**43.57**	149.4	0.00
60	55.89	17.09	5.03	12.06	43.43	149.2	0.00
70	49.79	15.23	5.01	10.22	42.91	148.5	0.00
80	44.99	13.76	4.98	8.77	42.12	147.5	0.00
90	41.11	12.57	4.95	7.62	41.16	146.2	0.00
100	37.90	11.59	4.91	6.68	40.06	144.7	0.00
110	35.20	10.76	4.87	5.89	38.89	143.1	0.00
120	32.89	10.06	4.83	5.23	37.64	141.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	149.42	0.15	5.03	43.57	44.00	0.00

Subdrainage Area: R102C
Area (ha): 0.12
C: 1.00

Maximum Storage Depth: Roof 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	59.57	5.70	53.87	32.32	130.6	0.00
20	119.95	40.02	6.03	33.99	40.79	141.1	0.00
30	91.87	30.65	6.16	24.49	44.08	145.2	0.00
40	75.15	25.07	6.20	18.87	45.28	146.6	0.00
50	63.95	21.34	6.21	15.13	**45.38**	146.8	0.00
60	55.89	18.65	6.19	12.46	44.86	146.1	0.00
70	49.79	16.61	6.15	10.46	43.93	145.0	0.00
80	44.99	15.01	6.10	8.90	42.74	143.5	0.00
90	41.11	13.71	6.05	7.66	41.38	141.8	0.00
100	37.90	12.64	5.99	6.65	39.91	140.0	0.00
110	35.20	11.74	5.93	5.81	38.35	138.1	0.00
120	32.89	10.97	5.87	5.10	36.75	136.1	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	146.77	0.15	6.21	45.38	48.00	0.00

Subdrainage Area: R102B
Area (ha): 0.08
C: 1.00

Maximum Storage Depth: Roof 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	39.71	3.43	36.29	21.77	131.0	0.00
20	119.95	26.68	3.63	23.04	27.65	141.9	0.00
30	91.87	20.43	3.72	16.71	30.08	146.4	0.00
40	75.15	16.71	3.75	12.96	31.10	148.3	0.00
50	63.95	14.22	3.76	10.46	**31.38**	148.8	0.00
60	55.89	12.43	3.76	8.67	31.22	148.6	0.00
70	49.79	11.07	3.74	7.33	30.79	147.8	0.00
80	44.99	10.01	3.72	6.28	30.17	146.6	0.00
90	41.11	9.14	3.69	5.45	29.42	145.2	0.00
100	37.90	8.43	3.67	4.76	28.58	143.7	0.00
110	35.20	7.83	3.63	4.19	27.69	142.0	0.00
120	32.89	7.32	3.60	3.71	26.75	140.3	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	148.85	0.15	3.76	31.38	32.00	0.00

Subdrainage Area: L102A
Area (ha): 0.37
C: 1.00

Controlled - Tributary

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	198.67	72.59	126.08	75.65
20	119.95	138.38	72.59	65.79	**78.95**
30	91.87	109.50	72.59	36.91	66.43
40	75.15	92.30	72.59	19.70	47.29
50	63.95	80.79	72.59	8.19	24.58
60	55.89	72.50	72.50	0.00	0.00
70	49.79	66.22	66.22	0.00	0.00
80	44.99	61.28	61.28	0.00	0.00
90	41.11	57.29	57.29	0.00	0.00
100	37.90	53.99	53.99	0.00	0.00
110	35.20	51.21	51.21	0.00	0.00
120	32.89	48.84	48.84	0.00	0.00

Storage: Underground cistern to be controlled by mechanical pump at set flow rate
Roof areas R102B, R102C, and R102D to outlet to cistern

	% of Area	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check	
100-year Water Level	23.05%	72.59	78.95	80.00	OK	17.29%
				1.05		82.71%

SUMMARY TO OUTLET

		Vrequired	Vavailable*	
Tributary Area	2.950 ha			
Total 100yr Flow to Sewer	315 L/s	703	744 m^3	Ok
Non-Tributary Area	0.000 ha			
Total 100yr Flow Uncontrolled	0 L/s			
Total Area	2.950 ha			
Total 100yr Flow	315 L/s			
Target	315 L/s			

E.3 Time of Concentration

Job # 160402067 - 1010 Somerset Street

Date: 5-Jun-25

PRE-DEVELOPMENT CONDITIONS
Calculation of Time of Concentration and Peak Flow

Runoff Coefficient Calculation

Area (ha)	C	Description	A x C
1.35	0.82		1.107
1.4			1.107

Composite C-Factor: 0.82

Diff. Elev. 3.00 m
Length 170 m (longest overland flow path)

C- factor from MTO Design Chart 1.07: Runoff Coefficients

Overland Flow Time of Concentration

Bransby Williams (C>0.40)
$tc = 0.057 \times L / (S_w^{0.2} \times A^{0.1})$

L	170	m (longest flow path)
S_w	1.8%	
A	1.3500	ha
t_c	8.4	min
	0.14	hrs

Airport (C<0.40)
$tc = [3.26 \times (1.1-C) \times L^{0.5}] / S_w^{0.33}$

L	170	m
S_w	1.8%	
C	0.82	
t_c	10	min

Worst-case T_c =	10	min
	0.17	hrs

Rational Method Calculation of Catchment Flow Rate

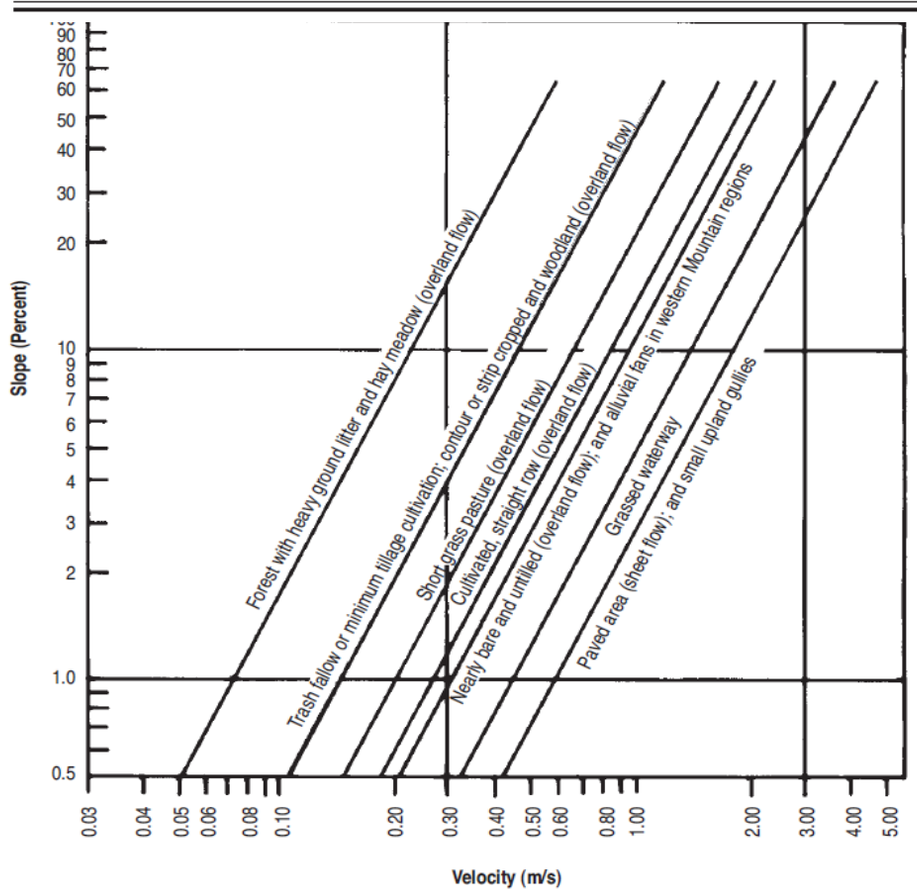
IDF Parameters, City of Ottawa 2012

Return Period	a	b	c	Intensity	Qpeak
100	1735.688	6.014	0.820	178.6	549.1
50	1569.58	6.014	0.820	161.5	496.5
25	1402.884	6.018	0.819	144.7	444.9
10	1174.184	6.014	0.816	122.1	375.6
5	998.071	6.053	0.814	104.2	320.4
2	732.951	6.199	0.810	76.8	236.2

Uplands Method Chart

Table 3.9 $V/S^{0.5}$ relationship for various land covers

Land Cover	$V/S^{0.5}$ (m/s)
Forest with heavy ground litter, hay meadow (overland flow)	0.6
Trash fallow or minimum tillage cultivation, contour, strip cropped woodland (overland flow)	1.5
Short grass pasture (overland flow)	2.3
Cultivated, straight row (overland flow)	2.7
Nearly bare and untilled (overland flow) or alluvial fans in Western mountain regions	3.0
Grassed waterway	4.6
Paved areas (sheet flow); small upland gullies	6.1



E.4 External Area Post-development to Pre-development Comparison

Pre-development to Post-development External Area Comparison									
		Pre-development			Post-development			Difference	
Outlet	**Area ID**	**Area**	**C**	**AxC**	**Area**	**C**	**AxC**	**AxC**	**Percentage**
Preston Street	EX-2	0.58	0.67	0.389	0.28	0.85	0.238	-0.151	-38.8%
	EX-4	0.18	0.62	0.112	0.18	0.62	0.112	0.000	0.0%
	Total	**0.760**		**0.500**	**0.460**		**0.350**	**-0.151**	**-30.1%**

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Stantec Consulting Ltd.
300 - 1331 Clyde Avenue
Ottawa ON K2C 3G4
Stantec.com