CLIENT : BÂTIMO DÉVELOPPEMENT INC.

PROJECT : LIB ORLÉANS - 500 Famille-Côté Avenue

ÉQUIPE LAURENCE PROJECT NUMBER: 601401

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Sainte-Adèle (Qc)
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Sainte-Adèle
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Beloeil

Design report – Stormwater management and serviceability

For Site Plan Application

Prepared under supervision by : Valérie Mercier, ing.

LICENSED PROFESSIONAL ENGINEER
B. BRAY
100568973
PROVINCE OF ONTARIO

Prepared / Verified by : Benoit Bray. Ing. PEO : 100568973

Équipe Laurence inc.

January 2026

EMISSION REGISTER		
#	Date	Emission
A	2025-09-15	For URPD
B	2025-12-09	For Site Plan Application
C	2026-01-29	For Site Plan Application, Rev 01
D		

PROJECT TEAM
L-C. Tellier, tech.
V.Mercier, ing
B.Bray, ing

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1 INTRODUCTION

This project consists of the residential development located at 500 Famille-Côté Avenue in Ottawa ON. Équipe Laurence Inc. was mandated to carry out the design of the drinking water, storm and sanitary sewer systems that serve the proposed building as well as the stormwater management report. The civil engineering plans depicting the general features of the site, such as the parking areas, sewer structures and landscaping is attached to this report in appendix A.

In this report, the design and calculations of the sanitary sewer, domestic water and stormwater management systems will be discussed. The design was completed in accordance with the following design guidelines and regulations:

- Ottawa Sewer Design Guidelines (2012);
- *Pre-Consultation Preliminary Assessment* written by Kelsey Charie, Infrastructure Project Manager, Development Review- Central. File No. PC2024-0522
- Ottawa Design Guidelines – Water Distribution (2010);
- Ottawa Technical Bulletin ISTB-2018-02 (2018);
- Water Supply for Public Fire Protection, Fire Underwriters Survey (2020).

2 STORMWATER MANAGEMENT

As part of the stormwater management system, the flow of water will be controlled on-site and discharged through a 250 mm diameter service connection. This pipe will be connected to the existing 450 mm diameter storm sewer below De la Famille-Côté Avenue as shown on the attached plans.

According to a complementary land survey completed by *Annis, O'Sullivan, Vollebekk Ltd.* on September 9th, 2025, attached in appendix B, the subject site is primarily occupied by a grassed area.

For the design of the stormwater management system, the calculations were done to ensure that the post-development flows are equivalent to or lesser than the allocated stormwater release rate of 26.1 L/s stated in the *pre-consultation memo*. Hence, the stormwater flows for the developed site as well as the storage requirements will be explored in the following sections.

2.1 DESIGN CRITERIA FOR POST-DEVELOPPMENT FLOWS

According to the *pre-consultation memo*, the allowable release rate for the proposed site is 26.1 L/s. Flows in excess the allowable release rate, up to and including the 100-yr storm event, must be retained on site. Hence, these storm events must be considered for the post-development storage requirements calculations.

The post-development storage requirements were determined using the criteria outlined in the *Ottawa Sewer Design Guidelines* as well as the following site information:

- The proposed site area of 0.896 hectares.
- The Rational Method for the calculation of flow as indicated in Section 5.4.4.1 of the design guideline;
- The IDF curves and equations as indicated in Section 5.4.2 of the design guideline;
- The runoff coefficients as shown in Table 5.7 of the design guideline.

In addition, to account for the effects of climate change, a 20% increase will be added to the rainfall intensities of the 100-yr storm event, as per the *Ottawa Sewer Design Guideline*.

2.2 POST-DEVELOPPMENT: UNCONTROLLED FLOWS

For the proposed stormwater management system, there is an uncontrolled flow on the sides of the building near Jeanne d'Arc boulevard and Bilberry Drive. The total uncontrolled surface is of 734 m², and the calculated time of concentration is of 10 minutes. Therefore, the uncontrolled flows for the 100-year storm events are 14.3 L/s. The detailed calculations are described in the appendix C.

The uncontrolled flow will be subtracted from the allowable release rate for the proposed site to determine the allowable flowrate for the controlled flow as well as the storage requirements.

2.3 POST-DEVELOPMENT: CONTROLLED FLOWS AND STORAGE REQUIREMENTS

The outflow to the storm sewers will be the subtraction of the 100-year uncontrolled flow to the allowable release rate of 26.1L/s, resulting in an allowable controlled flowrate of 11.8 L/s. The required storage for the developed site was calculated using the Rational Method.

Therefore, the project will have a total retention requirement of 525.6 m^3. This is the maximum requirement including the 20% increase for the climate change as required by the city and using the average release rate and a 10% increase to the volume as a safety factor. The detailed calculations are found in Appendix C.

The required volume will be retained on the roof of the proposed building, in the storm sewer structures and pipes, as well as in an underground concrete retention tank located along the south side of the underground parking, as shown on the C-204 drawing (appendix A). A submersible pump, designed to regulate a maximum flowrate of 11.8 L/s, will be installed at the outlet of the underground tank. This system will manage stormwater collected from the roof drains as well as runoff from the site along the Bilberry Drive facade. In addition, a flow control device will be installed in the manhole downstream of the storm sewer system limiting the discharge of the remaining site runoff to a maximum of 11.8 L/s for the rest of the runoff of the site. Furthermore, an overflow pipe will be incorporated into the retention tank with an invert at the water retention elevation, preventing flooding if a blockage or malfunction occurs. The proposed stormwater storage distribution is shown in Table 1.

Table 1 - Proposed Stormwater Storage – 500 Famille-Côté Avenue

Parameters	Values	Units
100-year required storage of the project[1,2]	525.6	m^3
Volume retained in storm pipes and structures	10.6	m^3
Volume retained on the roof (to be validated by mechanical ing)	128.0	m^3
Volume retained in underground concrete tank	390	m^3
Total storage volume available	528.6	m^3

1 - A 10% increase was included in the volume requirement as an extra safety measure
2 – A 20% increase to rainfall was included for the climate change effects

The following items related to rooftop drainage will need to be completed by the mechanical and structural engineer responsible for the design:

- Flow Control Roof Drainage Declaration;
- Design of the underground concrete tank. See appendix C.

The proposed Inlet control device (ICD) is a vortex flow regulator model 100 VHV-1 by the company John Meunier. The water head is 0.88m, see Appendix C. The ICD will have an overflow, see plans for more details.

2.4 STORMWATER QUALITY

Stormwater quality control is mandatory for all sites. As mentioned in the *pre-consultation memo*, the site must reach 80% Total Suspended Solids (TSS) removal prior to discharge into the storm sewer. Low Impact Development (LID) Best Management Practices (BMPs) should be used wherever possible as part of the proposed development. LID measures such as bioretention, permeable pavement, tree conservation and green roofs are intended to address water quality and quantity concerns. Many of these measures can't be provided for this project due to development requirements and site constraints.

Thus, to meet this requirement, a stormwater quality control system capable of 80% TSS removal, as per the Jellyfish Filter JF4-2-1 from Imbrium Systems Inc., will be installed upstream of the connection point between the proposed storm network and the existing storm sewer.

2.5 EROSION AND SEDIMENT CONTROL

Prior to, during and after construction, the following erosion and sediment control measures should be implemented to avoid the sediment transfer to existing streams and storm sewer systems.

Pre-Construction

- Installation of a silt fence (geotextile)
- Installation of inserts inside all existing manholes adjacent to construction zone
- Control measures to be inspected once installed
- Installation of a mud mat at the site access point

Construction

- Minimize the extent of disturbed areas
- Protect disturbed areas of runoff
- Provide cover if disturbed areas will not be reinstated within a reasonable period.
- Inspect silt fence regularly during construction. Clean and repair, as required.
- Control dust during construction

After Construction

- Provide permanent cover to disturbed areas (i.e. topsoil and seed)
- Remove all temporary erosion and sediment control items (silt fence and filter cloths) once disturbed areas have been reinstated

Inspections

- Erosion and sediment control measures will be inspected upon completion
- Control measures are to be inspected weekly

All control measures are to be inspected once installed as well as during construction.

3 SANITARY SEWER DESIGN FLOWS

The proposed sanitary sewer service connection for the new building is 250 mm in diameter and made of PVC. The pipe will be connected on the existing 250 mm diameter municipal sewer pipe under De La Famille-Côté Avenue, via a new manhole.

The proposed sanitary system is designed in accordance with the *Ottawa Sewer Design Guidelines*. The calculations for the proposed development flows are shown in the following sections.

3.1 POPULATION DENSITY

The population density of the proposed development is calculated using the number and type of housing units within this development. The detailed calculations are shown in table below and in the appendix D.

Table 2 – Population Density Calculation

Unit Types	Number of Units	Persons Per Unit	Population Density
1-bedroom	195	1.4	273
2-bedroom	159	2.1	334
		Total =	607

Using the values in Table 4.2 of the *Ottawa Sewer Design Guidelines* for per unit populations, the population densities of the proposed development are found to be 607 persons. This value will be used in the following sections to determine the sewer design flows.

3.2 AVERAGE WASTEWATER FLOWS AND PEAKING FACTORS

The average wastewater flow for residential developments of 280 L/c/d is used to determine the average day demand for residential use. The new building will not include commercial areas. Using this information, the total average wastewater flow for the proposed development is calculated below.

Average wastewater flow per capita for residential use: 280 L/c/d

Average wastewater flow for residential use: 169 932 L/d

The Harmon equation is then used to calculate the residential peak factor.

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000}\right)^{1/2}} \right) \times K, \qquad where\ K = 1$$

Hence, the peak factor for residential use is of 3.93.

3.3 EXTRANEOUS FLOWS

In accordance with Article 4.4.1.4 of the *Ottawa Sewer Design Guidelines*, an allowance for flows from extraneous sources must be considered in the calculation of the peak design flow.

The average infiltration allowance is of 0.28 L/s/gross ha for wet-weather inflow into the manholes and pipes. Therefore, with a total site area of 0.897 ha, the infiltration flow is 0.25 L/s.

3.4 TOTAL SANITARY SEWER DESIGN FLOW

Combining the results from the above calculations, the total sanitary sewer design flow is calculated as follows:

$$Q_{design} = [(3.93 \times 169\,932\; L/d)] \times \frac{1}{86\,400\; sec/d} + 0.25 L/s$$

$$Q_{design} = 7.98\; L/s$$

The summary of this calculation is shown in appendix D.

4 DOMESTIC WATER DEMAND

The proposed water service connection for the new building will consist of two separate branch connections: one on De la Famille-Côté Avenue and one on Jeanne d'Arc Boulevard. Each connection will be 150 mm in diameter and made of PVC. The first connection will be connected to the existing 203 mm diameter municipal watermain on De la Famille-Côté Avenue, while the second on the existing 406 mm diameter municipal watermain on Jeanne d'Arc Boulevard. Two shutoff valves will be installed at the property line for each connection as per the City guidelines. Additionally, both connections will be looped at the service entry inside the building, and an isolation valve will be placed between the two water service connections

The proposed water system is designed in accordance with the *Ottawa Design Guidelines – Water Distribution*. The calculations for the proposed water demand are shown in the following sections.

4.1 WATER DEMANDS

We can determine the average day demand for the proposed development using the values found in Table 4.2 of the *Ottawa Design Guidelines – Water Distribution* as the population density of the development was determined to be 607 people. Hence, an average day demand of 280 L/c/d is used for the residential spaces.

Average day demand per capita for residential use:	280	L/c/d
Average day demand for residential use:	169 932	L/d

Therefore, the total average day demand is:

$$Q_{avg,day} = \left(169\,932 \frac{L}{d}\right) \times \frac{1}{86{,}400} sec/d = 1.97\; L/s$$

The maximum daily demand and the maximum hour demand are calculated using the factors found in Table 4.2 of the *Ottawa Design Guidelines – Water Distribution*.

$$Q_{max,day} = \left(2.5 \times 169\,932\,\frac{L}{d}\right) \times \frac{1}{86{,}400}\,sec/d = 4.92\ L/s$$

$$Q_{max,hr} = \left(2.2 \times 2.5 \times 169\,932\,\frac{L}{d}\right) \times \frac{\frac{1}{86{,}400}\,sec}{d} = 10.82\ L/s$$

The detailed calculations for domestic water demand are found in appendix E.

4.2 BOUNDARY CONDITIONS

This section presents the existing boundary conditions for the water distribution system for the connection sites. Note, this information is to be provided by the City of Ottawa and is to be determind.

5 REQUIRED FIRE DEMAND

The flow rates required for fire protection vary according to the zoning, the type of units, the fire resistivity of the construction materials, the ground floor area as well as many other factors. The method described in *Water Supply for Public Fire Protection*, written by the Fire Underwriters Survey (FUS) (2020) is used to estimate the fire demand required for fire protection, as per the City Guidelines.

Essentially, the required flow rate (F), expressed in liters per minute, is calculated based on the floor area of the building (A) in square meters and the type of construction (C), using the following equation.

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

The value of C used is 0.8 for a non-combustible construction. According to the FUS, a non-combustible construction is "any structure having all structural members including walls, columns, piers, beams, girders, trusses, floors and roofs made of non-combustible material and not qualifying as fire-resistive construction." In this case, the building will be full non-combustible construction both for the construction type and exterior cladding.

The value of A represents the gross floor area of the building, that is, the sum of the surface area of all floors. See in the table below that surface area of each floor. The effective area is to be calculated as per the 2020 regulations for the *Water Supply for Public Fire Protection in Canada*, the total effective area is to be calculated as the largest floor with the addition of 25% of the next 2 adjacent floors.

Table 3 – Gross Floor Area for the Proposed Development

Floor	Surface Area Per Floor (m²)	Number of Floors	Floor Area (m²)
Ground Floor	3 237	1	3 237
Levels 2-3	3 097	2	6 194
Level 4	3 100	1	3 100
Level 5	1 970	1	1 970
Levels 6-12	2 057	7	14 399
Levels 13-14	1 165	2	2 330
		Total =	31 230

Finally, according to the FUS method, certain reductions and increases may be applied depending on a variety of factors such as the combustibility of the occupying materials or furniture, the presence of automatic sprinklers systems as well as the development's distance from neighbouring buildings. For example, for buildings protected by automatic sprinklers designed in accordance with the NPFA 13, the flow rate required for fire protection, F, can be reduced by 50%.

Using this method, the total fire demand was determined to be 5000 L/min. Moreover, for a duration of water supply of 2 hours, the required volume of water is 600 m³. The details of the fire flow calculations are shown in the appendix F.

6 RÉFÉRENCES

CITY OF OTTAWA. *Ottawa Design Guidelines – Water Distribution*, 2010.

CITY OF OTTAWA. *Ottawa Sewer Design Guidelines*, 2012.

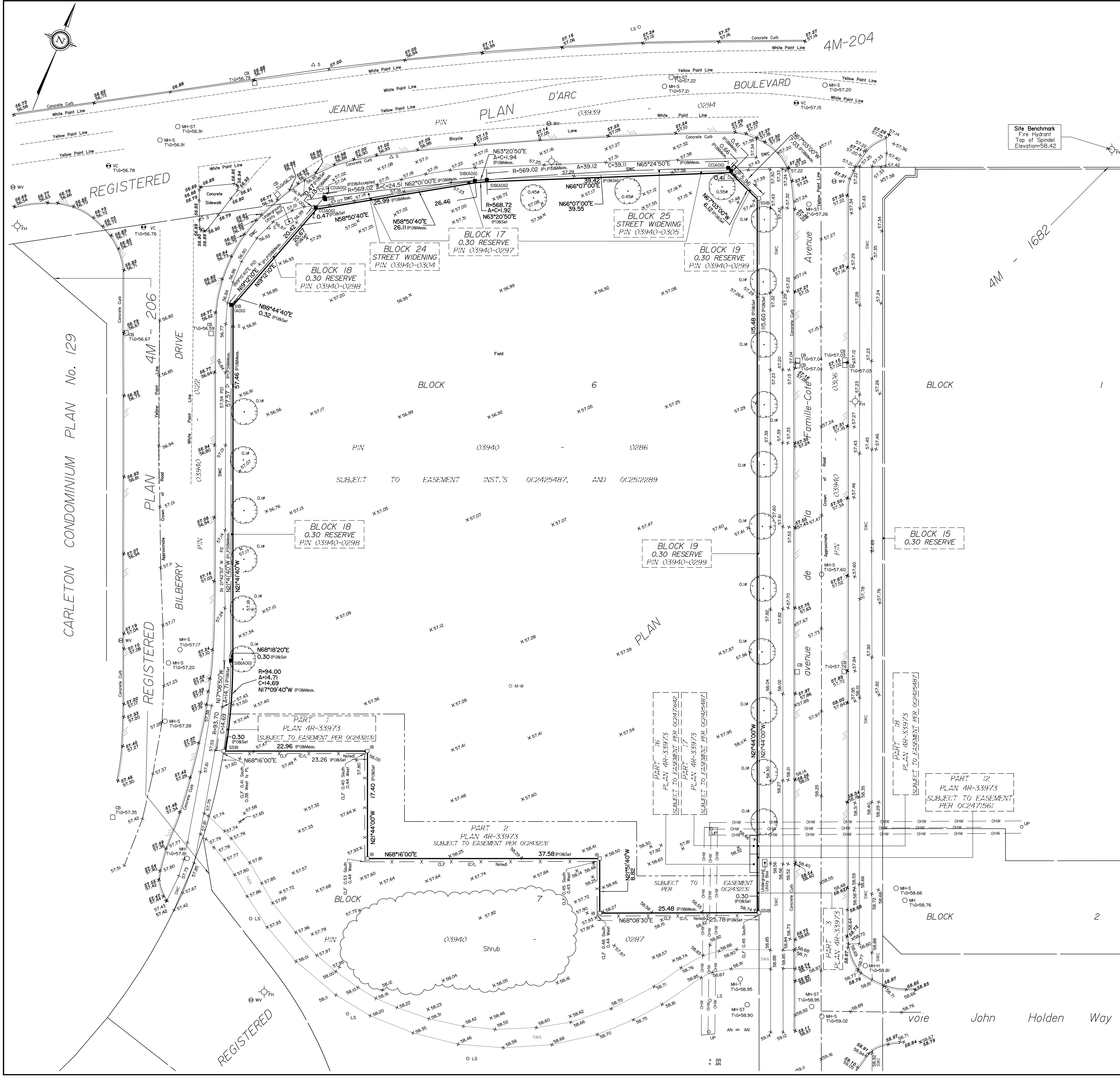
CITY OF OTTAWA. *Technical Bulletin ISTB-2018-02*, 2018.

FIRE UNDERWRITERS SURVEY, *Water Supply for Public Fire Protection*, 2020.

Appendix A – Civil Engineering Plans

Appendix B – Background Documents

Land Survey by Annis, O'Sullivan, Vollebekk Ltd. on September 9th, 2025



TOPOGRAPHIC PLAN OF SURVEY OF

BLOCK 6
REGISTERED PLAN 4M-1682
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the regulations made under them.
2. The survey was completed on the 19th day of August, 2025.

Date

T. Hartwick
Ontario Land Surveyor

Notes & Legend

—□—	=	Survey Monument Planted
—■—	=	Survey Monument Found
SIB	=	Standard Iron Bar
SSIB	=	Short Standard Iron Bar
IB	=	Iron Bar
CC	=	Cut Cross
(AOG)	=	Annis, O'Sullivan, Vollebekk Ltd.
(P1)	=	Registered Plan 4M-1682
(P2)	=	Registered Plan 4M-206
(P3)	=	Plan 4R-16870
MH-ST	=	Maintenance Hole (Storm Sewer)
MH-S	=	Maintenance Hole (Sanitary)
MH-T	=	Maintenance Hole (Traffic)
MH	=	Maintenance Hole (Unidentified)
MH-H	=	Maintenance Hole (Hydro)
VC	=	Valve Chamber (Watermain)
OHW	=	Overhead Wires
UP	=	Utility Pole
AN	=	Anchor
LS	=	Light Standard
CB	=	Catch Basin
FH	=	Fire Hydrant
WV	=	Water Valve
T/G	=	Top of Grate
S	=	Sign
CLF	=	Chain Link Fence
SWA	=	Asphalt Sidewalk
SWC	=	Concrete Sidewalk
M-W	=	Monitoring Well
Ø	=	Diameter
65.00	=	Location of Elevations
65.00	=	Top of Concrete Curb Elevation
C/L	=	Centreline
——	=	Property Line
○	=	Deciduous Tree

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-110937

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

SITE AREA = 8947.0 m²

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.999963.

Bearings are grid, derived from Easterly limit of Block 1 Plan 4M-206 shown to be N21°43'00"W and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

Coordinate values are to urban accuracy in accordance with O. Reg. 216/10.

. 01919680184	Northing	5040610.16	Easting	384736.56
. 019198434761	Northing	5036178.12	Easting	372436.11

Caution: Coordinates cannot, in themselves, be used to re-establish corners or boundaries shown on this plan.

ELEVATION NOTES

1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference
4. Sanitary and storm sewer grades and inverts were derived from
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

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Ontario Land Surveyors

Job No. 26110-25 Batimo Developpment Inc Blk 6 4M-1682 O D3 KHC

Appendix C – Stormwater Flows and Storage Requirements, Detailed Calculations, Storage tank drawing

STORMWATER CALCULATIONS

IDF CURVES FOR THE CITY OF OTTAWA

IDF curve equations (Intensity in mm/hr)

100 year Intensity	$= 1735.688 / (\text{Time in min} + 6.014)^{0.820}$
50 year Intensity	$= 1569.580 / (\text{Time in min} + 6.014)^{0.820}$
25 year Intensity	$= 1402.884 / (\text{Time in min} + 6.018)^{0.819}$
10 year Intensity	$= 1174.184 / (\text{Time in min} + 6.014)^{0.816}$
5 year Intensity	$= 998.071 / (\text{Time in min} + 6.053)^{0.814}$
2 year Intensity	$= 732.951 / (\text{Time in min} + 6.199)^{0.810}$

WATERSHED

The watersheds of the project are as displayed in the drawing below. The red zones represent the areas that are considered uncontrolled flow as the water will lease the site without control, and the green zone represents the areas where the runoff is controlled before being directed into the municipal sewer system.

HYPOTHESE

- The roof is a part of the drainage areas draining downstream of the underground tank.

Here are the calculations for the post-development flowrate as asked by the city.

TABLE 1 – PROPOSED POST-DEVELOPMENT CATCHMENT AREAS

Drainage area	Total area (m²)	Impervious surfaces		Grass surfaces		100-year runoff coefficient
		Area (m²)	Runoff coefficient	Area (m²)	Runoff coefficient	
Building	4073	4073	0.95	0	-	0.95
Total Regulated	8237	6597	0.95	1640	0.25	0.811
Total Unregulated	734	75	0.95	658	0.25	0.322

RUNOFF COEFFICIENT CALCULATION

$$C = \frac{\sum(Ai \times Ci)}{\sum A}$$

Where Ai is the Area of a certain material type

Ci is the runoff coefficient of a certain material type

Example:

$$C_{CB-04} = \frac{698 \times 0.900 + 186 \times 0.250}{698 + 186} = 0.763$$

TABLE 2 - PROPOSED UNCONTROLLED FLOW

Parameters	Values	Units
Impervious surfaces	75	m²
Grass surfaces	658	m²
Total area	734	m²
100-year Runoff coefficient	0.322	-
Time of concentration	10	min
Uncontrolled 100-year flow	14.3	ℓ/s

* The 100-year runoff coefficients are determined by increasing the 2-year runoff coefficients by 25% as per the city of Ottawa sewer design guidelines.

TABLE 3 - PROPOSED CONTROLLED FLOW

Parameters	Values	Units
Allowable release rate / total flow	26.1	ℓ/s
100-year uncontrolled flow	14.3	ℓ/s
Allowable release rate / Controlled flow	11.8	ℓ/s
Release rate controlled by ICD 1 (submersible pump)	11.8	ℓ/s
Release rate controlled by ICD 2	11.8	
100-year storage requirement *	**525.6**	m^3

*Storage requirement calculations includes a 20% increase in rainfall

*Storage requirement calculations includes a 10% increase in volume

TABLE 4 - PROPOSED STORMWATER STORAGE

Parameters	Values	Units
100-year required storage of the project[1,2]	525.6	m^3
Volume retained in storm pipes and structures	10.6	m^3
Volume retained on the roof (to be validated by mechanical ing)	128.0	m^3
Volume retained in underground concrete tank	390	m^3
Total storage volume available	528.6	m^3

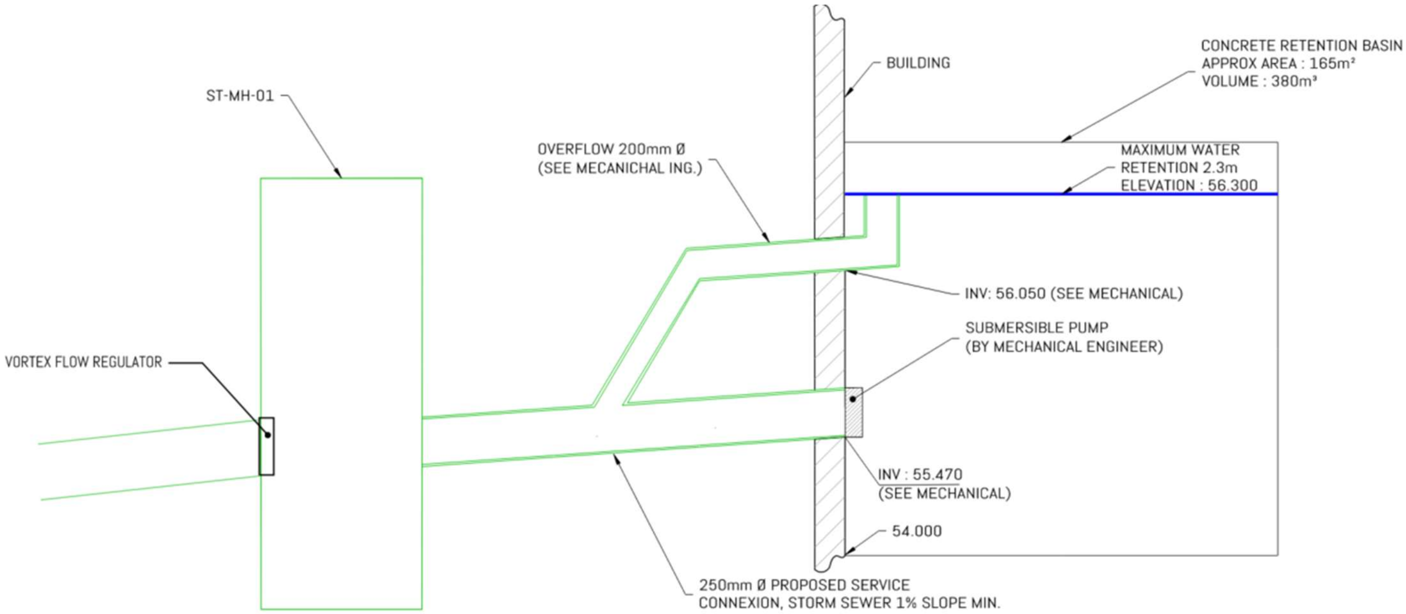
1 - A 10% increase was included in the volume requirement as an extra safety measure

2 - A 20% increase to rainfall was included for the climate change effects

TABLE 5 – INLET CONTROL DEVICE (ICD)

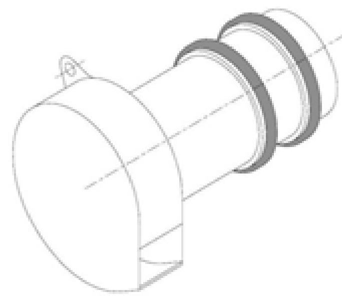
Zone	Pipe	Flowrate (L/s)	Water level	Invert (m)	Water head (m)	Type *
1	250 mm PVC	11.8	56.30	55.42	0.88	Vortex 100 VHV-1 from Veolia or equivalent approved
2	250 mm PVC	11.8	56.30	55.470	0.83	Submersible pump

*The type of ICD and specifications has to be validated with the manufacturer and mechanical engineer

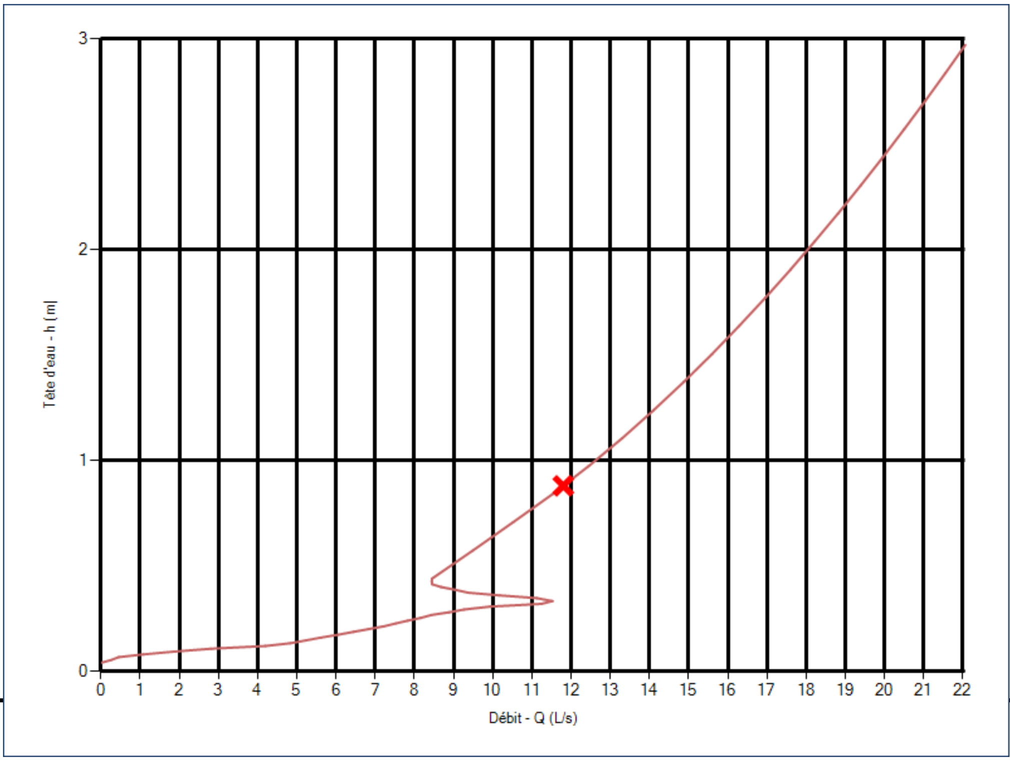

ST-MH-01
VORTEX FLOW REGULATOR
OVERFLOW 200mm Ø
(SEE MECANICHAL ING.)
BUILDING
CONCRETE RETENTION BASIN
APPROX AREA : 165m²
VOLUME : 380m³
MAXIMUM WATER
RETENTION 2.3m
ELEVATION : 56.300
INV: 56.050 (SEE MECHANICAL)
SUBMERSIBLE PUMP
(BY MECHANICAL ENGINEER)
INV : 55.470
(SEE MECHANICAL)
54.000
250mm Ø PROPOSED SERVICE
CONNEXION, STORM SEWER 1% SLOPE MIN.

INFORMATION GÉNÉRALE

Application	Eau Pluviale	
Nom du projet	Test	
Numéro de projet		
Commentaire		
Identification		
Débit de conception (Q)	11.8	L/s
Charge d'eau de conception (h)	0.88	m
Diamètre de la conduite de sortie (C)	250	mm
Type de conduite	PVC	
Modèle	100 VHV-1,10,STD	
Item #	PRIPHY200281	
Quantité	1	
Dégagement minimum (H)	200	mm
Diamètre minimum du regard (B)	900	mm

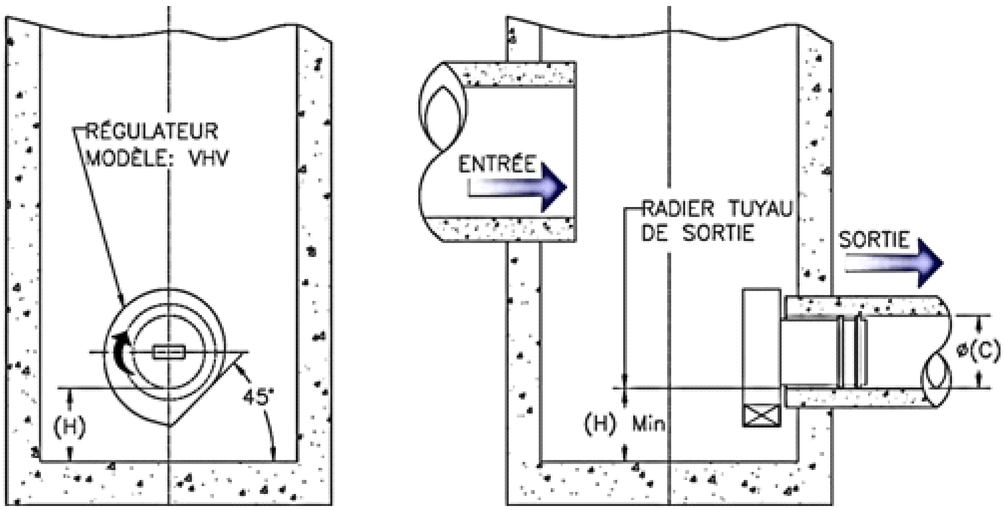


COURBE DE DÉBIT



Q (L/s)	h (m)
0.000	0.040
2.804	0.107
6.040	0.173
7.826	0.240
9.933	0.307
9.369	0.373
8.451	0.440
13.302	1.106
16.956	1.773
19.952	2.439
22.554	3.106
24.885	3.772
36.428	8.038
47.028	13.370

INSTALLATION TYPIQUE



SPÉCIFICATIONS

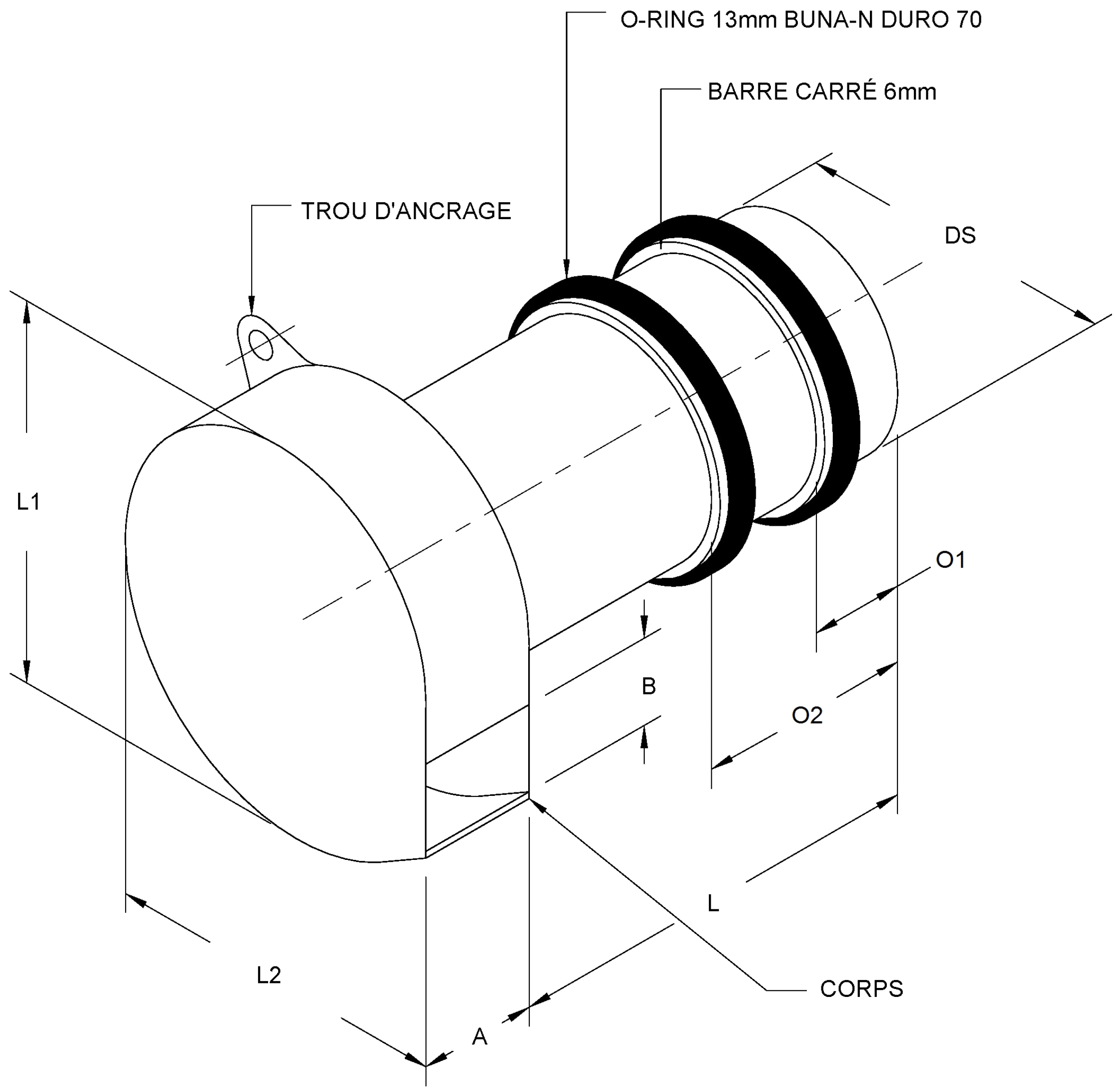
Le régulateur de débit sera du type statique utilisant le principe du vortex et n'aura aucune partie mobile. Le débit sera régularisé sur toute la charge en utilisant uniquement les propriétés hydrauliques de l'unité. Le régulateur sera auto activé et ne nécessitera pas d'instrumentation ou alimentation externe.

Chaque régulateur de débit est constitué d'un corps à l'intérieur duquel s'effectue le contrôle de débit. Un manchon est soudé au corps pour permettre son insertion convenable à l'intérieur du tuyau de sortie du regard. Deux joints toriques en caoutchouc assurent l'étanchéité et le maintien du manchon dans le tuyau. Deux barres soudées au manchon empêchent les joints toriques de se déplacer durant l'installation et le fonctionnement.

Le régulateur sera construit entièrement à partir d'acier inoxydable 304 avec soudures continues, tel que fabriqué par Veolia Water Technologies Canada Inc. (John Meunier), 514-334-7230, cso@veolia.com.

Nom du projet: Test
Numéro de projet:
Identification:
Débit (Q): 11.8 L/s
Charge d'eau (h): 0.88 m
Modèle: 100 VHV-1,10,STD
item: PRIPHY200281
Quantité: 1

Dimensions (mm)	
A	100
B	82
L1	365
L2	328
L	200
DS	225
O1	38
O2	100
Ø ÉVENT	N/A



Toutes les dimensions sont en milimètres à moins avis du contraire

2025-12-09

Appendix D – Sanitary Sewer Design Flows, Detailed Calculations

SANITARY SEWER DESIGN FLOWS - 500 Famille-Côté Ave

Reference : Ottawa Sewer Design Guidelines, *Infrastructure Services Department* , October 2012

A. Population Density

(Article 4.3, Table 4.2)	Number of units	Persons Per Unit	Population Density
Studio	0	1,4	0
1-bedroom	195	1,4	273
2-bedroom	159	2,1	334
3-bedroom	0	3,1	0

Total population density: 606,9

B. Average Wastewater Flows

(Article 4.4.1, Figure 4.3)

Average wastewater flow per capita for residential use: 280 L/c/d
Average wastewater flow for residential use: 169 932 L/d

Average wastewater flow for commercial use: 28 000 L/gross ha/d
Commercial Areas: 0 m² 0 L/d

C. Peaking Factors

(Article 4.4.1, Figure 4.3)

Residential peak factor: Harmon Equation
K=1

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000}\right)^{1/2}} \right) \times K$$

Residential peak factor: 3,93
Commercial peak factor: 1,50

D. Extraneous Flows

(Article 4.4.1.4)

Infiltration allowance: 0,28 L/s/effective gross ha for 0.897 ha
Inflitration flow: 0,25 L/s

F. Total Wastewater Design Flow

Q_{design} = [(3,93 x 169 932 L/d) + (1.50 x 0 L/d)] x 1/86 400 sec/d + 0.25 L/s

Q_{design} = 7,98 L/s

SANITARY SEWER CALCULATION SHEET

Manning's n = 0,013

LOCATION			RESIDENTIAL AREA AND POPULATION						COMM		INDUST			INST		C+I+I	INFILTRATION				PIPE				
STREET	FROM M.H.	TO M.H.	AREA (ha)	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FACTOR (per	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	LENGTH (m)	DIA. (mm)	SLOPE (%)	CAP. (FULL) (l/s)	VEL. (FULL) (m/s)
Famille-côté Ave	BUILD.	City		607			3,93	7,98	0,0000	0,0000	-	-	1,5	-	-	0,0000	0,8970		0,25	8,23	19,20	250	2,00	84,10	1,71

DESIGN PARAMETERS

Average Daily Flow =	280 l/p/day	Industrial Peak Factor =	as per MOE Graph
Comm/Inst Flow =	28000 L/ha/da	Extraneous Flow =	0,28 L/s/ha
Industrial Flow =	28000 L/ha/da	Minimum Velocity =	0,86 m/s
Max Res. Peak Factor =	4,02	Manning's n =	0,013
Commercial / Inst Peak Factor =	1,50		

Designed:	PROJECT: LIB Orléans		
Checked:	LOCATION: 500 Famille-Côté Ave, OTTAWA, ON		
Dwg. Reference: C-204	File Ref.: 601401	Date: 2025-12-09	Sheet No. 1 of 1

Appendix E – Domestic Water Demand, Detailed Calculations, Watermain Pressure

File : 601401
Project : 500 Famille-Côté Ave

DOMESTIC WATER DEMAND CALCULATION

Reference : Ottawa Design Guidelines - Water Distribution, *Infrastructure Services department* , July 2010

A. Population Density

(Article 4.2.8, Table 4.1)	Number of units	Persons Per Unit	Population Density
Studio	0	1,4	0
1-bedroom	195	1,4	273
2-bedroom	159	2,1	333,9
3-bedroom	0	3,1	0
		Total population density:	607

B. Average Day Demand

(Article 4.2.8, Table 4.2)

Average day demand per capita for residential use: 280 L/c/d
Average day demand for residential use: 169 932 L/d

Total average day demand: 169 932 L/d = 1,97 L/s

C. Maximum Daily Demand

(Article 4.2.8, Table 4.2)

Maximum daily demand = 2.5 x 169 932 L/d
= 424 830 L/d = 424 830 L/d
= 4,92 L/s

D. Maximum Hour Demand

(Article 4.2.8, Table 4.2 and Technical Bulletin ISD-2010-2)

Maximum hour demand = 2.2 x (Max Day_{res}) L/d
Maximum hour demand = 2.2 x 424 830 L/d = 934 626 L/d
= 10,82 L/s

F. Results

Population density =	607	people
Average day demand =	1,97	L/s
Maximum daily demand =	4,92	L/s
Maximum hour demand =	10,82	L/s

Appendix F – Required Fire Demand, Detailed Calculations

Fire Flow Requirement - OBC

500 de la Famille-Côté Avenue

A. Total Building volume (m3)

	Surface Area Per Floor		Number of Floors	Floor Area	Floors height	Volume Per Floor
Ground Floor	3 237	m²	1	3 237 m²	3,66 m	11 847 m^3
Levels 2-3	3 097	m²	2	6 194 m²	2,845 m	17 622 m^3
Level 4	3 100	m²	1	3 100 m²	2,995 m	9 285 m^3
level 5	1 970	m²	1	1 970 m²	2,846 m	5 607 m^3
Levels 6-12	2 057	m²	7	14 399 m²	2,845 m	40 965 m^3
Levels 13-14	1 165		2	2 330	2,996 m	6 981

Total A = 31 230 m²

Total V = 92 306 m^3

B. Fire Flow

$Q = KVS_{tot}$

Q	Minimum supply of water in litres
K	Water supply coefficient from Table 1
V	Total building volume in cubic meters
S_{tot}	Total of spatial coefficient values from property line exposures on all sides – Refer to Formula associated with A-3.2.5.7 in OBC.

C. Water Supply Coefficient

Building Group: C (Residential Occupancies)

Table 1; K = 10

(Refer to Architect's email for Type of Construction)

D. Spatial Coefficient

Building Face	Exposure Distance	Spatial Coefficient
North	More than 10m	0,0
East	More than 10m	0,0
South	More than 10m	0,0
West	More than 10m	0
Total		0,0

Stot = 1.0 + (Sum of side spatial coefficient)

Stot = 1,0

E. Required Fire Flow

Q = KVStot

Q= 923063,1 Liters

Based on Table 2 of A-3.2.5.7 OBC, the required minimum water supply flow rate is : 9000 Lpm or 150L\s

File : 601401
Project : 500 Famille-Côté Ave

REQUIRED FIRE DEMAND CALCULATION

References : Ottawa Technical Bulletin ISTB-2018-02, March 2018
Water Supply for Public Fire Protection, *Fire Underwriters Survey*, 1999

A. Type of construction

Non-combustible construction : C = 0,8

B. Total Floor Area

	Surface Area Per Floor	Number of Floors	Floor Area
Ground Floor	3 237 m²	1	3 237 m²
Levels 2-3	3 097 m²	2	6 194 m²
Levels 4	3 100 m²	1	3 100 m²
Level 5	1 970 m²	1	1 970 m²
Levels 6-12	2 057 m²	7	14 399 m²
Levels 13-14	1 165 m²	2	2 330 m²
		Total:	31 230

A = Largest floor area + 25% of each of the two immediately adjoining floors

A = $3237 m^2$ + 25% * $3097\ m^2$ + 25% * $3097\ m^2$

A = $4786\ m^2$

D. Base Fire Flow

$$F = 220 \times C\sqrt{A}$$ = 12 175 L/min

The base fire flow must be rounded up to the nearest 1,000 L/min, hence : *F* = 12 000 L/min

E. Fire Flow Adjustments

E.1 Building occupancy (adjustments to the value obtained in D) ①

Occupancy : Non-combustible -25% *F* = 9 000 L/min

E.2 Automatic sprinkler system (adjustments to the value obtained in E.1)

NPFA 13 Designed system:	Yes	-30%
Standard water supply:	Yes	-10%
Fully supervised system:	Yes	-10%

E.3 Exposure surcharge (adjustments to the value obtained in E.1)

Length-Height Factors

North side	No adjacent building
East side	No adjacent building
South side	Height of adjacent building < building height
West side	Height of adjacent building < building height

North side	No adjacent building	0%
East side	No adjacent building	0%
South side	47,3m (> 45m)	0%
West side	52m (> 45m)	0%

Reductions from E.2 =	-50%	=	-4 500	L/min	(2)
Increases from E.3 =	0%	=	0	L/min	(3)

(1) + (2) + (3) *F =* 4 500 L/min

The fire flow must be rounded up to the nearest 1,000 L/min, hence : *F =* 5 000 L/min

F. volume of Water Required During the Fire

The duration of water supply for a fire is: 2 hours

Required Volume = 600 000 L = 600 m³

Fire Demand =	5 000	L/min	Required Volume =	600	m³