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SITE SERVICING STUDY & STORMWATER MANAGEMENT REPORT

245-263 ROCHESTER STREET & 27 BALSAM STREET
OTTAWA, ONTARIO

CITY OF OTTAWA APPLICATION NO.
D02-02-22-0102 & D07-12-22-0156

REPORT NO. 22076-REV.02

APRIL 14, 2023

CONTENTS

1.0 INTRODUCTION

2.0 WATER SERVICING

2.1 WATER SUPPLY FOR FIREFIGHTING

2.2 DOMESTIC WATER SUPPLY

3.0 SANITARY SERVICING

4.0 STORMWATER MANAGEMENT

4.1 PRE-DEVELOPMENT CONDITIONS

4.2 QUALITY CONTROL

4.3 QUANTITY CONTROL

4.4 STORM SERVICING

5.0 CONCLUSIONS

LIST OF APPENDICES

A PRE-APPLICATION CONSULTATION MEETING NOTES

B WATER SERVICING

C SANITARY SERVICING

D STORMWATER MANAGEMENT

E DEVELOPMENT SERVICING STUDY CHECKLIST

1.0 INTRODUCTION

This report has been prepared in support of the Site Plan Control application for the proposed 9-storey mixed-use building comprised of 120 residential apartment units and partial ground floor commercial located at 245-263 Rochester Street & 27 Balsam Street in Ottawa, Ontario. Refer to Pre-Application Consultation meeting notes in Appendix A.

This report forms part of the servicing and stormwater management design for the proposed development. Also refer to drawings C-1 to C-4 prepared by D.B. Gray Engineering Inc.

2.0 WATER SERVICING

2.1 WATER SUPPLY FOR FIREFIGHTING

The proposed building will have a sprinkler system with the fire department connection located at the SW corner of the building. There is an existing municipal Class AA fire hydrant located at the intersection of Rochester Street and Balsam Street. It is ±35 m unobstructed distance to the proposed fire department connection, which is less than the maximum 45 m permitted by the Ontario Building Code; therefore, a private fire hydrant is not required.

In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when calculating the required fire flow where pipe sizing is not affected, the Ontario Building Code Method is to be used. Using the Ontario Building Code Method the required fire flow was calculated to be 9,000 L/min (150 L/s). In accordance with City of Ottawa Technical Bulletin ISTB-2021-03, when the Ontario Building Code Method yields a required fire flow of 9,000 L/min (150 L/s), the Fire Underwriters Survey Method is to be used instead. Using the Fire Underwriters Survey Method the required fire flow was subsequently calculated to be 19,000 L/min (316.7 L/s). Refer to calculations in Appendix B.

The boundary conditions in the 200 mm Rochester Street municipal watermain provided by the City of Ottawa for the 316.7 L/s fire flow at the subject property indicate a hydraulic grade line (HGL) of 102.9 m. Refer to Appendix B. This HGL calculates to 364 kPa (53 psi). Since the pressure is above the Ontario Building Code's minimum required pressure of 140 kPa (20 psi), there is an adequate water supply for firefighting from the existing municipal water distribution system.

In accordance with City of Ottawa Technical Bulletin ISTB-2018-02, the aggregate flow of all contributing fire hydrants within 150 m of the building shall not be less than the required fire flow. In accordance with City of Ottawa Technical Bulletin ISTB-2018-02 Appendix I:

Class	Distance (m)	Contribution (L/min)
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800

The existing municipal Class AA fire hydrant serving the fire department connection discussed above can contribute 5,700 L/min (95 L/s). There is another existing municipal Class AA fire hydrant within 75 m of the proposed building located at the intersection of Rochester Street and Willow Street. It can also contribute 5,700 L/min (95 L/s). There are also two existing municipal Class AA fire hydrants within between 75 m and 150 m of the proposed building; one is located between 85 Willow Street and 87 Willow Street; and the other is located at the intersection of Balsam Street and Booth Street. Each can contribute 3,800 L/min (63.3 L/s). The aggregate flow of the four contributing fire hydrants is 19,000 L/min (316.7 L/s), which is equal to the required fire flow.

2.2 DOMESTIC WATER SUPPLY

In accordance with

i. the City of Ottawa Water Design Guidelines for the residential populations, commercial consumption rate and commercial peaking factors,
ii. City of Ottawa Technical Bulletin ISTB-2021-03 for the residential consumption rate, and
iii. the Ministry of the Environment Water Design Guidelines for the residential peaking factors, and

based on the 106 – 1 bedroom apartment units, 14 – 2 bedroom apartment units and partial ground floor commercial representing ±10% of the property, the average daily demand was calculated to be 0.6 L/s, the maximum daily demand was calculated to be 2.7 L/s and the maximum hourly demand was calculated to be 4.1 L/s. Refer to calculations in Appendix B. Since the average daily demand is more than 50,000 L/day, a redundant water supply separated by an isolation valve is required to avoid the creation of a vulnerable service area.

The boundary conditions in the 200 mm Rochester Street municipal watermain provided by the City of Ottawa at the subject property indicate a minimum HGL of 107.2 m and a maximum HGL of 115.3 m. Refer to Appendix B. Based on these boundary conditions the pressure at the water meter is calculated to vary between 426 kPa (62 psi) and 506 kPa (73 psi). This is an acceptable range for the proposed development.

A 150 mm water service connecting to the existing 200 mm Rochester Street municipal watermain is proposed to service the sprinkler system. The same 150 mm water service will provide an adequate domestic water supply.

3.0 SANITARY SERVICING

In accordance with

i. the City of Ottawa Sewer Design Guidelines for the residential populations and commercial peaking factor,
ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates, Harmon Formula correction factor and infiltration allowance, and
iii. the Harmon Formula for the residential peaking factor, and

based on the 106 – 1 bedroom apartment units, 14 – 2 bedroom apartment units and partial ground floor commercial representing ±10% of the property, the post-development sanitary flow rate was calculated to be 1.91 L/s. A 150 mm sanitary sewer service at 2% slope (21.54 L/s capacity) is proposed to service the development. At the design flow rate the sanitary sewer service will only be at 9% of its capacity. The proposed 150 mm sanitary sewer service will connect to the existing 375 mm Balsam Street municipal combined sewer, which at 1.11% slope has a capacity of 184.72 L/s. Refer to calculations in Appendix C.

The proposed development is expected to have an acceptable impact on the 375 mm Balsam Street municipal combined sewer.

The basement plumbing fixtures will drain to a sanitary sump and be pumped to the sanitary building drain. The point of connection to the sanitary building drain is to be at high level in the basement. Refer to mechanical.

4.0 STORMWATER MANAGEMENT

4.1 PRE-DEVELOPMENT CONDITIONS

Based on the topographic sketch,

i. stormwater appears to drain from north to south,
ii. the subject property does not appear to receive any significant stormwater from adjacent properties, and
iii. adjacent properties do not appear to receive any significant stormwater from the subject property.

4.2 QUALITY CONTROL

The Rideau Valley Conservation Authority has stated: *"The RVCA has no water quality control requirements based on the proposed site plan. Best management practices are encouraged where feasible."* Refer to Appendix D. As such, no permanent stormwater quality control measures are proposed.

An Erosion & Sediment Control Plan has been developed to be implemented during construction. Refer to drawing C-2 and notes 4.0 to 4.7 on drawing C-3. Sediment capture filter sock inserts are to be installed in all existing catch-basins adjacent to the site, and any material deposited on the public road is to be removed.

4.3 QUANTITY CONTROL

The stormwater quantity control criterion is to control the post-development peak flows with the use of flow control roof drains to the pre-development 2-year peak flow rate using the post-development roof area, a pre-development runoff coefficient not more than 0.4 and a pre-development time of concentration not less than 10 minutes. Using the Rational Method with the post-development roof area of 1,070 sq.m, a time of concentration of 10 minutes and runoff coefficient of 1.0, the pre-development flow rate during the 100-year event was calculated to be 53.11 L/s. Using the Rational Method with the post-development roof area of 1,070 sq.m, a time of concentration of 10 minutes and runoff coefficient of 0.9, the pre-development flow rates were calculated to be 27.89 L/s during the 5-year event and 20.56 L/s during the 2-year event. Using the Rational Method with the post-development roof area of 1,070 sq.m, a time of concentration of 10 minutes and runoff coefficient of 0.4, the target release rate was calculated to be 9.14 L/s. The Rational and Modified Rational Methods were used to calculate the post-development flow rates and corresponding storage volumes. Refer to calculations in Appendix D.

Drainage Area I (Uncontrolled Flow Off Site – 763 sq.m)
Other than roof storage, stormwater from the property will drain uncontrolled to the right-of-way. The flow rates are calculated at a time of concentration of 10 minutes.

	100-Year Event	5-Year Event
Maximum Flow Rate	28.27 L/s	14.66 L/s

Drainage Area II (Penthouse Roof – 206 sq.m)
The 2 roof drains are to be flow control type roof drains which will restrict the flow of stormwater and cause it to pond on the roof. Roof drains are to be Watts RD-100 c/w a Watts Adjustable Accutrol Weir in the ¼ open position and release 0.95 L/s at 150 mm (15 USgpm at 6”). The opening at the top of the flow control weir is to be a minimum 50 mm in diameter. A minimum of 4 scuppers each a minimum 150 mm wide are to be installed 150 mm above the roof drains. Refer to architectural for exact locations and details. The roof is to be designed to carry the load of water having a 50 mm depth at the scuppers (i.e. 200 mm depth at the roof drains). Refer to structural.

	100-Year Event	5-Year Event
Maximum Release Rate	1.80 L/s	1.58 L/s
Maximum Depth at Roof Drains	137 mm	101 mm
Maximum Volume Stored	6.23 cu.m	2.46 cu.m

Drainage Area III (9th Floor Roof – 666 sq.m)
The 8 roof drains are to be flow control type roof drains which will restrict the flow of stormwater and cause it to pond on the roof. Roof drains are to be Watts RD-100 c/w a Watts Adjustable Accutrol Weir in the ¼ open position and release 0.95 L/s at 150 mm (15 USgpm at 6”). The opening at the top of the flow control weir is to be a minimum 50 mm in diameter. A minimum of 8 scuppers each a minimum 250 mm wide are to be installed 150 mm above the roof drains. Refer to architectural for exact locations and details. The roof is to be designed to carry the load of water having a 50 mm depth at the scuppers (i.e. 200 mm depth at the roof drains). Refer to structural.

	100-Year Event	5-Year Event
Maximum Release Rate	7.05 L/s	6.16 L/s
Maximum Depth at Roof Drains	131 mm	95 mm
Maximum Volume Stored	18.27 cu.m	6.99 cu.m

Drainage Area IV (5th Floor Terrace – 144 sq.m)
The 2 roof drains are to be flow control type roof drains which will restrict the flow of stormwater and cause it to pond on the roof. Each roof drain is to be installed with a single-parabolic slotted weir and release 0.01242 L/s/mm (5 USgpm/in). Roof drains are to be Watts with an Accutrol Weir RD-100-A1 or approved equivalent. The opening at the top of the flow control weir is to be a minimum 50 mm in diameter. A minimum of 2 scuppers each a minimum 250 mm wide are to be installed 150 mm above the roof drains. Refer to architectural for exact locations and details. The roof is to be designed to carry the load of water having a 50 mm depth at the scuppers (i.e. 200 mm depth at the roof drains). Refer to structural.

	100-Year Event	5-Year Event
Maximum Release Rate	2.78 L/s	2.03 L/s
Maximum Depth at Roof Drains	112 mm	82 mm
Maximum Volume Stored	2.64 cu.m	1.03 cu.m

Drainage Area V (2nd Floor Terrace – 54 sq.m)
The roof drain is to be a flow control type roof drain which will restrict the flow of stormwater and cause it to pond on the roof. The roof drain is to be installed with a single-parabolic slotted weir and release 0.01242 L/s/mm (5 USgpm/in). The roof drain is to be a Watts with an Accutrol Weir RD-100-A1 or approved equivalent. The opening at the top of the flow control weir is to be a minimum 50 mm in diameter. A minimum of 1 scupper a minimum 150 mm wide is to be installed 150 mm above the roof drain. Refer to architectural for exact location and details. The roof is to be designed to carry the load of water having a 50 mm depth at the scupper (i.e. 200 mm depth at the roof drain). Refer to structural.

	100-Year Event	5-Year Event
Maximum Release Rate	1.32 L/s	0.93 L/s
Maximum Depth at Roof Drain	106 mm	75 mm
Maximum Volume Stored	0.82 cu.m	0.29 cu.m

Summary
The maximum post-development release rate during the 100-year event through the flow control roof drains was calculated to be 12.95 L/s, which is 76% less than the pre-development flow rate during the 100-year event, 37% less than the pre-development flow rate during the 2-year event and 42% more than the target release rate. The maximum post-development release rate during the 5-year event through the flow control roof drains was calculated to be 10.70 L/s, which is 62% less than the pre-development flow rate during the 5-year event, 48% less than the pre-development flow rate during the 2-year event and 17% more than the target release rate. The proposed development is expected to have a positive impact on the 375 mm Balsam Street municipal combined sewer.

4.4 STORM SERVICING

The peak unrestricted roof flow rate during the 5-year event was calculated to be 39.05 L/s. A 250 mm storm sewer service at 2% slope (84.10 L/s capacity) is proposed to service the development. At the peak unrestricted 5-year flow rate the storm sewer service would only be at 46% of its capacity. The peak restricted roof flow rate during the 5-year event was calculated to be 21.85 L/s. At the peak restricted 5-year flow rate the storm sewer service will only be at 26% of its capacity. The proposed 250 mm storm sewer service will connect to the existing 375 mm Balsam Street municipal combined sewer, which at 1.11% slope has a capacity of 184.72 L/s. Refer to calculations in Appendix D.

The rainwater leaders inside the building are to be constructed to withstand the pressure from a water column the height of the rainwater leader. It is recommended pressure tests be performed on the systems in accordance with the mechanical engineer's instructions.

The foundation drain will drain to a storm sump and be pumped to the storm building drain. The point of connection to the storm building drain is to be at high level in the basement. Refer to mechanical.

Since the proposed storm sewer service connects to a combined sewer, an Environmental Compliance Approval from the Ministry of the Environment, Conservation and Parks will be required.

5.0 CONCLUSIONS

1. A private fire hydrant is not required.
2. There is an adequate water supply for firefighting from the existing municipal water distribution system.
3. There is an acceptable range of water pressures in the existing municipal water distribution system.
4. The post-development sanitary flow rate will be adequately handled by the proposed sanitary sewer service.
5. The Rideau Valley Conservation Authority does not require permanent stormwater quality control measures. As such, no permanent measures are proposed.
6. An Erosion & Sediment Control Plan has been developed to be implemented during construction.
7. The proposed development is expected to have a positive impact on the existing municipal combined sewer.
8. The unrestricted flow rate during the 5-year event will be adequately handled by the proposed storm sewer service.
9. The rainwater leaders inside the building are to be constructed to withstand the pressure from a water column the height of the rainwater leader. It is recommended pressure tests be performed on the systems in accordance with the mechanical engineer's instructions.
10. An Environmental Compliance Approval from the Ministry of the Environment, Conservation and Parks will be required.

Prepared by D.B. Gray Engineering Inc.

APPENDIX A

PRE-APPLICATION CONSULTATION MEETING NOTES

Pre-Application Consultation Meeting Notes

245-267 Rochester Street
File Number: D07-01-22-0146
Wednesday June 16, 2022, Microsoft Teams

Attendees:

City of Ottawa:
Jean-Charles Renaud, File Lead
Joyce Tshiyoyo, Student Planner
Reza Bakhit, Project Manager
Wally Dubyk, Transportation
Christopher Moise, Urban Designer

Applicant Team:
Carl Madigan, Owner
Eric Forhan, Planner (J.L. Richards & Associates Limited)
Alexander Elgin, Senior Planner/Urban Designer (J.L. Richards & Associates Limited)
Scott Hayward, Architecture (Simmonds Architecture)

Community Association Representatives:
David Seaborn

Subject: 245-267 Rochester Street

Meeting Notes:

Opening & attendee introduction

- Introduction of meeting attendees

Proposal Overview

- Proposing a 11-storey, high-rise mixed-use building with 143 dwelling units.
- Proposal to feature a potential retail, restaurant or other uses in ground floor, including outside public amenity space.
    - This will encourage the welcome of community members and create a community hub
- Creating an urban space to amplify public realm
- Corner expression
- Transition building
    - The beginning stories being used with brick or specific stone
    - The middle levels using a different material
    - The upper levels using a different level
- Features
    - Amenity space and sustainability
        - Adding terrace features with green roof

    - Courtyard
    - Adding trees and green for shade

Questions:

- Reza: Are you on the process of completing the ESA report?
    - Eric: Yes.
    - Reza: There is a letter to write after the EU has reviewed the ESA report. It will be finalized once it has been reviewed.

Preliminary Comments from Related Discipline:

Planning (JC)

- There are still concerns with the proposed height. The General Urban Area is intended mostly for low-rise residential budlings and maybe some mid-rise buildings
- General Urban Area is mostly intended for low-rise developments, with some instances of mid-rises.
- While the SP does not extend to this area, the permitted heights, when extrapolated out to the subject property, would suggest a height of 6 storeys
- The neighbourhood is established with R4 zoning throughout. Rezoning to permit a high-rise would be a significant departure from this context. Although there is a tall building within the vicinity of the site, Balsam Street acts as a divide between the more stable low-rise neighbourhood to the north and more dense uses to the south.
- Perhaps a better transition could be provided in the form of a mid-rise building.
- New OP: Downtown Core Transect, Neighbourhood. Low-rise: minimum 2 storeys, generally permit 3 storeys, allow a built height of up to 4 storeys where appropriate
- While some policies allow greater heights in areas characterized by taller buildings, staff are doubtful that a single tall building can be used to describe a neighbourhood as being characterized by it. A more accurate description would state that the neighbouhood is characterized by low-rise developments.
- If you are moving ahead with a high-rise building, then you would need to look at the high-rise design guidelines to see what is needed and expected
- The setbacks/as-of-right zoning
    - It will be difficult to justify reduced setbacks based on the existing schedule, seeing as the proposed height is more than doubled. Instead, look to the underlying zone.
- Bike parking
    - Please provide bike parking at a rate of at least one space per unit in order to promote cycling in all weather and throughout the year.

Urban Design (Christopher)

- This proposal does not run along or does not meet the threshold in one of the City's Design Priority Areas and need not attend the City's UDRP. Staff will be responsible for evaluating the proposal and providing design direction;
- We appreciate the effort made in the presentation materials and found them thorough and clear. We have the following comments/questions about the proposal:

- **OP policy**: I think you make a strong argument in your analysis for a change above the current zoning, however, I think there are things which need to be considered to find the best fit into this context. Being outside the 400m ring is problematic;
- **Louisa St. comparison**: Is difficult because the lot fabric and context are not exactly the same;
- **Block pattern**: This proposal does not command the whole block (in the way the Louisa st. example does) and the relationship to adjacent properties needs a careful approach to minimize impact;
- **Adjacent development**: The proposal does not include analysis of the recent development immediately to the south which is already providing a suitable transition going from a mid-rise facing Gladstone to a low-rise built form fronting Balsam. This proposal will disrupt the transition created by the property to the south which establishes a low-rise street wall along Balsam;
- **High-rise guidelines**: Lot size, tower floor plate and separation distance. Proposing a high-rise instead of a mid-rise in this location may be challenged to achieve the tower separation of 11.5m from the interior lot lines;
- **Replicability**: We would like to understand how this proposal will impact the block and the character of the neighbourhood if it were replicated on adjacent properties;
- **Design Priority Areas**: This property does not sit within one of the City's DPA's and is not intended to see this level of intensification so needs to have a very strong rationale;

- A scoped Design Brief is a required submittal for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided.
  - ***Note. The Design Brief submittal should have a section which addresses these pre-consultation comments;***

Transportation (Wally)

- Rochester Street and Balsam Street are classified as Local roadways. There are no additional protected ROW limits identified in the OP.
- The Screening Form has indicated that TIA Triggers have been met. Further TIA reports will be required. Please proceed with the TIA Step 2 – Scoping Report.

Update to the TIA Guideline Forecasting Report:

- We would like to inform all consultants making TIA Forecasting Report submissions to the City of Ottawa as part of a development application, that all new applications (pre-consultation meetings dated after March 3, 2021) must use the NEW TRANS Trip Generation Manual when forecasting site generated trips using this manual (see attached).
- The TRANS committee (a joint transportation planning committee serving the National Capital region) finalized a new manual early in March 2021. The document will be available in French and English on the TRANS website http://www.ncr-trans-rcn.ca/surveys/2009-trip-generation.
- The new manual has simplified the conversion from vehicle trips to person trips and then trips by modal share. The City has also developed a spreadsheet that will apply the factors of location and building type to quickly provide the existing trip numbers by mode share.

- During the Analysis, ensure that both TDM checklists are filled out and appropriate measures are taken to achieve the target modal shares. In the future, please contact Tim Wei (tim.wei@ottawa.ca) to obtain a local snapshot of the Long-Range Transportation model to help inform background growth rates.

- The consultant is to address how they plan to enable and encourage travel by sustainable modes (i.e. to make walking, cycling, transit, carpooling and telework more convenient, accessible, safe and comfortable). At a minimum, complete the City of Ottawa's *TDM Measures Checklist*.
- Ensure that potential tenants who are not assigned a parking space are aware that on street parking is not a viable option for tenants.
- All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the sight triangles and/or future road widening protection limits.
- Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.
- The City of Ottawa Zoning By-Law Corner Sight Triangles (Sec. 57) states that no obstruction to the vision of motor vehicle operators higher than 0.75 metres above grade. The consultant should review the sight distance to ensure that no obstructions hinder the view of the driver at the Rochester Street and Balsam Street intersection.
- The consultant should review the sight distance to the access and any obstructions that may hinder the view of the driver.
- The Tactile Walking Surface Indicator (TWSI) should be provided at pedestrian crossings. Under the Integrated Accessibility Standards of the Accessibility for Ontarians with Disabilities Act, 2005, and the City of Ottawa Accessibility Design Standards, TWSI's are required for new construction and the redevelopment of elements in public spaces, such as for exterior paths of travel (e.g. sidewalks and at the top of stairs).

- The Owner acknowledges and agrees that all private accesses to Roads shall 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.
- The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed access.
- No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
- The proponent is to provide an access grade that does not exceed 2%-6% within the private property for a minimum distance of 9.0 metres from the **ROW limits**. This is a critical safe distance to allow a driver to stop at the top of the ramp and have a good sight angle of pedestrians. Any grade exceeding 6% will require a subsurface melting device
- Underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%.

- The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed access.
- No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

- The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.
- For any planter boxes/trees on the City's road right-of-way, an Encroachment Agreement along with a Maintenance Agreement will be required.
- Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

Civil Engineer/Project Manager (Reza)

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided and all easements shall be shown on the engineering plans.
- An application to consolidate the parcels (245-267 Rochester Street) of land will be required otherwise the proposed stormwater works will be servicing more than one parcel of land and thus does not meet the exemption set out in O.Reg. 525/98. This would mean an **ECA would be required** regardless of who owns the parcels.
- The subject site is located within a combined sewershed therefore the approval exemption set out in Section 3 of O.Reg. 525/98 under the OWRA would not apply and an **Environmental Compliance Approval (ECA)** application under direct submission **will be required to** be submitted to the Ministry post planning approval.
- A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.) will not have an impact on any adjacent buildings and infrastructure.
- A **Record of Site Condition (RSC) in accordance with O.Reg.** 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change to a more sensitive property use.

Reference documents for information purposes:

- Ottawa Sewer Design Guidelines (October 2012)
- Technical Bulletin PIEDTB-2016-01
- Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
- Ottawa Design Guidelines - Water Distribution (2010)
- Technical Bulletin ISTB-2021-03

- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January 2016)
- City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)
- Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).

Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.

Disclaimer:

The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only.

Stormwater Management Criteria and Information:

- **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.** The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than **0.4.** The time of concentration (T_c) 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; T_c 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. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- Please note that foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**
- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- 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**.
- **Underground Storage:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**
- In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.
- Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?
- Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.
- Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.
- In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

- Please note that the minimum orifice dia. for a plug style **ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s** in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution**.
- **If rooftop control** and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
- Considering the size of the site, it would be acceptable to control the roof portion only and leave the remainder of the site uncontrol as long as the uncontrolled portion is directed towards the right of way. This approach should be discussed in the SWM report. Also, the grading plan should clearly demonstrate that the runoff from the uncontrolled portion of the site will be directed towards the ROW
- If **Window wells** are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.
- There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

Combined Sewer:

- A 300mm dia. CONC storm sewer (1996) is available within Rochester Street**.**
- Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity. An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided. Needs to be demonstrated that there is adequate capacity to support any increase in wastewater flow.
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01.*
- Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- A backwater valve is required on the sanitary service for protection.

Water:

- A 203 mm dia. PVC watermain (1995) is available within Rochester Street**.**
- Existing residential service to be blanked at the main.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m^3/day (0.57 L/s) are required to be connected to a minimum of two water services

separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.*

- Please **review Technical Bulletin ISTB-2018-0**, 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.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. 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. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address
    - A plan showing the proposed water service connection location.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Fire Flow** (L/min)

[*Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS)** Water Supply for Public Fire Protection 2020*]

[Fire flow demand requirements shall be based on ISTB-2021-03]

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.

Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).

- **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved**. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

Snow Storage:

- Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patters or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

Gas pressure regulating station

A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is

to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

Gas Pressure Regulating Station.pd

Regarding Quantity Estimates:

Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities. In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

Road Reinstatement

Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

Permits and Approvals:

Please note that this project will be subject to an Environmental Compliance Approval (ECA) for Private Sewage Works. (Any connection to a combined Sewer system required the Ministry (MECP) approval)

Required Engineering Plans and Studies:

PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Roof Drainage Plan

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study/Investigation (including sensitive marine clays and unstable slopes)
- Noise Control Study
- Phase I ESA
- Phase II ESA (Depending on recommendations of Phase I ESA)
- RSC

- Site lighting certificate
- Wind analysis
- Shadow Study

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**

Specific information has been incorporated into both the Guide to Preparing Studies and Plans for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Added to the general information for servicing and grading plans is a note that an O.L.S. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an **O.L.S**. for development projects is emphasized.

Phase One Environmental Site Assessment:

- 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.
- 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.
- Official Plan Section 4.8.4:

https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety

RSC (Record of the site Conditions)

- An RSC is required when changing the land use (zoning) of a property to a more sensitive land use.

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.

https://documents.ottawa.ca/sites/documents/files/geotech_report_en.pdf

Noise Study:

- A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of an Arterial Road
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the

surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

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

Wind analysis:

When greater than 9-storey in height Wind Study for all buildings/dwellings.

- A wind analysis must be prepared, signed and stamped by an engineer who specializes in pedestrian level wind evaluation. Where a wind analysis is prepared by a company which do not have extensive experience in pedestrian level wind evaluation, an independent peer review may be required at the expense of the proponent.

Terms of Reference: Wind Analysis (ottawa.ca)

Shadow Study

When greater than 9 storey in height, a Shadow Study required for all buildings/dwellings.

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Fourth (4th) Review Charge:

Please be advised that additional charges for each review, after the 3rd review, will be applicable to each file. There will be no exceptions.

Construction approach – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead on this request.

Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

Community Association Comments:

David Seaborn

- This is great architecture but poor planning
- There are tall buildings to the south, but the north area has a lot of low-rise expect for Willow area, which was built before the zoning was implemented
- This is a low-rise neighborhood, there is no place for high-rise
- The OCH has three storey max cause they recognized the low-rise area
- The strange setbacks were a problem for already existing four-storey buildings
- Must be a walkable neighborhood
- You got 25% of two-bedroom units but that is small for families that would consider moving in
- There are some tall buildings in the area, but we cannot expect this high-rise as it does not go well with the low-rise residential neighborhood
- Must be mindful of the neighborhood

Next Steps:

- Encourage applicant to reach out to the neighborhood, community associations, and some councillors

APPENDIX B

WATER SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

August 24, 2022

245-263 Rochester Street & 27 Balsam Street

9-Storey Mixed-Use Building

Ottawa, Ontario

FIRE FLOW CALCULATIONS

OBC Method

Q = Required water supply in litres
= KVS_{Total}

S_{Total} = Total of spatial coefficients from exposure distances
= 1.0 + $S_{Side\ 1}$ + $S_{Side\ 2}$ + $S_{Side\ 3}$ + $S_{Side\ 4}$

	Spatial Coefficient	Exposure Distance (m)	
$S_{Side\ 1}$	0.5	1.5	(to north property line)
$S_{Side\ 2}$	0.5	1.5	(to east property line)
$S_{Side\ 3}$	0.1	9.5	(to centerline of Balsam Street)
$S_{Side\ 4}$	0.0	11.5	(to centerline of Rochester Street)
S_{Total}	2.1		Need not exceed 2.0

Group C Occupancy

K_1 = Water supply coefficient as per OBC A-3.2.5.7. Table 1

= 10 Building is of noncombustible construction with fire separations and fire resistance ratings in accordance with Subsection 3.2.2.

V_1 = Building volume in cubic meters

	Floor Area (sq.m)	Height (m)	Volume (cu.m)
Penthouse:	105	3.05	320
9th Floor:	950	3.45	3,278
8th Floor:	950	3.10	2,945
7th Floor:	965	3.10	2,992
6th Floor:	1,115	3.10	3,457
5th Floor:	1,230	3.10	3,813
4th Floor:	1,300	3.10	4,030
3rd Floor:	1,330	3.10	4,123
2nd Floor:	1,330	3.10	4,123
1st Floor:	1,108.5	4.00	4,434
			33,514

Q_1 = 670,275 L

Group E Occupancy

K_2 = Water supply coefficient as per OBC A-3.2.5.7. Table 1

= 17 Building is of noncombustible construction with fire separations and fire resistance ratings in accordance with Subsection 3.2.2.

V_2 = Building volume in cubic meters

	Floor Area (sq.m)	Height (m)	Volume (cu.m)
1st Floor:	91.5	4.00	366

Q_2 = 12,444 L

$Q_{Total} = Q_1 + Q_2$

= 682,719 L

= 9,000 L/min as per OBC A-3.2.5.7. Table 2

= 150 L/s

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

September 16, 2022

245-263 Rochester Street & 27 Balsam Street

9-Storey Mixed-Use Building

Ottawa, Ontario

FIRE FLOW CALCULATIONS

FUS Method

F = Required fire flow in litres per minutes
= $220CA^{0.5}$

C = Coefficient related to the type of construction
= 0.8 Noncombustible Construction

A = Total floor area in square meters (excluding basements at least 50% below grade)

Penthouse:	105	sq.m
9th Floor:	950	sq.m
8th Floor:	950	sq.m
7th Floor:	965	sq.m
6th Floor:	1,115	sq.m
5th Floor:	1,230	sq.m
4th Floor:	1,300	sq.m
3rd Floor:	1,330	sq.m
2nd Floor:	1,330	sq.m
1st Floor:	1,200	sq.m
	10,475	sq.m

F =	18,013	L/min	
=	18,000	L/min (rounded to nearest 1,000 L/min)	
	-14.7%	Charge for Limited Combustible and Free Burning Occupancies	
		-15%	Charge for Limited Combustible Occupancy (10,383.5 sq.m Residential)
		15%	Charge for Free Burning Occupancy (91.5 sq.m Commercial)
=	15,347	L/min	
	30%	Credit for sprinkler system designed in conformance with NFPA standards	
	10%	Credit for standard water supply for both sprinkler system and fire department hose lines	
=	6,139	L/min	

Side	Charge	Separation	Construction	Length	Storeys	Length • Height
North	22%	0 to 3 m	Wood Frame	2	1	2
East	22%	0 to 3 m	Wood Frame	4	2	8
South	14%	10.1 to 20 m	Wood Frame	27	3	81
West	9%	20.1 to 30 m	Wood Frame	40	2	80

67%	Total Exposure Charge	
= 10,283	L/min Exposure Increase	
= 19,491	L/min	
= 19,000	L/min (rounded to nearest 1,000 L/min)	
= 316.7	L/s	

316.7 L/s Fire Flow:	102.9	m				
Elevation at Fire Hydrant:	65.8	m				
Static Pressure at Fire Hydrant:	37.1	m	364	kPa	53	psi

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

March 6, 2023

245-263 Rochester Street & 27 Balsam Street

9-Storey Mixed-Use Building

Ottawa, Ontario

WATER DEMAND CALCULATIONS

	Number of Units	Persons per Unit	Population
1 Bedroom:	106	1.4	148.4
2 Bedroom:	14	2.1	29.4
3 Bedroom:	0	3.1	0
Average:	0	1.8	0
Total:	120		177.8

Residential Average Daily Demand:	280	L/capita/day				
	34.6	L/min	0.6	L/s	9.1	USgpm
Residential Maximum Daily Demand:	4.7	(Peaking factor for a population of 177.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	161.1	L/min	2.7	L/s	42.6	USgpm
Residential Maximum Hourly Demand:	7.0	(Peaking factor for a population of 177.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	243.0	L/min	4.1	L/s	64.2	USgpm

Commercial Average Daily Demand:	0.0185	ha (±10% of 1,833 sq.m)				
	28,000	L/ha/day				
	518	L/day				
	24	hour day				
	0.4	L/min	0.01	L/s	0.1	USgpm
Commercial Maximum Daily Demand:	1.5	(Peaking factor as per City of Ottawa Water Design Guidelines)				
	0.5	L/min	0.01	L/s	0.1	USgpm
Commercial Maximum Hourly Demand:	1.8	(Peaking factor as per City of Ottawa Water Design Guidelines)				
	1.0	L/min	0.02	L/s	0.3	USgpm
Total Average Daily Demand:	34.9	L/min	0.6	L/s	9.2	USgpm
Total Maximum Daily Demand:	161.6	L/min	2.7	L/s	42.7	USgpm
Total Maximum Hourly Demand:	244.0	L/min	4.1	L/s	64.5	USgpm
Elevation of Water Meter:	63.70	m				
Basement Floor Elevation:	62.80	m				
Minimum HGL:	107.2	m				
Static Pressure at Water Meter:	43.5	m	426	kPa	62	psi
Maximum HGL:	115.3	m				
Static Pressure at Water Meter:	51.6	m	506	kPa	73	psi

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

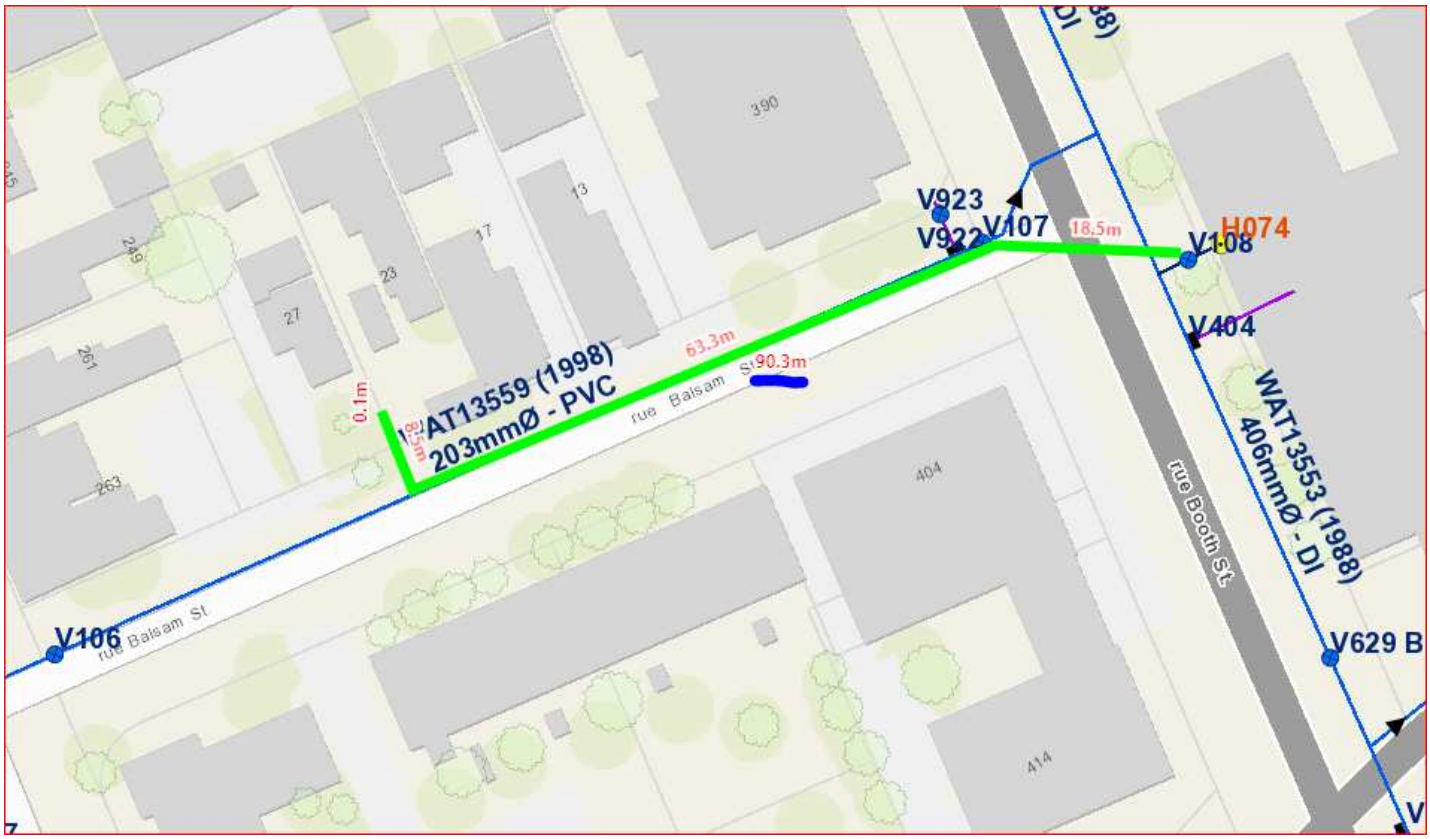
RE: Request for Boundary Conditions - 245-263 Rochester Street & 27 Balsam Street

1 message

Bakhit, Reza <reza.bakhit@ottawa.ca> Fri, Sep 16, 2022 at 8:48 AM
To: Ryan Faith <r.faith@dbgrayengineering.com>

Hi Ryan,

For the future submissions and cases like this , please makes sure to not use diagonal lines to measure distance from hydrants to the building. You need to consider sidewalks and roads when taking the measurements from the hydrants to the building. Below is an example how you should have taken the measurements.



The following are boundary conditions, HGL, for hydraulic analysis at 245-263 Rochester Street (zone 1W) assumed to be a dual connection to the 203 mm watermain on Rochester Street (see attached PDF for location).

Minimum HGL: 107.2 m

Maximum HGL: 115.3 m

Max Day + Fire Flow (316.7 L/s): 102.9 m

Max Day + Fire Flow (150 L/s): 108.2 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

Regards

Reza Bakhit, P.Eng, C.E.T

Project Manager

Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique

Development Review - Centeral Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca

Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: Wednesday, September 14, 2022 10:32 AM
To: Bakhit, Reza <reza.bakhit@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: Request for Boundary Conditions - 245-263 Rochester Street & 27 Balsam Street

Hi Reza,

Understood. See attached.

Thanks,

Ryan Faith
D.B. Gray Engineering Inc.
700 Long Point Circle
Ottawa, Ontario K1T 4E9
613-425-8044

On Wed, Sep 14, 2022 at 10:16 AM Bakhit, Reza <reza.bakhit@ottawa.ca> wrote:

Hi Ryan,

This is not new.

We do not need a CAD plan . A simple sketch or snapshot from GeoOttawa that shows the noted FH , and travel path from each FH to the proposed building and the measured distance on the travel path to the proposed building. City will confirm what is the actual capacity on those hydrants.

When we have multiple hydrants operating at the same time , the available flow at each hydrant reduces. Therefore, the City have to confirm the actual available flow when the demand is high similar to this project.

Thank,

Reza Bakhit, P.Eng, C.E.T

Project Manager

Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique

Development Review - Centeral Branch

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613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca

Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: Tuesday, September 13, 2022 8:13 AM
To: Bakhit, Reza <reza.bakhit@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: Request for Boundary Conditions - 245-263 Rochester Street & 27 Balsam Street

Hi Reza,

Is this a new procedure? We've never had to do this before. Seems somewhat labour intensive for no added benefit.

Regards,

Ryan Faith
D.B. Gray Engineering Inc.
700 Long Point Circle
Ottawa, Ontario K1T 4E9
613-425-8044

On Tue, Sep 13, 2022 at 7:41 AM Bakhit, Reza <reza.bakhit@ottawa.ca> wrote:

> Hi Ryan,
>
> Thanks for the clarification.
>
> Please provide a table and a figure that reflects the information/calculations in support your notes.
>
> Thank,
>
> **Reza Bakhit, P.Eng, C.E.T**
>
> Project Manager
>
> Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
>
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> 613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca
>
> **Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.**
>
> ---
>
> **From:** Ryan Faith <r.faith@dbgrayengineering.com>
> **Sent:** Monday, September 12, 2022 3:21 PM
> **To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
> **Cc:** Douglas Gray <d.gray@dbgrayengineering.com>
> **Subject:** Re: Request for Boundary Conditions - 245-263 Rochester Street & 27 Balsam Street
>
>
>
> The two closest existing municipal fire hydrants are Class AA and are within 75 m of the proposed building; one is located at the intersection of Rochester Street and Balsam Street; and the other is located at the intersection of Rochester Street and Willow Street. Each can contribute 5,700 L/min (95 L/s). The next two closest existing municipal fire hydrants are Class AA and are within between 75 m and 150 m of the proposed building; one is located between 85 Willow Street and 87 Willow Street; and the other is located at the intersection of Balsam Street and Booth Street. Each can contribute 3,800 L/min (63.3 L/s). The aggregate flow of the four contributing fire hydrants is 19,000 L/min (316.7 L/s), which is equal to the required fire flow.
>
> Regards,
>
> **Ryan Faith**
> **D.B. Gray Engineering Inc.**
> 700 Long Point Circle

Ottawa, Ontario K1T 4E9
613-425-8044

On Mon, Sep 12, 2022 at 2:51 PM Bakhit, Reza <reza.bakhit@ottawa.ca> wrote:

> Hi Ryan,
>
> Please identify the hydrants used to fight FIRE and how the fire requirements are met from hydrants perspective. If not adequate, then please look at ways of reducing the fire demand.
>
> Regards,
>
> **Reza Bakhit, P.Eng, C.E.T**
>
> Project Manager
>
> Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
>
> Development Review - Centeral Branch
>
> City of Ottawa | Ville d'Ottawa
>
> 110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
>
> 613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca
>
> **Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.**
>
> ---
>
> **From:** Ryan Faith <r.faith@dbgrayengineering.com>
> **Sent:** Wednesday, August 24, 2022 11:22 AM
> **To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
> **Cc:** Douglas Gray <d.gray@dbgrayengineering.com>
> **Subject:** Request for Boundary Conditions - 245-263 Rochester Street & 27 Balsam Street
>
>
>
> Please provide the boundary conditions for the 200 mm Rochester Street municipal watermain at 263 Rochester Street. Point of connection will be in the SW corner of the property. We have calculated the following expected demands:
>
> Average daily demand: 0.7 L/s
>
> Maximum daily demand: 2.9 L/s
>
> Maximum hourly demand: 4.4 L/s
>
> Fire flow demand: 316.7 L/s (FUS)
>
> Fire flow + maximum daily demand: 319.6 L/s

> > > Calculations are attached.
> > >
> > > Thanks,
> > >
> > > Ryan Faith
> > >
> > > D.B. Gray Engineering Inc.
> > >
> > > *Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains*
> > >
> > > 700 Long Point Circle 613-425-8044
> > > Ottawa, Ontario r.faith@dbgrayengineering.com
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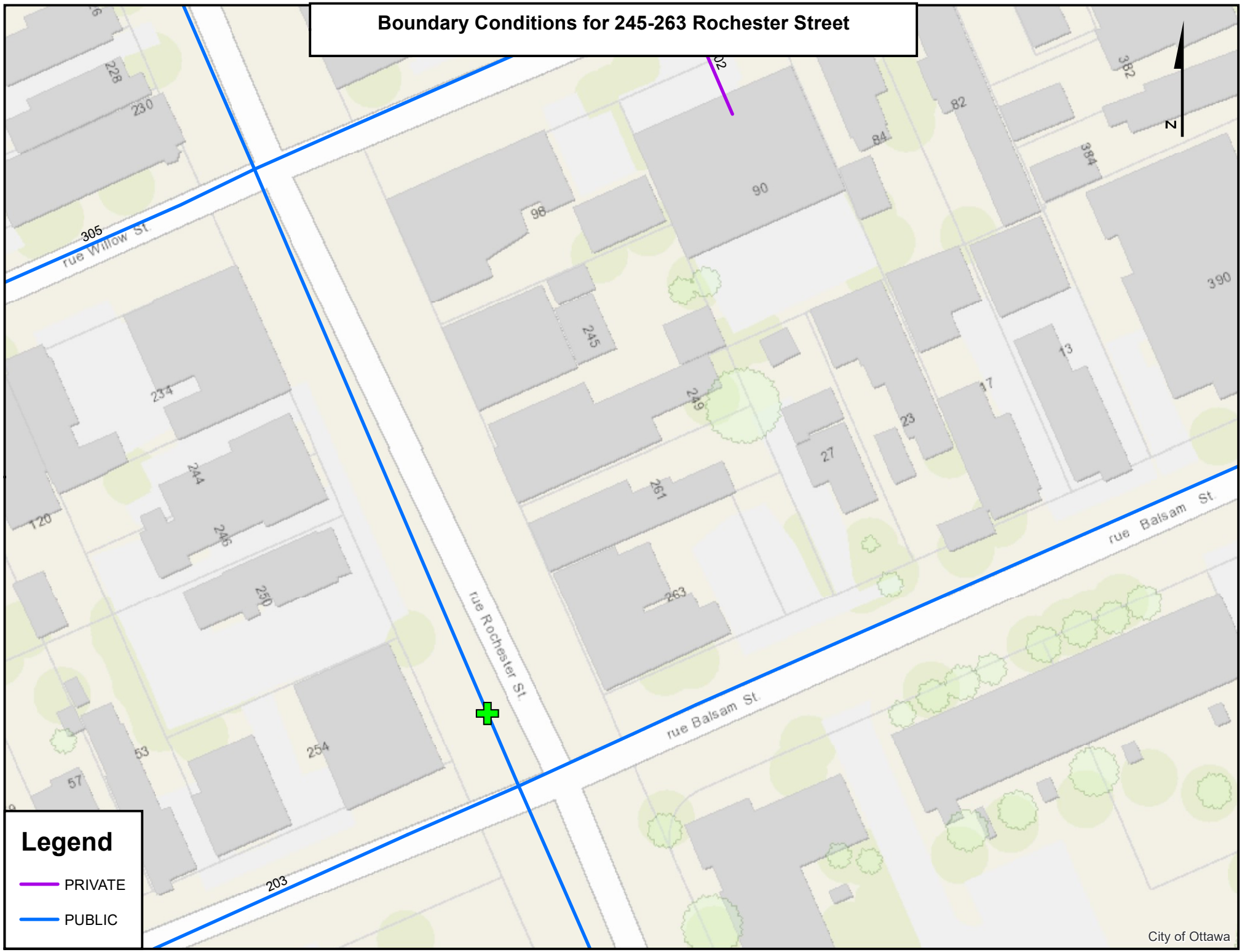
245-263 Rochester Street August 2022.pdf
838K


Boundary Conditions for 245-263 Rochester Street
N
305
rue Willow St
rue Rochester St
rue Balsam St
rue Balsam St
203
Legend
PRIVATE
PUBLIC
City of Ottawa

March 1, 2023

Re: 245, 249, 261, 263 Rochester Street and 27 Balsam Street
1st Review Comments, Engineering – Site Servicing and SWM Report

Reply to Comment 12.

The structure of the proposed new nine-storey apartment building will be of non-combustible construction (cast in place concrete) and the occupancy will be Group C (Residential Occupancy) as per Ontario Building Code Section 3.1.2.1. Classification of Buildings. A 115 square meter Group E ground floor retail unit will also be included in the design.

The building will include a one-storey storage garage complete with 30 parking spots.

Additionally, the proposed building will be sprinkler protected.

Scott Hayward
Simmonds Architecture

APPENDIX C

SANITARY SERVICING

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

SANITARY SEWER CALCULATIONS

Project: 245-263 Rochester Street & 27 Balsam Street
9-Storey Mixed-Use Building
Ottawa, Ontario

Date: March 6, 2023

Residential Average Daily Flow:	280	L/capita/day
Commercial Average Daily Flow:	28,000	L/ha/day
Institutional Average Daily Flow:	28,000	L/ha/day
Light Industrial Average Daily Flow:	35,000	L/ha/day
Heavy Industrial Average Daily Flow:	55,000	L/ha/day
Infiltration Allowance:	0.33	L/s/ha

Residential Peaking Factor:	Harmon Formula
Harmon Formula Correction Factor:	0.8
Commercial Peaking Factor:	1.5
Institutional Peaking Factor:	1.5
Industrial Peaking Factor:	Ministry of the Environment
Manning's Roughness Coefficient:	0.013

		Residential												
		Individual									Cumulative			
Location		Single Family	Semi Detached	Duplex	Apartment (1 Bed)	Apartment (2 Bed)	Apartment (3 Bed)	Apartment (Average)	Area (ha)	Population	Area (ha)	Population	Peaking Factor	Flow Rate (L/s)
From	To	ppu = 3.4	ppu = 2.7	ppu = 2.3	ppu = 1.4	ppu = 2.1	ppu = 3.1	ppu = 1.8						
Proposed Building	Existing 375 COMB				106	14			0.1648	177.8	0.1648	177.8	3.2	1.84

		Commercial				Infiltration			Q	Sewer Data						
		Individual	Cumulative			Individual	Cumulative		Total							
Location		Area (ha)	Area (ha)	Peaking Factor	Flow Rate (L/s)	Area (ha)	Area (ha)	Flow Rate (L/s)	Flow Rate (L/s)	Length (m)	Nominal Diameter (mm)	Actual Diameter (mm)	Slope (%)	Velocity (m/s)	Q_{Full} Capacity (L/s)	Q / Q_{Full}
From	To															
Proposed Building	Existing 375 COMB	0.0185	0.0185	1.5	0.01	0.1833	0.1833	0.06	1.91	8	150	150	2	1.22	21.54	9%
Existing 375 mm Balsam Street Municipal Combined Sewer:											375	375	1.11	1.67	184.72	

APPENDIX D

STORMWATER MANAGEMENT

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

RE: RVCA Stormwater Management Comments - 245-263 Rochester Street & 27 Balsam Street

1 message

Eric Lalande <eric.lalande@rvca.ca> Wed, Sep 28, 2022 at 11:42 AM
To: Ryan Faith <r.faith@dbgrayengineering.com>

Hi Ryan,

The RVCA has no water quality control requirements based on the proposed site plan. Best management practices are encouraged where feasible.

Thank you,

Eric Lalande, MCIP, RPP

Planner, RVCA

613-692-3571 x1137

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: Wednesday, September 28, 2022 10:30 AM
To: Eric Lalande <eric.lalande@rvca.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: RVCA Stormwater Management Comments - 245-263 Rochester Street & 27 Balsam Street

Hi Eric,

Following up on my previous email.

Thanks,

Ryan Faith
D.B. Gray Engineering Inc.
700 Long Point Circle
Ottawa, Ontario K1T 4E9
613-425-8044

On Wed, Aug 24, 2022 at 8:59 AM Ryan Faith <r.faith@dbgrayengineering.com> wrote:

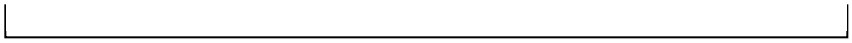
> Hi Eric,
>
> We are working on a proposed 9-storey mixed-use building located at 245-263 Rochester Street & 27 Balsam Street in

Ottawa.

Please comment on the stormwater management for the site.

I have attached a site plan for your reference.

Thanks,



SUMMARY TABLES

100-YEAR EVENT			
Drainage Area	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	28.27	-	-
AREA II (Penthouse Roof)	1.80	6.23	6.23
AREA III (9th Floor Roof)	7.05	18.27	18.27
AREA IV (5th Floor Terrace)	2.78	2.64	2.64
AREA V (2nd Floor Terrace)	1.32	0.82	0.82
TOTAL	41.22	27.96	27.96

SUMMARY TABLES (Continued)

5-YEAR EVENT			
Drainage Area	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
AREA I (Uncontrolled Flow Off Site)	14.66	-	-
AREA II (Penthouse Roof)	1.58	2.46	2.46
AREA III (9th Floor Roof)	6.16	6.99	6.99
AREA IV (5th Floor Terrace)	2.03	1.03	1.03
AREA V (2nd Floor Terrace)	0.93	0.29	0.29
TOTAL	25.36	10.77	10.77

March 6, 2023

245-263 Rochester Street & 27 Balsam Street

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS

Modified Rational Method

100-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(100-YEAR EVENT)

			C
Roof Area:	215	sq.m	1.00
Hard Area:	290	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Permeable Paver Area:	0	sq.m	0.375
Soft Area:	258	sq.m	0.25
Total Catchment Area:	763	sq.m	0.75
Area (A):	763	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.75		
Flow Rate (2.78AiC):	28.27	L/s	

DRAINAGE AREA II (Penthouse Roof)

(100-YEAR EVENT)

			C
Total Catchment Area:	206	sq.m	1.00

No. of Flow Control Roof Drains:	2				
Wier Opening:	1/4				
Depth at Flow Control Roof Drains:	137	mm			
Maximum Release Rate:	1.80	L/s	Pond Area:	136	sq.m
			Maximum Volume Stored:	6.23	cu.m
			Maximum Volume Required:	6.23	cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	10.23	1.80	8.42	5.05
15	143	8.18	1.80	6.38	5.74
20	120	6.87	1.80	5.07	6.08
25	104	5.95	1.80	4.14	6.22
30	92	5.26	1.80	3.46	6.23
35	83	4.73	1.80	2.93	6.15
40	75	4.30	1.80	2.50	6.00
45	69	3.95	1.80	2.15	5.81
50	64	3.66	1.80	1.86	5.58
55	60	3.41	1.80	1.61	5.32
60	56	3.20	1.80	1.40	5.03
65	53	3.01	1.80	1.21	4.73
70	50	2.85	1.80	1.05	4.40
75	47	2.71	1.80	0.90	4.07
80	45	2.58	1.80	0.77	3.71
85	43	2.46	1.80	0.66	3.35
90	41	2.35	1.80	0.55	2.98
95	39	2.26	1.80	0.46	2.60
100	38	2.17	1.80	0.37	2.21
105	36	2.09	1.80	0.29	1.81
110	35	2.02	1.80	0.21	1.41
115	34	1.95	1.80	0.14	1.00
120	33	1.88	1.80	0.08	0.58

DRAINAGE AREA III (9th Floor Roof)

(100-YEAR EVENT)

			C
Total Catchment Area:	666	sq.m	1.00

No. of Flow Control Roof Drains: 8

Wier Opening: 1/4

Depth at Flow Control Roof Drains: 131 mm

Maximum Release Rate: 7.05 L/s

Pond Area: 420 sq.m

Maximum Volume Stored: 18.27 cu.m

Maximum Volume Required: 18.27 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	33.06	7.05	26.01	15.61
15	143	26.46	7.05	19.41	17.47
20	120	22.21	7.05	15.16	18.19
25	104	19.23	7.05	12.18	18.27
30	92	17.01	7.05	9.96	17.93
35	83	15.29	7.05	8.24	17.31
40	75	13.91	7.05	6.86	16.48
45	69	12.78	7.05	5.74	15.49
50	64	11.84	7.05	4.79	14.38
55	60	11.04	7.05	3.99	13.17
60	56	10.35	7.05	3.30	11.88
65	53	9.75	7.05	2.70	10.53
70	50	9.22	7.05	2.17	9.11
75	47	8.75	7.05	1.70	7.65
80	45	8.33	7.05	1.28	6.15
85	43	7.95	7.05	0.90	4.61
90	41	7.61	7.05	0.56	3.04
95	39	7.30	7.05	0.25	1.44
100	38	7.02	7.02	0.00	0.00
105	36	6.76	6.76	0.00	0.00
110	35	6.52	6.52	0.00	0.00
115	34	6.30	6.30	0.00	0.00
120	33	6.09	6.09	0.00	0.00

DRAINAGE AREA IV (5th Floor Terrace)

(100-YEAR EVENT)

			C
Total Catchment Area:	144	sq.m	1.00

No. of Flow Control Roof Drains: 2

Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Flow Control Roof Drains: 112 mm

Maximum Release Rate: 2.78 L/s Pond Area: 71 sq.m

Maximum Volume Stored: 2.64 cu.m

Maximum Volume Required: 2.64 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	7.15	2.78	4.37	2.62
15	143	5.72	2.78	2.94	2.64
20	120	4.80	2.78	2.02	2.42
25	104	4.16	2.78	1.38	2.06
30	92	3.68	2.78	0.90	1.61
35	83	3.31	2.78	0.52	1.10
40	75	3.01	2.78	0.23	0.54
45	69	2.76	2.76	0.00	0.00
50	64	2.56	2.56	0.00	0.00
55	60	2.39	2.39	0.00	0.00
60	56	2.24	2.24	0.00	0.00
65	53	2.11	2.11	0.00	0.00
70	50	1.99	1.99	0.00	0.00
75	47	1.89	1.89	0.00	0.00
80	45	1.80	1.80	0.00	0.00
85	43	1.72	1.72	0.00	0.00
90	41	1.65	1.65	0.00	0.00
95	39	1.58	1.58	0.00	0.00
100	38	1.52	1.52	0.00	0.00
105	36	1.46	1.46	0.00	0.00
110	35	1.41	1.41	0.00	0.00
115	34	1.36	1.36	0.00	0.00
120	33	1.32	1.32	0.00	0.00

DRAINAGE AREA V (2nd Floor Terrace)

(100-YEAR EVENT)

			C
Total Catchment Area:	54	sq.m	1.00

No. of Flow Control Roof Drains: 1

Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Flow Control Roof Drain: 106 mm

Maximum Release Rate: 1.32 L/s Pond Area: 23 sq.m

Maximum Volume Stored: 0.82 cu.m

Maximum Volume Required: 0.82 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	179	2.68	1.32	1.36	0.82
15	143	2.15	1.32	0.83	0.75
20	120	1.80	1.32	0.49	0.58
25	104	1.56	1.32	0.24	0.36
30	92	1.38	1.32	0.06	0.11
35	83	1.24	1.24	0.00	0.00
40	75	1.13	1.13	0.00	0.00
45	69	1.04	1.04	0.00	0.00
50	64	0.96	0.96	0.00	0.00
55	60	0.90	0.90	0.00	0.00
60	56	0.84	0.84	0.00	0.00
65	53	0.79	0.79	0.00	0.00
70	50	0.75	0.75	0.00	0.00
75	47	0.71	0.71	0.00	0.00
80	45	0.68	0.68	0.00	0.00
85	43	0.64	0.64	0.00	0.00
90	41	0.62	0.62	0.00	0.00
95	39	0.59	0.59	0.00	0.00
100	38	0.57	0.57	0.00	0.00
105	36	0.55	0.55	0.00	0.00
110	35	0.53	0.53	0.00	0.00
115	34	0.51	0.51	0.00	0.00
120	33	0.49	0.49	0.00	0.00

5-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(5-YEAR EVENT)

			C
Roof Area:	215	sq.m	0.90
Hard Area:	290	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Permeable Paver Area:	0	sq.m	0.30
Soft Area:	258	sq.m	0.20
Total Catchment Area:	763	sq.m	0.66
Area (A):	763	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	104	mm/hr	
Runoff Coeficient (C):	0.66		
Flow Rate (2.78AiC):	14.66	L/s	

DRAINAGE AREA II (Penthouse Roof)

(5-YEAR EVENT)

			C
Total Catchment Area:	206	sq.m	0.90

No. of Flow Control Roof Drains:	2				
Wier Opening:	1/4				
Depth at Flow Control Roof Drains:	101	mm			
Maximum Release Rate:	1.58	L/s	Pond Area:	73	sq.m
			Maximum Volume Stored:	2.46	cu.m
			Maximum Volume Required:	2.46	cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	5.37	1.58	3.79	2.28
15	84	4.31	1.58	2.73	2.46
20	70	3.62	1.58	2.04	2.45
25	61	3.14	1.58	1.56	2.34
30	54	2.78	1.58	1.20	2.17
35	49	2.50	1.58	0.92	1.94
40	44	2.28	1.58	0.70	1.68
45	41	2.09	1.58	0.52	1.40
50	38	1.94	1.58	0.36	1.09
55	35	1.81	1.58	0.23	0.77
60	33	1.70	1.58	0.12	0.44

DRAINAGE AREA III (9th Floor Roof)

(5-YEAR EVENT)

			C
Total Catchment Area:	666	sq.m	0.90

No. of Flow Control Roof Drains:	8	
Wier Opening:	1/4	
Depth at Flow Control Roof Drains:	95	mm
Maximum Release Rate:	6.16	L/s

Pond Area:	221	sq.m
Maximum Volume Stored:	6.99	cu.m
Maximum Volume Required:	6.99	cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	17.36	6.16	11.20	6.72
15	84	13.92	6.16	7.76	6.99
20	70	11.71	6.16	5.55	6.66
25	61	10.15	6.16	3.99	5.98
30	54	8.99	6.16	2.83	5.09
35	49	8.08	6.16	1.93	4.04
40	44	7.36	6.16	1.20	2.89
45	41	6.77	6.16	0.61	1.65
50	38	6.27	6.16	0.11	0.34
55	35	5.85	5.85	0.00	0.00
60	33	5.49	5.49	0.00	0.00

DRAINAGE AREA IV (5th Floor Terrace)

(5-YEAR EVENT)

			C
Total Catchment Area:	144	sq.m	0.90

No. of Flow Control Roof Drains: 2

Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Flow Control Roof Drains: 82 mm

Maximum Release Rate: 2.03 L/s

Pond Area: 38 sq.m

Maximum Volume Stored: 1.03 cu.m

Maximum Volume Required: 1.03 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	3.75	2.03	1.72	1.03
15	84	3.01	2.03	0.98	0.88
20	70	2.53	2.03	0.50	0.60
25	61	2.19	2.03	0.16	0.24
30	54	1.94	1.94	0.00	0.00
35	49	1.75	1.75	0.00	0.00
40	44	1.59	1.59	0.00	0.00
45	41	1.46	1.46	0.00	0.00
50	38	1.36	1.36	0.00	0.00
55	35	1.27	1.27	0.00	0.00
60	33	1.19	1.19	0.00	0.00

DRAINAGE AREA V (2nd Floor Terrace)

(5-YEAR EVENT)

			C
Total Catchment Area:	54	sq.m	0.90

No. of Flow Control Roof Drains: 1

Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Flow Control Roof Drain: 75 mm

Maximum Release Rate: 0.93 L/s Pond Area: 12 sq.m

Maximum Volume Stored: 0.29 cu.m

Maximum Volume Required: 0.29 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Required Storage Volume (cu.m)
10	104	1.41	0.93	0.48	0.29
15	84	1.13	0.93	0.20	0.18
20	70	0.95	0.93	0.02	0.03
25	61	0.82	0.82	0.00	0.00
30	54	0.73	0.73	0.00	0.00
35	49	0.66	0.66	0.00	0.00
40	44	0.60	0.60	0.00	0.00
45	41	0.55	0.55	0.00	0.00
50	38	0.51	0.51	0.00	0.00
55	35	0.47	0.47	0.00	0.00
60	33	0.45	0.45	0.00	0.00

D.B. Gray Engineering Inc.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengineering.com

STORM SEWER CALCULATIONS

Rational Method

5-YEAR EVENT

Project: 245-263 Rochester Street & 27 Balsam Street
9-Storey Mixed-Use Building
Ottawa, Ontario

Date: March 6, 2023

Manning's Roughness Coefficient: 0.013

Location		Individual					Cumulative				Sewer Data							
From	To	Roof C = 0.90 (ha)	Hard C = 0.90 (ha)	Gravel C = 0.70 (ha)	Soft C = 0.20 (ha)	2.78AC	2.78AC	Time (min)	Rainfall Intensity (mm/hr)	Q Flow Rate (L/s)	Length (m)	Nominal Diameter (mm)	Actual Diameter (mm)	Slope (%)	Velocity (m/s)	Q_{Full} Capacity (L/s)	Time (min)	Q / Q_{Full}
Roof Drains	250 ST	0.0215				0.0538	0.0538	10.00	104	5.60								
Area Drains	250 ST		0.0175		0.0170	0.0532	0.0532	10.00	104	5.55								
Roof Drains	250 ST	0.1070				0.2677	0.2677	10.00	104	27.89								
							Flow through flow control roof drains:			10.70								
Proposed Building	Existing 375 COMB						0.3747	10.00	104	39.05	8	250	250	2	1.71	84.10	0.08	46%
								Maximum release rate:		21.85	8	250	250	2	1.71	84.10	0.08	26%
							Existing 375 mm Balsam Street Municipal Combined Sewer:					375	375	1.11	1.67	184.72		

APPENDIX E

DEVELOPMENT SERVICING STUDY CHECKLIST

GENERAL

Executive Summary: **N/A**

Date and revision number of report: **Included**

Location map and plan showing municipal address, boundary and layout of proposed development: **Included**

Plan showing site and location of all existing services: **Included**

Development statistics, land use, density, adherence to zoning and Official Plan and reference to applicable watershed and subwatershed plans: **N/A**

Summary of Pre-Application Consultation meetings with City of Ottawa and other approval agencies: **Included**

Confirmation of conformance with higher level studies: **N/A**

Statement of objectives and servicing criteria: **Included**

Identification of existing and proposed infrastructure available in the immediate area: **Included**

Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development: **N/A**

Concept level master grading plan to confirm existing and proposed grades in the proposed development: **Included**

Identification of potential impacts of proposed piped services on private services on adjacent lands: **N/A**

Proposed phasing of proposed development: **N/A**

Reference to geotechnical studies: **Included**

All preliminary and formal site plan submissions should have the following information:

- Metric scale: **Included**
- North arrow: **Included**
- Key plan: **Included**
- Property limits: **Included**
- Existing and proposed structures and parking areas: **Included**
- Easements, road widenings and right-of-ways: **Included**
- Street names: **Included**

WATER SERVICING

Confirmation of conformance with Master Servicing Study: **N/A**

Availability of public infrastructure to service proposed development: **Included**

Identification of system constraints: **Included**

Identification of boundary conditions: **Included**

Confirmation of adequate domestic supply: **Included**

Confirmation of adequate fire flow: **Included**

Check of high pressures: **Included**

Definition of phasing constraints: **N/A**

Address reliability requirements: **Included**

Check on necessity of a pressure zone boundary modification: **N/A**

Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for proposed development: **Included**

Description of proposed water distribution network: **Included**

Description of required off-site infrastructure to service proposed development: **N/A**

Confirmation that water demands are calculated based on the City of Ottawa Water Design Guidelines: **Included**

Provision of a model schematic showing the boundary conditions locations, streets, parcels and building locations: **Included**

SANITARY SERVICING

Summary of proposed design criteria: **Included**

Confirmation of conformance with Master Servicing Study: **N/A**

Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the City of Ottawa Sewer Design Guidelines: **N/A**

Description of existing sanitary sewer available for discharge of wastewater from proposed development: **Included**

Verification of available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service proposed development: **N/A**

Calculations related to dry-weather and wet-weather flow rates: **Included**

Description of proposed sewer network: **Included**

Discussion of previously identified environmental constraints and impact on servicing: **N/A**

Impacts of proposed development on existing pumping stations or requirements for new pumping station: **N/A**

Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity: **N/A**

Identification and implementation of emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding: **N/A**

Special considerations (e.g. contamination, corrosive environment): **N/A**

STORMWATER MANAGEMENT & STORM SERVICING

Description of drainage outlets and downstream constraints: **Included**

Analysis of available capacity in existing public infrastructure: **N/A**

Plan showing subject lands, its surroundings, receiving watercourse, existing drainage pattern and proposed drainage pattern: **Included**

Water quantity control objective: **Included**

Water quality control objective: **Included**

Description of the stormwater management concept: **Included**

Setback from private sewage disposal systems: **N/A**

Watercourse and hazard lands setbacks: **N/A**

Record of pre-consultation with the Ministry of the Environment, Conservation and Parks and the Conservation Authority having jurisdiction on the affected watershed: **Included**

Confirmation of conformance with Master Servicing Study: **N/A**

Storage requirements and conveyance capacity for minor events (5-year return period) and major events (100-year return period): **Included**

Identification of watercourses within the proposed development and how watercourses will be protected or if necessary altered by the proposed development: **N/A**

Calculation of pre-development and post-development peak flow rates: **N/A**

Any proposed diversion of drainage catchment areas from one outlet to another: **N/A**

Proposed minor and major systems: **N/A**

If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event: **N/A**

Identification of potential impacts to receiving watercourses: **N/A**

Identification of municipal drains: **N/A**

Description of how the conveyance and storage capacity will be achieved for the proposed development: **Included**

100-year flood levels and major flow routing: **N/A**

Inclusion of hydraulic analysis including hydraulic grade line elevations: **N/A**

Description of erosion and sediment control during construction: **Included**

Obtain relevant floodplain information from Conservation Authority: **N/A**

Identification of fill constraints related to floodplain and geotechnical investigation: **N/A**

APPROVAL AND PERMIT REQUIREMENTS

Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act: **N/A**

Application for Certificate of Approval (CofA) under the Ontario Water Resources Act: **N/A**

Changes to Municipal Drains: **N/A**

Other permits (e.g. National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation): **N/A**

CONCLUSIONS

Clearly stated conclusions and recommendations: **Included**

Comments received from review agencies: **N/A**

Signed and stamped by a professional Engineer registered in Ontario: **Included**