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SITE SERVICING & STORMWATER MANAGEMENT REPORT

266 PARK STREET
OTTAWA, ONTARIO

CITY OF OTTAWA APPLICATION NO.
D02-02-23-0024 & D07-12-23-0038

REPORT NO. 22092

OCTOBER 24, 2023

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LIST OF APPENDICES

1.0 INTRODUCTION

This report has been prepared in support of the Site Plan Control application for the proposed 3-storey, 18-unit apartment building located at 266 Park Street in Ottawa, Ontario. The property is currently vacant. Refer to Pre-Application Consultation meeting notes in Appendix A.

This report forms part of the site servicing and stormwater management design for the proposed development. Also refer to drawings C-1 to C-5 prepared by D.B. Gray Engineering Inc.

2.0 WATER SERVICING

2.1 WATER SUPPLY FOR FIREFIGHTING

There is an existing municipal Class AA fire hydrant located between 251 Park Street and 255 Park Street. It is 70 m unobstructed distance to the far side of the front façade of the proposed building, which is less than the maximum 90 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 5,400 L/min (90 L/s). Refer to calculations in Appendix B.

The boundary conditions in the 150 mm Park Street municipal watermain provided by the City of Ottawa for the 90 L/s fire flow at the subject property indicate a hydraulic grade line (HGL) of 85.8 m. Refer to Appendix B. This HGL calculates to 265 kPa (38 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 AA fire hydrants within 75 m can contribute 5,700 L/min (95 L/s).

The existing municipal Class AA fire hydrant discussed above can contribute 5,700 L/min (95 L/s), which is greater than the required fire flow of 5,400 L/min (90 L/s).

2.2 DOMESTIC WATER SUPPLY

In accordance with

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

based on the 12 – 1 bedroom apartment units and 6 – 2 bedroom apartment units, the average daily demand was calculated to be 0.1 L/s, the maximum daily demand was calculated to be 0.9 L/s and the maximum hourly demand was calculated to be 1.4 L/s. Refer to calculations in Appendix B.

The boundary conditions in the 150 mm Park Street municipal watermain provided by the City of Ottawa at the subject property indicate a minimum HGL of 109.6 m and a maximum HGL of 118.4 m. Refer to Appendix B. Based on these boundary conditions the pressure at the water meter is calculated to vary between 507 kPa (74 psi) and 593 kPa (86 psi). This is an acceptable range for the proposed development. Since the water pressure may be above 80 psi at times, a pressure reducing valve is to be installed immediately after the water meter.

Using the American Water Works Association Manual of Water Supply Practices M22 for fixture values, and based on an average water pressure at the water meter of 550 kPa (80 psi), the peak demand was calculated to be 3.2 L/s. A 50 mm water service connecting to the existing 150 mm Park Street municipal watermain is proposed to service the development. The peak demand will produce an acceptable velocity of 1.7 m/s (5.4 ft/s) in the proposed 50 mm water service. Refer to calculations in Appendix B.

3.0 SANITARY SERVICING

In accordance with

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

based on the 12 – 1 bedroom apartment units and 6 – 2 bedroom apartment units, the post-development sanitary flow rate was calculated to be 0.32 L/s. A 150 mm sanitary sewer service at 2% slope (20.41 L/s capacity) is proposed to service the development. At the design flow rate the sanitary sewer service will only be at 2% of its capacity. The proposed 150 mm sanitary sewer service will connect to the existing 225 mm Park Street municipal sanitary sewer, which at 1.19% slope has a capacity of 48.98 L/s. Refer to calculations in Appendix C. The proposed development is expected to have an acceptable impact on the 225 mm Park Street municipal sanitary 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 QUALITY CONTROL

An Erosion & Sediment Control Plan has been developed to be implemented during construction. Refer to drawing C-3 and notes 4.1 to 4.9 on drawing C-4.

i. Sediment capture filter sock inserts are to be installed in all existing catch-basins and catch-basin/manholes adjacent to and within the site.
ii. A silt fence barrier is to be installed along the perimeter of the site.
iii. Any material deposited on the public road is to be removed.

4.2 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 calculated pre-development runoff coefficient not more than 0.5 and a calculated pre-development time of concentration not less than 10 minutes.. It was calculated that the pre-development conditions reflect a 5-year runoff coefficient of 0.81. The individual runoff coefficients were each increased by 25% to a maximum of 1.00 to calculate the pre-development conditions during the 100-year event. Using the Bransby Williams Formula the pre-development time of concentration was calculated to be 2 minutes. Using the Rational Method with a time of concentration of 10 minutes, the pre-development flow rates were calculated to be 27.20 L/s during the 100-year event and 14.23 L/s during the 5-year event. Using the Rational Method with the post-development roof area of 312 sq.m, a time of concentration of 10 minutes and runoff coefficient of 0.5, the maximum allowable release rate was calculated to be 3.33 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 – 296 sq.m)
Other than roof storage, stormwater from the property will drain uncontrolled off site. The flow rates are calculated at a time of concentration of 10 minutes.

	100-Year Event	5-Year Event
Maximum Flow Rate	6.20 L/s	3.09 L/s

Drainage Area II (Roof – 312 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 4 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	3.15 L/s	2.37 L/s
Maximum Depth at Roof Drains	127 mm	95 mm
Maximum Volume Stored	8.79 cu.m	3.74 cu.m

Summary

The maximum post-development release rate during the 100-year event was calculated to be 9.35 L/s, which is 66% less than the pre-development flow rate during the 100-year event. The maximum post-development release rate during the 100-year event through the flow control roof drains was calculated to be 3.15 L/s, which is 6% less than the maximum allowable release rate. To achieve the maximum post-development release rate, a maximum storage volume of 8.79 cu.m is required and provided. The maximum post-development release rate during the 5-year event was calculated to be 5.46 L/s, which is 62% less than the pre-development flow rate during the 5-year event. The maximum post-development release rate during the 5-year event through the flow control roof drains was calculated to be 2.37 L/s, which is 29% less than the maximum allowable release rate. The post-development reduction in flow is expected to have a positive impact on the 375 mm Park Street municipal storm sewer.

	100-Year Event	5-Year Event
Pre-Development Flow Rate	27.20 L/s	14.23 L/s
Maximum Release Rate	9.35 L/s	5.46 L/s
Maximum Volume Required	8.79 cu.m	3.74 cu.m
Maximum Volume Stored	8.79 cu.m	3.74 cu.m

4.3 STORM SERVICING

The peak unrestricted roof flow rate during the 5-year event was calculated to be 8.58 L/s. A 150 mm storm sewer service at 2% slope (20.41 L/s capacity) is proposed to service the development. At the design flow rate the storm sewer service will only be at 42% of its capacity. The proposed 150 mm storm sewer service will connect to the existing 375 mm Park Street municipal storm sewer, which at 1.14% slope has a capacity of 175.46 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.

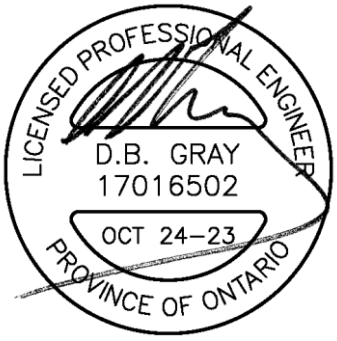
The foundation drain will drain to a storm sump and be pumped to the storm building drain. The point of connection to the storm building drain is to be at high level in the basement. Refer to mechanical.

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. Since the water pressure may be above 80 psi at times, a pressure reducing valve is to be installed immediately after the water meter.
5. The peak demand will produce an acceptable velocity in the proposed water service.

6. The post-development sanitary flow rate will be adequately handled by the proposed sanitary sewer service.
7. The post-development increase in sanitary flow is expected to have an acceptable impact on the existing municipal sanitary sewer.
8. An Erosion & Sediment Control Plan has been developed to be implemented during construction.
9. The maximum post-development release rate during the 100-year event will be less than the maximum allowable release rate.
10. The post-development reduction in stormwater flow is expected to have a positive impact on the existing municipal storm sewer.
11. The unrestricted flow rate during the 5-year event will be adequately handled by the proposed storm sewer service.
12. 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.

Prepared by D.B. Gray Engineering Inc.



APPENDIX A

PRE-APPLICATION CONSULTATION MEETING NOTES

Pre-Application Consultation Meeting Notes

Property Address: 266 Park Street
PC2022-0317
December 21, 2022; 11:00 AM – 12:00 PM – Microsoft Teams

Attendees: Colette Gorni, Planner (File Lead) – City of Ottawa
Eric Forhan, Planner – City of Ottawa
Christopher Moise, Urban Designer – City of Ottawa
Steve Gauthier, Parks Planner – City of Ottawa
Amber Chen, Planning Co-op Student – City of Ottawa
Jordan Tannis – Concorde Properties
Ryan Koolwine – Project1 Studio
Benjamin Gianni – Vanier Community Association
Steven Schumann – Vanier Community Association

Regrets: Mark Richardson, Planning Forester – City of Ottawa
Matthew Hayley, Environmental Planner – City of Ottawa
Wally Dubyk, Transportation Project Manager – City of Ottawa
Vincent Duquette, Engineering Intern (EIT) – City of Ottawa
Eric Lalande, RVCA Planner – Rideau Valley Conservation Authority

Subject: 266 Park Street

Meeting notes:

Overview of the Proposal (Applicant)

1. The subject site was previously used as an access to the surface parking lot on 261 Montreal Road. It has since been severed and is now a separate parcel. Surface parking lot access to be shifted to 257 Montreal Road following the development of the subject site.
2. The applicant is proposing to construct a 3-storey low-rise apartment building with a total of 18 units. The proposed building includes 2 studio units, eight one-bedroom units, and eight two-bedroom units.
3. No parking is proposed.
4. A total of eight bicycle parking spaces are proposed. All bicycle parking space are located within the building.
5. Waste and recycling storage is located within the building and is accessible via a 1.5 metre pathway along the south side of the building.
6. Seeking to rezone the subject site from TM3 (Traditional Mainstreet, Subzone 3) to R4UC[XXXX] (Residential Fourth Density, Subzone UC, Urban Exception XXXX). The site-specific exception is required to provide relief from several

performance standards within the R4UC zone and reduce the parking requirement to zero.

7. There are overhead wires along the sidewalk.

Planning (Colette Gorni)

1. Please note that the TM3 zone (Traditional Mainstreet, Subzone 3) does not permit a standalone residential building/use; only dwelling units in a building containing one or more non-residential uses permitted by Section 197(1) and Section 198(3)(b).
2. Resident/visitor parking is not required for the first 12 units; however, it is required for any additional units at a rate of 0.5 spaces per dwelling unit, as per Section 101 of the Zoning By-law. With the understanding that 18 units are proposed, 3 resident parking spaces and 1 visitor parking space is required. If a parking reduction is being sought, please note that staff would be seeking additional bicycle parking as part of the proposed development (i.e., at least 1 bicycle parking space per unit).
3. The alternative yard setbacks affecting low-rise residential development in the R1 to R4 zones within the Greenbelt provisions identified in Section 144 of the Zoning By-law apply.
4. Internal bicycle and waste/recycling storage is appreciated.
5. Consider opportunities for tree planting throughout the site.
6. Staff are generally supportive of the proposed development. However, please note that an R4-UA zone may be more appropriate in this location given the surrounding context.
7. Required Applications:
    a. A Major Zoning By-law Amendment is required to permit the proposed development. More information on the Zoning By-law Amendment application process can be found here.
    b. A Complex Site Plan Control application is required to permit the proposed development. More information on the Site Plan Control application process can be found here.

Urban Design (Christopher Moise)

1. 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.
    a. We recommend the proposal considered clay brick to tie in to the neighbouring residential context to the north.

b. We recommend the brick wrap the corners enough to keep the material treatment from looking like a thin facade.

c. Trees: We recommend preserving the existing tree if possible and provide additional trees in the front and rear yards.

d. We recommend using an opaque fence in the rear yard to protect the amenity from the surrounding parking lot.

2. 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.

    a. ***Note. The Design Brief submittal should have a section which addresses these pre-consultation comments;***

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

Engineering (Vincent Duquette, Reza Bakhit)

1. 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**.

2. 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.

3. **Concern** about Sanitary sewer capacity, Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity. Also provide the size proposed sanitary service.

4. 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.

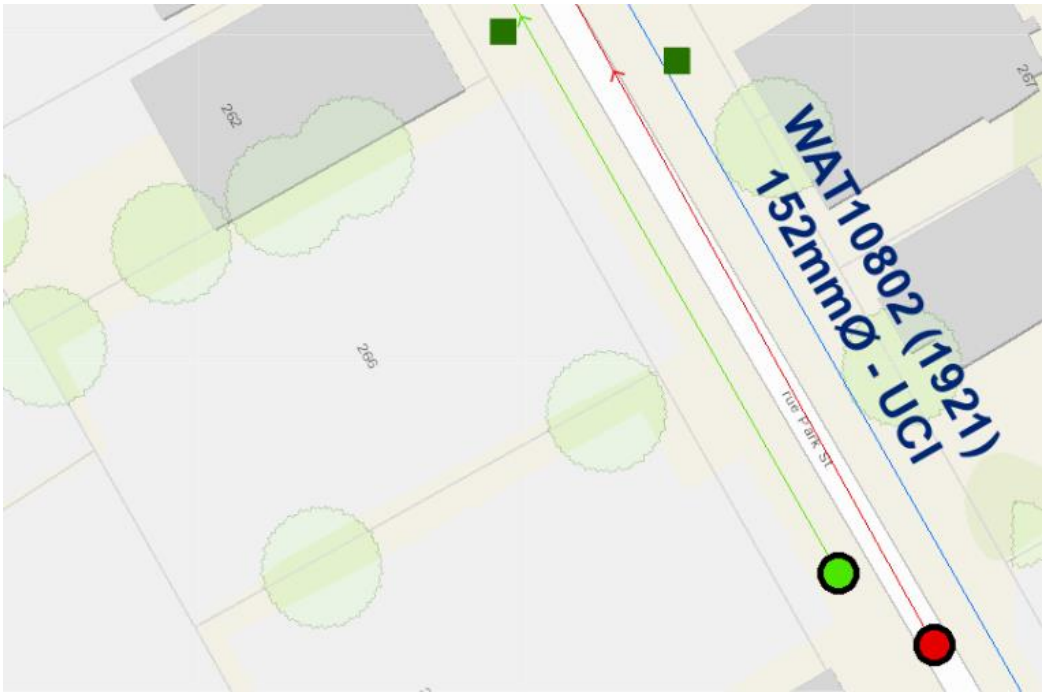
5. A **Record of Site Condition (RSC) in accordance with O.Reg.** 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change to a more sensitive property use.

6. Existing buildings require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.

7. All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.
8. 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)
    - 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 it is the responsibility of the applicant to refer to the latest applicable guidelines while preparing reports and studies.



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9. Stormwater Management Criteria and Information:

    a. **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 0.5. [**If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5**]. 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*].

    b. 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. Ensure that the storm water does not flows towards the neighboring properties. Please note this is a site-specific criterion and should not set precedence on other sites.

    c. 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.

    d. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. 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.**

    e. **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.

f. 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 5-year storm rainfall event**.

g. **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.

   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. 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.

h. 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.

i. 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.

j. 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**.

k. **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.

l. 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.

m. 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.

n. Park Street was formerly a combined sewer area and as such, this is an old partially separated area, which means that basements weeping tiles are not connected to the storm system and that ICDs are not used to control the flow into the storm system. We do not have this part of the storm system modelled, but due to the uncontrolled nature of the storm sewers it is safe to assume that the HGL becomes elevated during extreme condition. Please keep this situation in mind should you use underground storage for SWM. Modeling is required! City Dept. to provide capacity information to applicant.

o. Street catch basins are not to be located at any proposed entrances.

10. Storm Sewer:

    a. A 375mm dia. storm sewer (year and material unknown) is available within Park Street**.**

11. Sanitary Sewer:

    a. A 225 mm dia. sanitary sewer (year and material unknown) is available within Park Street**.**

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

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

d. A backwater valve is required on the sanitary service for protection.

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

12. Water:

a. A 150 mm dia. UCI watermain (1921) is available within Park Street**.**

b. Existing residential service to be blanked at the main.

c. **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.* The basic day demand for this site not expected to exceed 50m^3/day.

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

e. 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* ***ISTB-2021-03***]

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.

13. Other Construction Projects: There is no anticipated works on Park Street.
14. 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).
15. Trees: Please note that a new Tree By-law is now in effect.

General Bulletin_New Tree Protection Bylaw

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

    https://ottawa.ca/en/city-hall/planning-and-development/community-plans-and-design-guidelines/design-and-planning/completed-guidelines/tree-planting-sensitive-marine-clay-soils-2017-guidelines

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

18. 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

19. 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.

20. CCTV sewer inspection required for pre and post construction conditions to ensure no damage to City Assets surrounding site.

21. Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.

22. 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).

23. **Required Engineering Plans and Studies:**

    PLANS:

    - Existing Conditions and Removals Plan
    - Site Servicing Plan
    - Grade Control and Drainage Plan
    - Road Reinstatement Plan
    - Erosion and Sediment Control Plan
    - Roof Drainage Plan
    - Foundation Drainage System Detail (if applicable)

- Topographical survey

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study/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/default/files/documents/cap137602.pdf
- Slope Stability Assessment Reports (if required, please see requirements below)
    - A report addressing the stability of slopes, prepared by a qualified geotechnical engineer licensed in the Province of Ontario, should be provided wherever a site has slopes (existing or proposed) steeper than 5 horizontal to 1 vertical (i.e., 11 degree inclination from horizontal) and/or more than 2 metres in height.
    - A report is also required for sites having retaining walls greater than 1 metre high, that addresses the global stability of the proposed retaining walls. https://documents.ottawa.ca/en/document/slope-stability-guidelines-development-applications
- Noise Control Study
    - A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of Montreal Road, Marier Avenue and Deschamps Avenue.
    - 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

- Phase I ESA
    - 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
- Phase II ESA (Depending on recommendations of Phase I ESA)
- RSC (Record of the site Conditions)
    - A RSC is required when changing the land use (zoning) of a property to a more sensitive land use and **a memorandum prepared by an environmental consultant confirming that no potential contaminating activities have taken place within the RSC area since the filling of the RSC.**
    - Submitting a record of site condition | Ontario.ca
- Site lighting certificate
    - 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.

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.

24. 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.

25. 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.

Transportation (Wally Dubyk)

1. No concerns.

Environmental (Mark Elliot)

1. No concerns with the proposal from an environmental perspective. There are no natural heritage, wetland, or watercourse features nearby and the site itself is already heavily disturbed.
2. The applicant is encouraged to consider additional tree plantings to help meet the urban canopy goals and to combat extreme heat events per sections 4.8.2 and 10.3, respectively.
3. It is recommended that the applicant consider applying some protective features of the Bird Safe Design Guidelines in the design of the building. Though it should be noted that this is not strictly required for a development of this size - it's just a recommendation.

Forestry (Mark Richardson & Tracy Smith)

Tree Conservation Report (TCR) Requirements:

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City.
    a. An approved TCR is a requirement of Site Plan approval.
    b. The TCR may be combined with the LP provided all information is supplied.
2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection

Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

   a. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR.

   b. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester.

3. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit.
4. The TCR must contain 2 separate plans:
   a. Plan/Map 1 - show existing conditions with tree cover information
   b. Plan/Map 2 - show proposed development with tree cover information
   c. Please ensure retained trees are shown on the landscape plan
5. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition.
6. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line).
7. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
8. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca.
   a. The location of tree protection fencing must be shown on the plan.
   b. Show the critical root zone of the retained trees.
9. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
10. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

Landscape Plan Tree Planting Requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

11. Minimum Setbacks
    a. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    b. Maintain 2.5m from curb

c. Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

d. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

12. Tree specifications

a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).

d. Plant native trees whenever possible

e. No root barriers, dead-man anchor systems, or planters are permitted.

f. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

13. Hard surface planting

a. Curb style planter is highly recommended

b. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

c. Trees are to be planted at grade

14. Soil Volume

a. Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

*Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

15. Sensitive Marine Clay
    a. Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines
16. Tree Canopy Cover
    a. The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.
    b. At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.
    c. Indicate on the plan the projected future canopy cover at 40 years for the site.

Parks (Steve Gauthier)

1. Parks will be requesting cash-in-lieu of parkland for the proposed development.
2. A new Parkland Dedication By-law, By-law No. 2022-280, was approved by Council on August 31, 2022. The By-law increases the required parkland conveyance for mid-rise and high-rise residential development and includes one-year transition policies for in-stream development and building permit applications or those that met the requirements for completeness by September 1, 2022.

City Surveyor (Bill Harper)

1. The determination of property boundaries, minimum setbacks and other regulatory constraints are a critical component of development. An Ontario Land Surveyor (O.L.S.) needs to be consulted at the outset of a project to ensure properties are properly defined and can be used as the geospatial framework for the development.
2. Topographic details may also be required for a project and should be either carried out by the O.L.S. that has provided the Legal Survey or done in consultation with the O.L.S. to ensure that the project is integrated to the appropriate control network.

Questions regarding the above requirements can be directed to the City's Surveyor, Bill Harper, at Bill.Harper@ottawa.ca

Waste Services (Andre Laplante)

1. New multi-unit residential development, defined as containing six (6) or more units, intending to receive City waste collection services will be required, as of June 1, 2022, to participate in the City's Green Bin program in accordance with Council's approval of the multi-residential waste diversion strategy. The development must include adequate facilities for the proper storage of allocated

garbage, recycling, and green bin containers and such facilities built in accordance with the approved site design. Questions regarding this change and requirements can be directed to Andre.Laplante@ottawa.ca.

Rideau Valley Conservation Authority (Eric Lalande)

1. No concerns.

Vanier Community Association (VCA)

1. The VCA is generally supportive of the proposed development.
2. The preference for unit mix is to have more 2-bedroom units and less one-bedroom/studio units.
3. Concerns with the number of windows along building walls abutting the interior side yards.
4. Is an elevator required?
    a. No elevator required for a building of this size.
5. Will there be any affordable units?
    a. No – all units to be market rate.
6. Will there be a composting program implemented in the building?
    a. Yes – green bins/composting will be made available to residents.
7. Will the project have any green building design elements (e.g., LEED, passive building design, etc.)?
    a. Owner to pursue grants for green building design if available.
8. It is understood that the building would qualify for funding for the provision of affordable housing through the Community Improvement Plan (CIP).
    a. Need to confirm.

Submission requirement and fees

- Refer to attached list of submission requirements for plans and studies to be submitted at the time of a formal application.
- Additional information regarding fees related to planning applications can be found here.
- Plans are to be standard A1 size (594 mm x 841 mm) or Arch D size (609.6 mm x 914.4 mm) sheets, dimensioned in metric and utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400 or 1:500).
- All PDF submitted documents are to be unlocked and flattened.

Next steps

- You are encouraged to contact the Ward Councillor, Councillor Stephanie Plante, at Stephanie.Plante@ottawa.ca about the proposal. You may also consider contacting the Vanier Community Association at vca.acv@gmail.com.
- It is anticipated that, as a result of the *More Homes for Everyone Act, 2022*, for applications for site plan approval and zoning by-law amendments, new processes in respect of pre-application consultation will be in place as of January 1, 2023. The new processes are anticipated to require a multiple phase pre-application consultation approach before an application will be deemed complete. Applicants who have not filed a complete application by the effective date may be required to undertake further pre-application consultation(s) consistent with the provincial changes. The by-laws to be amended include By-law 2009-320, the Pre-Consultation By-law, By-law 2022-239, the planning fees by-law and By-law 2022-254, the Information and Materials for Planning Application By-law. The revisions are anticipated to be before Council in the period after the new Council takes office and the end of the year.

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

March 27, 2023

266 Park Street

3-Storey (4-Level) Apartment Building

Ottawa, Ontario

FIRE FLOW CALCULATIONS

OBC Method

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

K = Water supply coefficient as per OBC A-3.2.5.7. Table 1
= 23 Group C Occupancy, Building is of combustible construction with fire separations but no fire resistance rating.

V = Building volume in cubic meters

	Floor Area (sq.m)	Height (m)	Volume (cu.m)
Lower Level	329	3.0	987
Ground Floor	329	3.0	987
2nd Floor:	329	3.0	987
3rd Floor:	329	3.0	987
			3,948

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	1.3	(to north property line)
$S_{Side\ 2}$	0.0	10.3	(to centerline of road)
$S_{Side\ 3}$	0.5	1.5	(to south property line)
$S_{Side\ 4}$	0.2	7.6	(to west property line)
S_{Total}	2.2		Need not exceed 2.0

Q = 181,608 L
= 5,400 L/min as per OBC A-3.2.5.7. Table 2
= 90 L/s

HGL 90 L/s Fire Flow:	85.8	m					
Elevation at Fire Hydrant:	58.8	m					
Static Pressure at Fire Hydrant:	27.0	m		265	kPa	38	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

June 15, 2023

266 Park St

18-Unit 3-Storey Apartment Building

Ottawa, Ontario

WATER DEMAND CALCULATIONS

	Number of Units	Persons per Unit	Population
1 Bedroom:	12	1.4	16.8
2 Bedroom:	6	2.1	12.6
3 Bedroom:	0	3.1	0.0
Average:	0	1.8	0.0
Total:	18		29.4

Average Daily Demand:	280	L/capita/day				
	5.7	L/min	0.1	L/s	1.5	USgpm
Maximum Daily Demand:	9.5	(Peaking factor for a population of 30.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	54.3	L/min	0.9	L/s	14.3	USgpm
Maximum Hourly Demand:	14.3	(Peaking factor for a population of 30.8 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	81.7	L/min	1.4	L/s	21.6	USgpm

Elevation of Water Meter:	57.90	m				
Sub-Basement Floor Elevation:	57.00	m				
Minimum HGL:	109.6	m				
Static Pressure at Water Meter:	51.7	m	507	kPa	74	psi
Maximum HGL:	118.4	m				
Static Pressure at Water Meter:	60.5	m	593	kPa	86	psi

D.B. Gray Engineering Inc.

Laurent Brosseau <l.brosseau@dbgrayengineering.com>

266 Park St - Boundary Conditons Request

Duquette, Vincent <Vincent.Duquette@ottawa.ca> Fri, Mar 24, 2023 at 1:33 PM
To: laurent Brosseau <l.brosseau@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>

Hi Laurent,

Correction on the unit in the highlighted below. It should be 85.8m not 85.8L/s.

Best Regards,

Vincent Duquette, E.I.T

Project Manager, Infrastructure Approvals

Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique

Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Duquette, Vincent
Sent: March 14, 2023 4:50 PM
To: Laurent Brosseau <l.brosseau@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: RE: 266 Park St - Boundary Conditons Request

Hi Laurent,

The following are boundary conditions, HGL, for hydraulic analysis at 266 Park Street (zone 1E) assumed to be connected to the 152 mm watermain on Park Street (see attached PDF for location).

Min HGL: 109.6 m

Max HGL: 118.4 m

Max Day + Fire Flow: 85.8 L/s

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.

Best Regards,

Vincent Duquette, E.I.T

Engineering Intern

Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique

Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Laurent Brosseau <l.brosseau@dbgrayengineering.com>
Sent: February 27, 2023 9:33 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: 266 Park St - Boundary Conditons Request

Hi Vincent,

Sorry about the delay, see attached our revised Water Demand calculations for 18-Units, Fire flows did not need to be revised but are attached for your convenience.

Average daily demand: 0.1 L/s.

Maximum daily demand: 0.9 L/s.

Maximum hourly daily demand: 1.4 L/s

Fire Flow demand: 90.0 L/s

Fire Flow + Max Day: 90.9 L/s

Let us know if you need anything else.

On Tue, Feb 21, 2023 at 10:30 AM Duquette, Vincent <Vincent.Duquette@ottawa.ca> wrote:

Hi Doug,

Thanks for sending over the boundary request information. Before send them to our Water Resources department I wanted to confirm the proposed units and types. The attached plans provided at pre-consultation meeting showed 12 one-bedroom units and 6 two-bedroom units. The supporting calculation for water demand and sanitary discharge are based off of 12 one-bedroom units and 4 two-bedroom units. Please confirm the dwellings units proposed for this building.

Best Regards,

Vincent Duquette, E.I.T

Engineering Intern

Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique

Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Douglas Gray <d.gray@dbgrayengineering.com>
Sent: February 20, 2023 1:06 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: laurent Brosseau <l.brosseau@dbgrayengineering.com>
Subject: 266 Park St - Boundary Conditons Request

Hi Vincent

Please provide the boundary conditions at 266 Park St. We have calculated the following expected demands based on a 16-Unit apartment building.

Average daily demand: 0.1 L/s.

Maximum daily demand: 0.9 L/s.

Maximum hourly daily demand: 1.4 L/s

Fire Flow demand: 90.0 L/s

Fire Flow + Max Day: 90.9 L/s

Our calculations are attached.

Thanks, Doug

D.B. Gray Engineering Inc.

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

700 Long Point Circle Tel: 613-425-8044

Ottawa, Ontario K1T 4E9 d.gray@dbgrayengineering.com

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Laurent Brosseau

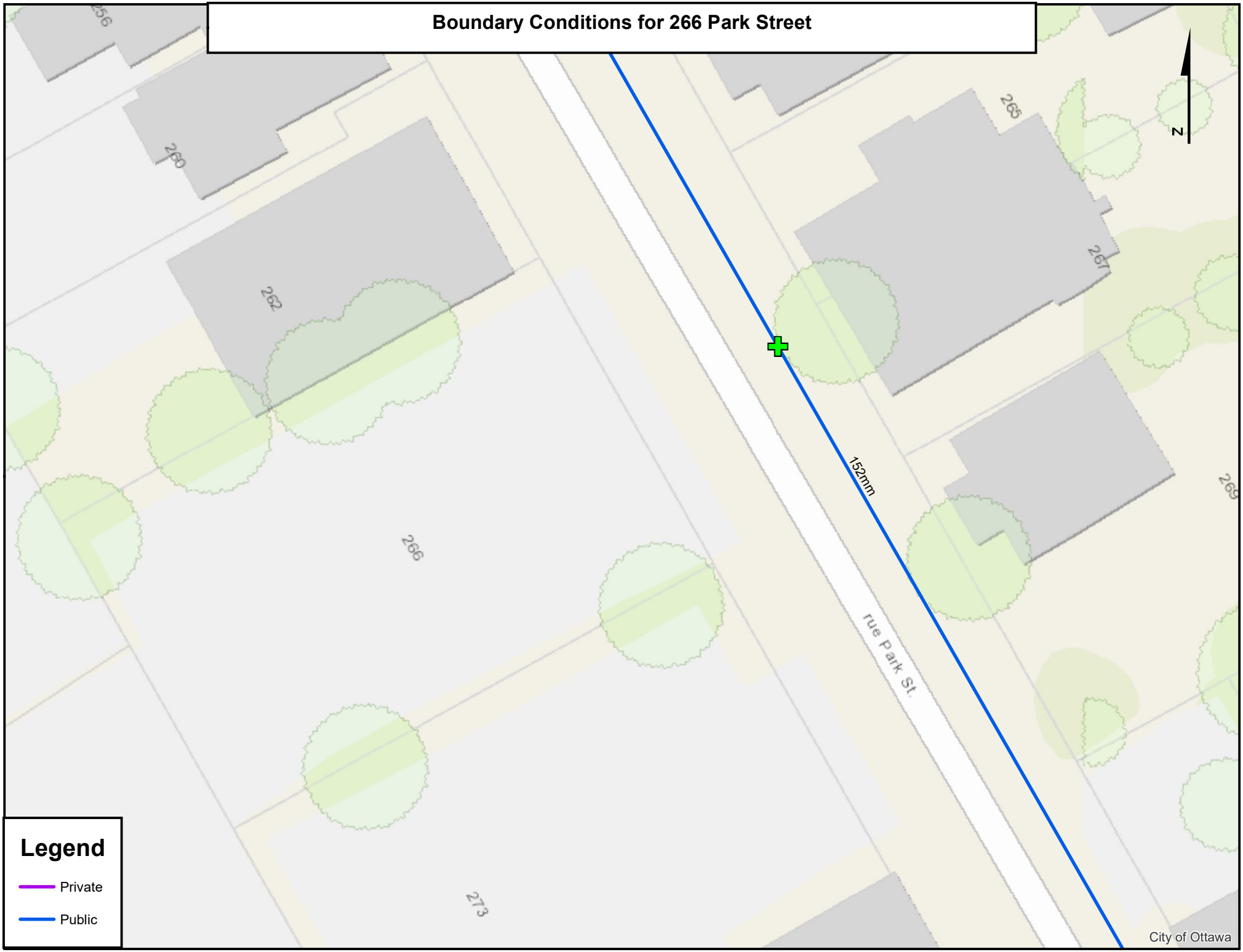
D. B. GRAY ENGINEERING INC.

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

700 Long Point Circle Tel: 613-425-8044

Ottawa, Ontario K1T 4E9 l.brosseau@dbgrayengineering.com

Boundary Conditions for 266 Park Street



15-Jun-23

266 Park St
3-Storey Apartment Building
Ottawa, Ontario

Peak Water Demand

WATER FIXTURE VALUE
(AWWA Manual M22 - Sizing Water Service Lines and Meters)

	No.	F.V.	Total		
Bathtub	18	8	144	18	Units
Toilet - tank	24	6	144		
Toilet - flush valve	0	24	0		
Lavs.	24	1.5	36		
Bidet	0	2	0		
Urinal - wall flush valve	0	10	0		
Shower	6	2.5	15		
K. Sink	18	1.8	32.4		
Dishwasher	18	1.3	23.4		
Clothes Washer	18	3	54		
Commercial Sink	0	4	0		
J. Sink	0	4	0		
Commercial Dishwasher	0	4	0		
Commercial Washer	0	4	0		
Hose 1/2 in	3	5	15		
Hose 3/4 in	0	12	0		
			463.8		

Peak Demand (fig 4-2 or 4-3 AWWA M22)			44	USgpm		
Pressure @ Meter	550	kPa	80	psi		
Pressure Factor (table 4-1 AWWA M22)			1.17			
Peak Demand			51	USgpm		
Irrigation - hose 1/2 in	0		0	USgpm (includes pressure factor)		
(assumes hose bibs operating in non peak hours)						
TOTAL PEAK DEMAND	195	l/min	51	USgpm	3.2	l/s
		Nominal Size	2.0	in	50	mm
			5.4	ft/s	1.7	m/s

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

266 Park St
3-Storey Apartment Building
Ottawa, Ontario

March 15, 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														Non-Residential				Infiltration			Q	Sewer Data						
		Individual									Cumulative					Individual			Cumulative	Individual	Cumulative		Total							
Location		Single	Semi		Apartment				Area	Population	Area	Population	Peaking	Flow Rate	Area	Daily Flow	Peaking	Flow Rate	Area	Area	Flow Rate	Flow Rate	Length	Nominal Diameter	Actual Diameter	Slope	Velocity	Q_{Full} Capacity	
From	To	Family	Detached	Duplex	(1 Bed)	(2 Bed)	(3 Bed)	(Average)	(ha)		(ha)		Factor	(L/s)	(ha)	L/ha/day	Factor	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(m)	(mm)	(mm)	(%)	(m/s)	(L/s)	Q / Q_{Full}
		ppu = 3.4	ppu = 2.7	ppu = 2.3	ppu = 1.4	ppu = 2.1	ppu = 3.1	ppu = 1.8																					
Proposed	Existing				12	6			0.0608	29	0.0608	29	3.2	0.30	0.0000	28,000	4.5	0.00	0.0608	0.0608	0.02	0.32	12	150	147	2	1.20	20.41	0.02
Buidling	225 SAN																												
																							225 mm Park Street Sanitary Sewer:	225	225	1.19	1.23	48.98	

APPENDIX D

STORMWATER MANAGEMENT

SUMMARY TABLES

100-YEAR EVENT

Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Release Rate (L/s)	Roof Maximum Allowable Release Rate (L/s)	Roof Maximum Release Rate (L/s)	Maximum Volume Stored & Required (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	6.20	-	-	-
AREA II (Roof)	-	3.15	-	3.15	8.79
TOTAL	27.20	9.35	3.33	3.15	8.79

5-YEAR EVENT

Drainage Area	Pre-Development Flow Rate (L/s)	Maximum Release Rate (L/s)	Roof Maximum Allowable Release Rate (L/s)	Roof Maximum Release Rate (L/s)	Maximum Volume Stored & Required (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	3.09	-	-	-
AREA II (Roof)	-	2.37	-	2.37	3.74
TOTAL	14.23	5.46	3.33	2.37	3.74

June 20, 2023

266 Park St

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS
Modified Rational Method

PRE-DEVELOPMENT CONDITIONS

100-YEAR EVENT

			C
Roof Area:	0	sq.m	1.00
Hard Area:	528	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	80	sq.m	0.25
Total Catchment Area:	608	sq.m	0.90

Bransby Williams Formula

$$Tc = \frac{0.057 \bullet L}{Sw^{0.2} \bullet A^{0.1}} \text{ min}$$

Sheet Flow Distance (L):	31	m
Slope of Land (Sw):	5.3	%
Area (A):	0.0608	ha
Time of Concentration (Sheet Flow):	2	min
Area (A):	608	sq.m
Time of Concentration:	10	min
Rainfall Intensity (i):	179	mm/hr
Runoff Coeficient (C):	0.90	
100-Year Pre-Development Flow Rate (2.78AiC):	27.20	L/s

5-YEAR EVENT

			C
Roof Area:	0	sq.m	0.90
Hard Area:	528	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	80	sq.m	0.20
Total Catchment Area:	608	sq.m	0.81

Area (A):	608	sq.m
Time of Concentration:	10	min
Rainfall Intensity (i):	104	mm/hr
Runoff Coeficient (C):	0.81	
5-Year Pre-Development Flow Rate (2.78AiC):	14.23	L/s

Roof Control: Maximum Allowable Flow Rate

(Control roof to 2-year pre development level and leave the remainder of the site uncontrolled)

			C
Roof Area:	312	sq.m	0.50
Time of Concentration:	10	min	
Rainfall Intensity (i):	77	mm/hr (2-year event)	
Roof Control: Maximum Allowable Flow Rate (2.78AiC):	3.33	L/s	

100-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(100-YEAR EVENT)

			C
Roof Area:	16	sq.m	1.00
Hard Area:	52	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	228	sq.m	0.25
Total Catchment Area:	296	sq.m	0.42

Area (A):	296	sq.m
Time of Concentration:	10	min
Rainfall Intensity (i):	179	mm/hr
Runoff Coeficient (C):	0.42	
Flow Rate (2.78AiC):	6.20	L/s

DRAINAGE AREA II (Roof)

(100-YEAR EVENT)

			C
Total Catchment Area:	312	sq.m	1.00

No. of Roof Drains: 2
Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Roof Drains: 127 mm

Maximum Release Rate: 3.15 L/s Pond Area: 208 sq.m

Maximum Volume Stored: 8.79 cu.m

Maximum Volume Required: 8.79 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	15.49	3.15	12.34	7.40
15	143	12.39	3.15	9.25	8.32
20	120	10.40	3.15	7.26	8.71
25	104	9.01	3.15	5.86	8.79
30	92	7.97	3.15	4.82	8.68
35	83	7.16	3.15	4.02	8.43
40	75	6.52	3.15	3.37	8.09
45	69	5.99	3.15	2.84	7.68
50	64	5.55	3.15	2.40	7.20
55	60	5.17	3.15	2.03	6.68
60	56	4.85	3.15	1.70	6.13
65	53	4.57	3.15	1.42	5.54
70	50	4.32	3.15	1.17	4.92
75	47	4.10	3.15	0.95	4.29
80	45	3.90	3.15	0.76	3.63
85	43	3.73	3.15	0.58	2.95
90	41	3.57	3.15	0.42	2.26
95	39	3.42	3.15	0.27	1.56
100	38	3.29	3.15	0.14	0.85
105	36	3.17	3.15	0.02	0.12
110	35	3.05	3.05	0.00	0.00
115	34	2.95	2.95	0.00	0.00
120	33	2.85	2.85	0.00	0.00
125	32	2.76	2.76	0.00	0.00
130	31	2.68	2.68	0.00	0.00

5-YEAR EVENT

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(5-YEAR EVENT)

			C
Roof Area:	16	sq.m	0.90
Hard Area:	52	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	228	sq.m	0.20
Total Catchment Area:	296	sq.m	0.36
Area (A):	296	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	104	mm/hr	
Runoff Coeficient (C):	0.36		
Flow Rate (2.78AiC):	3.09	L/s	

DRAINAGE AREA II (Roof)

(5-YEAR EVENT)

			C
Total Catchment Area:	312	sq.m	0.90

No. of Roof Drains:	2	
Slots per Wier:	1	0.01242 L/s/mm/slot (5 USgpm/in/slot)
Depth at Roof Drains:	95	mm
Maximum Release Rate:	2.37	L/s

Pond Area:	118	sq.m
Maximum Volume Stored:	3.74	cu.m
Maximum Volume Required:	3.74	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	8.13	2.37	5.77	3.46
15	84	6.52	2.37	4.16	3.74
20	70	5.48	2.37	3.12	3.74
25	61	4.75	2.37	2.39	3.58
30	54	4.21	2.37	1.84	3.32
35	49	3.79	2.37	1.42	2.98
40	44	3.45	2.37	1.08	2.60
45	41	3.17	2.37	0.80	2.17
50	38	2.94	2.37	0.57	1.72
55	35	2.74	2.37	0.38	1.24
60	33	2.57	2.37	0.20	0.74
65	31	2.42	2.37	0.06	0.22
70	29	2.29	2.29	0.00	0.00
75	28	2.18	2.18	0.00	0.00
80	27	2.07	2.07	0.00	0.00
85	25	1.98	1.98	0.00	0.00
90	24	1.90	1.90	0.00	0.00
95	23	1.82	1.82	0.00	0.00
100	22	1.75	1.75	0.00	0.00
105	22	1.68	1.68	0.00	0.00
110	21	1.63	1.63	0.00	0.00
115	20	1.57	1.57	0.00	0.00
120	19	1.52	1.52	0.00	0.00
125	19	1.47	1.47	0.00	0.00
130	18	1.43	1.43	0.00	0.00

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STORM SEWER CALCULATIONS

Rational Method

FIVE YEAR EVENT

266 Park St
3-Storey Apartment Building
Ottawa, Ontario

June 20, 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)	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	Existing	0.0312				0.0781	0.0781	10.00	104	8.58	8.7	150	147	2	1.20	20.41	0.12	0.42
	375 St							+0.45L/s per building as per SDG 5.4.7										
											EXISTING PARK STREET MUNICIPAL STORM SEWER							
												375	366	1.14	1.67	175.46		