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SITE SERVICING & STORMWATER MANAGEMENT REPORT

83-91 SWEETLAND AVENUE
OTTAWA, ONTARIO

REPORT NO. 24123

FEBRUARY 19, 2025

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1.0 INTRODUCTION

This report has been prepared in support of the Site Plan Control application for the proposed 4-storey, 84-unit apartment building located at 83-91 Sweetland Avenue in Ottawa, Ontario. 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-8 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 main entry. The sprinkler system is to be designed, installed and maintained in accordance with NFPA standards and the Fire Underwriters Survey. Refer to Appendix B. There is an existing municipal Class AA fire hydrant located in front of 82 Sweetland Avenue. It is 21 m unobstructed distance to the proposed fire department connection, which is less than the maximum 45 m required by the Ontario Building Code (OBC); 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 OBC method, the required fire flow is calculated to be 9,000 L/min (150 L/s). In accordance with the City of Ottawa Technical Bulletin ISTB-2021-03, when the OBC method yields a required fire flow of 9,000 L/min (150 L/s), the Fire Underwriters Survey (FUS) method is to be used instead. Using the FUS method and based on ordinary construction Type III (as defined by the FUS), the required fire flow is calculated to be 14,000 L/min (233.3 L/s). Refer to calculations in Appendix B.

The boundary conditions in the 200 mm Sweetland Avenue municipal watermain, provided by the City of Ottawa for the 233.3 L/s fire flow at the subject property, indicate a hydraulic grade line (HGL) of 97.5 m. Refer to Appendix B. This HGL calculates to 336 kPa (49 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 in front of 112 Sweetland Avenue. It can also contribute 5,700 L/min (95 L/s). There is also an existing municipal Class AA fire hydrant within 150 m of the proposed building located at the intersection of Sweetland Avenue and Osgoode Street. It can contribute 3,800 L/min (63.3 L/s). The aggregate flow of the three contributing fire hydrants is 15,200 L/min (253.3 L/s), which is greater than the required fire flow of 14,000 L/min (233.3 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 63 1-bedroom apartment units, 3 2-bedroom apartment units and 18 3-bedroom apartment units, the average daily demand is calculated to be 0.5 L/s, the maximum daily demand is calculated to be 2.4 L/s, and the maximum hourly demand is calculated to be 3.6 L/s. Refer to calculations in Appendix B.

The boundary conditions in the 200 mm Sweetland Avenue municipal watermain provided by the City of Ottawa at the subject property indicate a minimum HGL of 106.0 m and a maximum HGL of 115.6 m. Refer to Appendix B. Based on these boundary conditions, the pressure at the water meter is calculated to vary between 433 kPa (63 psi) and 527 kPa (76 psi). This is an acceptable range for the proposed development.

A 150 mm water service connecting to the existing 200 mm Sweetland Avenue 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 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 63 1-bedroom apartment units, 3 2-bedroom apartment units and 18 3-bedroom apartment units, the post-development sanitary flow rate is calculated to be 1.61 L/s. A 150 mm sanitary sewer service at 1.5% slope (18.65 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 250 mm Sweetland Avenue municipal sanitary sewer, which at 5.77% slope has a capacity of 142.85 L/s. The City of Ottawa has stated *"No capacity concerns with the proposed 1.59L/s of sanitary flow proposed to connect to the 250mm Conc Sanitary sewer on Sweetland avenue".* Refer to Appendix C.

4.0 STORMWATER MANAGEMENT

4.1 QUANTITY CONTROL

Criterion
The original stormwater quantity control criterion was to control the post-development 100-year peak flow rate to the pre-development 2-year peak flow rate using a calculated pre-development runoff coefficient not more than 0.4 and a calculated pre-development time of concentration not less than 10 minutes. In consultation with City of Ottawa staff it was agreed that controlling the post-development peak flows with the use of flow control roof drains would suffice. The Rational and Modified Rational Methods are used to calculate the post-development flow rates and corresponding storage volumes. Refer to calculations in Appendix D.

Drainage Area A (Uncontrolled Flow Off Site to Sweetland Avenue – 385 m^2)
(Pre-development Conditions)
&
Drainage Area I (Uncontrolled Flow Off Site to Sweetland Avenue – 209 m^2)
(Post Development)

The front yard currently drains off site to Sweetland Avenue. It is calculated that the pre-development conditions reflect a runoff coefficient of 0.90 during the 100-year event, and 0.79 during the 2-year event. Using the Bransby Williams Formula, the pre-development time of concentration is calculated to be 2 minutes. Using the Rational Method with a time of concentration of 10 minutes, the pre-development flow rates are calculated to be 17.13 L/s during the 100-year event, and 6.46 L/s during the 2-year event.

Post development the front yard will drain uncontrolled off site to Sweetland Avenue. The flow rates are calculated at a time of concentration of 10 minutes. The post-development uncontrolled flow off site to Sweetland Avenue during the 100-year event is calculated to be 5.94 L/s, which is 65% less than the pre-development flow rate; and during the 2-year event it is calculated to be 2.24 L/s, also 65% less than the pre-development flow rate.

	100-Year Event	2-Year Event
Pre-development Flow Rate	17.13 L/s	6.46 L/s
Post Development Flow Rate	5.94 L/s	2.24 L/s

Drainage Area B (Uncontrolled Flow Off Site to Rear – 1,264 m^2)
(Pre-development Conditions)
&
Drainage Area II (Uncontrolled Flow Off Site to Rear – 600 m^2)
(Post Development)

The rear yard currently drains off site to the rear. It is calculated that the pre-development conditions reflect a runoff coefficient of 0.49 during the 100-year event, and 0.43 during the 2-year event. Using the Bransby Williams Formula, the pre-development time of concentration is calculated to be 2 minutes. Using the Rational Method with a time of concentration of 10 minutes, the pre-development flow rates are calculated to be 30.98 L/s during the 100-year event, and 11.49 L/s during the 2-year event.

Post development the rear yard will continue to drain uncontrolled off site to the rear. The flow rates are calculated at a time of concentration of 10 minutes. The post development uncontrolled flow off site to the rear during the 100-year event is calculated to be 10.42 L/s, which is 66% less than the pre-development flow rate; and during the 2-year event it is calculated to be 3.76 L/s, 67% less than the pre-development flow rate.

	100-Year Event	2-Year Event
Pre-development Flow Rate	30.98 L/s	11.49 L/s
Post Development Flow Rate	10.42 L/s	3.76 L/s

Drainage Area III (Roof – 840 m^2)
The eight 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 8 scuppers, each a minimum 310 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	2-Year Event
Maximum Release Rate	11.74 L/s	7.53 L/s
Maximum Depth at Roof Drains	118 mm	76 mm
Maximum Volume Stored	19.53 m^3	5.17 m^3

Site Summary
The maximum post development release rate during the 100-year event is calculated to be 28.10 L/s, which is 42% less than the pre-development flow rate during the 100-year event. A maximum storage volume of 19.53 m^3 is required and provided during the 100-year event. The maximum post development release rate during the 2-year event is calculated to be 13.53 L/s, which is 25% less than the pre-development flow rate during the 2-year event. A maximum storage volume of 5.17 $m^3$is required and provided during the 2-year event. The post development reduction in flow is expected to have a positive impact on the 450 mm Sweetland Avenue municipal storm sewer.

	100-Year Event	2-Year Event
Pre-Development Flow Rate	48.11 L/s	17.95 L/s
Maximum Release Rate	28.10 L/s	13.53 L/s
Maximum Volume Required	19.53 m^3	5.17 m^3
Maximum Volume Stored	19.53 m^3	5.17 m^3

4.2 QUALITY CONTROL

Runoff from the roof and landscape areas is typically considered clean; 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-4 and notes 2.1 to 2.6 on drawing C-6.

i. Sediment capture filter sock inserts are to be installed in all existing and proposed 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.

4.3 STORM SERVICING

The peak unrestricted roof flow rate during the 100-year event is calculated to be 41.70 L/s. A 200 mm storm sewer service at 8% slope (92.77 L/s capacity) is proposed to service the building. At the design flow rate the storm sewer service will only be at 45% of its capacity.

The peak flow rate draining into catch basin CB-1 during the 100-year event is calculated to be 2.61 L/s. A 200 mm private storm sewer at 0.58% slope (24.98 L/s capacity) is proposed to drain CB-1. At the peak 100-year flow rate the proposed 200 mm storm sewer will only be at 10% of its capacity.

The proposed storm sewers will connect to the existing 450 mm Sweetland Avenue municipal storm sewer, which at 5.48% slope has a capacity of 691.41 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. Pressure tests are to 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 a storm drain. The point of connection to the storm 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. The post-development sanitary flow rate will be adequately handled by the proposed sanitary sewer service and existing municipal sanitary sewer.

5. The post development uncontrolled flow off site to the rear during the 100-year event is calculated to be 66% less than the pre-development flow rate; and during the 2-year event it is calculated to be 67% less.

6. The maximum post-development release rate during the 100-year event will be less than the pre-development flow rate during the 100-year event; and the maximum post-development release rate during the 2-year event will be less than the pre-development flow rate during the 2-year event.

7. The post-development reduction in stormwater flow is expected to have a positive impact on the existing municipal storm sewer.

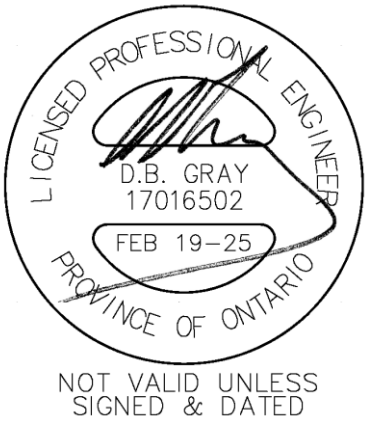
8. It is expected that permanent quality control measures will not be required. As such, no permanent measures are proposed.

9. An Erosion & Sediment Control Plan has been developed to be implemented during construction.

10. The peak unrestricted flow rates during the 100-year event will be adequately handled by the proposed storm sewer service and private storm sewer.

11. The rainwater leaders inside the building are to be constructed to withstand the pressure from a water column the height of the rainwater leader. Pressure tests are to 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

File No.: PC2024-0116

April 30, 2024

Jonathan Harris
RJH Architecture + Planning
Via email: jonathan@rjhill.ca

Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 83-91 Sweetland

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on April 25, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☒	**3** ☐	**4** ☐	**5** ☐

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

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. Please proceed to complete a Phase 2 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca.

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

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

Supporting Information and Material Requirements

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

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

Consultation with Technical Agencies

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

Planning

Comments:

Official Plan:

1. The subject property is located within the Downtown Core Transect (Section 5.1)

2. The subject property is designated Neighbourhood within the Official Plan (Section 6.3).

    a. These policies generally support intensification of low-rise development.

3. Table 3B of OP outlines target of 25% large household dwelling units for neighbourhood designation within the downtown core transect.

    a. Large-household dwellings are units with three or more bedrooms or an equivalent floor area and are typically within ground-oriented built forms (Section 3.2 (8) (b)).

4. Section 5.1.2 (3) (Downtown Core Transect) prohibits surface parking lots within the Downtown Core, and where accessory parking is proposed is meant to be located underground, or if within the building not along the frontage. **An Official Plan Amendment would be required to permit a surface parking lot in the rear yard.**

Central and East Downtown Core Secondary Plan:

5. Schedule A identifies the lands as being within the Sandy Hill Character Area (Section 4.7).

6. Schedule B outlines the lands as being designated "Local Neighbourhood" (Section 2.1).

7. Schedule C outlines a maximum height of 4 storeys on the subject lands.

8. The Secondary Plan policies generally support intensification as well, however there are additional policies to take into consideration:

    a. Section 3.1 outlines policies on built form, including but not limited to main entrances to each unit at the ground level, indoor and outdoor amenity areas, public realm, lower floor articulation, and active frontages.

    b. Section 3.2 outlines policies related to public realm.

    c. Section 3.3 outlines policies related to mobility, including but not limited to direction for the development of the Right-of Way, provision of adequate bicycle parking, and minimizing of motor vehicle parking.

    d. Section 3.4 outlines policies relating to Heritage assets.

9. Section 4.7 outlines policies relating to the Sandy Hill character area. Please ensure the proposal includes component in keeping with this character area to contribute to a positive evolution of the community and to strengthen the neighbourhood's place identity. These policies seek to provide an attractive residential neighbourhood which provides family housing and housing for a broad range of socio-economic groups. Further, these policies seek to ensure that the scale, form, and proportion of new development will cause minimal intrusion on neighboring developments.

    a. Section 4.7.8 outlines: "Within the Sandy Hill Character Area, any maximum building heights permitted in the Zoning By-law that exceed the heights indicated on Schedule B as of the date of adoption of this Secondary Plan will continue to apply. **Any increases beyond these maximum heights will require an Official Plan Amendment.**"

Zoning:

10. The subject property is zoned "R4UD (480)" within the City's Zoning By-law 2008-250, as amended.

11. The property is located within the Mature Neighborhoods Overlay.

12. Please ensure the proposal is in conformity with Sections 161 & 162 of the Zoning By-law, which pertain to the R4 zone; including but not limited to landscaping and soft landscaping requirements, maximum height, permanent fixtures in the front yard, fenestration, front façade recession, and proportion of two-bedroom units.

13. The subject property is subject to Low-rise Residential Developments within the Greenbelt (Section 139), Mature Neighbourhoods Overlays (Section 140), and Alternative Setbacks for Lands Within the Greenbelt (Section 144).

14. Parking is to be provided as per the provisions of Part 4.0 of the Zoning By-law.

    a. Currently, the proposal is deficient in providing adequate number of parking spaces, and will require relief.

    b. Visitor Parking spaces should be provided in accordance with Section 102 of the Zoning By-law, to minimize impacts of on-street parking in the community.

    c. S.111 outlines requirements for bicycle parking spaces. Staff strongly encourage that you provide a 1:1 bicycle parking space per dwelling unit ratio, in consistency with policy direction and in lieu of reduced vehicle parking spaces.

15. If the proposed height implements more than 4-storeys based on zoning definitions, the building would be considered a mid-rise apartment building, which is not permitted within the R4UD zone and would therefore require a Zoning By-law Amendment.

    a. The R4 zoning outlines that the maximum height of any permitted use may not exceed that which is specified in the Zoning By-law, and in no case, may be greater than a maximum four-storeys.

Site Plan

16. The proposal should include articulation to reduce the impacts of the proposed building.

17. When working through the design of the building, the materiality, massing, and articulation should be considerate of the surrounding context.

18. Show all setbacks and applicable details to confirm zoning conformity on the site plan.

19. Please include a zoning table on the Site Plan which outlines applicable zoning requirements and provided standards.

Requirements

20. The Plans, Studies, and Reports identified within the SPIL are to be prepared to and include all applicable details as outlined in the City's Term's of Reference (ToR). If plans are not prepared to the ToR, are missing details, or are inconsistent with one another, it would constitute a deficient submission and would not be able to proceed beyond the Phase 3 pre-con process until resolved.

21. A Zoning Confirmation Report will be included as part of a complete submission which outlines all applicable zoning requirements, how they are met, or to identify deficiencies requiring relief.

    a. Should there be zoning deficiencies, and should a Minor Zoning By-law Amendment application be the desired method to obtain this relief, a Phase 1 Pre-Con for a Zoning By-law Amendment on the subject lands will be required. We suggest that this pre-con be scheduled prior to the next phase of pre-con for Site Plan Control, to help inform the design, and for both submissions to move concurrently through the process following the meeting. A Phase 3 pre-consutlation for Site Plan Control cannot proceed to formal submission of Site Plan Control application until zoning deficiencies are addressed.

22. Mature Neighbourhood Streetscape Character Analysis will be required, as the development proposal is a low-rise residential use within a Mature Neighbourhood Overlay.

Please feel free to contact Jack Smith - Planner I, or Jean-Charles Renaud - Planner III, for follow-up questions.

Urban Design

Comments:

Submission Requirements

23. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation of the submission.

    a. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.

    b. The following elements are particularly important for this development application.

24. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of reference (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies. These drawings include:

    a. Elevations, Site Plan, Landscape Plan, Basement/Ground Floor plans.

Preliminary Design

25. The following elements of the preliminary design are appreciated:

    a. Multiple entrances facing the public right-of-way.

b. Primary entrance from grade.

c. Use of masonry on street facing façade.

26. The following element of the preliminary design are of concern:

    a. Garbage storage external to the building. Is there enough provided?

    b. Bike parking within landscaped area. Weather protected? On concrete pad?

        i. It is difficult to keep bike parking facing the public right-of-way from looking like a mess.

    c. How are the basement units at the north getting light?

    d. How does this very large massing fit within the character of the neighbourhood?

    e. The five-storey wall facing south becomes out of scale to the low-rise neighbourhood.

Recommendations

27. We recommend considering a step back of the top floor on the southern façade to mitigate the five-storey built form with exposed basement.

28. We recommend putting all bike parking within the building and/or weather protected in the rear yard including any visitor spaces.

29. We recommend providing landscaping in the front yard.

Please feel free to contact Christopher Moise, Urban Designer, for follow-up questions.

Engineering

Comments:

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

    a. This site is in a combined area, as the storm sewer fronting the property discharges to the combined sewer on Somerset. The post-development allowable release rate for the site will be equal to the 2-year pre-development runoff calculated with a maximum C=0.5 and a minimum time of concentration of 10 minutes.

b. The 2-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

c. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site.

31. Deep Services (Storm, Sanitary & Water Supply)

a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.

b. Connections to trunk sewers and easement sewers are typically not permitted.

c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area). Where the underground parking extends to the lot line a cast in place monitoring maintenance hole is required within the underground parking garage structure.

d. Review provision of a high-level sewer.

e. Sewer connections to be made above the springline of the sewermain as per:

i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

ii. Std Dwg S11 (For rigid main sewers) – lateral must be less that 50% the diameter of the sewermain,

iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,

iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

v. No submerged outlet connections.

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

    a. Location of service

    b. Type of development and the amount of fire flow required (as per FUS).

    c. Average daily demand: ___ l/s.

    d. Maximum daily demand: ___l/s.

    e. Maximum hourly daily demand: ___ l/s.

33. Water

    As per ISTB-2021-03, Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/day and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.

34. Sewer (sanitary and storm)

    Sanitary sewer capacity, please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity.

    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 storm 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*.

35. Stormwater

    a. 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.

b. **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.
c. 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.
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.**

36. Grading

    Post-development site grading shall match existing property line grades 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.

37. Fire-fighting flow rate(s)

    a. 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.

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

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

    d. **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.

38. Geotechnical (including sensitive marine clay, where appropriate)

    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. See the Studies Plans and Identification List for more information.

    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

39. Slope stability assessment

    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.

40. Retaining Walls

    Retaining walls over 1.0m in height must be designed and sealed by a structural P.Eng. A stamped engineering report, stating that retaining wall is designed with factor of safety ≥1.5 against global instability is required. Successive walls are considered as a single wall if the spacing is less than 1.5 m between the two walls, or the grading is greater than 5% between the two walls.

41. Gas Pressure regulation 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.

42. CCTV sewer inspection

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

43. Capital Works Projects scheduled

    Various capital works project scheduled near by subject site please see image below from GeoOttawa.

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.

44. 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).

45. 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).

46. Exterior Site Lighting

The following will be added as a condition of approval:

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.

47. 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

Required Engineering Plans and Studies:

PLANS:

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

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study
- Noise Control Study

- Phase I Environmental Site Assessment
- Phase II Environmental Site Assessment (Depending on recommendations of Phase I ESA)
- Slope stability assessment

Feel free to contact Amy Whelan, Infrastructure Project Manager, and John Wu, Senior Engineer for follow-up questions.

Noise

Comments:

48. A Transportation Noise Assessment is required as the subject development is located within 100m proximity of Somerset Street East and existing Collector Road.

49. A Stationary Noise Assessment is required 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.

Feel free to contact Amy Whelan, Project Manager, and John Wu, Senior Engineer for follow-up questions.

Transportation

Comments:

50. Sweetland Avenue is classified as a Local Road. There are no additional protected ROW limits identified in the OP.

51. The Screening Form has indicated that no TIA Triggers have been met. This development would not generate sufficient traffic to warrant a TIA report. 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). Please complete the City of Ottawa's *TDM Measures Checklist*.

52. The purchaser, tenant or sub-lessee acknowledges the unit being rented/sold is not provided with any on-site parking and should a tenant/purchaser have a vehicle for which they wish to have parking that alternative and lawful arrangements will need to be made to accommodate their parking need at an alternative location. The Purchaser/Tenant also acknowledges that the availability and regulations governing on-street parking vary; that access to on-street parking, including through residential on-street parking permits issued by the City cannot be guaranteed now or in the future; and that a purchaser, tenant,

or sub-lessee intending to rely on on-street parking for their vehicle or vehicles does so at their own risk.

53. Ensure that potential tenants who are not assigned a parking space are aware that on street parking is not a viable option for tenants.

54. 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 right-of-way limits.

55. Permanent structures such as curbing, stairs, retaining walls, and bicycle parking racks are not to extend into the City's right-of-way limits.

56. 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.

57. The closure of existing private approaches shall reinstate the sidewalk, shoulder, curb, and boulevard to City standards.

58. 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.

59. The concrete sidewalk should be 2.0 metres in width and be continuous and depressed through the proposed access.

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

61. 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.

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

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

Environment

Comments:

63. There are no natural features on or adjacent to the site that will trigger an Environmental Impact Study.

64. If the building is 4 stories or less, the bird-safe design guidelines do not apply.

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

Planning Forestry

Comments:

65. A Tree Conservation Report and Landscape Plan are submission requirements.

66. Removal and/or injury of an adjacent or boundary trees will require written permission from the adjacent landowner. Design the site, particularly the surface parking (if permitted), without impact to trees.

67. Minimal surface parking should be provided to maintain as much soft landscaping on the property as feasible. The original schematic showed 7 spaces with the updated plan showing 9.

68. Trees must be planted on the site, particularly along the Sweetland frontage. Native and large species at maturity should be prioritized. The Official Plan strongly supports tree planting in the Downtown Core to reduce the urban heat island effect and help manage extreme heat risk (Section 2.2.3 and 5.1.1. policy 5a).

69. **Tree Conservation Report requirements. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca**

    a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
    b. Any tree 10 cm in diameter or greater and 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.
    c. The TCR must contain 2 separate plans/maps:
        i. Plan/Map 1 - show existing conditions with tree cover information.
        ii. Plan/Map 2 - show proposed development with tree cover information.

d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.
e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
g. The removal of trees on a property line will require the permission of both property owners.
h. 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
i. 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.

70. **Landscape Plan (LP) requirements.**

a. Landscape Plan Terms of Reference must be adhered to for all tree planting: Landscape Plan Terms of Reference. For more information on these requirements please contact hayley.murray@ottawa.ca

Additional Elements for Tree Planting in the Right of Way:

a) Please ensure any retained trees are shown on the LP.
b) Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
c) The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
d) Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years

e) Minimum Setbacks
    i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    ii. Maintain 2.5m from curb
    iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
    iv. 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.

v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

f) Tree specifications
   i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
   ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
   iii. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
   iv. No root barriers, dead-man anchor systems, or planters are permitted.
   v. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

g) Hard surface planting
   i. If there are hard surface plantings, a planting detail must be provided.
   ii. Curb style planters are highly recommended.
   iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
   iv. Trees are to be planted at grade.
   v. Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions

Parkland

Comments:

71. Cash-in-lieu of parkland will be collected at a rate of 1ha per 1000 units.

Feel free to contact Steve Gauthier, Parks Planner, for follow-up questions.

Heritage

Comments:

72. The subject lands include 87-89 Sweetland Avenue, which are non-designated properties listed on the City of Ottawa Heritage Register, in accordance with Section 27 of the Ontario Heritage Act. This redbrick residence is an example of a flat-roof semi-detached house, a popular building type in Ottawa from 1876 to 1914. The vernacular design has Edwardian detailing evidenced in the cornice

and porch ornamentation. Its built form and materials (historic redbrick, limestone, wood) support and maintain the heritage character of the Sandy Hill area.

73. The current proposal is non-compliant with Section 27 (9) of the Ontario Heritage Act.

74. The applicant is encouraged to consider retaining the listed heritage building at 87-89 Sweetland and incorporating it or reusing it in the proposed development.

75. Retention is the preferred option from a heritage conservation lens. If the applicant cannot feasibly retain, and they intend to demolish the listed building at 87-89 Sweetland, the owner must provide the City of Ottawa with 60 days' notice of the intent to demolish, along with other required information which may include site photos and/or a Cultural Heritage Evaluation Report (CHER).

76. The applicant is required to provide a Heritage Act Acknowledgement Report as part of their final submission, demonstrating that they are working towards compliance with Section 27 (9) of the Ontario Heritage Act. The Heritage Act Acknowledgement Report is prepared after submission of the 60-day notice of intent to demolish.

77. Please be advised that 87-89 Sweetland Avenue is scheduled for removal from the Heritage Register before Jan 1, 2025, which is the Province's deadline as set out in Bill 23. Once a property is removed from the Heritage Register, the 60-day notice of intent to demolish and the Heritage Act Acknowledgement Report would no longer be required. It would however, be required in the interim.

Feel free to contact Avery Marshall, Heritage Planner, for follow-up questions.

Community issues

Comments:

78. The community would like to see a broader mix of unit types and encourages the proponent to consider some 1-bdrm and 3 bdrm typologies. We hope the proponent can see this as a positive from their own point of view by lowering business risk via appealing to a wider variety of potential tenants as well as to lower turnover rates (bachelor units are more likely to appeal to tenants with shorter leases). The community sees the 75% composition of bachelor units as a net negative for the community.

79. The community asks that the proponent consider design options of the front facade that would contribute to breaking up as much as possible the visual effect of a long institutional building thereby creating a better fit with the streetscape. The renderings shown thus far give the impression that this is more like a low-rise institutional student residence building than an example of mid level intensification of a residential neighbourhood.

80. The community would be receptive to a slight reduction in the visitor parking at the rear, based on a perception that eliminating 2 of the parking spaces looks like it could yield a significant % increase in amenity space available for the 120+ potential residents of the building.

81. The community has concerns about garbage management for a development of this density and would like to ensure garbage storage is contained within the building.

82. The community would like to suggest that some of the bachelor units be considered to be rented as furnished units to lower the probability that the likely frequent move-in/move-out events are disruptive to other properties on the street as well as to lower the amount of household items that are left at the curb as junk. (Ie. often furniture and other household items are just left behind by departing tenants for others to deal with)

83. The community would like to ensure that a build such as this one does not locate large numbers of discrete HVAC units on the exterior sides of the building (from the perspective of propagating noise to adjacent properties).

Other

84. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

    a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

    b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

Submission Requirements and Fees

1. A Phase 2 pre-consultation will be required.
    a. Additional information regarding fees related to planning applications can be found here.
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and

Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,

Jack Smith, Planner I

c.c. Jean-Charles Renaud, Planner III
Amy Whelan, Infrastructure Project Manager
John Wu, Infrastructure Project Manager
Wally Dubyk, Transportation Project Manager
Christopher Moise, Urban Designer
Hayley Murray, Forester
Matthew Hayley, Environmental Planner
Avery Marshall, Heritage Planner
Steve Gauthier, Parks Planner

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

February 5, 2025

83-91 Sweetland Avenue

4-Storey Apartment Building

Ottawa, Ontario

FIRE FLOW CALCULATIONS

FUS Method

RFF = Required Fire Flow in litres per minute
= $220CA^{0.5}$

C = Construction Coefficient related to the type of construction of the building
= 1.0 Type III Ordinary Construction

A = Total Effective Floor Area in square meters of the building

4th Floor:	840	sq.m
3rd Floor:	840	sq.m
2nd Floor:	840	sq.m
1st Floor:	840	sq.m
Basement:	840	sq.m
	4,200	sq.m

RFF = 14,258 L/min
= 14,000 L/min (rounded to nearest 1,000 L/min)

Occupancy and Contents Adjustment Factor
-15% Limited Combustible Contents

= -2,100 L/min Occupancy and Contents Adjustment Factor

RFF = 11,900 L/min

Automatic Sprinkler Protection Credit

	30%	Sprinkler system designed, installed and maintained in accordance with NFPA standards
	10%	Standard water supply for both the sprinkler system and fire department hose lines

= 4,760 L/min Automatic Sprinkler Protection Credit

Exposure Adjustment Charge

Side	Charge	Distance	Construction	Length	Storeys	Factor
NE	10%	10.1 m to 20 m	Type V	10	1	10
SE	20%	0 m to 3 m	Type V	9	3	27
SW	10%	20.1 m to 30 m	Type V	60	3	180
NW	17%	3.1 m to 10 m	Type V	17	3	51

57% Exposure Adjustment Charge

= 6,783 L/min Exposure Adjustment Charge

RFF = 13,923 L/min

= 14,000 L/min (rounded to nearest 1,000 L/min)

= 233.3 L/s

233.3 L/s Fire Flow HGL: 97.5 m

Elevation at Fire Hydrant: 63.2 m

Static Pressure at Fire Hydrant: 34.3 m 336 kPa 49 psi

Construction Coefficient (C)

Note that the construction typology used by the insurance industry and public fire protection differs from the terms of reference in the National Building Code of Canada (NBC).

The following Construction Types and Coefficients are used in the required fire flow formula:

C	=	1.5 for **Type V** Wood Frame Construction
	=	0.8 for **Type IV-A** Mass Timber Construction
	=	0.9 for **Type IV-B** Mass Timber Construction
	=	1.0 for **Type IV-C** Mass Timber Construction
	=	1.5 for **Type IV-D** Mass Timber Construction
	=	1.0 for **Type III** Ordinary Construction
	=	0.8 for **Type II** Noncombustible Construction
	=	0.6 for **Type I** Fire Resistive Construction

When determining the predominate Construction Coefficient of a building, the following reference terms are used by fire underwriters and fire departments.

Wood Frame Construction (Type V)
A building is considered to be of Wood Frame construction (Type V) when structural elements, walls, arches, floors, and roofs are constructed entirely or partially of wood or other material.

Note: Includes buildings with exterior wall assemblies that are constructed with any materials that do not have a fire resistance rating that meets the acceptance criteria of CAN/ULC-S114. May include exterior surface brick, stone, or other masonry materials where they do not meet the acceptance criteria.

Mass Timber (Type IV)
Mass timber construction, including Encapsulated Mass Timber, Heavy Timber and other forms of Mass Timber are considered as one of the following sub-types relating to the fire resistance ratings of assemblies as follows:

- Type IV-A (Encapsulated Mass Timber)
    - A building is considered to be of Mass Timber Type IV-A (Encapsulated Mass Timber) construction when structural elements, walls, arches, and floors have a minimum 2-hour fire resistance rating and the roof has a minimum 1 hour fire resistance rating. Additionally all elements of the building must meet the requirements set out for Encapsulated Mass Timber Construction within the 2020 National Building Code of Canada . For types of mass timber construction that do not fully meet these criteria, treat as Type IV-B, Type IV-C or Type IV-D.
- Type IV-B (Rated Mass Timber)
    - A building is considered to be of Mass Timber Type IV-B (Rated Mass Timber) construction when the building assemblies include mass timber construction elements and all structural elements, exterior walls, interior bearing walls and roof have a minimum 1-hour fire resistance rating.

- Type IV-C (Ordinary Mass Timber)
    - A building is considered to be of Mass Timber Type IV-C (Partially Rated Mass Timber) construction when exterior walls are of Mass Timber construction with a minimum 1-hour fire resistance rating. Other structural elements, interior bearing walls and the roof may not have a fire resistance rating.
- Type IV-D (Un-Rated Mass Timber)
    - A building is considered to be of Mass Timber Type IV-D (Un-Rated Mass Timber) construction when exterior walls do not have a minimum 1-hour fire resistance rating, regardless of the fire resistance rating of other structural elements, interior bearing walls and the roof.

Ordinary Construction (Type III also known as joisted masonry)

A building is considered to be of Ordinary construction (Type III) when exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but where other elements such as interior walls, arches, floors and/or roof do not have a minimum 1 hour fire resistance rating.

Noncombustible Construction (Type II)

A building is considered to be of Noncombustible construction (Type II) when all structural elements, walls, arches, floors, and roofs are constructed with a minimum 1-hour fire resistance rating and are constructed with noncombustible materials.

Fire-Resistive Construction (Type I)

A building is considered to be of Fire-resistive construction (Type I) when all structural elements, walls, arches, floors, and roofs are constructed with a minimum 2-hour fire resistance rating, and all materials used in the construction of the structural elements, walls, arches, floors, and roofs are constructed with noncombustible materials.

Items of Note Regarding Construction Coefficients

i. Unprotected noncombustible construction (example unprotected steel) should be considered within ordinary construction or noncombustible construction based on the minimum fire resistance rating of the structural elements, exterior walls, and interior bearing walls;
    - If minimum fire resistance rating of exterior walls is 1 hr, apply Ordinary Construction Coefficient (1.0)
    - If minimum fire resistance rating of all structural elements, walls, arches, floors, and roofs is 1 hr, apply Noncombustible Construction Coefficient (0.8).

ii. If a building cannot be defined within a single Construction Coefficient, the Construction Coefficient is determined by the predominate Construction Coefficient that makes up more than 66% or over of the Total Floor Area.

Automatic Sprinkler Protection

The required fire flow may be reduced by up to 50 percent for complete Automatic Sprinkler Protection depending upon adequacy of the system. Where only part of a building is protected by Automatic Sprinkler Protection, credit should be interpolated by determining the percentage of the Total Floor Area being protected by the automatic sprinkler system.

To be able to apply the full 50 percent reduction, the following areas should be reviewed to determine the appropriate level of credit for having Automatic Sprinkler Protection as per the table below:

Table 4 Sprinkler Credits

Automatic Sprinkler System Design	Credit	
	With complete building coverage	With partial building coverage of X%
Automatic sprinkler protection designed and installed in accordance with NFPA 13	30%	30% × Percentage of Total Floor Area Serviced by Sprinkler System
Water supply is standard for both the system and Fire Department hose lines	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System
Fully supervised system	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System

Automatic Sprinkler Protection Designed and Installed in Accordance with Applicable NFPA Standards (30%)

The initial credit for Automatic Sprinkler Protection is a maximum of 30% based on the system being designed and installed in accordance with the applicable criteria of NFPA 13, *Standard for Installation of Sprinkler Systems,* NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential* Occupancies, or NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes* and being maintained in accordance with the applicable criteria of NFPA 25, *Standard for the Inspections, Testing and Maintenance of Water-Based Fire* (see Recognition of Automatic Sprinkler Protection).

Water Supply is Standard for both the Sprinkler System and Fire Department Hose Lines (10%)

To qualify to apply an additional 10% reduction, a water supply that is standard for both the sprinkler system and fire department hose lines is required, to qualify the following conditions should be satisfied:

a) Sprinkler system is supplied by a pressurized water supply system (public or private) that is designed and built with no major non-conformance issues (i.e. water supply system is designed in accordance with Part 1 of the Water Supply for Public Fire Protection to qualify for fire insurance grading recognition).

b) Calculated demand for maximum sprinkler design area operation in addition to hose stream requirements are below the available water supply curve (at the corresponding flow rate and pressure). An appropriate safety margin is used to take into account the difference between the available water supply curve at the time of hydrant flow testing as compared to the available water supply curve during Maximum Day Demand.

c) Volume of water available is adequate for the total flow rate including the maximum sprinkler design area operation plus required hose streams plus Maximum Day Demand for the full duration of the design fire event.
d) Residual pressure at all points in the water supply system can be maintained at not less than 150 kPa during the flowing of the sprinkler and required hose streams (plus Maximum Day Demand).

Fully Supervised System (10%)

To qualify to apply an additional 10% reduction, an automatic sprinkler system should be fully supervised. The purpose of the supervisory signal is to ensure that malfunctions of the automatic sprinkler system will be discovered and corrected promptly, while the water flow alarm serves to notify emergency services of the fire as soon as the automatic sprinkler system activates.

- a distinctive supervisory signal to indicate conditions that could impair the satisfactory operation of the sprinkler system (a fault alarm), which is to sound and be displayed, either at a location within the building that is constantly attended by qualified personnel (such as a security room), or at an approved remotely located receiving facility (such as a monitoring facility of the sprinkler system manufacturer); and
- a water flow alarm to indicate that the sprinkler system has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department.

Additional Reductions for Community Level Automatic Sprinkler Protection of Area

Buildings located within communities or subdivisions that are completely sprinkler protected may apply up to a maximum additional 25% reduction in required fire flows beyond the normal maximum of 50% reduction for sprinkler protection of an individual building.
This additional reduction may be applied where all the following conditions are met:

a) the community has a bylaw requiring all buildings that may be built within 30 m of the subject building to be fully sprinkler protected. I.e. future development will not create unsprinklered buildings within 30 m of the subject building, and
b) all buildings within 30 meters of the subject building are fully sprinkler protected with systems that are designed and installed in accordance with the applicable criteria of NFPA 13, *Standard for Installation of Sprinkler Systems,* NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential* Occupancies, or NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes,* and
c) the community has in place a Fire Prevention Program that provides a system of ensuring that installed fire sprinkler systems are inspected, tested, and maintained in accordance with NFPA 25: *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, and
d) the community maintains the pressure and flow rate requirements for fire sprinkler installations. I.e. the community does not make significant reductions to the operating pressures or flows across the distribution network.

Adjustment of Sprinkler Reductions for Community Level Oversight of Sprinkler Maintenance, Testing and Water Supply Requirements

The reduction in required fire flows for sprinkler protection may be reduced or eliminated if

a) the community does not have a Fire Prevention Program that provides a system of ensuring that installed fire sprinkler systems are inspected, tested, and maintained in accordance with NFPA 25: *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, or
b) the community does not maintain the pressure and flow rate requirements for fire sprinkler installations, or otherwise allows the flow rates and pressure levels that were available during sprinkler system design to significantly degrade, increasing the probability of inadequate water supply for effective sprinkler operation.

Recognition of Automatic Sprinkler Protection

A property should be considered as "sprinkler protected" for the purposes of determining required fire flows, if the building has an automatic fire sprinkler system:

- designed and installed throughout all areas in accordance with NFPA 13, *Standard for Installation of Sprinkler Systems*, and maintained in accordance with the NFPA 25, *Standard for the Inspections, Testing and Maintenance of Water-Based Fire Protection Systems*, and
- supplied by water infrastructure capable of meeting all pressure and flow requirements of the sprinkler system concurrently with Max Day Demand (if connected to a domestic system)

Evidence of the sprinkler system design, installation should be acquired from the party responsible for the building (the owner, building engineer or property manager) or the municipal fire prevention office.

On site, the sprinkler system should carry test tags verifying that a qualified person has conducted tests including:

- flushing and hydrostatic tests of both the underground and overhead piping in accordance with NFPA 13;
- full-flow main drain test within the previous 48 months.
- dry-pipe trip test (if applicable) conducted within the last 48 months
- fire-pump test (if applicable) conducted within the last 48 months

Items of Note for Sprinkler Systems

i. It is important to note that installation of automatic sprinkler systems provides a highly effective and reliable system of fire protection however, this does not preclude the need for manual fire flows entirely as some fires, for various reasons, grow beyond the capability of sprinkler protection to be effective, and in these cases, manual fire fighting intervention is required.

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

February 5, 2025

83-91 Sweetland Avenue

4-Storey Apartment Building

Ottawa, Ontario

WATER DEMAND CALCULATIONS

	Number of Units	Persons per Unit	Population
1 Bedroom:	63	1.4	88.2
2 Bedroom:	3	2.1	6.3
3 Bedroom:	18	3.1	55.8
Average:	0	1.8	0
Total:	84		150.3

Average Daily Demand:	280	L/capita/day				
	29.2	L/min	0.5	L/s	7.7	USgpm
Maximum Daily Demand:	4.9	(Peaking factor for a population of 150.3 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	143.1	L/min	2.4	L/s	37.8	USgpm
Maximum Hourly Demand:	7.4	(Peaking factor for a population of 150.3 interpolated from MOE Design Guidelines for Drinking Water Systems Table 3-3)				
	216.1	L/min	3.6	L/s	57.1	USgpm

Elevation of Water Meter:	61.82	m				
Basement Floor Elevation:	60.92	m				
Minimum HGL:	106.0	m				
Static Pressure at Water Meter:	44.2	m	433	kPa	63	psi
Maximum HGL:	115.6	m				
Static Pressure at Water Meter:	53.8	m	527	kPa	76	psi

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

RE: Request for Boundary Conditions - 83-91 Sweetland Avenue

1 message

Whelan, Amy <amy.whelan@ottawa.ca> Mon, Dec 23, 2024 at 11:05 AM
To: Ryan Faith <r.faith@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>

Good morning Ryan,

The following are boundary conditions, HGL, for hydraulic analysis at 83-91 Sweetland Avenue (zone 1W) assumed a dual connection connected to the 203mm watermain on Sweetland Avenue (see attached PDF for location).

Minimum HGL: 106.0 m

Maximum HGL: 115.6 m

Max Day + Fire Flow (166.7 L/s): 102.8m

Max Day + Fire Flow (233.3 L/s): 97.5m

Please refer to Guidelines and Technical bulletin ISDTB-2021-01 concerning residential areas serving 50 or more dwellings.

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.

Amy Whelan, E.I.T

Project Manager, Infrastructure Approvals

Development Review, Central | Examen des projets d'aménagement, Central

Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

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

613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: December 04, 2024 10:36 AM
To: Whelan, Amy <amy.whelan@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: Request for Boundary Conditions - 83-91 Sweetland Avenue

Hi Amy,

In front of 83 Sweetland should suffice. I suspect they're hoping for greater than 50% above grade but to be confirmed with the grading plan.

Please also provide the boundary conditions for the following expected demands:

Fire flow demand: 233.3 L/s
Average daily demand: 0.5 L/s
Maximum daily demand: 2.4 L/s
Maximum hourly demand: 3.6 L/s

Calculations are attached.

Thanks,

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

On Wed, Dec 4, 2024 at 10:01 AM Whelan, Amy <amy.whelan@ottawa.ca> wrote:

> Hey Ryan,
>
> In order to process the boundary condition request we require the location of the service (map or plan with connection location(s)).
>
> Additionally, as per the FUS basement floor area is excluded from the total effective area when the basement is at least 50% below grade. Can you confirm that the basement for the proposed development is greater than 50% above grade?
>
> Kind regards,
>
> **Amy Whelan, E.I.T**

Project Manager, Infrastructure Approvals

Development Review, Central | Examen des projets d'aménagement, Central

Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

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

613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: December 02, 2024 8:00 AM
To: Whelan, Amy <amy.whelan@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Request for Boundary Conditions - 83-91 Sweetland Avenue

Hi Amy,

Please provide the boundary conditions for the Sweetland Avenue municipal watermain at 83-91 Sweetland Avenue. We have calculated the following expected demands:

Fire flow demand: 166.7 L/s
Average daily demand: 0.5 L/s
Maximum daily demand: 2.4 L/s
Maximum hourly demand: 3.6 L/s

Calculations are attached.

Thanks,

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

'

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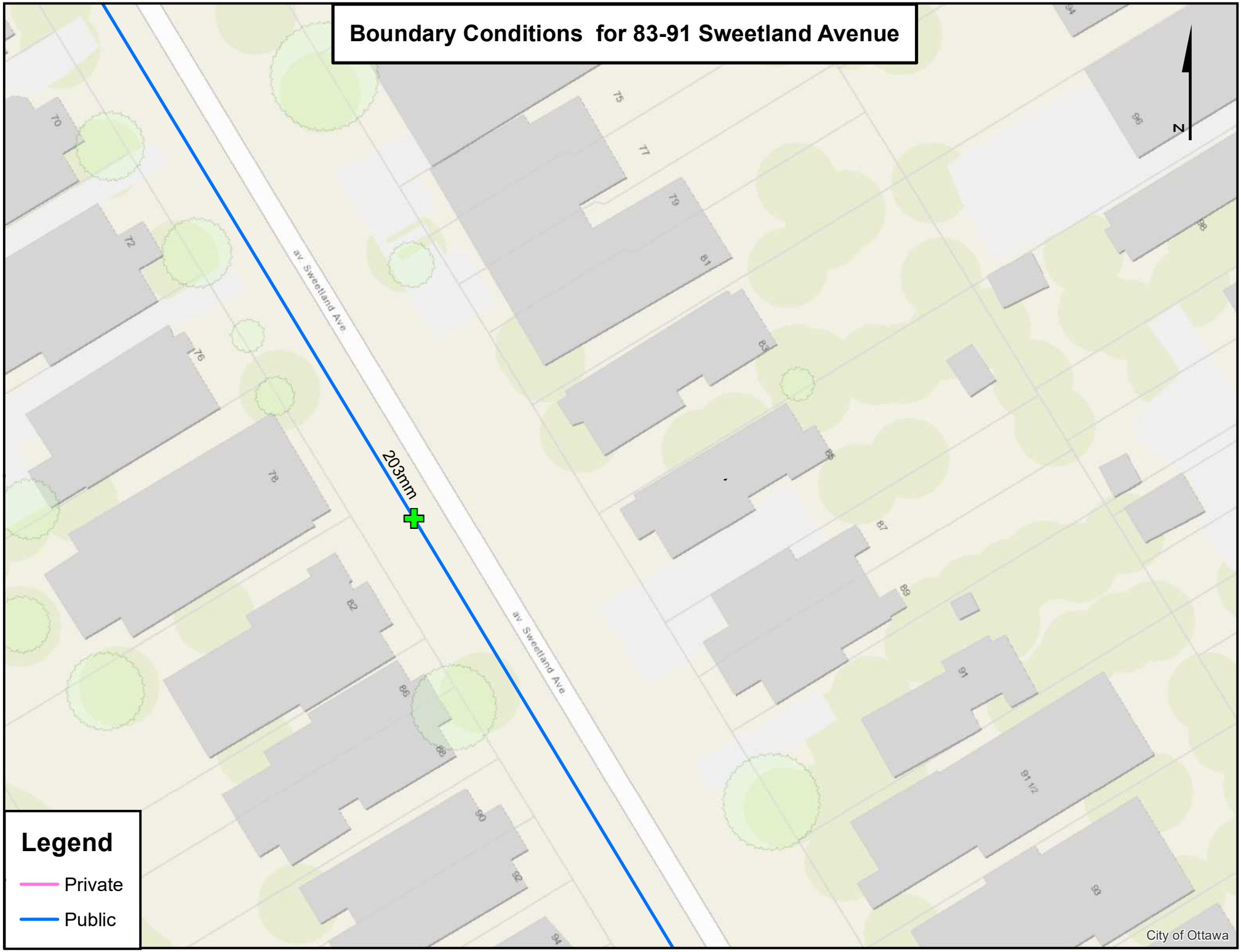
83-91 Sweetland Avenue December 2024.pdf
520K


Boundary Conditions for 83-91 Sweetland Avenue
av Sweetland Ave
av Sweetland Ave
203mm
N
Legend
Private
Public
City of Ottawa

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: 83-91 Sweetland Avenue
4-Storey Apartment Building
Ottawa, Ontario

Date: February 5, 2025

Residential Average Daily Flow:	280	L/capita/day	Residential Peaking Factor:	Harmon Formula
Commercial Average Daily Flow:	28,000	L/ha/day	Harmon Formula Correction Factor:	0.8
Institutional Average Daily Flow:	28,000	L/ha/day	Commercial Peaking Factor:	1.5
Light Industrial Average Daily Flow:	35,000	L/ha/day	Institutional Peaking Factor:	1.5
Heavy Industrial Average Daily Flow:	55,000	L/ha/day	Industrial Peaking Factor:	Ministry of the Environment
Infiltration Allowance:	0.33	L/s/ha	Manning's Roughness Coefficient:	0.013

		Residential													Commercial				Infiltration			Q	Sewer Data						
		Individual							Cumulative						Individual	Cumulative			Individual	Cumulative		Total							
Location		Single	Semi	Duplex	Apartment	Apartment	Apartment	Apartment	Area	Population	Area	Population	Peaking	Flow Rate	Area	Area	Peaking	Flow Rate	Area	Area	Flow Rate	Flow Rate	Length	Nominal Diameter	Actual Diameter	Slope	Velocity	Q_{Full} Capacity	
From	To	Family	Detached		(1 Bed)	(2 Bed)	(3 Bed)	(Average)	(ha)		(ha)		Factor	(L/s)	(ha)	(ha)	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 Building	250 SAN				63	3	18		0.1649	150.3	0.1649	150.3	3.2	1.56					0.1649	0.1649	0.05	1.61	13.4	150	150	1.5	1.06	18.65	0.09
																					Existing 250 mm Sweetland Avenue Municipal Sanitary Sewer:			250	250	5.77	2.91	142.85	

D.B. Gray Engineering Inc.

Ryan Faith <r.faith@dbgrayengineering.com>

RE: Request for Boundary Conditions - 83-91 Sweetland Avenue

1 message

Whelan, Amy <amy.whelan@ottawa.ca> Thu, Dec 5, 2024 at 12:02 PM
To: Ryan Faith <r.faith@dbgrayengineering.com>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>

Good afternoon Ryan,

No capacity concerns with the proposed 1.59L/s of sanitary flow proposed to connect to the 250mm Conc Sanitary sewer on Sweetland avenue

Kind regards,

Amy Whelan, E.I.T

Project Manager, Infrastructure Approvals

Development Review, Central | Examen des projets d'aménagement, Central

Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

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

613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

From: Ryan Faith <r.faith@dbgrayengineering.com>
Sent: December 02, 2024 8:16 AM
To: Whelan, Amy <amy.whelan@ottawa.ca>
Cc: Douglas Gray <d.gray@dbgrayengineering.com>
Subject: Re: Request for Boundary Conditions - 83-91 Sweetland Avenue

Hi Amy,

Please confirm the attached sanitary flow rate is acceptable.

Thanks,

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

On Mon, Dec 2, 2024 at 8:00 AM Ryan Faith <r.faith@dbgrayengineering.com> wrote:

> Hi Amy,
>
> Please provide the boundary conditions for the Sweetland Avenue municipal watermain at 83-91 Sweetland Avenue. We have calculated the following expected demands:
>
> Fire flow demand: 166.7 L/s
> Average daily demand: 0.5 L/s
> Maximum daily demand: 2.4 L/s
> Maximum hourly demand: 3.6 L/s
>
> Calculations are attached.
>
> Thanks,
>
> **Ryan Faith**
> **D.B. Gray Engineering Inc.**
> 700 Long Point Circle
> Ottawa, Ontario K1T 4E9
> 613-425-8044

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83-91 Sweetland Ave Sanitary Sewer Calcs Dec2-24.pdf
112K

APPENDIX D

STORMWATER MANAGEMENT

SUMMARY TABLES

100-YEAR EVENT

Drainage Area	Pre-development Flow Rate (L/s)	Post Development Flow Rate or Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
Pre-development AREA A / Post Developement AREA I (Flow Off Site to Sweetland Avenue)	17.13	5.94	-	-
Pre-development AREA B / Post Developement AREA II (Flow Off Site to Rear)	30.98	10.42	-	-
AREA III (Roof)	-	11.74	19.53	19.53
TOTAL	48.11	28.10	19.53	19.53

2-YEAR EVENT

Drainage Area	Pre-development Flow Rate (L/s)	Post Development Flow Rate or Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)	Maximum Volume Stored (cu.m)
Pre-development AREA A / Post Developement AREA I (Flow Off Site to Sweetland Avenue)	6.46	2.24	-	-
Pre-development AREA B / Post Developement AREA II (Flow Off Site to Sweetland Avenue)	11.49	3.76	-	-
AREA III (Roof)	-	7.53	5.17	5.17
TOTAL	17.95	13.53	5.17	5.17

February 5, 2025

83-91 Sweetland Avenue

Ottawa, Ontario

STORMWATER MANAGEMENT CALCULATIONS
Modified Rational Method

PRE-DEVELOPMENT CONDITIONS

DRAINAGE AREA A (Flow Off Site to Sweetland Avenue)

(Pre-development Conditons - 100-YEAR EVENT)

			C
Roof Area:	215	sq.m	1.00
Hard Area:	50	sq.m	1.00
Gravel Area:	80	sq.m	0.875
Soft Area:	40	sq.m	0.25
Total Catchment Area:	385	sq.m	0.90

Time of Concentration (Tc)

Bransby Williams Formula (Used when C > 0.40)

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

Sheet Flow Distance (L):	44	m
Slope of Land (Sw):	7	%
Area (A):	0.0385	ha
Time of Concentration (Sheet Flow):	2	min
Time of Concentration:	10	min
Rainfall Intensity (i):	179	mm/hr
100-Year Pre-Development Flow Rate (2.78AiC):	17.13	L/s

DRAINAGE AREA B (Flow Off Site to Rear)

(Pre-development Conditons - 100-YEAR EVENT)

			C
Roof Area:	195	sq.m	1.00
Hard Area:	195	sq.m	1.00
Gravel Area:	25	sq.m	0.875
Soft Area:	849	sq.m	0.25
Total Catchment Area:	1,264	sq.m	0.49

Time of Concentration (Tc)

Bransby Williams Formula (Used when C > 0.40)

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

Sheet Flow Distance (L):	44	m
Slope of Land (Sw):	7	%
Area (A):	0.1264	ha
Time of Concentration (Sheet Flow):	2	min
Time of Concentration:	10	min
Rainfall Intensity (i):	179	mm/hr
100-Year Pre-Development Flow Rate (2.78AiC):	30.98	L/s

DRAINAGE AREA A (Flow Off Site to Sweetland Avenue)

(Pre-development Conditons - 2-YEAR EVENT)

			C
Roof Area:	215	sq.m	0.90
Hard Area:	50	sq.m	0.90
Gravel Area:	80	sq.m	0.70
Soft Area:	40	sq.m	0.20
Total Catchment Area:	385	sq.m	0.79
Time of Concentration:	10	min	
Rainfall Intensity (i):	77	mm/hr	
2-Year Pre-Development Flow Rate (2.78AiC):	6.46	L/s	

DRAINAGE AREA B (Flow Off Site to Rear)

(Pre-development Conditons - 2-YEAR EVENT)

			C
Roof Area:	195	sq.m	0.90
Hard Area:	195	sq.m	0.90
Gravel Area:	25	sq.m	0.70
Soft Area:	849	sq.m	0.20
Total Catchment Area:	1,264	sq.m	0.43
Time of Concentration:	10	min	
Rainfall Intensity (i):	77	mm/hr	
2-Year Pre-Development Flow Rate (2.78AiC):	11.49	L/s	

POST-DEVELOPMENT CONDITIONS

DRAINAGE AREA I (Uncontrolled Flow Off Site to Sweetland Avenue)

(Post Development Conditons - 100-YEAR EVENT)

			C
Roof Area:	0	sq.m	1.00
Hard Area:	90	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	119	sq.m	0.25
Total Catchment Area:	209	sq.m	0.57
Area (A):	209	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.57		
Flow Rate (2.78AiC):	5.94	L/s	

DRAINAGE AREA II (Uncontrolled Flow Off Site to Rear)

(Post Development Conditons - 100-YEAR EVENT)

			C
Roof Area:	0	sq.m	1.00
Hard Area:	80	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Soft Area:	520	sq.m	0.25
Total Catchment Area:	600	sq.m	0.35
Area (A):	600	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr	
Runoff Coeficient (C):	0.35		
Flow Rate (2.78AiC):	10.42	L/s	

DRAINAGE AREA III (Roof)

(100-YEAR EVENT)

			C	
Total Catchment Area:	840	sq.m	1.00	
No. of Roof Drains:	8			
Slots per Wier:	1	0.01242 L/s/mm/slot (5 USgpm/in/slot)		
Depth at Roof Drains:	118	mm		
Maximum Release Rate:	11.74	L/s	Pond Area:	496 sq.m
			Maximum Volume Stored:	19.53 cu.m
			Maximum Volume Required:	19.53 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	41.70	11.74	29.96	17.98
15	143	33.37	11.74	21.63	19.47
20	120	28.01	11.74	16.28	19.53
25	104	24.25	11.74	12.51	18.77
30	92	21.45	11.74	9.72	17.49
35	83	19.28	11.74	7.55	15.85
40	75	17.55	11.74	5.81	13.95
45	69	16.12	11.74	4.39	11.85
50	64	14.93	11.74	3.20	9.60
55	60	13.92	11.74	2.19	7.22
60	56	13.05	11.74	1.32	4.74
65	53	12.29	11.74	0.56	2.18
70	50	11.63	11.63	0.00	0.00
75	47	11.04	11.04	0.00	0.00
80	45	10.51	10.51	0.00	0.00
85	43	10.03	10.03	0.00	0.00
90	41	9.60	9.60	0.00	0.00

POST-DEVELOPMENT CONDITIONS

DRAINAGE AREA I (Uncontrolled Flow Off Site to Sweetland Avenue)

(Post Development Conditons - 2-YEAR EVENT)

			C
Roof Area:	0	sq.m	0.90
Hard Area:	90	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	119	sq.m	0.20
Total Catchment Area:	209	sq.m	0.50
Area (A):	209	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	77	mm/hr	
Runoff Coeficient (C):	0.50		
Flow Rate (2.78AiC):	2.24	L/s	

DRAINAGE AREA II (Uncontrolled Flow Off Site to Rear)

(Post Development Conditons - 2-YEAR EVENT)

			C
Roof Area:	0	sq.m	0.90
Hard Area:	80	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Soft Area:	520	sq.m	0.20
Total Catchment Area:	600	sq.m	0.29
Area (A):	600	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	77	mm/hr	
Runoff Coeficient (C):	0.29		
Flow Rate (2.78AiC):	3.76	L/s	

DRAINAGE AREA III (Roof)

(2-YEAR EVENT)

			C
Total Catchment Area:	840	sq.m	0.90

No. of Roof Drains: 8
Slots per Wier: 1 0.01242 L/s/mm/slot (5 USgpm/in/slot)

Depth at Roof Drains: 76 mm

Maximum Release Rate: 7.53 L/s Pond Area: 204 sq.m

Maximum Volume Stored: 5.17 cu.m

Maximum Volume Required: 5.17 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	77	16.14	7.53	8.61	5.17
15	62	12.98	7.53	5.45	4.90
20	52	10.94	7.53	3.40	4.08
25	45	9.49	7.53	1.96	2.94
30	40	8.42	7.53	0.88	1.59
35	36	7.58	7.53	0.05	0.09
40	33	6.91	6.91	0.00	0.00
45	30	6.36	6.36	0.00	0.00
50	28	5.89	5.89	0.00	0.00
55	26	5.50	5.50	0.00	0.00
60	25	5.16	5.16	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

100-YEAR EVENT

Project: 83-91 Sweetland Avenue
4-Storey Apartment Building
Ottawa, Ontario

Date: February 5, 2025

Manning's Roughness Coefficient: 0.013

Location		Individual					Cumulative				Sewer Data							
From	To	Roof C = 1.00 (ha)	Hard C = 1.00 (ha)	Gravel C = 0.875 (ha)	Soft C = 0.25 (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	Existing 450 ST	0.0840				0.2335	0.2335	10.00	179	41.70	15.1	200	200	8	2.95	92.77	0.09	45%
CB-1	Existing 450 ST		0.0040		0.0050	0.0146	0.0146	10.00	179	2.61	13.8	200	200	0.58	0.80	24.98	0.29	10%
										Existing 450 mm Sweetland Avenue Municipal Storm Sewer:		450	456	5.48	4.23	691.41		