

# 1146 Snow Street

Site Servicing and Stormwater Management Report



Prepared for:  
1146 Snow Street Inc.

February 27, 2025

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City of Ottawa File No:  
PC2024-0084

## 1146 Snow Street

### Site Servicing and Stormwater Management Report

| Revision | Description                        | Author     | Date       | Quality Check | Date       | Independent Review | Date       |
|----------|------------------------------------|------------|------------|---------------|------------|--------------------|------------|
| 0        | ZBA/SPC 1 <sup>st</sup> Submission | Michael W. | 2025-02-27 | Dustin T.     | 2025-03-03 | Alyssa G.          | 2025-02-28 |
|          |                                    |            |            |               |            |                    |            |
|          |                                    |            |            |               |            |                    |            |



## 1146 Snow Street

### Site Servicing and Stormwater Management Report

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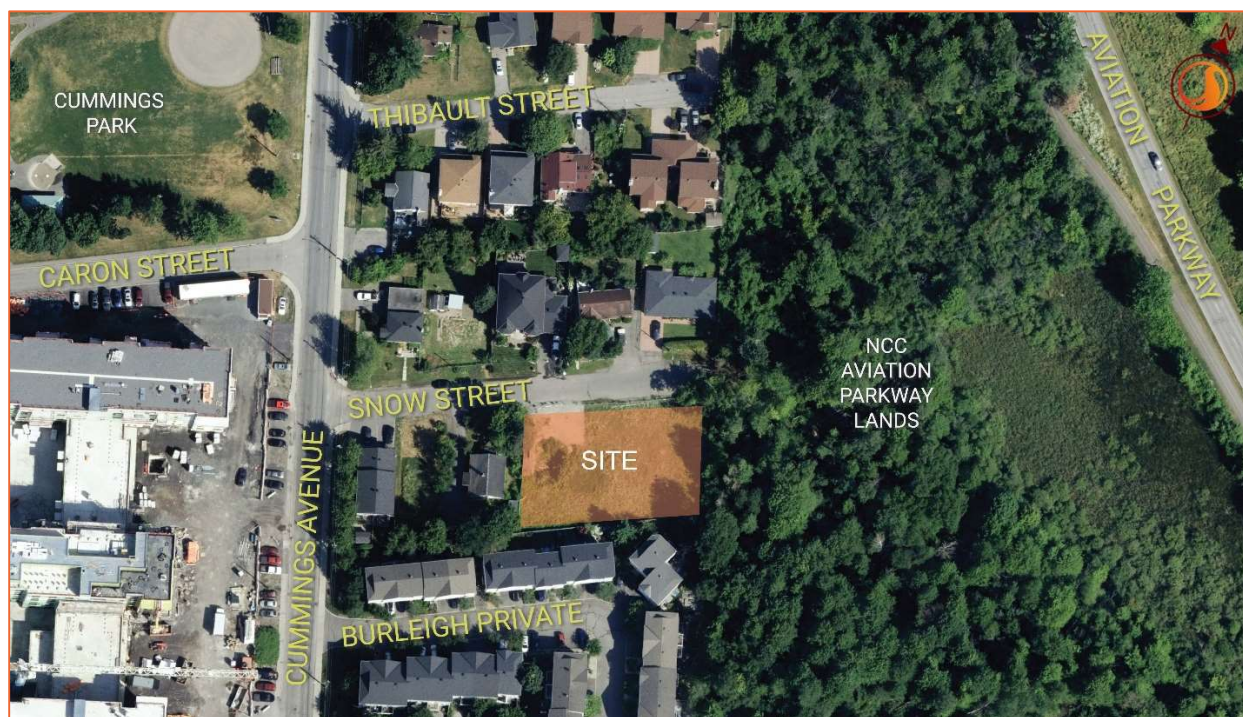
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# 1 Introduction

Stantec Consulting Ltd. has been commissioned by 1146 Snow Street Ltd. to prepare the following Site Servicing and Stormwater Management Report in support of a Zoning By-Law Amendment (ZBLA) and a Site Plan Control (SPC) application for the proposed development located at 1146 Snow Street in the City of Ottawa.

The 0.15 ha site is situated along the south side of the east end of Snow Street, east of the Snow Street and Cummings Avenue intersection. The site is currently zoned R3VV, is presently vacant, and is predominantly grassed with some pavement for surface parking. The site had previously housed a small one-storey building that was for commercial usage. The site is bound by Snow Street to the north, existing residential development to the west and south, and the National Capital Commission (NCC) Aviation Parkway woodlands to the east, as shown in **Figure 1.1** below.



*Figure 1.1: Key Plan of Site Location*

A four-storey medium-rise residential building with a total of 43 apartment units is proposed on the site. M. David Blakely Architect Inc. has prepared a site plan dated February 4, 2025 (**Appendix A.1**), which defines the proposed development, while the unit type breakdown is presented in **Table 1.1** below.



*Table 1.1: Unit Type Breakdown*

| Unit Type    | Number    |
|--------------|-----------|
| Studio       | 9         |
| One-bedroom  | 20        |
| Two-bedroom  | 14        |
| <b>Total</b> | <b>43</b> |

## 1.1 Objectives

This site servicing and stormwater management (SWM) report presents a servicing scheme that is free of conflicts, provides on-site servicing in accordance with City of Ottawa Design Guidelines, and uses the existing municipal infrastructure in accordance with any limitations communicated during consultation with the City of Ottawa staff. Details of the existing infrastructure located within the Snow Street right of way (ROW) were obtained from available as-built drawings and site topographic survey.

Criteria and constraints provided by the City of Ottawa have been used as a basis for the detailed servicing design of the proposed development. Specific and potential development constraints to be addressed are as follows:

- Potable Water Servicing
  - Estimated water demands to characterize the proposed feed(s) for the development which will be serviced from the existing 150 mm diameter watermain within the Snow Street ROW.
  - Watermain servicing for the development is to be able to provide average day and maximum day (including peak hour) demands (i.e., non-emergency conditions) at pressures within the acceptable range of 345 to 552 kPa (50 to 80 psi)
  - Under fire flow (emergency) conditions, the water distribution system is to maintain a minimum pressure greater than 140 kPa (20 psi)
- Wastewater (Sanitary) Servicing
  - Define and size the sanitary service lateral which will be connected to the existing sanitary sewer within the Snow Street ROW.
- Storm Sewer Servicing
  - Define major and minor conveyance systems in conjunction with the proposed grading plan.



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#### 1 Introduction

- Determine the stormwater management storage requirements to meet the allowable release rate for the site.
  - Define and size the proposed storm service lateral and storm sewer extension from the existing storm sewer within the Snow Street ROW.
- Prepare a grading plan in accordance with the proposed site plan and existing grades. Identify key drainage patterns and grading features.
- Incorporate the relevant geotechnical information, constraints, and recommendations.
- Identify utility site constraints (existing infrastructure removals/accommodations, easements, offsets, etc.)
- Assess the availability of utility plant in proximity of the site
- Identify other approval requirements

**Drawing SP-1** illustrates the proposed internal servicing scheme for the site.



## 2 Background

Documents referenced in preparing of this stormwater and servicing report for the 1146 Snow Street development include:

- *City of Ottawa Sewer Design Guidelines (SDG)*, City of Ottawa, October 2012, including all subsequent technical bulletins
- *City of Ottawa Design Guidelines – Water Distribution*, City of Ottawa, July 2010, including all subsequent technical bulletins
- *Design Guidelines for Drinking Water Systems*, Ministry of the Environment, Conservation, and Parks (MECP), 2008
- *Fire Protection Water Supply Guideline* for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020
- *Water Supply for Public Fire Protection*, Fire Underwriters Survey (FUS), 2020
- *Geotechnical Investigation – Proposed Residential Building, 1146 Snow Street, Ottawa, Ontario*, Paterson Group, October 31, 2024
- *Pre-consultation Meeting Minutes – 1146 Snow Street (File No.: PC2024-0084)*, City of Ottawa, March 26, 2024



## 3 Water Servicing

### 3.1 Background

The proposed building is in Pressure Zone 1E of the City of Ottawa's Water Distribution System and an existing 150 mm diameter municipal watermain is available at the site frontage in Snow Street. The 150 mm diameter watermain dead ends near the east boundary of the site and may present water flow and pressure constraints for the site design. All water service lateral connections previously servicing this site have been blanked at the main by City forces prior to the building demolition.

### 3.2 Water Demands

#### 3.2.1 Domestic Water Demands

The City of Ottawa Water Distribution Guidelines (July 2010) and ISTB 2021-03 Technical Bulletin were used to determine water demands based on projected population densities for residential dwellings and associated peaking factors. The population was estimated using an occupancy of 1.4 persons per unit for studio and one-bedroom apartments and 2.1 persons per unit for two-bedroom apartments. Based on the unit type breakdown in **Table 1.1**, the proposed building is estimated to have a total population of 71 persons.

A daily rate of 280 L/cap/day has been used to estimate average daily (AVDY) potable water demand for the residential units. Maximum day (MXDY) demands were determined by multiplying the AVDY demands by a factor of 2.5 for residential areas, while peak hourly (PKHR) demands were determined by multiplying the MXDY by a factor of 2.2 for residential areas. The estimated demand for the proposed residential building is summarized in **Table 3.1** below and detailed in **Appendix B.1**.

*Table 3.1: Estimated Water Demands*

| Population | AVDY<br>(L/s) | MXDY<br>(L/s) | PKHR<br>(L/s) |
|------------|---------------|---------------|---------------|
| 71         | 0.2           | 0.6           | 1.3           |

#### 3.2.2 Fire Flow Demands

Fire flow requirements were estimated using Fire Underwriters Survey (FUS) methodology, as the estimated fire flow for the site equals or exceeds 9,000 L/min (150.0 L/s) when determined through the Office of the Fire Marshal (OFM) fire protection water supply guidelines under the Ontario Building Code.

Through Section 3.2.2.45 of the Ontario Building Code and correspondence with the architect, the FUS estimate is based on the following characteristics of the proposed building, as confirmed through correspondence with the architect attached in **Appendix A.3**.



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#### 3 Water Servicing

1. The building is to be of Type IV-B Mass Timber Construction. As a result, the 'effective floor area' was determined to be the sum of the two largest floors plus 50% of the two remaining floor areas was used for the purpose of the FUS calculation, as per page 22 of the *Fire Underwriters Survey's Water Supply for Public Fire Protection*, 2020.
2. The building will be equipped with an automatic sprinkler system that is fully supervised and conforms to the NFPA 13 standard.

The preliminary fire flow demands were determined to be 117 L/s (7,000 L/min) for the proposed building. Boundary Conditions received from the City of Ottawa identified that only 110 L/s fire flow is available from the municipal watermain at 20 psi. Various architectural options were considered to reduce the building's required fire flow (RFF). A 2-hour firewall is proposed to run through the middle of the building (along Gridline C in the site plan), thereby reducing the effective floor area of the building.

The proposed firewall will reduce the building's RFF to 83 L/s (5,000 L/min). Detailed fire flow calculations per the FUS methodology are included in **Appendix B.2**.

### 3.3 Level of Servicing

The preliminary domestic water (AVDY: 0.2 L/s, MXDY: 0.6 L/s, PKHR: 1.3 L/s) and fire flow demands (7,000 L/min) were submitted to City of Ottawa staff to assess the level of servicing available from the municipal watermain and hydrants within Snow Street. **Table 3.2** outlines the boundary conditions received from the City of Ottawa's modelling group on November 25<sup>th</sup>, 2024 (see **Appendix B.3**). Note that as the preliminary domestic and fire flow demands were greater than the current demands, the preliminary boundary conditions provided are acceptable for a conservative estimate of the available servicing. Updated boundary conditions will be requested to the City following receipt of First Submission City Comments.

Table 3.2: Boundary Conditions at Snow Street

|                                    | 150 mm Ø WM |
|------------------------------------|-------------|
| Min. HGL (m)                       | 110.0       |
| Max. HGL (m)                       | 118.3       |
| Max. Day + Fire Flow (117 L/s) (m) | *           |

\*The maximum available fire flow at 20 psi under existing conditions is 110 L/s.

#### 3.3.1 Allowable Domestic Pressures

The desired normal operating pressure range in occupied areas as per the City of Ottawa 2010 Water Distribution Design Guidelines is 345 kPa to 552 kPa (50 psi to 80 psi) under a condition of maximum daily flow and no less than 276 kPa (40 psi) under a condition of maximum hourly demand. Furthermore, the maximum pressure at any point in the water distribution should not exceed 689 kPa (100 psi) as per



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the Ontario Building/Plumbing Code; pressure reducing measures are required to service areas where pressures greater than 552 kPa (80 psi) are anticipated in occupied areas.

The proposed finished floor elevation of the first floor, 75.8 m, will serve as the ground floor elevation for the calculation of the residual pressures at ground level. As calculated from the boundary conditions, the on-site pressures are expected to range from 335 to 416 kPa (48.5 to 60.3 psi) under normal operating conditions, satisfying the design criteria. The mechanical consultant will determine the domestic booster pump requirements to service the upper floors of the building at a later phase of design.

### 3.3.2 Allowable Fire Flow Pressures

The RFF of 83 L/s (5,000 L/min) can be provided by the 150 mm diameter municipal watermain in Snow Street and nearby hydrants, which provide a maximum fire flow of 110 L/s at the minimum residual pressure of 20 psi. The mechanical consultant will determine fire pump requirements for the proposed sprinkler system at a later phase of design.

### 3.3.3 Fire Hydrant Coverage

There are two existing fire hydrants in the proximity of the proposed development site, as shown in **Figure 3.1** below.

According to the NFPA 1 Table 18.5.4.3 in Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02, a hydrant situated less than 76 m away from a building can supply a maximum capacity of 5,678 L/min. Hence, the site's RFF can be met by the two fire hydrants in combination. See **Appendix B.4** for fire hydrant coverage table calculations and NFPA Table 18.5.4.3.

The existing fire hydrants have light blue bonnets. Per Table 4.10 of the City of Ottawa Water Design Guidelines these are classified as Class AA fire hydrants.

HYD-01 is located within 45 m of the Siamese connection per Section 3.2.5.16 of the Ontario Building Code.



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#### 3 Water Servicing

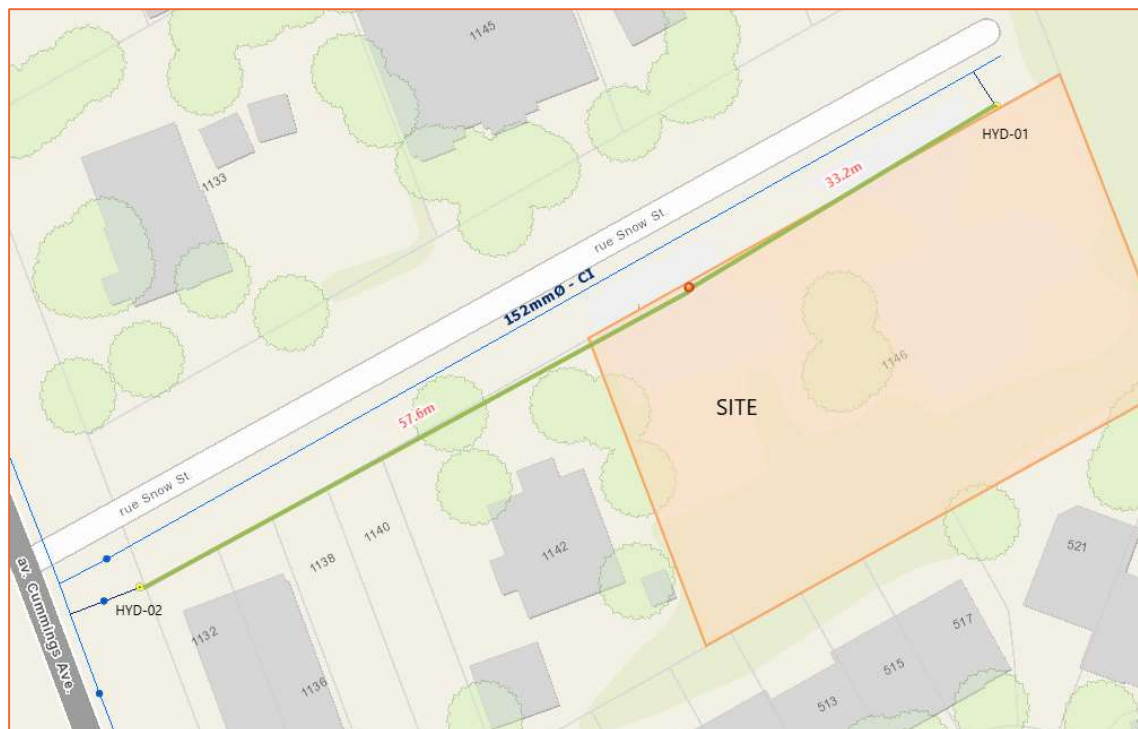


Figure 3.1: Fire Hydrant Coverage Sketch

## 3.4 Proposed Water Servicing

The proposed water servicing is shown on **Drawing SP-1**. The development will be serviced from the 150 mm diameter watermain on Snow Street via a single 150 mm building service lateral complete with a valve at the property line. The mechanical consultant will confirm the service size at a later phase of design.

The existing fire hydrant HYD-01 will be relocated 11.9 m west to accommodate the ramp to the underground parking and a 3.0 m offset from the Hydro Ottawa transformer. The new location of HYD-01 will also be within 45 m of the Siamese connection per Section 3.2.5.16 of the Ontario Building Code.



## 4 Wastewater Servicing

### 4.1 Background

The site is located at the upstream leg of an existing 300 mm diameter municipal sanitary sewer within Snow Street, with the upstream manhole located in front of the site.

### 4.2 Design Criteria

As outlined in the City of Ottawa Sewer Design Guidelines and the MECP Design Guidelines for Sewage Works, the following criteria were used to estimate the wastewater flow rates and to determine the size and location of the sanitary service lateral:

- Minimum velocity = 0.6 m/s (0.8 m/s for upstream sections)
- Maximum velocity = 3.0 m/s
- Manning roughness coefficient for all smooth wall pipes = 0.013
- Minimum size of sanitary sewer service = 135 mm diameter
- Minimum grade of sanitary sewer service = 1.0 % (2.0 % preferred)
- Average wastewater generation = 280 L/person/day (per City Design Guidelines)
- Peak Factor = based on Harmon Equation; maximum of 4.0 (residential)
- Harmon correction factor = 0.8
- Infiltration allowance = 0.33 L/s/ha (per City Design Guidelines)
- Minimum cover for sewer service connections – 2.0 m
- Population density for studio and one-bedroom apartments – 1.4 persons/apartment
- Population density for two-bedroom apartments – 2.1 persons/apartment

### 4.3 Wastewater Generation and Servicing Design

Based on the current site plan and unit breakdown as shown in **Table 1.1**, the estimated peak wastewater flow rate generated from the proposed development is summarized in **Table 4.1** below.

*Table 4.1: Estimated Peak Wastewater Flow*

| Peak Residential Wastewater Flow |             |                 | Infiltration Flow (L/s) | Total Peak Flow (L/s) |
|----------------------------------|-------------|-----------------|-------------------------|-----------------------|
| Population                       | Peak Factor | Peak Flow (L/s) |                         |                       |
| 71                               | 3.63        | 0.8             | 0.1                     | 0.9                   |

Detailed sanitary sewage calculations are included in **Appendix C.1**. A full port backwater valve will be required for the proposed building service in accordance with the Sewer Design Guidelines and will be coordinated with the building mechanical consultant



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#### 4 Wastewater Servicing

The anticipated peak wastewater flows for the proposed development were provided to the City of Ottawa staff on October 23, 2024 (see **Appendix C.2**) to evaluate the adequacy of the receiving municipal sanitary sewer system in the vicinity of the site and downstream network. The City has confirmed that the 300 mm diameter sanitary sewer in Snow Street has the capacity to receive the additional sanitary peak flows from the proposed development.

## 4.4 Proposed Sanitary Servicing

The proposed sanitary servicing is shown on **Drawing SP-1**. A 200 mm diameter sanitary service, complete with full port backwater valve, is required to service the proposed development. The mechanical consultant will confirm the sanitary lateral size at a later phase of design. The lateral is to be gravity-drained, with a sanitary sump pump required for the lower levels. The mechanical consultant will confirm and design the sanitary sump pump at a later phase of design.

A sanitary monitoring manhole is provided onsite per City standard S18.1. A new manhole is proposed on the existing 300 mm diameter sanitary sewer in Snow Street to accommodate the building service connection.



## **5 Stormwater Management and Servicing**

### **5.1 Background**

There is no storm sewer at the frontage of the property. The 300 mm diameter Snow Street municipal storm sewer is stubbed approximately 48 m west of the property. The roadway is not curbed and there are no standard ditches within the ROW. Runoff from the existing developments along the ROW appear to drain west along the road's edge of asphalt to the storm sewers and catch basins on Cummings Avenue. The existing site drains from east to west into the Snow Street ROW. A small portion of the site appears to drain into the adjacent property to the west under existing conditions.

### **5.2 Stormwater Management (SWM) Criteria**

The Stormwater Management (SWM) criteria were established by combining current design practices outlined by the City of Ottawa Sewer Design Guidelines (SDG) (October 2012), review of project pre-consultation notes with the City of Ottawa, and through consultation with City of Ottawa staff. The following summarizes the criteria, with the source of each criterion indicated in brackets:

#### **General**

- Use of the dual drainage principle (City of Ottawa SDG).
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff (City of Ottawa SDG).
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on the major and minor drainage systems (City of Ottawa SDG).

#### **Storm Sewer & Inlet Controls**

- Intensity-Duration-Frequency (IDF) information is to be derived from the Meteorological Services of Canada rainfall data. Historical data must be taken from the MacDonald Cartier Airport, collected between 1966 to 1997 (City of Ottawa pre-consultation).
- Discharge for each storm event to be restricted to a 5-year storm event pre-development rate with a maximum pre-development C coefficient of 0.5 (City of Ottawa pre-consultation).
- Peak flows generated from events greater than the 5-year and including the 100-year storm must be detained on site (City of Ottawa pre-consultation).
- The preferred stormwater system outlet for this site is the 300 mm diameter storm sewer stub within Snow Street, which needs to be extended to service the development (City of Ottawa pre-consultation).
- Time of Concentration ( $T_c$ ) should be not less than 10 minutes (City of Ottawa SDG).

#### **Surface Storage & Overland Flow**

- Building openings to be a minimum of 0.30 m above the 100-year water level (City of Ottawa SDG).



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#### 5 Stormwater Management and Servicing

- Maximum depth of flow under either static or dynamic conditions shall be less than 0.35 m (City of Ottawa SDG).
- Provide adequate emergency overflow conveyance off-site with a minimum vertical clearance of 15 cm between the spill elevation and the ground elevation at the building envelope in the proximity of the flow route or ponding area (City of Ottawa SDG).

#### Quality Control

- Quality control measures are not required for this site, as the proposed development has no surficial parking areas or other known sources of contaminants.

### 5.3 Existing Drainage Conditions

The existing site (0.15 ha) is presently vacant and grassed with only a small asphalt surface parking area (measured to be around 124 m<sup>2</sup>). The overall site pre-development runoff coefficient was determined to be C=0.26.

The pre-development release rates for the site have been determined using the rational method and the drainage characteristics identified above. A time of concentration for the pre-development area was first determined using the FAA method and found to be below 10 minutes. Consequently, the minimum 10-minute T<sub>c</sub> was assigned. The peak pre-development flow rates shown in **Table 5.1** have been calculated using the rational method as follows:

$$Q = 2.78 (C)(I)(A)$$

Where:

$Q$  = peak flow rate, L/s

$C$  = site runoff coefficient

$I$  = rainfall intensity, mm/hr (per City of Ottawa IDF curves)

$A$  = drainage area, ha

Table 5.1: Peak Pre-Development Flow Rates

| Design Storm | Pre-Development Flow Rate (L/s)<br>for C=0.26, A=0.15 ha, t <sub>c</sub> = 10 min |
|--------------|-----------------------------------------------------------------------------------|
| 5-year       | 11.4                                                                              |

### 5.4 Stormwater Management Design

The Modified Rational Method was employed to assess the rate and volume of runoff anticipated during post-development rainfall runoff events. The site was subdivided into sub-catchments (subareas) as defined by the proposed grades and the location, nature, or presence/absence of inlet control devices (ICDs). Each sub-catchment was assigned a runoff coefficient based on the proposed finished surface. A



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#### 5 Stormwater Management and Servicing

summary of subareas and runoff coefficients is provided in **Table 5.2** below. Further details can be found in **Appendix D.1**, while **Drawing SD-1** illustrates the proposed sub-catchments.

*Table 5.2: Summary of Subcatchment Areas*

| Catchment Areas | C           | A (ha)       | Flow Type    | Storage Type        | Outlet            |
|-----------------|-------------|--------------|--------------|---------------------|-------------------|
| C500A           | 0.36        | 0.037        | Controlled   | Clear Stone Trench  | Snow Street Sewer |
| RAMP-1          | 0.90        | 0.001        | Uncontrolled | -                   | Snow Street Sewer |
| RAMP-2          | 0.90        | 0.001        | Uncontrolled | -                   | Snow Street Sewer |
| R102A           | 0.90        | 0.067        | Controlled   | Rooftop and Cistern | Snow Street Sewer |
| R102B           | 0.90        | 0.024        | Controlled   | Rooftop and Cistern | Snow Street Sewer |
| UNC-1           | 0.43        | 0.014        | Uncontrolled | -                   | Snow Street ROW   |
| UNC-2           | 0.51        | 0.006        | Uncontrolled | -                   | Snow Street ROW   |
| UNC-3           | 0.20        | 0.001        | Uncontrolled | -                   | Snow Street ROW   |
| Total Site      | <b>0.71</b> | <b>0.152</b> | -            | -                   | -                 |

#### 5.4.1 Allowable Release Rate

The pre-development 5-year release rate for the site was determined using the rational method to be 11.4 L/s. Consequently, the target release rate for 1146 Snow Street under all events up to and including the 100-year event will be 11.4 L/s. Runoff coefficient values have been increased by 25% for the post-development 100-year storm event based on the City of Ottawa SDG.

#### 5.4.2 Quantity Control

The site requires quantity control measures to meet the restrictive stormwater release criteria. It is proposed to be achieved with three methods of storage:

1. The upper roof areas are to provide rooftop storage to a maximum depth of 150 mm via restricted release roof drains. The roof drains will outlet to the building cistern.
2. The stormwater cistern will be located below the underground parking level. The release rate from the cistern will be restricted by mechanically pumping to a maximum release rate. The cistern will outlet through the building storm service to the storm sewer extension in Snow Street.
3. In the rear yard, underground storage is provided in a clearstone trench, subdrain, and catch basin. The release rate from the rear yard will be restricted with an Inlet Control Device (ICD). The rear yard infrastructure will outlet through a catch basin lead to the storm sewer extension in Snow Street.

A spreadsheet using the Modified Rational Method (MRM) was used to design the roof drain release rates, cistern, and rear yard underground storage, as shown in **Appendix D.1**.



### 5.4.2.1 Rooftop Storage

It is proposed to retain stormwater on the building rooftop by installing restricted flow roof drains. The MRM calculations assume the roof will be equipped with 11 standard Watts model roof drains complete with Adjustable Accutrol Weirs, as per the roof plans provided by the architect. Discharge from the controlled roof drains will be routed by the mechanical consultant through the building's internal plumbing to the proposed building cistern located below the underground parking level.

Watts Drainage Adjustable Accutrol roof drain weir data and the roof plan has been used to calculate a practical roof release rate and detention storage volume for the rooftop areas, with 80 % of the roof area assumed to be available for storage. It should be noted that the Watts model roof drains and Accutrol weir have been used as examples only, and that other products may be specified for use, provided that:

- the peak roof drain release rate is restricted to match the maximum rate of release indicated in **Table 5.3**,
- sufficient roof storage is provided to meet (or exceed) the required volume of detained stormwater indicated in **Table 5.3**, and
- the maximum ponding depth of 150 mm is not exceeded during a design storm event.

The proposed drain release rates and storage volumes have been calculated based on three (3) of the roof drain weirs at 50 % opened setting, and eight (8) drains at the closed setting. Rooftop storage volumes and controlled release rates are calculated in **Appendix D.1** and summarized in **Table 5.3**.

*Table 5.3: Roof Subcatchment Areas Stormwater Management*

| Design Storm     | Storage Depth (mm) | Peak Discharge (L/s) | Volume Stored (m <sup>3</sup> ) |
|------------------|--------------------|----------------------|---------------------------------|
| 5-Year (R102A)   | 110                | 3.0                  | 10.9                            |
| 100-Year (R102A) | 146                | 3.7                  | 24.9                            |
| 5-Year (R102B)   | 91                 | 2.5                  | 2.3                             |
| 100-Year (R102B) | 132                | 2.5                  | 6.7                             |

### 5.4.2.1 Stormwater Cistern

The volume of storage required to attenuate rainfall runoff within the building footprint can't be achieved with the rooftop storage areas alone. Additional stormwater detention storage capacity is to be achieved with a stormwater cistern located below the underground parking level. Outflow from the roof drains is to be directed by the building internal mechanical systems to the cistern. The release rate from the cistern will be restricted by mechanically pumping to a maximum release rate. The cistern will outlet to the building storm service.

The stormwater cistern is to provide a minimum active storage volume of 20 m<sup>3</sup> with a maximum controlled release rate of 3.0 L/s. The release rate of the cistern has been over-controlled to compensate for the runoff from the uncontrolled areas of the site, to ensure that the overall site meets the target



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release rate. The stormwater cistern is to discharge at the specified controlled release rate using a mechanical pump. Cistern storage volumes and controlled release rates are calculated in **Appendix D.1** and summarized in **Table 5.4** for the 5-year and 100-year return period post-development storm events.

*Table 5.4: Proposed Cistern 5- and 100-Year Storage Requirements*

| Design Storm Return Period | Area ID      | Drainage Area (ha) | Q <sub>release</sub> (L/s) | V <sub>required</sub> (m <sup>3</sup> ) | V <sub>available</sub> (m <sup>3</sup> ) |
|----------------------------|--------------|--------------------|----------------------------|-----------------------------------------|------------------------------------------|
| 5-year                     | R102A, R102B | 0.09               | 3.0                        | 6.9                                     | 20.0                                     |
| 100-year                   |              |                    |                            | 19.9                                    |                                          |

The final design and location of the cistern and outlet pump within the proposed building is to be completed by the mechanical and structural engineers and coordinated with the architect.

#### 5.4.2.2 Rear Yard Underground Storage

In the rear yard, surface drainage is to be collected through a landscape catch basin and a standard ditch inlet catch basin. A subdrain embedded in a clear stone trench connects the two structures as per City of Ottawa Standard Drawing S29. Stormwater storage is provided within the void space of the 25 mm clear stone as well as within the 250 mm diameter subdrain pipe. The clear stone trench has a consistent 1.0 m depth, 0.9m width and 46.1m length. Approximately 15.7 m<sup>3</sup> of storage will be available in the clear stone trench. The rear yard storage volume does not include any surface storage. For events exceeding the 100-year event or if the ICD becomes clogged, the maximum static ponding limits in the rear yard are shown with a striped hatch in the SD-1 drawing. Beyond these limits, ponded water spills over and drains in the direction of the overland flow arrows.

The post-development runoff coefficient of the C500A area is  $C=0.36$ , which is greater than the pre-development conditions. Consequently, the release rate from the rear yard must be restricted to meet the release rate design criteria. Outflow from catch basin (CB500) is restricted by an LMF 40 ICD installed at the outgoing pipe. The LMF type of ICD was selected to prevent clogging in this low flow rate scenario. The rear yard storage volumes, controlled release rates, and ICD sizing are calculated in **Appendix D.1** and summarized in **Table 5.4** for the 5-year and 100-year return period post-development storm events.

*Table 5.5: Rear Yard 5- and 100-Year Storage Requirements and Peak Release Rates*

| Design Storm Return Period | Area ID | Drainage Area (ha) | Q <sub>release</sub> (L/s) | V <sub>required</sub> (m <sup>3</sup> ) | V <sub>available</sub> (m <sup>3</sup> ) |
|----------------------------|---------|--------------------|----------------------------|-----------------------------------------|------------------------------------------|
| 5-year                     | C500A   | 0.037              | 1.6                        | 1.4                                     | 15.7                                     |
| 100-year                   |         |                    |                            | 4.9                                     |                                          |

The pipe sizing for the Snow Street storm sewer extension is detailed in the storm sewer design sheet attached in **Appendix D.2**.



### 5.4.2.3 Uncontrolled Areas

There are three uncontrolled subcatchment areas, consisting of UNC-1, UNC-2, and UNC-3, which drain by overland (surface) flows to the Snow Street ROW. The peak post-development release rates from the uncontrolled areas are calculated in **Appendix D.1** and are summarized in **Table 5.6**. Note that the totals may not sum exactly due to rounding.

*Table 5.6: Peak Post-Development Uncontrolled Surface Release Rates*

| Design Storm | Release Rate (L/s) |       |       |         |
|--------------|--------------------|-------|-------|---------|
|              | UNC-1              | UNC-2 | UNC-3 | Total * |
| 5-Year       | 1.7                | 0.9   | 0.1   | 2.6     |
| 100-Year     | 3.6                | 1.9   | 0.1   | 5.6     |

There are two uncontrolled areas (RAMP-1 and RAMP-2) that drain through the building mechanical system to the building storm service. The reverse sloped ramp to the underground parking garage is to be equipped with a trench drain (as designed by others) to provide a storm outlet for the two ramp drainage areas. The mechanical consultant will route piping from the ramp drain through the building and connect to the building storm service downstream of the cistern and upstream of the backwater flow prevention valve. The peak post-development release rates from the uncontrolled ramp areas are calculated in **Appendix D.1** and are summarized in **Table 5.7**.

*Table 5.7: Peak Post-Development Uncontrolled Building Drain Release Rates*

| Design Storm | Release Rate (L/s) |        |       |
|--------------|--------------------|--------|-------|
|              | RAMP-1             | RAMP-2 | Total |
| 5-Year       | 0.3                | 0.3    | 0.6   |
| 100-Year     | 0.7                | 0.6    | 1.2   |

### 5.4.2.4 Results

The proposed stormwater management plan meets the requirements identified during pre-consultation that the stormwater release rates under all storm events, up to and including the 100-year storm event, are to be controlled to the 5-year pre-development target release rate. **Table 5.8** provides a summary of the peak design discharge rates calculated from the MRM analysis, shown in **Appendix D.1**. Note that the sums in **Table 5.7** may not sum exactly due to rounding.



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#### 5 Stormwater Management and Servicing

Table 5.8: Summary Site 5-Year and 100-Year Event Peak Release Rates

| Drainage Areas                                   | 5-year Peak Discharge (L/s) | 100-Year Peak Discharge (L/s) |
|--------------------------------------------------|-----------------------------|-------------------------------|
| Uncontrolled Surface Areas                       | 2.6                         | 5.6                           |
| Cistern to Sewer                                 | 3.0                         | 3.0                           |
| Uncontrolled Ramp Drain to Sewer                 | 0.6                         | 1.2                           |
| Controlled Surface Areas (Rear Yard CB to Sewer) | 1.6                         | 1.6                           |
| <b>Total (L/s)</b>                               | <b>7.9</b>                  | <b>11.4</b>                   |
| <b>Target (L/s)</b>                              | <b>11.4</b>                 | <b>11.4</b>                   |

### 5.4.3 Quality Control

City of Ottawa Staff have confirmed in email correspondence (**Appendix D.4**) that the site is not subject to any quality control criteria.

## 5.5 Proposed Stormwater Servicing

The proposed stormwater servicing is shown on **Drawings SP-1, SD-1, and PP-1**.

The existing 300 mm diameter storm sewer on Snow Street, currently a stub, will be extended approximately 63.3 m east to service the site. Two 1200 mm diameter maintenance holes will be installed on the pipe extension, the first to replace the existing stub and the second at the proposed building service connection. The works proposed within the Snow Street ROW are shown in the plan and profile **Drawing PP-1** and will be approved through the Utilities Circulation process for ROW approvals. The storm sewer design sheet for the proposed sewer extension is attached in the **Appendix D.2**.

One 200 mm diameter stormwater service is proposed for the building storm service lateral, as per **Drawing SP-1**. The service will connect to the storm sewer extension via a new manhole (STM 101). The service is to be complete with a full port backwater valve as per City Standard S14.1 and an onsite stormwater monitoring manhole (1200 mm diameter) as per the City of Ottawa SDG. The mechanical consultant will confirm the service size and backwater valve details at a later phase of design.

The building service will accommodate discharge from the parking ramp trench drain, the foundation drains, and the stormwater cistern. A stormwater sump and pump may be required for the elevator pit and building foundation drain, depending on the as-built depth of footings. The mechanical consultant will confirm the stormwater sump pump and cistern pump requirements at a later phase of design.

The rear yard drainage infrastructure is to outlet from CB 500 through a 200 mm diameter storm sewer which connects to the Snow Street storm sewer extension via a vertical riser as per City Standard S11.1.



## 6 Site Grading

A detailed grading plan (see **Drawing GP-1**) has been prepared to satisfy the stormwater management requirements, as detailed in **Section 5**, allow for positive drainage away from the face of proposed building, and provide minimum cover requirements for water services, storm and sanitary sewers, and footings, where possible.

Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City of Ottawa requirements. The limits of static ponding have been identified with a striped hatch in the south corner of the property.

No grade raise restriction has been identified for this site. However, grade changes along the east property line (adjacent to the NCC Aviation Parkway lands) are to be kept to a minimum. Under the existing drainage conditions, some of the adjacent NCC lands to the east drain toward the site, though most of the adjoining lands drain to the south. Minor regrading is required along the east property line to eliminate a low point and provide positive drainage south. The largest proposed grade raise in this area is 270 mm. The regrading works have been reviewed by the Landscape Architect, and the trees in the adjacent property should not be significantly impacted. The regrading in this area will create a property line swale that will intercept the external areas draining toward the site and direct them. See Drawing GP-1 for details.

An existing retaining wall runs along the full length of the south property line, within the adjacent residential lots. Onsite, a low retaining wall ( $\leq 0.25$  m height concrete barrier curb wall per City Standard SC1.1) is proposed in the rear yard between the patio and drainage trench. A second low retaining wall ( $< 0.4$  m height Type II concrete toe wall per OPSD 3120.10) is proposed in the east side yard.



## 7 Utilities

Overhead (OH) hydro-wires and a natural gas line run parallel to the north side of Snow Street. All utilities within the work area will require relocation during construction. The existing utility poles within the public right of way are to be protected during construction; however, existing overhead wires and utility plants may need to be temporarily moved/reconfigured to allow sufficient clearance for the movement of heavy machinery required for construction. The relocation of existing utilities will be coordinated with the individual utility providers upon design circulation.

As the site is surrounded by existing residential developments, Hydro Ottawa, Bell, Rogers, and Enbridge servicing is readily available through existing infrastructure to service this site. The exact size, location, and routing of utilities will be finalized after design circulation.

A hydro Ottawa transformer is proposed at the front of the building (to the west of the underground parking ramp). A minimum 3.0 m clearance has been provided from the transformer to all underground services (water, storm, and sanitary). The transformer bollards and a concrete pad are shown in **Drawings SP-1 and GP-1**.

## 8 Approvals

The proposed development lies on a private site under singular ownership; drains to an approved separated sewer outlet; and is not intended to service industrial land or land uses. Therefore, the onsite storage and stormwater management works are exempt from the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Application (ECA) process under Ontario Regulation 525/98.

For ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). It is possible that groundwater may be encountered during the foundation excavation on this site. A minimum of two to four weeks should be allotted for completion of the EASR registration and the preparation of the Water Taking and Discharge Plan by a Qualified Person as stipulated under O.Reg. 63/16. An MECP Permit to Take Water (PTTW), which is required for dewatering volumes exceeding 400,000L/day, is not anticipated for the site.

A Utilities Circulation and Approval is required for the proposed storm sewer extension within the Snow Street ROW. The approval process will be completed as part of the circulation for the Zoning Bylaw Amendment and Site Plan Application. A Sewer Extension Agreement will be developed with City Staff for the proposed works. An MECP ECA is required for the storm sewer extension, expected under the City's existing CLI-ECA for storm sewer works.



## **9 Erosion and Sediment Control During Construction**

To protect downstream water quality and prevent sediment build-up in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. The following recommendations will be included in the contract documents and communicated to the Contractor.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with geotextiles, geogrid, or synthetic mulches.
6. Install silt barriers/fencing around the perimeter of the site as indicated in **Drawing ECDS-1** to prevent the migration of sediment offsite.
7. Install trackout control mats (mud mats) at the entrance/egress to prevent migration of sediment into the public ROW.
8. Provide sediment traps and basins during dewatering works.
9. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
10. Schedule the construction works at times which avoid flooding due to seasonal rains.

The Contractor will also be required to complete inspections and guarantee the proper performance of their erosion and sediment control measures at least after every rainfall. The inspections are to include:

- Verification that water is not flowing under silt barriers.
- Cleaning and changing the sediment traps placed on catch basins.

Refer to **Drawing ECDS-1** for the proposed location of silt fences, sediment traps, and other erosion control measures for the onsite works.



## 10 Geotechnical Investigation

A geotechnical investigation report was prepared by Paterson Group on October 31, 2024, to provide an assessment of the subsurface conditions found at the site. Four (4) boreholes, numbered BH 1-24 to BH 4-24, were advanced to a maximum depth of 3.0 metres below the existing ground surface in the investigation carried out on October 1, 2024. The information obtained from the field investigation will guide the detailed design of the site and identify development constraints. Excerpts from the geotechnical investigation report are attached in **Appendix E**.

The subsurface profile encountered at the test hole locations are characterized primarily by loose fill comprising of brown silty sand, gravel, and traces of organics, underlain by a loose to compact brown silty sand layer and compact to dense brown sandy silt layer, which in turn is underlain by glacial till and the underlying bedrock formation. From available geological mapping, the bedrock consists of black shale from the Billings formation at depths ranging from 4.5 m to 5.7 m. Groundwater levels were measured from monitoring wells at all four boreholes in the October 2024 investigation and are expected to be 3.5 metres to 4.5 metres below the existing ground surface, though as groundwater levels are subject to seasonal fluctuations, they could vary at the time of construction.

Based on Paterson's recommendations, the site is suitable for the proposed development. It is recommended that the foundation support for the proposed building consist of spread footings placed on a loose to compact silty bearing surface and/or approved engineered fill. Bedrock removal might be required to complete the elevator shaft.

The report also recommends various pavement structures as shown in **Table 10.1** below.

*Table 10.1: Recommended Pavement Structure*

| Material                                                  | Car-only Parking Areas | Access Lanes |
|-----------------------------------------------------------|------------------------|--------------|
| Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete   | 50 mm                  | 40 mm        |
| Binder Course – HL-8 or Superpave 19.0 Asphaltic Concrete | -                      | 50 mm        |
| BASE – OPSS Granular A Crushed Stone                      | 150 mm                 |              |
| SUBBASE – OPSS Granular B Type II                         | 300 mm                 | 400 mm       |

Refer to the full geotechnical report for any further details.



## 11 Closing

The water, wastewater, and storm water servicing conditions assessed in this report indicate that the existing public services immediately adjacent to the project site and the proposed servicing strategy are adequate to support the proposed development, provided that the Snow Street storm sewer is extended, as proposed.

The mechanical engineering consultant is responsible to confirm:

- The water pressure within the building is adequate to meet building code requirements, or appropriate domestic or fire flow pumps have been provided.
- The appropriate sanitary sewer backwater valve requirements are satisfied, and sanitary sump pump and pit requirements.
- The appropriate storm sewer backwater valve requirements are satisfied, the nature of the foundation drainage system, sump pump and pit requirements, cistern mechanical pump requirements, and that any roof drainage systems (including internal storage systems, roof drains, scuppers, etc.) are adequate for accommodating the 100-year design storm conditions. It is noted that the 100-year SWM design condition is more stringent than the design condition associated with the typical building code requirements.

The structural engineering consultant is responsible to confirm:

- The stormwater cistern configuration is adequate to accommodate the 100-year design storm conditions.



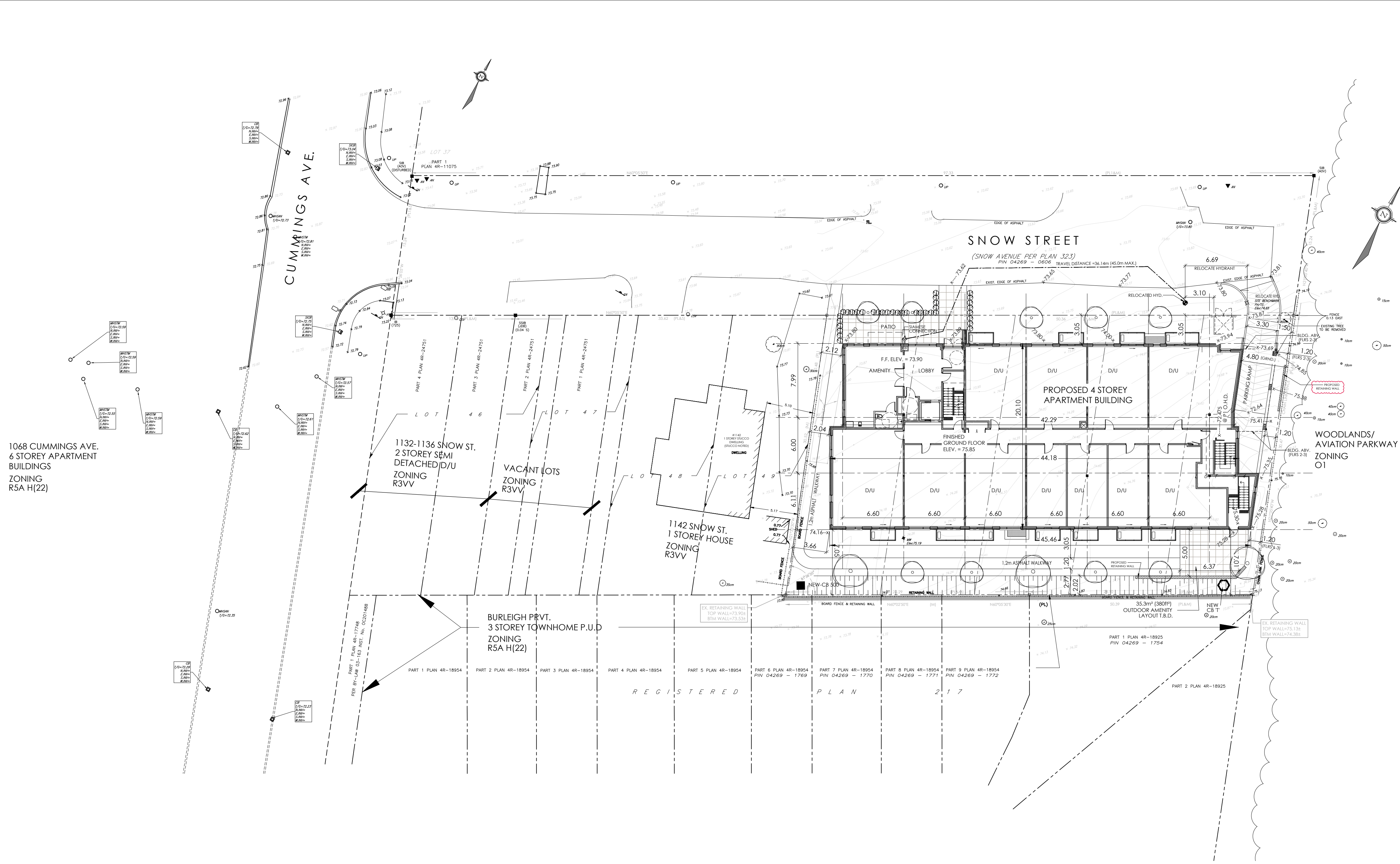
# Appendices



## **Appendix A Background**

### **A.1 Site Plan**





KEY PLAN: N.T.S.

SITE BOUNDRIES DERIVED FROM TOPOGRAPHIC SURVEY  
LOTS 50, 51, 52, 53 & 54  
REGISTERED PLAN 323 CITY OF OTTAWA  
PREPARED BY STANTEC GEOMATICS LTD.  
DATED: \_\_\_\_\_

Section 4 – City-Wide Policies

4.2 Housing

4.2.1 Enable greater flexibility and an adequate supply and diversity of housing options throughout the city

2) The City shall support the production of a **missing middle housing** range of mid-density, low-rise multi-unit housing, in order to support the evolution of healthy walkable 15-minute neighbourhoods by:

- a) Allowing housing forms which are denser, small-scale, of generally three or more units per lot in appropriate locations, with lot configurations that depart from the traditional lot division and put the emphasis on the built form and the public realm, as-of-right within the Zoning By-law;
- b) Allowing housing forms of eight or more units in appropriate locations as-of-right within the Zoning By-law; and
- c) In appropriate locations allowing missing middle housing forms while prohibiting lower-density typologies near rapid-transit stations within the Zoning By-law.

Definition

Missing Middle Housing:

In Ottawa's context and for the purposes of this Plan, missing middle housing generally refers to **low-rise, multiple unit residential development of between three and sixteen units, or more in the case of unusually large lots** and for the lower-density types is typically ground oriented.

Section 5 – Transects

Table 7 – Minimum and Maximum Height Overview Based on Official Plan Policy

| Transect               | Official Plan Policy Reference | Designation          | Height Category and Details                                                                                                   |
|------------------------|--------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Downtown Core Transect | 5.1.3(1)                       | Hubs                 | High-rise and High-rise 41+; between 10 stories and 40 stories and 41 stories plus, through criteria and area-specific policy |
|                        | 5.1.4(1)                       | Hubs                 | Low-rise, Mid-rise and High-rise; minimum 4 stories and maximum 40 stories                                                    |
|                        | 5.1.4(3)                       | Mainstreet Corridors | Low-rise and Mid-rise; minimum 2 stories and maximum 9 stories                                                                |
|                        | 5.1.4(4)                       | Minor Corridors      | Low-rise and Mid-rise; minimum 2 stories and maximum 4 stories                                                                |
|                        | 5.1.5(1)                       | Neighbourhoods       | Low-rise; minimum 2 stories, generally permit 3 stories, allow a built height of up to 4 stories where appropriate            |
| Inner Urban Transect   | 5.2.3(1)                       | Hubs                 | Low-rise, Mid-rise and High-rise; minimum 3 stories and maximum 40 stories                                                    |
|                        | 5.2.3(2)                       | Mainstreet Corridors | Low-rise and Mid-rise and High-rise; minimum 2 stories and maximum 40 stories dependent on road width and transition          |
|                        | 5.2.3(3)                       | Minor Corridors      | Low-rise and Mid-rise; minimum 2 stories and maximum 4 stories                                                                |
|                        | 5.2.4(1)                       | Neighbourhoods       | Low-rise; minimum 2 stories, generally permit 3 stories, allow built height of up to 4 stories where appropriate              |

5.2.4 Provide direction to the Neighbourhoods located within the Inner Urban Transect

1) Neighbourhoods located in the Inner Urban area and within a short walking distance of Hubs and Corridors shall accommodate residential growth to meet the Growth Management Framework as outlined in Subsection 3.2, Table 3b. The Zoning By-law shall implement the density thresholds in a manner which adheres to the built form requirements as described in Subsection 5.6.1, as applicable and that:

- a) Allows and supports a wide variety of housing types with a focus on missing-middle housing, which may include new housing types that are currently not contemplated in this Plan;
- b) The application of Zoning By-law development standards to be applied as one lot for zoning purposes to support missing middle housing;
- c) Provides for a low-rise built form, by requiring in Zoning a minimum built height of 2 stories, generally permitting 3 stories, and where appropriate, will allow a built height of up to 4 stories to permit higher-density low-rise residential development;
- d) Provides an emphasis on regulating the maximum built form envelope that frames the public right of way rather than unit count or lot configuration; and
- e) In appropriate locations, to support the production of missing middle housing, lower density typologies may be prohibited.

PROPOSED RE-ZONING

| R4UD ZONING PROVISIONS    | LOW-RISE APARTMENT REQUIRED  | LOW-RISE APARTMENT PROVIDED       |
|---------------------------|------------------------------|-----------------------------------|
| MIN. LOT WIDTH -          | 15.0 m                       | 50.36m                            |
| MIN. LOT AREA -           | 450m <sup>2</sup> (0.045 ha) | 1,520.28m <sup>2</sup> (0.152 ha) |
| MAX. BUILDING HEIGHT -    | 14.5 m                       | 14.7 m (T.O., ROOF DECK)          |
| MIN. FRONT YARD -         | 4.5 m                        | ** 3.05 m **                      |
| MIN. CORNER SIDE YARD -   | 4.5 m                        | N/A                               |
| MIN. REAR YARD -          | 7.5m (VARIES SEE NOTE 1)     | ** 7.01 m **                      |
| MIN. INTERIOR SIDE YARD - | 1.5 m                        | ** 1.2 m **                       |

NOTES:

1- FOR LOTS LOCATED WITHIN S. 342 AND WHOSE REAR LOT LINE ABUTS AN R1, R2, R3 OR R4 ZONE, SEE PART V, SECTION 144 – ALTERNATIVE YARD SETBACKS FOR LOWRISE DWELLINGS IN THE GREENBELT. IN ALL OTHER CASES THE MINIMUM REAR YARD SETBACK IS 25% OF THE LOT DEPTH WHICH MUST COMPRISE AT LEAST 25% OF THE AREA OF THE LOT, AND NEED NOT EXCEED 7.5 M, EXCEPT ON LOTS WITH DEPTHS OF 15 METRES OR LESS, IN WHICH CASE THE MINIMUM REAR YARD SETBACK IS 4 M. (BY-LAW 2022-103)

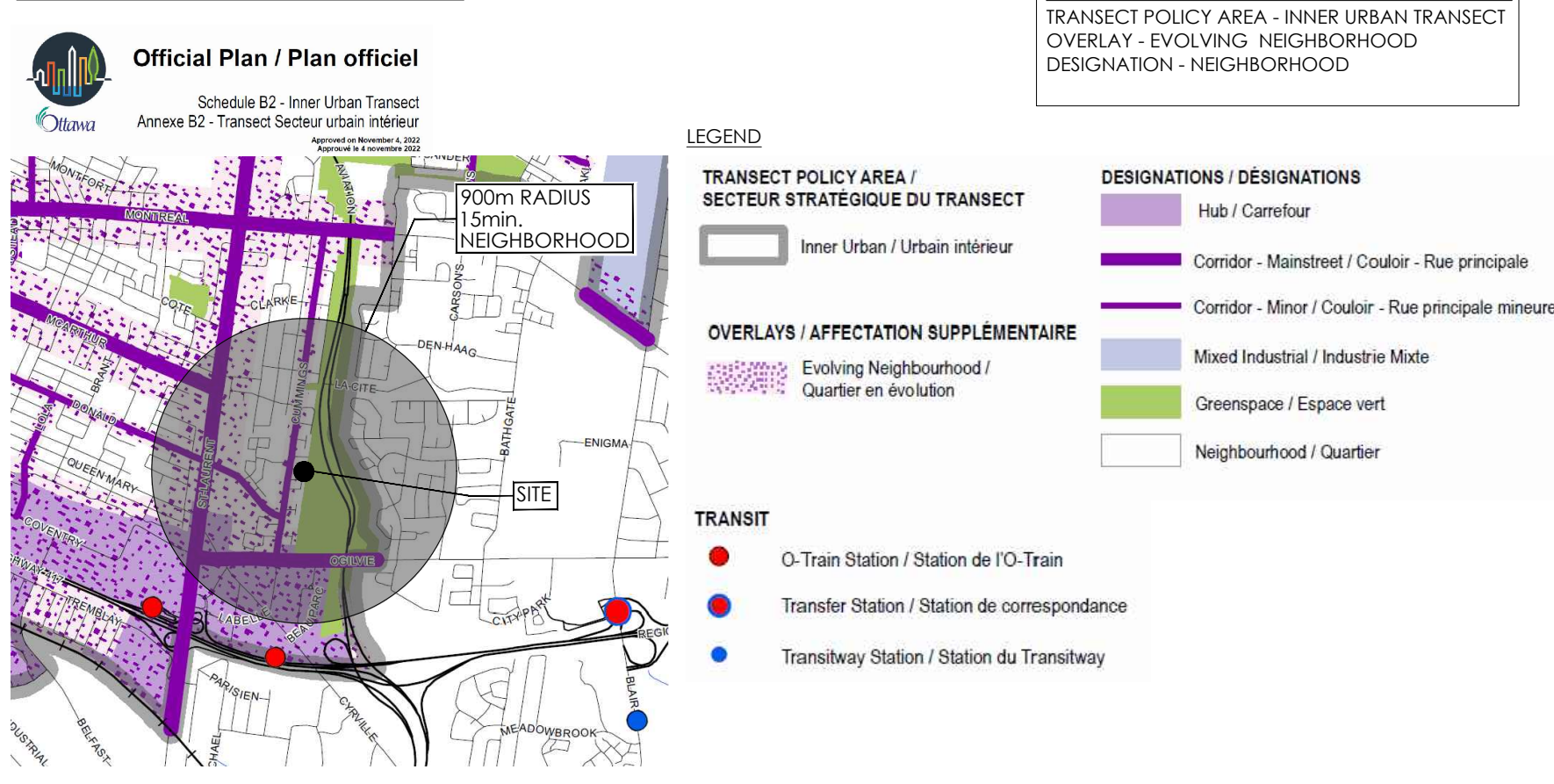
| UNIT COUNT               | STUDIO                            | 1 BR. | 2 BR. | B.F. UNIT COUNT | STUDIO    | 1 BR.              | 2 BR.              |
|--------------------------|-----------------------------------|-------|-------|-----------------|-----------|--------------------|--------------------|
| GROUND FLOOR             | 11                                | 3     | 6     | 2               | N/A       | 1                  | 1                  |
| 2nd FLOOR                | 13                                | 3     | 6     | 4               | 2nd FLOOR | N/A                | 1                  |
| 3rd FLOOR                | 13                                | 3     | 6     | 4               | 3rd FLOOR | N/A                | 1                  |
| 4th FLOOR                | 6                                 | 0     | 2     | 4               | 4th FLOOR | N/A                | 0                  |
| TOTAL UNITS=             | 43                                | 9     | 20    | 14              | TOTAL =   | 3 (15% 1BR. UNITS) | 4 (28% 2BR. UNITS) |
| VEHICLE PARKING REQUIRED | % TOTAL UNITS B.F.= 7/43 = 16.27% |       |       |                 |           |                    |                    |

43-12= 31 x 0.5 = 15.5= 16 SPACES (RESIDENTS)  
43-12= 31 x 0.1 = 3.1 = 3 SPACES (VISITOR)  
TOTAL PARKING REQUIRED = 19 SPACES  
TOTAL PARKING PROVIDED = 16 SPACES UNDERGROUND

BICYCLE PARKING REQUIRED

SECTION 111- TABLE 111A = 0.5 SPACES/d.u.  
43 x 0.5= 21.5 = 22 SPACES  
TOTAL BICYCLE PARKING PROVIDED = 20 SPACES UNDERGROUND

CITY OF OTTAWA OFFICIAL PLAN



SEAL

| No. | DATE     | DESCRIPTION                                        | INT. | No. | DATE | DESCRIPTION | INT. |
|-----|----------|----------------------------------------------------|------|-----|------|-------------|------|
| 12. | 05/02/25 | REVISED BUILDING @ SOUTH EAST CORNER/ COORDINATION | JB   | 24. |      |             |      |
| 11. | 22/01/25 | REVISED PER NEW TOPO SURVEY/ CIVIL COORDINATION    | JB   | 23. |      |             |      |
| 9.  | 20/01/25 | REVISED BUILDING/ CIVIL COORDINATION               | JB   | 21. |      |             |      |
| 8.  | 20/11/24 | EXT 'B' EXTERIOR EGRESS/ HYDRANT & TRANSFORMER     | JB   | 20. |      |             |      |
| 7.  | 12/11/24 | REVISED BUILDING FOR 43 UNITS/ FOR COORDINATION    | JB   | 19. |      |             |      |
| 6.  | 07/10/24 | HYDRANT RELOCATED & SANITSE CONNECTION ADDED       | JB   | 18. |      |             |      |
| 5.  | 22/07/24 | PRELIM. GRADES & FINISHED FLOOR ELEVATIONS ADDED   | JB   | 17. |      |             |      |
| 4.  | 25/06/24 | PER TOPOGRAPHIC SURVEY/ FOR COORDINATION           | JB   | 16. |      |             |      |
| 3.  | 28/02/24 | FOR REVIEW                                         | JB   | 15. |      |             |      |
| 2.  | 05/12/23 | FOR REVIEW                                         | JB   | 14. |      |             |      |
| 1.  | 05/12/23 | FOR REVIEW                                         | JB   | 13. |      |             |      |

## **A.2 Pre-Consultation**



March 26, 2024

Evan Saunders  
Fotenn Planning + Design  
Via email: saunders@fotenn.com

**Subject: Pre-Consultation: Meeting Feedback  
Proposed Zoning By-Law Amendment and Site Plan Control  
Application – 1146 Snow Street**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on March 21, 2024.

### **Pre-Consultation Preliminary Assessment**

|                            |                            |                                       |                            |                            |
|----------------------------|----------------------------|---------------------------------------|----------------------------|----------------------------|
| 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input checked="" type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
|----------------------------|----------------------------|---------------------------------------|----------------------------|----------------------------|

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

### **Next Steps**

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

1. The site is within the Inner Urban Transect of the City of Ottawa's Official Plan (2022) and is designated Neighbourhood. The site is zoned R3VV. A [Planning Rationale](#) is required that demonstrates how the new development will be consistent with the vision, goals, and objectives of both the Provincial Policy Statement and Official Plan.
  - a. Planning staff would recommend that the applicant consider the R4-UD zone as the proposal most closely aligns with the provisions for a low-rise apartment of nine or more units. The Planning Rationale and [Zoning Confirmation Report](#) must clearly identify and provide justification for any requested relief from the Zoning provisions.
  - b. Section 139 – Low-Rise Residential Development in All Neighbourhoods within the Greenbelt and Section 144 – Alternative Yard Setbacks affecting Low-rise Residential Development in the R1 to R4 Zones within the Greenbelt of the Zoning By-law applies to this site.
2. The former Section 37 regime has been replaced with a "Community Benefits Charge", By-law No. 2022-307, of 4% of the land value. This charge will be required for ALL buildings that are 5 or more storeys and 10 or more units and will be required at the time of building permit unless the development is subject to an existing registered Section 37 agreement. Questions regarding this change can be directed to [Ranbir.Singh@ottawa.ca](mailto:Ranbir.Singh@ottawa.ca).
3. City staff and the National Capital Commission (NCC) have signaled that it may be the case that the drive aisle to the underground parking garage be located away from the eastern property line given the presence of a woodlot on the adjacent parcel owned by the NCC.

If the design concept remains largely the same for the proposed development once an Environmental Impact Study and Tree Conservation Report have been completed by the consultants, the applicant may proceed to apply for a Phase 3

pre-consultation. However, if the applicant desires more detailed feedback on a concept redesign due to the findings of those reports, an application for a Phase 2 pre-consultation should be made. Planning staff can assist the applicant in the determination of whether a Phase 2 or Phase 3 pre-consultation would be more appropriate.

4. The applicant should be aware of the City's [Urban Design Guidelines for Low-rise Infill Housing](#) and [Bird-Safe Design Guidelines](#).

Please contact Jerrica Gilbert, Planner II, for follow-up questions related to planning policy and application submission requirements.

### **Urban Design**

Comments:

5. An Urban Design Brief is required. Please see attached a 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**.
6. Additional drawings and studies are required as shown on the attached Study and Plan Identification List. Please follow the terms of reference ([Planning application submission information and materials | City of Ottawa](#)) to prepare these drawings and studies.
7. The following elements of the preliminary design are appreciated:
  - a. Entrance provided at grade.
  - b. Pedestrian focus closest to the intersection.
  - c. Reduction in parking provided.
  - d. Sensitive massing adjacent to the surrounding low-rise residential neighbourhood.
  - e. Use of masonry to conform with the neighbourhood character.
  - f. Setback of the top floor to support the surrounding low-rise context.
8. The design is a well-considered proposal. There are no additional recommendations at this time.

Please contact Christopher Moise, Planner II, for follow-up questions related to urban design.

## **Engineering**

### Comments:

9. The Stormwater Management Criteria for the subject site is to be based on the following:
  - a. The 5-year storm event using the IDF information derived from the Meteorological Services of Canada rainfall data. Historical data must be taken from the MacDonald Cartier Airport, collected between 1966 to 1997.
  - b. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever result is lower (§ 8.3.7.3).
  - c. A calculated time of concentration that must not be less than 10 minutes.
  - d. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.
10. Deep Services (Storm, Sanitary & Water Supply)
  - a. Provide existing servicing information and the recommended location for the proposed connections. To minimize the number of road cuts, services are ideally grouped in a common trench.
  - b. Connections to trunk sewers and easement sewers are typically not permitted.
  - c. Provide information on the monitoring manhole requirements. These are to be located in an accessible location on private property near the property line. Locating such facilities in a parking area is not acceptable.
  - 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 than 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 than 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.

11. Water Boundary condition requests must include the location of the service with a clearly articulated map or plan depicting the connection location(s) indicated. The expected loads required by the proposed development and calculations are required. 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.

An MECP Environmental Compliance Approval (Municipal/Private Sewage Works) may be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office (Charlie Primeau at (613) 521-3450, ext. 251 or [Charlie.Primeau@ontario.ca](mailto:Charlie.Primeau@ontario.ca)) to arrange a pre-submission consultation.

## 12. Water

- a. Capacity and boundary conditions are to be provided as soon as possible by the applicant's engineering consultant, as the existing 150mm diameter watermain may require upgrading.
- b. The architectural plans submitted for PH1 appear to require relocation of the existing fire hydrant.

## 13. Sewer (sanitary)

- a. Capacity and estimated peak flows are to be provided by the engineering consultant as soon as possible for asset management to confirm capacity.

## 14. Stormwater

- a. There are no existing municipal storm services fronting this property. As such, a storm sewer extension is required. MECP approval and application will be required with a Sewer Extension Agreement between the City.

Please contact Derek Unrau, Infrastructure Project Manager, for follow-up questions related to engineering.

### **Noise**

Comments:

15. A [Noise Control Study](#) is required as the site is within 100m of Cummings Avenue, and within 250m of Aviation Parkway.

Please contact Neeti Paudel, Project Manager – Transportation, for follow-up questions related to noise study requirements.

### **Transportation**

Comments:

16. Traffic Impact Assessment is not required.
17. The site plan must demonstrate how the largest vehicle will access the site and turning movement around Snow Street with corresponding turning templates for (garbage trucks etc.).

Please contact Neeti Paudel, Transportation Project Manager, for follow-up questions related to traffic and roadways.

### **Environment**

Comments:

18. An Environmental Impact Statement (EIS) is required for this application. The triggering feature is the presence of Natural Heritage System woodlands and wetlands on the wooded parcel adjacent to the east.
  - a. The EIS must consider the significance of the woodlands and any potential impacts of this development to this natural system. A survey for species-at-risk birds and potential bat maternity trees are to be incorporated. Although butternuts are a concern, the Tree Conservation Report (TCR), as requested by Forestry will cover such concerns. The results of the TCR must be incorporated into the EIS.
  - b. Wetlands are located on the adjacent property. The City mapping is inexact. A wetland delineation survey must be conducted to determine the

boundaries of the wetlands to ensure that the proposed development remains outside of all required setbacks for these features.

19. At 4-storeys, this application is not required to adhere to the Bird Safe Design Guidelines. However, given its proximity to bird habitat, it is highly recommended for the applicant to consider utilizing necessary mitigation measures included in the [Bird Safe Design Guidelines](#).

Please contact Sami Rehman/Mark Elliott, Environmental Planner, for follow-up questions.

## **Forestry**

Comments:

20. A Landscape Plan and Tree Conservation Report are submission requirements for the Site Plan Application.
21. The development cannot impact adjacently owned trees. The applicant is advised to investigate tree impacts early in the design process to address adaptations, if necessary. **All adjacently owned trees with critical root zones extending into the development site must be addressed in the Tree Conservation Report (TCR).**
22. If an increased setback between the developable area and adjacent trees would facilitate retention, options would be explored through the Zoning By-law application process.
23. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines:
- 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.

24. 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](mailto:hayley.murray@ottawa.ca)

25. Additional Elements for Tree Planting in the Right of Way:

- a. Sensitive Marine Clay - Please follow the City's [2017 Tree Planting in Sensitive Marine Clay Guidelines](#).
- b. The City requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- c. 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 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.
- d. 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.
- e. 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).
- f. 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.

Please contact Hayley Murray, Planning Forester, for follow-up questions to trees.

### **Parkland**

Comments:

#### 26. Cash-in-lieu of parkland / parkland dedication

- a. Parkland Dedication [By-law No. 2022-280](#).

Please contact Phil Castro, Parks Planner, for follow-up questions related to parks.

### **National Capital Commission**

Comments:

#### 27. General

- a. The National Capital Commission (NCC) does not have jurisdiction over approvals of development on these privately-owned lands. These comments are offered as the federal land use planner for the National

Capital Region and the approval authority for works on federally owned properties.

- b. The NCC is the owner of the adjacent Aviation Parkway corridor, which is designated as Capital Urban Greenspace in the NCC's [Capital Urban Lands Plan](#).
- c. The NCC has no objection to the proposed development. The NCC is supportive of urban intensification and infill development.
- d. Our below comments relate principally to the avoidance of damage to NCC property during construction.

## 28. Trees

- a. The adjacent NCC-owned lands are densely wooded. Excavation close to the property line may risk injury to the critical root zone (CRZ) of NCC-owned trees.
- b. Please ensure that the Tree Conservation Report submitted that:
  - i. Includes a full inventory of all trees whose CRZ extends into the property. This includes all trees to a minimum distance of 5 metres of the shared property line, identifying their size, species, DBH, condition, and financial value.
  - ii. Discusses the proposed impact to those trees, why it is required, and why alternatives that do not require impact to the trees are not pursued.
  - iii. Discusses the management of excavation near trees (e.g. exposed roots, stabilization, pruning, mulching, watering).
  - iv. Proposes how reporting and monitoring of the state of trees during construction and post-construction will be conducted.
  - v. Outlines recommendations on mitigation in scenarios where injury or stress to the trees is proposed.
  - vi. Discusses where there are nearby NCC-owned trees, where no impact is proposed and the expected method of protection (e.g. tree protection fencing, signage)
- c. Request that any setbacks established by the amending zoning by-law do not permit construction that will cause injury to the NCC-owned trees without the NCC's consent.

## 29. Construction

- a. The development should be able to be constructed without relying upon encumbrances or damages to the NCC's land. It is our experience that early consideration of construction methods avoids last-minute requests for works on NCC lands. This analysis and approval of which (if permitted) may delay development.
- b. Please ensure the civil and geotechnical studies address the intended approach to excavation and shoring without relying upon shoring or tiebacks on NCC lands.

### 30. Stormwater Management and Erosion

- a. There is currently no municipal storm sewer in the Snow Street right-of-way.
- b. The NCC does not accept the discharge of stormwater from other parties onto its lands.
- c. Please ensure, through the extension of a new storm sewer, on-site detention, low-impact development, or other means, that the site contains its stormwater or discharges it to municipal facilities without directing runoff to the NCC's lands.
- d. To ensure no siltation or erosion of the adjacent NCC lands, please ensure that an appropriate erosion and sediment control plan is provided at the time of detailed design.

### 31. Pathways

- a. The plans presented at the pre-consultation indicated a potential pathway connection from Snow Street to Ken Steele Park.
- b. The NCC's plans for pathways in the National Capital Region are demonstrated in the [Capital Pathways Strategic Plan](#).
- c. The Capital Pathways Strategic Plan directs the NCC to consolidate informal access points into clear, public access points. This increases visibility and limits damage to natural areas caused by informal accesses.
- d. No pathway access is planned between Snow Street and the Aviation Parkway Capital Pathway.

### 32. Aviation Parkway

- a. The NCC is undertaking [a refresh of studies for a potential sixth interprovincial crossing](#). One of the corridors under consideration as an approach to such a crossing is Aviation Parkway. No decision on a potential future crossing location has yet been made.
- b. To ensure resident comfort and determine whether enhanced building components may be required, the proponent may wish to consider undertaking a Roadway Traffic Noise Assessment. This will project traffic volumes and noise based on the possibility of this corridor serving as the future approach to a sixth crossing.

### 33. NCC Lands and Access

- a. A [Land Access Permit](#) is required from the NCC, if during the preparation of studies to support future applications, or during construction, the proponent requires access to, or the use of, the abutting NCC lands. The owner is responsible to initiate formal requests to ensure adequate timing for any proposed access approvals from the NCC.



Please contact Ted Horton, National Capital Commission, for follow-up questions on NCC permits and concerns.

**Other**

34. 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](http://ottawa.ca/HPDS) for more information.
35. The [Ottawa Neighbourhood Equity Index](#) (2019) identifies this neighbourhood as having a strong equity concern. A strong proposal will consider how the proposed development contributes positively to well-being of both the future inhabitants and the surrounding community.

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

Yours Truly,  
Jerrica Gilbert, Planner II

c.c. Neeti Paudel, PM (Transportation)  
Kris Haynes, Senior PM (Infrastructure Approvals)  
Derek Unrau, PM (Infrastructure Approvals)  
Zoha Rashid, PL (Development Review)  
Christopher Moise, PL (Urban Design)  
Sami Rehman, PL (Environmental)  
Mark Elliott, PL (Environmental)  
Phil Castro, PL (Parks and Facilities)  
Hayley Murray, PL (Forestry)  
Ted Horton, Planner (National Capital Commission)

Joe Vaz, Owner (Canada Trim)

Jonathon Blakely, Architect (David Blakely Architect Inc.)

## **SUPPLEMENTARY DEVELOPMENT INFORMATION**

The following details have been compiled to provide additional information on matters for consideration throughout the application approval and development process. Please note, this document is updated from time to time and should be reviewed for each project proposed to be undertaken.

### **General**

- Refer to [Planning application submission information and materials](#) and [fees](#) for further information on preparing for application submission. Be aware that other fees and permits may be required, outside of the development review process.
- Additional information is available related to [building permits, development charges, and the Accessibility Design Standards](#).
- You may obtain background drawings by contacting [geoinformation@ottawa.ca](mailto:geoinformation@ottawa.ca).
- 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, flattened and not saved as a portfolio file.
- Where private roads are proposed:
  - Submit a Private Roadway Street Naming application to Building Code Services Branch for any internal private road network.
  - Applications are available at all Client Service Centres and the private roadway approval process takes three months.

### **Servicing and Site Works**

Servicing and site works shall be in accordance with the following documents:

- Ottawa Sewer Design Guidelines (October 2012)
- 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 Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

### **Exterior Site Lighting**

Where proposed, requires certification by an acceptable professional engineer, licensed in the Province of Ontario, which states that the exterior site lighting has been designed to meet the following criteria:

- It uses only fixtures that meet the criteria for Full Cut-Off (Sharp cut-off) classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and
- It results in minimal light spillage onto adjacent properties. As a guideline, 0.5 foot-candle is normally the maximum allowable spillage.

The location of the fixtures, fixture type (make, model, part number and the mounting height) must be shown on one of the approved plans.

### **City Surveyor Direction**

- 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.
- 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](mailto:Bill.Harper@ottawa.ca).

### **Waste Management**

- 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](mailto:Andre.Laplante@ottawa.ca).
- For sites containing:
  - One or more buildings with a total GFA greater than 2000 square metres;
  - Retail shopping complexes with a total GFA greater than 10,000 square metres;
  - Sites containing office buildings with total GFA greater than 10,000 square metres;
  - Hotels and motels with more than 75 units;
  - Hospitals (human);
  - Educational institutions with more than 350 students; or
  - Manufacturing establishments working more than 16,000 person-hours in a month



A Waste Reduction Workplan Summary is required for the construction project as required by O.Reg. 102/94, being "Waste Audits and Waste Reduction Work Plans" made under the Environmental Protection Act, RSO 1990, c E.19, as amended.

### **Fire Routes**

- Fire routes are required to be designated by By-law for Fire Services to establish them as a legal fire route. Where a development proposes to establish a fire route, an Application for Fire Route Designation is to be made. Questions regarding the designation of fire routes and required process can be directed to [fireroutes@ottawa.ca](mailto:fireroutes@ottawa.ca).

### **Dewatering Activities**

- Project contractors and/or your engineers are required to contact the Sewer Use Program to arrange for the proper agreements or approvals to allow for the discharge of water from construction dewatering activities to the City's sanitary or storm sewer system. Please contact the Sewer Use Duty Officer at 613-580-2424 ext. 23326 and/or [suppue@ottawa.ca](mailto:suppue@ottawa.ca).

### **Backflow Prevention Devices for Premise Isolation**

- Buildings or facilities installing a backflow preventer for premise isolation of the drinking water system must register with the City's Backflow Prevention Program where a moderate or severe hazard may be caused in accordance with CSA B64.10 "Selection and Installation of Backflow Preventers". Please contact the Backflow Prevention Program at 613-580-2424 ext. 22299 or [backflow@ottawa.ca](mailto:backflow@ottawa.ca) to submit a Premise Isolation Survey.

### **Energy Considerations**

- Are you considering harvesting thermal energy from the wastewater infrastructure or harvesting geothermal energy?
  - Additional information can be found on the City [website](#) or by contacting [Melissa Jort-Conway](#).

### **Flood Plain Mapping and Climate Change**

- An interactive map, for informational purposes only, showing the results of on-going flood plain mapping work completed by the Conservation Authorities in partnership with the City is now available. This mapping may be used to identify known riverine flood hazards for a property or area. The map and additional related information can be found on [Ottawa.ca](http://Ottawa.ca).

### **Blasting**

- Where blasting may take place:
  - Blasting activities will be required to conform to the City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.
  - To avoid future delays in process, including the Municipal Consent process for shoring, ensure communication with necessary entities, including utilities, is undertaken early.

- Blasting and pile driving activities in the vicinity of Enbridge Gas Distribution and Storage (GDS) facilities require prior approval by GDS. The Blasting and Pile Driving Form, referenced in Enbridge's [Third Party Requirements in the Vicinity of Natural Gas Facilities Standard](#), must be provided to [mark-ups@enbridge.com](mailto:mark-ups@enbridge.com) by the Owner of the proposed work for all blasting and pile driving operations. In addition, a licensed blasting consultant's stamped validation report must be submitted to GDS for review if blasting is to occur within thirty (30) metres of GDS facilities. The request must be submitted a minimum of four weeks prior to the beginning of work to allow sufficient time for review.

### **Archaeological**

- Archaeological Resources
  - Should potential archaeological resources be encountered during excavation activities, all Work in the area must stop immediately and the Owner shall contact a provincially licensed archaeologist.
  - If during the process of development deeply buried/undetected archaeological remains are uncovered, the Owner shall immediately notify the Archaeology Section of the Ontario Ministry of Tourism, Culture and Sport.
  - In the event that human remains are encountered during construction, the Owner shall immediately contact the police, the Ministry of Tourism, Culture and Sport and the Registrar of Cemeteries, Cemeteries Regulation Unit, Ministry of Consumer and Business Services, Consumer Protection Branch.

### **Trees**

- The City's Tree Protection Bylaw, being By-Law No. 2020-340, as amended, requires that any trees to be removed shall be removed in accordance with an approved Tree Permit and Tree Conservation Report and that all retained trees will be protected in accordance with an approved Tree Conservation Report.

### **Limiting Distance and Parks**

- A Limiting Distance Agreement may be required by Building Code Services before building permit(s) can be issued with respect to the proximity of the building to a park block. The City will consider entering into a Limiting Distance Agreement with the Owner with such Agreement to be confirmed through the City's Corporate Real Estate Office. A Limiting Distance Agreement is at the expense of the Owner.

### **Development Constructability**

How a development is constructed, its constructability, is being looked at earlier in the development review process to raise awareness of potential impacts to the City's right of way and facilitate earlier issue resolution with stakeholders. Where a construction management plan is required as part of the site plan or subdivision application approval, conditions will be included that set out the specific parameters to be addressed for the specific project. However, please note the following construction and traffic management requirements and considerations in the development of your project.

- **Open Lane (includes all vehicular lanes, transit lanes and cycling lanes) Requirements**
  - Unless specified in the site-specific conditions to be provided by City of Ottawa Traffic Management at the time of approval, the following requirements must be adhered to and accommodated as part of any proposed encroachments and construction management plan. The standard requirements outlined in this section shall further apply to cycling facilities and Transit.
    - All lanes are to function uninterrupted at all times.
    - No interruption or blockage of traffic is permitted.
    - No loading or unloading from an open lane is permitted.
    - All vehicular travel lanes are to be a minimum of 3.5 metres in width.
    - All cycling lanes are to be a minimum of 1.5 metres.
- **Pedestrian Requirements**
  - Unless specified in the site-specific conditions provided by City of Ottawa Traffic Management at the time of approval, the contractor is required to maintain a minimum width of 1.5 metres for a pedestrian facility on one side of the corridor at all times; even in instances where a pedestrian facility was not present prior to construction.
  - The facility shall include a free and unobstructed hard surface acceptable for the use of all pedestrians including those with accessibility challenges and shall maintain access to all buildings and street crossings.
  - The facility must always be maintained in a clean condition and in a good state of repair to the satisfaction of the City.
  - Any change of level which is over 13 millimetres in height is to be provided with a smooth non-tripping transition.
  - Any temporary barriers or fencing shall include a cane detectable boundary protection with edge or barrier at least 75 millimetres high above the ground surface.
  - If works overhead are required, a 2.1 metre minimum clear headroom must be provided.
  - If overhead protection is required above the pedestrian facility, it is to be offset a minimum of 600 millimetres from any travel lane.
- **Transit Requirements**
  - Travel lanes accommodating OC Transpo must be a minimum of 3.5 metres in width and have a minimum 4.5 metre vertical clearance at all times.
  - Should access to a bus stop be impacted, the developer will be required to email [TOPConstructionandDetours@ottawa.ca](mailto:TOPConstructionandDetours@ottawa.ca) a minimum of 20 working days prior to work commencing to coordinate any site-specific conditions as part of the work. This includes temporary relocation of transit stops, removal of bus shelters or stops and transit detour routes.
  - The contractor may be required to relocate and provide a suitable alternative to OC Transpo's bus stop to the satisfaction of OC Transpo

- The Contractor shall provide OC Transpo with a minimum of ten (10) working days' notice to coordinate temporary relocation of bus stops. When a bus stop and/or shelter must be temporarily relocated, the contractor may be required to provide stop infrastructure (i.e. bench, bus and/or shelter pads), to the satisfaction of OC Transpo.
- All temporary stop locations including infrastructure are to be fully accessible in accordance with City of Ottawa [Accessibility Design Standards](#) and to the satisfaction of the OC Transpo.
- Temporary bus stops are to be constructed and ready for use prior to the start of any works that would impact the regular bus stop location(s).
- **Public Consultation**
  - May include, but not be limited to, proponent lead public meeting(s), letter notification(s) and information dissemination via print, electronic means or social media, to impacted properties above and beyond the notification requirements specified in the Road Activity By-law.
- **General Considerations for all Applications**
  - A comprehensive construction management plan should include and consider the following:
    - The proposed stages of construction and the anticipated durations of each stage and any impact to existing travel lanes, pedestrian facilities, cycling facilities and/or transit facilities. Any proposed encroachment should be identified and dimensioned on the site plan for review of feasibility.
    - The proposed constructability methods being used as part of the proposed development (ie: fly forming, Peri forming etc.) and any additional traffic impacts/interruptions anticipated with proposed methods. If a crane is being placed on site, the location should be identified, and show the overhead impacts of the crane.
    - Consideration that any tie-backs and/or shoring within the City of Ottawa Right of Way are subject to Municipal Consent in advance of commencement of the project. Approval for encroachments is not guaranteed if impacts to transportation facilities cannot be addressed to the City's satisfaction.
    - Identify any truck hauling routes to and from the proposed development site and any proposed accesses. Designated heavy truck routes are to be followed at all times, however, if a deviation is required from the existing heavy truck route network, then a structural review may be required as part of an [Over-dimensional Vehicle Project Permit](#).
    - Identify the location of any site trailers and the location. Note, if placing a site trailer above any walk-through scaffolding or on the second floor (or above), an engineering drawing must be submitted to building code services for review. More information can be found on the [Building Permit Approval process](#).
    - Identify equipment and/or materials storage locations as required. Storage is not permitted on the road or the roadway shoulders or boulevards, unless

the storage areas are identified in the traffic control plan and appropriate traffic control devices protect the equipment or materials.

- Any work as part of the development that requires a road cut, road closure or encroachment will be subject to the [Road Activity By-law](#) and potential site-specific conditions identified at site plan or subdivision approval which will be noted on the subsequent Permit(s). Information about [construction in the right-of-way](#) including applying for permits and associated fees can be found on the City's website.

## List of Technical Agencies to Consult

### Proposed Zoning By-Law Amendment and Site Plan Control Application – 1146 Snow Street - PC2024-0084

|                                     |                                              |                                                                                                                                                                     |
|-------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | National Capital Commission                  | <a href="mailto:Ted.Horton@ncc-ccn.ca">Ted.Horton@ncc-ccn.ca</a>                                                                                                    |
| <input checked="" type="checkbox"/> | Zayo                                         | <a href="mailto:Utility.Circulations@Zayo.com">Utility.Circulations@Zayo.com</a>                                                                                    |
| <input checked="" type="checkbox"/> | Bell Canada                                  | <a href="mailto:circulations@wsp.com">circulations@wsp.com</a>                                                                                                      |
| <input checked="" type="checkbox"/> | Telus Communications                         | <a href="mailto:Engineering.Requests@telus.com">Engineering.Requests@telus.com</a> / <a href="mailto:jovica.stojanovski@telus.com">jovica.stojanovski@telus.com</a> |
| <input checked="" type="checkbox"/> | Rogers Communications                        | <a href="mailto:OPE.Ottawa@rci.rogers.com">OPE.Ottawa@rci.rogers.com</a>                                                                                            |
| <input checked="" type="checkbox"/> | Enbridge Gas Distribution                    | <a href="mailto:municipalplanning@enbridge.com">municipalplanning@enbridge.com</a>                                                                                  |
| <input checked="" type="checkbox"/> | O.C. District School Board                   | <a href="mailto:planningcirculations@ocdsb.ca">planningcirculations@ocdsb.ca</a>                                                                                    |
| <input checked="" type="checkbox"/> | O.C. Catholic School Board                   | <a href="mailto:planningcirculations@ocsb.ca">planningcirculations@ocsb.ca</a>                                                                                      |
| <input checked="" type="checkbox"/> | Conseil des écoles publiques                 | <a href="mailto:planification@cepeo.on.ca">planification@cepeo.on.ca</a>                                                                                            |
| <input checked="" type="checkbox"/> | Conseil des écoles catholiques du Centre-Est | <a href="mailto:planification@ecolecatholique.ca">planification@ecolecatholique.ca</a>                                                                              |
| <input checked="" type="checkbox"/> | Conservation Authority                       | RVCA – <a href="mailto:planning@rvca.ca">planning@rvca.ca</a>                                                                                                       |
| <input checked="" type="checkbox"/> | Hydro Ottawa (Local Distribution)            | <a href="mailto:Ottawa.circulations@HydroOne.com">Ottawa.circulations@HydroOne.com</a>                                                                              |

## **A.3 Building Construction Confirmation**



## Gladish, Alyssa

---

**From:** mdblakely\_jon@bellnet.ca  
**Sent:** Friday, October 11, 2024 10:35 AM  
**To:** Gladish, Alyssa  
**Cc:** 'David Blakely (David Blakely)'; alsaffar2@hotmail.com; moscatelboutique@hotmail.com; slmc.eddie@gmail.com; vigomanagement@outlook.com; chuck.vanalstine@gmail.com; 'George Laschewski'; 'Evan Saunders'; 'Lisa Dalla Rosa'; joev@canadatrim.com  
**Subject:** RE: 1146 Snow Street - Project Status Report

Alyssa,

The building is designed under Part 3 of the Ontario Building Code.

4 Storey apartment -fully sprinklered.

Concrete below grade & Wood framed walls and floors above grade (typical for low rise)

**Ground floor slab** - 2hr fire resistance rating between U/G Parking & ground floor

**Floors 1 thru 4** – 1 hour rated floor assemblies

- 1 hour rated wall assemblies between unit/unit & unit/ common spaces

- All interior & exterior loadbearing walls, columns & arches supporting a fire separation have a 1 hour fire resistance rating

Exterior walls have a fire resistance rating & cladding in compliance with OBC with respect to unprotected openings & wall construction.

## Jonathon Blakely

**M. David Blakely Architect Inc.**

2200 Prince of Wales Dr., Suite 101

Ottawa, Ontario K2E 6Z9

P- 613-226-8811

F- 613-226-7942

E- [mdblakely\\_jon@bellnet.ca](mailto:mdblakely_jon@bellnet.ca)

---

**From:** Gladish, Alyssa <Alyssa.Gladish@stantec.com>

**Sent:** October 10, 2024 1:27 PM

**To:** mdblakely\_jon@bellnet.ca

**Cc:** 'David Blakely (David Blakely)' <mdblakely@bellnet.ca>; alsaffar2@hotmail.com; moscatelboutique@hotmail.com; slmc.eddie@gmail.com; vigomanagement@outlook.com; chuck.vanalstine@gmail.com; 'George Laschewski' <everestengineeringlimited@gmail.com>; 'Evan Saunders' <saunders@fotenn.com>; 'Lisa Dalla Rosa' <dallarosa@fotenn.com>; joev@canadatrim.com

**Subject:** RE: 1146 Snow Street - Project Status Report

Hello Jonathon,

Can you please confirm which of the following Construction Types will best apply to the construction of the proposed building:

### **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.

Thank you kindly,  
Alyssa

**Alyssa Gladish** E.I.T.  
Project Manager, Community Development

Direct: 780 917-8567  
Mobile: 587 721-1241  
Alyssa.Gladish@stantec.com



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**From:** [mdblakely\\_jon@bellnet.ca](mailto:mdblakely_jon@bellnet.ca) <[mdblakely\\_jon@bellnet.ca](mailto:mdblakely_jon@bellnet.ca)>

**Sent:** Monday, October 7, 2024 4:09 PM

**To:** [chuck.vanalstine@gmail.com](mailto:chuck.vanalstine@gmail.com); Gladish, Alyssa <[Alyssa.Gladish@stantec.com](mailto:Alyssa.Gladish@stantec.com)>; 'George Laschewski' <[everestengineeringlimited@gmail.com](mailto:everestengineeringlimited@gmail.com)>; 'Evan Saunders' <[saunders@fotenn.com](mailto:saunders@fotenn.com)>; 'Lisa Dalla Rosa' <[dallarosa@fotenn.com](mailto:dallarosa@fotenn.com)>; [joev@canadatrim.com](mailto:joev@canadatrim.com)

**Cc:** 'David Blakely (David Blakely)' <[mdblakely@bellnet.ca](mailto:mdblakely@bellnet.ca)>; [alsaffar2@hotmail.com](mailto:alsaffar2@hotmail.com); [moscatelboutique@hotmail.com](mailto:moscatelboutique@hotmail.com); [slmc.eddie@gmail.com](mailto:slmc.eddie@gmail.com); [vigomanagement@outlook.com](mailto:vigomanagement@outlook.com)

**Subject:** RE: 1146 Snow Street - Project Status Report

Alyssa,

**Blakely to provide:**

1. I've reached out to Paterson Group for a completion date. I'll let you know when I hear back from them.
2. Revised Site Plan is attached with relocated Hydrant & Siamese connection shown beside the main entrance.
3. Cistern is possible only if required.
4. I'll prepare a preliminary roof plan and send it to you in the next couple of days.

**Blakely/Everest:**

1. Yes
2. Yes
3. To follow up on Chuck's comments. I've partially revised section 1/A6 with our preliminary from the site plan, see below & attached.

The fitness room is below the lobby and the slab is dropped 1980mm from the mechanical room slab.

Yes the elevator opens directly into the fitness room (barrier free amenity, no space for ramp) so the current configuration would be preferable.

Can the water run along the west side yard into the mechanical room & the electrical service can enter into the fitness room and run along the West wall into the mechanical room.

We can lose space along this wall in the fitness room for the electrical service.

Note: the finished floor slab of the mechanical room will be approx. 1525mm below grade in the west side yard.

## **Appendix B Water Servicing**

### **B.1 Domestic Water Demands**



**1146 Snow Street, Ottawa, ON - Domestic Water Demand Estimates**

Site Plan provided by M. David Blakely Architect Inc. Rev 07 (2024-11-12)

Stantec Project No. 160402005    Designed by: MW

Revision Date: 14-Nov-2024    Checked by: AG

Revision: 01    City File No.: PC2024-0084

| Population densities per Table 4.1 City of Ottawa Water Design Guidelines:                                                 |     |           |
|----------------------------------------------------------------------------------------------------------------------------|-----|-----------|
| 1 Bedroom                                                                                                                  | 1.4 | ppu       |
| 2 Bedroom                                                                                                                  | 2.1 | ppu       |
| Demand conversion factors per Table 4.2 of the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03: |     |           |
| Residential                                                                                                                | 280 | L/cap/day |



| Building ID         | No. of Units | Population | Avg Day Demand |            | Max Day Demand <sup>1 2</sup> |            | Peak Hour Demand <sup>1 2</sup> |            |
|---------------------|--------------|------------|----------------|------------|-------------------------------|------------|---------------------------------|------------|
|                     |              |            | (L/min)        | (L/s)      | (L/min)                       | (L/s)      | (L/min)                         | (L/s)      |
| 1 Bedroom           | 29           | 41         | 8.0            | 0.13       | 19.9                          | 0.33       | 43.8                            | 0.73       |
| 2 Bedroom           | 14           | 30         | 5.8            | 0.10       | 14.6                          | 0.24       | 32.1                            | 0.53       |
|                     |              |            |                |            |                               |            |                                 |            |
| <b>Total Site :</b> | <b>43</b>    | <b>71</b>  | <b>13.8</b>    | <b>0.2</b> | <b>34.5</b>                   | <b>0.6</b> | <b>75.9</b>                     | <b>1.3</b> |

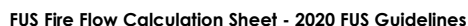
1 The City of Ottawa water demand criteria used to estimate peak demand rates for residential areas are as follows:

maximum day demand rate = 2.5 x average day demand rate

peak hour demand rate = 2.2 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

## **B.2 Fire Flow Demands (2020 FUS)**





Date: 27-Feb-2025

Fire Flow Calculation Rev#: 3

**Description:** 4-Storey residential apartment building with one level of underground parking. Firewall at Gridline C in Site Plan.

Notes: 1. Site Plan provided by M. David Blakely Architect Inc. Rev. 11 (05-Feb-2025).

**2. Building construction type per OBC 3.2.2.45 (Section 3.2.2.53 post-2024 OBC).**

| Step | Task                                        | Notes                                                           |                       |                    |                          |                                    |                                    |                          |  |  |      | Value Used | Req'd Fire Flow (L/min) |
|------|---------------------------------------------|-----------------------------------------------------------------|-----------------------|--------------------|--------------------------|------------------------------------|------------------------------------|--------------------------|--|--|------|------------|-------------------------|
| 1    | Determine Type of Construction              | Type IV-B Mass Timber Construction                              |                       |                    |                          |                                    |                                    |                          |  |  |      | 0.9        | -                       |
| 2    | Determine Effective Floor Area              | Sum of Two Largest Floors + 50% of Eight Additional Floors      |                       |                    |                          |                                    | Vertical Openings Protected?       |                          |  |  |      | NO         | -                       |
|      |                                             | 635                                                             | 635                   | 602                | 392                      |                                    |                                    |                          |  |  | 1767 | -          |                         |
| 3    | Determine Required Fire Flow                | (F = 220 x C x A <sup>1/2</sup> ). Round to nearest 1000 L/min  |                       |                    |                          |                                    |                                    |                          |  |  |      | -          | 8000                    |
| 4    | Determine Occupancy Charge                  | Limited Combustible                                             |                       |                    |                          |                                    |                                    |                          |  |  |      | -15%       | 6800                    |
| 5    | Determine Sprinkler Reduction               | Conforms to NFPA 13                                             |                       |                    |                          |                                    |                                    |                          |  |  |      | -30%       | -3400                   |
|      |                                             | Standard Water Supply                                           |                       |                    |                          |                                    |                                    |                          |  |  |      | -10%       |                         |
|      |                                             | Fully Supervised                                                |                       |                    |                          |                                    |                                    |                          |  |  |      | -10%       |                         |
|      |                                             | % Coverage of Sprinkler System                                  |                       |                    |                          |                                    |                                    |                          |  |  |      | 100%       |                         |
| 6    | Determine Increase for Exposures (Max. 75%) | Direction                                                       | Exposure Distance (m) | Exposed Length (m) | Exposed Height (Stories) | Length-Height Factor (m x stories) | Construction of Adjacent Wall      | Firewall / Sprinklered ? |  |  | -    | -          |                         |
|      |                                             | North                                                           | 20.1 to 30            | 34                 | 2                        | 61-80                              | Type V                             | NO                       |  |  | 6%   | 1360       |                         |
|      |                                             | East                                                            | > 30                  | 0                  | 0                        | 0-20                               | Type V                             | NO                       |  |  | 0%   |            |                         |
|      |                                             | South                                                           | 10.1 to 20            | 31                 | 3                        | 81-100                             | Type V                             | NO                       |  |  | 14%  |            |                         |
|      |                                             | West                                                            | 0 to 3                | 17                 | 4                        | 61-80                              | Type III-IV - Unprotected Openings | YES                      |  |  | 0%   |            |                         |
| 7    | Determine Final Required Fire Flow          | Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min |                       |                    |                          |                                    |                                    |                          |  |  |      | 5000       |                         |
|      |                                             | Total Required Fire Flow in L/s                                 |                       |                    |                          |                                    |                                    |                          |  |  |      | 83.3       |                         |
|      |                                             | Required Duration of Fire Flow (hrs)                            |                       |                    |                          |                                    |                                    |                          |  |  |      | 1.75       |                         |
|      |                                             | Required Volume of Fire Flow (m³)                               |                       |                    |                          |                                    |                                    |                          |  |  |      | 525        |                         |

## **B.3 Boundary Conditions**



**Wu, Michael**

---

**From:** Unrau, Derek <derek.unrau@ottawa.ca>  
**Sent:** November 25, 2024 10:55  
**To:** Wu, Michael  
**Cc:** Gladish, Alyssa; Haynes, Kris  
**Subject:** RE: File No. PC2024-0084 - 1164 Snow Street Sanitary Sewer Capacity Confirmation  
**Attachments:** 1146 Snow Street REVISED November 2024.pdf

Good morning Michael,

I received this morning the results, apologies for the length of time it has taken.

The following are boundary conditions, HGL, for hydraulic analysis at 1146 Snow Street (zone 1E) assumed to be connected to the 152mm watermain (Scenario 1) **OR** an upsized 203 mm watermain (Scenario 2) on Snow Street (see attached PDF for location).

Scenario 1 – 152 mm watermain on Snow St

Min HGL: 110.0 m

Max HGL: 118.3 m

Available Fire Flow at 20 (psi): 110.0 L/s, assuming ground elevation of 73.7 m

Scenario 2 – upsized 203 mm watermain on Snow St

Min HGL: 110.0 m

Max HGL: 118.3 m

Max Day + Fire flow (116.7 L/s): 106.4 m

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

*Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.*

Please let me know if you have any questions.

Regards,

**Derek Unrau, C.E.T.**

Project Manager

Planning, Development and Building Services Department (PDBS)

Development Review - East 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 27670, [Derek.Unrau@ottawa.ca](mailto:Derek.Unrau@ottawa.ca)



## Wu, Michael

---

**From:** Wu, Michael  
**Sent:** October 16, 2024 11:58  
**To:** derek.unrau@ottawa.ca  
**Cc:** Gladish, Alyssa  
**Subject:** 1146 Snow Street Boundary Condition Request  
**Attachments:** 2024-10-10\_1146\_Snow\_FUS\_Fire\_Flow.pdf; 2024-10-10\_1146\_Snow\_Water\_Demand.pdf; 1146 Snow Street BC Request Map.jpg; Snow Street\_Site Plan\_2024\_10\_07-SP1.pdf

Good morning, Derek:

We are requesting hydraulic boundary conditions for the site at 1146 Snow Street based on a proposed 4-storey apartment building projected to service around 63 persons. The site is projected to be serviced by the existing dead end watermain on Snow Street (marked in **green** in the attached map), and the request is for the following two scenarios:

1. Existing scenario, in which the 150 mm diameter watermain in Snow Street remains in place
2. The Snow Street watermain is upsized to 200 mm

The domestic and fire flow demands for the development are anticipated to be as follows:

- Average Day Demand: 0.2 L/s
- Maximum Day Demand: 0.5 L/s
- Peak Hour Demand: 1.1 L/s
- Fire Flow Demand: 117 L/s (7,000 L/min)

Attached are the calculation sheets and site plan for your reference, and please let us know if you have any questions or require further information.

Thank you,

**Michael Wu** EIT  
Civil Engineering Intern, Community Development  
Direct: 1 (613) 738-6033  
Michael.Wu@stantec.com

Stantec  
300-1331 Clyde Avenue  
Ottawa ON K2C 3G4



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## **B.4 Fire Hydrant Coverage Table**



|                                                                                  |                                                 |                  |           |
|----------------------------------------------------------------------------------|-------------------------------------------------|------------------|-----------|
|  | Project:                                        | 1146 Snow Street | 160402005 |
|                                                                                  | <b>TABLE 1:<br/>FIRE HYDRANT COVERAGE TABLE</b> |                  |           |
|                                                                                  | Revision: 01                                    | Prepared By: MW  |           |
|                                                                                  | Revision Date: 2024-11-25                       | Checked By: AG   |           |

| Description                                     | Hydrants <sup>1</sup> |        |        | Total Available<br>Fire Flow<br>(L/min) | Total Required<br>Fire Flow <sup>2</sup><br>(L/min) |
|-------------------------------------------------|-----------------------|--------|--------|-----------------------------------------|-----------------------------------------------------|
|                                                 | HYD-01                | HYD-02 | HYD-03 |                                         |                                                     |
| 1146 Snow Street                                |                       |        |        |                                         |                                                     |
| Distance from building (m)                      | 33.2                  | 57.6   | -      | -                                       | -                                                   |
| Maximum fire flow capacity <sup>3</sup> (L/min) | 5,678                 | 5,678  | -      | 11,356                                  | 5,000                                               |
|                                                 |                       |        |        |                                         |                                                     |

| NFPA 1 Table 18.5.4.3    |                          |
|--------------------------|--------------------------|
| Distance to Building (m) | Maximum Capacity (L/min) |
| ≤ 76                     | 5,678                    |
| > 76 and ≤ 152           | 3,785                    |
| > 152 and ≤ 305          | 2,839                    |

- Notes:
- Hydrant locations as per GeoOttawa accessed on November 25, 2024. Refer to fire hydrant coverage sketch (Figure 3.1).
  - See FUS Calculations, Appendix B.2 for fire flow requirements.
  - See NFPA 1 Table 18.5.4.3 for maxiumim fire flow capacity of hydrants by distance to building.

## **Appendix C Wastewater Servicing**

### **C.1 Sanitary Design Sheet**



|                                                                                  |                  |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              |                                  |                |                       |                |                                      |               |                       |                       |                              |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|----------------------------------------------------------------------------------|------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|------|----------------------------|------|---------------|-----------------------|--------------|----------------------------------|----------------|-----------------------|----------------|--------------------------------------|---------------|-----------------------|-----------------------|------------------------------|-----------------------|--------------------------|---------------|---------------|-------------|----------|-------|--------------|-------------------------|----------------------------|-------------------------|------|--|--|--|--|
|  | SITE:            |                         | <div>SANITARY SEWER<br/>DESIGN SHEET<br/>(City of Ottawa)</div> <div>STANTEC FILE NUMBER: 160402005<br/>CITY FILE NUMBER: PC2024-0084</div> |           |           |           |      |                            |      |               |                       |              | DESIGN PARAMETERS                |                |                       |                |                                      |               |                       |                       |                              |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  | 1146 Snow Street |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | MAX PEAK FACTOR (RES.)= 4.0      |                |                       |                | AVG. DAILY FLOW / PERSON 280 l/p/day |               |                       |                       | MINIMUM VELOCITY 0.60 m/s    |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  | DATE: 2024-11-14 |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | MIN PEAK FACTOR (RES.)= 2.0      |                |                       |                | COMMERCIAL 28,000 l/ha/day           |               |                       |                       | MAXIMUM VELOCITY 3.00 m/s    |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  | REVISION: 1      |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | PEAKING FACTOR (INDUSTRIAL): 2.4 |                |                       |                | INDUSTRIAL (HEAVY) 55,000 l/ha/day   |               |                       |                       | MANNINGS n 0.013             |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  | DESIGNED BY: MW  |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | PEAKING FACTOR (ICI >20%): 1.5   |                |                       |                | INDUSTRIAL (LIGHT) 35,000 l/ha/day   |               |                       |                       | BEDDING CLASS B              |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  | CHECKED BY: AG   |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | PERSONS / 1 BEDROOM 1.4          |                |                       |                | INSTITUTIONAL 28,000 l/ha/day        |               |                       |                       | MINIMUM COVER 2.50 m         |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  |                  |                         |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              | PERSONS / 2 BEDROOM 2.1          |                |                       |                | INFILTRATION 0.33 l/s/Ha             |               |                       |                       | HARMON CORRECTION FACTOR 0.8 |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
|                                                                                  |                  | PERSONS / 3 BEDROOM 3.1 |                                                                                                                                             |           |           |           |      |                            |      |               |                       |              |                                  |                |                       |                |                                      |               |                       |                       |                              |                       |                          |               |               |             |          |       |              |                         |                            |                         |      |  |  |  |  |
| LOCATION                                                                         |                  |                         | RESIDENTIAL AREA AND POPULATION                                                                                                             |           |           |           |      |                            |      |               |                       | COMM/AMENITY |                                  | INDUSTRIAL (L) |                       | INDUSTRIAL (H) |                                      | INSTITUTIONAL |                       | GREEN / UNUSED        |                              | C+H                   |                          | INFILTRATION  |               |             | TOTAL    | PIPE  |              |                         |                            |                         |      |  |  |  |  |
| AREA ID<br>NUMBER                                                                | FROM<br>M.H.     | TO<br>M.H.              | AREA<br>(ha)                                                                                                                                | 1 BEDROOM | 2 BEDROOM | 3 BEDROOM | POP. | CUMULATIVE<br>AREA<br>(ha) | POP. | PEAK<br>FACT. | PEAK<br>FLOW<br>(l/s) | AREA<br>(ha) | ACCU.<br>AREA<br>(ha)            | AREA<br>(ha)   | ACCU.<br>AREA<br>(ha) | AREA<br>(ha)   | ACCU.<br>AREA<br>(ha)                | AREA<br>(ha)  | ACCU.<br>AREA<br>(ha) | PEAK<br>FLOW<br>(l/s) | TOTAL<br>AREA<br>(ha)        | ACCU.<br>AREA<br>(ha) | INFILT.<br>FLOW<br>(l/s) | FLOW<br>(l/s) | LENGTH<br>(m) | DIA<br>(mm) | MATERIAL | CLASS | SLOPE<br>(%) | CAP.<br>(FULL)<br>(l/s) | CAP. V<br>PEAK FLOW<br>(%) | VEL.<br>(FULL)<br>(m/s) |      |  |  |  |  |
| R2A, G2A                                                                         | BLDG             | SAN 2                   | 0.085                                                                                                                                       | 29        | 14        | 0         | 71   | 0.085                      | 71   | 3.63          | 0.83                  | 0.00         | 0.00                             | 0.00           | 0.00                  | 0.00           | 0.00                                 | 0.07          | 0.07                  | 0.00                  | 0.152                        | 0.15                  | 0.05                     | 0.88          | 2.2           | 200         | PVC      | DR 28 | 1.00         | 33.4                    | 2.64%                      | 1.05                    |      |  |  |  |  |
|                                                                                  | SAN 2            | SAN 1                   | 0.000                                                                                                                                       | 0         | 0         | 0         | 0    | 0.085                      | 71   | 3.63          | 0.83                  | 0.00         | 0.00                             | 0.00           | 0.00                  | 0.00           | 0.00                                 | 0.00          | 0.07                  | 0.00                  | 0.00                         | 0.000                 | 0.15                     | 0.05          | 0.88          | 11.0        | 200      | PVC   | DR 28        | 1.00                    | 33.4                       | 2.64%                   | 1.05 |  |  |  |  |

Notes

1. Unit breakdown for proposed residential apartment building provided by M. David Blakely Architect Inc. Site Plan Rev.7, 2024/11/12.

2. Entire site area considered as potential source of infiltration.

## **C.2 Confirmation of Sanitary Sewer Capacity**



**Wu, Michael**

---

**From:** Unrau, Derek <derek.unrau@ottawa.ca>  
**Sent:** October 28, 2024 08:33  
**To:** Wu, Michael  
**Cc:** Gladish, Alyssa  
**Subject:** RE: File No. PC2024-0084 - 1164 Snow Street Sanitary Sewer Capacity Confirmation

Good morning,

I received response from Asset Management , and there are no concerns with the proposed flows provided.

Please let me know if you have any questions.

Regards,

**Derek Unrau, C.E.T.**

Project Manager  
Planning, Development and Building Services Department (PDBS)  
Development Review - East 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 27670, [Derek.Unrau@ottawa.ca](mailto:Derek.Unrau@ottawa.ca)



---

**From:** Wu, Michael <Michael.Wu@stantec.com>  
**Sent:** October 23, 2024 1:57 PM  
**To:** Unrau, Derek <derek.unrau@ottawa.ca>  
**Cc:** Gladish, Alyssa <Alyssa.Gladish@stantec.com>  
**Subject:** File No. PC2024-0084 - 1164 Snow Street Sanitary Sewer Capacity Confirmation

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Good morning, Derek:

We are requesting confirmation that the downstream sanitary sewers have the capacity to receive an additional 0.79 L/s of sanitary peak flow from the proposed development at 1146 Snow Street.

Attached is the calculation sheet for your review.

Please let us know if you have any questions or require further information.

Thanks,

**Michael Wu** EIT  
Civil Engineering Intern, Community Development

Direct: 1 (613) 738-6033  
Michael.Wu@stantec.com

Stantec  
300-1331 Clyde Avenue  
Ottawa ON K2C 3G4



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## **Appendix D Stormwater Management**

### **D.1 Modified Rational Method**



## Stormwater Management Calculations

File No: **160402005**  
 Project: **1146 Snow Street**  
 Date: **24-Feb-25**

SWM Approach:  
 Post-development to Pre-development flows

**Post-Development Site Conditions:**

**Overall Runoff Coefficient for Site and Sub-Catchment Areas**

| Runoff Coefficient Table       |                  |      |       |                  |                           |         |       |                            |
|--------------------------------|------------------|------|-------|------------------|---------------------------|---------|-------|----------------------------|
| Sub-catchment Area             |                  |      |       | Area (ha)<br>"A" | Runoff Coefficient<br>"C" | "A x C" |       | Overall Runoff Coefficient |
| Catchment Type                 | ID / Description |      |       |                  |                           |         |       |                            |
| Controlled - Tributary         | C500A            | Hard | 0.009 | 0.037            | 0.9                       | 0.008   | 0.013 | 0.360                      |
|                                |                  | Soft | 0.029 |                  | 0.2                       | 0.006   |       |                            |
| Roof                           | R102B            | Hard | 0.024 | 0.024            | 0.9                       | 0.022   | 0.022 | 0.900                      |
|                                |                  | Soft | 0.000 |                  | 0.2                       | 0.000   |       |                            |
| Roof                           | R102A            | Hard | 0.067 | 0.067            | 0.9                       | 0.061   | 0.061 | 0.900                      |
|                                |                  | Soft | 0.000 |                  | 0.2                       | 0.000   |       |                            |
| Uncontrolled - Tributary       | RAMP-2           | Hard | 0.001 | 0.001            | 0.9                       | 0.001   | 0.001 | 0.900                      |
|                                |                  | Soft | 0.000 |                  | 0.2                       | 0.000   |       |                            |
| Uncontrolled - Tributary       | RAMP-1           | Hard | 0.001 | 0.001            | 0.9                       | 0.001   | 0.001 | 0.900                      |
|                                |                  | Soft | 0.000 |                  | 0.2                       | 0.000   |       |                            |
| Uncontrolled - Non-Tributary   | UNC-3            | Hard | 0.000 | 0.001            | 0.9                       | 0.000   | 0.000 | 0.200                      |
|                                |                  | Soft | 0.001 |                  | 0.2                       | 0.000   |       |                            |
| Uncontrolled - Non-Tributary   | UNC-2            | Hard | 0.003 | 0.006            | 0.9                       | 0.002   | 0.003 | 0.510                      |
|                                |                  | Soft | 0.003 |                  | 0.2                       | 0.001   |       |                            |
| Uncontrolled - Non-Tributary   | UNC-1            | Hard | 0.004 | 0.014            | 0.9                       | 0.004   | 0.006 | 0.430                      |
|                                |                  | Soft | 0.009 |                  | 0.2                       | 0.002   |       |                            |
| Total                          |                  |      |       | 0.152            | 0.107                     |         |       |                            |
| Overall Runoff Coefficient= C: |                  |      |       |                  |                           |         | 0.71  |                            |

|                                                                    |                 |
|--------------------------------------------------------------------|-----------------|
| <b>Total Roof Areas</b>                                            | <b>0.092 ha</b> |
| <b>Total Tributary Surface Areas (Controlled and Uncontrolled)</b> | <b>0.040 ha</b> |
| <b>Total Tributary Area to Outlet</b>                              | <b>0.131 ha</b> |
| <b>Total Uncontrolled Areas (Non-Tributary)</b>                    | <b>0.021 ha</b> |
| <b>Total Site</b>                                                  | <b>0.152 ha</b> |

# Roof Drain Design Calculation Sheet

**Project #160402005, 1146 Snow Street**  
**Roof Drain Design Sheet, Area R102A**  
**Standard Watts Accutrol Weir - Single Notch Roof Drain**

| Rating Curve     |                            |                              |                    | Volume Estimation |                 |                |             | Water Depth<br>(m) |
|------------------|----------------------------|------------------------------|--------------------|-------------------|-----------------|----------------|-------------|--------------------|
| Elevation<br>(m) | Discharge Rate<br>(cu.m/s) | Outlet Discharge<br>(cu.m/s) | Storage<br>(cu. m) | Elevation<br>(m)  | Area<br>(sq. m) | Volume (cu. m) |             |                    |
|                  |                            |                              |                    |                   |                 | Increment      | Accumulated |                    |
| 0.000            | 0.0000                     | 0.0000                       | 0                  | 0.000             | 0               | 0              | 0           | 0.000              |
| 0.025            | 0.0003                     | 0.0009                       | 0                  | 0.025             | 15              | 0              | 0           | 0.025              |
| 0.050            | 0.0006                     | 0.0019                       | 1                  | 0.050             | 60              | 1              | 1           | 0.050              |
| 0.075            | 0.0008                     | 0.0024                       | 3                  | 0.075             | 135             | 2              | 3           | 0.075              |
| 0.100            | 0.0009                     | 0.0028                       | 8                  | 0.100             | 239             | 5              | 8           | 0.100              |
| 0.125            | 0.0011                     | 0.0033                       | 16                 | 0.125             | 374             | 8              | 16          | 0.125              |
| 0.150            | 0.0013                     | 0.0038                       | 27                 | 0.150             | 539             | 11             | 27          | 0.150              |

| Drawdown Estimate   |                  |            |                     |
|---------------------|------------------|------------|---------------------|
| Total Volume (cu.m) | Total Time (sec) | Vol (cu.m) | Detention Time (hr) |
| 0.0                 | 0.0              | 0.0        | 0                   |
| 0.9                 | 461.3            | 0.9        | 0.12815             |
| 3.2                 | 1001.7           | 2.4        | 0.4064              |
| 7.9                 | 1625.6           | 4.6        | 0.85796             |
| 15.5                | 2297.2           | 7.6        | 1.49608             |
| 26.8                | 2998.6           | 11.3       | 2.32902             |

## Rooftop Storage Summary

|                                          |       |                                                             |
|------------------------------------------|-------|-------------------------------------------------------------|
| Total Building Area (sq.m)               | 673.5 |                                                             |
| Assume Available Roof Area (sq.m)        | 80%   | 538.8                                                       |
| Roof Imperviousness                      |       | 0.99                                                        |
| Roof Drain Requirement (sq.m/Notch)      |       | 232                                                         |
| Number of Roof Notches*                  |       | 3                                                           |
| Max. Allowable Depth of Roof Ponding (m) | 0.15  | * As per Ontario Building Code section OBC 7.4.10.4.(2)(c). |
| Max. Allowable Storage (cu.m)            |       | 27                                                          |
| Estimated 100 Year Drawdown Time (h)     |       | 2.2                                                         |

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

| Calculation Results | 5yr   | 100yr | Available |
|---------------------|-------|-------|-----------|
| Qresult (cu.m/s)    | 0.003 | 0.004 | -         |
| Depth (m)           | 0.110 | 0.145 | 0.150     |
| Volume (cu.m)       | 10.9  | 24.9  | 26.9      |
| Draintime (hrs)     | 1.1   | 2.2   |           |

| Adjustable Accutrol Weir Flow Rate Settings From Watts Drain Catalogue |        |        |        |        |        |
|------------------------------------------------------------------------|--------|--------|--------|--------|--------|
| Head (m)                                                               | L/s    |        |        |        |        |
|                                                                        | Open   | 75%    | 50%    | 25%    | Closed |
| 0.025                                                                  | 0.3154 | 0.3154 | 0.3154 | 0.3154 | 0.3154 |
| 0.05                                                                   | 0.6308 | 0.6308 | 0.6308 | 0.6308 | 0.3154 |
| 0.075                                                                  | 0.9462 | 0.8674 | 0.7885 | 0.7097 | 0.3154 |
| 0.1                                                                    | 1.2617 | 1.104  | 0.9462 | 0.7885 | 0.3154 |
| 0.125                                                                  | 1.5771 | 1.3405 | 1.104  | 0.8674 | 0.3154 |
| 0.15                                                                   | 1.8925 | 1.5771 | 1.2617 | 0.9462 | 0.3154 |

# Roof Drain Design Calculation Sheet

**Project #160402005, 1146 Snow Street**  
**Roof Drain Design Sheet, Area R102B**  
**Standard Watts Accutrol Weir - Single Notch Roof Drain**

| Rating Curve     |                            |                              |                    | Volume Estimation |                 |                |             | Water Depth<br>(m) |
|------------------|----------------------------|------------------------------|--------------------|-------------------|-----------------|----------------|-------------|--------------------|
| Elevation<br>(m) | Discharge Rate<br>(cu.m/s) | Outlet Discharge<br>(cu.m/s) | Storage<br>(cu. m) | Elevation<br>(m)  | Area<br>(sq. m) | Volume (cu. m) |             |                    |
|                  |                            |                              |                    |                   |                 | Increment      | Accumulated |                    |
| 0.000            | 0.0000                     | 0.0000                       | 0                  | 0.000             | 0               | 0              | 0           | 0.000              |
| 0.025            | 0.0003                     | 0.0025                       | 0                  | 0.025             | 5               | 0              | 0           | 0.025              |
| 0.050            | 0.0003                     | 0.0025                       | 0                  | 0.050             | 22              | 0              | 0           | 0.050              |
| 0.075            | 0.0003                     | 0.0025                       | 1                  | 0.075             | 48              | 1              | 1           | 0.075              |
| 0.100            | 0.0003                     | 0.0025                       | 3                  | 0.100             | 86              | 2              | 3           | 0.100              |
| 0.125            | 0.0003                     | 0.0025                       | 6                  | 0.125             | 135             | 3              | 6           | 0.125              |
| 0.150            | 0.0003                     | 0.0025                       | 10                 | 0.150             | 194             | 4              | 10          | 0.150              |

| Drawdown Estimate         |                        |               |                        |
|---------------------------|------------------------|---------------|------------------------|
| Total<br>Volume<br>(cu.m) | Total<br>Time<br>(sec) | Vol<br>(cu.m) | Detention<br>Time (hr) |
| 0.0                       | 0.0                    | 0.0           | 0                      |
| 0.3                       | 124.5                  | 0.3           | 0.03459                |
| 1.2                       | 338.0                  | 0.9           | 0.12846                |
| 2.8                       | 658.1                  | 1.7           | 0.31128                |
| 5.6                       | 1085.0                 | 2.7           | 0.61267                |
| 9.6                       | 1618.6                 | 4.1           | 1.0623                 |

## Rooftop Storage Summary

|                                          |        |                                                             |
|------------------------------------------|--------|-------------------------------------------------------------|
| Total Building Area (sq.m)               | 242.37 |                                                             |
| Assume Available Roof Area (sq.m)        | 80%    | 193.896                                                     |
| Roof Imperviousness                      |        | 0.99                                                        |
| Roof Drain Requirement (sq.m/Notch)      |        | 232                                                         |
| Number of Roof Notches*                  |        | 8                                                           |
| Max. Allowable Depth of Roof Ponding (m) | 0.15   | * As per Ontario Building Code section OBC 7.4.10.4.(2)(c). |
| Max. Allowable Storage (cu.m)            |        | 10                                                          |
| Estimated 100 Year Drawdown Time (h)     |        | 0.7                                                         |

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

| Calculation Results | 5yr   | 100yr | Available |
|---------------------|-------|-------|-----------|
| Qresult (cu.m/s)    | 0.003 | 0.003 | -         |
| Depth (m)           | 0.091 | 0.131 | 0.150     |
| Volume (cu.m)       | 2.3   | 6.7   | 9.7       |
| Draintime (hrs)     | 0.3   | 0.7   |           |

| Adjustable Accutrol Weir Flow Rate Settings<br>From Watts Drain Catalogue |        |         |         |         |         |
|---------------------------------------------------------------------------|--------|---------|---------|---------|---------|
| Head (m)                                                                  | L/s    |         |         |         |         |
|                                                                           | Open   | 75%     | 50%     | 25%     | Closed  |
| 0.025                                                                     | 0.3154 | 0.31542 | 0.31542 | 0.31542 | 0.31542 |
| 0.05                                                                      | 0.6308 | 0.63083 | 0.63083 | 0.63083 | 0.31542 |
| 0.075                                                                     | 0.9462 | 0.8674  | 0.78854 | 0.70969 | 0.31542 |
| 0.1                                                                       | 1.2617 | 1.10396 | 0.94625 | 0.78854 | 0.31542 |
| 0.125                                                                     | 1.5771 | 1.34052 | 1.10396 | 0.8674  | 0.31542 |
| 0.15                                                                      | 1.8925 | 1.57708 | 1.26167 | 0.94625 | 0.31542 |

# Stormwater Management Calculations

Project #160402005, 1146 Snow Street

## Modified Rational Method Calculations for Storage

|                                  |                   |  |     |         |         |           |
|----------------------------------|-------------------|--|-----|---------|---------|-----------|
| 5 yr Intensity<br>City of Ottawa | $I = a/(t + b)^c$ |  | a = | 998.071 | t (min) | I (mm/hr) |
|                                  |                   |  | b = | 6.053   | 10      | 104.2     |
|                                  |                   |  | c = | 0.814   | 20      | 70.3      |
|                                  |                   |  |     |         | 30      | 53.9      |
|                                  |                   |  |     |         | 40      | 44.2      |
|                                  |                   |  |     |         | 50      | 37.7      |
|                                  |                   |  |     |         | 60      | 32.9      |
|                                  |                   |  |     |         | 70      | 29.4      |
|                                  |                   |  |     |         | 80      | 26.6      |
|                                  |                   |  |     |         | 90      | 24.3      |
|                                  |                   |  |     |         | 100     | 22.4      |
|                                  |                   |  |     |         | 110     | 20.8      |
|                                  |                   |  |     |         | 120     | 19.5      |

### 5 YEAR Predevelopment Target Release from the Existing Site

Subdrainage Area: Predevelopment Tributary Area to Outlet

Area (ha): 0.1520

C: 0.26

Typical Time of Concentration

| tc<br>(min) | I (5 yr)<br>(mm/hr) | Qtarg<br>(L/s) |
|-------------|---------------------|----------------|
| 10          | 104.2               | 11.4           |

### 5 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTERN

Area (ha): 0.09

C: 0.90

Cistern

| tc<br>(min) | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
|-------------|---------------------|------------------|-------------------|------------------|-----------------|
| 10          | 104.2               | 5.4              | 3.0               | 2.4              | 1.5             |
| 20          | 70.3                | 5.5              | 3.0               | 2.5              | 3.0             |
| 30          | 53.9                | 5.5              | 3.0               | 2.6              | 4.6             |
| 40          | 44.2                | 5.5              | 3.0               | 2.5              | 6.1             |
| 50          | 37.7                | 5.2              | 3.0               | 2.3              | 6.8             |
| 60          | 32.9                | 4.9              | 3.0               | 1.9              | 6.9             |
| 80          | 26.6                | 4.4              | 3.0               | 1.4              | 6.9             |
| 100         | 22.4                | 4.0              | 3.0               | 1.1              | 6.3             |
| 120         | 19.5                | 3.7              | 3.0               | 0.7              | 5.3             |
| 140         | 17.3                | 3.5              | 3.0               | 0.5              | 4.1             |
| 160         | 15.6                | 3.2              | 3.0               | 0.3              | 2.4             |
| 180         | 14.2                | 3.0              | 3.0               | 0.0              | 0.4             |

Storage: Cistern

| Stage              | Head<br>(m) | Discharge<br>(L/s) | Vreq<br>(cu. m) | Vavail<br>(cu. m) | Volume<br>Check |
|--------------------|-------------|--------------------|-----------------|-------------------|-----------------|
| 5-year Water Level | -           | -                  | 3.0             | 6.9               | 20.0 OK         |

Subdrainage Area: C500A

Area (ha): 0.04

C: 0.36

Controlled - Tributary

| tc<br>(min) | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
|-------------|---------------------|------------------|-------------------|------------------|-----------------|
| 10          | 104.2               | 3.9              | 1.6               | 2.3              | 1.4             |
| 20          | 70.3                | 2.6              | 1.6               | 1.0              | 1.2             |
| 30          | 53.9                | 2.0              | 1.6               | 0.4              | 0.8             |
| 40          | 44.2                | 1.7              | 1.6               | 0.1              | 0.1             |
| 50          | 37.7                | 1.4              | 1.4               | 0.0              | 0.0             |
| 60          | 32.9                | 1.2              | 1.2               | 0.0              | 0.0             |
| 70          | 29.4                | 1.1              | 1.1               | 0.0              | 0.0             |
| 80          | 26.6                | 1.0              | 1.0               | 0.0              | 0.0             |
| 90          | 24.3                | 0.9              | 0.9               | 0.0              | 0.0             |
| 100         | 22.4                | 0.8              | 0.8               | 0.0              | 0.0             |
| 110         | 20.8                | 0.8              | 0.8               | 0.0              | 0.0             |
| 120         | 19.5                | 0.7              | 0.7               | 0.0              | 0.0             |

Storage: Perforated subdrain pipe and clear stone trench (City of Ottawa S29)

Orifice Diameter: LMF 40

Invert Elevation 72.4 m

T/G Elevation 73.8 m

Max Ponding Depth 0.0 m

Downstream W/L 70.4 m

| Stage              | Head<br>(m) | Discharge<br>(L/s) | Vreq<br>(cu. m) | Vavail<br>(cu. m) | Volume<br>Check |
|--------------------|-------------|--------------------|-----------------|-------------------|-----------------|
| 5-year Water Level | 73.8        | 1.4                | 1.6             | 1.4               | 15.7 OK         |

Subdrainage Area: R102B

Area (ha): 0.02

C: 0.90

Maximum Storage Depth: 150 mm

| tc<br>(min) | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) | Depth<br>(mm) |
|-------------|---------------------|------------------|-------------------|------------------|-----------------|---------------|
| 10          | 104.2               | 6.3              | 2.5               | 3.8              | 2.3             | 91.0 0.00     |
| 20          | 70.3                | 4.3              | 2.5               | 1.7              | 2.1             | 88.1 0.00     |
| 30          | 53.9                | 3.3              | 2.5               | 0.7              | 1.3             | 77.0 0.00     |
| 40          | 44.2                | 2.7              | 2.5               | 0.2              | 0.4             | 50.5 0.00     |
| 50          | 37.7                | 2.3              | 2.3               | 0.0              | 0.0             | 22.5 0.00     |
| 60          | 32.9                | 2.0              | 2.0               | 0.0              | 0.0             | 19.7 0.00     |
| 80          | 26.6                | 1.6              | 1.6               | 0.0              | 0.0             | 15.9 0.00     |
| 100         | 22.4                | 1.4              | 1.4               | 0.0              | 0.0             | 13.4 0.00     |
| 120         | 19.5                | 1.2              | 1.2               | 0.0              | 0.0             | 11.7 0.00     |
| 140         | 17.3                | 1.0              | 1.0               | 0.0              | 0.0             | 10.4 0.00     |
| 160         | 15.6                | 0.9              | 0.9               | 0.0              | 0.0             | 9.3 0.00      |
| 180         | 14.2                | 0.9              | 0.9               | 0.0              | 0.0             | 8.5 0.00      |

Storage: Roof Storage

Project #160402005, 1146 Snow Street

## Modified Rational Method Calculations for Storage

|                                    |                   |  |     |          |         |           |
|------------------------------------|-------------------|--|-----|----------|---------|-----------|
| 100 yr Intensity<br>City of Ottawa | $I = a/(t + b)^c$ |  | a = | 1735.688 | t (min) | I (mm/hr) |
|                                    |                   |  | b = | 6.014    | 10      | 178.6     |
|                                    |                   |  | c = | 0.820    | 20      | 120.0     |
|                                    |                   |  |     |          | 30      | 91.9      |
|                                    |                   |  |     |          | 40      | 75.1      |
|                                    |                   |  |     |          | 50      | 64.0      |
|                                    |                   |  |     |          | 60      | 55.9      |
|                                    |                   |  |     |          | 70      | 49.8      |
|                                    |                   |  |     |          | 80      | 45.0      |
|                                    |                   |  |     |          | 90      | 41.1      |
|                                    |                   |  |     |          | 100     | 37.9      |
|                                    |                   |  |     |          | 110     | 35.2      |
|                                    |                   |  |     |          | 120     | 32.9      |

### 100 YEAR Predevelopment Target Release from the Existing Site

Subdrainage Area: Predevelopment Tributary Area to Outlet

Area (ha): 0.1520

C: 0.26

Estimated Time of Concentration after Development

| tc<br>(min) | I (100 yr)<br>(mm/hr) | Q100yr<br>(L/s) |
|-------------|-----------------------|-----------------|
| 10          | 178.6                 | 19.6            |

### 100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: CISTERN

Area (ha): 0.09

C: 1.00

Cistern

| tc<br>(min) | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
|-------------|-----------------------|------------------|-------------------|------------------|-----------------|
| 10          | 178.6                 | 5.9              | 3.0               | 2.9              | 1.8             |
| 20          | 120.0                 | 6.1              | 3.0               | 3.1              | 3.8             |
| 30          | 91.9                  | 6.2              | 3.0               | 3.2              | 5.8             |
| 40          | 75.1                  | 6.2              | 3.0               | 3.2              | 7.8             |
| 50          | 64.0                  | 6.2              | 3.0               | 3.2              | 9.7             |
| 60          | 55.9                  | 6.2              | 3.0               | 3.2              | 11.6            |
| 80          | 45.0                  | 6.1              | 3.0               | 3.2              | 15.1            |
| 100         | 37.9                  | 6.1              | 3.0               | 3.1              | 18.5            |
| 120         | 32.9                  | 5.7              | 3.0               | 2.7              | 19.4            |
| 140         | 29.2                  | 5.3              | 3.0               | 2.4              | 19.8            |
| 160         | 26.2                  | 5.1              | 3.0               | 2.1              | 19.9            |
| 180         | 23.9                  | 4.8              | 3.0               | 1.8              | 19.6            |

Storage: Cistern

| Stage                | Head<br>(m) | Discharge<br>(L/s) | Vreq<br>(cu. m) | Vavail<br>(cu. m) | Volume<br>Check |
|----------------------|-------------|--------------------|-----------------|-------------------|-----------------|
| 100-year Water Level | -           | -                  | 3.0             | 19.9              | 20.0 OK         |

Subdrainage Area: C500A

Area (ha): 0.04

C: 0.45

Controlled - Tributary

| tc<br>(min) | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
|-------------|-----------------------|------------------|-------------------|------------------|-----------------|
| 10          | 178.6                 | 8.4              | 1.6               | 6.8              | 4.1             |
| 20          | 120.0                 | 5.6              | 1.6               | 4.0              | 4.8             |
| 30          | 91.9                  | 4.3              | 1.6               | 2.7              | 4.9             |
| 40          | 75.1                  | 3.5              | 1.6               | 1.9              | 4.6             |
| 50          | 64.0                  | 3.0              | 1.6               | 1.4              | 4.2             |
| 60          | 55.9                  | 2.6              | 1.6               | 1.0              | 3.7             |
| 70          | 49.8                  | 2.3              | 1.6               | 0.7              | 3.1             |
| 80          | 45.0                  | 2.1              | 1.6               | 0.5              | 2.5             |
| 90          | 41.1                  | 1.9              | 1.6               | 0.3              | 1.8             |
| 100         | 37.9                  | 1.8              | 1.6               | 0.2              | 1.1             |
| 110         | 35.2                  | 1.6              | 1.6               | 0.1              | 0.4             |
| 120         | 32.9                  | 1.5              | 1.5               | 0.0              | 0.0             |

Storage: Perforated subdrain pipe and clear stone trench (City of Ottawa S29)

Orifice Diameter: LMF 40

Invert Elevation 72.4 m

T/G Elevation 73.8 m

Max Ponding Depth 0.0 m

Downstream W/L 70.4 m

Perforated subdrain pipe and clear stone trench

Length 46.1 m

Width 0.9 m

Depth 1.0 m

Porosity 0.4

Area 0.9 m2

| Stage                | Head<br>(m) | Discharge<br>(L/s) | Vreq<br>(cu. m) | Vavail<br>(cu. m) | Volume<br>Check |
|----------------------|-------------|--------------------|-----------------|-------------------|-----------------|
| 100-year Water Level | 73.8        | 1.4                | 1.6             | 4.9               | 15.7 OK         |

Subdrainage Area: R102B

Area (ha): 0.02

C: 1.00

Maximum Storage Depth: 150 mm

| tc<br>(min) | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) | Depth<br>(mm) |
|-------------|-----------------------|------------------|-------------------|------------------|-----------------|---------------|
| 10          | 178.6                 | 12.0             | 2.5               | 9.5              | 5.7             | 125.6 0.00    |
| 20          | 120.0                 | 8.1              | 2.5               | 5.6              | 6.7             | 131.5 0.00    |
| 30          | 91.9                  | 6.2              | 2.5               | 3.7              | 6.6             | 131.1 0.00    |
| 40          | 75.1                  | 5.1              | 2.5               | 2.5              | 6.1             | 128.0 0.00    |
| 50          | 64.0                  | 4.3              | 2.5               | 1.8              | 5.4             | 122.7 0.00    |
| 60          | 55.9                  | 3.8              | 2.5               | 1.2              | 4.5             | 114.6 0.00    |
| 80          | 45.0                  | 3.0              | 2.5               | 0.5              | 2.4             | 93.5 0.00     |
| 100         | 37.9                  | 2.6              | 2.5               | 0.0              | 0.2             | 36.0 0.00     |
| 120         | 32.9                  | 2.2              | 2.2               | 0.0              | 0.0             | 21.9 0.00     |
| 140         | 29.2                  | 2.0              | 2.0               | 0.0              | 0.0             | 19.4 0.00     |
| 160         | 26.2                  | 1.8              | 1.8               | 0.0              | 0.0             | 17.5 0.00     |
| 180         | 23.9                  | 1.6              | 1.6               | 0.0              | 0.0             | 15.9 0.00     |

Storage: Roof Storage

# Stormwater Management Calculations

Project #160402005, 1146 Snow Street

Modified Rational Method Calculations for Storage

|                                                                                                             | Depth<br>(mm)       | Head<br>(m)      | Discharge<br>(L/s) | Vreq<br>(cu. m)  | Vavail<br>(cu. m)            | Discharge<br>Check |
|-------------------------------------------------------------------------------------------------------------|---------------------|------------------|--------------------|------------------|------------------------------|--------------------|
| 5-year Water Level                                                                                          | 91.0                | 0.1              | 2.5                | 2.3              | 9.7                          | 0.0                |
| <b>Subdrainage Area:</b> R102A<br><b>Area (ha):</b> 0.07<br><b>C:</b> 0.90<br>Maximum Storage Depth: 150 mm |                     |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) | Depth<br>(mm)      |
| 10                                                                                                          | 104.2               | 17.6             | 2.9                | 14.7             | 8.8                          | 102.7              |
| 20                                                                                                          | 70.3                | 11.8             | 3.0                | 8.8              | 10.6                         | 108.6              |
| 30                                                                                                          | 53.9                | 9.1              | 3.0                | 6.1              | 10.9                         | 109.6              |
| 40                                                                                                          | 44.2                | 7.4              | 3.0                | 4.4              | 10.7                         | 108.8              |
| 50                                                                                                          | 37.7                | 6.3              | 3.0                | 3.4              | 10.1                         | 107.0              |
| 60                                                                                                          | 32.9                | 5.6              | 2.9                | 2.6              | 9.4                          | 104.8              |
| 80                                                                                                          | 26.6                | 4.5              | 2.8                | 1.6              | 7.9                          | 99.5               |
| 100                                                                                                         | 22.4                | 3.8              | 2.7                | 1.1              | 6.5                          | 92.1               |
| 120                                                                                                         | 19.5                | 3.3              | 2.6                | 0.7              | 5.2                          | 85.0               |
| 140                                                                                                         | 17.3                | 2.9              | 2.4                | 0.5              | 4.0                          | 78.5               |
| 160                                                                                                         | 15.6                | 2.6              | 2.3                | 0.3              | 3.1                          | 71.7               |
| 180                                                                                                         | 14.2                | 2.4              | 2.2                | 0.2              | 2.4                          | 64.6               |
| Storage: Roof Storage                                                                                       |                     |                  |                    |                  |                              |                    |
|                                                                                                             | Depth<br>(mm)       | Head<br>(m)      | Discharge<br>(L/s) | Vreq<br>(cu. m)  | Vavail<br>(cu. m)            | Discharge<br>Check |
| 5-year Water Level                                                                                          | 109.6               | 0.1              | 3.0                | 10.9             | 26.9                         | 0.0                |
| <b>Subdrainage Area:</b> RAMP-2<br><b>Area (ha):</b> 0.001<br><b>C:</b> 0.90<br>Uncontrolled - Tributary    |                     |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 104.2               | 0.3              | 0.3                |                  |                              |                    |
| 20                                                                                                          | 70.3                | 0.2              | 0.2                |                  |                              |                    |
| 30                                                                                                          | 53.9                | 0.2              | 0.2                |                  |                              |                    |
| 40                                                                                                          | 44.2                | 0.1              | 0.1                |                  |                              |                    |
| 50                                                                                                          | 37.7                | 0.1              | 0.1                |                  |                              |                    |
| 60                                                                                                          | 32.9                | 0.1              | 0.1                |                  |                              |                    |
| 70                                                                                                          | 29.4                | 0.1              | 0.1                |                  |                              |                    |
| 80                                                                                                          | 26.6                | 0.1              | 0.1                |                  |                              |                    |
| 90                                                                                                          | 24.3                | 0.1              | 0.1                |                  |                              |                    |
| 100                                                                                                         | 22.4                | 0.1              | 0.1                |                  |                              |                    |
| 110                                                                                                         | 20.8                | 0.1              | 0.1                |                  |                              |                    |
| 120                                                                                                         | 19.5                | 0.1              | 0.1                |                  |                              |                    |
| <b>Subdrainage Area:</b> RAMP-1<br><b>Area (ha):</b> 0.001<br><b>C:</b> 0.90<br>Uncontrolled - Tributary    |                     |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 104.2               | 0.4              | 0.4                |                  |                              |                    |
| 20                                                                                                          | 70.3                | 0.2              | 0.2                |                  |                              |                    |
| 30                                                                                                          | 53.9                | 0.2              | 0.2                |                  |                              |                    |
| 40                                                                                                          | 44.2                | 0.1              | 0.1                |                  |                              |                    |
| 50                                                                                                          | 37.7                | 0.1              | 0.1                |                  |                              |                    |
| 60                                                                                                          | 32.9                | 0.1              | 0.1                |                  |                              |                    |
| 70                                                                                                          | 29.4                | 0.1              | 0.1                |                  |                              |                    |
| 80                                                                                                          | 26.6                | 0.1              | 0.1                |                  |                              |                    |
| 90                                                                                                          | 24.3                | 0.1              | 0.1                |                  |                              |                    |
| 100                                                                                                         | 22.4                | 0.1              | 0.1                |                  |                              |                    |
| 110                                                                                                         | 20.8                | 0.1              | 0.1                |                  |                              |                    |
| 120                                                                                                         | 19.5                | 0.1              | 0.1                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-3<br><b>Area (ha):</b> 0.001<br><b>C:</b> 0.20<br>Uncontrolled - Non-Tributary |                     |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 104.2               | 0.1              | 0.1                |                  |                              |                    |
| 20                                                                                                          | 70.3                | 0.0              | 0.0                |                  |                              |                    |
| 30                                                                                                          | 53.9                | 0.0              | 0.0                |                  |                              |                    |
| 40                                                                                                          | 44.2                | 0.0              | 0.0                |                  |                              |                    |
| 50                                                                                                          | 37.7                | 0.0              | 0.0                |                  |                              |                    |
| 60                                                                                                          | 32.9                | 0.0              | 0.0                |                  |                              |                    |
| 70                                                                                                          | 29.4                | 0.0              | 0.0                |                  |                              |                    |
| 80                                                                                                          | 26.6                | 0.0              | 0.0                |                  |                              |                    |
| 90                                                                                                          | 24.3                | 0.0              | 0.0                |                  |                              |                    |
| 100                                                                                                         | 22.4                | 0.0              | 0.0                |                  |                              |                    |
| 110                                                                                                         | 20.8                | 0.0              | 0.0                |                  |                              |                    |
| 120                                                                                                         | 19.5                | 0.0              | 0.0                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-2<br><b>Area (ha):</b> 0.01<br><b>C:</b> 0.51<br>Uncontrolled - Non-Tributary  |                     |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 104.2               | 0.9              | 0.9                |                  |                              |                    |
| 20                                                                                                          | 70.3                | 0.6              | 0.6                |                  |                              |                    |
| 30                                                                                                          | 53.9                | 0.5              | 0.5                |                  |                              |                    |
| 40                                                                                                          | 44.2                | 0.4              | 0.4                |                  |                              |                    |
| 50                                                                                                          | 37.7                | 0.3              | 0.3                |                  |                              |                    |
| 60                                                                                                          | 32.9                | 0.3              | 0.3                |                  |                              |                    |
| 70                                                                                                          | 29.4                | 0.2              | 0.2                |                  |                              |                    |
| 80                                                                                                          | 26.6                | 0.2              | 0.2                |                  |                              |                    |
| 90                                                                                                          | 24.3                | 0.2              | 0.2                |                  |                              |                    |
| 100                                                                                                         | 22.4                | 0.2              | 0.2                |                  |                              |                    |
| 110                                                                                                         | 20.8                | 0.2              | 0.2                |                  |                              |                    |
| 120                                                                                                         | 19.5                | 0.2              | 0.2                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-1<br><b>Area (ha):</b> 0.01<br>Uncontrolled - Non-Tributary                    |                     |                  |                    |                  |                              |                    |

Project #160402005, 1146 Snow Street

Modified Rational Method Calculations for Storage

|                                                                                                             | Depth<br>(mm)         | Head<br>(m)      | Discharge<br>(L/s) | Vreq<br>(cu. m)  | Vavail<br>(cu. m)            | Discharge<br>Check |
|-------------------------------------------------------------------------------------------------------------|-----------------------|------------------|--------------------|------------------|------------------------------|--------------------|
| 100-year Water Level                                                                                        | 131.5                 | 0.1              | 2.5                | 6.7              | 9.7                          | 0.0                |
| <b>Subdrainage Area:</b> R102A<br><b>Area (ha):</b> 0.07<br><b>C:</b> 1.00<br>Maximum Storage Depth: 150 mm |                       |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) | Depth<br>(mm)      |
| 10                                                                                                          | 178.6                 | 33.4             | 3.4                | 30.0             | 18.0                         | 130.3              |
| 20                                                                                                          | 120.0                 | 22.5             | 3.6                | 18.9             | 22.6                         | 140.5              |
| 30                                                                                                          | 91.9                  | 17.2             | 3.7                | 13.5             | 24.3                         | 144.3              |
| 40                                                                                                          | 75.1                  | 14.1             | 3.7                | 10.4             | 24.9                         | 145.5              |
| 50                                                                                                          | 64.0                  | 12.0             | 3.7                | 8.3              | 24.8                         | 145.4              |
| 60                                                                                                          | 55.9                  | 10.5             | 3.7                | 6.8              | 24.4                         | 144.5              |
| 80                                                                                                          | 45.0                  | 8.4              | 3.6                | 4.8              | 23.0                         | 141.4              |
| 100                                                                                                         | 37.9                  | 7.1              | 3.5                | 3.5              | 21.3                         | 137.5              |
| 120                                                                                                         | 32.9                  | 6.2              | 3.5                | 2.7              | 19.4                         | 133.3              |
| 140                                                                                                         | 29.2                  | 5.5              | 3.4                | 2.1              | 17.4                         | 129.0              |
| 160                                                                                                         | 26.2                  | 4.9              | 3.3                | 1.6              | 15.5                         | 124.5              |
| 180                                                                                                         | 23.9                  | 4.5              | 3.2                | 1.3              | 13.8                         | 119.0              |
| Storage: Roof Storage                                                                                       |                       |                  |                    |                  |                              |                    |
|                                                                                                             | Depth<br>(mm)         | Head<br>(m)      | Discharge<br>(L/s) | Vreq<br>(cu. m)  | Vavail<br>(cu. m)            | Discharge<br>Check |
| 100-year Water Level                                                                                        | 145.5                 | 0.1              | 3.7                | 24.9             | 26.9                         | 0.0                |
| <b>Subdrainage Area:</b> RAMP-2<br><b>Area (ha):</b> 0.001<br><b>C:</b> 1.00<br>Uncontrolled - Tributary    |                       |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 178.6                 | 0.6              | 0.6                |                  |                              |                    |
| 20                                                                                                          | 120.0                 | 0.4              | 0.4                |                  |                              |                    |
| 30                                                                                                          | 91.9                  | 0.3              | 0.3                |                  |                              |                    |
| 40                                                                                                          | 75.1                  | 0.2              | 0.2                |                  |                              |                    |
| 50                                                                                                          | 64.0                  | 0.2              | 0.2                |                  |                              |                    |
| 60                                                                                                          | 55.9                  | 0.2              | 0.2                |                  |                              |                    |
| 70                                                                                                          | 49.8                  | 0.2              | 0.2                |                  |                              |                    |
| 80                                                                                                          | 45.0                  | 0.1              | 0.1                |                  |                              |                    |
| 90                                                                                                          | 41.1                  | 0.1              | 0.1                |                  |                              |                    |
| 100                                                                                                         | 37.9                  | 0.1              | 0.1                |                  |                              |                    |
| 110                                                                                                         | 35.2                  | 0.1              | 0.1                |                  |                              |                    |
| 120                                                                                                         | 32.9                  | 0.1              | 0.1                |                  |                              |                    |
| <b>Subdrainage Area:</b> RAMP-1<br><b>Area (ha):</b> 0.001<br><b>C:</b> 1.00<br>Uncontrolled - Tributary    |                       |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 178.6                 | 0.7              | 0.7                |                  |                              |                    |
| 20                                                                                                          | 120.0                 | 0.4              | 0.4                |                  |                              |                    |
| 30                                                                                                          | 91.9                  | 0.3              | 0.3                |                  |                              |                    |
| 40                                                                                                          | 75.1                  | 0.3              | 0.3                |                  |                              |                    |
| 50                                                                                                          | 64.0                  | 0.2              | 0.2                |                  |                              |                    |
| 60                                                                                                          | 55.9                  | 0.2              | 0.2                |                  |                              |                    |
| 70                                                                                                          | 49.8                  | 0.2              | 0.2                |                  |                              |                    |
| 80                                                                                                          | 45.0                  | 0.2              | 0.2                |                  |                              |                    |
| 90                                                                                                          | 41.1                  | 0.2              | 0.2                |                  |                              |                    |
| 100                                                                                                         | 37.9                  | 0.1              | 0.1                |                  |                              |                    |
| 110                                                                                                         | 35.2                  | 0.1              | 0.1                |                  |                              |                    |
| 120                                                                                                         | 32.9                  | 0.1              | 0.1                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-3<br><b>Area (ha):</b> 0.001<br><b>C:</b> 0.25<br>Uncontrolled - Non-Tributary |                       |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 178.6                 | 0.1              | 0.1                |                  |                              |                    |
| 20                                                                                                          | 120.0                 | 0.1              | 0.1                |                  |                              |                    |
| 30                                                                                                          | 91.9                  | 0.1              | 0.1                |                  |                              |                    |
| 40                                                                                                          | 75.1                  | 0.0              | 0.0                |                  |                              |                    |
| 50                                                                                                          | 64.0                  | 0.0              | 0.0                |                  |                              |                    |
| 60                                                                                                          | 55.9                  | 0.0              | 0.0                |                  |                              |                    |
| 70                                                                                                          | 49.8                  | 0.0              | 0.0                |                  |                              |                    |
| 80                                                                                                          | 45.0                  | 0.0              | 0.0                |                  |                              |                    |
| 90                                                                                                          | 41.1                  | 0.0              | 0.0                |                  |                              |                    |
| 100                                                                                                         | 37.9                  | 0.0              | 0.0                |                  |                              |                    |
| 110                                                                                                         | 35.2                  | 0.0              | 0.0                |                  |                              |                    |
| 120                                                                                                         | 32.9                  | 0.0              | 0.0                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-2<br><b>Area (ha):</b> 0.01<br><b>C:</b> 0.64<br>Uncontrolled - Non-Tributary  |                       |                  |                    |                  |                              |                    |
| tc<br>(min)                                                                                                 | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s)  | Qstored<br>(L/s) | Vstored<br>(m <sup>3</sup> ) |                    |
| 10                                                                                                          | 178.6                 | 1.9              | 1.9                |                  |                              |                    |
| 20                                                                                                          | 120.0                 | 1.3              | 1.3                |                  |                              |                    |
| 30                                                                                                          | 91.9                  | 1.0              | 1.0                |                  |                              |                    |
| 40                                                                                                          | 75.1                  | 0.8              | 0.8                |                  |                              |                    |
| 50                                                                                                          | 64.0                  | 0.7              | 0.7                |                  |                              |                    |
| 60                                                                                                          | 55.9                  | 0.6              | 0.6                |                  |                              |                    |
| 70                                                                                                          | 49.8                  | 0.5              | 0.5                |                  |                              |                    |
| 80                                                                                                          | 45.0                  | 0.5              | 0.5                |                  |                              |                    |
| 90                                                                                                          | 41.1                  | 0.4              | 0.4                |                  |                              |                    |
| 100                                                                                                         | 37.9                  | 0.4              | 0.4                |                  |                              |                    |
| 110                                                                                                         | 35.2                  | 0.4              | 0.4                |                  |                              |                    |
| 120                                                                                                         | 32.9                  | 0.3              | 0.3                |                  |                              |                    |
| <b>Subdrainage Area:</b> UNC-1<br><b>Area (ha):</b> 0.01<br>Uncontrolled - Non-Tributary                    |                       |                  |                    |                  |                              |                    |

# Stormwater Management Calculations

## Project #160402005, 1146 Snow Street Modified Rational Method Calculations for Storage

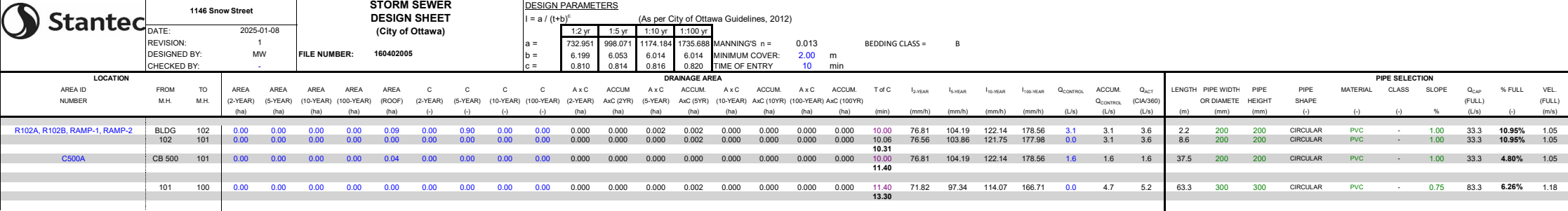
| C: 0.43                              |                     |                  |                   |                  |                 |
|--------------------------------------|---------------------|------------------|-------------------|------------------|-----------------|
| tc<br>(min)                          | I (5 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
| 10                                   | 104.2               | 1.7              | 1.7               |                  |                 |
| 20                                   | 70.3                | 1.1              | 1.1               |                  |                 |
| 30                                   | 53.9                | 0.9              | 0.9               |                  |                 |
| 40                                   | 44.2                | 0.7              | 0.7               |                  |                 |
| 50                                   | 37.7                | 0.6              | 0.6               |                  |                 |
| 60                                   | 32.9                | 0.5              | 0.5               |                  |                 |
| 70                                   | 29.4                | 0.5              | 0.5               |                  |                 |
| 80                                   | 26.6                | 0.4              | 0.4               |                  |                 |
| 90                                   | 24.3                | 0.4              | 0.4               |                  |                 |
| 100                                  | 22.4                | 0.4              | 0.4               |                  |                 |
| 110                                  | 20.8                | 0.3              | 0.3               |                  |                 |
| 120                                  | 19.5                | 0.3              | 0.3               |                  |                 |
|                                      |                     |                  |                   |                  |                 |
|                                      |                     |                  |                   |                  |                 |
|                                      |                     |                  |                   |                  |                 |
| <b>SUMMARY TO OUTLET</b>             |                     |                  |                   |                  |                 |
| Tributary Area                       |                     |                  | 0.221 ha          | Vrequired        | Vavailable*     |
| Total 5yr Uncontrolled Flow to Sewer |                     |                  | 0.6 L/s           |                  |                 |
| Total 5yr Controlled Flow to Sewer   |                     |                  | 4.6 L/s           | 21.5             | 72.3 m³         |
| Non-Tributary Area                   |                     |                  | 0.023 ha          |                  |                 |
| Total 5yr Flow Uncontrolled          |                     |                  | 2.6 L/s           |                  |                 |
| Total Area                           |                     |                  | 0.244 ha          |                  |                 |
| Total 5yr Flow                       |                     |                  | 7.9 L/s           |                  |                 |
| Target                               |                     |                  | 11.4 L/s          |                  |                 |

## Project #160402005, 1146 Snow Street Modified Rational Method Calculations for Storage

| C: 0.54                                |                       |                  |                   |                  |                 |
|----------------------------------------|-----------------------|------------------|-------------------|------------------|-----------------|
| tc<br>(min)                            | I (100 yr)<br>(mm/hr) | Qactual<br>(L/s) | Qrelease<br>(L/s) | Qstored<br>(L/s) | Vstored<br>(m³) |
| 10                                     | 178.6                 | 3.6              | 3.6               |                  |                 |
| 20                                     | 120.0                 | 2.4              | 2.4               |                  |                 |
| 30                                     | 91.9                  | 1.9              | 1.9               |                  |                 |
| 40                                     | 75.1                  | 1.5              | 1.5               |                  |                 |
| 50                                     | 64.0                  | 1.3              | 1.3               |                  |                 |
| 60                                     | 55.9                  | 1.1              | 1.1               |                  |                 |
| 70                                     | 49.8                  | 1.0              | 1.0               |                  |                 |
| 80                                     | 45.0                  | 0.9              | 0.9               |                  |                 |
| 90                                     | 41.1                  | 0.8              | 0.8               |                  |                 |
| 100                                    | 37.9                  | 0.8              | 0.8               |                  |                 |
| 110                                    | 35.2                  | 0.7              | 0.7               |                  |                 |
| 120                                    | 32.9                  | 0.7              | 0.7               |                  |                 |
|                                        |                       |                  |                   |                  |                 |
|                                        |                       |                  |                   |                  |                 |
|                                        |                       |                  |                   |                  |                 |
| <b>SUMMARY TO OUTLET</b>               |                       |                  |                   |                  |                 |
| Tributary Area                         |                       |                  | 0.221 ha          | Vrequired        | Vavailable*     |
| Total 100yr Uncontrolled Flow to Sewer |                       |                  | 1.2 L/s           |                  |                 |
| Total 100yr Controlled Flow to Sewer   |                       |                  | 4.6 L/s           | 56.4             | 72.3 m³         |
| Non-Tributary Area                     |                       |                  | 0.023 ha          |                  |                 |
| Total 100yr Flow Uncontrolled          |                       |                  | 5.6 L/s           |                  |                 |
| Total Area                             |                       |                  | 0.244 ha          |                  |                 |
| Total 100yr Flow                       |                       |                  | 11.4 L/s          |                  |                 |
| Target                                 |                       |                  | 11.4 L/s          |                  |                 |

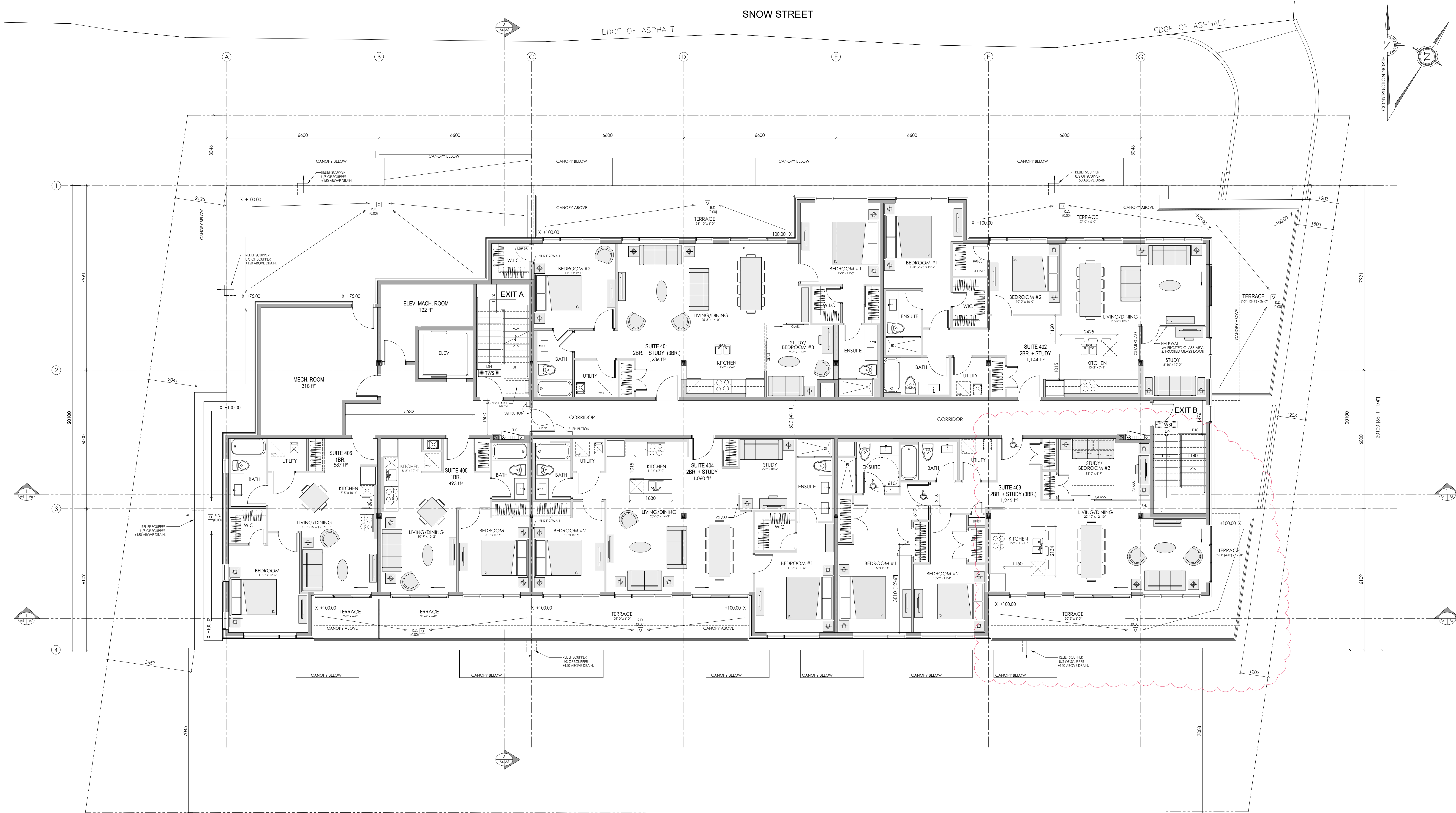
## **D.2 Storm Sewer Design Sheet**





## **D.3 Roof Drainage Plan**

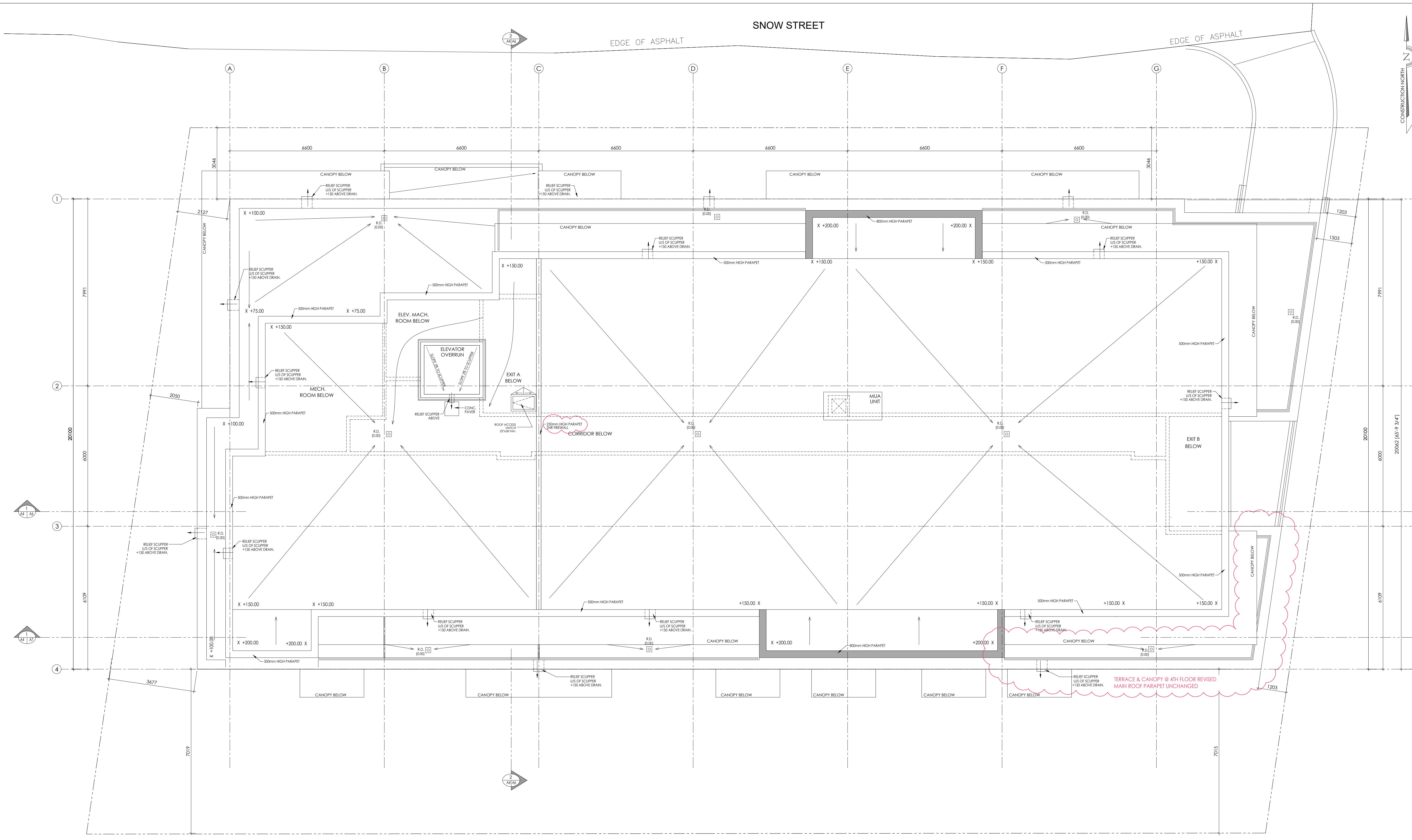




**4TH FLOOR PLAN**  
 SCALE= 1:75    GROSS FLOOR AREA = 673.01m<sup>2</sup> (7,244.21ft<sup>2</sup>)

**6 UNITS**  
 2- 1 BEDROOM  
 4- 2 BEDROOM

REV. - FEB. 4th, 2025



ROOF PLAN

SCALE= 1:75

REV. - FEB. 4th, 2025

## **D.4 SWM Quality Control Confirmation**



## Wu, Michael

---

**From:** Unrau, Derek <derek.unrau@ottawa.ca>  
**Sent:** November 25, 2024 13:43  
**To:** Wu, Michael  
**Cc:** Gladish, Alyssa; Haynes, Kris  
**Subject:** RE: File No. PC2024-0084 - 1164 Snow Street SWM Quality Control Criteria

Hi Michael,

As the proposed is all residential there are no stormwater quality controls required such as an OGS unit, etc...

Note, that as provided in the pre-consultation feedback form (Page 6., item 14.a.), a stormwater sewer extension will be required as there are no ditches on the street to convey the flows.

Please let me know if you have any questions.

Regards,

**Derek Unrau, C.E.T.**

Project Manager

Planning, Development and Building Services Department (PDBS)

Development Review - East 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 27670, [Derek.Unrau@ottawa.ca](mailto:Derek.Unrau@ottawa.ca)



---

**From:** Wu, Michael <Michael.Wu@stantec.com>  
**Sent:** November 25, 2024 12:59 PM  
**To:** Unrau, Derek <derek.unrau@ottawa.ca>  
**Cc:** Gladish, Alyssa <Alyssa.Gladish@stantec.com>  
**Subject:** File No. PC2024-0084 - 1164 Snow Street SWM Quality Control Criteria

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Good afternoon, Derek:

Hope this email finds you well. We are looking to confirm if there are any stormwater quality control measures that are applicable to the 1146 Snow Street site.

Thanks,

**Michael Wu** EIT

Civil Engineering Intern, Community Development

Direct: 1 (613) 738-6033  
Michael.Wu@stantec.com

Stantec  
300-1331 Clyde Avenue  
Ottawa ON K2C 3G4



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## **Appendix E External Reports**



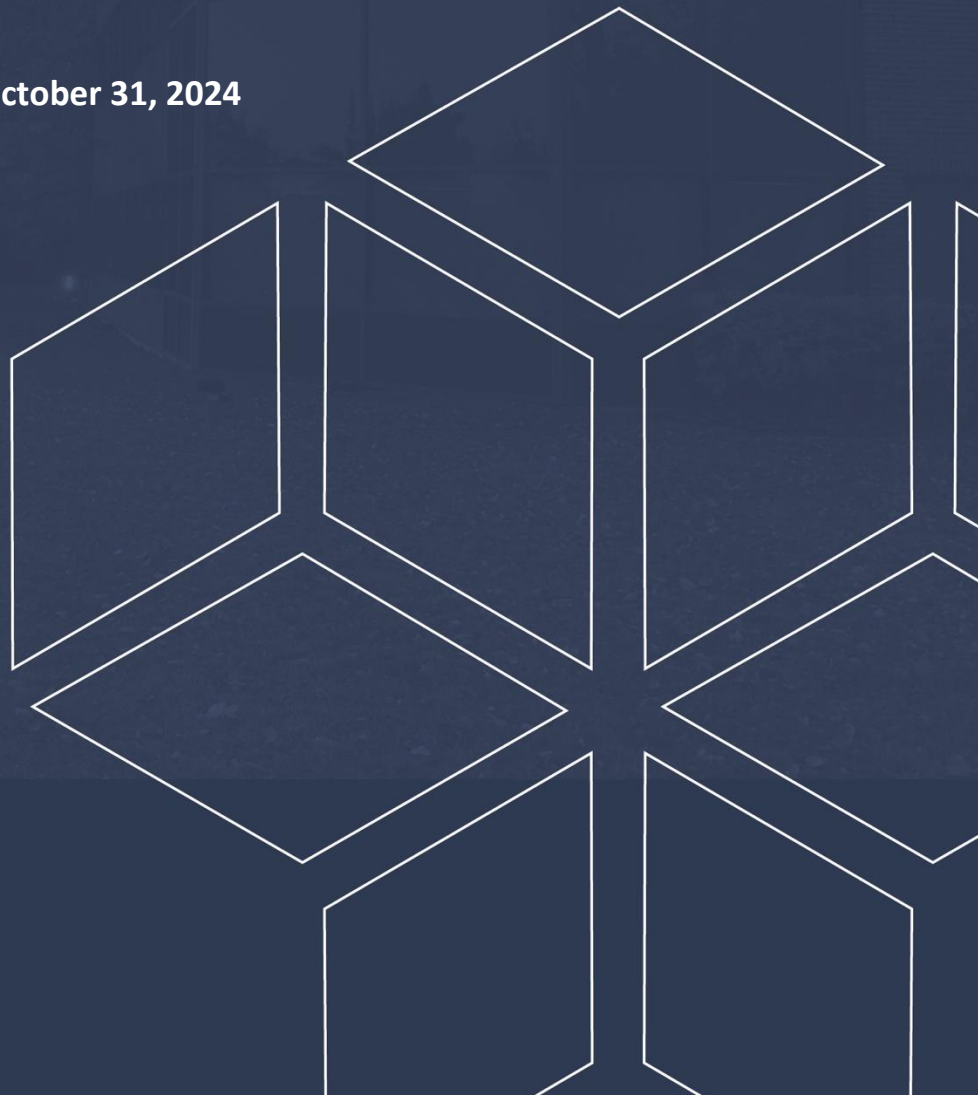
# **Geotechnical Investigation**

## **Proposed Residential Building**

1146 Snow Street  
Ottawa, Ontario

Prepared for 1146 Snow Street Inc.

Report PG7295 -1 dated October 31, 2024



## **4.0 Observations**

### **4.1 Surface Conditions**

The site is currently vacant with low vegetation. However, historical pictures show that two small buildings on the northwestern portion of the site which were demolished. Approximately 3 to 4 m deep open excavation was observed within the western portion of the site due to the excavation of the existing house within that area. The site is bordered to the east by vacant land featuring mature vegetation composed of large trees, to the north by Snow Street, to the west and south by residential development.

The site is gently sloped down from south to north. The site is approximately 0.5 to 1 m above the grade of Snow Street.

### **4.2 Subsurface Profile**

#### **Fill**

Generally, the subsurface profile encountered at the boreholes consists of loose fill comprised of brown silty sand, gravel and traces of organics.

#### **Silty Sand**

The fill was generally underlain by a loose to compact brown silty sand layer. An intermittent layer of compact grey silty sand to sandy silt was observed underlying the upper fill layer in BH 3-24. Furthermore, traces of gravel and organics were observed in the silty sand layer at BH 3-24.

#### **Sandy Silt**

The silty sand was noted to be underlain by a compact to dense brown sandy silt in BH 3-24 and BH 1-24, respectively.

#### **Glacial Till**

The silty sand or sandy silt was generally underlain by a compact to dense glacial till comprised of brown to grey silty sand with gravel. The glacial till was observed to transition to a compact sandy silt with traces of gravel and shale in all the boreholes except for BH 1-24.

#### **Bedrock**

Practical refusal to augering was generally encountered between 4.5 and 5.7 m below ground surface. Bedrock coring was conducted at boreholes BH 1-24 and BH 2A-24, beginning at depths of 5.66 m and 4.50 m below ground surface, respectively, and extending to the final depths of the boreholes. The bedrock consists of black shale from the Billings Formation.

Based on the RQDs of the rock core samples recovered, the bedrock quality ranges from fair to excellent, with an hardness typically between 2 and 3 on the Mohs hardness scale.

### 4.3 Groundwater

Groundwater monitoring wells were installed in BH 1-24 & BH 3-24. Flexible standpipe piezometers were installed in the remainder of the boreholes. Groundwater level readings were recorded on October 8, 2024, in all the boreholes. The recorded groundwater level readings are presented in the Soil Profile and Test Data sheet presented in Appendix 1.

The observed groundwater levels readings obtained from the current field program are summarized in Table 1.

| <b>Table 1 - Summary of Groundwater Level Readings</b>                                                                               |                                     |                              |                                  |                       |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------------------------|-----------------------|
| <b>Test Hole Number</b>                                                                                                              | <b>Ground Surface Elevation (m)</b> | <b>Groundwater Depth (m)</b> | <b>Groundwater Elevation (m)</b> | <b>Recording Date</b> |
| BH 1-24*                                                                                                                             | 74.78                               | 4.19                         | 70.59                            | October 8, 2024       |
| BH 2-24                                                                                                                              | 74.08                               | 3.76                         | 70.32                            | October 8, 2024       |
| BH 2A-24                                                                                                                             | 74.06                               | 4.13                         | 69.93                            | October 8, 2024       |
| BH 3-24*                                                                                                                             | 74.45                               | 4.13                         | 70.32                            | October 8, 2024       |
| <b>Note:</b><br>- The ground surface elevations are referenced to a geodetic datum.<br>- * Borehole with groundwater monitoring well |                                     |                              |                                  |                       |

Long-term groundwater levels can also be estimated based on the observed color, moisture levels and consistency of the recovered soil samples. Based on these observations, the long-term groundwater level is anticipated at approximate depths of 3.5 to 4.5 m below the existing ground surface.

It should be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.

## **5.0 Discussion**

### **5.1 Geotechnical Assessment**

#### **Foundation Design Considerations**

From a geotechnical perspective, the subject site is considered satisfactory for the proposed development. The proposed residential building is anticipated to be founded on spread footings placed on a loose to compact silty bearing surface and/or approved engineered fill.

Based on available drawing, the elevator shaft footing foundation will be located at an elevation ranging from 69 to 70 m. Therefore, bedrock removal might be required to complete the elevator shaft. Hoe ramming is an option where only small quantities of bedrock need to be removed. It is expected that the bedrock removal will all be completed by hoe ramming and excavating, and that blasting will not be used for this project.

The above and other considerations are further discussed in the following sections.

### **5.2 Site Grading and Preparation**

#### **Stripping Depth**

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, pipe bedding and other settlement sensitive structures. Any construction debris should be entirely removed from within the perimeter of all buildings.

The existing fill material, free of organic materials, should be reviewed by Paterson personnel at the time of construction to determine if the existing fill can be left in place below paved areas.

#### **Bedrock Removal**

Based on the bedrock encountered in the area, it is expected the bedrock removal will be completed by hoe-ramming. In areas of weathered bedrock and where only a small quantity of bedrock is to be removed, bedrock removal may be completed by an excavator.

Vibration may be induced by rock removal activities. As a general guideline, peak particle velocities (measured at the structures) should not exceed 50 mm/s during the blasting program to reduce the risks of damage to the existing structures. The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

## 5.7 Pavement Structure

The flexible pavement structure presented in Table 2 and Table 3 should be used for driveways and car only parking areas and at grade access lanes and heavy loading parking areas.

| <b>Table 2 - Recommended Pavement Structure – Driveways Car Only Parking Areas</b>                                     |                                                                |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Thickness (mm)</b>                                                                                                  | <b>Material Description</b>                                    |
| 50                                                                                                                     | <b>Wear Course</b> - HL-3 or Superpave 12.5 Asphaltic Concrete |
| 150                                                                                                                    | <b>BASE</b> - OPSS Granular A Crushed Stone                    |
| 300                                                                                                                    | <b>SUBBASE</b> - OPSS Granular B Type II                       |
| <b>SUBGRADE</b> - Either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or fill |                                                                |

| <b>Table 3 - Recommended Pavement Structure – Access Lanes</b>                                                                                  |                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Thickness (mm)</b>                                                                                                                           | <b>Material Description</b>                                      |
| 40                                                                                                                                              | <b>Wear Course</b> - HL-3 or Superpave 12.5 Asphaltic Concrete   |
| 50                                                                                                                                              | <b>Binder Course</b> - HL-8 or Superpave 19.0 Asphaltic Concrete |
| 150                                                                                                                                             | <b>BASE</b> - OPSS Granular A Crushed Stone                      |
| 400                                                                                                                                             | <b>SUBBASE</b> - OPSS Granular B Type II                         |
| <b>SUBGRADE</b> - Either fill, in situ soil, select subgrade material or OPSS Granular B Type I or II material placed over in situ soil or fill |                                                                  |

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type I or Type II material.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 98% of the material's SPMDD using suitable compaction equipment.

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for parking areas and local roadways and PG 64-34 asphalt cement should be used for roadways with bus traffic. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable vibratory equipment.

The proposed pavement structure, where it abuts the existing pavement, should match the existing pavement layers. It is recommended that a 300 mm wide and 50 mm deep stepped joint be provided where the new asphalt layer joins with the existing asphalt layer to provide more resistance to cracking at the joint.

## 7.0 Recommendations

For the foundation design data provided herein to be applicable that a material testing and observation services program is required to be completed.

The following aspects be performed by the geotechnical consultant:

- ☐ Review preliminary and detailed grading, servicing, and structural plan(s) from a geotechnical perspective.
- ☐ Review of the geotechnical aspects of the excavation contractor's shoring design, prior to construction, if applicable.
- ☐ Review of architectural plans pertaining to foundation and underfloor drainage systems and waterproofing details for elevator shafts.

For the foundation design data provided herein to be applicable, a material testing and observation services program is required to be completed. The following aspects be performed by Paterson:

- ☐ Review the bedrock stabilization and excavation requirements at the time of construction.
- ☐ Review and inspection of the installation of the foundation and underfloor drainage systems and elevator waterproofing.
- ☐ Observation of all bearing surfaces prior to the placement of concrete.
- ☐ Sampling and testing of the concrete and fill materials.
- ☐ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ☐ Observation of all subgrades prior to backfilling.
- ☐ Field density tests to determine the level of compaction achieved.
- ☐ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming the construction has been conducted in general accordance with the recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by Paterson. All excess soil must be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management*.

## 8.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. We request that we be permitted to review the grading plan once available and our recommendations when the drawings and specifications are complete.

A geotechnical investigation of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. The extent of the limited area depends on the soil, bedrock and groundwater conditions, as well the history of the site reflecting natural, construction, and other activities. Should any conditions at the site be encountered which differ from those at the test locations, we request notification immediately in order to permit reassessment of our recommendations.

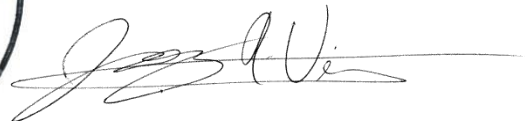
The recommendations provided in this report are intended for the use of design professionals associated with this project. Contractors bidding on or undertaking the work should examine the factual information contained in this report and the site conditions, satisfy themselves as to the adequacy of the information provided for construction purposes, supplement the factual information if required, and develop their own interpretation of the factual information based on both their and their subcontractor's construction methods, equipment capabilities and schedules.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than 1146 Snow Street Inc. or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

**Paterson Group Inc.**



Fabrice Venadiambu, P. Eng., ing.



Joey R. Villeneuve, M.A.Sc., P.Eng, ing.

**Report Distribution:**

- ☐ 1146 Snow Street Inc. (e-mail copy)
- ☐ Paterson Group Inc (1 copy)



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