283-285 MCLEOD STREET SITE SERVICING AND STORMWATER MANAGEMENT REPORT

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1 Introduction

Stantec Consulting Ltd. has been commissioned by REZY Properties Inc. to prepare the following Site Servicing and Stormwater Management (SWM) report in support of a Site Plan Control (SPC) application for the proposed 5-storey residential development at 283 and 285 McLeod Street in the City of Ottawa.

The 0.08 ha site is situated on the north side of McLeod Street, just east of the intersection between McLeod and O'Connor Streets. The Zoning By-Law Amendment, Official Plan Amendment, and Heritage applications for this site were approved in November 2023. The existing site contains two existing buildings, which will be demolished to allow for the development. The site is bound by McLeod Street and the Museum of Nature to the south, an existing commercial development to the north, and existing residential developments to the west, northeast, and east, as shown in **Figure 1.1** below.

Figure 1.1: Location Map

The proposed 0.08 ha development will see the amalgamation of Lots 283 and 285 and will consist of two building portions: The five-storey portion along the full length of the rear of the building, and two three-storey portions at the front (separated by the parking garage ramp) which mimic the appearance of two houses. Colizza Bruni Architecture Inc. have prepared a Site Plan of the proposed development dated March 25, 2024 (see **Appendix A.1**). The unit type breakdown is listed in **Table 1.1** below.

Table 1.1: Unit Type Breakdown

Unit Type	Number
Bachelor	6
1 Bedroom	11
1 Bedroom + Den	3
2 Bedroom	10
2 Bedroom + Den	1
Total	**31**

1.1 Objective

This site servicing and stormwater management (SWM) report presents a servicing scheme that is free of conflicts, provides site servicing in compliance 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 McLeod Street right of way (ROW) were obtained from available as-built drawings and site topographic survey (see **Appendix A.2**).

Criteria and constraints provided by the City of Ottawa have been used as a basis for the detailed servicing design of the proposed development as follows:

- Potable Water Servicing
    - Estimated water demands to characterize the proposed feed(s) for the proposed development which will connect to the existing 203 mm diameter watermain within McLeod Street.
    - 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 connect to the existing 525 mm diameter combined sewer within McLeod Street.
- Storm Sewer Servicing
    - Define major and minor conveyance systems in conjunction with the proposed grading plan.
    - Determine the stormwater management storage requirements to meet the allowable release rate for the site.
    - Define and size the proposed storm service laterals that will connect to the existing 525 mm diameter municipal combined sewer within McLeod Street.
- Prepare a grading plan in accordance with the proposed site plan and existing grades.

In support of the Site Plan Control Application, civil design drawings have been drafted to illustrate the proposed internal servicing scheme for the site including the following set:

- DWG EC/DS-1 Erosion Control and Detail Sheet
- DWG EXRM-1 Existing Conditions and Removals Plan
- DWG GP-1 Grading Plan
- DWG SSP-1 Site Servicing Plan
- DWG EXSD-1 Existing Storm Drainage Plan
- DWG SD-1 Storm Drainage Plan

2 References

Documents referenced in preparation of this servicing and stormwater management study include:

- *City of Ottawa Design Guidelines - Water Distribution*, City of Ottawa, July 2010 (as amended, including all subsequent technical bulletins).
- *City of Ottawa Sewer Design Guidelines (SDG)*, City of Ottawa, October 2012 (as amended, including all subsequent technical bulletins).
- *Geotechnical Investigation - Proposed Multi-Storey Building, 283 & 285 McLeod Street, Ottawa, ON*, Paterson Group Inc, July 2021.
- *Geotechnical Investigation Memorandum – Response to City Comments, Proposed Multi-Storey Building, 283-285 McLeod Street, Ottawa, ON*, Paterson Group Inc., October 2022.
- *Sewer Use (By-law No. 2003-514)*, City of Ottawa, January 2003 (as amended)
- *Topographical Plan of Survey – Part of Lots 2 and 3 (East O'Connor Street) and Lot 10 (North McLeod Street), Registered Plan 30, City of Ottawa*, Annis, O'Sullivan, Vollebekk Ltd., April 2018
- *Sketch Showing Additional Elevation Spots, "283 McLeod Street", City of Ottawa,* Annis, O'Sullivan, Vollebekk Ltd., January 2024
- *Fire Underwriters Survey's Water Supply for Public Fire Protection*, 2020.
- *Servicing and Stormwater Management Report: 283-285 McLeod Street* (Functional), Stantec Consulting Ltd., Revision 2, May 2023

3 Potable Water Servicing

3.1 Background

The proposed building is in Pressure Zone 1W of the City of Ottawa's Water Distribution System. The existing dwellings have water service lateral connections to the existing 203 mm diameter watermain on McLeod Street. The existing services will be blanked at the main by City forces, as shown in the Existing Conditions and Removals Plan (**Drawing EXRM-1**).

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 areas and associated peaking factors. The population was estimated using an occupancy of 1.4 persons per unit for bachelor and one-bedroom apartments, 2.1 persons per unit for one-bedroom with den and two-bedroom apartments, and 3.1 persons for two-bedroom with den. Based on the unit type breakdown in **Table 1.1**, the proposed building is estimated to have a total population of 54 persons.

A daily rate of 280 L/cap/day has been used to estimate average daily (AVDY) potable water demand for the residential units, and 28,000 L/ha/day for amenity spaces. Maximum day (MXDY) demands were determined by multiplying the AVDY demands by a factor of 2.5 for residential areas and 1.5 for amenity areas, while peak hourly (PKHR) demands were determined by multiplying the MXDY by a factor of 2.2 for residential areas and 1.8 for amenity 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 Domestic Water Demands

Demand Type	Population	Area (m^2)	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Residential	54	-	0.18	0.43	0.96
Communal Amenity Space	-	249	0.01	0.01	0.02
Total Site:	**54**	-	**0.19**	**0.45**	**0.98**

3.2.2 FIRE FLOW DEMANDS

The fire flow demands were estimated using the Fire Underwriter's Survey (FUS) methodology and following the 2020 FUS Guidelines. The FUS fire flow estimate is based on a building of ordinary construction type, so the gross construction area of all above-ground floors was used for the purposes of the FUS calculations. The building will be equipped with an automatic sprinkler system that is fully supervised and conforms to the NFPA 13 standard. Required fire flows were determined to be 116.7 L/s (7,000 L/min). Correspondence with the architect on the construction type is provided in **Appendix A.4**,

letter of confirmation from COSMEL confirming the level of service of the building's sprinkler system is provided in **Appendix A.5**, while the fire flow calculations are provided in **Appendix B.2**.

3.3 Level of Servicing

3.3.1 BOUNDARY CONDITIONS

The estimated domestic water and fire flow demands were used to define the level of servicing required for the proposed development from the municipal watermain and hydrants on McLeod Street. **Table 3.2** outlines the boundary conditions provided by the City of Ottawa on March 26th, 2024, as shown in **Appendix B.3**.

Table 3.2: Boundary Conditions

	Connection at McLeod Street
Min. HGL (m)	106.4
Max. HGL (m)	115.3
Max. Day + Fire Flow (116.7 L/s) HGL (m)	104.0

3.3.2 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 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 ground floor, 72.3 m, will serve as the elevation for the calculation of the residual pressures at ground level. As per the boundary conditions, the on-site pressures are expected to range from 334.7 kPa (48.5 psi) to 421.6 kPa (61.1 psi) under daily operating conditions, which are within the normal operating pressure range. It is anticipated that booster pumps may be required to service the upper floors of the building to achieve the minimum pressure 345 kPa (50 psi) during maximum daily flow conditions. Booster pump requirements are to be confirmed by the mechanical engineer, while the hydraulic analysis calculations are provided in **Appendix B.4**.

3.3.3 ALLOWABLE FIRE FLOW PRESSURES

According to the Ontario Building/Plumbing Code and the City of Ottawa 2010 Water Distribution Design Guidelines, watermains must maintain a residual pressure of 20 psi during emergency fire flow scenarios. The boundary conditions provided by the City of Ottawa indicate that watermain within McLeod Street is expected to maintain a residual pressure greater than 31.7 m equivalent to 310.8 kPa (45.1 psi) under the worst-case conditions (fire flow demands plus maximum day demands). This demonstrates that the

existing watermain within McLeod Street will provide adequate fire flow servicing for the proposed development.

3.3.4 FIRE HYDRANT COVERAGE

The building will be sprinklered and a Siamese (fire department) connection is to be provided on the northeast corner of the building. There are two existing hydrants, both Class AA (light blue cap, Table 4.10 of the City of Ottawa Water Design Guidelines), in the proximity of the proposed development site, as shown in **Figure 3.1**.

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. The distance of each existing municipal hydrant from the proposed building is less than 76 m. Hence, the required fire flow for the site (7,000 L/min) can be achieved with the two hydrants shown. See **Appendix B.5** for fire hydrant coverage table calculations, NFPA Table 18.5.4.3, and the hydrant classifications.

Figure 3.1: Existing Fire Hydrant Coverage Map

HYD-2 is located within 45 m of the Siamese connection which meets the requirements outlined in Section 3.2.5.16 of the Ontario Building Code.

3.4 Proposed Water Servicing

The development will be serviced via a new 6-inch (152 mm) diameter water service connection to the existing 203 mm diameter watermain on McLeod Street. The servicing sizing is designed by COSMEL with further details shown on **Drawing SSP-1**. Based on the City of Ottawa Design Guidelines, the existing 203 mm diameter watermain on McLeod Street can provide adequate fire and domestic flows for the subject site.

It is anticipated that booster pumps are required to service the upper stories. The mechanical consultant will ultimately be responsible to confirm the building pressures, and booster pump requirements meet all building code requirements.

4 Wastewater Servicing

4.1 Background

The site will be serviced from the existing 525 mm diameter combined sewer within McLeod Street. The existing buildings on 283 and 285 McLeod Street are each serviced by a sanitary service lateral, which will be capped and abandoned as per City Standard S11.4 and as shown on **Drawing EXRM-1**.

4.2 Design Criteria

As outlined in the City of Ottawa Sewer Design Guidelines (as amended) and the MECP Design Guidelines for Sewage Works, the following criteria were used to calculate projected wastewater flow rates and to size the sanitary sewer 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
- 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 one-bedroom and bachelor apartments – 1.4 persons/apartment
- Population density for one-bedroom with den and two-bedroom apartments – 2.1 persons/apartment
- Population density for two-bedroom with den – 3.1 persons/apartment

4.3 Wastewater Generation and Servicing Design

The estimated peak wastewater flow is based on the current site plan and unit breakdown as shown in **Table 1.1**. Peak wastewater flow is calculated in **Appendix C.1** and summarized in **Table 4.1** below.

Table 4.1: Estimated Wastewater Peak Flow

Residential/Amenity Peak Flows					Infiltration Flow (L/s)	Total Peak Flow (L/s)
Demand Type	No. of Units/ Area (ha)	Population	Peak Factor	Peak Flow (L/s)		
Residential	31 units	54	3.45	0.61	0.03	0.64
Amenity	0.025 ha	-	1.50	0.01		

The adequacy of the receiving municipal combined sewer system in the vicinity of the site and downstream network to receive the anticipated peak wastewater flows for the proposed development will be confirmed with City of Ottawa staff prior to the formal Site Plan Control submission.

4.4 Proposed Sanitary Servicing

A 6-inch (152 mm) diameter sanitary building service, complete with full port backwater valve (BWV) as per City Standard Drawing S14.1, is proposed for the sanitary sewage service from the proposed development. The servicing sizing of the lateral is designed by COSMEL, with further details indicated in **Drawing SSP-1**. Full port BWVs are to be installed on all sewer services within the site to prevent any surcharge from the downstream sewer from impacting the proposed development and will be coordinated with the building mechanical consultant.

The proposed sanitary lateral for the property will be installed to provide a gravity outlet for the basement level and all floors above grade. See **Drawing SSP-1** for further details of the sewer connection. Furthermore, floor drains will be installed in the parking garage to collect wastewater and convey it to the building's sanitary service lateral.

The service lateral size is less than half of the existing municipal combined sewer within the McLeod Street ROW; therefore, a manhole is not required at the connection to the combined sewer. As per Section 14 of the Sewer Use By-law, internal test ports will be provided for the service lateral. A wastewater sampling / inspection chamber is to be provided near the property line as per City of Ottawa Detail S18.1. Pumping requirements are to be confirmed by the mechanical consultant.

5 Stormwater Management

5.1 Objectives

The goal of this stormwater servicing and stormwater management (SWM) plan is to determine the measures necessary to control the quantity and quality of stormwater released from the proposed development to meet the criteria established during the consultation process with City of Ottawa and to provide sufficient details required for SPC approval.

5.2 SWM Criteria and Constraints

Criteria were established by combining current design practices outlined by the City of Ottawa Design Guidelines (2012, as amended), 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).
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff. (City of Ottawa)
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on major and minor drainage system (City of Ottawa)
- The proposed site is not subject to quality control criteria due to the small site size (less than 0.1 ha) and proposed land usage of the development (City of Ottawa).

Storm Sewer & Inlet Controls

- Size storm sewers to convey 2-year storm event under free-flow conditions using City of Ottawa I-D-F parameters (City of Ottawa).
- Site discharge rates for flat roof area to be restricted to 2-year storm event pre-development rates with a maximum pre-development C coefficient of 0.4 (City of Ottawa). Remaining site area (uncontrolled roofs and non-building areas) are to be uncontrolled with runoff directed to the McLeod Street ROW (refer to **Appendix D.4**).
- Peak stormwater discharge rates during wet weather events to be further reduced by peak calculated sanitary discharge from the site (City of Ottawa).
- Proposed site to discharge stormwater into the existing 525 mm diameter combined sewer within McLeod Street which drains to the Rideau Canal trunk sewer and into the interceptor Sewer at Wellington Street (City of Ottawa).
- Tc = 20 minutes or less can be calculated; Tc should be not less than 10 minutes since IDF curves become unrealistic at less than 10 min (City of Ottawa).
- A separate storm sewer lateral is required for the reverse sloped ramp to the parking garage (depressed driveway) trench drain (SDG Section 5.7.6).

Surface Storage & Overland Flow

- As per consultation with the City of Ottawa staff on December 8, 2022, it has been permitted to match post- to pre-development flows, provide storage/control through optimization of rooftop storage, and allow a portion of the site to drain uncontrolled to the McLeod Street right of way, directed to the nearby catch basins (refer to **Appendix D.4**).
- There must be at least 15 cm of vertical clearance between the spill elevation (lowest building openings) and the ground elevation at the building envelope that is in proximity of the flow route or ponding areas. (City of Ottawa).

The outlet for the storm system for this site is the combined sewer within McLeod Street and the McLeod Street ROW. The City of Ottawa requires separate connections for the sanitary and storm services to the combined sewer. As such, separate service connections have been proposed. There is no evidence of existing building services uniquely for stormwater. It is assumed that the existing lateral is a combined service lateral connection to the McLeod Street combined sewer, which will be capped and abandoned as outlined in Section 4.1.

5.3 Existing Conditions

The existing site (0.08 ha) consists of two two-storey buildings, vegetated/sodded areas, surface parking, and a driveway. The existing structures will be removed to allow for the proposed development, as shown in the Existing Conditions and Removals Plan (see **Drawing EXRM-1**).

A single sub-catchment area is provided in the Existing Conditions Storm Drainage Plan (see **Drawing EXSD-1**), covering the whole site. The site is characterized by a mix of gravel, roof, and vegetated areas, as well as a single direction of uncontrolled discharge towards the McLeod Street ROW under existing conditions. **Drawing EXSD-1** was used to establish the overall site runoff coefficient of C=0.77 under existing conditions.

5.3.1 ALLOWABLE RELEASE RATE

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 calculated to be below 10 minutes using the FAA method. The minimum 10-minute Tc was assigned. The peak pre-development flow rates shown in **Table 5.1** have been calculated using the rational method as follows:

$$Q = 2.78\ CiA$$

Where:
Q = peak flow rate, L/s
C = site runoff coefficient
i = rainfall intensity, mm/hr (as per Ottawa IDF curves)
A = drainage area, ha

Table 5.1: Peak Pre-Development Flow Rates

Design Storm	Pre-Development Flow Rate (L/s) for C=0.40, A=0.08 ha, t_c = 10 min
2-year	**7.10**

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 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	Outlet
ROOF-1	0.90	0.022	Controlled	Building Service Lateral
ROOF-2	0.90	0.012	Controlled	
ROOF-3	0.90	0.005	Uncontrolled	
ROOF-4	0.90	0.008	Uncontrolled	
DRAIN-1	0.90	0.003	Uncontrolled	Trench Drain Service Lateral
DRAIN-2	0.90	0.001	Uncontrolled	Building Service Lateral
DRAIN-3	0.90	0.001	Uncontrolled	
L1A	0.37	0.011	Controlled	Catch Basin Lead
L2A	0.86	0.005	Controlled	
UNC-1	0.66	0.007	Uncontrolled	Surface/Sheet Flow to ROW
UNC-2	0.51	0.008	Uncontrolled	
Total Site	**0.77**	**0.083**	-	-

5.4.1 ALLOWABLE RELEASE RATE

The pre-development 2-year release rate for the site was determined using the rational method to be 7.10 L/s. As the site is in a combined sewer area, the allowable release rate must subtract the proposed peak sanitary flows, which was indicated to be 0.64 L/s as shown in **Section 4**. Consequently, the target release rate for 283-285 McLeod Street under all events up to and including the 100-year event will be 6.46 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.

Based on numerous development constraints onsite and limited onsite stormwater storage opportunities, a request was made to the City of Ottawa Staff to reduce the stormwater management criteria, allowing for roof-only control and the remaining site area to drain uncontrolled to the McLeod Street ROW. The site is less than 0.1 ha in total area and the roof storage area occupies most (41.6 %) of the site. This approach has been allowed for this site, provided the uncontrolled flow is directed to the existing catch basins in the roadway. See **Appendix D.4** for correspondence with the City of Ottawa Staff regarding the stormwater management approach.

5.4.2 QUANTITY CONTROL

The site requires quantity control measures to meet the restrictive stormwater release criteria. It is proposed that within the flat roof of the 5-storey rear portion of the building, rooftop stormwater detention via restricted roof release is to be maximized for onsite storage. As per City Comments, an ICD was required to be installed in CB2 to limit the inflow to the combined sewer in case of a watermain break. The ICD has been sized to provide some additional onsite storage during the 100-year event. A spreadsheet using the Modified Rational Method (MRM) was used to size the onsite storage in **Appendix D.1.**

5.4.2.1 Rooftop Storage

It is proposed to retain stormwater on the building rooftop to a maximum depth of 0.15 m by installing restricted flow roof drains and overflow scuppers. The MRM calculations assume the roof will be equipped with two standard Watts model roof drains complete with Adjustable Accutrol Weirs. Discharge from the two controlled roof drains will be routed by the mechanical consultant through the building's internal plumbing to the storm service lateral.

Watts Drainage Adjustable Accutrol roof drain weir data (see **Appendix D.3**) and the roof plan (see **Appendix A.1**) have been used to calculate a practical roof release rate and detention storage volume for the rooftop areas. The mechanical penthouse roof and elevator roof have no available storage; hence only 272 m^2 of the total 340 m^2 roof area is available for storage. It should be noted that the Accutrol weir has been used as an example 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 the two roof drain weirs at the 25 % open setting. The proposed roof drains are to be plumbed internally through the building (by others) and contribute to the main building storm service lateral. Rooftop storage volumes and controlled release rates are summarized in **Table 5.3**.

Table 5.3: Controlled Roof Areas – Peak Discharge and Storage Summary

Area	Design Storm	Depth (mm)	Discharge (L/s)	Volume Stored (m^3)	Available Storage (m^3)
ROOF-1	2-Year	86.7	0.8	0.9	4.3
	100-Year	140.5	1.0	3.6	
ROOF-2	2-Year	95.1	0.8	2.4	9.3
	100-Year	145.2	1.1	8.5	

5.4.2.2 Rear and Side Yard Storage

A 250 mm diameter PVC perforated pipe system is proposed to collect drainage from the rear and east side yard subcatchment areas (L1A and L2A) and discharge through a catch basin lead to the combined sewer on McLeod Street. The system consists of a landscape catch basin (CB1) and landscape catch basin tee (CB-T) in the rear yard and a proposed catch basin (CB2) in the east side yard, which will be equipped with a LMF40 inlet-control device (ICD) to restrict discharge into the combined sewer. Storage is provided within the perforated pipes and CB2 structure. The stormwater discharge from the ICD and volume of runoff stored are summarized in **Table 5.4** below.

Table 5.4: Controlled Rear and Side Yard Areas – Peak Discharge and Storage Summary

Design Storm	Discharge (L/s)	Volume Stored (m^3)	Available Storage (m^3)
2-Year	1.8	0.0	5.8
100-Year	2.6	1.6	

The pre-consultation notes indicate that a minimum flow rate typically allowed for an ICD is 6.0 L/s. The quoted minimum rate forms part of the preapproved product listing for ICDs on City maintained property. The specified ICD (LMF 40) is required to improve the stormwater detention on this private property and does not otherwise contravene city standard S4.1: "The (lowest) restriction allowed *typically* is 6 L/s". The LMF40 is a low to medium flow rate vortex ICD which is designed to have better protection against clogging and reduced discharge rates for equivalent head compared to plug-style ICDs. The LMF ICD design also provides odour management and restricts the flow to the combined sewer in case of a watermain break.

5.4.2.3 Tributary Drainage

The two uncontrolled roof subcatchment areas, ROOF-3, and ROOF-4, the three drain subcatchment areas, DRAIN-1 to DRAIN-3, and the two rear and east side subcatchment areas, L1A, and L2A, are all tributary to the combined sewer on McLeod Street.

The reverse sloped ramp to the parking garage is considered a depressed driveway. A trench drain is proposed at the bottom of the ramp to provide an outlet for the driveway area (DRAIN-1 subcatchment). As per Section 5.7.6 of the City SDG (as amended), a separate stormwater service lateral is proposed to

connect the trench drain by gravity to the combined sewer. A full port BWV will be provided on this lateral to prevent surcharge from the combined municipal sewer entering the parking garage.

There are two other building areas lower than the surface grade, including basement level entrances and exits as represented by subcatchments DRAIN-2 and DRAIN-3. One area (floor) drain is proposed to provide an outlet for each area and limit surface ponding. These area drains are plumbed internally through the building (by others). It is critical that these drains are always kept clean and clear of debris.

The uncontrolled roof areas include sloped/peaked roofs that drain into flat roof areas where rooftop control is not feasible (balconies). The flat roof areas are equipped with unrestricted drains that are plumbed internally through the building (by others).

The area drains and uncontrolled roofs contribute to the building stormwater service lateral. Assuming unrestricted flow, the peak discharges anticipated from these areas are summarized in **Table 5.5**.

Table 5.5: Drain and Uncontrolled Roof Areas - Peak Discharge Rate Summary

Subcatchment Area	2-Year Discharge (L/s)	100-Year Discharge (L/s)
DRAIN-1	0.6	1.5
Subtotal Trench Drain	**0.6**	**1.5**
DRAIN-2	0.2	0.5
DRAIN-3	0.2	0.5
Subtotal Area Drains	**0.4**	**1.0**
ROOF-3	1.0	2.5
ROOF-4	1.5	4.0
Subtotal Uncontrolled Roofs	**2.5**	**6.5**
Total	**3.5**	**9.0**

5.4.2.4 Uncontrolled Drainage

There are two uncontrolled subcatchment areas, UNC-1, and UNC-2, which drain a small portion of the rear yard, west side yard, and front yard areas. UNC-2 also includes a portion of the sloped roof area which sheet drains directly to the west side yard. The west side-yard is swaled and directs the uncontrolled runoff south toward the existing west catch basin in Mc Leod Street ROW. UNC-1 also drains south to the McLeod Street ROW via surface/sheet flows and is directed towards the existing roadway catch basins in the McLeod Street ROW.

The two window wells at the front of the building and the two landscaped areas on either side of the main building entrance ramp (pedestrian bridge) will be equipped with window drains, which will be indirectly connected to the weeping tile system by discharging to the clear stone sloped towards weeping tile.

These areas have been included in the uncontrolled drainage areas UNC-1 and UNC-2. The peak post-development release rates from the uncontrolled areas are summarized in **Table 5.6**.

Table 5.6: Peak Post-Development Uncontrolled Surface Release Rates

Design Storm	Release Rate (L/s)		
	UNC-1	UNC-2	Total
2-Year	1.0	0.9	**1.9**
100-Year	2.9	2.5	**5.4**

5.4.3 RESULTS

A summary of the peak design discharge rates calculated from the MRM analysis (see **Appendix D.1**) is provided in **Table 5.7** below. The table shows that under peak conditions, the total flows to the combined sewer exceed the 2-year target release rate for the site.

Table 5.7: Summary of Total 2-Year and 100-Year Event Release Rates

Drainage Areas	2-Year Peak Discharge (L/s)	100-Year Peak Discharge (L/s)
Controlled Roof Areas	1.6	2.1
Uncontrolled Roof Areas	2.5	6.5
Uncontrolled Area Drains	0.4	1.0
Subtotal to STM Lateral 1	***4.5***	***9.6***
Uncontrolled Trench Drain	0.6	1.5
Subtotal to STM Lateral 2	***0.6***	***1.5***
Controlled Rear and East Side Yard Areas	1.8	2.6
Subtotal to Catch Basin Lead	***1.8***	***2.6***
Total Discharge to Sewer	**6.9**	**13.7**
Uncontrolled Surface Areas	1.9	5.4
Total Site	**8.8**	**19.1**
Target	**6.4**	**6.4**
Exceedance	***2.4***	***12.7***

The noted exceedance and uncontrolled surface flow is acceptable for this site given its size (less than 0.1 ha) and proximity to the receiving waterbody of the major system (the site is located less than one kilometer from the Rideau Canal). The development of the property and the addition of onsite storage provides a significant improvement compared to existing conditions. **Table 5.8**, below, compares the existing-to-post development stormwater release rates to demonstrate the stormwater management

benefits of this development, which provides a peak discharge rate reduction of 35% for the 2-year event and 40% for the 100-year event.

Table 5.8: Comparison of Existing to Post-Development Release Rate to 283 & 285 McLeod

	2-Year Peak Discharge				100-Year Peak Discharge			
	Existing C=0.77	Post-Dev.	Difference		Existing C=0.77	Post-Dev.	Difference	
	(L/s)	(L/s)	(L/s)	%	(L/s)	(L/s)	(L/s)	%
Uncontrolled	13.6	1.9	-11.7	-	31.7	5.4	-26.3	-
Controlled	0	6.9	6.9	-	0	13.7	13.7	-
Total	**13.6**	**8.8**	**-4.8**	**-35.3%**	**31.7**	**19.1**	**-12.6**	**-39.7%**

5.5 Quality Control

There are no significant sources of sediments or contaminants anticipated on the site due to the proposed land use and absence of surface parking. Details for the underground parking drainage are to be determined by the mechanical consultant as part of the building's sanitary system. No additional quality control measures are required for the site based on the Site Plan provided.

5.6 Proposed Stormwater Servicing

Stormwater servicing for the building will require two (2) service laterals, comprising of one 6-inch (152 mm) diameter service lateral for the foundation, area, and roof drains, and the other 4-inch (102 mm) diameter service lateral for the trench drain from the underground parking ramp. Both are designed by COSMEL and will be equipped with full port BWV as per City standard S14.1 and as shown on **Drawing SSP-1**. The building service lateral is proposed for the area drains (DRAIN-2 to DRAIN-3) with the roof drain connected to the building service lateral via a manufactured tee-wye fitting downstream of the full port BWV. The building service will outlet through the foundation wall and the foundation drain will outlet below the raft slab at the invert of the proposed storm service lateral. The building service will connect downstream of the foundation drain BWV via a manufactured tee-wye fitting. A storm monitoring test port will be installed on the primary building storm service as per Section 14 of the Sewer Use By-law. A wastewater sampling / inspection chamber is to be provided near the property line on both building services as per City of Ottawa standard Detail S18.1.

The second service lateral will be for the trench drain only (DRAIN-1). Both laterals are gravity-drained and there are no requirements for stormwater sump pumps from the civil servicing perspective. As the size of each lateral (102- and 152-mm diameter) is less than half the size of the existing municipal combined sewer within the McLeod Street ROW (525 mm diameter), manholes are not required at the connections to the combined sewer.

The rear yard drainage and east side yard drainage will be collected in the proposed onsite catch basin and perforated pipe network located within subcatchment areas L1A and L2A. The proposed 250 mm

diameter storm pipe has been offset a minimum of 0.94 m from the building foundation wall and is not located within the zone of influence of the building footings. A manhole is not required at the proposed connection. This proposed onsite sewer network is above the outlet invert of the existing street catch basin located near the southeast corner of the site. The system is also set above the peak dry weather HGL from the adjacent areas which was identified to be 66.28 m (see **Appendix D.4**). The proposed stormwater collection system is above the HGL of the combined sewer.

6 Site Grading and Drainage

The proposed re-development site measures approximately 0.08 ha in area and consists of two existing residential dwellings, an asphalt driveway, surface parking, and some grassed spaces. The topography across the site is relatively flat, and currently drains from north to south, with overland flow generally being directed to the adjacent McLeod Street ROW.

A detailed grading plan (see **Drawing GP-1**) has been provided to satisfy the stormwater management requirements, as detailed in **Section 5**, adhere to any grade raise restrictions for the site, and provide for minimum cover requirements for storm and sanitary sewers.

Site grading has been established to provide the required emergency overland flow routes, prevent drainage from 283-285 McLeod Street onto adjacent properties, direct overland flow to the McLeod Street ROW, and provide a minimum 150 mm clearance between building openings and flow paths. The rear of the site is bound by existing retaining walls located on the adjacent properties, which are to remain.

On the east side of the site, the existing retaining wall on the east property boundary is to be removed, as it does not currently align with the property line. The grading plan includes a new concrete curb per SC1.1 along a portion of the east property line and in the northeast corner, closing off the rear yard. The concrete curb is required because the subject site is higher than the neighbouring property in this area. A steel curb is proposed along the east pedestrian walkway. See architectural drawings for details. The proposed steel curb is required to prevent drainage running east onto the 275 McLeod Street property, and because the proposed grades along the walkway of the subject site are lower than the adjacent property. Both curbs are offset a minimum of 150mm from the property line.

On the west side of the site, a swale is to be provided at the subgrade level (below the proposed river rock layer) to convey the drainage from the west rear and side yards to the McLeod Street ROW and prevent drainage running west onto the 287 McLeod Street property. In the west side yard, an existing landscape wall separates the river rock from the driveway pavers. When this landscape wall is reinstalled, it is to include a drain with an invert of 71.14 m to allow for unimpeded drainage of the west side yard swale to the ROW.

Grade raises on the site do not exceed 1.5 m as recommended in the geotechnical report. The peak dry weather HGL from the adjacent areas was identified to be 66.28 m (see **Appendix D.4**). The Finished Floor Elevation (FFE), underside of raft slab and foundation drain invert have adequate freeboard (FB) above the HGL such that the site is not expected to endure a system surcharge (backup) from the combined sewer; however, a BWV is to be installed on each service lateral to minimize basement flooding risks.

The preliminary location of the gas pressure regulating station (shown as a footprint /concrete pad) does not obstruct the overland flow routes or conflict with any proposed grading or landscape features.

Due to the presence of marine clay soils, there are planting restrictions for the size and locations of trees onsite. Tree planting does not impact the grading and drainage plan on this site. For details regarding the tree planting and geotechnical considerations, please refer to the landscape plan and geotechnical report.

7 Utilities

As the subject site lies within a mature developed residential community, Hydro, Bell, Gas and Cable servicing for the proposed development should be readily available within subsurface plant and adjacent overhead utility lines within the McLeod Street ROW. Exact size, location, and routing of utilities, along with determination of any off-site works required for redevelopment, will be coordinated by the mechanical consultant. The preliminary location of the gas pressure regulating station has been shown on the servicing drawings. Design of the gas pressure regulating station is to be completed by the mechanical consultant and the proposed location confirmed.

8 Approvals/Permits

Pre-consultation with Ontario Ministry of Environment, Conservation and Parks (MECP) staff concerning Environmental Compliance Approvals (ECAs) is forthcoming. It is expected that a direct submission ECA will be required for approval of the proposed building service connections as they connect directly to an existing combined sewer.

If the ground or surface water volumes being pumped during the construction phase are between 50,000 and 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). 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 Ontario Regulation 63/16. A Permit to Take Water (PTTW) through the MECP would be required for dewatering in excess of 400,000 L/day, which is unlikely for this site. However, if a PTTW is required, at least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP. If blasting is used to remove the bedrock as part of the excavation for the building foundation, prior approval is required from the owners/operators of any water storage reservoir, pumping station, or water works transformer station within 200 m of the site.

9 Erosion and Sediment Control During Construction

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving watercourse(s).
2. Limit extent of 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 plastic 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 track out 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. Plan construction at proper time to avoid flooding.

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 inspection is to include:

1. Verification that water is not flowing under silt barriers.
2. Clean and change catch basin sediment traps.

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

10 Geotechnical Investigation

A Geotechnical Investigation Report was prepared by Paterson Group on December 11, 2023, as a follow-up to the Revision 1 of the Report prepared on July 22nd, 2021. Relevant excerpts of the documents have been provided in **Appendix E.1**. The report summarizes the findings of the September 2020 field investigation, subsequent soil sample analyses, and provides design and construction recommendations.

Subsurface soil conditions within the subject area were determined from 3 boreholes distributed across the proposed site. Generally, the subsurface profile at the test hole locations consists of an approximate 50 mm to 100 mm thickness of asphalt underlain by fill which extends to approximate depths of 2.3 m to 3.1 m below the existing ground surface. The fill was generally observed to consist of either a brown silty sand with gravel and brick or a brown silty clay.

Bedrock at the site consists of shale of the Billings formation with a drift thickness of 25 m to 50 m, and groundwater levels were observed to be well below the basement level at 7.70 m to 10.4 m depth from ground surface elevation. Due to the presence of the silty clay deposit, a permissible grade raise restriction of 1.5 m was recommended for grading at the subject site.

Due to the presence of marine clay soils, there are planting restrictions for the size and locations of trees onsite. Tree planting does not impact the grading and drainage plan on this site. For details regarding the tree planting and geotechnical considerations, please refer to the landscape plan and geotechnical report.

A raft slab foundation is recommended for this site. The geotechnical report recommends a minimum 75 mm thick lean concrete mud slab was recommended to be placed on the undisturbed silty clay subgrade shortly after completion of the excavation to reduce the risk of disturbance of the subgrade under the traffic of workers and equipment. To minimize the exposure time and avoid disturbing/drying the silty clay, the mud slab may be completed in smaller sections. For further details, please refer to the full Paterson report or the excerpts in **Appendix E.1.**

11 Conclusions

11.1 Water Servicing

Based on the supplied boundary conditions for existing watermain and calculated domestic and fire flow demands for the subject site, the watermain on McLeod Street has sufficient capacity to sustain both the required domestic and emergency fire flow demands for the development. Booster pump(s) may be required to provide adequate pressures to the building's upper storeys. The proposed development requires a 152 mm diameter water service lateral, as designed by COSMEL, which will be connected to the existing 203 mm diameter watermain in the McLeod Street ROW. Requirements for booster pump(s) are to be confirmed by the mechanical consultant, COSMEL.

11.2 Wastewater Servicing

The proposed sanitary sewer service will consist of a 152 mm diameter sanitary pipe directing wastewater to the existing 525 mm diameter combined sewer, as designed by COSMEL. Existing connections are to be removed and a full port BWV installed on the proposed sanitary service within the site. An internal monitoring test port will be installed on the building service lateral as per Section 14 of the Sewer Use By-law and a wastewater sampling/inspection chamber will be installed on the lateral near the property line. The proposed sanitary lateral provides a gravity outlet for all levels of the building. Pumping requirements are to be confirmed by the mechanical consultant, COSMEL.

11.3 Stormwater Servicing and Management

Due to numerous development constraints on the site, stormwater storage is limited to the flat rooftop of the rear portion of the proposed building. Rooftop storage has been maximized, and the outflow from the roof restricted to limit the stormwater discharge from the site. The remaining site area drains uncontrolled toward the McLeod Street ROW and are directed, where possible to the gutter and existing street catch basins. The proposed development maximizes rooftop storage and stormwater detention volume within the available flat roof area.

Two storm service laterals are proposed, a 152 mm diameter PVC service for the building's foundation drain, area drains, and controlled roof drains and a 102 mm diameter PVC service for the parking ramp trench drain, as designed by COSMEL. Both laterals are to be gravity drained and include full port backwater valves. The roof drain is to be connected through internal plumbing to the service lateral on the downstream side of the backwater valve. An internal monitoring test port will be installed on the building service lateral as per Section 14 of the Sewer Use By-law. Wastewater sampling/inspection chambers are to be provided on both laterals near the property line. Sump pump requirements, controlled roof drains, and internal plumbing are to be further designed by the mechanical consultant, COSMEL.

A catch basin and storm sewer system are proposed to facilitate the collection and drainage of the stormwater runoff from the rear and east side yards. The 250 mm storm sewer is to be controlled with an

LMF40 ICD and connect to the combined sewer in the McLeod Street ROW. The catch basin proposed at the southeast corner of the building is to be equipped with an odour trap.

Given the proposed land use, no additional quality control measures are required for the site.

11.4 Geotechnical Considerations

The geotechnical investigation was completed by Paterson Group in September 2020 and a revised report, dated July 22, 2021, and memo, dated October 17, 2022, were provided for reference. Subsurface soil conditions within the subject area were determined from three boreholes distributed across the proposed site. Generally, the subsurface profile at the test hole locations consists of an approximate 50 mm to 100 mm thickness of asphalt underlain by fill which extends to approximate depths of 2.3 m to 3.1 m below the existing ground surface. Groundwater levels were observed to be well below the basement level at 7.70 m to 10.4 m depth from ground surface elevation. Due to the presence of the silty clay deposit, a permissible grade raise restriction of 1.5 m was recommended for the site, tree planting restrictions were recommended (see landscape plans and geotechnical plans) and a raft slab foundation was recommended to reduce the risk of disturbance of the subgrade under the traffic of workers and equipment.

11.5 Grading

The proposed development site measures approximately 0.083 ha in area and is bound by existing retaining walls on the north and northeast east sides. The topography across the site is relatively flat, and currently drains from north to south, with overland flow generally being directed to the adjacent McLeod Street ROW. Site grading has been established to allow stormwater surface drainage south to the McLeod Street ROW. The grading works include the construction of a concrete curb wall along the north-east property line and northeast corner per SC1.1, a steel curb along the proposed pedestrian walkway, and a subgrade swale along the west side yard. Emergency overland flow routes and minimum building opening clearances have been provided.

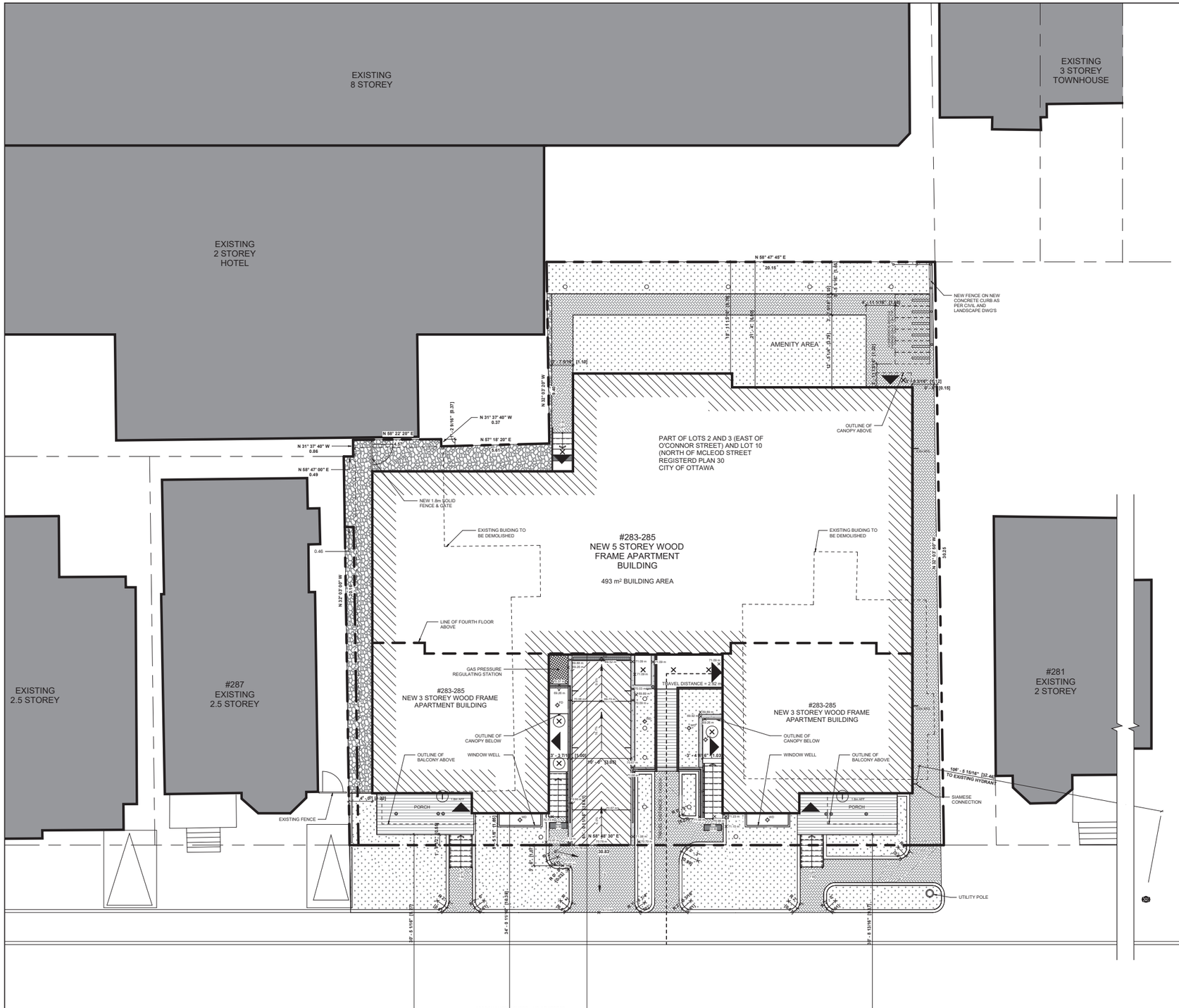
11.6 Utilities

As the subject site lies within a mature developed residential community, Hydro, Bell, Gas, and Cable servicing for the proposed development should be readily available within subsurface plant and adjacent overhead utility lines within the McLeod Street ROW. Exact size, location, and routing of utilities, along with determination of any off-site works required for redevelopment, will be coordinated by the mechanical consultant.

APPENDICES

Appendix A Background

A.1 Site Plan – March 25, 2024, and Roof Plan – February 16, 2024



1 SP1 SITE PLAN 1 : 100

OWNER/APPLICANT:
REZY PROPERTIES INC.
285 MCLEOD ST
OTTAWA, ON
K2P 1A1
613-233-0349

ARCHITECT:
COLIZZA BRUNI ARCHITECTURE INC.
76 CHAMBERLAIN AVENUE
OTTAWA, ON
K1S 1V9
613-236-2944

MECHANICAL & ELECTRICAL ENGINEERING:
COSMEL CORP.
178, GR6BER BLVD, SUITE 105
GATINEAU, QC
J8T 6Z6
819-205-3283

STRUCTURAL ENGINEERING:
GOODEVE STRUCTURAL INC.
77 AURIGA DR.
NEPEAN, ON
K2E 7Z7
613-226-4558

CIVIL ENGINEERING:
STANTEC
1331 CLYDE AVE, SUITE 300
OTTAWA, ON
K2C 3G4
613-722-4420

GEOTECHNICAL ENGINEERING:
PATTERSON GROUP
9 AURIGA DR.
OTTAWA, ON
K2E 7T9
613-226-7381

LANDSCAPE ARCHITECTURE:
STANTEC
1331 CLYDE AVE, SUITE 300
OTTAWA, ON
K2C 3G4
613-722-4420

SURVEYOR:
ANNIS O'SULLIVAN VOLLEBEKK LTD.
ONTARIO LAND SURVEYORS
14 CONCOURSE GATE, SUITE 500,
NEPEAN, ON
K2E 7S6
613-727-0850

PLANNER:
FOTENN PLANNING & DESIGN
396 COOPER ST SUITE 300,
OTTAWA, ON
K2P 2H7
613-730-5709

NOTES:

1. REFER TO LANDSCAPE PLAN FOR VEGETATION TYPE AND LOCATION
2. ALL NEW EXTERIOR HARD SURFACES, PATHS, AND DRIVES TO BE EQUIPPED WITH SNOW MELTING
3. PROPERTY BOUNDARY INFORMATION DERIVED FROM SURVEY PERFORMED ON THE 4TH DAY OF APRIL, 2018 BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

LEGEND:

- NEW SOFT SCAPE
- NEW HARD SCAPE
- NEW RIVER STONE
- PROPERTY LINE
- FD — FLOOR DRAIN
- WD — WINDOW WELL DRAIN
- SOFFIT LIGHT
- WALL MOUNTED LIGHT
- UNIT PANEL CONTROLLED
- PEDESTAL LIGHTING 32"H
- AFF — ABOVE FINISHED FLOOR
- AFG — ABOVE FINISHED GRADE

DEVELOPMENT INFORMATION

ZONING: RSB H(19) — TOTAL # OF UNITS: 31

BYLAW	REQUIRED	PROVIDED
MIN. LOT WIDTH		30.83m
MIN. LOT AREA		832.1 m2
MAX. LOT COVERAGE		67%
MAX. BUILDING HEIGHT	19m - 13m WITHIN 9m OF FRONT LOT LINE	
MIN. FRONT YARD SETBACK	1.65m	1.65m
MIN. REAR YARD SETBACK	5.7m	5.7m
MIN. INTERIOR SIDE YARD SETBACK	1.2m	1.2m
MIN. SIDE YARD SETBACK	1.2m	1.2m
TOTAL PARKING	7+1V	8 U/G
INDOOR PARKING	7+1V	7+1V U/G
OUTDOOR PARKING	N/A	0
VISITOR PARKING	1	1
BARRIER-FREE PARKING	0	0
BICYCLE PARKING	31	31

UNIT BREAKDOWN

UNIT TYPE	AREA	CONFIGURATION	# OF UNITS	# OF BEDROOMS	OCCUPANT LOAD
A	79.89 m²	2 BR	1	2	4
B	61.97 m²	2 BR	2	4	8
B1 (BF)	61.97 m²	2 BR	2	4	8
B2	44.46 m²	1 BR	1	1	2
C	36.66 m²	1 BR	5	5	10
D	56.00 m²	1 BR & DEN	1	1	2
D1 (BF)	72.03 m²	2 BR	1	2	4
D2	56.14 m²	1 BR & DEN	1	1	2
D3	58.37 m²	1 BR & DEN	1	1	2
E	68.72 m²	2 BR	1	2	4
F	83.85 m²	2 BR	1	2	4
G	47.65 m²	1 BR	1	1	2
G1 (BF)	54.83 m²	1 BR	1	1	2
G2 (BF)	57.45 m²	1 BR	1	1	2
H	36.62 m²	BACHELOR	1	1	2
H1 (BF)	37.91 m²	BACHELOR	1	1	2
I	75.71 m²	2 BR	1	2	4
J	85.14 m²	2 BR	1	2	4
K	51.03 m²	BACHELOR	1	1	2
L	47.79 m²	BACHELOR	1	1	2
M	105.81 m²	2 BR & DEN	1	2	4
N	46.08 m²	1 BR	1	1	2
O	51.90 m²	1 BR	1	1	2
P	44.56 m²	1 BR	1	1	2
Q	33.73 m²	BACHELOR	1	1	2
TOTAL			31	42	84

BARRIER-FREE UNIT %

CONFIGURATION	# OF UNITS	# OF BEDROOMS	OCCUPANT LOAD	% OF TOTAL 3.8.2.1.(5)	BF
1 BR	2	2	4	5%	Yes
2 BR	3	6	12	14%	Yes
BACHELOR	1	1	2	2%	Yes
1 BR	10	10	20	24%	No
1 BR & DEN	3	3	6	7%	No
2 BR	7	14	28	33%	No
2 BR & DEN	1	2	4	5%	No
BACHELOR	4	4	8	10%	No

UNIT FLOOR AREA BY LEVEL

FLOOR LEVEL	AREA	# OF UNITS	# OF BDRMS	OCC. LOAD
T/O BASEMENT SLAB	97.98 m²	2	2	4
T/O MAIN FLOOR SLAB	348.31 m²	6	9	18
T/O SECOND FLOOR SUBFLOOR	397.70 m²	7	10	20
T/O THIRD FLOOR SUBFLOOR	390.39 m²	6	9	18
T/O FOURTH FLOOR SUBFLOOR	251.99 m²	5	6	12
T/O FIFTH FLOOR SUBFLOOR	250.46 m²	5	6	12
TOTAL	1736.83 m²	31	42	84

GROSS FLOOR AREA ABOVE/BELOW GRADE

ABOVE GRADE	GFA OF APARTMENTS	1638.85 m²	84%
ABOVE GRADE	REMAINING GFA	316.81 m²	16%
BELOW GRADE	GFA OF APARTMENTS	97.98 m²	21%
BELOW GRADE	REMAINING GFA	364.26 m²	79%

GROSS BUILDING AREA BY LEVEL

FLOOR LEVEL	AREA	PERCENTAGE
T/O BASEMENT SLAB	493.52 m²	19%
T/O MAIN FLOOR SLAB	492.90 m²	19%
T/O SECOND FLOOR SUBFLOOR	496.22 m²	19%
T/O THIRD FLOOR SUBFLOOR	423.03 m²	16%
T/O FOURTH FLOOR SUBFLOOR	333.48 m²	13%
T/O FIFTH FLOOR SUBFLOOR	342.46 m²	13%
TOTAL	2581.61 m²	

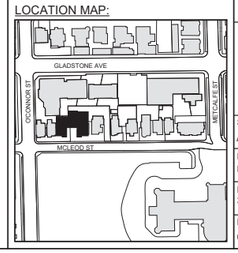
FLOOR AREA PERCENTAGE

NAME	AREA	PERCENTAGE
GFA OF APARTMENTS	1736.83 m²	72%
REMAINING GFA	681.07 m²	28%
TOTAL	2417.90 m²	

SITE & L.O.S.

NAME	AREA	PERCENTAGE REQUIRED	PERCENTAGE PROVIDED
LANDSCAPE	276.09 m²	30%	33%
BUILDING	555.93 m²	N/A	67%
TOTAL	832.02 m²		

LOCATION MAP:



GENERAL NOTES

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND OMISSIONS TO THE ARCHITECT. ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS. DO NOT SCALE DRAWINGS. THESE DRAWINGS MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF COLIZZA BRUNI ARCHITECTURE INCORPORATED. COPYRIGHT RESERVED.

NO.	REV DATE	REV DESCRIPTION
01	24-01-23	ISSUED FOR SPC SUBMISSION
02	24-03-21	RE-ISSUED FOR SPC SUBMISSION

COLIZZA BRUNI
architecture
76 CHAMBERLAIN AVE • OTTAWA • ONTARIO • K1S 1V9
T 613.236.2944 • F 613.236.6777 • www.colizzabruni.com

PROJECT NAME
283 & 285 McLEOD STREET
OTTAWA, ON

DRAWING TITLE
SITE PLAN

SCALE
AS NOTED

DRAWN BY
BS

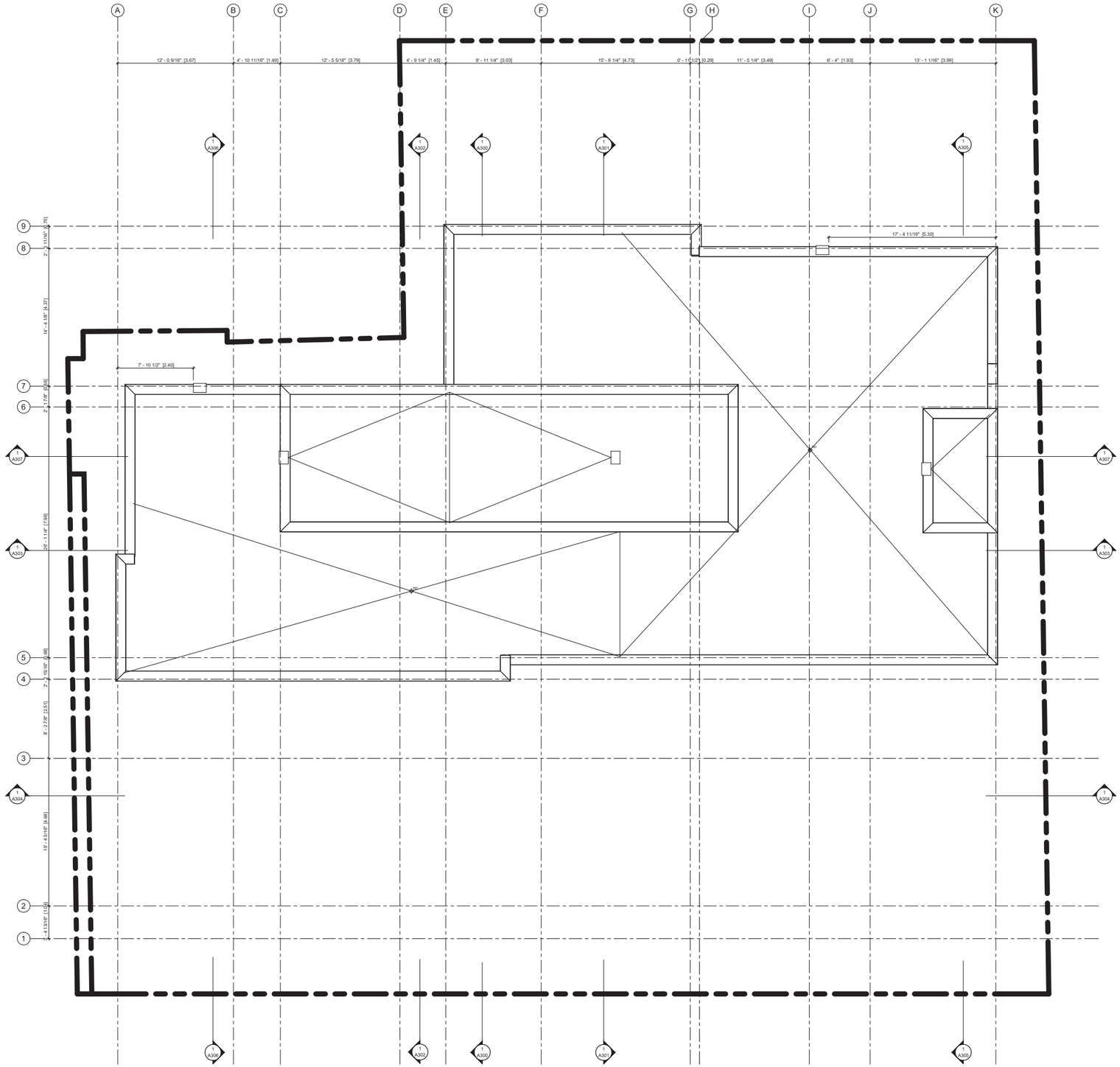
DATE
3/25/2024 4:55:30 PM

PROJECT NO.
01917

DRAWING NO.
SP1

D01-01-21-0014 & D02-02-21-0084

PLAN NO.:18721



1 A108 ROOF PLAN
3/16" = 1'-0"

GENERAL NOTES

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NO.	REV DATE	REV DESCRIPTION

COLIZZA BRUNI
architecture

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T 613.236.2944 • F 613.236.6777 • www.colizzabruni.com

PROJECT NAME

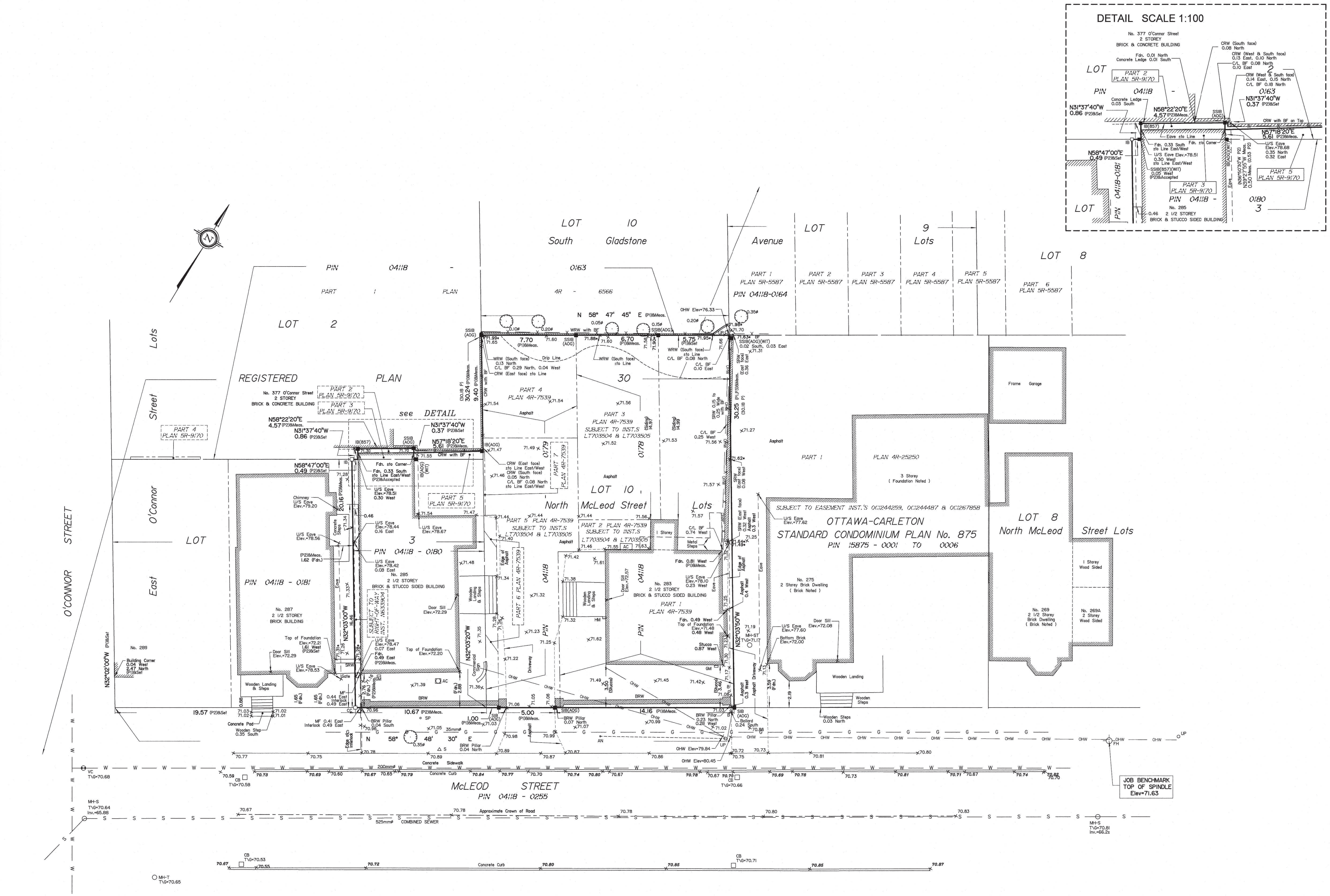
283 & 285 McLEOD STREET

OTTAWA, ON

DRAWING TITLE
ROOF PLAN

SCALE AS NOTED	DRAWING NO. A108
DRAWN BY BS	
DATE 2024-02-13 6:25:49 AM	
PROJECT NO. 01917	

A.2 Survey Plan - April 2018



TOPOGRAPHICAL PLAN OF SURVEY OF

PART OF LOTS 2 AND 3 (East O'Connor Street) and LOT 10 (North McLeod Street) REGISTERED PLAN 30 CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 4th day of April, 2018.

May 10, 2018
Date

A. J. Broxham
Andrew J. Broxham
Ontario Land Surveyor

Notes & Legend

	Denotes	
—□—	"	Survey Monument Planted
—■—	"	Survey Monument Found
SIB	"	Standard Iron Bar
SSIB	"	Short Standard Iron Bar
IB	"	Iron Bar
CC	"	Cut Cross
(WIT)	"	Witness
Meas.	"	Measured
(AOG)	"	Annis, O'Sullivan, Vollebekk Ltd.
(P)	"	Registered Plan 30
(P1)	"	Plan 4R-7539
(P2)	"	(AOG) Plan & Field Notes November 22, 1990
(P3)	"	Ottawa-Carleton Standard Condominium Plan 875
FH	"	Fire Hydrant
SP	"	Water Stand Post
VC	"	Valve Chamber (Watermain)
MH-S	"	Maintenance Hole (Sanitary)
MH-T	"	Maintenance Hole (Traffic)
MH-ST	"	Maintenance Hole (Storm Sewer)
CB	"	Catch Basin
BRW	"	Brick Retaining Wall
SRW	"	Stone Retaining Wall
CRW	"	Concrete Retaining Wall
WRW	"	wood Retaining Wall
CLF	"	Chain Link Fence
BF	"	Board Fence
MF	"	Metal Fence
AC	"	Air Conditioner
	"	Gas Meter
OHW	"	Overhead Wires
UP	"	Utility Pole
AN	"	Anchor
B	"	Bollard
Ø	"	Diameter
65.00	"	Location of Elevations
65.00	"	Top of Wall Elevations
65.00	"	Top of Concrete Curb Elevation
C/L	"	Centreline
———	"	Property Line
T/G	"	Top of Grate
U/S	"	Underside
Fdn.	"	Foundation
△ S	"	Sign
○	"	Deciduous Tree
— S —	"	Underground Sanitary Sewer
— W —	"	Underground Water
— G —	"	Underground Gas

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2046766

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

SITE AREA = 832.1 m²

Bearings are grid and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) NAD-83 (original).
For bearing comparisons, a rotation of 1°20'00" counter-clockwise was applied to bearings on plans P1 and P2.

ELEVATION NOTES

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

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
4. Underground services and inverts are taken from City of Ottawa Engineering Drawings F-12-04, B20 and 5285 Sheet 3 of 8.

Ontario Land Surveyors
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 17916-18 NOI Lt 10 RP 30 T F | ig

A.3 Sketch Showing Additional Elevation Spots – January 2024

LOT 10 30

WRW with BF

72.26*

72.26*
71.65

CRW with BF

LOT 2

71.24 71.22 71.27

71.29

72.25*

CRW with BF on Top

71.62

72.25*

71.49

71.28 71.28

Gravel

71.31

Concrete Steps

72.13

LOT 3

71.40

71.39

71.37

Gravel

REGISTERED PLAN

LOT 10

North McLeod Street

Lots

71.43

71.32

Asphalt Parking Area

SRW 0.15 to 0.25 Wide with BF

71.30

71.31

71.35

71.32

71.26

71.24

STANDARD CONDOMINIUM PLAN No. 875 OTTAWA-CARLETON

Asphalt Driveway

71.18

71.31* SRW 71.28*

71.17 71.14

71.16

70.97

71.00

Interlock

McLEOD STREET

70.77

70.72

Concrete Sidewalk

Concrete Curb

SKETCH SHOWING ADDITIONAL ELEVATION SPOTS

" 283 Mcleod Street "
CITY OF OTTAWA
Prepared by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 150

6 4.5 3.0 1.5 0 3 6 Metres

Metric

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

Notes & Legend

	Denotes	
SRW	"	Stone Retaining Wall
CRW	"	Concrete Retaining Wall
WRW	"	wood Retaining Wall
BF	"	Board Fence
+ 65.00	"	Location of Elevations
+ 65.00*	"	Top of Wall Elevations

Caution

This is NOT a Plan of Survey and shall not be used except for the purpose indicated in the title block.

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
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Nepean, Ont. K2E 7S6
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Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 17916-18 NOI Lt10 PL 30 SK F | FS

Y:\2018\17916-18\Emails\17916-18 NOI Lt10 PL 30 SK F.dwg

A.4 Building Construction Confirmation – Correspondence

Gladish, Alyssa

From: James Colizza <JC@colizzabruni.com>
Sent: Monday, November 14, 2022 9:04 AM
To: Gladish, Alyssa; David Murcia
Cc: Anthony Bruni; Peter Goodeve; kevinzhang; petryshyn@fotenn.com; Wu, Michael
Subject: RE: 283 & 285 McLeod Street - Seeking Confirmation of Proposed Building Construction

Alyssa…..see comments below

JAMES COLIZZA
B.COMM B.ARCH FRAIC OAA

COLIZZA BRUNI architecture
76 CHAMBERLAIN AVE · OTTAWA · ONTARIO · K1S 1V9 · (P) 613.236.2944 · (F) 613.236.6777

From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: Friday, November 11, 2022 4:35 PM
To: David Murcia <dm@colizzabruni.com>
Cc: James Colizza <JC@colizzabruni.com>; Anthony Bruni <AB@colizzabruni.com>; Peter Goodeve <pg@goodevestructural.ca>; kevinzhang <Kevinzhang@zyerdevelopments.com>; petryshyn@fotenn.com; Wu, Michael <Michael.Wu@stantec.com>
Subject: 283 & 285 McLeod Street - Seeking Confirmation of Proposed Building Construction

Good afternoon David,

Can you please confirm the following information regarding the proposed building construction for 283 & 285 McLeod Street and provide any additional details that may be pertinent to the building's fire resistivity (such as minimum fire-resistance rating of floors, walls or openings, any intentional fire separations). This will support our OFM and FUS 2020 fire flow requirement calculations.

1. Building classification: C – Residential Occupancy, 5-storey + full basement apartment building with 31 units. (5 x bachelor, 17 x one-bedroom, 9 x two-bedroom). ……..correct
2. What is the type of construction as defined by the FUS 2020? (see PDF page 21-22 in the attached for details). …..building is combination of combustible and noncombustible construction …..side walls and floor between basement and ground floor are noncombustible…..remainder is combustible with conventional wood frame with 1 hour rating of floors, roof and walls
    a. Type I – Fire Resistive Construction Non-Combustible without Fire-Resistive Ratings
    b. Type II – Non-Combustible Construction / Type IV-A – Mass Timber Construction
    c. Type III – Ordinary Construction / Type IV-C – Mass Timber Construction
    d. Type IV-B – Mass Timber Construction
    e. Type V – Wood Frame / Type IV-D – Mass Timber Construction
3. Will the building be sprinklered in Accordance with Applicable NFPA Standards? ….yes
4. Will the sprinkler system be *fully supervised* as defined by the FUS 2020? (see PDF page 29 in the attached for details). Yes

5. Are there any additional details pertinent to the building's fire resistivity? …fire resistive rating between the basement and ground floor is 2hrs.

Thank you for your time.

Best regards,

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

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

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

A.5 Mechanical Confirmation of Sprinkler System

March 7, 2024

City of Ottawa
110 Laurier Ave. West,
Ottawa (Ontario) K1P 1J1

File No. : PC2024-0043

Subject: **Phase 3 Pre-Consultation: Review Feedback**
Proposed Site Plan Control Application- 283/285 McLeod Street

To whom it may concern,

In respect to the above-mentioned project, please find the below response to the City of Ottawa comments received on March 1st, 2024, from the city planner.

	Inspection Comments	Cosmel's Response
33	The mechanical engineer needs to provide a letter (signed and sealed) confirming each building sprinkler system will meet the requirements of a fully supervised system as per the NFPA and are fully supervised by a monitored fire alarm system as per OBC to support applying the maximum 50% sprinkler protection credit to the FUS method. Otherwise, a maximum credit of 40% should only be applied. Provide this letter within the Appendix to confirm that the buildings will be complete with a sprinkler system conforming to NFPA13	Acting as the mechanical and electrical consultants on this project, we hereby confirm that the building will meet the requirements of a fully supervised system as stated in the NFPA. Furthermore, we also confirm that the building will be fully supervised by a monitored fire alarm system as per OBC.

We trust that the above is to your satisfaction. If, however, additional information is required, please do not hesitate to contact the undersigned.

Sincerely,

Ryan Chartrand, ing. P.Eng.
Division Mécanique / *Mechanical Division*
T 819.205.3283 ext.119
F 819.205.3284
Ryan.Chartrand@cosmel.ca

LICENSED PROFESSIONAL ENGINEER
R. CHARTRAND
100222645
PROVINCE OF ONTARIO

2024-03-07

A.6 Application Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☒ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available
☒ Availability of public infrastructure to service proposed development
☒ Identification of system constraints
☒ Identify boundary conditions
☒ Confirmation of adequate domestic supply and pressure
☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
☒ Address reliability requirements such as appropriate location of shut-off valves
☐ Check on the necessity of a pressure zone boundary modification.
☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- ☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- ☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- ☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☒ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☐ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☒ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- ☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- ☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- ☐ Changes to Municipal Drains.
- ☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☒ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

Appendix B Water Servicing

B.1 Water Demand Calculations

283 - 285 Mcleod, Ottawa, ON - Domestic Water Demand Estimates

Site Plan provided by Colizza Bruni Architecture (2024-03-25)

Project No. 160401782

Densities as per Table 4.1 of City Guidelines:		
Apartment Units		
1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu

Stantec

Building ID	Amenity areas (m^2)	No. of Units	Population	Daily Rate of Demand [1] [2] (L/cap/day or L/ha/day)	Avg Day Demand		Max Day Demand [3] [4]		Peak Hour Demand [3] [4]	
					(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Apartment Units										
Bachelor		6	8	280	1.6	0.03	4.1	0.07	9.0	0.15
1 Bedroom		11	15	280	3.0	0.05	7.5	0.12	16.5	0.27
1 Bedroom + Den [5]		3	6	280	1.2	0.02	3.1	0.05	6.7	0.11
2 Bedroom		10	21	280	4.1	0.07	10.2	0.17	22.5	0.37
2 Bedroom + Den [5]		1	3	280	0.6	0.01	1.5	0.03	3.3	0.06
Subtotal		**31**	**54**		**10.5**	**0.18**	**26.3**	**0.44**	**58.0**	**0.96**
Amenity Areas	249			28000	0.48	0.01	0.7	0.01	1.3	0.02
Total Site :		**31**	**54**		**11.0**	**0.19**	**27.1**	**0.45**	**59.3**	**0.98**

1 Average day water demand for residential areas: 280 L/cap/d

2 Average day water demand for Amenity/common areas: 28,000 L/ha/d (based on commercial water demand rates)

3 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 for residential

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

4 Water demand criteria used to estimate peak demand rates for amenity/common areas are as follows:

maximum daily demand rate = 1.5 x average day demand rate

peak hour demand rate = 1.8 x maximum day demand rate (as per Technical Bulletin ISD-2010-02)

5 Assumption that "1 bedroom with den" has density of 2.1 ppu, "2-bedroom with den" has density of 3.1 ppu

B.2 Fire Flow Demand Calculations

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401782
Project Name: 283-285 McLeod Street SPC Application
Date: 2024-04-03
Fire Flow Calculation #: 1
Description: 5-Storey Residential Apartment Building.

Notes: Floor plans provided by Colizza Bruni Architecture (2024-03-25)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type III - Ordinary Construction / Type IV-C - Mass Timber Construction										1	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		494	497	424	334	343						2090	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min										-	10000
4	Determine Occupancy Charge	Limited Combustible										-15%	8500
5	Determine Sprinkler Reduction	Conforms to NFPA 13										-30%	-4250
		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	0 to 3	27.18	5	> 100	Type I-II - Unprotected Openings	YES				0%	3230
		East	3.1 to 10	20.25	2	41-60	Type V	NO				17%	
		South	> 30	0	0	0-20	Type V	NO				0%	
		West	0 to 3	16.27	2	21-49	Type V	NO				21%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											7000
		Total Required Fire Flow in L/s											116.7
		Required Duration of Fire Flow (hrs)											2.00
		Required Volume of Fire Flow (m^3)											840

B.3 Boundary Conditions

Wu, Michael

From: Whelan, Amy <amy.whelan@ottawa.ca>
Sent: March 26, 2024 10:52
To: Wu, Michael
Cc: Gladish, Alyssa
Subject: 283-285 Mcleod
Attachments: 283-285 Mcleod Street REVISED March 2024.pdf

Good morning Michael,

The following are boundary conditions, HGL, for hydraulic analysis at 283-285 McLeod Street (zone 1W) with an assumed connection to the 203 mm watermain on McLeod Street (see attached PDF for location).

Minimum HGL: 106.4 m

Maximum HGL: 115.3 m

Max Day + Fire Flow (116.7 L/s): 104.0 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.

Amy Whelan, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department– Direction générale de la planification, des biens immobiliers et du développement Development Review – Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 26642, amy.whelan@ottawa.ca

'

'

B.4 Hydraulic Analysis Sheet

Stantec	Project:	**283-285 McLeod Street SPC**	No. **160401782**
	SITE PLAN HYDRAULIC ANALYSIS		
	Revision:	01	Prepared By: MW
	Revision Date:	26-Mar-2024	Checked By: AG

BOUNDARY CONDITIONS (BC)	
Connection at McLeod	
Site Plan Revision Date	25-Mar-2024
Min. HGL (m)	106.4
Max. HGL (m)	115.3
Max. Day + Fire Flow (166.67 L/s) (m)	104

Ground Floor Elevation (GFE) (Level 01) (m)	72.3

GROUND FLOOR (GF) PRESSURE RANGE				
	GF HGL (m)	**GF Pressure (kPa)**	**GF Pressure (psi)**	**Outcome**
	= BC HGL (m) - FFE (m)	= GF HGL (m) x 9.804 (kPa/m)	= GF Pressure (kPA) x 0.145 (psi/kPa)	If min <50 psi: booster pump If max >100 psi: pressure reducer
Minimum Normal	34.14	334.7	48.5	May Require Booster Pump
Maximum Normal	43	421.6	61.1	No Pressure Reducer Required

Number of Floors Above Ground	5
Approximate Height of One Storey (m)	3.19
Pressure Drop Per Floor (kPa)	31.3
Pressure Drop Per Floor (psi)	4.5

RESIDUAL PRESSURE RANGE IN MULTI-LEVEL BUILDINGS			
	Residual Pressure (kPa)	**Residual Pressure (psi)**	**Outcome**
Top Floor Min	209.6	30.4	May Require Booster Pump
Top Floor Max	296.5	43.0	
Maximum Number of Floors Above Ground at Minimum Pressure	1		

RESIDUAL PRESSURE UNDER FIRE FLOW CONDITIONS			
	Residual HGL (m)	**Residual Pressure (kPa)**	**Residual Pressure (psi)**
Ground Floor	31.7	310.8	45.1
Top Floor	18.94	185.7	26.9

PRESSURE CHECK		
	Pressure (kPa)	**Pressure (psi)**
UNDER NORMAL OPERATING CONDITIONS		
Pressure Below Minimum	<276	<40
Pressure Below Normal	276-345	40-50
Pressure Within Normal Range	345-552	50-80
Pressure Above Normal Range	552-690	80-100
Pressure Above Maximum	>690	>100
UNDER FIRE FLOW CONDITIONS		
Pressure Below Minimum	<140	<20
Acceptable Pressure	≥140	≥20

B.5 Fire Hydrant Coverage Table

Stantec	Project:	**283-285 McLeod Street SPC**	160401782
	TABLE 1: FIRE HYDRANT COVERAGE TABLE		
	Revision: 01	Prepared By: MW	
	Revision Date: 2024-04-03	Checked By:	

Description	Hydrants[1]			Total Available Fire Flow (L/min)	Total Required Fire Flow[2] (L/min)
	HYD-01	**HYD-02**			
283-285 McLeod Street					
Distance from building (m)	45.8	34.1	-	-	-
Maximum fire flow capacity[3] (L/min)	5,678	5,678	-	**11,356**	7,000
Classification[4]	AA	AA	-	-	-

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**

City of Ottawa WDG Table 4.10	
Cap colour	Hydrant Classification
Red	**C**
Orange	**B**
Green	**A**
Light Blue	**AA**

Notes:

1. Hydrant locations as per GeoOttawa accessed Janurary 10, 2024. Refer to fire hydrant coverage sketch (Figure 3.1).
2. See FUS Calculations, Appendix B.2 for fire flow requirements.
3. See NFPA 1 Table 18.5.4.3 for maxiumim fire flow capacity of hydrants by distance to building.
4. Hydrant classifications as per Google Streetview accessed April 3, 2024.

Appendix C Wastewater Servicing

C.1 Sanitary Sewer Design Sheet

Stantec

SITE:

283 - 285 Mcleod Street SPC

DATE: 2024-04-03
REVISION: 1
DESIGNED BY: MW
CHECKED BY:

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401782

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280	l/p/day	MINIMUM VELOCITY	0.60	m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000	l/ha/day	MAXIMUM VELOCITY	3.00	m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000	l/ha/day	MANNINGS n	0.013	
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000	l/ha/day	BEDDING CLASS	B	
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+I+I	INFILTRATION			TOTAL	PIPE							
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA	1 BEDROOM	2 BEDROOM	3 BEDROOM	POP.	CUMULATIVE AREA	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	FLOW	LENGTH	DIA	MATERIAL	CLASS	SLOPE	CAP. (FULL)	CAP. V PEAK FLOW	VEL. (FULL)
			(ha)					(ha)			(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)			(%)	(l/s)	(%)	(m/s)
PROPOSED BLDG	BLDG	EX SAN	0.049	17	13	1	54	0.049	54	3.45	0.61	0.025	0.025	0.00	0.00	0.00	0.00	0.00	0.00	0.034	0.03	0.01	0.083	0.08	0.03	0.64	8.0	200	PVC	SDR 35	1.00	33.4	**1.93%**	1.05

Notes

1. Unit breakdown for proposed 5-storey residential building provided by Colizza Bruni Architecture in March 25 2024
2. Site to outlet to existing 525 mm dia. combined sewer on McLeod Street.
3. Entire site area considered as potential source of infiltration.

Appendix D Stormwater Servicing and Management

D.1 Modified Rational Method

Project #160401782, 283 & 285 McLeod Street SPC
Roof Drain Design Sheet, Area ROOF-1
Standard Watts Roof Drain with Adjustable Accutrol Weir

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.000000	0.0000	0.00	0.000	0	0.00	0.00	0.000
0.025	0.000631	0.0006	0.02	0.025	2.40	0.02	0.02	0.025
0.050	0.000710	0.0007	0.16	0.050	9.62	0.14	0.16	0.050
0.075	0.000789	0.0008	0.54	0.075	21.64	0.38	0.54	0.075
0.100	0.000867	0.0009	1.28	0.100	38.47	0.74	1.28	0.100
0.125	0.000946	0.0009	2.50	0.125	60.11	1.22	2.50	0.125
0.150	0.001104	0.0011	4.33	0.150	86.55	1.82	4.33	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
0.1	197.6	0.1	0.05489
0.5	482.8	0.4	0.18899
1.3	854.6	0.7	0.42639
2.5	1291.6	1.2	0.78517
4.3	1651.5	1.8	1.24392

Rooftop Storage Summary	
Total Building Area (sq.m)	120
Available Roof Area (sq.m)	87
Roof Imperviousness	0.99
Roof Drain Requirement (sq.m/Notch)	232
Number of Roof Notches	1
Max. Allowable Depth of Roof Ponding (m)*	0.15
Max. Allowable Storage (cu.m)	4.3
Estimated 100 Year Drawdown Time (h)	1.1

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

Adjustable Accutrol Weir Flow Rate Settings From Watts Drain Catalogue					
Head (m)	L/s Open	75%	50%	**25%**	Closed
0.025	0.6308	0.63083	0.63083	**0.63083**	0.63083
0.05	0.7097	0.70969	0.70969	**0.70969**	0.63083
0.075	1.104	0.94625	0.8674	**0.78854**	0.63083
0.1	1.3405	1.26167	1.10396	**0.8674**	0.63083
0.125	1.8925	1.57708	1.26167	**0.94625**	0.63083
0.15	0	1.8925	1.34052	**1.10396**	0.63083

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.001	0.001	-
Depth (m)	0.087	0.141	0.150
Volume (cu.m)	0.9	3.6	4.3
Draintime (hrs)	0.3	1.1	

Project #160401782, 283 & 285 McLeod Street SPC
Roof Drain Design Sheet, Area ROOF-2
Standard Watts Roof Drain with Adjustable Accutrol Weir

Rating Curve				Volume Estimation				
Elevation (m)	Discharge Rate (cu.m/s)	Outlet Discharge (cu.m/s)	Storage (cu. m)	Elevation (m)	Area (sq. m)	Volume (cu. m) Increment	Volume (cu. m) Accumulated	Water Depth (m)
0.000	0.000000	0.0000	0.00	0.000	0	0.00	0.00	0.000
0.025	0.000631	0.0006	0.04	0.025	5.14	0.04	0.04	0.025
0.050	0.000710	0.0007	0.34	0.050	20.58	0.30	0.34	0.050
0.075	0.000789	0.0008	1.16	0.075	46.30	0.81	1.16	0.075
0.100	0.000867	0.0009	2.74	0.100	82.32	1.59	2.74	0.100
0.125	0.000946	0.0009	5.36	0.125	128.62	2.62	5.36	0.125
0.150	0.001104	0.0011	9.26	0.150	185.21	3.90	9.26	0.150

Drawdown Estimate			
Total Volume (cu.m)	Total Time (sec)	Vol (cu.m)	Detention Time (hr)
0.0	0.0	0.0	0
0.3	422.9	0.3	0.11747
1.1	1033.0	0.8	0.40442
2.7	1828.8	1.6	0.91243
5.3	2763.8	2.6	1.68016
9.2	3534.1	3.9	2.66185

Rooftop Storage Summary

Total Building Area (sq.m)	220
Available Roof Area (sq.m)	185
Roof Imperviousness	0.99
Roof Drain Requirement (sq.m/Notch)	232
Number of Roof Notches	1
Max. Allowable Depth of Roof Ponding (m)*	0.15
Max. Allowable Storage (cu.m)	9.3
Estimated 100 Year Drawdown Time (h)	2.5

* As per Ontario Building Code section OBC 7.4.10.4.(2)(c).

Adjustable Accutrol Weir Flow Rate Settings From Watts Drain Catalogue

Head (m)	L/s Open	75%	50%	**25%**	Closed
0.025	0.6308	0.6308	0.6308	**0.6308**	0.6308
0.05	0.7097	0.7097	0.7097	**0.7097**	0.6308
0.075	1.104	0.9462	0.8674	**0.7885**	0.6308
0.1	1.3405	1.2617	1.104	**0.8674**	0.6308
0.125	1.8925	1.5771	1.2617	**0.9462**	0.6308
0.15	0	1.8925	1.3405	**1.104**	0.6308

Calculation Results	**5yr**	**100yr**	**Available**
Qresult (cu.m/s)	0.001	0.001	-
Depth (m)	0.095	0.145	0.150
Volume (cu.m)	2.4	8.5	9.3
Draintime (hrs)	0.8	2.5	

Stormwater Management Calculations

File No: **160401782**
Project: **283 & 285 McLeod Street SPC**
Date: **04-Apr-24**

SWM Approach:
Post-development to Pre-development flows

Post-Development Site Conditions:

Overall Runoff Coefficient for Site and Sub-Catchment Areas

Runoff Coefficient Table

Catchment Type	Sub-catchment Area ID / Description		Area (ha) "A"		Runoff Coefficient "C"	"A x C"		Overall Runoff Coefficient
Controlled - Tributary	L1A & L2A	Hard	0.007		0.9	0.007		
		Soft	0.009		0.2	0.002		
		Subtotal		0.016			0.00837	0.523
Uncontrolled - Tributary	ROOF-4	Hard	0.008		0.9	0.007		
		Soft	0.000		0.2	0.000		
		Subtotal		0.008			0.0072	0.900
Uncontrolled - Tributary	ROOF-3	Hard	0.005		0.9	0.005		
		Soft	0.000		0.2	0.000		
		Subtotal		0.005			0.0045	0.900
Roof	ROOF-2	Hard	0.022		0.9	0.020		
		Soft	0.000		0.2	0.000		
		Subtotal		0.022			0.0198	0.900
Roof	ROOF-1	Hard	0.012		0.9	0.011		
		Soft	0.000		0.2	0.000		
		Subtotal		0.012			0.0108	0.900
Uncontrolled - Tributary	DRAIN-3	Hard	0.001		0.9	0.001		
		Soft	0.000		0.2	0.000		
		Subtotal		0.001			0.0009	0.900
Uncontrolled - Tributary	DRAIN-2	Hard	0.001		0.9	0.001		
		Soft	0.000		0.2	0.000		
		Subtotal		0.001			0.0009	0.900
Uncontrolled - Tributary	DRAIN-1	Hard	0.003		0.9	0.003		
		Soft	0.000		0.2	0.000		
		Subtotal		0.003			0.0027	0.900
Uncontrolled - Non-Tributary	UNC-2	Hard	0.004		0.9	0.003		
		Soft	0.004		0.2	0.001		
		Subtotal		0.008			0.00408	0.510
Uncontrolled - Non-Tributary	UNC-1	Hard	0.005		0.9	0.004		
		Soft	0.002		0.2	0.000		
		Subtotal		0.007			0.00462	0.660
Total				**0.083**			**0.064**	
Overall Runoff Coefficient= C:								**0.77**

Total Controlled Roof Areas	**0.034 ha**
Total ICD Controlled Surface Areas	**0.016 ha**
Total Drains and Uncontrolled Roof Areas	**0.018 ha**
Total Tributary Area to Outlet	**0.068 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.015 ha**
Total Site	**0.083 ha**

Stormwater Management Calculations

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

2 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	732.951
b =	6.199
c =	0.81

t (min)	I (mm/hr)
10	76.81
20	52.03
30	40.04
40	32.86
50	28.04
60	24.56
70	21.91
80	19.83
90	18.14
100	16.75
110	15.57
120	14.56

2 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.083
C: 0.40

Target stormwater release rate determined using a C of 0.4 in a 2-year event and subtracting the peak sanitary flow rate (as per pre-consultation with the City).

Using a typical time of concentration of 10 minutes
(Used Federal Aviation Administration Method (1970) to confirm that the actual pre-development time of concentration is less than 10 minues)

tc (min)	I (2 yr) (mm/hr)	Qtarget (L/s)
10	76.81	**7.09**

Subtracting the peak sanitary discharge of: 0.64 L/s

Target release rate: 6.45 L/s

2 YEAR Modified Rational Method for Entire Site

Subdrainage Area: L1A & L2A — Controlled - Tributary
Area (ha): 0.02
C: 0.52

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	1.79	1.79	0.00	**0.00**
20	52.03	1.21	1.21	0.00	**0.00**
30	40.04	0.93	0.93	0.00	**0.00**
40	32.86	0.76	0.76	0.00	**0.00**
50	28.04	0.65	0.65	0.00	**0.00**
60	24.56	0.57	0.57	0.00	**0.00**
70	21.91	0.51	0.51	0.00	**0.00**
80	19.83	0.46	0.46	0.00	**0.00**
90	18.14	0.42	0.42	0.00	**0.00**
100	16.75	0.39	0.39	0.00	**0.00**
110	15.57	0.36	0.36	0.00	**0.00**
120	14.56	0.34	0.34	0.00	**0.00**

Storage: Surface Storage Above CB

Orifice Equation: LMF40

Invert Elevation	67.33	m
T/G Elevation	70.99	m
Max Ponding Depth	0.00	m
Downstream W/L	66.35	m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
2-year Water Level	70.99	3.66	1.79	0.00	7.07	OK

Subdrainage Area: ROOF-4 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	1.54	1.54		
20	52.03	1.04	1.04		
30	40.04	0.80	0.80		
40	32.86	0.66	0.66		
50	28.04	0.56	0.56		
60	24.56	0.49	0.49		
70	21.91	0.44	0.44		
80	19.83	0.40	0.40		
90	18.14	0.36	0.36		
100	16.75	0.34	0.34		
110	15.57	0.31	0.31		
120	14.56	0.29	0.29		

Subdrainage Area: ROOF-3 — Uncontrolled - Tributary
Area (ha): 0.01
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.96	0.96		
20	52.03	0.65	0.65		
30	40.04	0.50	0.50		
40	32.86	0.41	0.41		
50	28.04	0.35	0.35		
60	24.56	0.31	0.31		
70	21.91	0.27	0.27		
80	19.83	0.25	0.25		
90	18.14	0.23	0.23		
100	16.75	0.21	0.21		
110	15.57	0.19	0.19		
120	14.56	0.18	0.18		

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

100 yr Intensity
City of Ottawa

$I = a/(t + b)^c$

a =	1735.688
b =	6.014
c =	0.820

t (min)	I (mm/hr)
10	178.56
20	119.95
30	91.87
40	75.15
50	63.95
60	55.89
70	49.79
80	44.99
90	41.11
100	37.90
110	35.20
120	32.89

100 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.0830
C: 0.40

Target stormwater release rate determined using a C of 0.4 in a 2-year event and subtracting the peak sanitary flow rate (as per pre-consultation with the City).

Target release rate: 6.45 L/s

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: L1A & L2A — Controlled - Tributary
Area (ha): 0.02
C: 0.65

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	5.19	2.62	2.58	**1.55**
20	119.95	3.49	2.62	0.87	1.05
30	91.87	2.67	2.62	0.06	0.10
40	75.15	2.19	2.19	0.00	0.00
50	63.95	1.86	1.86	0.00	0.00
60	55.89	1.63	1.63	0.00	0.00
70	49.79	1.45	1.45	0.00	0.00
80	44.99	1.31	1.31	0.00	0.00
90	41.11	1.20	1.20	0.00	0.00
100	37.90	1.10	1.10	0.00	0.00
110	35.20	1.02	1.02	0.00	0.00
120	32.89	0.96	0.96	0.00	0.00

Storage: Surface Storage Above CB

Orifice Equation: LMF40

Invert Elevation	67.33	m
T/G Elevation	70.99	m
Max Ponding Depth	0.00	m
Downstream W/L	66.35	m

Storage provided

CB2	1.32	cu. m
Pipe	5.75	cu. m

	Stage	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	70.99	3.66	2.62	1.55	7.07	OK
					5.52	

Subdrainage Area: ROOF-4 — Uncontrolled - Tributary
Area (ha): 0.01
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	3.97	3.97		
20	119.95	2.67	2.67		
30	91.87	2.04	2.04		
40	75.15	1.67	1.67		
50	63.95	1.42	1.42		
60	55.89	1.24	1.24		
70	49.79	1.11	1.11		
80	44.99	1.00	1.00		
90	41.11	0.91	0.91		
100	37.90	0.84	0.84		
110	35.20	0.78	0.78		
120	32.89	0.73	0.73		

Subdrainage Area: ROOF-3 — Uncontrolled - Tributary
Area (ha): 0.01
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	2.48	2.48		
20	119.95	1.67	1.67		
30	91.87	1.28	1.28		
40	75.15	1.04	1.04		
50	63.95	0.89	0.89		
60	55.89	0.78	0.78		
70	49.79	0.69	0.69		
80	44.99	0.63	0.63		
90	41.11	0.57	0.57		
100	37.90	0.53	0.53		
110	35.20	0.49	0.49		
120	32.89	0.46	0.46		

Stormwater Management Calculations

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

Subdrainage Area: ROOF-2 — Roof
Area (ha): 0.02 — Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	4.23	0.83	3.40	2.04	88.9	0.00
20	52.03	2.86	0.85	2.01	2.42	94.8	0.00
30	40.04	2.20	0.85	1.35	**2.43**	95.1	0.00
40	32.86	1.81	0.85	0.96	2.31	93.2	0.00
50	28.04	1.54	0.84	0.71	2.12	90.2	0.00
60	24.56	1.35	0.83	0.52	1.88	86.4	0.00
70	21.91	1.21	0.82	0.39	1.64	82.5	0.00
80	19.83	1.09	0.80	0.29	1.38	78.6	0.00
90	18.14	1.00	0.79	0.21	1.13	74.0	0.00
100	16.75	0.92	0.77	0.15	0.91	67.5	0.00
110	15.57	0.86	0.75	0.11	0.71	61.3	0.00
120	14.56	0.80	0.73	0.07	0.52	55.4	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	95.11	0.10	0.85	2.43	9.26	0.00

Subdrainage Area: ROOF-1 — Roof
Area (ha): 0.01 — Maximum Storage Depth: 150 mm
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	76.81	2.31	0.83	1.48	**0.89**	86.7	0.00
20	52.03	1.56	0.83	0.74	0.88	86.6	0.00
30	40.04	1.20	0.81	0.40	0.71	80.8	0.00
40	32.86	0.99	0.78	0.21	0.50	72.2	0.00
50	28.04	0.84	0.74	0.10	0.31	59.6	0.00
60	24.56	0.74	0.70	0.04	0.14	46.4	0.00
70	21.91	0.66	0.65	0.01	0.05	30.0	0.00
80	19.83	0.60	0.59	0.00	0.02	23.4	0.00
90	18.14	0.54	0.54	0.00	0.02	21.5	0.00
100	16.75	0.50	0.50	0.00	0.02	19.8	0.00
110	15.57	0.47	0.47	0.00	0.01	18.4	0.00
120	14.56	0.44	0.44	0.00	0.01	17.3	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
2-year Water Level	86.71	0.09	0.83	0.89	4.33	0.00

Subdrainage Area: DRAIN-3 — Uncontrolled - Tributary
Area (ha): 0.00
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.19	0.19		
20	52.03	0.13	0.13		
30	40.04	0.10	0.10		
40	32.86	0.08	0.08		
50	28.04	0.07	0.07		
60	24.56	0.06	0.06		
70	21.91	0.05	0.05		
80	19.83	0.05	0.05		
90	18.14	0.05	0.05		
100	16.75	0.04	0.04		
110	15.57	0.04	0.04		
120	14.56	0.04	0.04		

Subdrainage Area: DRAIN-2 — Uncontrolled - Tributary
Area (ha): 0.00
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.19	0.19		
20	52.03	0.13	0.13		
30	40.04	0.10	0.10		
40	32.86	0.08	0.08		
50	28.04	0.07	0.07		
60	24.56	0.06	0.06		
70	21.91	0.05	0.05		
80	19.83	0.05	0.05		
90	18.14	0.05	0.05		
100	16.75	0.04	0.04		
110	15.57	0.04	0.04		
120	14.56	0.04	0.04		

Subdrainage Area: DRAIN-1 — Uncontrolled - Tributary
Area (ha): 0.00
C: 0.90

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.58	0.58		
20	52.03	0.39	0.39		
30	40.04	0.30	0.30		
40	32.86	0.25	0.25		
50	28.04	0.21	0.21		
60	24.56	0.18	0.18		
70	21.91	0.16	0.16		
80	19.83	0.15	0.15		
90	18.14	0.14	0.14		
100	16.75	0.13	0.13		
110	15.57	0.12	0.12		
120	14.56	0.11	0.11		

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

Subdrainage Area: ROOF-2 — Roof
Area (ha): 0.02 — Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	10.92	0.97	9.95	5.97	128.9	0.00
20	119.95	7.34	1.04	6.30	7.56	139.1	0.00
30	91.87	5.62	1.06	4.56	8.20	143.2	0.00
40	75.15	4.60	1.07	3.52	8.46	144.9	0.00
50	63.95	3.91	1.07	2.84	**8.51**	145.2	0.00
60	55.89	3.42	1.07	2.35	8.45	144.8	0.00
70	49.79	3.05	1.07	1.98	8.31	143.9	0.00
80	44.99	2.75	1.06	1.69	8.13	142.7	0.00
90	41.11	2.51	1.05	1.46	7.91	141.4	0.00
100	37.90	2.32	1.04	1.28	7.67	139.8	0.00
110	35.20	2.15	1.03	1.12	7.42	138.2	0.00
120	32.89	2.01	1.02	0.99	7.15	136.5	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	145.21	0.15	1.07	8.51	9.26	0.00
	88.38					

Subdrainage Area: ROOF-1 — Roof
Area (ha): 0.01 — Maximum Storage Depth: 150 mm
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	5.96	0.99	4.97	2.98	131.5	0.00
20	119.95	4.00	1.04	2.96	3.56	139.4	0.00
30	91.87	3.06	1.04	2.02	**3.64**	140.5	0.00
40	75.15	2.51	1.04	1.47	3.53	139.1	0.00
50	63.95	2.13	1.02	1.11	3.34	136.5	0.00
60	55.89	1.86	1.00	0.87	3.12	133.4	0.00
70	49.79	1.66	0.98	0.68	2.87	130.0	0.00
80	44.99	1.50	0.96	0.54	2.62	126.5	0.00
90	41.11	1.37	0.94	0.44	2.35	121.9	0.00
100	37.90	1.26	0.92	0.35	2.08	116.2	0.00
110	35.20	1.17	0.90	0.27	1.80	110.7	0.00
120	32.89	1.10	0.88	0.21	1.54	105.2	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	140.53	0.14	1.04	3.64	4.33	0.00
	88.37					

Subdrainage Area: DRAIN-3 — Uncontrolled - Tributary
Area (ha): 0.00
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	0.50	0.50		
20	119.95	0.33	0.33		
30	91.87	0.26	0.26		
40	75.15	0.21	0.21		
50	63.95	0.18	0.18		
60	55.89	0.16	0.16		
70	49.79	0.14	0.14		
80	44.99	0.13	0.13		
90	41.11	0.11	0.11		
100	37.90	0.11	0.11		
110	35.20	0.10	0.10		
120	32.89	0.09	0.09		

Subdrainage Area: DRAIN-2 — Uncontrolled - Tributary
Area (ha): 0.00
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	0.50	0.50		
20	119.95	0.33	0.33		
30	91.87	0.26	0.26		
40	75.15	0.21	0.21		
50	63.95	0.18	0.18		
60	55.89	0.16	0.16		
70	49.79	0.14	0.14		
80	44.99	0.13	0.13		
90	41.11	0.11	0.11		
100	37.90	0.11	0.11		
110	35.20	0.10	0.10		
120	32.89	0.09	0.09		

Subdrainage Area: DRAIN-1 — Uncontrolled - Tributary
Area (ha): 0.00
C: 1.00

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	1.49	1.49		
20	119.95	1.00	1.00		
30	91.87	0.77	0.77		
40	75.15	0.63	0.63		
50	63.95	0.53	0.53		
60	55.89	0.47	0.47		
70	49.79	0.42	0.42		
80	44.99	0.38	0.38		
90	41.11	0.34	0.34		
100	37.90	0.32	0.32		
110	35.20	0.29	0.29		
120	32.89	0.27	0.27		

Stormwater Management Calculations

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

Subdrainage Area: UNC-2 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.51

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.87	0.87		
20	52.03	0.59	0.59		
30	40.04	0.45	0.45		
40	32.86	0.37	0.37		
50	28.04	0.32	0.32		
60	24.56	0.28	0.28		
70	21.91	0.25	0.25		
80	19.83	0.22	0.22		
90	18.14	0.21	0.21		
100	16.75	0.19	0.19		
110	15.57	0.18	0.18		
120	14.56	0.17	0.17		

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.66

tc (min)	I (2 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	76.81	0.99	0.99		
20	52.03	0.67	0.67		
30	40.04	0.51	0.51		
40	32.86	0.42	0.42		
50	28.04	0.36	0.36		
60	24.56	0.32	0.32		
70	21.91	0.28	0.28		
80	19.83	0.25	0.25		
90	18.14	0.23	0.23		
100	16.75	0.22	0.22		
110	15.57	0.20	0.20		
120	14.56	0.19	0.19		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.068	ha			
2yr Flow to STM Sewer (Controlled)	3.5	L/s	3.3	13.6 m^3	Ok
2yr Flow to STM Sewer (Uncontrolled)	3.5	L/s			
Total 2yr Flow to STM Sewer	6.9	L/s			
Non-Tributary Area	0.015	ha			
2yr Surface Flow Uncontrolled to Mcleod ROW	1.9	L/s			
Total Area	0.083	ha			
Total 2yr Release Rate from Site	8.8	L/s			
Target Release Rate to McLeod Combined Sewer	6.4	L/s			

Project #160401782, 283 & 285 McLeod Street SPC
Modified Rational Method Calculations for Storage

Subdrainage Area: UNC-2 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.64

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	2.53	2.53		
20	119.95	1.70	1.70		
30	91.87	1.30	1.30		
40	75.15	1.07	1.07		
50	63.95	0.91	0.91		
60	55.89	0.79	0.79		
70	49.79	0.71	0.71		
80	44.99	0.64	0.64		
90	41.11	0.58	0.58		
100	37.90	0.54	0.54		
110	35.20	0.50	0.50		
120	32.89	0.47	0.47		

Subdrainage Area: UNC-1 — Uncontrolled - Non-Tributary
Area (ha): 0.01
C: 0.83

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	2.87	2.87		
20	119.95	1.93	1.93		
30	91.87	1.47	1.47		
40	75.15	1.21	1.21		
50	63.95	1.03	1.03		
60	55.89	0.90	0.90		
70	49.79	0.80	0.80		
80	44.99	0.72	0.72		
90	41.11	0.66	0.66		
100	37.90	0.61	0.61		
110	35.20	0.57	0.57		
120	32.89	0.53	0.53		

SUMMARY TO OUTLET

			Vrequired	Vavailable*	
Tributary Area	0.068	ha			
100yr Flow to STM Sewer (Controlled)	4.7	L/s	12.2	13.6 m^3	Ok
100yr Flow to Storm Sewer (Uncontrolled)	8.9	L/s			
Total 100yr Flow to STM Sewer	13.7	L/s			
Non-Tributary Area	0.015	ha			
100yr Surface Flow Uncontrolled to Mcleod ROW	5.4	L/s			
Total Area	0.083	ha			
Total 100yr Release Rate from Site	19.1	L/s			
Target Release Rate to McLeod Combined Sewer	6.4	L/s			

D.2 Storm Sewer Design Sheet

Stantec

283-285 McLeod Street

DATE: 2024-04-05
REVISION: 1
DESIGNED BY: MW
CHECKED BY: AG

STORM SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401782

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr
a =	732.951	998.071	1174.184	1735.688
b =	6.199	6.053	6.014	6.014
c =	0.810	0.814	0.816	0.820

MANNING'S n = 0.013
BEDDING CLASS = B
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min

LOCATION			DRAINAGE AREA																				PIPE SELECTION									
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (100-YEAR) (-)	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	$I_{2\text{-YEAR}}$ (mm/h)	$I_{5\text{-YEAR}}$ (mm/h)	$I_{10\text{-YEAR}}$ (mm/h)	$I_{100\text{-YEAR}}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)	LENGTH (m)	PIPE WIDTH OR DIAMETE (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	TIME OF FLOW (min)
ROOF-1, ROOF-2, ROOF-3, ROOF-4, DRAIN-2, DRAIN-3	BLG	EXIST	0.000	0.000	0.00	0.015	0.034	0.90	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	**10.00**	76.81	104.19	122.14	178.56	2.100	2.1	9.54	17.80	150	200	CIRCULAR	PVC	-	1.00	15.3	**62.32%**	0.86	0.38
DRAIN-1	DRAIN-1	EXIST	0.000	0.000	0.00	0.003	0.000	0.90	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**10.00**	76.81	104.19	122.14	178.56	0.000	0.00	1.49	17.80	150	200	CIRCULAR	PVC	-	1.00	15.3	**9.72%**	0.86	0.66
L1A, L2A	CB 1	EXIST	0.000	0.000	0.00	0.016	0.000	0.52	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	**10.00**	76.81	104.19	122.14	178.56	0.000	0.00	14.12	37.30	250	250	CIRCULAR	PVC	-	2.00	85.4	**16.53%**	1.72	0.59
																		10.38																		

D.3 Watts Adjustable Accutrol Weir

Adjustable Accutrol Weir

Tag: _____

Adjustable Flow Control for Roof Drains

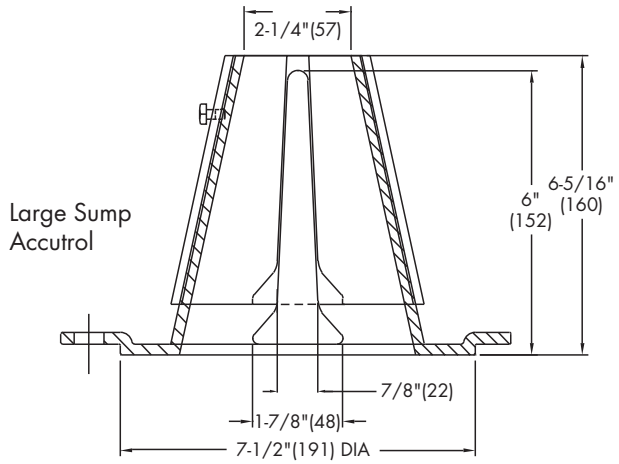
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

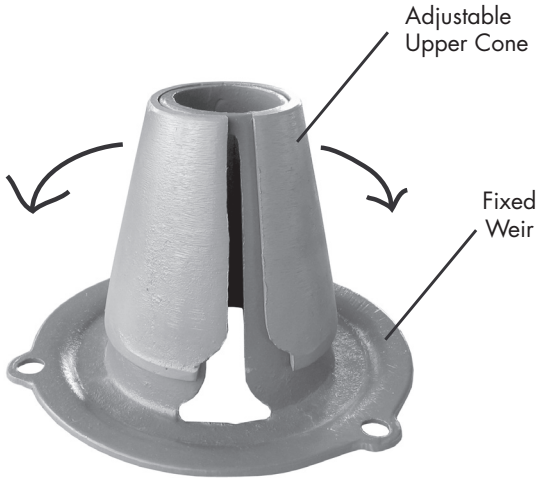
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

A Watts Water Technologies Company

D.4 Stormwater Management Approach Correspondence

Wu, Michael

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Thursday, 8 December, 2022 11:20
To: Gladish, Alyssa
Cc: Wu, Michael; Cody, Neal; Burton, David; 'James Colizza'; McCreight, Andrew
Subject: RE: 283-285 McLeod Street Stormwater Management Requirements
Attachments: Paterson Group Report PG5489-1 Rev. 1 dated July 22, 2021.pdf; 221110_283+285 MCLEOD_FOOTING ELEVATIONS.pdf; 221102_283+285 MCLEOD_BASEMENT_FLOOR_PLAN.pdf

Good afternoon, Alyssa and thank you for your email.

Considering the following:

1. Peak dry weather flows from the adjacent areas, the HGL is 66.28 m, provide adequate FB for the McLeod system in front of 283-285 McLeod St.
   Furthermore, another 1.58 l/s release rate from this site to the City system will not have a significant impact on the HGL, whereas this site is not expected to endure a system surcharge (backup), although we do however recommend a BWV be installed at the property as a second line of defense to minimize basement flooding.

2. Matching post to predevelopment, with mostly controlling on the site at roof and a small amount of uncontrolled flows directed to nearby CBs in ROW.

3. The release rate of 1.58 l/s directed to the City sewer system. Attached drawing has indicated that roof top storage is being controlled by roof drains.

4. Geotech Report speaks to using a mud slab on exposed clay during excavation process to protect subgrade and the use of either a raft or pile foundation system due to subgrade soil type, which does not permit a cistern in this case.

We are fine with what is being proposed, with the exception to the following item that we wanted to note and prior to detailed design review:

A. As per SDG, trench drains typically drain to sanitary, whereas the City infrastructure fronting this site is a combined sewer and therefore a separate lateral for trench drain to the combined sewer is required. Refer to Standard Detail Drawing S17. We also suggest pumping with a backup pump and power and in either case, require a plan for emergency overflow due to connection to combined sewer system and opportunity for surcharge flows to enter garage at this location.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Pronouns: he/him | Pronom: il
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Real Estate and Economic Development Department | Direction générale de la planification des biens immobiliers et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: December 07, 2022 1:45 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Wu, Michael <Michael.Wu@stantec.com>; Cody, Neal <Neal.Cody@stantec.com>; Burton, David <David.Burton@stantec.com>; 'James Colizza' <JC@colizzabruni.com>; McCreight, Andrew <Andrew.McCreight@ottawa.ca>
Subject: RE: 283-285 McLeod Street Stormwater Management Requirements

Hello Shawn,

I have attached the geotechnical report, elevation plans, and basement floor plan for your review. I do not believe the geotechnical report speaks to the cistern specifically.

This is not my area of expertise, but it is my understanding that there are engineering and safety concerns with situating the cistern below the raft slab due to the fundamental principles of the raft slab design. Providing the cistern's maintenance/monitoring access hole through to the 3' slab of concrete introduces additional concerns.

We will review Section 5.7.6 of the City SDG (with latest ISTB updates) regarding the treatment of the reverse-sloped ramp.

We are hoping to have this ZBA/OPA resubmission prepared as soon as possible – is there any way our team might be able to have a meeting with yourself, and other pertinent City staff (perhaps someone from the modelling group), to collectively work through these ideas?

Thank you,
Alyssa

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

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

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Friday, December 2, 2022 8:39 PM
To: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Cc: Wu, Michael <Michael.Wu@stantec.com>; Cody, Neal <Neal.Cody@stantec.com>; Burton, David <David.Burton@stantec.com>; 'James Colizza' <JC@colizzabruni.com>; McCreight, Andrew <Andrew.McCreight@ottawa.ca>
Subject: RE: 283-285 McLeod Street Stormwater Management Requirements

Hello again Alyssa

May I request the Geotechnical Report and the floor and foundation plans for our review so as to understand why the cistern is not a viable option.

I realize that this is a small site, although we are dealing with a combined sewer system which may be near capacity and I would like to see some documentation that speaks to these issues.

I have also consulted our modeling group to better understand how this proposal may benefit or affect our system, albeit being close to a nearby outlet, and taking into account previous files that permitted a deviation from our required SWM criteria.

I did note that the reverse sloped ramp to the garage is considered a depressed driveway and want to refer you to Section 5.7.6 of the City SDG (with latest ISTB updates).

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Real Estate and Economic Development Department | Direction générale de la planification des biens immobiliers et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: Gladish, Alyssa <Alyssa.Gladish@stantec.com>
Sent: November 30, 2022 6:50 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Wu, Michael <Michael.Wu@stantec.com>; Cody, Neal <Neal.Cody@stantec.com>; Burton, David <David.Burton@stantec.com>; 'James Colizza' <JC@colizzabruni.com>
Subject: 283-285 McLeod Street Stormwater Management Requirements

Good afternoon, Shawn:

I am looking to initiate some dialogue regarding the stormwater management requirements for 283-285 McLeod Street. Specifically, we would like to discuss the approach for the SWM Quantity Control.

It is our understanding through the pre-consultation notes that the following SWM criteria have been identified for this site:

- Time of concentration for the site is to be equal to or greater than 10 minutes
- Existing conditions are to be determined based on a rational method runoff coefficient of no greater than 0.4
- Storms up to and including the 100-year event are to be attenuated to the 2-year pre-development event

For the first submission, the SWM targets were met using rooftop storage with restricted release as well as a cistern (proposed below the basement slab) to be mechanically pumped at a restricted release rate.

During the development review process, Heritage Planning and Urban Design required many changes to the Site Plan to accommodate the streetscape and landscaping. The two front 3-storey portions of the building

were required to have peaked roofs to mimic individual houses. As a result, we lost about 30% of our available rooftop storage area.

As I mentioned in my last email, due to the complex foundation requirements and difficult soil conditions, it is no longer feasible to situate the cistern below the basement slab. This has left us with virtually no opportunities within the building footprint to situate the cistern. Other detention storage techniques were investigated, such as having an underground storage unit/pipe (providing approximately 14 m^3 of storage) located directly underneath the ramp to the underground parking garage. Outflow from the underground storage pipe would be controlled by an appropriately sized ICD. Given there are concerns regarding the elevated hydraulic grade lines in the combined sewer, a cistern or storage pipe outlet could increase the risk of surcharging the sewer. In addition, underground storage (whether a tank or pipe) will require a manhole for monitoring and maintenance. The addition of a manhole cover within the driveway pavers does not benefit the visual appeal of the frontage and works against the directives from Heritage and Urban Planning for this site. Infiltration and LID stormwater management strategies were not considered for this site, as the challenging soil conditions do not recommend the addition of moisture to the subsurface. With the loss of roof storage area compounded with the underground cistern/pipe storage concerns, it is no longer feasible to reasonably meet the stringent stormwater quantity control criteria for this site.

This site has a total area of 0.082 ha, and the proposed building covers 0.048 ha (58.5 %).

The breakdown of the site surfacing is as follows:

- 0.033 ha (40.2 %) flat roof that is available for stormwater storage
- 0.023 ha (28.1 %) outdoor amenity spaces
- 0.015 ha (18.3 %) peaked roofs
- 0.011 ha (13.4 %) other landscaped areas

Since the site is less than 0.1ha in total area, and the roof storage area occupies most of the site, we would like to request **controlling only the roof storage area and allowing the remaining site area to flow uncontrolled** to the McLeod Street right of way.

The roof-only control approach has recently been recommended in pre-consultation minutes for many similar infill development sites in the city, where the site is less than 0.1 ha, and the roof storage area covers most of the site. Some examples include 138 Forward Avenue (D07-12-21-0237), 139 Parkdale Avenue (PC2021.0385), 1806 Scott Street, and 391 Dieppe Street, to name a few. In each case, roof-only control was permitted provided the uncontrolled areas were directed toward the right of way. In the proposed SWM approach for this site, the uncontrolled area can effectively be directed to the McLeod Street ROW to the south.

We believe this approach should be acceptable for this site for four key reasons:

1. Many changes that were required for Heritage and Urban design work against the site being able to fulfill all technical criteria. Since every effort has been made to accommodate and comply with the architectural and planning requirements, we are hoping the city will allow for some compromise regarding the stormwater management criteria.
2. The site is less than 0.1 ha, and the controlled roof area occupies the majority of the site.
3. The site is situated relatively close to the receiving waterbody of the major system (less than one kilometer from the canal). Getting stormwater to the receiving body as quickly as possible provides some benefits to the overall system, since it avoids compounding the upstream hydrograph peak. Hence, allowing a portion of the site to flow uncontrolled to the right of way may reduce peak burdens/demands on the combined municipal sewer.
4. The development of the property and the addition of roof storage provides a significant improvement compared to existing conditions. To support this claim, we have prepared an existing stormwater drainage plan for the site (see attached) to determine the existing runoff coefficient (C) value and the table below (Table 1) that compares pre-to-post development stormwater release rates. We found that

under existing conditions the runoff coefficient for the site is C=0.77. Using the rational method, we determined the pre-development stormwater release rates for the site are 12.88 L/s for the 2-year event and 30.74 L/s for the 100-year event.

In the attached preliminary stormwater management plan (SD-1) and preliminary MRM analysis, you will find that we have maximized the use of the rooftop storage by using five flow-controlled roof drains set to the closed position (minimal release rate). The remaining "at grade" site area will drain uncontrolled to the ROW. Depressed patios, entrances, and the sunken rear yard amenity space will require area drains and will need to be routed through the internal plumbing to the building stormwater service. We will ensure that the combined STM and SAN service lateral release rates do not exceed the 2-year pre-development rate (@C=0.4) to the combined sewer under all events up to and including the 100-year event.

Based on the characteristics of the subcatchments in the SD-1 plan we used the modified rational method to calculate the post-development release rates for the developed site to be 10.44 L/s for the 2-year event and 25.90 L/s for the 100-year event.

Seeing as the exceedance originates from the uncontrolled subcatchment areas (areas that can't readily be captured by onsite SWM infrastructure), the benefits to introducing additional SWM infrastructure would be negligible. It is our understanding that due to the proximity of the canal, there are benefits to getting the stormwater to the canal as soon as possible and avoid compounding the upstream hydrograph peak. The 13.02 L/s exceedance under the 100-year event should be considered acceptable. Please confirm if this SWM approach for quantity control is supported by the City of Ottawa. In other words, by controlling the roof area, the overall stormwater release rate is reduced by 23 % for the 2-year event and by 17 % for the 100-year event, compared to the existing (pre-development) conditions.

TABLE 1 - COMPARISON OF PRE-TO-POST DEVELOPMENT STORMWATER RELEASE RATES

	2-Year Peak Discharge				100-Year Peak Discharge			
	Pre-Dev. @ C=0.77	Post-Dev.	Difference		Pre-Dev. @ C=0.77	Post-Dev.	Difference	
	(L/s)	(L/s)	(L/s)	%	(L/s)	(L/s)	(L/s)	%
Uncontrolled – Surface	13.48	8.86	-4.02	-	31.34	24.32	-6.42	-
Controlled – Rooftop Storage	-	1.58	1.58	-	-	1.58	1.58	-
Total	**13.48**	**10.44**	**-3.04**	**-23%**	**31.34**	**25.90**	**-5.44**	**-17%**

We would like to proceed with the SWM approach for quantity control where only the roof storage area is controlled, and the remaining site area is allowed to flow uncontrolled to the McLeod Street right of way. **Please confirm if this SWM approach for quantity control can be supported by the City of Ottawa.**

If you have any questions or concerns, or if additional information is required, please do not hesitate to contact me, or I would be happy to setup a Teams meeting for further discussion.

Best regards,

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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300-1331 Clyde Avenue
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Appendix E External Reports

E.1 Geotechnical Investigation

PATERSON GROUP

Geotechnical Investigation

Proposed Multi-Storey Building

283 & 285 McLeod Street
Ottawa, Ontario

Prepared for REZY Properties Inc.

Report PG5489-1 Revision 2 dated December 11, 2023

4.0 Observations

4.1 Surface Conditions

The subject site consists of 2 contiguous properties, 285 and 283 McLeod Street, which border each other to the east and west, respectively. The site is bordered by a commercial property to the north, residential properties to the east and west, and McLeod Street to the south.

The southern half of the subject site is currently occupied by a 2 storey residential structure at 283 McLeod Street and a 2 storey commercial structure at 285 McLeod Street. The northern half of the property is currently occupied by an asphalt paved parking lot. The ground surface across the site is relatively level at approximate geodetic elevation 71 m.

4.2 Subsurface Profile

Overburden

Generally, the subsurface profile at the test hole locations consists of an approximate 50 to 100 mm thickness of asphalt underlain by fill which extends to approximate depths of 2.3 to 3.1 m below the existing ground surface. The fill was generally observed to consist of a either a brown silty sand with gravel and brick or a brown silty clay.

A stiff, grey silty clay deposit was observed underlying the fill material in boreholes BH 1 and BH 3. The silty clay in borehole BH 2 was observed to transition from a very stiff brown silty clay crust to a stiff grey silty clay at a depth of 3.8 m below the existing ground surface.

Refusal of the DCPT was encountered at an approximate depth of 28.2 m below the existing ground surface.

Bedrock

Based on available geological mapping, the bedrock at the subject site consists of shale of the Billings formation with a drift thickness of 25 to 50 m.

4.3 Groundwater

Groundwater levels were measured in the standpipes on September 11, 2020. The observed groundwater levels are summarized in Table 1 below.

Table 1 – Summary of Groundwater Level Readings

Test Hole Number	Ground Surface Elevation (m)	Groundwater Depth (m)	Groundwater Elevation (m)	Recording Date
BH 1	71.04	7.70	63.34	Sept 11, 2020
BH 2	71.48	10.40	61.08	Sept 11, 2020
BH 3	71.46	Blocked and Dry	-	Sept 11, 2020

Note – The ground surface elevations at the borehole locations are referenced to a geodetic datum.

The long-term groundwater levels can also be estimated based on the observed colour, moisture content and consistency of the recovered samples. Based on these observations, the long-term groundwater levels are expected to range between approximately 8 to 10 m below ground surface.

However, 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

From a geotechnical perspective, the subject site is considered suitable for the proposed development. It is recommended that the proposed multi-storey building be founded on one of the following:

- A raft foundation bearing on an undisturbed, stiff silty clay bearing surface, or
- End-bearing piles extending to the bedrock.

Conventional spread footing may also be utilized to provide foundation support for isolated exterior columns and auxiliary structures.

Due to the presence of a deep silty clay deposit, a permissible grade raise restriction is required for the subject site.

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

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and fill, such as those containing organic or deleterious materials, should be stripped from under any building, paved areas, pipe bedding and other settlement sensitive structures.

Existing foundation walls and other construction debris should be entirely removed from within the building perimeter. Under paved areas, existing construction remnants, such as foundation walls, should be excavated to a minimum of 1 m below final grade.

Protection of Subgrade (Raft Foundation)

Since the subgrade material will consist of a silty clay deposit, it is recommended that a minimum 75 mm thick lean concrete mud slab be placed on the undisturbed silty clay subgrade shortly after the completion of the excavation. The main purpose of the mud slab is to reduce the risk of disturbance of the subgrade under the traffic of workers and equipment.

Permissible Grade Raise

Due to the presence of the silty clay deposit, a permissible grade raise restriction of **1.5 m** is recommended for grading at the subject site.

If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill, and/or other measures should be investigated to reduce the risks of unacceptable long-term post construction total and differential settlements.

5.4 Design for Earthquakes

For foundations constructed at the subject site, the site class for seismic site response can be taken as **Class D**, according to the Ontario Building Code (OBC) 2012. The soils underlying the subject site are not susceptible to liquefaction.

Reference should be made to the latest revision of the OBC 2012 for a full discussion of the earthquake design requirements.

5.5 Basement Floor Slab

If a raft slab is considered, a granular layer of OPSS Granular A is recommended to allow for the installation of sub-floor services above the raft slab foundation. The thickness of the OPSS Granular A crushed stone will be dependent on the piping requirements.

For a building founded on piles, it is recommended that the upper 200 mm of subfloor fill consists of 19 mm clear crushed stone, which is placed over an undisturbed, stiff silty clay subgrade.

An underslab drainage system, consisting of lines of perforated drainage pipe subdrains connected to a positive outlet, should be provided under the lowest level floor slab. This is discussed further in Subsection 6.1.

5.6 Basement Wall

There are several combinations of backfill materials and retained soils that could be applicable for the basement walls of the subject structure. However, the conditions can be well-represented by assuming the retained soil consists of a

The peak ground acceleration, (a_{max}), for the Ottawa area is 0.32g according to OBC 2012. Note that the vertical seismic coefficient is assumed to be zero.

The earth force component (P_o) under seismic conditions can be calculated using $P_o = 0.5\ K_o\ \gamma\ H^2$, where $K_o = 0.5$ for the soil conditions noted above.

The total earth force (P_{AE}) is considered to act at a height, h (m), from the base of the wall, where:

$$h = \{P_o \cdot (H/3) + \Delta P_{AE} \cdot (0.6 \cdot H)\}/P_{AE}$$

The earth forces calculated are unfactored. For the ULS case, the earth loads should be factored as live loads, as per OBC 2012.

5.7 Pavement Design

Should a flexible pavement be required for the project, the recommended flexible pavement structures shown in Tables 3 and 4 would be applicable.

Table 3 – Pavement Structure – Car Only Parking Areas and Driveways

Thickness (mm)	Material Description
50	**Wear Course –** HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE –** OPSS Granular A Crushed Stone
300	**SUBBASE –** OPSS Granular B Type II
	SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill

Table 4 – Pavement Structure – Local Residential Roadways with Bus Traffic

Thickness (mm)	Material Description
40	**Wear Course –** HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course –** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE –** OPSS Granular A Crushed Stone
400	**SUBBASE –** OPSS Granular B Type II
	SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project.

6.8 Landscaping Considerations

Tree Planting Setbacks

Tree planting shall follow the City of Ottawa's "Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines". As Atterberg limits testing was not completed as part of the geotechnical investigation program, it is recommended that tree planting setbacks be a minimum of **7.5 m** for trees with a mature height smaller than or equal to 7.5 m, and for trees with a mature height greater than 7.5 m, the tree planting setback should be equal to the mature height of tree. It should be noted that shrubs and other small planting with mature root depths less than 2 m are permitted within the tree planting setbacks.

It is well documented in the literature, and is our experience, that fast-growing trees located near buildings founded on cohesive soils that shrink on drying can result in long-term differential settlements of the structures. Tree varieties that have the most pronounced effect on foundations are seen to consist of poplars, willows and some maples (i.e. Manitoba Maples) and, as such, they should not be considered in the landscaping design.

7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that the following material testing and observation program be performed by the geotechnical consultant.

- ❑ Review the final grading plan, from a geotechnical perspective.
- ❑ Review the contractor's design of the temporary shoring system.
- ❑ Observe test pits to determine requirements for underpinning of adjacent structures.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials used.
- ❑ Observation of all subgrades prior to backfilling.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by the geotechnical consultant.

All excess excavated soils, with the exception of engineered crushed stone fill, generated by construction activities that will be transported on-site or off-site should be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management.*

8.0 Statement of Limitations

The recommendations provided 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 to review our recommendations when the drawings and specifications are complete.

A geotechnical investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, we request immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine its suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

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 REZY Properties Inc. or their agents is not authorized without review by Paterson for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.

Otillia McLaughlin B.Eng.

Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ REZY Properties Inc. (e-mail copy)
- ❑ Paterson Group (1 copy)

PATERSON GROUP

memorandum

re: **Geotechnical Investigation – Response to City Comment**
Proposed Multi-Storey Building
283 & 285 McLeod Street
Ottawa, Ontario

to: REZY Properties Inc. - **Mr. Kevin Zhang –** kevinzhang@zyerdevelopments.com
c/o AKG Management Inc. – **Mr. Tony Kazarian –** tony.k@akgmanagement.com
date: December 11, 2023
file: PG5489-MEMO.02

Further to your request and authorization, Paterson Group (Paterson) prepared this memorandum to provide responses to the geotechnical-related comment from the City of Ottawa. This memorandum should be read in conjunction with the Geotechnical Investigation Report (Paterson Group Report PG5489-1 Revision 2 dated December 11, 2023) which has been prepared for the proposed development.

Geotechnical Investigation Comment

Comment 1: *Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications.*

Response: The aforementioned geotechnical investigation has been completed in accordance with the City of Ottawa's "*Geotechnical Investigation and Reporting Guidelines for Development Applications"* dated September 2007. Specifically, the geotechnical investigation consisted of 3 boreholes extending to a maximum depth of 11 m below ground surface, which is deeper than the required depth of investigation depth of 8 to 10 m for a mid-rise building provided in the above-noted guidelines. Further, the borehole spacing was typically 18 m, which is more frequent than the 30 to 50 m spacing provided in the guidelines.

Further, the current Geotechnical Investigation Report, referenced above, now includes tree planting recommendations in Section 6.8, as the site has silty clay soils. Please make reference to the Geotechnical Investigation Report for the specific tree planting recommendations for this site.

We trust that this information satisfies your immediate requirements.

Paterson Group Inc.

Otillia McLaughlin B.Eng.

Scott S. Dennis, P.Eng.

PATERSON GROUP

memorandum

re: **Geotechnical Investigation – Responses to City Comments**
Proposed Multi-Storey Building
283 & 285 McLeod Street
Ottawa, Ontario

to: REZY Properties Inc. - **Mr. Kevin Zhang –** kevinzhang@zyerdevelopments.com
c/o AKG Management Inc. – **Mr. Tony Kazarian –** tony.k@akgmanagement.com
date: March 26, 2024
file: PG5489-MEMO.03

Further to your request and authorization, Paterson Group (Paterson) prepared this memorandum to provide responses to the geotechnical-related comments from the City of Ottawa. This memorandum should be read in conjunction with the Geotechnical Investigation Report (Paterson Group Report PG5489-1 Revision 2 dated December 11, 2023) and the Grading, Servicing & Landscape Plan Review memo (Paterson Group Memorandum PG5489-MEMO.04 dated March 26, 2024) which have been prepared for the proposed development at this site.

Geotechnical Investigation Comment

Comment 15: *It appears that the landscape plan is proposing trees within the required minimum 7.5m setback as prescribed in the geotechnical report. Plans and Reports are required to be consistent with one another. See comment 15 below for additional information.*

Response: Based on our review of the Landscape Plan and discussions with the Landscape Architect, it is understood that any trees located within the 7.5 m tree planting setback will have root structures which do not extend deeper than the bottom of foundation elevation.

These tree plantings are therefore considered acceptable, from a geotechnical perspective. Please reference the Grading, Servicing & Landscape Plan Review memo (Paterson Group Memorandum PG5489-MEMO.04 dated March 25, 2024) for further details.

Comment 16: *Atterberg limits testing may be performed to determine a safe planting distance within the sensitive marine clay. Please review the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines for more information. A letter from the geotechnical consultant confirming that they have reviewed the landscape plan and that it is in accordance with the recommendations of the geotechnical analysis may be requested upon subsequent submissions.*

Response: The Atterberg Limits testing noted in the City of Ottawa's "Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines" is specifically required for "new plans of subdivision" and is not considered to apply to in-fill developments.

Please reference the Grading, Servicing & Landscape Plan Review memo (Paterson Group Memorandum PG5489-MEMO.04 dated March 26, 2024) for details about our review of the Landscape Plan. In summary, any trees located within the 7.5 m tree planting setback will have root structures which do not extend deeper than the bottom of foundation elevation, and therefore will not affect the building foundations.

Comment 17: *As per Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines, in areas of clay soils, the following tests are required, please ensure the following test are performed.*
-Atterberg Limits test and one water content test
-Shrinkage test

Response: The Atterberg Limits testing noted in the City of Ottawa's "Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines", is specifically required for "new plans of subdivision" and does not mention this requirement for in-fill developments, such as this.

Comment 18: *Due to the consideration of blasting as part of the excavation processes for pile foundation (if required), a pre-blast survey and report may be required and may be part of the conditions of the Site Plan Agreement. Monitoring of all sewers and watermains may be required coupled with pre and post CCTV sewer surveys.*

Response: The proposed building excavation will not extend into the bedrock, therefore blasting will not occur at this site. Further, the building foundation will consist of a raft, and pile driving will not be required for a pile-supported foundation. Accordingly, a pre-blast survey and monitoring of the nearby sewers and watermains is not required.

Comment 19: *Any excavation utilizing hoe ramming and/or sheet pilling for shoring or foundation support will require a Pre-Construction Survey for existing dwellings within 75 meters of site with notice of planned work to dwellings within 150 meters of site. In addition, in the event blasting is utilized, due to pile foundation, a Pre-Blast Survey will be required for existing dwellings within 75 meters of site with notice of work to dwellings within 150 meters of site.*

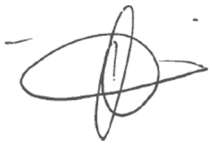
Response: Hoe-ramming and/or sheet piling is not anticipated as part of the proposed development at this site. The temporary shoring system is currently expected to consist of drilled soldier piles and lagging, which typically does not produce significant vibrations. A pre-construction survey will nonetheless be conducted as described above.

Comment 20: *Please submit a letter stating that the latest Grading and Servicing Plan has been reviewed and that it complies with the recommendations and statements of the latest Geotechnical Investigation.*

Response: Please reference the Grading, Servicing & Landscape Plan Review memo (Paterson Group Memorandum PG5489-MEMO.04 dated March 25, 2024). In summary, the proposed grading, servicing, and landscaping at the site is considered acceptable, from a geotechnical perspective.

We trust that this information satisfies your immediate requirements.

Paterson Group Inc.



Otillia McLaughlin B.Eng.

Scott S. Dennis, P.Eng.

PATERSON GROUP

memorandum

re: **Grading, Servicing & Landscape Plan Review**
Proposed Multi-Storey Building
283 & 285 McLeod Street
Ottawa, Ontario

to: REZY Properties Inc. - **Mr. Kevin Zhang –** kevinzhang@zyerdevelopments.com
c/o: AKG Management Inc. – **Mr. Tony Kazarian –** tony.k@akgmanagement.com
date: March 26, 2024
file: PG5489-MEMO.04

Further to your request and authorization, Paterson Group (Paterson) prepared the current memorandum to document our review of the grading, servicing, and landscaping plans for the proposed development to be located at 283 & 285 McLeod Street in the City of Ottawa. This memorandum should be read in conjunction with the current Geotechnical Investigation Report (Paterson Group Report PG5489-1 Revision 2 dated December 11, 2023).

Grading Plan Review

Paterson reviewed the following drawing prepared by Stantec as part of the Grading Plan Review:

- ❑ Grading Plan – Centretown 283-285 McLeod Street – Project No. 160401782 – Drawing No. GP-1

Based on our review of the above-noted grading plan drawing, the proposed grade raises at the subject site are within the recommended permissible grade raise restriction of 1.5 m. Therefore, the proposed grading is acceptable, from a geotechnical perspective.

Servicing Plan Review

Paterson reviewed the following drawing prepared by Stantec as part of the Servicing Plan Review:

- ❑ Site Servicing Plan – Centretown 283-285 McLeod Street – Project No. 160401782 – Drawing No. SSP-1

From our review of the above-noted servicing plan drawing, the proposed servicing pipes are all located more than 2.2 m below finished grades. Therefore, the proposed servicing is acceptable, from a geotechnical perspective, and does not require insulation due to the sufficient soil cover.

Landscape Plan Review

Paterson reviewed the following drawing prepared by Stantec as part of the Landscape Plan Review.

- ❑ Landscape Plan & Landscape Notes – Centretown 283-285 McLeod Street – Project No. 160401782 – Drawing No. L200

The Geotechnical Investigation Report, referenced above, recommends the following with regard to tree planting setbacks:

> "*…a minimum of 7.5 m for trees with a mature height smaller than or equal to 7.5 m, and for trees with a mature height greater than 7.5 m, the tree planting setback should be equal to the mature height of tree. It should be noted that shrubs and other small planting with mature root depths less than 2 m are permitted within the tree planting setbacks.*"

Based on our review of the Landscape Plan, trees are shown within the 7.5 m setback. However, based on discussions with the Landscape Architect, it is understood that the root structures of these trees will not extend below the raft foundation, which will be located approximately 3 m below finished grades.

As the roots will not extend below the foundation, they cannot absorb water and subsequently cause settlement of the clay soils supporting the foundation. These proposed tree plantings are therefore considered acceptable, from a geotechnical perspective.

We trust that this information satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

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