971 Montreal Road – Servicing and Stormwater Management Report

Stantec Project No. 160401667

February 13, 2023

Prepared for:

12318407 Canada Inc.
3500 Atwater, Suite 6
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Prepared by:

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Revision	Description	Author		Quality Check		Independent Review	
4	4th Submission	Warren Johnson	WJ	Dustin Thiffault	DT	Kris Kilborn	KK
3	3rd Submission	Warren Johnson	WJ	Dustin Thiffault	DT	Kris Kilborn	KK
2	2nd Submission	Nwanise Nwanise	NN	Dustin Thiffault	DT	Kris Kilborn	KK
1	1st Submission	Peter Mott	PM	Thakshika Rathnasooriya	TR	Kris Kilborn	KK

Sign-off Sheet

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Prepared by _____
(signature)

Warren Johnson C.E.T.

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(signature)

Dustin Thiffault, P.Eng.

Approved by _____
(signature)

Kris Kilborn

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1.0 BACKGROUND

Stantec Consulting Ltd. has been commissioned by 12318407 Canada Inc. to prepare the following Servicing and Stormwater Management Report for a proposed 9-storey residential building with 78 units to be located on the north side of Montreal Road (971 Montreal Road) between Burma Road and Foxview Place. The overall subject property comprises 0.18 ha with approximately 0.09 ha proposed for the proposed residential building and underground parking. The site is proposed to contain a new 9-storey residential building with both surface and underground ground parking, and an outdoor amenity area. An existing one-storey dine-in restaurant with surface parking is currently established on the subject property. The site limits are indicated in **Figure 1** below.

The intent of this report is to provide a servicing scenario for the site that is free of conflicts, provides on-site servicing in accordance with City of Ottawa design guidelines, and utilizes the existing local infrastructure in accordance with the guidelines outlined per consultation with City of Ottawa staff. This report also contains revisions and responses to City staff comments raised from the review process (**see Appendix** for response letter). The location of the site is provided in **Figure 1** below.

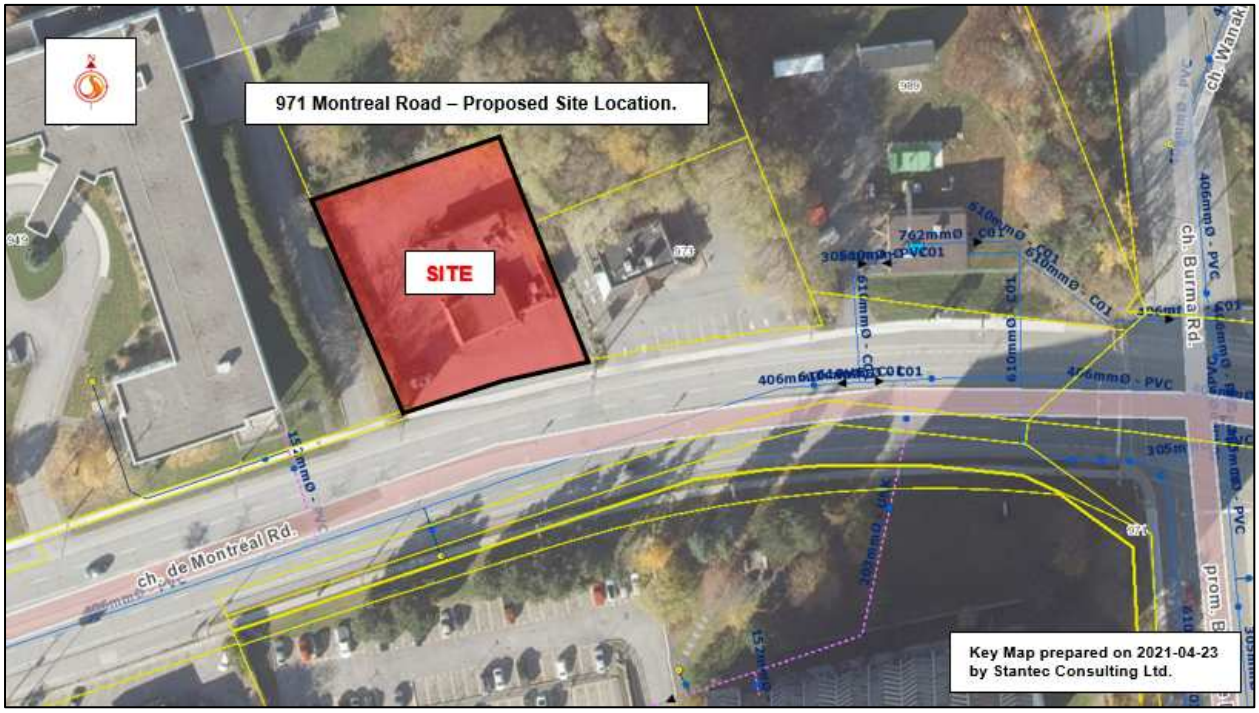

Figure 1: Key Map of Site

2.0 REFERENCES

The following background studies have been referenced during the preliminary servicing design for the proposed site:

- Geotechnical Investigation – Proposed Residential Development – 971 Montreal Road, Kollaard Associates July 31, 2020.
- City of Ottawa Design Guidelines – Water Distribution, Infrastructure Services Department, City of Ottawa, First Edition, July 2010
- City of Ottawa Sewer Design Guidelines, 2nd Ed., City of Ottawa, October 2012
- Technical Bulletin ISDTB-2014-01, City of Ottawa, February 2014
- Technical Bulletin ISTB-2018-01, City of Ottawa, March 21, 2018
- Technical Bulletin ISTB-2018-02, City of Ottawa, March 21, 2018
- Technical Bulletin ISTB-2018-03, City of Ottawa, March 21, 2018

3.0 POTABLE WATER SERVICING

The proposed development comprises one nine storey residential building, complete with associated infrastructure and parking. The proposed development is located within Zone MONT of the City of Ottawa's water distribution system. A 400 mm diameter PVC watermain exists south of the site within Montreal Road as shown on **Drawing SSP-1**. The site will be serviced through one 150mm building service connection to the existing 400mm diameter watermain within the Montreal Road ROW at the southern boundary of the site. Average ground elevations of the site are approximately 105.7m. Under normal operating conditions, the hydraulic gradeline is 146.9m as confirmed through boundary conditions as provided by the City of Ottawa (see **Appendix A.1**).

3.1 WATER DEMANDS

3.1.1 Domestic Water Demands

Water demands for the proposed development were estimated using the Ministry of Environment's Design Guidelines for Drinking Water Systems (2008) and the City of Ottawa Design Guidelines – Water Distribution (2010). A daily demand rate of 280 L/cap/day was applied for the population of the proposed site. Population densities have been assumed as 1.4 pers./one bedroom and bachelor apartment units, 2.1 pers./two-bedroom units and 3.1 pers./three-bedroom units. See for detailed domestic water demand estimates. See **Appendix A.2** for detailed domestic water demand estimates.

The average day demand (AVDY) for the site was determined to be 0.48 L/s. The maximum day demand rate (MXDY) is 2.5 times the AVDY for residential areas, which results in 1.19 L/s. The peak hour demand rate (PKHR) is 2.2 times the MXDY which was determined to be 2.62L/s.

Fire Underwriters Survey (FUS) methodology was used to determine the fire flow required for the proposed building. The building was considered to be of non-combustible construction with a sprinkler system. As a residential apartment, the building falls under occupancy class C. The FUS calculations assumed 2-hour fire separation between each floor and 1-hour fire separation for exterior vertical communications. Refer to **Appendix A.4** for the confirmation from the architect regarding the assumptions made. Based on calculations per the FUS guidelines (see **Appendix A.3),** the minimum required fire flows for this development are 133 L/s (8,000L/min).

3.2 PROPOSED SERVICING

Domestic water supply pressures are required to range within the guidelines of 50-80 psi specified in the City of Ottawa Design Guidelines for Water Distribution. Maximum day demand rates in addition to fire flow demands must result in a residual pressure at the main above the required minimum 140 kPa (20 psi).

Based on boundary conditions provided by the City of Ottawa and an approximate elevation of 105.7m, adequate domestic water supply is available for the subject site with pressures at 41.2m (58.6psi)). This

pressure value is within the guidelines of 50-80 psi specified in the City of Ottawa Design Guidelines for Water Distribution.

Since the proposed building is 9 storeys in height, an additional 34 kPa (5 psi) for every additional storey (above 2 storeys) is required to account for the change in elevation head and additional head loss when determining available pressure at upper building floors. Given that the available pressure is expected to be 404 kPa (58.6psi) at ground level, the resultant equivalent pressure at the 9th floor will be approximately 162 kPa (23.6 psi), below the City's minimum objective pressure value. As a result, building booster pump(s) will be required to maintain an acceptable level of service on the higher floors.

The boundary conditions provided for the proposed development under maximum day demands and fire flow conditions demonstrate that a fire flow rate of 133 L/s is available while maintaining a residual pressure above the required minimum 20 psi. The residual pressure in the system while providing maximum day demand plus a fire flow of 133 L/s is anticipated to be 41.0m (58.3 psi). This demonstrates that sufficient fire flow is available for the proposed development for the fire flow requirement of 133 L/s.

The closest hydrants are located on Montreal Road at the southern and eastern boundaries of the subject property and are within 90m of the proposed building as per City of Ottawa Water Distribution Design Guidelines. The primary hydrant to the south lies within 45m of the building fire department connection per Ontario Building Code requirements.

3.3 SUMMARY OF FINDINGS

The proposed development is in an area of the City's water distribution system that has sufficient capacity to provide both the required domestic and emergency fire flows. Based on boundary conditions provided by City of Ottawa staff shown in **Appendix A**, it is anticipated that there is sufficient supply and pressure in the proposed water distribution system to meet the demands expected from the new development on lower floors but will require the use of a booster pump to maintain minimum operating pressures on the higher floors.

4.0 WASTEWATER SERVICING

4.1 EXISTING CONDITIONS

An existing 225 mm diameter concrete sanitary sewer runs from east to west on Montreal Road, immediately south of the subject site. A proposed 150 mm diameter service lateral connection is to be made via new PVC tee branch installed within the existing 225 mm diameter concrete sanitary sewer line along Montreal Road to service the proposed site (see **Drawing SSP-1**). The location of the existing sanitary service lateral shall be confirmed prior to construction and is to be abandoned as part of the servicing works.

4.2 DESIGN CRITERIA

As outlined in the City's Sewer Design Guidelines and the MECP Design Guidelines for Sewage Works, the following criteria were used to calculate estimated wastewater flow rates and to preliminarily size on-site sanitary sewers:

- Minimum full flow velocity – 0.6 m/s
- Maximum full flow velocity – 3.0 m/s
- Manning's roughness coefficient for all smooth walled pipes – 0.013
- Minimum size – 200mm dia. for residential areas
- Max Peak Factor (Res.) – 4.0
- Min Peak Factor (Res.) – 2.0
- Extraneous flow allowance – 0.33 L/s/ha
- Harmon Correction Factor – 0.8
- Maintenance hole spacing – 120 m
- Minimum cover – 2.5 m

4.3 PROPOSED SERVICING

The proposed site will be serviced by gravity sewers which will direct the wastewater flows (approx. 1.7 L/s with allowance for infiltration) to the existing 225 mm diameter concrete sanitary sewer on Montreal Road. A sanitary sewer design sheet for the proposed service lateral is included in **Appendix B**. Full port backwater valves are to be installed on all sanitary services within the site to prevent any surcharge from the downstream sewer main from impacting the proposed property.

5.0 STORMWATER MANAGEMENT

5.1 OBJECTIVES

The objective of this stormwater management plan is to determine the measures necessary to control the quantity and quality of stormwater released from the proposed development to criteria established during the pre-consultation process, and to provide sufficient detail for approval and construction.

5.2 SWM CRITERIA AND CONSTRAINTS

Criteria were established by combining current design practices outlined by the City of Ottawa Design Guidelines (2012), and through consultation with City of Ottawa staff. The following summarizes the criteria, with the source of each criterion indicated in brackets:

General

- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff. (City of Ottawa).
- Use of the dual drainage principle (City of Ottawa).
- Assess impact of 100-year event outlined in the City of Ottawa Sewer Design Guidelines on major & minor drainage system (City of Ottawa)
- Quality control measures are not required for this site based on correspondence with the RVCA

Storm Sewer & Inlet Controls

- Proposed site to discharge the existing 225 mm diameter storm sewer on Montreal Road, south of the subject site.
- All stormwater runoff from the site up to and including the 100-year storm event to be stored on site and released into the minor system at a maximum discharge equivalent to the 5-year storm predevelopment release rate to Montreal Road at a maximum runoff coefficient of 0.5.
- Minor system inflow to be sized to convey 5-year storm event, under free-flow conditions using City of Ottawa I-D-F parameters (City of Ottawa).

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.30 m above the 100-year water level (City of Ottawa).
- Provide adequate emergency overflow conveyance off-site (City of Ottawa).

5.3 STORMWATER MANAGEMENT DESIGN

The proposed 0.18 ha development area is to contain a 9-storey high rise building with a total of 78 units. The site will be serviced by the existing 225 mm diameter concrete storm sewer running east to west on Montreal Road, as shown on **Drawing SD-1**.

The SWM strategy for the site is to provide roof storage and a stormwater cistern to attenuate peak flows to the downstream system to the allowable release rate. The proposed building will capture storm drainage through controlled roof drains and direct peak flows to a stormwater cistern located in the underground parking level for attenuation. Additionally, controlled drainage areas for surface drainage components within the building subsurface parking extents will allocate all stormwater flows to the cistern. The cistern, to be located near the southwest corner of the building in parking level P1, will be pumped at a controlled rate into the existing 225 mm diameter storm sewer on Montreal Road via 200 mm diameter storm service. The stormwater cistern location will be coordinated with the building's architect and structural engineer.

The intent of the stormwater management plan presented herein is to mitigate any negative impact that the proposed development will have on the existing storm sewer infrastructure, while providing adequate capacity to service the proposed buildings, parking and access areas. The proposed stormwater management plan is designed to detain runoff on site and within subsurface storage to ensure that peak flows after construction will not exceed the allowable site release rate detailed below.

The proposed site plan, drainage areas, runoff coefficients, and proposed storm sewer infrastructure are shown on **Drawing SD-1**.

5.3.1 Allowable Release Rate

The Modified Rational Method was employed to assess the rate of runoff generated during pre-development conditions. Based on consultation with City of Ottawa staff, the peak post-development discharge from the subject site to be controlled to the 5-year predevelopment release rate, to a maximum runoff coefficient C of 0.5. The predevelopment release rate for the area has been determined using the rational method based on the criteria above. A time of concentration for the predevelopment area (10 minutes) was assigned based on the relatively small site and its proximity to the existing drainage outlet for the site. Peak flow rates have been calculated using the rational method as follows:

$$\boldsymbol{Q} = \mathbf{2.78}\,(\boldsymbol{C})(\boldsymbol{I})(\boldsymbol{A})$$

Where:
$\boldsymbol{Q} = peak\ flow\ rate, L/s$
$\boldsymbol{C} = site\ runoff\ coefficient$
$\boldsymbol{I} = rainfall\ intensity, mm/hr\ (per\ City\ of\ Ottawa\ 5-year\ IDF\ curves)$
$\boldsymbol{A} = drainage\ area, ha$

The target release rate for the site is summarized in **Table 1** below:

Table 1: Target Release Rate to Montreal Road

Design Storm	Target Flow Rate (L/s)
5 and 100-year storm	26.1

5.3.2 Storage Requirements

The site requires quantity control measures to meet the restrictive stormwater release criteria. The use of controlled rooftop storage in addition to a cistern contained within the underground parking area are proposed to reduce site peak outflow to the allowable target release rates.

5.3.2.1 Rooftop Storage

It is proposed to detain stormwater within the rooftop area by installing restricted flow roof drains. Roof flows will be directed to the underground cistern unit proposed within the underground parking area. The following calculations assume that roofs will be equipped with Watts Model Adjustable Accutrol Roof Drains open at 25%.

Watts Drainage "Accutrol" roof drain weir data has been used to calculate a practical roof release rate and detention storage volume for the rooftops. 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 total roof drain release rate is restricted to match the maximum rate of release indicated in **Table 2**, and that sufficient roof storage is provided to meet (or exceed) the resulting volume of detained stormwater. Storage volume and controlled release rate are summarized in **Table 2**:

Table 2: Summary of Rooftop Storage (5 & 100-Year Events)

Storm Return Period	Area ID	Ponding Depth (mm)	Discharge (L/s)	$V_{required}$ (m^3)	$V_{available}$ (m^3)
5-year	BLDG	109	4.1	14.0	35.1
100-year	BLDG	146	4.7	32.9	35.1

*Drainage from the roof enters the cistern.

5.3.2.2 Subsurface Storage

It is proposed to detain stormwater within a 9 m^3 stormwater cistern below grade with a maximum controlled release rate of 16.4 L/s pumped to the gravity storm service provided. The Modified Rational Method was used to determine the peak volume requirement for the cistern. The majority of the site was assumed to be captured and directed to the cistern where it will be temporarily stored then released at a controlled rate.

Table 5 summarizes the flow rates and volume of stormwater in the cistern in the 5-year and 100-year storm events.

Table 5: Peak Controlled (Tributary) 5- and 100-Year Release Rates

Storm Return Period	Area ID	Area (ha)	Runoff 'C'	$Q_{release}$ (L/s)	V_{stored} (m^3)
5-year	BLDG, RAMP, CB-1, CB-2	0.14	0.87	16.44	0.23
100-year	BLDG, RAMP, CB-1A, CB-1B	0.14	0.98	16.44	7.99

The design of the stormwater cistern will be coordinated with the building's mechanical engineer. Coordination with the architect and the mechanical engineer will be required to determine the ideal location for the cistern to ensure that no conflicts exist, and any constraints are adequately managed. Refer to **Appendix C.4** for confirmation of the stormwater criteria for the proposed building from the mechanical consultant.

The outline of the stormwater cistern and its emergency overflow location is shown on **Drawing SD-1**, with additional details to be provided in the mechanical engineer's drawings.

5.3.3 Uncontrolled Areas

Due to grading restrictions, two subcatchment areas have been designed without a storage component. The UNC-1 catchment area discharges off-site uncontrolled to the adjacent Montreal Road ROW, while the UNC-2 catchment area discharges off-site uncontrolled to the adjacent properties to the northeast similar to existing conditions. Peak discharges from uncontrolled areas have been considered in the overall SWM plan and have been balanced through overcontrolling the proposed site discharge rates to meet target levels.

Table 3 summarizes the 5 and 100-year uncontrolled release rates from the proposed development.

Table 3: Peak Uncontrolled 5-year and 100-Year Release Rates

Storm Return Period	Area ID	Area (ha)	Runoff 'C'	Tc (min)	$Q_{release}$ (L/s)
5-year	UNC-1	0.03	0.39	10	3.77
	UNC-2	0.005	0.20	10	0.28
100-year	UNC-1	0.03	0.49	10	8.08
	UNC-2	0.005	0.25	10	0.59

5.3.4 Results

Table 5-4 demonstrates that the proposed stormwater management plan provides adequate attenuation storage to meet the target peak outflow for the site.

Table 5-4: Estimated Post-Development Discharge (5-Year, and 100-Year)

	5-Year Peak Discharge (L/s)	100-Year Peak Discharge (L/s)
Controlled Cistern Discharge	16.44	16.44
Uncontrolled Sheet Flow	4.05	8.67
Total	**20.49**	**25.11**
Target	**26.14**	

6.0 GRADING AND DRAINAGE

The proposed development measures approximately 0.18 ha in area and currently drains north. A detailed grading plan (see **Drawing GP-1**) has been provided to satisfy the stormwater management requirements and provide for minimum cover requirements for storm and sanitary sewers where possible. Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City of Ottawa requirements.

The subject site maintains emergency overland flow routes for flows deriving from storm events in excess of the maximum design event to the existing Montreal Road. Refer to grading plan **Drawings GP-1** for a detailed grading plan of the proposed site.

7.0 UTILITIES

Hydro, gas, and cable servicing are readily available for the development, as the site lies within a mature commercial area and the existing building on the site is presumed to be currently serviced by all utilities listed. The exact size, location, and routing of utilities, including determining whether off-site works are required to extend any additional utility services to the property, shall be finalized after design circulation and coordinated by the Electrical Consultant.

Several overhead hydro wires servicing the site may need to be removed, relocated, or buried as part of the site servicing works.

8.0 APPROVALS

An Environmental Compliance Approval (ECA) from the Ontario Ministry of Environment, Conservation, and Parks (MECP) is not anticipated for the proposed servicing works as all services are connecting into existing sewer infrastructure, and service a single property parcel of non-industrial nature.

Requirement for a MECP Permit to Take Water (PTTW) for pumping during construction of the underground parking area will be confirmed by the geotechnical consultant.

9.0 EROSION CONTROL DURING CONSTRUCTION

Erosion and sediment control measures must be implemented during construction. The following recommendations will be included in the contract documents.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with geotextiles, geogrid, or synthetic mulches.
6. Provide sediment traps and basins during dewatering works.
7. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
8. Schedule the construction works at times which avoid flooding due to seasonal rains.

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

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

Refer to **Drawing EC-1** for details of the proposed erosion control measures.

10.0 GEOTECHNICAL INVESTIGATION

A geotechnical investigation was completed for the subject site by Kollaard Associates on July 31, 2020 and revised February 8, 2022. The report summarizes the existing soil conditions within the subject area and provides construction recommendations. A memo was prepared on March 7, 2022 which provides the pavement design for areas over the parking structure. For details which are not summarized below, please see the original geotechnical report.

Subsurface soil conditions within the subject site were determined from 3 boreholes which were completed in July 2020. Fill material was encountered from the surface at all three boreholes and ranged in thickness from about 0.2 to 3.05 m. In general, the fill material consisted of asphaltic concrete underlain by grey crushed stone, then by grey-brown sand, some gravel, topsoil/organics and a trace of clay and brick. Grey limestone bedrock was encountered at between 1.37 m to 3.05 m. Based on the RQD index, the bedrock can be classified as fair to excellent.

Groundwater levels were found to range from 3.37 m to 4.32 m below the ground surface and are subject to seasonal fluctuations. No grade-raise restrictions adjacent to the proposed building foundation have been recommended for the subject site.

Pavement structure for car and light truck parking areas and access lane routes are provided in **Table 5** below.

Table 5: Recommended Pavement Structure – Car and Light Truck Parking Areas

Thickness (mm)	Material Description
50	Superpave 12.5 Asphaltic Concrete or hot mix asphalt concrete (HL3)
150	OPSS Granular A base
300	OPSS Granular B Type II Subbase

Table 6: Recommended Pavement Structure – Areas over the parking garage

Thickness (mm)	Material Description
266	• 150mm - Concrete Layer • 100mm - (2x50mm) Extruded Polystyrene Insulation, Shiplapped • 10mm - Drainage Board • 6mm - Monolithic Membrane System

11.0 CONCLUSIONS

11.1 POTABLE WATER SERVICING

Based on the supplied boundary conditions from the City for existing watermains and estimated domestic and fire flow demands for the subject site, it is anticipated that the proposed servicing in this development will provide sufficient capacity to sustain both the required domestic demands and emergency fire flow demands of the proposed site. Booster pumps will be required to achieve adequate pressures on higher levels.

11.2 WASTEWATER SERVICING

The proposed sanitary sewer network is sufficiently sized to provide gravity drainage of the site. The proposed site will be serviced by a gravity sewer service lateral which will direct wastewater flows to the existing 225 mm diameter sanitary sewer within Montreal Road ROW, directly south of the property.

11.3 STORMWATER MANAGEMENT

The proposed stormwater management plan is in compliance with the goals specified through consultation with the City of Ottawa. Rooftop storage with controlled roof release and subsurface storage via a stormwater cistern has been proposed to limit peak storm sewer inflows to downstream storm sewers to predevelopment levels as determined by City of Ottawa staff. No surface ponding is anticipated for events up to and including the 100-year storm. Minor system flows from the site will be controlled to the 5-year storm event.

11.4 GRADING

Grading for the site has been designed to provide an emergency overland flow route as per City requirements and reflects the recommendations in the Geotechnical Review prepared by Kollaard Associates. Erosion and sediment control measures will be implemented during construction to reduce the impact on existing facilities.

11.5 APPROVALS/PERMITS

An MECP Environmental Compliance Approval is not expected to be required for the subject site. Requirements for a Permit to Take Water (PTTW) are not anticipated. Need for a PTTW for sewer construction dewatering and building footing excavation will be confirmed by the geotechnical consultant. No other approval requirements from other regulatory agencies are anticipated.

APPENDICES

Appendix A POTABLE WATER SERVICING

A.1 BOUNDARY CONDITIONS

From: Fawzi, Mohammed
To: Mott, Peter
Cc: Kilborn, Kris
Subject: RE: 971 Montreal Road - Boundary Conditions Request
Date: Tuesday, April 27, 2021 2:16:34 PM
Attachments: 971 Montreal April 2021.pdf

Hi Peter,

The following are boundary conditions, HGL, for hydraulic analysis at 971 Montreal Rd (zone MONT) assumed to be connected to the 406 mm on Montreal Road (see attached PDF for location).

Minimum HGL = 146.9 m

Maximum HGL = 146.9 m

Max Day + Fire Flow (133 L/s) = 146.7 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.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
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110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

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From: Fawzi, Mohammed

Sent: April 21, 2021 7:11 PM
To: Mott, Peter <Peter.Mott@stantec.com>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>
Subject: RE: 971 Montreal Road - Boundary Conditions Request

Hi Peter,

This is to confirm that I have forwarded the request. I will forward you the results once received.

Thank you.

Best Regards,

Mohammed Fawzi, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - Central Branch
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613.580.2424 ext./poste 20120, Mohammed.Fawzi@ottawa.ca

Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me

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From: Mott, Peter <Peter.Mott@stantec.com>
Sent: April 19, 2021 10:02 AM
To: Fawzi, Mohammed <mohammed.fawzi@ottawa.ca>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>
Subject: 971 Montreal Road - Boundary Conditions Request

I would like to request the hydraulic boundary conditions for the proposed site located at 971 Montreal Road. Please find attached the site plan, the key map showing the location of the proposed development,

domestic water demand calculations, and fire flow calculations.

A summary of the proposed site is provided below:

We anticipate a connection to the existing watermain infrastructure to service the site. The following connection is expected for servicing:

➢Connection to existing 406mm (PVC) watermain on Montreal Road.

*Existing fire hydrant adjacent to the property on the south side of Montreal Road.

For the purpose of the boundary conditions request, may you please provide us with the boundary conditions for the following servicing option:

i. Watermain connection to the existing 406 mm (PVC) watermain on Montreal Road; assuming a fire flow requirement of **8,000 L/min** for the site in addition to the domestic water demands provided below.

- The intended land use is residential, per the summary provided in the Domestic Demands spreadsheet. (See attached Site Plan with project stats)
- Estimated fire flow demand per the FUS methodology: 8000 L/min (133 L/s)
- Domestic water demands for the entire development:
    - **Average day: 35.1 L/min (0.59 L/s)**
    - **Maximum day: 87.8 L/min (1.46 L/s)**
    - **Peak hour: 193.2 L/min (3.22 L/s)**

Thank you for your time and please contact me at your earliest convenience if any additional information or clarification is required.

Best regards,

Peter Mott EIT
Engineering Intern, Community Development

Mobile: 613-897-0445
Peter.Mott@stantec.com
Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

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A.2 DOMESTIC WATER DEMAND CALCULATIONS

971 Montreal Road - Domestic Water Demand Estimates

Based on Figurr Architectes' Site Plan 2022-07-31
Project No. 160401667
Proposed Use: High-rise Apartment Dwelling (9-storeys)

Densities as per City Guidelines [1]		
Apartment Units		
1 Bedroom	1.4	ppu
2 Bedroom	2.1	ppu
3 Bedroom	3.1	ppu

Unit Type	No. of Units	Area (m^2)	Population	Daily Rate of Demand [2] (L/cap/day)	Avg Day Demand		Max Day Demand [3]		Peak Hour Demand [3]	
					(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
Apartment Units										
1 Bedroom	38		54	280	10.5	0.18	26.3	0.44	57.8	0.96
2 Bedroom	32		68	280	13.2	0.22	33.1	0.55	72.7	1.21
3 Bedroom	8		25	280	4.9	0.08	12.2	0.20	26.7	0.45
Total Site :	**78.0**	**879.6**	**147**		**28.6**	**0.48**	**71.5**	**1.19**	**157.2**	**2.62**

1 Population counts based on a population densities provided in 'Table 4.1 Per Unit Populations' of the Ottawa Design Guidelines: Water Distribution (July 2010)

2 Average day water demand for residential areas equal to 280 L/cap/d

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

peak hour demand rate = 2.2 x maximum day demand rate

A.3 FUS CALCULATION SHEETS

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401667
Project Name: 971 Montreal Road
Date: 2/13/2023
Fire Flow Calculation #: 1
Description: 9 Storey Residential Apartment Building

Notes: 9-storey residential high-rise. Building information from Site Plan by figurr Architects Collective (2022-07-31).
2-hour fire separation provided between each floor and 1-hour fire separation provided for exterior vertical communications.

Step	Task	Notes								Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type II - Noncombustible Construction / Type IV-A - Mass Timber Construction								0.8	-
2	Determine Effective Floor Area*	Sum of Two Largest Floors + 50% of Eight Additional Floors					Vertical Openings Protected?			NO	-
		879.6	879.6	5765.7						4642.05	-
3	Determine Required Fire Flow	($F = 220 \times C \times A^{1/2}$). Round to nearest 1000 L/min								-	12000
4	Determine Occupancy Charge	Limited Combustible								-15%	10200
5	Determine Sprinkler Reduction	Conforms to NFPA 13								-30%	-4080
		Standard Water Supply								-10%	
		Not Fully Supervised or N/A								0%	
		% 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	> 30	32.7	3	81-100	Type V	NO		0%	2040
		East	3.1 to 10	33.7	2	61-80	Type V	NO		18%	
		South	> 30	32.7	2	61-80	Type V	NO		0%	
		West	20.1 to 30	32.1	1	21-49	Type V	NO		2%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min									8000
		Total Required Fire Flow in L/s									133.3
		Required Duration of Fire Flow (hrs)									2.00
		Required Volume of Fire Flow (m^3)									960

*Used the 'gross floor area' of the third floor (floor with the largest footprint, 879.6 m2) + 50% of the gross construction area of the up to eight immediately adjoining floors. Methodology as per Page 17 of the Fire Underwriters Survey's Water Supply for Public Fire Protection, 1999.

A.4 ARCHITECTURAL CONFIRMATIONS

Johnson, Warren

From: Sophie Couture <scouture@figurr.ca>
Sent: Thursday, July 28, 2022 11:03 AM
To: Johnson, Warren
Cc: Kilborn, Kris; Melissa Du Plessis
Subject: RE: 971 Montreal Road - 2nd Review Comments

Hi Warren,

Please see below in red.

Sophie Couture
Architecte

Figurr
collectif d'architectes
figurr.ca

FIG. 1
3550, Saint-Antoine O.
Montréal QC H4C 1A9
T 514 861–5122 x 115
M 438 837–6157

FIG. 2
190 Somerset St W #206
Ottawa ON
K2P 0J4
T 613 695–6122

****** Le cabinet d'architectes Rubin & Rotman devient le collectif d'architectes Figurr et a emménagé au-dessus de la galerie d'art Parisian Laundry. ******

From: Johnson, Warren <Warren.Johnson@stantec.com>
Sent: 28 juillet 2022 08:50
To: Sophie Couture <scouture@figurr.ca>
Cc: Kilborn, Kris <kris.kilborn@stantec.com>; Melissa Du Plessis <mduplessis@figurr.ca>
Subject: 971 Montreal Road - 2nd Review Comments

Hi Sophie,

As discussed, if you can please confirm the below assumptions we have made for our FUS calculations for 971 Montreal Road to address City comment #10 it would be appreciated.

- Non-combustible construction to be utilized YES
- Occupancy to be Limited Combustible YES
- Unsupervised sprinklers conforming to NFPA 13 to be provided YES
- The GFA of the largest floor is 879.6m2 (9468 SF) YES
- 2-hour fire separation will be provided between each floor YES
- 1-hour fire separation will be provided for exterior vertical communications YES

Thanks,

Warren Johnson C.E.T.
Civil Engineering Technologist

Direct: 613 784-2272
Warren.Johnson@stantec.com

Stantec

Appendix B WASTEWATER SERVICING

B.1 SANITARY SEWER DESIGN SHEET

Stantec

SITE: **971 Montreal Road**

DATE: 7/28/2022
REVISION: 2
DESIGNED BY: WAJ
CHECKED BY: DCT

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401667

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									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / STREET		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)	VEL. (ACT.)
			(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)	(m/s)
971 Montreal Road	BLDG	TEE	0.18	38	32	8	147	0.18	147	3.36	1.60	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.27	0.27	0.09	1.69	17.0	150	PVC	DR 28	1.00	15.3	**11.02%**	0.86	0.47

Appendix C STORMWATER MANAGEMENT

C.1 STORM SEWER DESIGN SHEET

Stantec

971 Montreal Road

DATE: 2022-07-28
REVISION: 2
DESIGNED BY: WAJ
CHECKED BY: DCT

STORM SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401667

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
MINIMUM COVER: 2.00 m
TIME OF ENTRY 10 min
BEDDING CLASS B

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 (5-YEAR) (-)	C (10-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 DIAMETER (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
BLDG, CB-1, CB-2, RAMP	BLDG	STM STUB.	0.000	0.05	0.00	0.00	0.09	0.00	0.81	0.00	0.00	0.000	0.000	0.044	0.044	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	4.7	4.7	17.5	17.6	200	200	CIRCULAR	PVC	SDR 35	1.00	33.3	**52.5%**	1.05	0.91	0.32
																				10.32									225	225									

C.2 MODIFIED RATIONAL METHOD CALCULATIONS

Stormwater Management Calculations

File No: **160401667**
Project: **971 Montreal Road**
Date: **28-Jul-22**

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
Roof	BLDG	Hard	0.088		0.9	0.079		
		Soft	0.000		0.2	0.000		
		Subtotal		0.0879			0.079074	0.900
Controlled - Tributary	RAMP	Hard	0.017		0.9	0.016		
		Soft	0.000		0.2	0.000		
		Subtotal		0.0174			0.01566	0.900
Controlled - Tributary	CB-1	Hard	0.017		0.9	0.016		
		Soft	0.000		0.2	0.000		
		Subtotal		0.0174			0.01566	0.900
Controlled - Tributary	CB-2	Hard	0.013		0.9	0.012		
		Soft	0.007		0.2	0.001		
		Subtotal		0.0197			0.013002	0.660
Uncontrolled - Non-Tributary	UNC-1	Hard	0.009		0.9	0.008		
		Soft	0.024		0.2	0.005		
		Subtotal		0.0334			0.013026	0.390
Uncontrolled - Non-Tributary	UNC-2	Hard	0.000		0.9	0.000		
		Soft	0.005		0.2	0.001		
		Subtotal		0.00475			0.00095	0.200
Total				**0.181**			**0.137**	
Overall Runoff Coefficient= C:								**0.76**

Total Roof Areas	**0.088 ha**
Total Tributary Surface Areas (Controlled and Uncontrolled)	**0.055 ha**
Total Tributary Area to Outlet	**0.142 ha**
Total Uncontrolled Areas (Non-Tributary)	**0.038 ha**
Total Site	**0.181 ha**

Stormwater Management Calculations

Project #160401667, 971 Montreal Road
Modified Rational Method Calculatons for Storage

5 yr Intensity
City of Ottawa

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

a =	998.071
b =	6.053
c =	0.814

t (min)	I (mm/hr)
10	104.19
20	70.25
30	53.93
40	44.18
50	37.65
60	32.94
70	29.37
80	26.56
90	24.29
100	22.41
110	20.82
120	19.47

5 YEAR Predevelopment Target Release from Portion of Site

Subdrainage Area: Predevelopment Tributary Area to Outlet
Area (ha): 0.1805
C: 0.50 (Per requirements from City of Ottawa staff)

Typical Time of Concentration

tc (min)	I (5 yr) (mm/hr)	Qtarget (L/s)
10	104.19	**26.14**

5 YEAR Modified Rational Method for Entire Site

Subdrainage Area: BLDG
Area (ha): 0.09
C: 0.90
Maximum Storage Depth: Roof 150 mm

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	104.19	22.90	3.98	18.92	11.35	102.37	0.00
20	70.25	15.44	4.07	11.37	13.65	108.14	0.00
30	53.93	11.85	4.09	7.77	13.99	109.00	0.00
40	44.18	9.71	4.07	5.65	**13.55**	107.90	0.00
50	37.65	8.28	4.04	4.24	12.73	105.83	0.00
60	32.94	7.24	3.99	3.25	11.69	103.22	0.00
70	29.37	6.46	3.95	2.51	10.54	100.31	0.00
80	26.56	5.84	3.88	1.96	9.41	95.85	0.00
90	24.29	5.34	3.80	1.54	8.29	91.18	0.00
100	22.41	4.93	3.73	1.19	7.17	86.53	0.00
110	20.82	4.58	3.66	0.92	6.07	81.94	0.00
120	19.47	4.28	3.59	0.69	4.98	77.45	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
5-year Water Level	109.00	0.11	4.09	13.99	35.14	0.00

Subdrainage Area: RAMP
Area (ha): 0.02
C: 0.90
Controlled - Tributary
Tributary to Trench Drain & Cistern

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	4.54	4.54	0.00	**0.00**
20	70.25	3.06	3.06	0.00	**0.00**
30	53.93	2.35	2.35	0.00	**0.00**
40	44.18	1.92	1.92	0.00	**0.00**
50	37.65	1.64	1.64	0.00	**0.00**
60	32.94	1.43	1.43	0.00	**0.00**
70	29.37	1.28	1.28	0.00	**0.00**
80	26.56	1.16	1.16	0.00	**0.00**
90	24.29	1.06	1.06	0.00	**0.00**
100	22.41	0.98	0.98	0.00	**0.00**
110	20.82	0.91	0.91	0.00	**0.00**
120	19.47	0.85	0.85	0.00	**0.00**

Subdrainage Area: CB-2
Area (ha): 0.02
C: 0.66
Controlled - Tributary
Tributary to Cistern

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	3.77	3.77	0.00	**0.00**
20	70.25	2.54	2.54	0.00	**0.00**
30	53.93	1.95	1.95	0.00	**0.00**
40	44.18	1.60	1.60	0.00	**0.00**
50	37.65	1.36	1.36	0.00	**0.00**
60	32.94	1.19	1.19	0.00	**0.00**
70	29.37	1.06	1.06	0.00	**0.00**
80	26.56	0.96	0.96	0.00	**0.00**
90	24.29	0.88	0.88	0.00	**0.00**
100	22.41	0.81	0.81	0.00	**0.00**
110	20.82	0.75	0.75	0.00	**0.00**
120	19.47	0.70	0.70	0.00	**0.00**

Subdrainage Area: CB-1
Area (ha): 0.02
C: 0.90
Controlled - Tributary
Tributary to Cistern

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	4.54	4.54	0.00	**0.00**
20	70.25	3.06	3.06	0.00	**0.00**
30	53.93	2.35	2.35	0.00	**0.00**
40	44.18	1.92	1.92	0.00	**0.00**
50	37.65	1.64	1.64	0.00	**0.00**
60	32.94	1.43	1.43	0.00	**0.00**
70	29.37	1.28	1.28	0.00	**0.00**
80	26.56	1.16	1.16	0.00	**0.00**
90	24.29	1.06	1.06	0.00	**0.00**
100	22.41	0.98	0.98	0.00	**0.00**
110	20.82	0.91	0.91	0.00	**0.00**
120	19.47	0.85	0.85	0.00	**0.00**

Project #160401667, 971 Montreal Road
Modified Rational Method Calculatons 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): 0.1805
C: 0.50

100-Year Target Release Rate 26.14 L/s

100 YEAR Modified Rational Method for Entire Site

Subdrainage Area: BLDG
Area (ha): 0.09
C: 1.00
Maximum Storage Depth: Roof 150 mm

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)	Depth (mm)	
10	178.56	43.61	4.42	39.19	23.51	130.36	0.00
20	119.95	29.30	4.59	24.71	29.65	140.73	0.00
30	91.87	22.44	4.65	17.79	32.02	144.73	0.00
40	75.15	18.35	4.67	13.68	32.84	146.11	0.00
50	63.95	15.62	4.67	10.95	32.85	146.13	0.00
60	55.89	13.65	4.66	8.99	**32.38**	145.33	0.00
70	49.79	12.16	4.64	7.52	31.60	144.02	0.00
80	44.99	10.99	4.61	6.38	30.61	142.35	0.00
90	41.11	10.04	4.58	5.46	29.49	140.45	0.00
100	37.90	9.26	4.55	4.71	28.26	138.37	0.00
110	35.20	8.60	4.51	4.08	26.96	136.18	0.00
120	32.89	8.03	4.48	3.56	25.61	133.90	0.00

Storage: Roof Storage

	Depth (mm)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Discharge Check
100-year Water Level	146.13	0.15	4.67	32.85	35.14	0.00

Subdrainage Area: RAMP
Area (ha): 0.02
C: 1.00
Controlled - Tributary
Tributary to Trench Drain & Cistern

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	8.64	8.64	0.00	**0.00**
20	119.95	5.80	5.80	0.00	**0.00**
30	91.87	4.44	4.44	0.00	**0.00**
40	75.15	3.63	3.63	0.00	**0.00**
50	63.95	3.09	3.09	0.00	**0.00**
60	55.89	2.70	2.70	0.00	**0.00**
70	49.79	2.41	2.41	0.00	**0.00**
80	44.99	2.18	2.18	0.00	**0.00**
90	41.11	1.99	1.99	0.00	**0.00**
100	37.90	1.83	1.83	0.00	**0.00**
110	35.20	1.70	1.70	0.00	**0.00**
120	32.89	1.59	1.59	0.00	**0.00**

Subdrainage Area: CB-2
Area (ha): 0.02
C: 0.83
Controlled - Tributary
Tributary to Cistern

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	8.07	8.07	0.00	**0.00**
20	119.95	5.42	5.42	0.00	**0.00**
30	91.87	4.15	4.15	0.00	**0.00**
40	75.15	3.40	3.40	0.00	**0.00**
50	63.95	2.89	2.89	0.00	**0.00**
60	55.89	2.53	2.53	0.00	**0.00**
70	49.79	2.25	2.25	0.00	**0.00**
80	44.99	2.03	2.03	0.00	**0.00**
90	41.11	1.86	1.86	0.00	**0.00**
100	37.90	1.71	1.71	0.00	**0.00**
110	35.20	1.59	1.59	0.00	**0.00**
120	32.89	1.49	1.49	0.00	**0.00**

Subdrainage Area: CB-1
Area (ha): 0.02
C: 1.00
Controlled - Tributary
Tributary to Cistern

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	8.64	8.64	0.00	**0.00**
20	119.95	5.80	5.80	0.00	**0.00**
30	91.87	4.44	4.44	0.00	**0.00**
40	75.15	3.63	3.63	0.00	**0.00**
50	63.95	3.09	3.09	0.00	**0.00**
60	55.89	2.70	2.70	0.00	**0.00**
70	49.79	2.41	2.41	0.00	**0.00**
80	44.99	2.18	2.18	0.00	**0.00**
90	41.11	1.99	1.99	0.00	**0.00**
100	37.90	1.83	1.83	0.00	**0.00**
110	35.20	1.70	1.70	0.00	**0.00**
120	32.89	1.59	1.59	0.00	**0.00**

Stormwater Management Calculations

Project #160401667, 971 Montreal Road
Modified Rational Method Calculatons for Storage

Cistern
Contributing Subcatchment Areas: BLDG, RAMP, CB-1, CB-2

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	16.82	16.44	0.38	0.23
20	70.25	12.73	12.73	0.00	**0.00**
30	53.93	10.73	10.73	0.00	**0.00**
40	44.18	9.51	9.51	0.00	**0.00**
50	37.65	8.67	8.67	0.00	**0.00**
60	32.94	8.05	8.05	0.00	**0.00**
70	29.37	7.57	7.57	0.00	**0.00**
80	26.56	7.15	7.15	0.00	**0.00**
90	24.29	6.80	6.80	0.00	**0.00**
100	22.41	6.49	6.49	0.00	**0.00**
110	20.82	6.22	6.22	0.00	**0.00**
120	19.47	5.99	5.99	0.00	**0.00**

Note: Cistern to be controlled by mechanical pump set at a flow rate of 16.44L/s

	Stage (m)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
5-year Water Level	105.33	1.15	16.44	0.23	9.00	OK

Subdrainage Area: UNC-1 Uncontrolled - Non-Tributary
Area (ha): 0.03
C: 0.39

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	3.77	3.77		
20	70.25	2.54	2.54		
30	53.93	1.95	1.95		
40	44.18	1.60	1.60		
50	37.65	1.36	1.36		
60	32.94	1.19	1.19		
70	29.37	1.06	1.06		
80	26.56	0.96	0.96		
90	24.29	0.88	0.88		
100	22.41	0.81	0.81		
110	20.82	0.75	0.75		
120	19.47	0.70	0.70		

Subdrainage Area: UNC-2 Uncontrolled - Non-Tributary
Area (ha): 0.005
C: 0.20

tc (min)	I (5 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	104.19	0.28	0.28		
20	70.25	0.19	0.19		
30	53.93	0.14	0.14		
40	44.18	0.12	0.12		
50	37.65	0.10	0.10		
60	32.94	0.09	0.09		
70	29.37	0.08	0.08		
80	26.56	0.07	0.07		
90	24.29	0.06	0.06		
100	22.41	0.06	0.06		
110	20.82	0.05	0.05		
120	19.47	0.05	0.05		

SUMMARY TO OUTLET

		Vrequired	Vavailable*	
Tributary Area	0.142 ha			
Total 5yr Flow to Sewer	16.4 L/s	14.2	44.1 m^3	Ok
Non-Tributary Area	0.038 ha			
Total 5yr Flow Uncontrolled	4.0 L/s			
Total Area	0.181 ha			
Total 5yr Flow	20.5 L/s			
Target	26.1 L/s			

Project #160401667, 971 Montreal Road
Modified Rational Method Calculatons for Storage

Cistern
Contributing Subcatchment Areas: BLDG, RAMP, CB-1, CB-2

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	29.76	16.44	13.32	7.99
20	119.95	21.61	16.44	5.17	6.20
30	91.87	17.69	16.44	1.25	2.24
40	75.15	15.34	15.34	0.00	**0.00**
50	63.95	13.75	13.75	0.00	**0.00**
60	55.89	12.59	12.59	0.00	**0.00**
70	49.79	11.70	11.70	0.00	**0.00**
80	44.99	11.00	11.00	0.00	**0.00**
90	41.11	10.42	10.42	0.00	**0.00**
100	37.90	9.93	9.93	0.00	**0.00**
110	35.20	9.51	9.51	0.00	**0.00**
120	32.89	9.15	9.15	0.00	**0.00**

Note: Cistern to be controlled by mechanical pump set at a flow rate of 16.44L/s

	Stage (m)	Head (m)	Discharge (L/s)	Vreq (cu. m)	Vavail (cu. m)	Volume Check
100-year Water Level	105.33	1.15	16.44	7.99	9.00	OK
					1.01	

Subdrainage Area: UNC-1 Uncontrolled - Non-Tributary
Area (ha): 0.03
C: 0.49

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	8.08	8.08		
20	119.95	5.43	5.43		
30	91.87	4.16	4.16		
40	75.15	3.40	3.40		
50	63.95	2.89	2.89		
60	55.89	2.53	2.53		
70	49.79	2.25	2.25		
80	44.99	2.04	2.04		
90	41.11	1.86	1.86		
100	37.90	1.72	1.72		
110	35.20	1.59	1.59		
120	32.89	1.49	1.49		

Subdrainage Area: UNC-2 Uncontrolled - Non-Tributary Ok
Area (ha): 0.005
C: 0.25

tc (min)	I (100 yr) (mm/hr)	Qactual (L/s)	Qrelease (L/s)	Qstored (L/s)	Vstored (m^3)
10	178.56	0.59	0.59		
20	119.95	0.40	0.40		
30	91.87	0.30	0.30		
40	75.15	0.25	0.25		
50	63.95	0.21	0.21		
60	55.89	0.18	0.18		
70	49.79	0.16	0.16		
80	44.99	0.15	0.15		
90	41.11	0.14	0.14		
100	37.90	0.13	0.13		
110	35.20	0.12	0.12		
120	32.89	0.11	0.11		

SUMMARY TO OUTLET

		Vrequired	Vavailable*	
Tributary Area	0.142 ha			
Total 100yr Flow to Sewer	16.4 L/s	40.8	44.1 m^3	
Non-Tributary Area	0.038 ha			
Total 100yr Flow Uncontrolled	8.7 L/s			
Total Area	0.181 ha			
Total 100yr Flow	25.1 L/s			
Target	26.1 L/s			

Project #160401667, 971 Montreal Road
Roof Drain Design Sheet, Area BLDG
Standard Watts Roof Drain

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	0.0000	0.0000	0	0.000	0	0	0	0.000
0.025	0.0003	0.0016	0	0.025	20	0	0	0.025
0.050	0.0006	0.0032	1	0.050	78	1	1	0.050
0.075	0.0007	0.0035	4	0.075	176	3	4	0.075
0.100	0.0008	0.0039	10	0.100	312	6	10	0.100
0.125	0.0009	0.0043	20	0.125	488	10	20	0.125
0.150	0.0009	0.0047	35	0.150	703	15	35	0.150

Rooftop Storage Summary

Total Building Area (sq.m)		878.6
Assume Available Roof Area (sq.m)	80%	702.88
Roof Imperviousness		0.99
Roof Drain Requirement (sq.m/Notch)		232
Number of Roof Notches*		5
Max. Allowable Depth of Roof Ponding (m)		0.15
Max. Allowable Storage (cu.m)		35
Estimated 100 Year Drawdown Time (h)		2.1

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

Calculation Results	5yr	100yr	Available
Qresult (cu.m/s)	0.004	0.005	-
Depth (m)	0.109	0.146	0.150
Volume (cu.m)	14.0	32.9	35.1
Draintime (hrs)	1.0	2.1	

C.3 RVCA CORRESPONDENCE

From: Jamie Batchelor
To: Rathnasooriya, Thakshika
Subject: RE: Quality Control Requirements - 971 Montreal Road, Ottawa
Date: Tuesday, June 15, 2021 10:00:12 PM

Good Evening Shika,

I have reviewed the storm sewer layer, and it would appear that the downstream outlet to the river is over 2 km. If my interpretation is correct, then we would not require any additional on-site water quality treatment as the distance to the downstream outlet would be significant enough that additional on-site water quality measures would have a negligible impact. We would however, encourage the incorporation of LID measures on-site.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

From: Rathnasooriya, Thakshika <Thakshika.Rathnasooriya@stantec.com>
Sent: Tuesday, June 15, 2021 1:12 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Subject: Quality Control Requirements - 971 Montreal Road, Ottawa

Hi Jamie,

We've been retained to help develop a 78 unit apartment building at 971 Montreal Road in Ottawa. The site currently used as a commercial site. The proposed development will include an apartment building covering majority of the property, and a proposed driveway for 10 parking spaces on the ground floor fully covered by the eight floors cantilevered above.

We are looking to confirm if quality control measures are required on-site. The proposed building includes a flat roof which will store and discharge stormwater into a cistern and ultimately into the 225mm diameter storm sewer within Montreal Road. We understand that rooftop runoff is considered clean water and does not require further water quality treatment. Please review the site servicing plan attached and confirm if quality treatment is required for the site. If you need any other information feel free to call.

Thank you,

Shika Rathnasooriya , P.Eng.

Direct: 613-668-9635
Thakshika.Rathnasooriya@stantec.com

Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

C.4 MECHANICAL DECLARATION

From: Elaine Guenette <elaine.guenette@smithandandersen.com>
Sent: 19 juillet 2022 16:57
To: Sophie Couture <scouture@figurr.ca>
Cc: Andre Drouin <Andre.Drouin@smithandandersen.com>; Melissa Du Plessis <mduplessis@figurr.ca>
Subject: RE: 2052 - Proximi-T - 9-storey apartment building - 971 Mtl Rd

Hi Sophie,

Yes this could be designed as such.

Regards,

Smith + Andersen

Elaine Guenette B.A.Sc., P.Eng., LEED AP
Principal
d 613 691 1853 **m** 343 961 2244

From: Sophie Couture <scouture@figurr.ca>
Sent: July 19, 2022 3:14 PM
To: Elaine Guenette <elaine.guenette@smithandandersen.com>
Cc: Andre Drouin <Andre.Drouin@smithandandersen.com>; Melissa Du Plessis <mduplessis@figurr.ca>
Subject: RE: 2052 - Proximi-T - 9-storey apartment building - 971 Mtl Rd

---

Good Afternoon Elaine,

Would it be possible for you to assist us again with this project?
The following comment is part of the City's 2nd Review:

Storm

6. **Orignal Comment**-Geotechnical Report speaks to underfloor drains and foun the report, nor the plans, speak to the footing and subfloor drains and how th into the site service design. Footing drains are to be independently connecte on appropriate plans. Revise.
    - Response – Storm Drainage and Site Servicing Drawings show the Foundat pipe to street from Cistern

Second Comment- Plans included in appendix F are different from Plans submitte To be specific plans submitted separately do not show the second storm sewer later If the Foundation drain is being pumped, then a separate storm lateral is not req and provide discussions in the report. Ensure the foundation drain is hydraulically storage or underground storage.

Is it possible for you to provide confirmation that the foundation drain can be hydraulically disconnected from the roof storage and cistern?
Don't hesitate if you need more information.

Thank you so much,
Sophie Couture
Architecte

Figurr

Smith + Andersen

1600 Carling Ave Suite 530 Ottawa Ontario K1Z 1G3
613 230 1186 f 613 230 2598 smithandandersen.com

2022-03-13

Figurr
190 Somerset Street
Ottawa, ON
K2P 0J4

Attention: Sophie Couture

RE: PROXIMI T – 9 STOREY APARTMENT BUILDING 971 MONTREAL ROAD STORMWATER CISTERN

Dear Sophie:

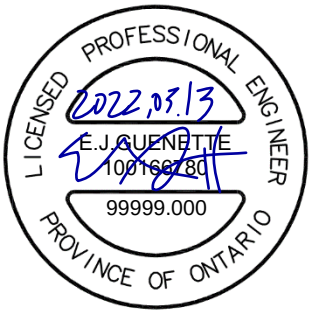
Per the calculations in the civil SWM report, the stormwater on site will be required to be detained within a 9m3 cistern below grade with a maximum controlled release rate of 16.4 L/s to the gravity storm service.

The design of the project shall proceed in accordance with these requirements.

Yours truly,

SMITH + ANDERSEN

Elaine Guenette, P.Eng.
Principal



2022.03.13 971 Montreal Road SWM Letter

Appendix D SUBMISSION DOCUMENTS

D.1 RESPONSE TO 2ND SUBMISSION ENGINEERING COMMENTS RAISED BY CITY OF OTTAWA (MAY, 2022)

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue, Ottawa ON K2C 3G4

February 13, 2023
File: 160401667

Attention: Jean-Charles Renaud
Planner III, Planning and Growth Management Department
City of Ottawa
110 Laurier Avenue W.
Ottawa, ON K1P 1J1
Mail Cose 01-14
T: 613-580-2424 Ext. 27629
E: jean-charles.Renaud@ottawa.ca

Reference: 971 Montreal Road – 3rd Review Engineering Comments

Please find our responses to the comments below.

Phase 1 and Phase 2 ESA

1. ERU is currently reviewing the Phase 1 and 2 ESA, Comments will be sent as soon as I get them.
   R/ Noted

Geotechnical Investigation

2. No Comments.

Site Servicing & Stormwater Management Report
Water

3. Please include an email from the architect confirming that the requirements of Protected Opening listed in FUS 2020 will be met in Building Design. This wasn't included in the earlier email.
   Protected openings:
   i. Enclosures shall have walls of masonry or other limited or noncombustible construction with a fire resistance rating of not less than one hour.
   ii. Openings including doors shall be provided with automatic closing devices
   iii. Elevator doors shall be of metal or metal covered construction, so arranged that the doors must normally be closed for operation of the elevator.

   R/ The FUS calculations have been reviewed and revised to reflect the final site plan design. With the available fire flow of 133L/s there is capacity to account for "the two largest adjoining floor areas plus 50% of all floors immediately above them to a maximum of eight" as per Total Effective Area section 2a of the FUS guidelines. The protection requirements outlined in this section allow for unprotected openings, so the above comment is no longer applicable.

Plan Specific Comments:
Existing Conditions and Removal Plan: EX-1

4. Proposed grades at the PL needs to match existing grades. Please confirm grades at NorthEast corner of the lot.
   R/ Elevation of northeast corner has been revised to match existing grade of 104.74.

Site Servicing Plan: SSP-1

5. For Sanitary service connection to the 225mm main, show more details on the plan including size of PVC tee and pipe, size of Rubber couplers and minimum length of existing sanitary concrete main that will be replaced with PVC pipe.
   R/ Reference has been added to City specification MS 18.1-17 for the rubber couplers. Given the age of the pipes (constructed circa 1960) the potential is high for the contractor to uncover discrepancies with the design assumptions once the pipes have been exposed. Due to this, additional details have not been provided to allow the contractor flexibility to choose a connection method in the field that is suitable for the existing main material and condition.
6. Ensure servicing are shown in correct order when facing the building as per SDG 4.4.4.3 & 5.7.1.
   R/ As per OSDG 4.4.4.3 "The sanitary service lateral shall be located to the right of the storm sewer lateral when looking at the house from the street." and 5.7.1 "The storm service lateral shall be located to the left of the sanitary sewer lateral when looking at the structure from the street."

   The proposed arrangement of the service laterals respects these requirements and is consistent with detail S11.3. Please confirm if additional changes are required.

7. It is a requirement to have a 150mm valve box for the water service at the PL and private Sanitary Monitoring MH inside the PL. Can the services be moved towards the east as there is more space between the Future Property line and proposed foundation wall. A Sanitary Monitoring Port inside the building is also an option.
   R/ The location of the service laterals is required due to the proximity of the proposed mechanical room as coordinated with the architect and mechanical consultant. The monitoring MH and valve box have been placed within the current private property and as close to the future road widening as possible while maintaining clearance from the extents of the underground parking foundation.

8. Please provide a separate Road Reinstatement plan. Ensure the resurfacing is as per City's Road cut and resurfacing policy. Single resurfacing is required if road cuts are within 12 meters. Ensure the resurfacing does not finish mid lane.
   https://documents.ottawa.ca/sites/documents/files/road_cut_policy_scenarios_en.pdf
   R/ Road cuts have been revised as per the Road cut and resurfacing policy. A separate plan was not deemed necessary as all required information can be shown on the grading plan as typically accepted by the City.
   As noted in the policy, single resurfacing is only required when there are three or more cuts associated with the development. Only two cuts are proposed so single resurfacing is not required.
9. Show Curb, Sidewalk and asphalt MUP details that will be raised. Show that median reinstatement details.
   R/ Refer the grading plan (GP-1) for notes regarding reinstatement of existing curb and sidewalk with relevant details included on the detail sheet (EC-1). Notes and details have been added to include the reinstatement of the 1.5m asphalt MUP.

Grading Plan: GP-1

10. Ensure Mud Mad does not block the sidewalk.
    R/ The mud mat has been shifted off the sidewalk.

Erosion Control Plan and Detail Sheet: EC-1

11. No Comments

Storm Drainage Plan SD-1

12. No Comments

Should you have any questions, please do not hesitate to contact the below.

Regards,

Kris Kilborn
Senior Associate,
Business Center Practice Leader
Community Development

Mobile: 613 297-0571
Fax: 613 722-2799
kris.kilborn@stantec.com

D.2 SERVICING STUDY CHECKLIST

Stantec

Development Servicing Study Checklist

Job#: 160401667

971 Montreal Road

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Executive Summary (for larger reports only).	N/A	-	Introduction
Date and revision number of the report.	Y	-	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	1.0	Report and drawings
Plan showing the site and location of all existing services.	Y		Existing Condtions and removals Plan
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.	Y	1	Section 1.0 of report
Summary of Pre-consultation Meetings with City and other approval agencies.	N/A		
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.	N/A		
Statement of objectives and servicing criteria.	Y		In each section
Identification of existing and proposed infrastructure available in the immediate area.	Y		In each section
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).	N/A		
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.	N/A		
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to addresspotential impacts.	N/A		
Proposed phasing of the development, if applicable.	N/A		
Reference to geotechnical studies and recommendations concerning servicing.		10.0	Report
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		Drawings
North arrow (including construction North)	Y		Drawings
Key plan	Y		Drawings
Name and contact information of applicant and property owner	Y		Drawings and section 1.0 of report
Property limits including bearings and dimensions	Y		Drawings
Existing and proposed structures and parking areas	Y		Drawings
Easements, road widening and rights-of-way	Y		Drawings
Adjacent street names	Y		Drawings

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available	N/A		
Availability of public infrastructure to service proposed development	Y	3.0	
Identification of system constraints	Y	3.0	
Identify boundary conditions	Y	3.0	Appendix A
Confirmation of adequate domestic supply and pressure	Y	3.0	Appendix A
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.	Y	3.0	Appendix A
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.	Y	3.0	
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	N/A		
Address reliability requirements such as appropriate location of shut-off valves	N/A		
Check on the necessity of a pressure zone boundary modification.	N/A		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for 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	Y	3.0	
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.	Y	3.0	
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.	Y	3.0	
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	3.0	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A		

4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
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).	Y	4.0	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A		
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.	N/A		
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	4.0	
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)	N/A		
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Y	4.0	Appendix B
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	4.0	
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).	N/A		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A		
Special considerations such as contamination, corrosive environment etc.	N		Refer to geotechnical investigation

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Y	5.0	
Analysis of available capacity in existing public infrastructure.	N/A		
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Y		Existing Conditions and Removals Plan
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.	Y	5.0	Appendix C
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	5.0	Section 5.0 of report and Appendix C
Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Y	5.0	Appendix C
Set-back from private sewage disposal systems.	N/A		
Watercourse and hazard lands setbacks.	N/A		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Y		Appendix C
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A		
Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Y	5.0	Appendix C
Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A		
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.	Y	5.0	Appendix C
Any proposed diversion of drainage catchment areas from one outlet to another.	N/A		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A		
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A		
Identification of potential impacts to receiving watercourses	N/A		
Identification of municipal drains and related approval requirements.	N/A		
Descriptions of how the conveyance and storage capacity will be achieved for the development.	Y	5.0	Appendix C
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A		
Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A		
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	9.0	
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.	N/A		
Identification of fill constraints related to floodplain and geotechnical investigation.	N/A		

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
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.	Y		Section 8.0
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	Y		
Changes to Municipal Drains.	N/A		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A		
4.6 Conclusion	**Addressed (Y/N/NA)**	**Section**	**Comments**
Clearly stated conclusions and recommendations	Y	11.0	
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.	Y		Appendix D
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	Y		