PROPOSED SIX-STOREY

MIXED USE BUILDING SITE

LOT 23, 25, 27 AND PART OF LOT 70

R-PLAN 49

337 MONTGOMERY STREET

CITY OF OTTAWA

SERVICEABILITY REPORT

REPORT R-818-15A

T.L. MAK ENGINEERING CONSULTANTS LTD.

MARCH 2019

REFERENCE FILE NUMBER 818-15

1.) INTRODUCTION

The developer of the property under consideration is proposing to construct a six-storey mixed use building on site. It is located east of the intersection of Montgomery Street and Selkirk Street and is situated east of Palace Street and west of Gardner Street.

The new mixed use building at 337 Montgomery Street will house a total of 36 units comprised of 1-bedroom 2-bedroom and 3-bedroom apartments as well as 2 rental commercial units at the ground floor level. The total area of the building is approximately 3,278.0 square metres. Area size of the development lot is ±0.104 ha. In addition to the apartment building, the other development features will comprise of a vehicle entrance/exit from Montgomery Street located at the southeast corner of the property. Ground level asphalt parking spaces, bike racks, as well as interlock paver walkways are proposed along the east and west side of the site, landscape areas, etc. to meet City of Ottawa site plan requirements.

This report will serve to provide the City of Ottawa with our serviceability brief to address the proposed servicing scheme for this site.

2.) EXISTING SITE CONDITIONS AND SERVICING

Presently, the said property under consideration for the mixed use building development site is referenced as 337 Montgomery Street. A two (2) storey dwelling unit currently occupies this lot and is located on the west side of the property. The east half of the existing site is mainly asphalt covered. The existing building will be retained and modified to form part of the new three storey apartment building.

Terrain of the property is relatively flat and slopes predominantly from north to south or from Selkirk Street towards Montgomery Street across the site. The lot west of the existing dwelling is presently lightly, vegetative grassed area.

As for the availability of underground services, there are existing municipal services along the Montgomery Street road right of way consisting of the following main sizes: a 750 mm diameter storm sewer and a 150 mm diameter watermain. Along the Selkirk Street road right of way, there exists a 150 mm diameter watermain and a 300 mm diameter sanitary sewer.

3.) PROPOSED RESIDENTIAL APARTMENT BUILDING SITE

An interlock pedestrian walkway located along both the southwest and southeast corner of the site is proposed to provide access to this property. One vehicle access for parking is proposed from Montgomery Street.

A.) Water Supply

The new residential building at 337 Montgomery Street is proposed to be 6 storeys with a total of 36 units comprised of 1-bedroom, 2-bedroom, and 3-bedroom apartments, as well as 2 rental commercial units at the floor level. The following boundary conditions for 337 Montgomery Street which is to be connected to the 150 mm diameter watermain along Montgomery Street were transmitted to Stantec on February 8th, 2018. The ground elevation at this location is approximately 57.3 m.

- Minimum HGL = 109.5 m
- Maximum HGL = 118.2 m
- Maximum Fire Flow (@ 20 psi) = 110 L/s (6600 Lpm)

During peak hour flow conditions, the resulting minimum hydraulic grade line of 109.5 m corresponds to a peak hour pressure of 512 kPa (74 psi). This value is well above the minimum pressure requirement of 276 kPa (40 psi).

With respect to the maximum pressure check during average day demands, the resulting maximum hydraulic grade line of 118.2 m corresponds to a pressure of 597 kPa (87 psi). This value is greater than the maximum pressure objective of 552 kPa (80 psi). The Ontario Building Code (OBC) Section 7.6.3.3 states that a pressure reducing valve shall be installed in areas that may be occupied where the static pressure exceeds 550 kPa (79.8 psi). The City's Water Distribution Design Guidelines technical bulletin (ISDTB-2014-02) further states that for areas that exceed 552 kPa (80 psi), pressure reducing valves should be installed immediately downstream of the isolation valve in the home/building.

The City has indicated that the available flow at a residual pressure of 20 psi is 110 L/s. This value is less than the calculated Fire Underwriter Survey (FUS) fire flow requirement of 250 L/s (per the attached calculation). Thus, the existing water distribution network available flow does not meet the fire flow requirements following the FUS method.

Stantec also reviewed the Ontario Building Code's Office of the Fire Marshal Ontario (OFM) methodology to estimate the building code fire flow requirement for the proposed building located at 337 Montgomery. The OFM methodology refers to NFPA 13 (National Fire Protection Association, see Section 11.2) for sprinklered building fire flow requirements. As per NFPA 13, the City's distribution is able to provide a flow (6,600 Lpm) which meets the full range of Acceptable Flow at Base of Riser (Including Hose Stream Allowance) as shown in Table 11.2.2.1 copied below. The distribution network can therefore meet the building code's requirements for a sprinklered design. It is noted that the sprinkler system would have to be designed accordingly based on the available flow and pressure to the site.

Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

Occupancy Classification	Minimum Residual Pressure Required		Acceptable Flow at Base of Riser (Including Hose Stream Allowance)		Duration (minutes)
	psi	bar	gpm	L/min	
Light hazard	15	1	500–750	1900-2850	30–60
Ordinary hazard	20	1.4	850–1500	3200-5700	60–90

In conclusion, based on the boundary condition provided, the 150 mm diameter watermain on Montgomery Street provides anticipated demand flows above the minimum pressure objective during peak demand, as per the City of Ottawa's Drinking Water Design Guidelines. During basic demand conditions, the maximum objective pressure of 552 kPa (80 psi) will be exceeded, therefore, pressure reducing valves will be required to service the proposed building per the City design guidelines and the Ontario Building Code.

With respect to fire flow, the City's existing distribution network and hydrants do not provide the calculated FUS fire flow requirements. However, the distribution network is capable of meeting flow requirements per NFPA13 sprinkler design requirements as required by the Ontario Building Code's Office of the Fire Marshal Ontario (OFM). Therefore, a sprinklered system will need to be installed in this building and designed by the owner's mechanical engineer to meet NFPA13 requirements that can achieve a flow of 6,600 L/min (minimum).

B.) Sanitary Flow

Outlet of sanitary flow from this site will be the existing 300 mm diameter Selkirk Street sanitary sewer. Peak sanitary flow for this proposed development site is estimated at Q = 0.84 L/s with an infiltration rate of 0.03 L/s. This flow will enter the existing 300 mm diameter sanitary sewer via the proposed apartment building 150 mm diameter PVC sanitary service lateral sloped at 1% (min.). Refer to Appendix B for details.

The peak sanitary flow estimated for the existing lot occupied by a 2 storey residential dwelling unit is Q = 0.05 L/s with an infiltration rate of 0.01 L/s. Therefore, the estimated net increase in peak flow from this proposed development is 0.79 L/s.

In view that the existing Selkirk Street sanitary sewer size is 300 mm diameter located in front of this property, an increase in sanitary flow to the sewer system by 0.79 L/s from this mixed use site is not expected to negatively impact the existing Selkirk Street sanitary sewer.

C.) Storm Flow

Storm-water outlet for this proposed property will be the existing 750 mm diameter storm sewer located on Montgomery Street. The proposed mixed use building will have a rooftop that is flat and will be able to provide on-site storm-water management (SWM) storage. Roof water from the building will be drained and controlled by three (3) roof drains in which each will have a release rate of 0.63 L/s (10 US gal/min.) for a total flow rate of 1.89 L/s which then outlets directly into the existing 750 mm diameter Montgomery Street storm sewer via the proposed 125 mm diameter PVC storm lateral from the building.

On-site drainage shall be graded to sheet drain the proposed landscaped and paver stone areas to the municipal street road right of way. The proposed asphalt parking lot in which most of the parking spaces are covered by the building rooftop will be drained by a catch basin and outlet to the Montgomery Street sewer via a 300 mm diameter storm pipe.

Based on the site plan from the architect, the average post-development runoff coefficient is estimated at C = 0.74 and A = 0.104 ha.

An estimation of the pre-development flow condition was carried out using the criteria accepted by the City of Ottawa. The maximum allowable pre-development runoff of coefficient into the Montgomery Street storm sewer from this site is C = 0.5 (max.).

For development of this residential site (±0.104 ha.) and in controlling the five (5)-year storm-water release rate off site to a net allowable rate of 2.14 L/s, a site storage volume of approximately 6.89 m^3 minimum is required during the five (5)-year event. For this site, three (3) flat rooftop storage areas will be used for storm-water management attenuation. The specified controlled roof drain flow rate is each at 0.63 L/s (20 U.S. gallons/minute).

During the five-year storm event for the flat rooftop storage, the ponding depth on this rooftop is estimated at 110 mm at the drain and 0 mm at the roof perimeter, assuming a 1.4% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 2.29 m^3, the roof top storage available at Roof Area 2 is 3.18 m^3, and the rooftop storage available at Roof Area 3 is 2.52 m^3, for a total of 7.99 m^3, which is greater than the required volume of 6.89 m^3.

To control the 100-year storm-water release rate off site to a net allowable rate of 2.14 L/s, a site storage volume of approximately 16.94 m^3 minimum is required during the 100-year event.

During the 100-year storm event for the flat rooftop storage, the ponding depth on this rooftop is estimated at 150 mm at the drain and 0 mm at the roof perimeter, assuming a 1.4% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 6.28 m^3, the rooftop storage available at Roof Area 2 is 8.3 m^3, and the rooftop storage available at Roof Area 3 is 6.82 m^3, for a total of 21.40 m^3, which is greater than the required volume of 16.94 m^3. Refer to Appendix B for the details about the available storage volume calculations.

Therefore, by means of flat building rooftop storage and grading the site to the proposed grades as shown on the Proposed Site Grading and Servicing Plan Dwg. 818-15 G-1 and the Proposed Rooftop Stormwater Management Plan Dwg. 818-15 SWM-1, the desirable five (5)-year storm and 100-year storm event detention volume of 7.99 m^3 and 21.40 m^3 respectively will be available on site.

The building weeping tile drainage will outlet via its separate 150 mm diameter PVC storm lateral. The roof drains will be outletted via a proposed 125 mm PVC storm lateral where both the roof storm-water and weeping-tile water lateral will be outletted directly to the existing Montgomery Street 750mm diameter storm sewer.

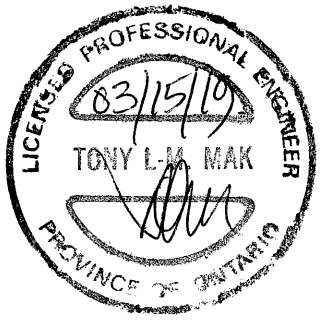
4.) EROSION AND SEDIMENT CONTROL

The contractor shall implement Best Management Practices to provide for protection of the receiving storm sewer during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of a silt fence barrier (as per OPSD 219.110 and associated specifications) along Montgomery Street and all other areas that sheet drain off site. Maintenance hole sediment barriers to be AMOCO 4555 non-woven geotextile or approved equivalent.

Refer to Appendix C for summary of the Development Servicing Study Checklist applicable for this development.

PREPARED BY T. L. MAK ENGINEERING CONSULTANTS LTD.

TONY L. MAK, P. ENG.



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337 MONTGOMERY STREET

CITY OF OTTAWA

APPENDIX A

CITY OF OTTAWA

WATER DATA BOUNDARY CONDITIONS

AND

FUS FIRE FLOW CALCULATIONS

From: Wu, John
To: TL Mak ;
Subject: RE: 337 Montgomery Street
Date: Thursday, February 07, 2019 2:15:16 PM
Attachments: 337 Montgomery Feb 2019.pdf

Here is the result:

The following are boundary conditions, HGL, for hydraulic analysis at 337 Montgomery (zone 1E) assumed to be connected to the 152mm on Montgomery (see attached PDF for location).

Minimum HGL = 109.5m

Maximum HGL = 118.2m; the maximum pressure is estimated to be above 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required.

Available Flow @ 20psi = 110 L/s assuming a ground elevation of 57.3m

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.

John

From: TL Mak <tlmakecl@bellnet.ca>
Sent: Thursday, January 31, 2019 2:58 PM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Subject: 337 Montgomery Street

Hi John,

The proposed residential building at 337 Montgomery Street is proposed to be 6 storeys with a total of 36 unit comprised of 1-bedroom, 2-bedroom, and 3-bedroom apartments, as well as 2 rental commercial units at the floor level. The building is to be serviced from the 152mm diameter watermain along Montgomery Street. The total area of the building is approximately 3,278 m^2.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines where the residential consumption rate of 350 L/cap/d is used to estimate average day demands (AVDY) of the residential units. Maximum day (MXDY) demands were calculated by multiplying AVDY by a factor of 2.5. Peak hourly (PKHR) demands were calculated by multiplying MXDY by a factor of 2.2. Persons per unit (PPU) for each unit were estimated based on the City of Ottawa's Water Design Guidelines. **Table 1** shows the estimated domestic demands of the proposed building.

Similarly, the consumption demand for the retail units were estimated as 2.5 L/m^2/d (value for shopping centers). For the retail units, the MXDY demands were calculated by multiplying AVDY by a factor of 1.5, and the PKHR demands were obtained by multiplying MXDY by a factor of 1.8.

Table 1 - Estimated Domestic Demand

Unit Type	Number of Units	PPU or m^2	Consumption	BSDY		MXDY		PKHR	
			L/cap/d or L/m^2/d	L/d	L/s	L/d	L/s	L/d	L/s
Rental Units	2	108	2.5	271	0.003	406	0.005	732	0.008
1-bedroom	27	1.4	350	13,230	0.153	33,075	0.383	72,765	0.842
2-bedroom	4	2.1	350	2,940	0.034	7,350	0.085	16,170	0.187
3-bedroom	5	3.1	350	5,425	0.063	13,563	0.157	29,838	0.345
Total	36			***21,866***	***0.253***	***54,394***	***0.630***	***119,504***	***1.383***

The fire flow required was determined following the Fire Underwriter Survey (FUS) method and is provided in the

attached spreadsheet. For this analysis, the building was classified as wood frame with building contents that are limited in combustibility. It is understood that the building will have a sprinkler system, as well as a 2-hr fire resistive wall along the east side of the building. The resulting total required fire flow is 14,000 L/min (233 L/s) for a duration of 3.00 hours.

In summary:
AVDY = 21,866 L/d (0.253 L/s)
MXDY = 54,394 L/d (0.630 L/s)
PKHR = 119,504 L/d (1.383 L/s)
Fire Flow = 14,000 L/min (233 L/s)

Thank you for your prompt attention to this matter. Please forward the boundary conditions as soon as possible.

Tony Mak
T.L. Mak Engineering Consultants Ltd.
1455 Youville Drive, Suite 218
Ottawa, ON K1C 6Z7
Tel: 613 837-5516 | Fax: 613 837-5277
E-mail: tlmakecl@bellnet.ca

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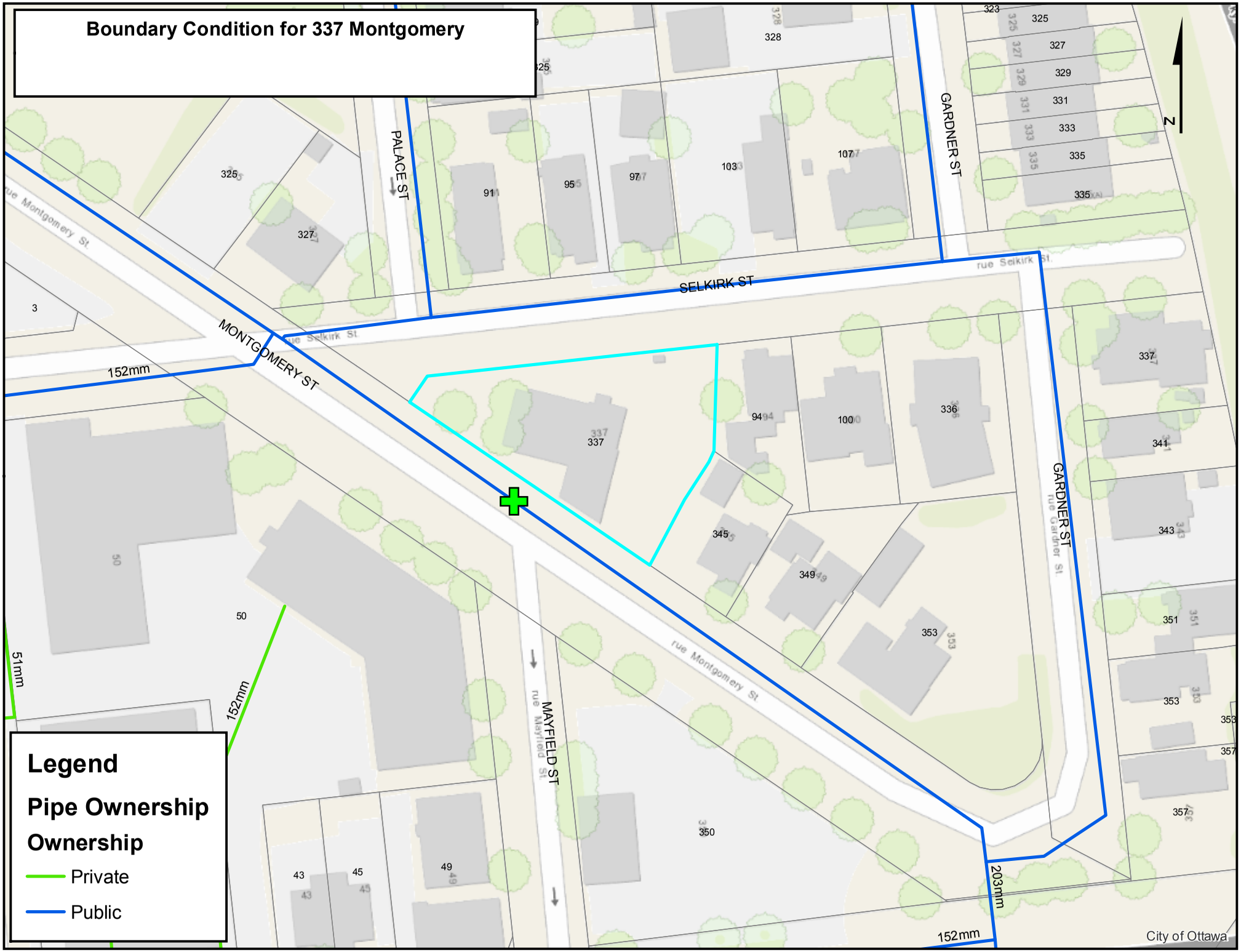
Boundary Condition for 337 Montgomery
PALACE ST
GARDNER ST
SELKIRK ST
rue Selkirk St
MONTGOMERY ST
rue Montgomery St
152mm
MAYFIELD ST
rue Mayfield St
GARDNER ST
rue Gardner St
51mm
152mm
203mm
152mm
N
Legend
Pipe Ownership
Ownership
Private
Public
City of Ottawa

From: TL Mak
To: John Wu;
cc: Richard Buchanan;
Subject: 337 Montgomery Street
Date: Thursday, January 31, 2019 2:57:00 PM
Attachments: STANTEC_FUS_FIREFLOW_CALCULATOR_337Montgomery.pdf

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Ottawa, ON K1C 6Z7
Tel: 613 837-5516 | Fax: 613 837-5277
E-mail: tlmakecl@bellnet.ca

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401084
Project Name: 337 Montgomery
Date: January 28, 2019
Data inputted by: Alexandre Mineault-Guitard, M.A Sc., EIT
Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 1
Building Type/Description/Name: Residential

Notes:

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	**Floor Space Area**						
		Type of Housing	Single Family	1	Other (Comm, Ind, Apt etc.)	36	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, Apt etc.)	36				
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):			5	5	Storeys	
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction):			656	3,278	Area in Square Meters (m^2)	
					Square Metres (m2)			
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1000L/min						**19,000**
5	Apply Factors Affecting Burning	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0 25	Limited combustible	-0.15	N/A	**16,150**
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0 25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	Adequate Sprinkler conforms to NFPA13	-0.3	N/A	**-4,845**
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is standard for sprinkler and fire dept. hose line	-0.1	N/A	**-1,615**
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler system is fully supervised	-0.1	N/A	**-1,615**
			Sprinkler not fully supervised or N/A	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.35	m	**5,653**
			East Side	Fire Wall	0.1			
			South Side	20.1 to 30.1m	0.1			
			West Side	30.1 to 45 0m	0 05			
6	Obtain Required Fire Flow, Duration & Volume	*Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:*						**14,000**
		Total Required Fire Flow (above) in L/s:						**233**
		Required Duration of Fire Flow (hrs)						**3.00**
		Required Volume of Fire Flow (m^3)						**2,520**

PROPOSED SIX-STOREY

MIXED USE BUILDING SITE

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R-PLAN 49

337 MONTGOMERY STREET

CITY OF OTTAWA

APPENDIX B

SANITARY SEWER DESIGN SHEET

PAGE 1 OF 1

SANITARY SEWER DESIGN SHEET

q = average daily per capita flow (280 L/cap. d)
I = unit of peak extraneous flow (0.28 L/ha. s)
M = peaking factor = 4 (MAX.)
Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow

RESIDENTIAL
DENSITY:
1 BEDROOM APT. = 1.4
2 BEDROOM APT. = 2.1
3 BEDROOM APT. = 3.1

COMMERCIAL
P.F. = 1.5
COMM = AVG. FLOW
= 50,000 L/Ha/Day

$M = 1 + \frac{14}{4 + \sqrt{P}}$ where P population in 1000's
$Q(p) = \frac{PqM}{86.4}$ (L/s)
Q(i) = IA (L/s) where A = area in hectares
Q(d) = Q(p) + Q(i) (L/s)

LOCATION			INDIVIDUAL		CUMULATIVE		Peaking factor M	Pop. flow Q(p) (L/s)	Peak extraneous flow Q(i) (L/s)	Peak design flow Q(d) (L/s)	PROPOSED SEWER						
STREET	FROM	TO	Pop.	Area A (hectares)	Pop.	Area A (hectares)					Length (m)	Pipe size (mm)	Type of pipe	Grade %	Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity at Q(d)
337 MONTGOMERY STREET	SITE	EX. 300Ø SAN SWR ON (SELKIRK STREET)		RESIDENTIAL													
				(27 x 1.4) + (4 x 2.1) + (5 x 3.1)													
			61.7	0.104	61.7	0.104	4	0.80	0.03								
				COMMERCIAL													
			A=	0.011 Ha													
				Q_C = 0.0064 x			1.5	0.01									
										0.84	10.0	150	PVC	1% (min)	42.6	1.36	

LICENCED PROFESSIONAL ENGINEER
03/12/19
TONY L-M. MAK
PROVINCE OF ONTARIO

(818-15)

DESIGN	TLM
CHECKED	TLM
DATE	MARCH 2019

PROJECT 337 MONTGOMERY STREET
PROPOSED SIX STOREY MIXED USE
BUILDING SITE - CITY OF OTTAWA

SHEET No. 1 of 1

PROPOSED SIX-STOREY

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337 MONTGOMERY STREET

CITY OF OTTAWA

APPENDIX C

DEVELOPMENT SERVICING STUDY CHECKLIST

SUMMARY

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