

**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**SERVICEABILITY REPORT**

**REPORT No. R-821-157A**

**T.L. MAK ENGINEERING CONSULTANTS LTD.**

**JUNE 2023**

**REFERENCE FILE NUMBER 821-157**

## **Introduction**

The developer of this site is proposing to redevelop the existing residential lot described as Lot 3 Registered Plan 267570 City of Ottawa by constructing a three (3) storey residential apartment building consisting of eighteen (18) units, including two (2) 2-bedroom units, fourteen (14) 1-bedroom units and two (2) studio/bachelor units.

The municipal address of the property is referenced as 1240 Carling Avenue and it is located in the City Ward (16 - River). The site is situated on the south side of Carling Avenue, west of Viscount Avenue and east of Merivale Road. See site plan and legal survey plan in **Appendix A** for details.

The area of this property is  $\pm 0.045$  hectares. In addition to the (3)-storey residential building, the other development features will comprise of concrete walkway access to the front entrance off Carling Avenue, a barrier free entrance facing Merivale Road, including an amenity area located in the rear yard, as well as a vehicle parking space at grade, soft landscaping is also proposed along the front (northside) of the building with additional landscaped areas throughout the site, etc., to meet the City of Ottawa's site plan requirements.

A site geotechnical report was prepared for this site by the owner's soils engineer, GEMTEC entitled Geotechnical Investigation – Proposed Residential Development (Project No. 100382.003 dated February 10, 2023) for this proposed development property.

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

## **Existing Site Conditions and Servicing**

This property is currently occupied by a 1½-storey vinyl-stucco, stone siding residential building. The existing house currently has its own asphalt driveway off of Carling Avenue for vehicle access and parking. Most of the existing site is currently permeable surface covered and consisting of grass/landscaped areas with the remaining areas being roof area, asphalt laneway, porches, decks and a shed. For additional details of the site's pre-development conditions, refer to the coloured Google Image (2023) and aerial photography from (GeoOttawa 2021) in **Appendix B**.

The topography of the land is found to be gently sloping from south to north or (back to front) with an average slope of  $\pm 2.5\%$ .

The existing house water services and sanitary lateral currently servicing the existing dwelling on 1240 Carling Avenue will be removed. The existing water services shall be blanked at the

main and the existing house laterals shall be capped at the front property line as part of the requirements for re-development of this site.

As for the availability of underground municipal services, there are existing municipal services along Carling Avenue in front of this property consisting of a 375mm diameter storm sewer, a 225mm diameter sanitary sewer and a 150mm diameter watermain for development of this property. Refer to the City of Ottawa Carling Avenue and Merivale Road UCC drawing and plan and profile drawings included in **Appendix C** for details.

Because the site is located within a separated sewer shed, therefore, the approval exemption under Ontario Regulations 525/98 would apply since storm water discharges from this site will outlet flow into a storm sewer. Thus, an Environmental Compliance Approval (ECA) application will not be required to be submitted to the Ministry.

### **Proposed Residential Apartment Building Site**

Vehicle access to this site will not be required for development of this property. A concrete surface parking space is proposed mainly for vehicle access for deliveries to the residential entrance at the front of the building. Concrete walkways are proposed along the north and east side of the new building for pedestrian access to front and side entrances.

#### **A. Water Supply**

The proposed building located within Pressure Zone 2W at 1240 Carling Avenue is a 3-storey residential building. The building contains eighteen (18) residential units, namely two (2) studios/bachelor, fourteen (14) 1-bedroom units, and two (2) 2-bedroom units. Three (3) 1-bedroom units will be constructed at basement level. Each floor covers an area of approximately 256 m<sup>2</sup>, for a total gross floor area of approximately 1,027 m<sup>2</sup>, including the basement level. The building will be serviced by the 305 mm dia. watermain along Merivale Road or the 152 mm dia. watermain along Carling Avenue.

The ground elevation on the property is approximately 79.5 m, as obtained from geoOttawa elevation contours (**Figure 1 in Appendix D**), and the Site Survey Plan provided to Stantec (see attached Site Survey Plan in **Appendix D**).

#### Demand Projections

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines. For residential units, a consumption rate of 280 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (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.

**Table 1: Estimated Domestic Demand**

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, Bachelor	2	1.4	280	784	0.01	1,960	0.02	4,312	0.05
Apartment, 1-Bedroom	14	1.4	280	5,488	0.06	13,720	0.16	30,184	0.35
Apartment, 2-Bedroom	2	2.1	280	1,176	0.01	2,940	0.03	6,468	0.07
<b>Total</b>	<b>18</b>			<b>7,448</b>	<b>0.09</b>	<b>18,620</b>	<b>0.22</b>	<b>40,964</b>	<b>0.47</b>

The fire flow requirement was determined following the Fire Underwriter Survey (FUS) method. For this analysis, the building was classified as wood frame construction, with building contents that are limited in combustibility. It is understood that the building will not have a sprinkler system. The resulting total required fire flow (RFF) is 14,000 L/min (233 L/s) for a duration of 3 hours. Details are provided in the attached **FUS Fire Flow Calculations** in **Appendix D**. The proposed **Site Plan** attached in **Appendix D** was used to determine distances from the proposed building to the property lines. **Figure 2** in **Appendix D** provides separation distances from adjacent buildings.

The City has previously indicated that the City’s Fire Marshall and various City departments were reviewing fire flow requirements for low- and mid-rise buildings. As per the City of Ottawa’s Water Design Guidelines, the FUS method is to be used for fire flow requirements affecting watermain sizing; with regards to fire protection on private property and not requiring new watermains, these are covered by the Ontario Building Code (OBC).

As such, the fire flow requirement was also determined following the OBC’s Office of the Fire Marshal (OFM) method. The proposed building will be of wood frame construction, where floors are fire separations, but without fire-resistance ratings. The resulting total required fire flow (RFF) for a non-sprinklered building is 5,400 L/min (90 L/s) for a minimum duration of 40 min. Details are provided in the attached **OFM Fire Flow Calculations** in **Appendix D**. **Figure 3** in **Appendix D** provides separation distances between the property line to the street centreline.

In summary, the estimated water demands for the proposed building are as follows:

- AVDY = 7,448 L/d (0.09 L/s)
- MXDY = 18,620 L/d (0.22 L/s);
- PKHR = 40,964 L/d (0.47 L/s); and,
- Fire Flow (FUS) = 14,000 L/min (233 L/s);
- Fire Flow (OFM) = 5,400 L/min (90 L/s).

## Boundary Conditions

The hydraulic gradeline (HGL) boundary conditions for 1240 Carling Avenue, as presented in **Table 2**, were provided by the City on June 1, 2023 (see attached **Water Boundary Conditions Email in Appendix D**).

**Table 2: Boundary Conditions**

Demand Scenario	Head (m)
Minimum HGL <sup>1</sup> (Peak Hour)	124.4
Maximum HGL <sup>1</sup> (Average Day)	132.8
Maximum Day + Fire Flow <sup>2</sup> (FUS – 14,000 L/min) – <u>Connection at the 305 mm dia. watermain along Merivale Road</u>	102.9

<sup>1</sup> Resulting boundary condition valid for either connection to the existing network (i.e., watermain along Merivale Road or Carling Avenue).

<sup>2</sup> The City noted that a fire flow of 9,300 L/min (155 L/s) at 20 psi residual pressure is available for the connection at the 152 mm dia. watermain along Carling Avenue.

## Hydraulic Analysis

### **Peak Hour & Average Day**

During average day demands, the resulting maximum hydraulic gradeline of 132.8 m corresponds to a maximum pressure of 558 kPa (81 psi). This value is slightly above the maximum pressure objective of 552 kPa (80 psi). As per the City guidelines, pressures exceeding 552 kPa (80 psi) require reduction mitigation, which could be achieved with a pressure reducing valve along the service line to the proposed building.

During peak hour demands, the resulting minimum hydraulic gradeline of 124.4 m corresponds to a peak hour pressure of 475 kPa (69 psi). This value is above the minimum pressure objective of 276 kPa (40 psi) for residential buildings up to two storeys. From a servicing perspective, the peak hour pressure exceeds this objective and is therefore considered acceptable. Given that this building consists of a total of 3 storeys, further consideration will be needed to service the higher floors. Adding 5 psi per floor above two stories (i.e., 1 additional floor), a minimum pressure of 310 kPa (45 psi) would be required for the third floor. The peak hour pressure calculated is equal to this objective and is therefore considered acceptable.

**Supporting hydraulic calculations** are attached in **Appendix D**.

### **Maximum Day + Fire Flow**

At the proposed connection to the 305 mm dia. watermain along Merivale Road, a maximum day plus fire flow (14,000 L/min as per FUS) hydraulic gradeline of 102.9 m corresponds to a

residual pressure of 265 kPa (38 psi) at this location, which is above the minimal residual pressure requirement of 140 kPa (20 psi).

Along the proposed connection on Carling Avenue (152 mm dia. watermain), the available fire flow is 9,300 L/min (155 L/s) at 20 psi residual. This is less than the required fire flow obtained from the FUS Guidelines. However, the available fire flow is greater than the RFF obtained from the OFM method (90 L/s or 5,400 L/min). As the City previously indicated that the Ontario Building Code (OFM method) covers the servicing of buildings which do not require new watermains, the connection along Carling Avenue is also deemed acceptable.

Based on Table 1 of Appendix I of the City of Ottawa Technical Bulletin ISTB-2018-02 and a desktop review (i.e., Google Street View) to confirm hydrant class, four (4) hydrants are located in the vicinity of the proposed building. Two (2) Class AA hydrants are within 75 m, both with a capacity contribution of up to 5,700 L/min. Two (2) others Class AA hydrants are within 150 m from the site, both with a capacity contribution of up to 3,800 L/min. The combined hydrant flow coverage for 1240 Carling Avenue is therefore 19,000 L/min, which is above the RFF obtained from both the FUS (14,000 L/min), and the OFM (5,400 L/min) methods.

The hydrant coverage is illustrated in **Figure 4** attached in **Appendix D**. A breakdown of the hydrant coverage is summarized in **Table 3**.

**Table 3: Minimum Fire Hydrant Coverage**

Building	Calculated Fire Flow Demand (L/min)	Fire Hydrants				Minimum Combined Hydrant Flow Coverage (L/min)	
		Hydrant Class	Within 75 m		Between 75 m and 150 m		
			Quantity	Contrib. to RFF	Quantity		Contrib. to RFF
1240 Carling Avenue	14,000 (FUS); 5,400 (OFM)	AA	2	5,700	2	3,800	19,000
		A					
		B					
		C					

In conclusion, based on the boundary condition provided, the 305 mm dia. watermain on Merivale Road or the 152 mm dia. watermain on Carling Avenue provides adequate fire flow capacity as per the Ontario Building Code's Office of the Fire Marshal (OFM) method for the proposed development at 1240 Carling Avenue. The 305 mm dia. watermain on Merivale Road also provides sufficient flow to meet the Fire Underwriter Survey (FUS) required fire flow.

Resulting pressures during anticipated demand flows meet the pressure objectives during peak demand conditions, as per the City of Ottawa's Drinking Water Design Guidelines. However, during average day demand conditions, the expected maximum pressure is slightly above the

maximum pressure objective of 552 kPa (80 psi). Thus, an individual pressure reducing valve is required along the service line to the proposed building.

#### B. Sanitary Flow

The peak sanitary flow for the proposed eighteen (18) units, which comprise of fourteen (14) 1-bedroom units, two (2) 2-bedroom units and two (2) studio/bachelor units, is estimated at  $Q = 0.37$  L/s with an infiltration rate of 0.02 L/s. Please refer to **Appendix E** regarding sanitary flow calculations. This flow will enter the existing 225mm diameter sanitary sewer on Carling Avenue via a proposed new 150mm diameter PVC sanitary service lateral from the three (3)-storey residential apartment building.

The existing peak sanitary flow of this site with a single detached dwelling unit is  $Q = 0.06$  L/s with an infiltration rate of 0.02 L/s. The net increase in flow from this proposed development is 0.31 L/s.

Waste water from the existing Carling Avenue 225mm dia. sanitary sewer located in front of this site then in turn outlets further west and north along Merivale Road and into the existing 1050mm dia. Merivale Road collector sanitary sewer. Waste water flow from this collector sewer then flows further north into the existing 1200mm dia. sewer at Faraday Street.

#### C. Storm Flow

The storm-water outlet for the proposed development property will be the existing 375mm diameter storm sewer located on Carling Avenue. Stormwater attenuation on site will be accomplished by means of rooftop storage with controlled roof drains that regulate flow off site.

Two (2) roof drains are proposed for this apartment building that will restrict maximum flow to a rate of 1.27 L/s (0.95 L/s + 0.32 L/s) under a head of 150mm and into the Carling Avenue storm sewer. The calculated net allowable controlled release rate from this site is estimated at 4.07 L/s under the 2 year pre-development event.

At this development site, for storm events up to the 100-year event the maximum post development flow draining off-site is the controlled roof top flow plus the 100-year uncontrolled flow from the site draining to the front which totals to 4.77 L/s (1.27 L/s + 3.5 L/s) and is 0.70 L/s greater than the allowable flow of 4.07 L/s.

Based on the residential site plan from the owner's architect, the average post-development runoff coefficient is estimated at  $C = 0.75$  and  $A = 0.045$  hectares.

An estimation of the 2-year pre-development flow condition was carried out using the criteria accepted by the City of Ottawa. If post-development C value exceeds the lesser of the  $C_{pre} = 0.42$  or  $C_{allow} = 0.5$  (max) then SWM is required. So from our calculations, the  $C_{pre} = 0.42$  value will be used at  $t_c = 10$  minutes for pre-development allowable flow calculation off-site.

The pre-development flow rate calculated into a storm sewer for this residential area is the lesser of the two (2)-Year storm event where  $C_{allow} = 0.5$  (max.) runoff value and  $t_c = 10$  minutes or the average  $C_{pre}$  value which is 0.42 using  $t_c = 10$  minutes. Because the site  $C_{post} = 0.75$  and  $C_{pre} = 0.42$  then SWM measures are required.

Therefore, based on our calculation, on-site retention is required for this proposed development site, because the site post-development C value of 0.75 is greater than the  $C_{pre} = 0.42$ .

The storage volume for the two (2)-year and up to the 100-year storm event will be stored by means of flat rooftop on the top of the third floor of the apartment building. Also refer to the site storm drainage report (Report No. R-821-157) for further details.

To control the two (2)-Year storm-water release rate off-site from roof top to a rate of 1.27 L/s, a site storage volume of approximately 3.56 m<sup>3</sup> minimum is required during the two (2)-year event.

During the two (2)-year storm event for the flat rooftop storage, the ponding depth of rooftop area 1 is estimated at 100 mm at the drain and 0mm at the roof perimeter, assuming a 1.3% minimum roof pitch to the drain. The ponding depth of roof top area 2 is estimated at 110mm at the drain and 0mm at the roof perimeter assuming a 1.3% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 2.34 m<sup>3</sup> and the rooftop storage available at Roof Area 2 is 2.68 m<sup>3</sup>, for a total of 5.02 m<sup>3</sup>, which is greater than the required volume of 3.56 m<sup>3</sup>.

During the 100-year storm event for the flat rooftop storage, the ponding depth of Roof Area 1 and 2 is estimated at 150 mm at the drain and 0mm at the roof perimeter, assuming a 1.3% minimum roof pitch to the drain. The rooftop storage available at Roof Area 1 is 7.92 m<sup>3</sup> and the rooftop storage available at Roof Area 2 is 6.75 m<sup>3</sup>, for a total of 14.67 m<sup>3</sup>, which is greater than the required volume of 12.86 m<sup>3</sup>.

Therefore, by means of flat building rooftop storage and grading the site to the proposed grades as shown on the Proposed Grading and Servicing Plan and Proposed Rooftop Stormwater Management Plan Dwg. 821-157 G-1 and 821-157 SWM-1 respectively, the desirable two (2)-year storm and 100-year storm event detention volume of 5.02 m<sup>3</sup> and



14.67 m<sup>3</sup> respectively will be available on site. Refer to Storm Drainage Report (Report No. R-821-157) in **Appendix D** for detailed calculations of available storage volumes.

At this development site, for storm events up to the 100-year event the maximum post development flow draining off-site is the controlled roof top flow plus the 100-year uncontrolled flow from the site draining to the front of the lot totals to 4.77 L/s (1.27 L/s + 3.50 L/s) which is approximately 0.70 L/s greater than the allowable flow of 4.07 L/s.

In comparing the pre-development flow of the current site conditions to the post development flow and with the SWM regulated flow plus uncontrolled flow from the proposed site under the post development conditions at the 2-Year event = 2.59 L/s and the 100-Year event = 4.77 L/s whereupon the post development flow events are less than the current 2-Year event and less than the current 100-Year event pre-development flow estimate for the site at 2-Year<sub>pre</sub> = 4.07 L/s and 100-Year<sub>pre</sub> = 10.77 L/s. Therefore with this proposed development, stormwater flow off-site is considered improved from that of the existing conditions.

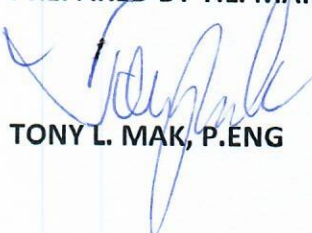
The building weeping tile drainage will outlet via its separate 150mm diameter PVC storm lateral. The roof drains will be outletted also via a separate 150mm PVC storm lateral in which both laterals will be connected to the existing Carling Avenue 375mm dia. storm sewer. The City of Ottawa recommends that pressurized drain pipe material be used in the building for the roof drain leader pipe in the event of surcharging in the City storm sewer system. Refer to the proposed site grading and servicing plan Dwg. 821-157 for details.

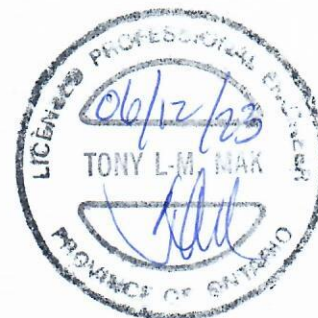
## Erosion and Sediment Control

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 "siltsack" catch basin sediment control device or equal in catch basins as recommended by manufacturer on-site and off-site within the Merivale Road Carling Avenue road right of way adjacent to this property. Siltsack shall be inspected every 2 to 3 weeks and after major storm. The deposits will be disposed of as per the requirements of the contract. See Dwg. #821-157 ESC-1 for details.

Refer to **Appendix F** for the summary of the Development Servicing Study Checklist that is applicable to this development.

**PREPARED BY T.L. MAK ENGINEERING CONSULTANTS LTD.**

  
**TONY L. MAK, P.ENG**



**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX A**

**SITE PLAN AND LEGAL SURVEY PLAN**



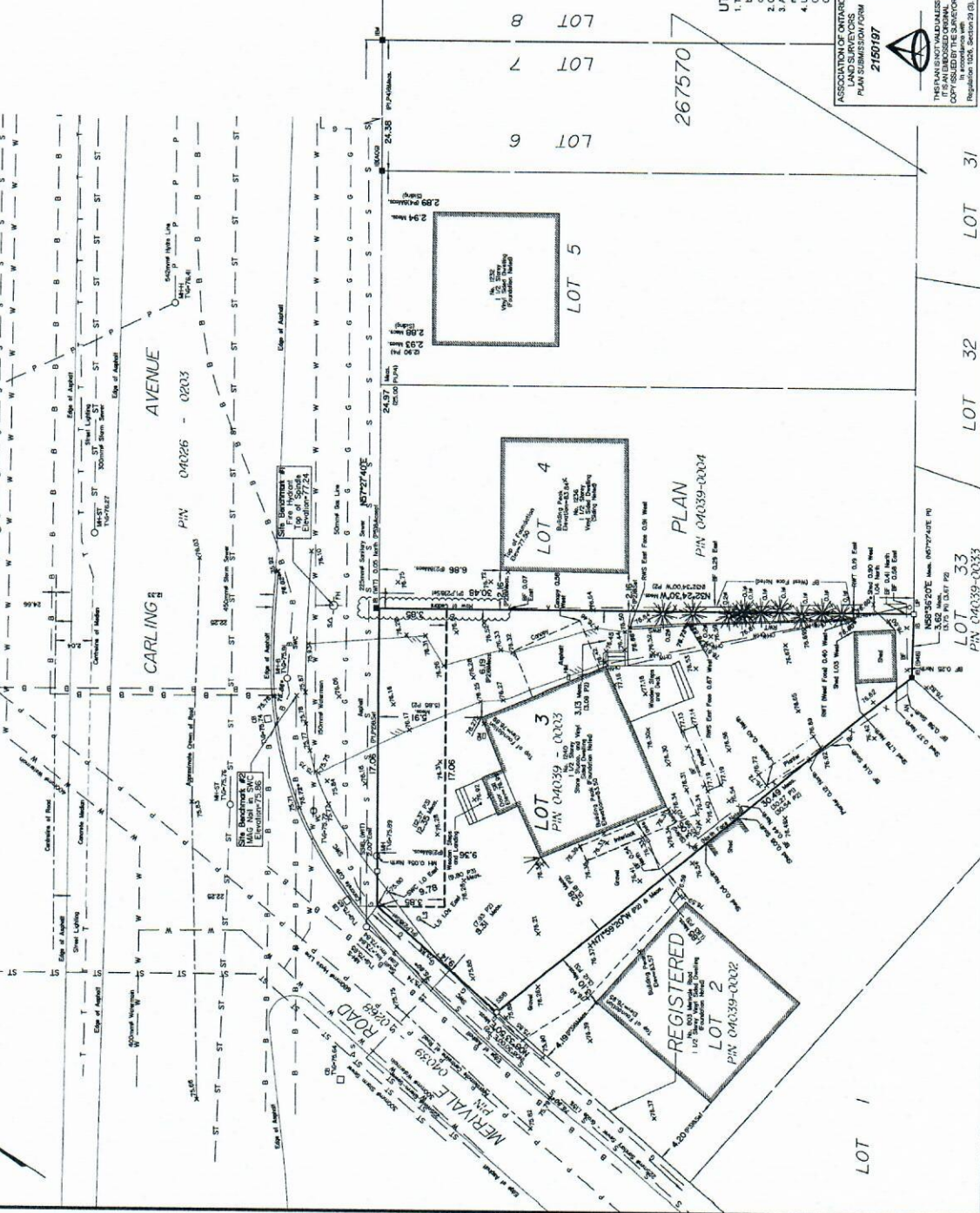
**TOPOGRAPHIC PLAN OF SURVEY OF  
LOT 3  
REGISTERED PLAN 267570  
CITY OF OTTAWA**  
Surveyed by Annis, O'Sullivan, Vollebek Ltd.  
Scale 1:150

**Metric**  
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND  
SHOULD BE CONSIDERED TO BE CORRECT TO 0.30M

**Surveyor's Certificate**  
I CERTIFY THAT:  
1. The site is correct and in accordance with the Survey Act and the Surveyors Act and the regulations made under them.  
2. The survey was completed on the 1st day of February, 2021.

Richard F. Coulter  
Ontario Land Surveyor

**ELEVATION NOTES**  
1. Elevations shown are geoidic and are referred to the CGVD28 specific datum.  
2. The elevations shown are for the ground surface and are not to be altered or disturbed and the information shown on this drawing agrees with the information shown on this drawing.



**Notes & Legend**

- Decks**
- Survey Monument Flashed
  - Survey Monument Found
  - Iron Bar
  - Powdered Iron Bar
  - Witness
  - Measured
- Notes**
- AO(3) Annis, O'Sullivan, Vollebek Ltd
  - RP(1) Registered Plan 267570
  - RP(2) (1235) Plan dated August 10, 1989
  - RP(3) (1237) Plan dated August 6, 1985
  - RP(4) (AO3) Plan dated September 24, 1980
  - RP(5) (AO3) Plan dated July 31, 1991
  - RP(6) (AO3) Field Notes dated July 30, 1991
- Deciduous Tree**
- 
- Continuous Tree**
- 
- Fire Hydrant**
- 
- Maintenance Hole (Storm Sewer)**
- 
- Maintenance Hole (Sanitary Sewer)**
- 
- Maintenance Hole (Gas)**
- 
- Maintenance Hole (Water)**
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- Maintenance Hole (Underdrilled)**
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- Valve Chamber (Watermain)**
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- Underground Storm Sewer**
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- Underground Sanitary Sewer**
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- Underground Water**
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- Underground Power**
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- Underground Gas**
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- Underground Traffic**
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- Overhead Retaining Wall**
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- Overhead Property Line**
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**UTILITY NOTES**

- The utility locations shown on this plan are based on the utility records and field verification. The utility owners are responsible for the accuracy of the utility records and for any utility relocation or modification.
- Only visible surface utilities were located.
- A field location of underground part by the pertinent utility authority is required.
- Underground utility locations were derived from the City of Ottawa Utility Coordinating Committee Sheet G-06-03 and inverts were derived from the City of Ottawa Department of Engineering and Works Plan 2285 Sheet 4.

ASSOCIATION OF ONTARIO  
LAND SURVEYORS  
PLAN SUBMISSION FORM  
2160197

THE PLAN(S) INDICATED  
HEREIN IS/ARE A  
COPY ISSUED BY THE SURVEYOR  
Registration Book Section 21 (D)

ANNIS, O'SULLIVAN, VOLLEBEK LTD.  
14 Dundas Street East, Suite 500  
Ottawa, Ontario, Canada K1H 3G9  
Phone: (613) 727-9550 / Fax: (613) 727-1919  
www.annis-osullivan.com

Beatings are grid, derived from Can-Nat 2016 Real Time Network  
and are referenced to the datum of the National Geodetic  
Zone 8 (120°00' West Longitude / NAD 83 (original)).

For competition purposes, a rotation of 0°12'29" counter clockwise  
is applied to the bearings and distances shown on this plan.

**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX B**

**SITE PRE-DEVELOPMENT CONDITION**

**GOOGLE IMAGE (2023)**

**AND**

**AERIAL PHOTOGRAPHY 2021 (GEOOTTAWA)**









**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX C**

**CARLING AVENUE AND MERIVALE ROAD**

**CITY OF OTTAWA**

**PLAN AND PROFILE**

**AND**

**UCC DRAWINGS**



# AVE.

VESTGATE

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ROYAL

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PLAN SECTION

PLAN SECTION

PLAN SECTION







REVISIONS / REVISIONS	DATE	BY
1. CORRECTED TO DRAWING	JUL 2017	JM
2. NEW LINES ADDED ON MEMPHIS/17	OCT 2018	AJ
3. CORRECTED TO DRAWING	JAN 2019	JZ
4. CORRECTED TO DRAWING	AUG 2019	MA
5. CORRECTED TO DRAWING	MAR 2020	MA
6. CORRECTED TO DRAWING	MAY 2022	CS

LEGEND
Water Main
Sanitary Sewer
Storm Sewer
Electric
Gas
Telephone
Optical Fibre
Other

TELECOM GLOSSARY
Abandonment
Access Point
Admission Control
Bandwidth
Capacity
Configuration
Connectivity
Core Network
Edge Network
Equipment
Facilities
Infrastructure
Interconnection
Network
Optimization
Performance
Quality of Service
Service
Support
System
Topology
Usage
Validation

GLOSSARY - OTHER
Abandonment
Access Point
Admission Control
Bandwidth
Capacity
Configuration
Connectivity
Core Network
Edge Network
Equipment
Facilities
Infrastructure
Interconnection
Network
Optimization
Performance
Quality of Service
Service
Support
System
Topology
Usage
Validation

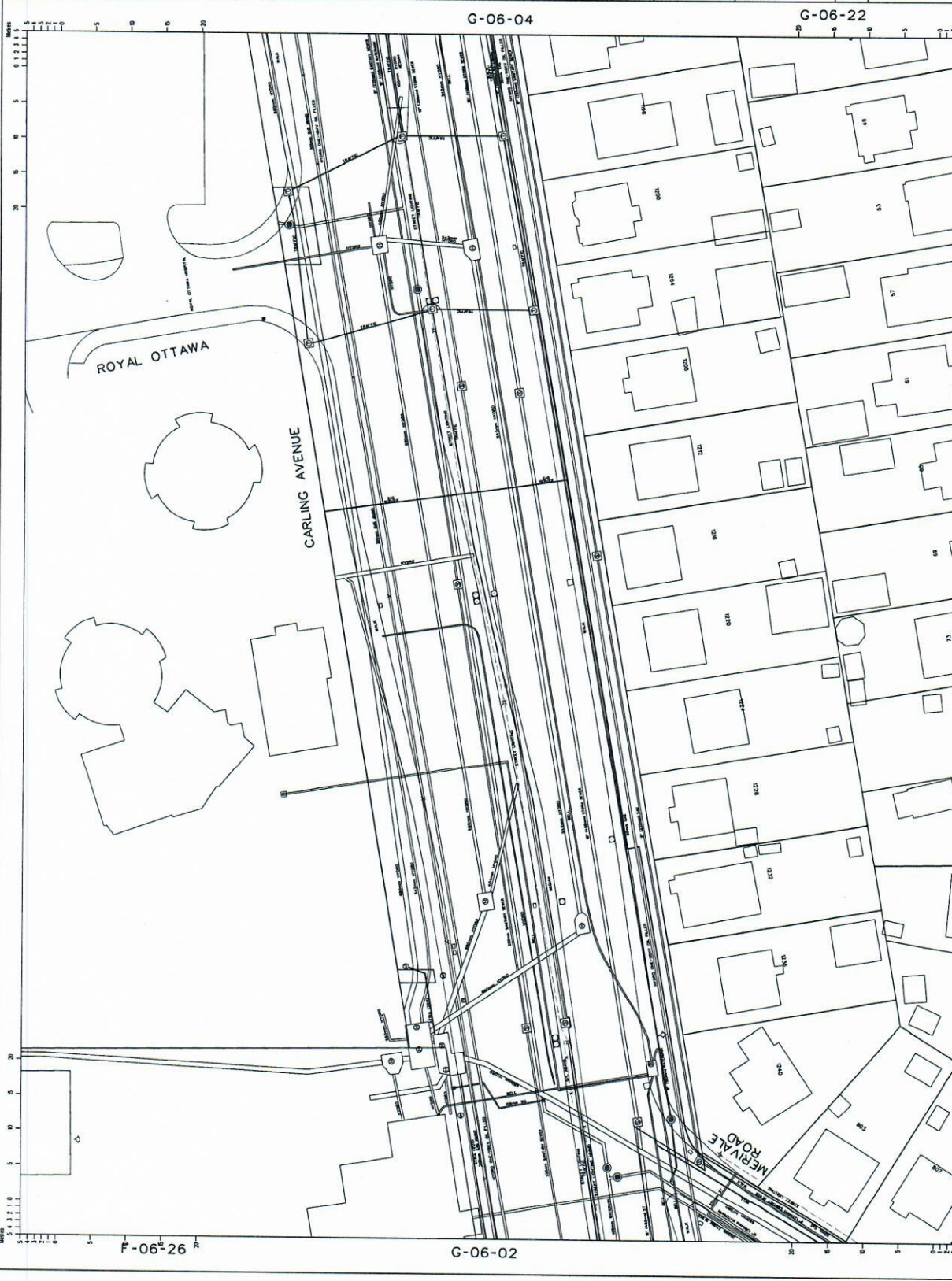
**CAUTION/TENTION**

Although UCC has made every effort to ensure the accuracy of the information provided in this drawing, it is not responsible for any errors or omissions. The user of this drawing is advised to verify all information before using it for any purpose. The user of this drawing is also advised to verify all information before using it for any purpose.



**OTTAWA UTILITY COORDINATING COMMITTEE**  
**COMITÉ DE COORDINATION DES SERVICES UTILITAIRES D'OTTAWA**  
**EMERGENCY/URGENT**

SCALE: 1:250	PROJECT NO. G-06-03
--------------	---------------------



F-06-26

G-06-02

G-06-22

G-06-16

**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX D**

- **SITE PLAN AND ARCHITECTURAL DRAWINGS**
- **SITE SURVEY PLAN**
- **ELEVATION CONTOURS (FIGURE 1)**
- **FUS FIRE FLOW CALCULATIONS**
- **OFM FIRE FLOW CALCULATIONS**
- **FUS EXPOSURE DISTANCES (FIGURE 2)**
- **OFM EXPOSURE DISTANCES (FIGURE 3)**
- **WATER BOUNDARY CONDITIONS**
- **SUPPORTING HYDRAULIC CALCULATIONS**
- **HYDRANT SPACING (FIGURE 4)**



**ATTACHMENT 1 : SITE PLAN AND ARCHITECTURAL DRAWINGS**



# CARLING DEVELOPMENT

1240 CARLING, OTTAWA ON.

ISSUED FOR COORDINATION

2023-05-04 4:40:54 PM

ARCHITECTURAL  
DRAWINGS



S.J. LAWRENCE ARCHITECTS INC.  
18 SPANISH ST. SUITE 205  
OTTAWA, ONTARIO K1P 5E7  
TEL: (613) 738-7772  
FAX: (613) 738-7700

STRUCTURAL  
DRAWINGS



CLELAND JARDINE ENGINEERING LIMITED  
400 BERRY FLOOR SUITE 200  
KAMUSTA, ONTARIO L2L 4B9  
TEL: (905) 881-1700  
FAX: (905) 881-1700





















Acub ENTERPRISE INC  
 10000 104th Ave NW  
 Suite 1000  
 Seattle, WA 98148  
 Phone: (206) 467-1000  
 Fax: (206) 467-1001  
 Website: www.acub.com

PROJECT: CARLING DEVELOPMENT  
 LOCATION: SEATTLE, WA  
 REFLECTED CEILING PLANS  
 DATE: 08/15/18  
 DRAWN BY: J. SMITH  
 CHECKED BY: M. JONES

NOTES:  
 1. REFER TO ALL OTHER SHEETS FOR NOTES.  
 2. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.  
 3. ALL WORK IS TO BE ACCORDING TO THE LATEST EDITIONS OF THE IBC AND ALL APPLICABLE CODES.  
 4. ALL MATERIALS AND METHODS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION.  
 5. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.  
 6. ALL WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ARCHITECT AT ALL STAGES.  
 7. ALL WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ARCHITECT AT ALL STAGES.

LEGEND:  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]

REVISIONS:  
 NO. DATE BY DESCRIPTION

DATE: 08/15/18  
 SCALE: AS SHOWN  
 SHEET: A3.0  
 TOTAL SHEETS: 3

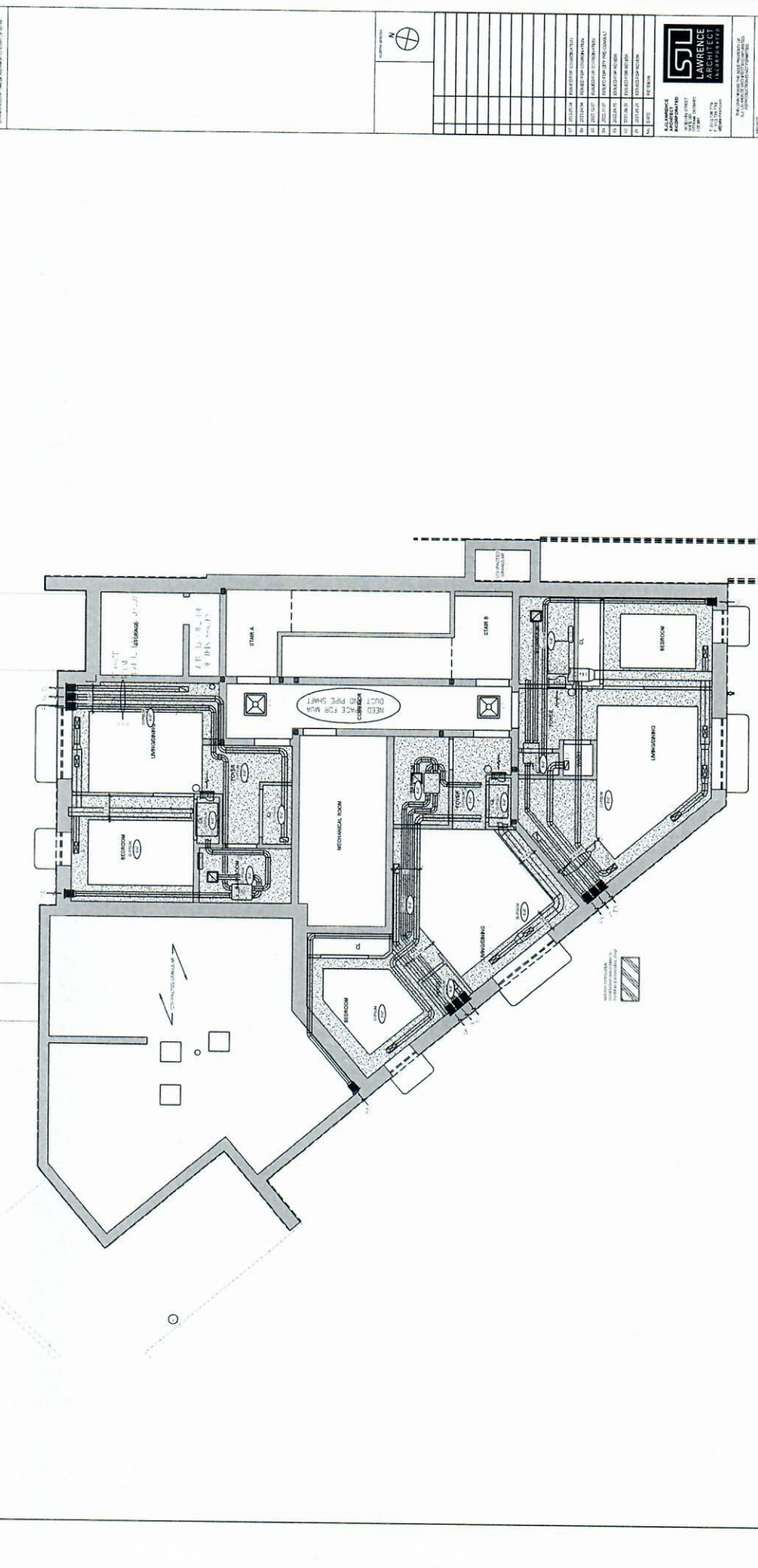
PROJECT: CARLING DEVELOPMENT  
 LOCATION: SEATTLE, WA  
 REFLECTED CEILING PLANS  
 DATE: 08/15/18  
 DRAWN BY: J. SMITH  
 CHECKED BY: M. JONES

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LEGEND:  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]

REVISIONS:  
 NO. DATE BY DESCRIPTION

DATE: 08/15/18  
 SCALE: AS SHOWN  
 SHEET: A3.0  
 TOTAL SHEETS: 3



Acub ENTERPRISE INC  
 10000 104th Ave NW  
 Suite 1000  
 Seattle, WA 98148  
 Phone: (206) 467-1000  
 Fax: (206) 467-1001  
 Website: www.acub.com

PROJECT: CARLING DEVELOPMENT  
 LOCATION: SEATTLE, WA  
 REFLECTED CEILING PLANS  
 DATE: 08/15/18  
 DRAWN BY: J. SMITH  
 CHECKED BY: M. JONES

LEGEND:  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]

REVISIONS:  
 NO. DATE BY DESCRIPTION

DATE: 08/15/18  
 SCALE: AS SHOWN  
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PROJECT: CARLING DEVELOPMENT  
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LEGEND:  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]  
 REFLECTED CEILING: [Pattern]

REVISIONS:  
 NO. DATE BY DESCRIPTION

DATE: 08/15/18  
 SCALE: AS SHOWN  
 SHEET: A3.0  
 TOTAL SHEETS: 3







**ATTACHMENT 2 : SITE SURVEY PLAN**



**TOPOGRAPHIC PLAN OF SURVEY OF  
LOT 3  
REGISTERED PLAN 267570  
CITY OF OTTAWA**  
Surveyed by Annis, O'Sullivan, Vollebakk Ltd.

Scale 1: 150  
0 1.5 3 4.5 6 7.5 9 10.5 12 13.5 15 Meters

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

**Surveyor's Certificate**  
I CERTIFY THAT:

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 1st day of February, 2021.

Richard F. Gauthier  
Ontario Licensed Surveyor

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

**Notes & Legend**

—○—	Survey Monument Planted
—●—	Survey Monument Found
—■—	Iron Bar
—□—	Round Iron Bar
(WIT)	Witness
Meas.	Measured
AOO	Annis, O'Sullivan, Vollebakk Ltd.
P1	Registered Plan 267570
P2	(1983) Plan dated August 10, 1989
P3	(1977) Plan dated August 6, 1985
P4	(AOS) Plan dated September 24, 1989
P5	(AOS) Plan dated July 31, 1991
P6	(AOS) Field Notes dated July 30, 1991
DT	Deciduous Tree
CT	Coniferous Tree
EH	Electric Hydrant
OH-S	Maintenance Hole (Storm Sewer)
OH-S	Maintenance Hole (Sanitary)
OH-T	Maintenance Hole (Bell Telephone)
OH-H	Maintenance Hole (Hydro)
OH-G	Maintenance Hole (Gas)
OH-U	Maintenance Hole (Undersified)
WC	Water Chamber (Watermain)
US	Underground Storm Sewer
US	Underground Sanitary Sewer
US	Underground Water Main
US	Underground Power
US	Underground Gas
US	Underground Traffic
OW	Overhead Wires
CB	Catch Basin
TM	Top of Grade
GM	Gas Meter
AS	Hydro Meter
BF	Board Fence
SWC	Concrete Sidewalk
SWC	Stone Retaining Wall
RWC	Retaining Wall (Concrete)
RM	Retaining Wall (Masonry)
UP	Utility Pole
AM	Anchor
LS	Light Standard
Ø	Diameter
EL	Location of Elevations
CC	Type of Concrete Curb and Retaining Wall Elevation
CL	Centreline
CL	Property Line

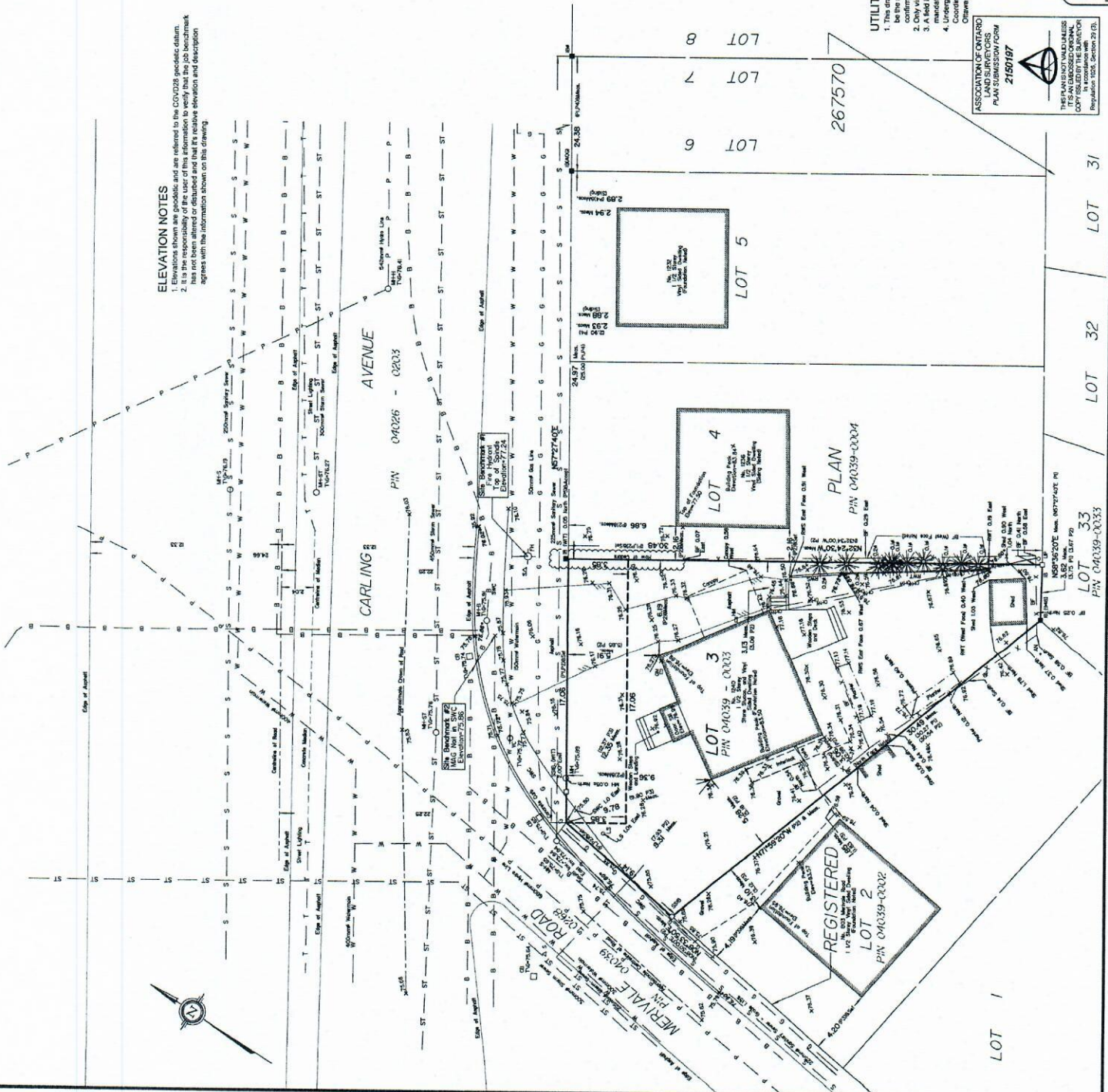
**UTILITY NOTES**

1. This drawing cannot be accepted as acknowledging all of the utilities and will be the responsibility of the user to contact the respective utility authorities for a complete utility survey.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating, etc.
4. Underground utility locations were derived from the City of Ottawa Utility Commission's Utility Catalogue (CUG) and other information derived from the City of Ottawa Department of Engineering and Works Plan 2658 Street C.

ASSOCIATION OF ONTARIO  
LAND SURVEYORS  
PLAN SUBMISSION FORM  
2150197

THIS PLAN IS NOT VALID UNLESS  
IT IS AN UNREVISED ORIGINAL  
COPY IN ACCORDANCE WITH  
REGULATION 1520, SECTION 29(1).

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.  
1400 Avenue, C/O 22E 758  
1400 Avenue, C/O 22E 758  
Phone: (613) 232-2222 Fax: (613) 232-2222  
E-mail: annis@annisov.com



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

**ATTACHMENT 3 : FIGURE 1 – ELEVATION CONTOURS**



**Figure 1: Elevation Contours**

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## **ATTACHMENT 4 : FUS FIRE FLOW CALCULATIONS**



## FUS Fire Flow Calculation - Long Method

Calculations based on: "Water Supply for Public Fire Protection" by Fire Underwriters' Survey, 2020

Stantec Project #: 163401084

Project Name: 1240 Carling Avenue

Date: May 8, 2023

Data inputted by: Hamidreza Mohabbat

Data reviewed by: Alexandre Mineault-Guitard M.A.Sc., ing., P.Eng.

Fire Flow Calculation #: 1

Building Type/Description/Name: Residential

Detached units.

Notes: Wood frame; 2 storeys more than 50% above grade. Gross floor area of 1,500 to 2,000 sqf. Not sprinklered.

Building setbacks per site plan (dated 2022/05/31).

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	Coefficient related to type of construction (C)	Framing Material						m	
			Type V - Wood Frame	1.5	Type V - Wood Frame	1.5				
			Type IV-A - Mass Timber	0.8						
			Type IV-B - Mass Timber	0.9						
			Type IV-C - Mass Timber	1						
			Type IV-D - Mass Timber	1.5						
			Type III - Ordinary construction	1						
			Type II - Non-combustible construction	0.8						
Type I - Fire resistive construction	0.6									
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Floor Space Area						Units	
			Single Family	0	Other (Comm, Ind, Apt etc.)	18				
			Townhouse - indicate # of units	0						
			Other (Comm, Ind, Apt etc.)	18						
2.2	# of Storeys	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade):	3	3				Storeys		
3	Enter Ground Floor Area of One Unit	Average Floor Area (A) based on total floor area of all floors for one unit (non-fire resistive construction):			279	279	Area in Square Metres (m <sup>2</sup> )			
		Square Metres (m <sup>2</sup> ):								
3.1	Obtain Total Effective Building Area	Total Effective Building Area (# of Storeys x # of Units (if single family or townhouse) x Average Floor Area):			837	837				
4	Obtain Required Fire Flow without Reductions	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						10,000		
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	8,500		
			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	None	0	N/A	0		
			None	0						
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	0		
			Water supply is not standard or N/A	0						
Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	0				
	Sprinkler not fully supervised or N/A	0								
5.3	Choose Presence of Sprinklers for Exposures within 30m	Sprinkler Conforms to NFPA13	Adequate sprinkler for exposures conforms to NFPA13		None for exposures		N/A	0		
			None for exposures							
		Water Supply	Water supply is standard for sprinkler and fire dept. hose line of exposures		Water supply is not standard or N/A for exposures	0	N/A			
			Water supply is not standard or N/A for exposures							
Sprinkler Supervision	Sprinkler system of exposures is fully supervised		Sprinkler not fully supervised or N/A for exposures		N/A					
	Sprinkler not fully supervised or N/A for exposures									
5.4	Choose Separation Distance Between Units	Exposure Distance Between Units	Front Yard (North Front)	30.1m or greater	0	0.65	m	5,525		
			Right Side (East Front)	3.1 to 10.0m	0.2					
			Rear Yard (South Front)	3.1 to 10.0m	0.2					
			Left Side (West Front)	0 to 3.0m	0.25					
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1,000 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 <sup>3</sup> )						2,520		

**ATTACHMENT 5 : OFM FIRE FLOW CALCULATIONS**

## Fire Flow Calculations as per the Ontario Building Code (OBC)



### OFM Fire Flow Calculation

Calculations based on Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code by the Office of the Fire Marshal (OFM 1999)

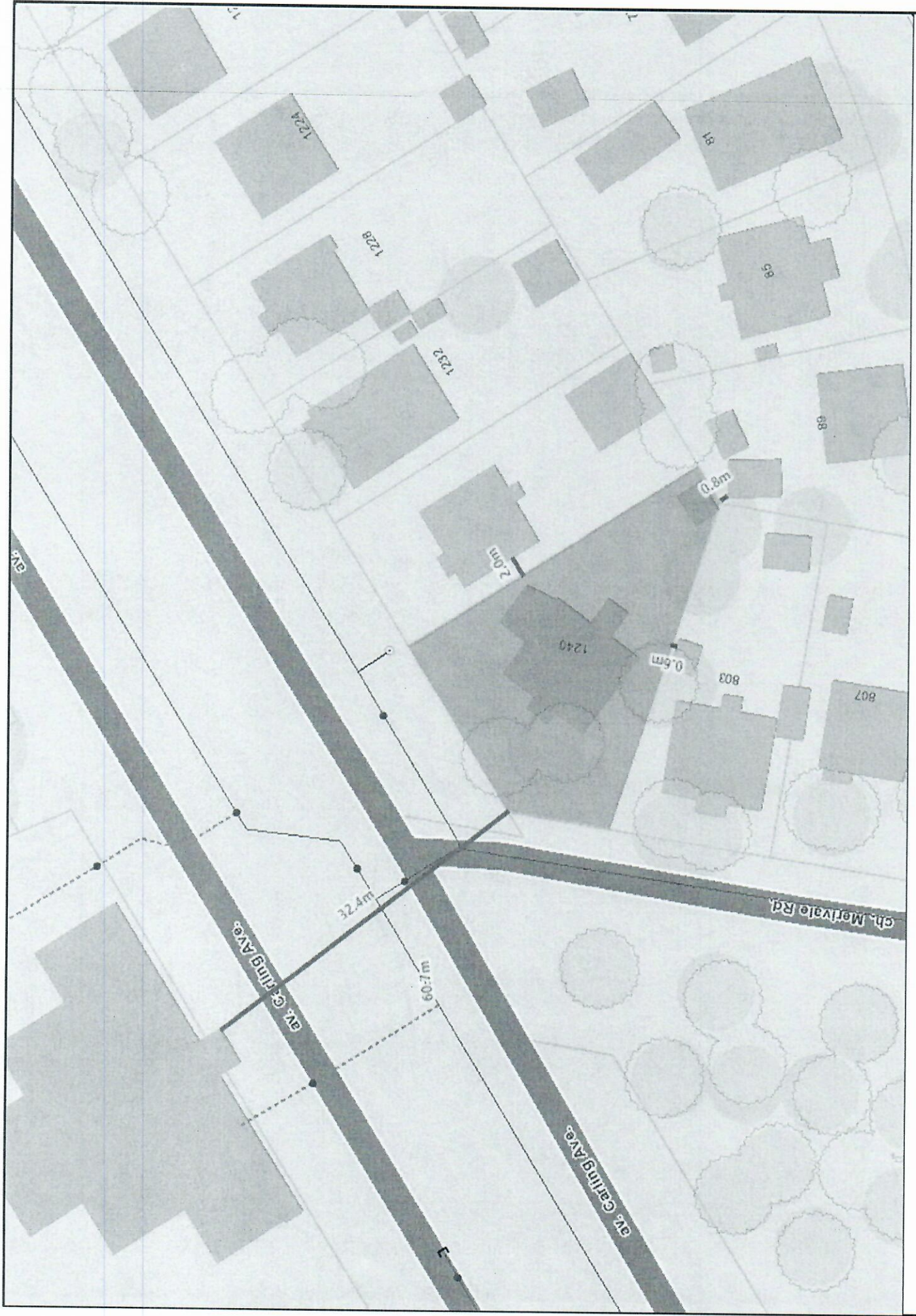
Stantec Project #: 163401084  
 Project Name: 1240 Carling Avenue  
 Date: June 5, 2023  
 Data inputted by: Alexandre Mineault-Guitard M.A.Sc., ing., P.Eng.  
 Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

Fire Flow Calculation #: 2  
 Building Type/Description/Name: Residential

Office of the Fire Marshal Determination of Required Fire Protection Water Supply											
Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit				
<b>1 General Building Details</b>											
1.1	Enter Number of Storeys	Number of Floors/Storeys in the Unit (incl. basement):			4	4	Storeys				
1.2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Type of Housing	Single Family	0	Other (Comm, Ind, Apt etc.)	18	Units				
			Townhouse - indicate # of units	0							
			Other (Comm, Ind, Apt etc.)	18							
1.3	Choose Presence of Sprinklers	Sprinklers?			None	None	N/A				
1.4	Choose Presence of Firewalls	Firewall separations?			None	None	N/A				
1.5	Choose Presence of Stand-Pipe System	Stand-pipe system?			None	None	N/A				
<b>2 Determining Water Supply Coefficient K</b>											
2.1	Choose Type of Construction	Type of Construction	Non-combustible construction + fire separations + fire-resistance ratings in accordance with Section 3.2.2.2 of OBC	Type I	Type IV	N/A	N/A				
			Non-combustible construction + fire separations + no fire-resistance rating	Type II							
			Combustible construction + fire separations + fire-resistance ratings in accordance with Section 3.2.2.2 of OBC	Type III							
			Combustible construction + fire separations + no fire-resistance rating	Type IV							
			<b>Building Classification</b>								
2.2	Choose Classification	Occupancy Classification (OBC)	A-2, B-1, B-2, B-3, C, D	23	C	A-2, B-1, B-2, B-3, C, D	N/A				
			A-4, F-3	28							
			A-1, A-3	32							
			E, F-2	39							
			F-1	53							
2.3	Water Supply Coefficient (K)	Water Supply Coefficient K			23	23	N/A				
<b>3 Determining Building Volume V</b>											
3.1	Enter Ground Floor Area of One Unit	<b>Floor Space Area</b>									
		Average Floor Area (A):			257	257	Area in Square Meters (m <sup>2</sup> )				
3.2	Building Height (h)	<b>Building Height</b>									
		Bottom Elevation:			61.4	15.2	Height in Meters (m)				
					Meters (m)						
		Top Elevation:			76.6						
			Meters (m)								
3.3	Building Volume (V)	Building Volume V = A * h			3,910	3,910	Volume in Meters Cube (m <sup>3</sup> )				
<b>4 Determining Spatial Coefficient S</b>											
4.1	Choose Exposure Distances from Building to Property Line	Exposure Distance from Building to Property Line in Meters (m)	North Side		0.50	2.00	Distance in Meters (m)				
			Property Line to Street Centreline (Street Facing)	1.2							
			Total Exposure Distance	3.8							
			East Side					0.50	2.00		
			Property Line to Street Centreline (Street Facing)	1.2							
			Total Exposure Distance	0							
			South Side							0.50	2.00
			Property Line to Street Centreline (Street Facing)	1.2							
			Total Exposure Distance	0							
			West Side								
Property Line to Street Centreline (Street Facing)	1.2										
Total Exposure Distance	0										
Total Exposure Distance	1.2										
4.2	Total Spatial Coefficient	Total Spatial Coefficient $S_{\text{tot}} = 1 + \sum S_x$			2.00	2.00	N/A				
<b>5 Determining Required Minimum Supply of Water Q and Fire Flow</b>											
5.1	Obtain Required Fire Volume, Flow & Duration	Minimum Supply of Water, rounded to nearest 1,000 L; $Q = K^*V^*S_{\text{tot}}$				180,000 L					
		Required Minimum Water Supply Flow Rate (L/min)				5,400 L/min					
		Required Minimum Water Supply Flow Rate (L/s)				90 L/s					
		Required Minimum Duration of Fire Flow (min)				40 min					

**ATTACHMENT 6 : FIGURE 2 – FUS EXPOSURE DISTANCES**

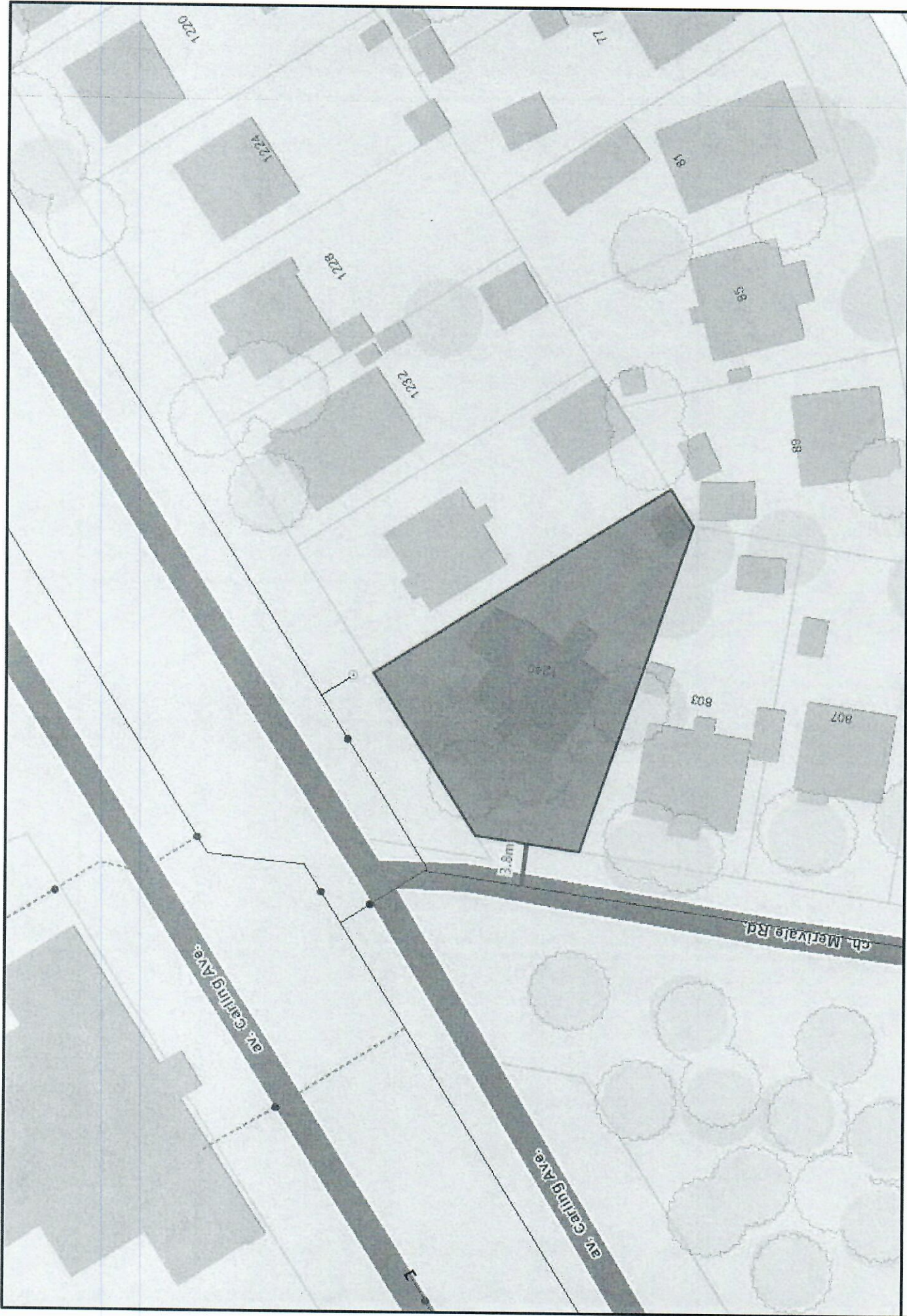




**Figure 2: FUS Exposure Distances (Property Line to Adjacent Buildings)**

Source: geoOttawa 2023; Contains information licensed under the Open Government Licence – City of Ottawa.

**ATTACHMENT 7 : FIGURE 3 – OFM EXPOSURE DISTANCES**



**Figure 3: OFM Exposure Distances (Property Line to Street)**

Source: geoOttawa 2023; Contains information licensed under the Open Government Licence – City of Ottawa.

**ATTACHMENT 8 : WATER BOUNDARY CONDITIONS**

## Mineault-Guitard, Alexandre

---

**From:** TL MaK <tlmakecl@bellnet.ca>  
**Sent:** Monday, June 5, 2023 12:19 PM  
**To:** Mineault-Guitard, Alexandre  
**Cc:** Alemany, Kevin  
**Subject:** RE: 1240 Carling Avenue - Water Boudary Conditions Request  
**Attachments:** 1240 Carling Avenue May 2023.pdf

Hi Alex,

Attached please find the City's water boundary conditions for your calculations received on June 1, 2023.

Thank You,

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

---

**From:** Cassidy, Tyler [mailto:tyler.cassidy@ottawa.ca]  
**Sent:** June 1, 2023 3:00 PM  
**To:** TL MaK  
**Cc:** 'Kayla Blakely'; 'Robert Haslett'  
**Subject:** RE: 1240 Carling Avenue - Water Boudary Conditions Request

Hi Tony,

Please see the boundary conditions below for the proposed development at 1240 Carling Avenue. Note that there are constraints on fire flow availability in the area.

The following are boundary conditions, HGL, for hydraulic analysis at 1240 Carling Avenue (zone 2W2C) with assumed to be connected to the 152 mm watermain on Carlin Avenue OR the 305 mm on Merivale Road (see attached PDF for location).

Both Connections:

Minimum HGL: 124.4 m

Maximum HGL: 132.8 m

Fire Flow:

Max Day + Fire Flow (233.3 L/s): 102.9 m (Merivale Connection)

Available fire flow at 20 psi: 155 L/s, assuming ground elevation of 75.9 m (Carling Connection)

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.*

**Tyler Cassidy, P.Eng**

Infrastructure Project Manager,  
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch  
City of Ottawa | Ville d'Ottawa  
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1  
613.580.2424 ext./poste 12977, [Tyler.Cassidy@ottawa.ca](mailto:Tyler.Cassidy@ottawa.ca)

---

**From:** TL MaK <[tlmakecl@bellnet.ca](mailto:tlmakecl@bellnet.ca)>

**Sent:** June 01, 2023 1:44 PM

**To:** Cassidy, Tyler <[tyler.cassidy@ottawa.ca](mailto:tyler.cassidy@ottawa.ca)>

**Cc:** Fawzi, Mohammed <[mohammed.fawzi@ottawa.ca](mailto:mohammed.fawzi@ottawa.ca)>; 'Kayla Blakely' <[k.blakely@novatech-eng.com](mailto:k.blakely@novatech-eng.com)>; 'Robert Haslett' <[rob@haslettconstruction.com](mailto:rob@haslettconstruction.com)>

**Subject:** RE: 1240 Carling Avenue - Water Boudary Conditions Request

**CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.**

**ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.**

Hi Tyler,

We are following-up on our water boundary request of May 8, 2023, could you please update us in regards to the status of this request. Sorry for the bother, we've been waiting for over 3 weeks from the City on this request as we are trying to complete our servicing report for next week.

Please forward us this information ASAP so that we can proceed with our work on this report. Thank you for your prompt attention to this matter.

Let us know if you have any questions or comments.

Regards,

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](mailto:tlmakecl@bellnet.ca)

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**From:** Cassidy, Tyler [<mailto:tyler.cassidy@ottawa.ca>]

**Sent:** May 8, 2023 2:54 PM

**To:** TL MaK  
**Cc:** Fawzi, Mohammed  
**Subject:** RE: 1240 Carling Avenue - Water Boudary Conditions Request

Hi Tony,

I've submitted your boundary condition request to our Water Resources group. Please allow up to 10 business days for results to be provided.

Thank you,

**Tyler Cassidy, P.Eng**  
Infrastructure Project Manager,  
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch  
City of Ottawa | Ville d'Ottawa  
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1  
613.580.2424 ext./poste 12977, [Tyler.Cassidy@ottawa.ca](mailto:Tyler.Cassidy@ottawa.ca)

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**From:** TL MaK <[tlmakecl@bellnet.ca](mailto:tlmakecl@bellnet.ca)>  
**Sent:** May 08, 2023 1:34 PM  
**To:** Cassidy, Tyler <[tyler.cassidy@ottawa.ca](mailto:tyler.cassidy@ottawa.ca)>  
**Cc:** Fawzi, Mohammed <[mohammed.fawzi@ottawa.ca](mailto:mohammed.fawzi@ottawa.ca)>  
**Subject:** 1240 Carling Avenue - Water Boudary Conditions Request

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Hi Tyler,

Regarding this site, we are requesting for water boundary conditions from the City of Ottawa to be provided for our hydraulic analysis. The particulars are as follows:

The proposed building located within Pressure Zone 2W at 1240 Carling Avenue is a 3-storey residential building. The building contains eighteen (18) residential units, namely two (2) studios/bachelor, fourteen (14) 1-bedroom units, and two (2) 2-bedroom units. Three (3) 1-bedroom units will be constructed at basement level. Each floor covers an area of approximately 256 m<sup>2</sup>, for a total gross floor area of approximately 1,027 m<sup>2</sup>, including the residential units located at basement level. The building is serviced by the 305mm watermain along Merivale Road or the 152mm watermain along Carling Avenue.

The domestic demands were calculated using the City of Ottawa's Water Design Guidelines. For residential units, a consumption rate of 280 L/cap/d was used to estimate average day demands (AVDY). Maximum day (MXDY) demands were calculated by multiplying AVDY demands by a factor of 2.5. Peak hour (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.

**Table 1: Estimated Domestic Demand**

Unit Type	Unit Count	PPU	Consumption	AVDY		MXDY		PKHR	
				L/d	L/s	L/d	L/s	L/d	L/s
Apartment, Bachelor	2	1.4	280	784	0.01	1,960	0.02	4,312	0.05

Apartment, 1-Bedroom	14	1.4	280	5,488	0.06	13,720	0.16	30,184	0.35
Apartment, 2-Bedroom	2	2.1	280	1,176	0.01	2,940	0.03	6,468	0.07
<b>Total</b>	<b>18</b>			<b>7,448</b>	<b>0.09</b>	<b>18,620</b>	<b>0.22</b>	<b>40,964</b>	<b>0.47</b>

The fire flow requirement was determined following the Fire Underwriter Survey (FUS) method and is provided in the attached worksheet. For this analysis, the building was classified as wood frame construction, with building contents that are limited in combustibility. It is understood that the building will not have a sprinkler system. The resulting total required fire flow (RFF) is 14,000 L/min (233 L/s) for a duration of 3 hours.

In summary:

- AVDY = 7,448 L/d (0.09 L/s);
- MXDY = 18,620 L/d (0.22 L/s);
- PKHR = 40,964 L/d (0.47 L/s); and,
- Fire Flow = 14,000 L/min (233 L/s).

The City is requested to provide boundary conditions for the Average Day, Maximum Day, Peak Hour and Fire Flow conditions indicated above.

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

Have a good day.

Regards,

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](mailto:tlmakecl@bellnet.ca)

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**Boundary Conditions for 1240 Carling Avenue**



Carling Connection

Merivale Connection

**Legend**

— Public

— Private

**ATTACHMENT 9 : SUPPORTING HYDRAULIC CALCULATIONS**



### Supporting Hydraulic Calculations

Stantec Project #: 163401084

Project Name: 1240 Carling Avenue

Date: June 5, 2023

Data inputted by: Alexandre Mineault-Guitard M.A.Sc., ing., P.Eng.

Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

#### Boundary Conditions provided by the City:

Scenario 1: Peak Hour (Min HGL): 124.4 m;

Scenario 2: Average Day (Max HGL): 132.8 m; and

Scenario 3: Maximum Day plus Fire Flow: 102.9 m.

#### Sample Calculations

$$HGL (m) = hp + hz \quad (1)$$

where: hp = Pressure Head (m); and hz = Elevation Head (m), estimated from topography.

For Scenario 1, we have:

$$HGL(m) = 124.4 \text{ and } hz (m) = 75.9.$$

Rearranging Equation 1, we can calculate the Pressure Head (hp) as follow:

$$hp (m) = HGL - hz$$

$$\therefore hp = 124.4 - 75.9 \text{ m} = 48.5 \text{ m}.$$

To convert from Pressure Head (m) to a pressure value (kPa), the following equation can be used:

$$P (kPa) = (\rho * g * hp) / 1000 \quad (2)$$

where:  $\rho$  = density of water = 1000 kg/m<sup>3</sup>; and g = gravitational acceleration = 9.81 m/s<sup>2</sup>.

Using Equation 2, we can calculate the Pressure Head (hp) as follow:

$$P (kPa) = (1000 * 9.81 * 48.5) / 1000$$

$$\therefore P = 475 \text{ kPa}.$$

Considering that 1 kPa = 0.145 psi, the pressure under Scenario 1 is equal to:

$$P = 69 \text{ psi}.$$

Applying the same procedures, the pressures under Scenario 2 and Scenario 3 are calculated as follows:

Scenario 2: P = 81 psi; and Scenario 3: P = 38 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 475 kPa (69 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 558 kPa (81 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 265 kPa (38 psi)



### Supporting Hydraulic Calculations

Stantec Project #: 163401084

Project Name: 1240 Carling Avenue

Date: June 5, 2023

Data inputted by: Alexandre Mineault-Guitard M.A.Sc., ing., P.Eng.

Data reviewed by: Kevin Alemany, M.A.Sc., P.Eng.

#### Boundary Conditions provided by the City:

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#### Sample Calculations

$$HGL (m) = hp + hz \quad (1)$$

where: hp = Pressure Head (m); and hz = Elevation Head (m), estimated from topography.

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$$HGL(m) = 124.4 \text{ and } hz (m) = 75.9.$$

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$$P (kPa) = (\rho * g * hp) / 1000 \quad (2)$$

where:  $\rho$  = density of water = 1000 kg/m<sup>3</sup>; and g = gravitational acceleration = 9.81 m/s<sup>2</sup>.

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Considering that 1 kPa = 0.145 psi, the pressure under Scenario 1 is equal to:

$$P = 69 \text{ psi}.$$

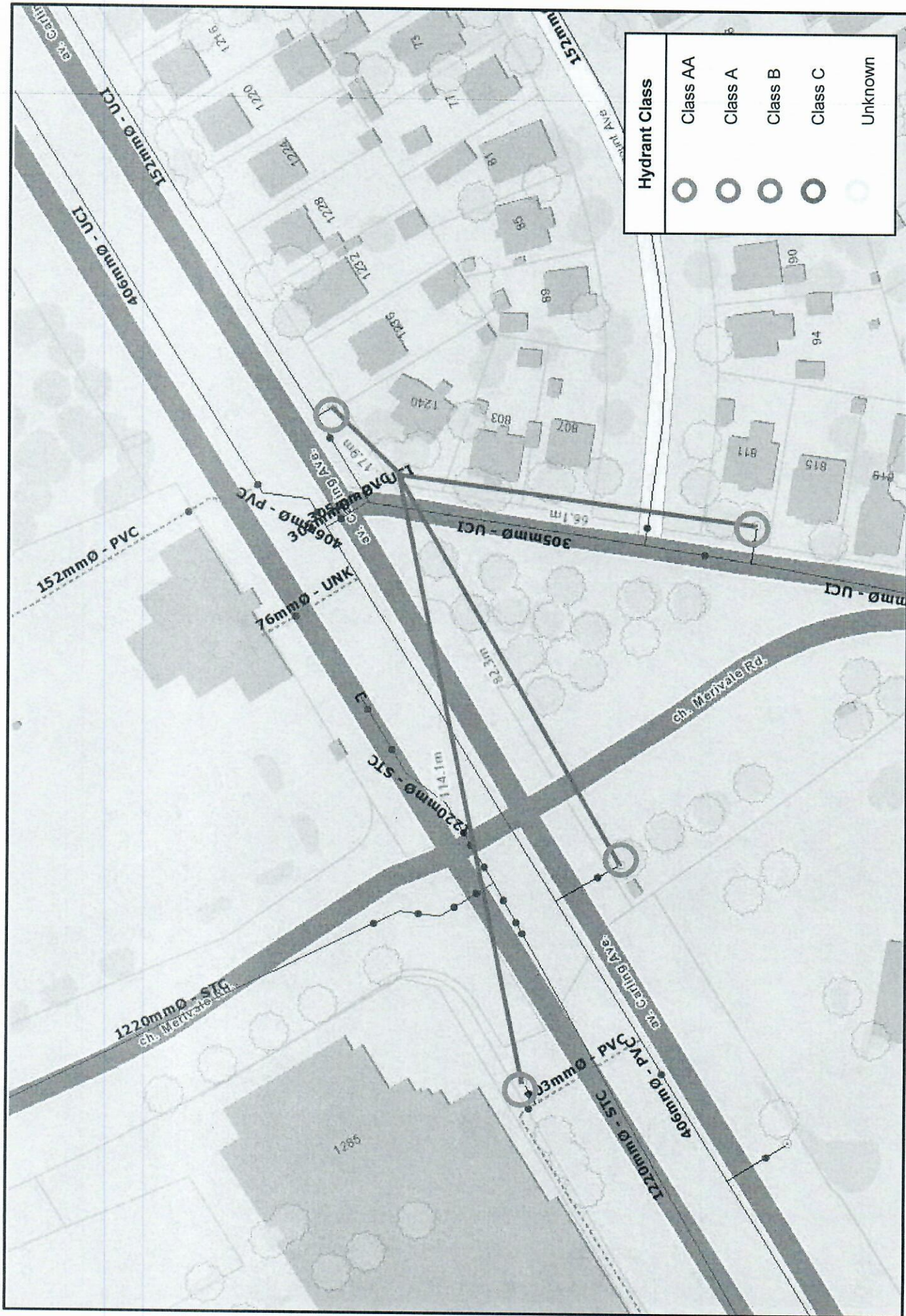
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Scenario 2: P = 81 psi; and Scenario 3: P = 38 psi.

To summarize:

Scenario 1: Minimum Pressure under Peak Hour Demand: 475 kPa (69 psi)
Scenario 2: Maximum Pressure under Average Day Demand: 558 kPa (81 psi)
Scenario 3: Minimum Pressure under Maximum Day + Fire Flow Demand: 265 kPa (38 psi)

**ATTACHMENT 10 : FIGURE 4 – HYDRANT SPACING**



**Figure 4: Hydrant Spacing**

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**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX E**

**SANITARY SEWER DESIGN SHEET**

**SHEET No. 1 OF 1**





**PROPOSED THREE STOREY RESIDENTIAL APARTMENT BUILDING SITE**

**LOT 3 (R-PLAN 287570)**

**1240 CARLING AVENUE**

**CITY OF OTTAWA**

**APPENDIX F**

**DEVELOPMENT SERVICING STUDY CHECKLIST SUMMARY**

## Servicing study guidelines for development applications

### 4. Development Servicing Study Checklist

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

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

#### 4.1 General Content

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible 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 feeder mains, 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