



Assessment of Adequacy of Public Services Report

1657 - 1673 Carling Ave, Ottawa, ON

Prepared for:

Inside Edge Properties

464 Bank St, Suite 200
Ottawa, ON K2P 1Z3

Attention: Jordan Bianconi

LRL File No.: 220449

July 3, 2024
Revised: May 27, 2025



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1 INTRODUCTION AND SITE DESCRIPTION

LRL Engineering Ltd. was retained by Inside Edge Properties to prepare a functional serviceability report to support Zoning Bylaw Amendment of the property located at 1657 - 1673 Carling Avenue within the City of Ottawa. The applicant is submitting a Zoning By-law Amendment in order to establish site-specific building height and setback provisions to permit the establishment of a 28-storey (86m) high-rise residential apartment building with ground floor commercial uses. The building will be supported by external and below-grade vehicle and bicycle parking.

The subject site is within the Kitchissippi ward, located on the northwest side of Carling Avenue, and has an approximate area of **0.36 ha**. The property is extended and encompasses 386 Tillbury Avenue, located northwest of 1657 – 1673 Carling Avenue and has an approximate area of **0.02 ha**. The properties are currently zoned AM10. The site at 1657 - 1673 Carling Ave consists of a 2-storey commercial building occupying a majority of the south half of the site. The balance of the site consists of a paved parking lot, driveway, and small grassed areas. The site at 386 Tillbury Avenue consists of residential 2 storey building.

The collective subject site can be seen below in Figure 1.



Sewer and watermain mapping, along with as-built information collected from the City of Ottawa indicate the following existing infrastructure located within the adjacent rights-of-way:

Carling Avenue:

- 300mmØ Concrete Sanitary Sewer
- 610mmØ PVC Watermain
- 225mmØ – 375mmØ Concrete Storm Sewer

Tillbury Avenue:

- 225mmØ Concrete Sanitary Sewer
- 305mmØ PVC Watermain
- 450mmØ Concrete Storm Sewer unopened

3 CONCEPT DEVELOPMENT

The intention of this serviceability report is to review the existing conditions of municipal services & infrastructure to determine the servicing feasibility of a high-density residential/commercial mixed development within the subject property. The contemplated development includes 28 multi-storey high-rise apartment building with surface and underground parking, with access from Carling Avenue and Tillbury Avenue.

The contemplated buildings transition down from 28 storeys at the south portion (bordered by Carling Avenue) to 9 storeys to 6 storeys and 4 storeys. The development contemplates a mixed-use floor area with retail and residential units. The following is a contemplated breakdown of the floor space:

Table 1: Conceptual Total Floor Area

	Building Area (m ²)
Retail (4 Units)	360.78
Residential (370 Units)	23 152.50
Total	23 513.28

Refer to the Site Plan SP-01 prepared by Project1 Studio Planning & Design included in **Appendix A**.

4 WATER SUPPLY SERVICING

The subject property lies within the City of Ottawa 1W water distribution network pressure zone. There are currently two existing watermains within servicing range of the site; a 610 mm PVC pipe located on Carling Ave, and a 305 mm PVC pipe located on Tillbury Avenue. There are currently seven (7) existing fire hydrants within a 300m proximity of the subject property. Refer to **Appendix B** for the water pressure zone map and location of fire hydrants.

According to the City of Ottawa Water Distribution Guidelines (Technical Bulletin ISDTB-2014-02), as the subject site is anticipated to house more than 50 residential units, it is required to be



served by two water service laterals, separated by an isolation valve, for redundancy and to avoid creation of a vulnerable service area. Hence, the contemplated development is anticipated to be serviced via two services connected to either the existing 200mm watermain within Carling Avenue or the existing 305mm watermain located on Tillbury Avenue. The service laterals are to be looped inside the building in coordination with the mechanical engineer at detailed design stage. Shall pressure concerns in the network be determined during the detailed design phase, the option to connect to the high pressure 610 mm diameter watermain could be explored further with approval from the City of Ottawa's Water department.

Table 2, included below, summarizes the City of Ottawa Design Guidelines design parameters in the preparation of the water demand estimate.

Table 2: City of Ottawa Design Guidelines - Water Design Parameters

Design Parameter	Value
Residential Bachelor / 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 3 Bedroom Apartment	3.1 P/unit
Commercial Average Daily Demand	2.8 L/m ² /d
Average Daily Demand	280 L/d/per
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Desired operating pressure range during normal operating conditions	345 kPa (50psi) to 552 kPa (80psi)
During normal operating conditions pressure must not drop below	275 kPa (40psi)
During normal operating conditions pressure shall not exceed	552 kPa
During fire flow operating conditions pressure must not drop below	140 kPa (20psi)
*Table updated to reflect technical Bulletin ISDTB-2018-02	

4.1 Residential Water Demands

Anticipated population demands have been interpreted from the Site Plan SP-02 provided by Project1 Studio Inc. The contemplated development is anticipated to include **370** residential units, which translates to a population of **616** as per the City of Ottawa Water Distribution Design Guidelines. Table 3 below summarizes the proposed population count as interpreted using Table 4.1 of the *City of Ottawa Water Distribution Design Guidelines*.

Table 3: Development Residential Population Estimate

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom Apartment / Studio	1.4	230	322
2 Bedroom Apartment	2.1	140	294
		Total	616

The required water supply requirements for the residential units in the proposed subdivision have been calculated using the following formula:



$$Q = (q \times P \times M)$$

Where:

q = average water consumption (L/capita/day)

P = design population (capita)

M = Peak factor

With reference to *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines*, using an average water consumption rate of 280 L/c/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 2.5 and 2.2, respectively, anticipated demands were calculated as follows:

- Average daily domestic water demand is **2.13** L/s,
- Maximum daily demand is **5.33** L/s, and
- Maximum hourly demand is **11.73** L/s.

4.2 Commercial Water Demands

As previously mentioned, the concept plan indicates that a portion of the floor area will be dedicated to commercial space. As per Site Plan SP-02, this commercial space would work out to a GFA of approximately **400 m²**.

The required water supply requirements for the commercial space within the proposed subdivision have been calculated using the following formula:

Where:

$$Q = (q \times A \times M)$$

q = average water consumption (L/m²/day)

A = commercial area (m²)

M = Peak factor

With reference to *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines* and *technical bulletin ISTB-18-02*, using an average water consumption rate of 2.5 L/m²/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 1.5 and 1.8, respectively, anticipated commercial demands were calculated as follows:

- Average daily domestic water demand is **0.012** L/s,
- Maximum daily demand is **0.017** L/s, and
- Maximum hourly demand is **0.031** L/s.



4.3 Total Water Demands

Based on calculated residential and commercial demands for the concept development, the total anticipated water demands are as follows.

- Average daily domestic water demand is **2.13 L/s**,
- Maximum daily demand is **5.19 L/s**, and
- Maximum hourly demand is **11.34 L/s**.

For greater detail on Water Demand Calculations, please refer to **Appendix C**.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in **Appendix D**. It was requested that hydraulic analysis be performed for Tillbury Avenue given we have not progressed into the details design required for the Site Plan Application. The boundary conditions are summarized in table 4 below (Table 4).

Table 4: Summary of Boundary Conditions

Water Pressure on Tillbury Ave			
HGL (m)		Pressure	
		kPa	Psi
Minimum =	108.2	297.24	43.11
Maximum =	114.9	362.97	52.64

As shown in Table 4, the pressures required for domestic water and fire demand requirements are above the minimum requirements specified in Table 2, in accordance with the City of Ottawa Design Guidelines.

Refer to **Appendix D** for Boundary Conditions.

4.4 Fire Protection

The estimated fire flow for the proposed building was calculated in accordance with *ISTB-2018-02*. The following parameters were assumed by Project1 Studio:

- Type of construction – Fire resistive construction > 2 hrs
- Occupancy type – Limited combustibility; and
- Sprinkler protection – Automatic Fully Supervised Sprinkler System

Based on the following parameters, it was calculated that the required fire flow for the contemplated building floor plan and layout is **9,000 L/min (150 L/s)**.

Through discussion & correspondence with the City of Ottawa asset management department, it was confirmed that, a fire flow of 165 L/s from the Tillbury Avenue watermain is available with the



addition of a new hydrant located within 75m of the property. Fire flow demands from the current concept building can be satisfied by tying to the 150mm Tillbury watermain with a dual connection and installing a new additional Hydrant on Tillbury within 75m of the property.
Refer to **Appendix D** for Boundary Conditions.

As for aggregate flow available for fire fighting services, there are two (2) existing fire hydrants and one new fire hydrant that will be required near the contemplated buildings that are available to provide the maximum required fire flow demands of **9,000 L/min (150L/s)**.
Refer to **Appendix D** for fire hydrant locations.

Table 5 below summarizes the aggregate fire flow of the contributing hydrants near the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.

Table 5: Fire Protection Summary Table

	Max. Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Fire Hydrant(s) within 150m	Fire Hydrant(s) within 300m	Available Combined Fire Flow (L/min)
Contemplated Development	9,000	1	2	0	(1 x 5,678) + (2 x 3,785) = 13,248

The total available fire flow from contributing hydrants is equal to **13,248 L/min** which is sufficient to provide adequate fire flow for the proposed development for fire fighting purposes. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

5 SANITARY SERVICE

There are two existing municipal sanitary sewers from which the contemplated development can tie into. The first municipal sanitary sewer is a 300mm concrete sanitary sewer located on Carling Avenue parallel to the southern property line of the subject site. The other sanitary sewer is a 225mm concrete sanitary sewer located on Tillbury Avenue which runs parallel to the northwest property line of 386 Tillbury Avenue.

The total anticipated post development total flow was calculated to be is **6.68 L/s** because of proposed residential population, commercial use and a small portion of infiltration. Refer to **Appendix E** for further information on the calculated sanitary flows.

As per preliminary correspondence with the City of Ottawa, the Tillbury Ave and Carling Ave sanitary sewers do have adequate capacity to accommodate the proposed development. It is still strongly recommended that the sanitary capacity determined during detailed design is to again be reviewed with the City of Ottawa to ensure the existing the City sanitary sewer has adequate capacity for the proposed sanitary flows. A conceptual servicing plan has been prepared which connects the sanitary service to the sewer located within Carling avenue.



6 STORMWATER MANAGEMENT

6.1 Existing Stormwater Infrastructure

There are three existing municipal storm sewers nearby the subject property. Two of them are located on Carling Avenue and one on Tillbury Avenue. The ones on Carling Avenue consists of a 225mm concrete storm sewer which is closer to the subject property and a 375mm storm sewer. The storm sewer located on Tillbury Avenue consists of a 450mm concrete pipe.

As-builts of the private storm network on the current site are not available; however, it is assumed that any collection and conveyance of stormwater in the underground sewers on site is directed to Carling Avenue storm sewers.

6.2 Design Criteria

The stormwater management criteria for this development are based on the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Planning and Design Manual, 2003 (SWMPD Manual).

The stormwater management are expected to have to meet the following stormwater design criteria;

- Meet an allowable release rate based on the pre-development Rational Method Coefficient or a maximum of 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a calculated time of concentration equal to or greater than 10 minutes;
- Attenuate all storms up to and including the City of Ottawa 100-year storm event on site, and control the 100-year storm event flow to the 2-year storm event pre-development release rate;
- Provide enhanced quality treatment (80% TSS removal) prior to release from site. Further consultation with the local conservation authority would confirm this; and
- During detailed design, the stormwater system will be designed following the principles of dual drainage, making accommodations for both major and minor flow.

6.3 Proposed Stormwater Management System

The contemplated development is anticipated to outlet to the existing 225mm municipal storm sewer located on Carling Avenue; mimicking the current assumed outlet location. It is anticipated that area drains on the surface parking lot along with roof drains on building rooftops will be utilised to collect and direct runoff to a control point on-site, prior to being released to the Carling Avenue storm sewer.



Currently, a private storm sewer connecting to Carling Avenue is present within the developable parcel. To meet pre-development stormwater conditions, post-development drainage will continue to be directed towards Carling Avenue. However, since part of the proposed development extends to a parcel of land on Tilbury Avenue, and the storm sewers there are at a lower elevation, any hydraulic grade line (HGL) concerns along Carling Avenue may require further investigation of a potential connection to Tilbury Avenue during the detailed design phase.

Based on stormwater objectives for the subject site, the allowable release rate for the contemplated development is $\pm 41.74 \text{ L/s}$ for all storms up to and including the 100-year storms. To meet the stormwater objectives, the contemplated development may contain a combination of roof top flow attenuation along with surface and subsurface storage.

According to the Geotechnical Investigation Report prepared by Paterson Group (dated December 6, 2024), it is anticipated that the perimeter and underslab drainage systems will collect up to 2.9L/s, which will be discharged to the building's sump pit and further discharge into infrastructure in the street. The overall allowable release rate that discharges into the infrastructure shall consider the flow expected from the perimeter and underslab drainage system.

Table 6 below summarizes assumed post-development drainage areas based on the *Site Plan*. Calculations can be seen in **Appendix F**.

Table 6: Post-Development Estimated Areas & Runoff Coefficients

Watershed	C=0.2 Pervious Area (ha)	C=0.9 Building Area/Asphalt (ha)	Total Area (ha)	Weighted Runoff Coefficient
Uncontrolled Areas	0.030	0.020	0.050	0.48
Controlled Areas	0.000	0.341	0.341	0.90
TOTAL	0.292	0.906	0.391	0.73

Table 7, below, summarizes post-development flow rates. The following storage requirement estimate conservatively assumes that approximately 12.8% of the development area will be directed to the outlet without flow attenuation. These areas will be compensated for in areas with flow attenuation controls.

Table 7: Summary of Post-Development Flow Rates

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m3)
Uncontrolled Areas	0.317	82.94	0
Controlled Areas	0.881	90.56	245.84



TOTAL	1.198	173.50	245.84
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It is anticipated that approximately **109.06 m³** of storage will be required on site to attenuate flow to the established release rate of **±26.50 L/s** in the 100-year storm; storage calculations are contained within **Appendix F**. It is anticipated that the contemplated development will achieve required storage via a combination of roof top flow attenuation along with surface and subsurface storage. Actual storage volumes will need to be confirmed at the detailed design stage based on a number of factors, including grading constraints and finalized site layout.

As per preliminary correspondence with the City, based on the concept stormwater management calculations provided, the storm sewer along Tillbury Ave does not have sufficient capacity to accommodate site runoff, and there is concern the storm sewer along Carling Ave may have low level of service. The Carling storm sewer capacity would need to be reviewed with the City of Ottawa during detailed design stage to ensure the existing the City storm sewer(s) has adequate capacity for the proposed release rate, and if not, provide the necessary constraint (i.e. maximum allowable release/flow rate) to design site stormwater management accordingly.

6.4 Quality Control

It is anticipated that the contemplated development would utilize an Oil/Grit Separator (OGS) to achieve the required 80% TSS removal treatment as specified by Rideau Valley Conservation Authority. The OGS would be required to treat all contaminated runoff collected in the surface parking lot before runoff is discharged into municipal storm sewer.

7 CONCLUSION

This evaluation is limited to assessing the serviceability of the site described within this document to support an Official Plan Amendment and Zoning By-law Amendment.

Based on the Site Plan *SP-01* provided by Project 1, included to **Appendix C**, the following conclusions, in relation to the serviceability of the site, can be made:

- **Water:**
 - The contemplated development is anticipated to be serviced via dual connections to the existing 152mm watermain within Tillbury Avenue.
 - Domestic demands from the proposed concept subdivision are expected to be in the range of **2.13 L/s** for the Average daily demand, **5.19 L/s** for the maximum daily and **11.34 L/s** for maximum hourly.
 - The maximum required fire flow was calculated at **9,000 L/min (150 L/s)** using the FUS method.
 - In order to operate municipal water services at 20psi, fire flows of **165 L/s** were available on Tillbury watermain with the addition of 1 new hydrant within 75m.
 - There are currently two existing fire hydrants available to support firefighting efforts for the proposed development. To meet the required fire flow of 165 L/s, an



additional hydrant is proposed to be installed on Tillbury Avenue. Hydrants within $\pm 150\text{m}$ will provide a combined fire flow of **13,248 L/min** to the site.

- **Sanitary:**

- The post development total sanitary effluent was calculated to be is **6.68 L/s** considering proposed residential & commercial population and a small portion of infiltration.
- It is anticipated to service the contemplated development via a 200 mm diameter sanitary service lateral to be connected to either the existing 300mm sanitary sewer within Carling Avenue or 225mm sanitary sewer within Tillbury Avenue. As per correspondence with the City of Ottawa, both Carling and Tillbury sanitary sewers have adequate capacity to support concept design sanitary flows.

- **Stormwater:**

- It is anticipated that an OGS will be installed to treat all contaminated runoff to an enhanced quality treatment level (80% TSS removal).
- As per correspondence with the City of Ottawa, the Tillbury storm sewer does not have adequate capacity to support stormwater runoff from the concept site, and the Carling storm sewer could potentially have a low level of service. In order to be able to tie the site stormwater outlet to the Carling storm sewer, the City will need to be consulted to review existing site conditions and ensure the existing storm sewer has adequate capacity for the proposed release rate. If not, the City will need to establish a maximum allowable stormwater release rate for the site, to which site stormwater management quantity control will be designed to.

Shall the concept plan change in relation to the number of units, building footprint, or impervious area of the site, the conclusions above would no longer be appropriate. During the detailed design stage of this development, the storm, sanitary and water servicing details will be further defined and confirmed.

Prepared by:

LRL Associates Ltd.



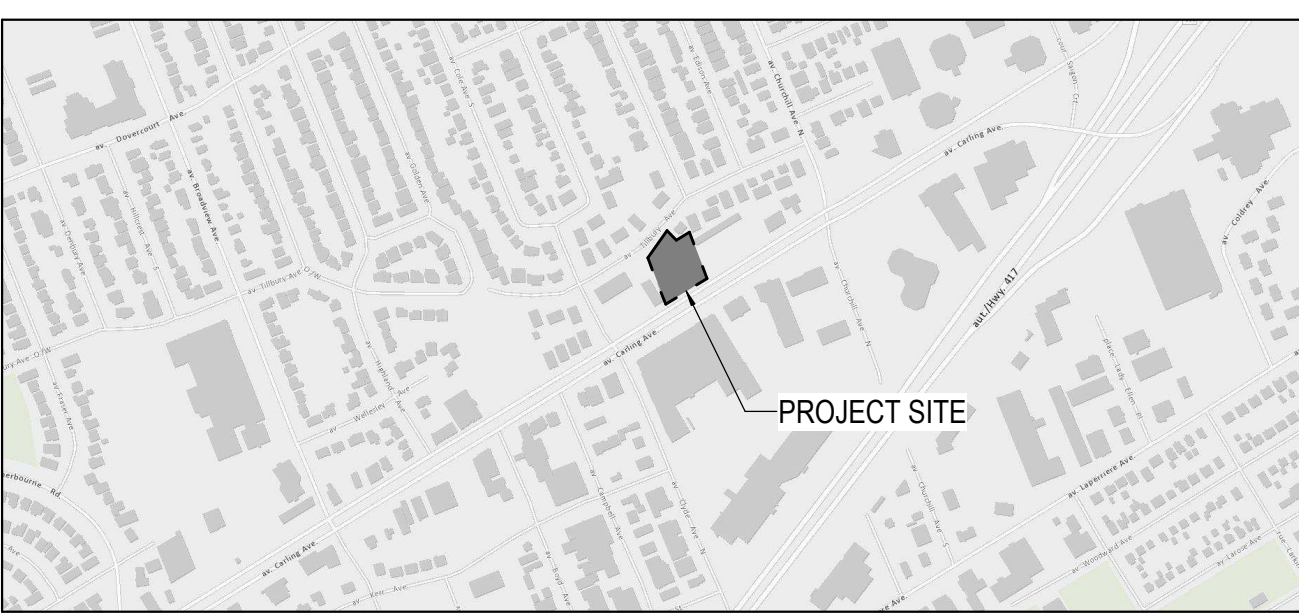
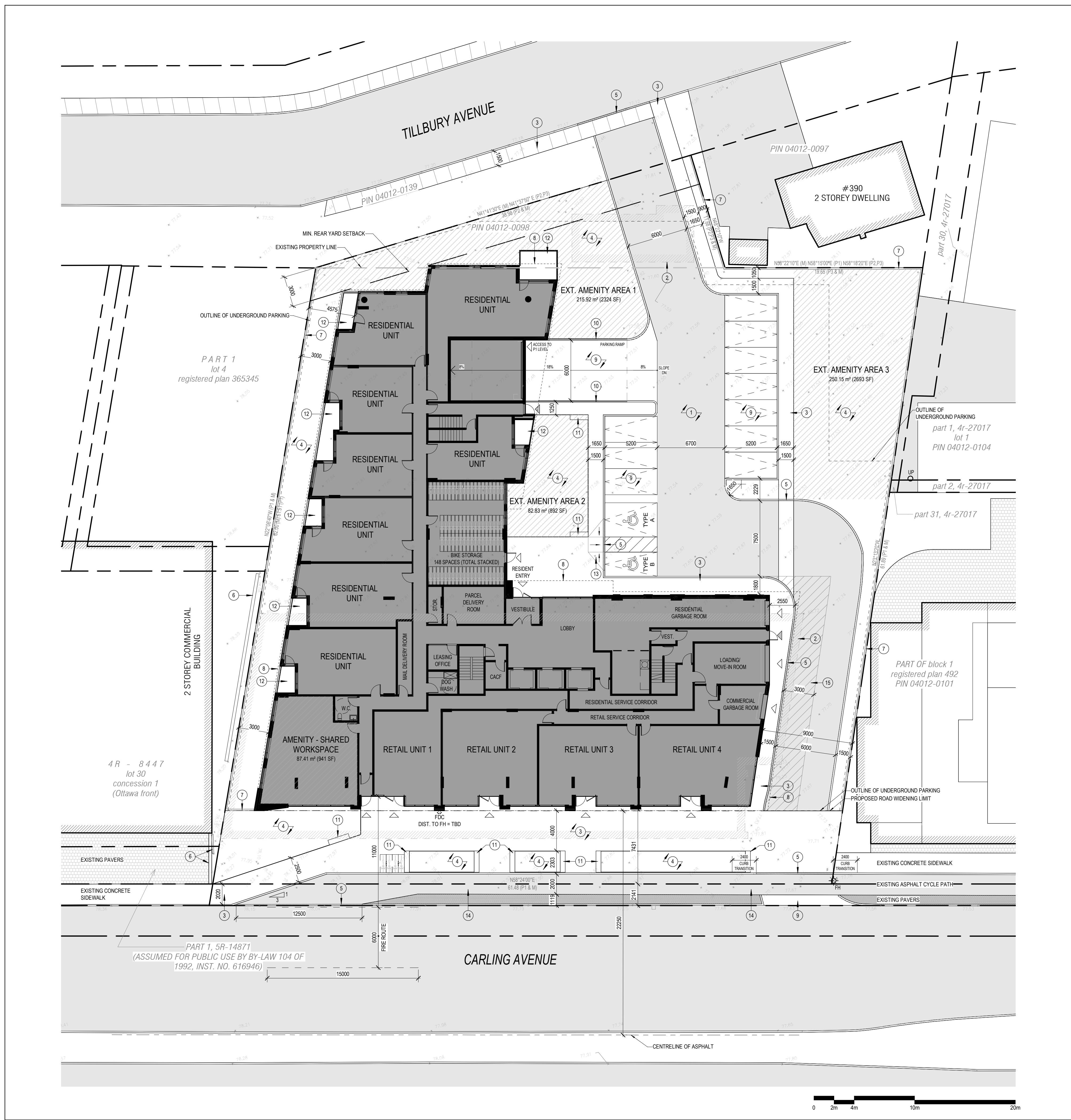
Virginia Johnson, P. Eng.
Civil Engineer



APPENDIX A

Concept Plan by Project1 Studio





2 LOCATION PLAN
SP-01 SCALE: NTS

SITE PLAN SYMBOLS LEGEND

	BUILDING ENTRANCE		FIRE DEPARTMENT CONNECTION
	BUILDING EXIT		FIRE HYDRANT
	BICYCLE PARKING		FIRE HYDRANT TO BE RELOCATED
	PROPERTY LINE		EXISTING UTILITY POLE TO REMAIN
	SETBACK LINE		EXISTING TOPOGRAPHY
	PAVERS		
R.L.	REDUCED LENGTH PARKING SPACE (4600mm x 2600mm)		
R.W.	REDUCED WIDTH PARKING SPACE (5200mm x 2400mm)		

TOPOGRAPHIC PLAN OF SURVEY OF
PART OF LOT 2
REGISTERED PLAN 492
AND
PART OF BLOCK 4
REGISTERED PLAN 310595
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA
STANTEC GEOMATICS LTD. 2023

1 SURVEY INFO
SCALE: 1 : 200

- SITE PLAN NOTES**
- 1 ASPHALT
 - 2 EXISTING STRUCTURE TO BE DEMOLISHED
 - 3 CONCRETE SIDEWALK
 - 4 REFER TO LANDSCAPE
 - 5 DEPRESSED CURB
 - 6 EXISTING RETAINING WALL
 - 7 2m HIGH WOOD PRIVACY FENCE
 - 8 CANOPY/BUILDING ABOVE
 - 9 CONCRETE
 - 10 RAILING
 - 11 REFER TO LANDSCAPE
 - 12 PRIVATE TERRACE
 - 13 CURB RAMP
 - 14 ASPHALT CYCLE TRACK
 - 15 PAINTED LINES

OWNER
INSIDE EDGE PROPERTIES
464 BANK STREET, SUITE 200
OTTAWA, ON, K2P 1Z3

ARCHITECT
PROJECT1 STUDIO
260 ST. PATRICK ST, SUITE 300
OTTAWA, ON, K1N 5K5

PLANNER
FOTENN PLANNING + DESIGN
396 COOPER ST SUITE, SUITE 300
OTTAWA, ON, K2P 2H7

CIVIL ENGINEER
LRL ENGINEERING
5430 CANOTEK RD
OTTAWA, ON, K1J 9G2

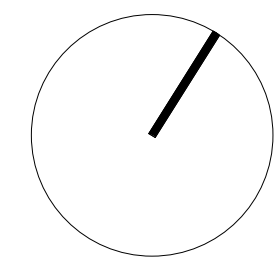
SURVEYOR
STANTEC GEOMATICS LTD.
1331 CLYDE AVENUE, SUITE 300
OTTAWA, ON, K2C 0A9

LANDSCAPE ARCHITECT
GJA INC
110 DIDSBURY ROAD, UNIT 9
OTTAWA, ON, K2T0C2

- GENERAL ARCHITECTURAL NOTES:
1. This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect.
 2. Drawings are not to be scaled. The Contractor is responsible for checking and verifying all levels and dimensions and shall report all discrepancies to the Architect and obtain clarification prior to commencing work.
 3. Upon notice in writing, the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents.
 4. The Architectural Drawings are to be read in conjunction with all other Contract Documents including Project Manuals and the Structural, Mechanical and Electrical Drawings.
 5. Positions of exposed or finished Mechanical or Electrical devices, fittings and fixtures are indicated on the Architectural Drawings. Locations shown on the Architectural Drawings shall govern over Mechanical and Electrical Drawings. Mechanical and Electrical items not clearly located will be located as directed by the Architect.
 6. These documents are not to be used for construction unless specifically noted for such purpose.

12	REISSUED FOR RE-ZONING	2025-03-13
11	ISSUED FOR COORDINATION	2025-03-07
10	ISSUED FOR COORDINATION	2025-03-04
9	REISSUED FOR RE-ZONING	2025-01-14
8	ISSUED FOR COORDINATION	2025-01-10
7	ISSUED FOR COORDINATION	2024-10-01
6	ISSUED FOR COORDINATION	2024-09-20
5	REISSUED FOR RE-ZONING	2024-07-05
4	ISSUED FOR COORDINATION	2024-06-27
3	ISSUED FOR RE-ZONING	2024-05-29
2	ISSUED FOR COORDINATION	2024-03-07
1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



project1
studio

Project1 Studio Incorporated
[613.884.3939] [mail@project1studio.ca]

1657 CARLING

1657 Carling Ave
Ottawa, ON K2A 0Y2

PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

SITE PLAN

SP-01

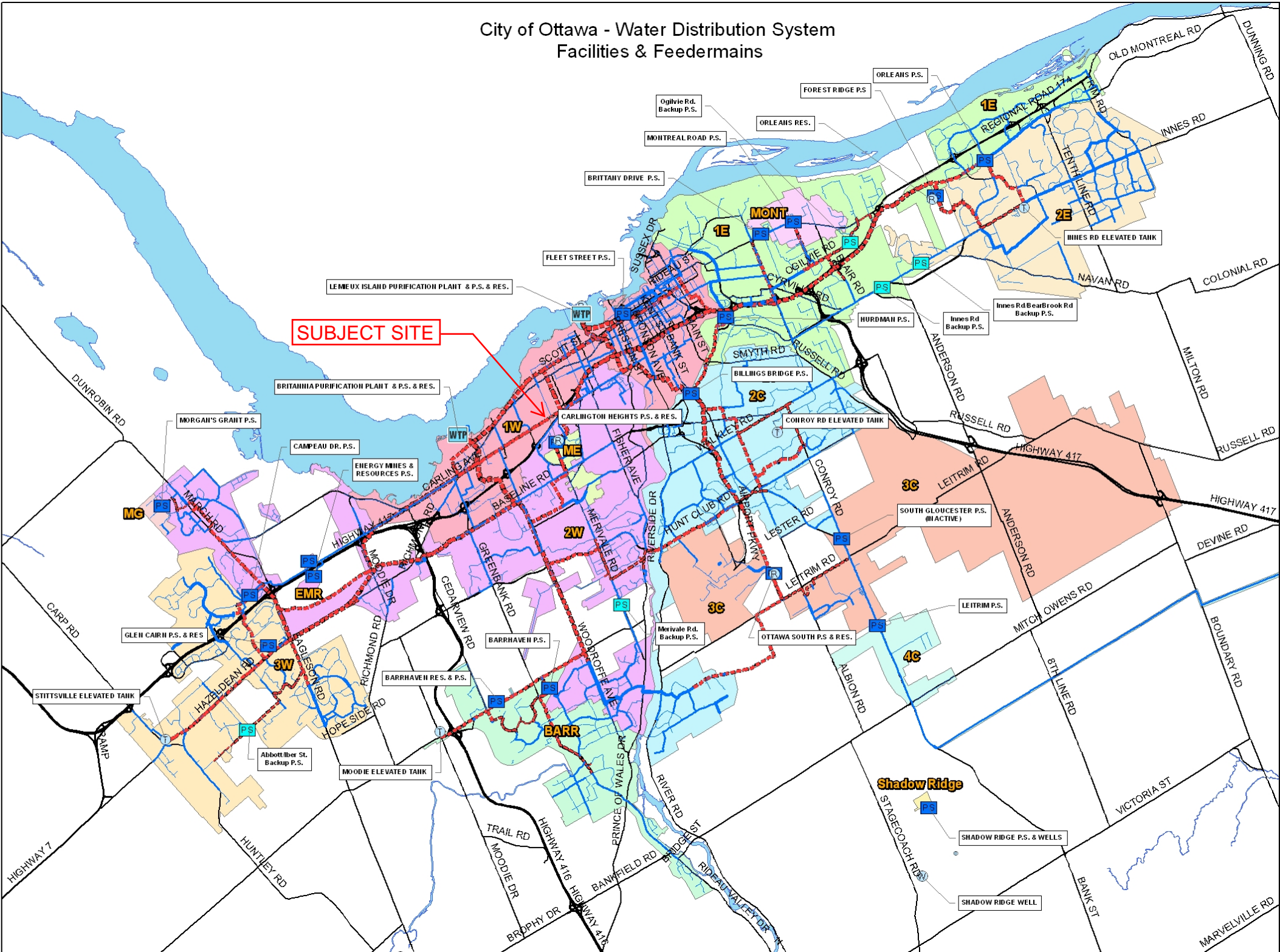
1 SITE PLAN
SP-01 SCALE: 1 : 200

APPENDIX B

Water Pressure Map & Fire Hydrant Locations



City of Ottawa - Water Distribution System
Facilities & Feeder mains



Legend

Water System Structure

- Pump Station
- Backup Pump Station
- Water Treatment Plant
- Well
- Elevated Tank
- Reservoir

WATERMAINS

- Priority, Internal Diameter
- Backbone 1524mm - 1981mm
 - Backbone 1067mm - 1372mm
 - Backbone 610mm - 914mm
 - Backbone 406mm - 508mm
 - Backbone 152mm - 305mm
 - Distribution 1676mm - 1981mm
 - Distribution 1067mm - 1372mm
 - Distribution 610mm - 914mm
 - Distribution 406mm - 508mm
 - Distribution 305mm - 381mm

PRESSURE ZONES

- 1E
- 1W
- 2C
- 2E
- 2W
- 3C
- 3W
- 4C
- BARR
- EMR
- ME
- MG
- MONT
- SHAD



Infrastructure Services & Community Sustainability
Infrastructure Services



FIGURE 5.1

DRAWN BY: D. HESS DATE: 10 JAN 2013

FIRE HYDRANT LOCATIONS FIGURE



Table 18.5.4.3 Maximum Fire Hydrant Fire Flow Capacity

Distance to Building ^a		Maximum Capacity ^b	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

^aMeasured in accordance with 18.5.1.4 and 18.5.1.5.

^bMinimum 20 psi (139.9 kPa) residual pressure.

LEGEND

SUBJECT SITE



HYDRANTS WITHIN 75 M



HYDRANTS WITHIN 150 M



APPENDIX C

Water Demand & Fire Flow Calculations





Water Supply Calculations

LRL File No. : 220449-01

Project: Proposed Mix Use building

Location: 1657-1673 Carling Ave.

Date: 2025-04-09

Designed: M.S.

Checked: V.J.

Dwg Reference: C401

Water Demand based on the City of Ottawa Design Guidelines-Water Distribution, 2010

Domestic Demand

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom / Studio	1.4	229	320.6
2 Bedroom	2.1	141	296.1
Total		370	616.7

Average Water Consumption Rate =	280 L/c/d		
Average Day Demand =	172,676 L/d	2.00 L/s	
Maximum Day Factor =	2.50	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand =	431,690 L/d	5.00 L/s	
Peak Hour Factor =	2.20	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand =	949,718 L/d	10.99 L/s	

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate (L/ha/d)	Area (ha)	Demand (L/d)
Commercial	28000	0.395	11060

Average Day Demand	11,060 L/d	0.128 L/s	
Maximum Day Factor	1.5	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Daily Demand	16,590 L/d	0.192 L/s	
Peak Hour Factor	1.8	(Design Guidelines-Water Distribution Table 4.2)	
Maximum Hour Demand	29,862 L/d	0.346 L/s	

TOTAL DEMAND			
Average Day Demand	183,736 L/d	2.13 L/s	
Maximum Daily Demand	448,280 L/d	5.19 L/s	
Maximum Hour Demand	979,580 L/d	11.34 L/s	

Water Service Pipe Sizing

$$Q = VA$$

Where: V = velocity (m/s)

A = area of pipe (m²)

Q = flow rate (L/s)

Assuming a maximum velocity of 1.8m/s, the diameter of pipe is calculated as:

$$\begin{aligned} \text{Minimum pipe diameter (d)} &= (4Q/\pi V)^{1/2} \\ &= 0.090 \text{ m} \\ &= 90 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{Proposed pipe diameter (d)} &= 150 \text{ mm} \\ &= 6 \text{ Inches} \end{aligned} \quad \text{(to be confirmed with hydraulic pressure analysis)}$$



Fire Flow Calculations

LRL File No. 220449-01

Project: Mix Use Building

Location: 1657 Carling Ave

Date: April 14, 2025

Method: Fire Underwriter's Survey (FUS)

Prepared by: M.S.

Step	Task	Term	Options	Multiplier	Choose:	Value	Unit	Fire Flow	
Structural Framing Material									
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Fire resistive construction >2 hrs	0.6			
			Ordinary Construction	1.0					
			Non-combustible construction	0.8					
			Fire resistive construction <2 hrs	0.7					
			Fire resistive construction >2 hrs	0.6					
Floor Space Area (A)									
2	Total area					8,664	m ²		
3	Obtain fire flow before reductions	Required fire flow (rounded to nearest 1000)	Fire Flow = 220 x C x A ^{0.5}					L/min	13,000
Reductions or surcharge due to factors affecting burning									
4	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-25%	Limited combustible	-15%	L/min	11,050	
			Limited combustible	-15%					
			Combustible	0%					
			Free burning	15%					
			Rapid burning	25%					
5	Choose reduction for sprinklers	Sprinkler reduction	Full automatic sprinklers	-30%	True	-30%	L/min	5,525	
			Water supply is standard for both the system and fire department hose lines	-10%	True	-10%			
			Fully supervised system	-10%	True	-10%			
6	Choose separation	Exposure distance between units	North side	30.1 to 45m	0%		L/min	9,393	
			East side	10.1 to 20m	15%				
			South side	30.1 to 45m	0%				
			West side	3.1 to 10m	20%	35%			
Net required fire flow									
7	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	9,000	
		Minimum required fire flow rate					L/s	150.0	
		Required duration of fire flow					hr	2	

APPENDIX D

Boundary Conditions



Momen Siam

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: May 14, 2025 9:47 AM
To: Virginia Johnson; Momen Siam
Cc: Jordan R. Bianconi; David Hunter
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request
Attachments: 1657 Carling Avenue REVISED - Multi Hydrant Analysis May 2025.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hello and good morning, Virginia.

Please find BC, below and attached, as requested.

Please note: Scenario 2 considers a NEW Additional hydrant on Tilbury fronting the site.

The following are boundary conditions, HGL, for hydraulic analysis at 1657 Carling Avenue, (zone 1W) assumed to be connected to via dual connection to the 152 mm on Tillbury Avenue. Also, it is assumed that the 610mm backbone on Carling Avenue is closed (see attached PDF for location).

-

Min HGL: 108.2 m

Max HGL: 114.9 m

Multi-hydrant Analysis:

Scenario 1: 610mm Backbone on Carling Avenue is Closed AND the two closest hydrants are available within 75m to 150 m of the property (see attached PDF for location).

A multi-hydrant analysis was performed with two existing hydrants within 150 m of the property. **The total aggregate flow assuming the two identified hydrants running simultaneously can provide the requested fire flow of 126 L/s for the site.**

Scenario 2: 610mm Backbone on Carling Avenue is Closed AND the two closest hydrants are available within 75m to 150 m of the property AND it is assumed a **NEW additional Hydrant** is available on Tillbury within 75 m of the property (see attached PDF for location).

A multi-hydrant analysis was performed with two existing hydrants within 150 m of the property, AND one new Hydrant within 75 m the property. **The total aggregate flow assuming the three hydrants running simultaneously can provide the requested fire flow of 165 L/s for the site.**

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 watermain 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. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji

Pronouns: he/him | Pronom: il

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

City of Ottawa | Ville d'Ottawa

110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1

(613) 580 2424 Ext. | Poste 33017

Int. Mail Code | Code de Courrier Interne 01-14

shawn.wessel@ottawa.ca

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Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Virginia Johnson <vjohnson@lrl.ca>

Sent: Tuesday, May 13, 2025 9:07 AM

To: Wessel, Shawn <shawn.wessel@ottawa.ca>; Momen Siam <msiam@lrl.ca>

Cc: Jordan R. Bianconi <jbianconi@ieproperties.com>; David Hunter <dhunter@ieproperties.com>

Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

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Hello Shawn,

Just following up on this request- It's really critical we get some feedback from water services on this as it's been quite some time, and it's the connection location we need to move this application forward.

Thanks,

Virginia Johnson, P.Eng
Civil Engineering Manager/Associate



LRL ENGINEERING | INGÉNIERIE

Head Office – 5430 Canotek Rd., Ottawa, ON

Pembroke Office – 1344 Pembroke St W, Pembroke ON

C +1 613-915-9503 **E** vjohnson@lrl.ca

Ottawa | Pembroke | Moncton

www.lrl.ca

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Wessel, Shawn <shawn.wessel@ottawa.ca>

Sent: May 5, 2025 4:48 PM

To: Virginia Johnson <vjohnson@lrl.ca>; Momen Siam <msiam@lrl.ca>

Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Hello Virginia

I have not heard anything and will follow up with them tomorrow.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji

Pronouns: he/him | Pronom: il

Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale

Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)

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shawn.wessel@ottawa.ca



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



Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Virginia Johnson <vjohnson@lrl.ca>

Sent: Monday, May 5, 2025 4:47 PM

To: Wessel, Shawn <shawn.wessel@ottawa.ca>; Momen Siam <msiam@lrl.ca>

Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

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Hello Shawn

I wanted to follow up on this request. Has the Water Dept provided the boundary conditions along Tilbury?

Thanks,

Virginia Johnson, P.Eng

Civil Engineering Manager/Associate



LRL ENGINEERING | INGÉNIERIE

Head Office – 5430 Canotek Rd., Ottawa, ON

C +1 613-915-9503 **E** vjohnson@lrl.ca

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From: Virginia Johnson

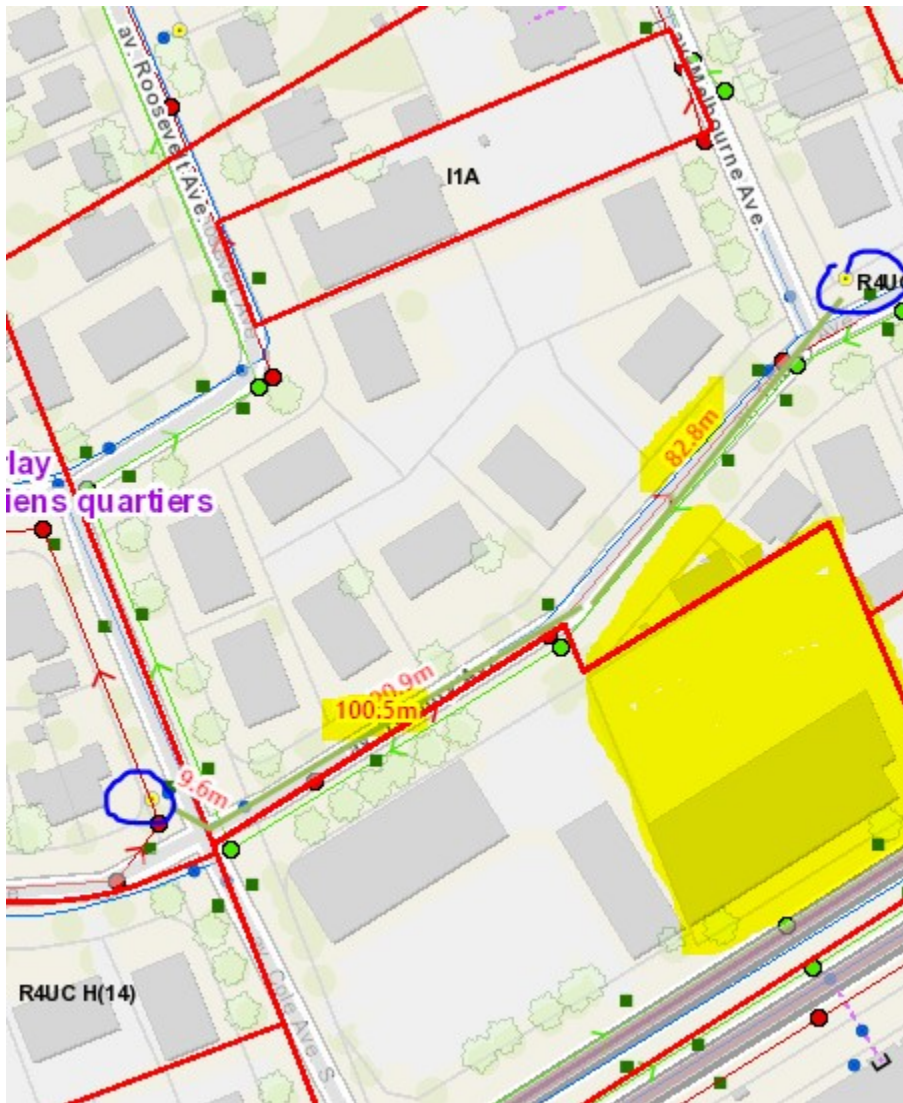
Sent: April 22, 2025 9:25 PM

To: Wessel, Shawn <shawn.wessel@ottawa.ca>; Momen Siam <msiam@lrl.ca>

Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Hello, yes, can they please provide BC's for this request.

If we are not able to assess the FH off of the carling backbone as discussed, it leaves the two hydrants shown below.



Hoping you can help expedite receiving these BC's from Tillbury as the architect is willing to work with us to help find a solution.

Thank you,

Virginia Johnson, P.Eng
Civil Engineering Manager/Associate



LRL ENGINEERING | INGÉNIERIE

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,

APPENDIX E

Sanitary Calculations & City Correspondence



LRL Associates Ltd.
Sanitary Sewer Design Sheet



LRL File No.: 220449
Project: Mixed Use Development
Location: 1657-1673 Carling Ave.
Designed: M.S
Checked: V.J.
Date: April 9, 2025
DWG. Reference: C401

Sanitary Design Parameters

Commercial & Institutional Flow = 28000 L/ha/day
Light Industrial Flow = 35000 L/ha/day
Heavy Industrial Flow = 55000 L/ha/day
Maximum Residential Peak Factor = 4.0
Commercial & Institutional Peak Factor = 1.5

Average Daily Flow = 280 L/p/day
Industrial Peak Factor = as per Appendix 4-B
Extraneous Flow = 0.33 L/s/ha

Pipe Design Parameters

Maximum Velocity = 3.00 m/s
Minimum Velocity = 0.60 m/s
Manning's n = 0.013

LOCATION			RESIDENTIAL						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW, Q	PIPE						
STREET	FROM	TO	AREA	POP.	ACCU.		PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FACT.	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW		LENGTH	DIA.	SLOPE	MATERIAL	CAP. Q(FULL)	VEL. V(FULL)	RATIO Q /QFULL
					AREA	POP.																					
			(Ha)		(Ha)			(L/s)	(Ha)	(Ha)		(Ha)		(Ha)	(Ha)	(L/s)	(Ha)	(Ha)	(L/s)	(L/s)	(m)	(mm)	(%)		(L/s)	(m/s)	
CARLING AVE.	BLDG	Ex. SAN	1.200	617.0	1.200	617.0	4.0	8.00	0.370	0.370	0.00	0.00	0.0	0.0	0.0		1.200	1.200	0.40	8.39		150	4.50%	PVC	32.31	1.83	0.26

Notes: Existing inverts and slopes are estimated. They are to be confirmed on-site.

Kyle Herold

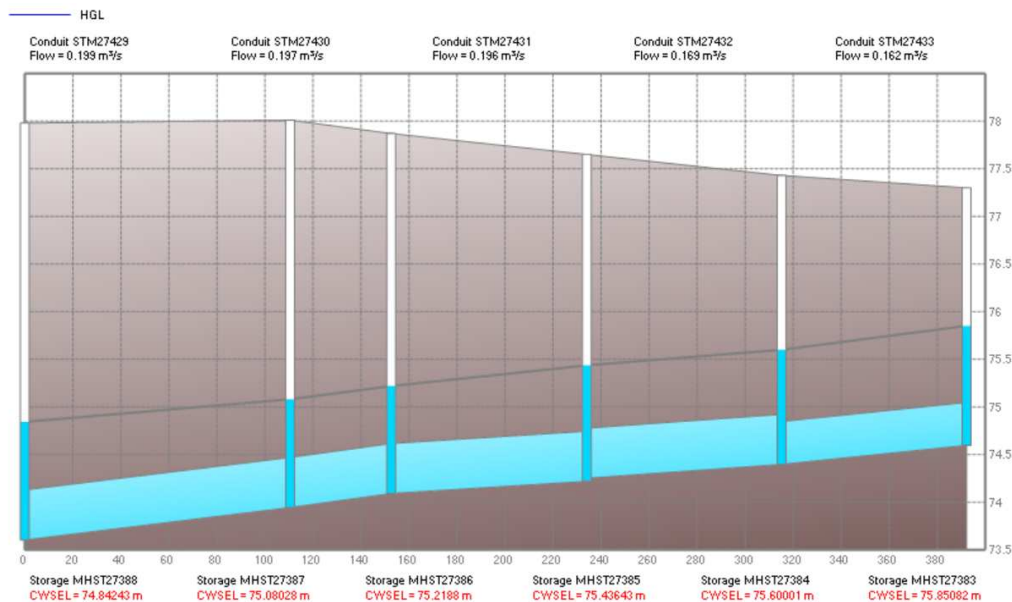
From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: August 23, 2023 10:33 AM
To: Virginia Johnson
Cc: Maxime Longtin; Kyle Herold
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Virginia

Here is the response I got from Asset management. Can you please provide the predevelopment drainage area plan and related storm flow calculations as requested below.

I checked the sanitary in more detail and Tillbury has capacity for the proposed 6.94 L/s. As for the storm, below is the 2 year HGL along Tillbury and Cole and you can see that it does not even have 2 year capacity. The 2 year flow in Tillbury in front of their property is 219 L/s and they are asking for 42 L/s (20% increase). We therefore need to figure out where the site already drains and if it already has storm pipes. This will help me figure out what is already in the system. Can you ask them where their site currently drains?



Thanks

Nishant

From: Kyle Herold <kherold@lrl.ca>
Sent: August 18, 2023 10:35 AM
To: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request
Importance: High

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Good morning Nishant,

1657 Carling Avenue

I would like to request review of adequacy of the existing sewers in comparison to expected flow and release rates for the proposed development.

Review of adequacy will need to be performed for the storm sewers and sanitary sewers within Tillbury Ave and Carling Ave.

Expected Sanitary Total Flow = 6.94 L/s

Expected Maximum Allowable Stormwater Release Rate = 41.74 L/s*

*(assuming control of 100y post to 2yr pre)

If you have any questions, or require additional information, please do not hesitate to reach out.

Thank you,

Kyle Herold

Civil Engineering Designer

LRL Engineering | lrl.ca

Cell: (613) 915-2988 | kherold@lrl.ca



APPENDIX F

Stormwater Calculations & City Correspondence



LRL Associates Ltd.
Storm Watershed Summary



LRL File No. 220449-01

Project: Adaquacy of Servicing

Location: 1657 Carling Ave, Ottawa

Date: August 31, 2023

Designed: K. Herold

Drawing Ref.:

Pre-Development Catchments (within Development Area)

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
EWS-01 (uncontrolled)	0.024	0.000	0.367	0.391	0.86
Total	0.024	0.000	0.367	0.391	0.86

Post-Development Catchments (within Development Area)

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
WS-01 (controlled)	0.000	0.000	0.341	0.341	0.90
WS-02 (uncontrolled)	0.030	0.000	0.020	0.050	0.48
Total	0.030	0.000	0.361	0.391	0.85



LRL File No. 220449-01
Project: Adequacy of Servicing
Location: 1657 Carling Ave, Ottawa
Date: August 31, 2023
Designed: K. Herold
Checked: V. Johnson
Drawing Ref.:

**Stormwater Management
Design Sheet**

STORM - 100 YEAR

Runoff Equation

$Q = 2.78CIA$ (L/s)
 C = Runoff coefficient
 $I = \text{Rainfall intensity (mm/hr)} = A / (T_d + C)^B$
 A = Area (ha)
 $T_c = \text{Time of concentration (min)}$

Pre-Development Catchments within Development Area

	Total Area =	0.391	ha	$\Sigma R =$	0.86
		0.391	ha	R =	0.86
	Total Uncontrolled =	0.391	ha	$\Sigma R =$	0.86

100 Year Allowable Release Rate (Max C=0.5, 2yr Pre-dev)

$I_2 = 732.951 / (T_d + 6.199)^{0.81}$ **A = 732.951** **B = 0.81** **C = 6.199**
 C = 0.50 max C=0.5 as per City Guidelines
 I = 76.8 mm/hr
 $T_c = 10$ min min 10mins as per City Guidelines
 A = 0.391 ha
100y Allowable Release Rate = 41.74 L/s

Post-development Stormwater Management

				$\Sigma R_{2\&5}$	ΣR_{100}
	Total Site Area =	0.391	ha	$\Sigma R =$	1.00
Controlled	WS-01	0.341	ha	R =	0.90
Uncontrolled	WS-02	0.050	ha	R =	0.60
	Total Controlled =	0.391	ha	$\Sigma R =$	0.85

100 Year Post-development Stormwater Management

$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$ **A = 1735.688** **B = 0.820** **C = 6.014**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m ³)	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	169.27	85.66	26.50	14.89	41.39
15	142.89	135.46	98.06	26.50	14.89	41.39
20	119.95	113.71	104.65	26.50	14.89	41.39
25	103.85	98.44	107.92	26.50	14.89	41.39
30	91.87	87.09	109.06	26.50	14.89	41.39
35	82.58	78.28	108.74	26.50	14.89	41.39
40	75.15	71.24	107.37	26.50	14.89	41.39
45	69.05	65.46	105.19	26.50	14.89	41.39
50	63.95	60.63	102.38	26.50	14.89	41.39
60	55.89	52.99	95.35	26.50	14.89	41.39
70	49.79	47.20	86.94	26.50	14.89	41.39
80	44.99	42.65	77.52	26.50	14.89	41.39
90	41.11	38.97	67.35	26.50	14.89	41.39

Onsite Stormwater Retention

Total Storage Required = 109.06 m³

Kyle Herold

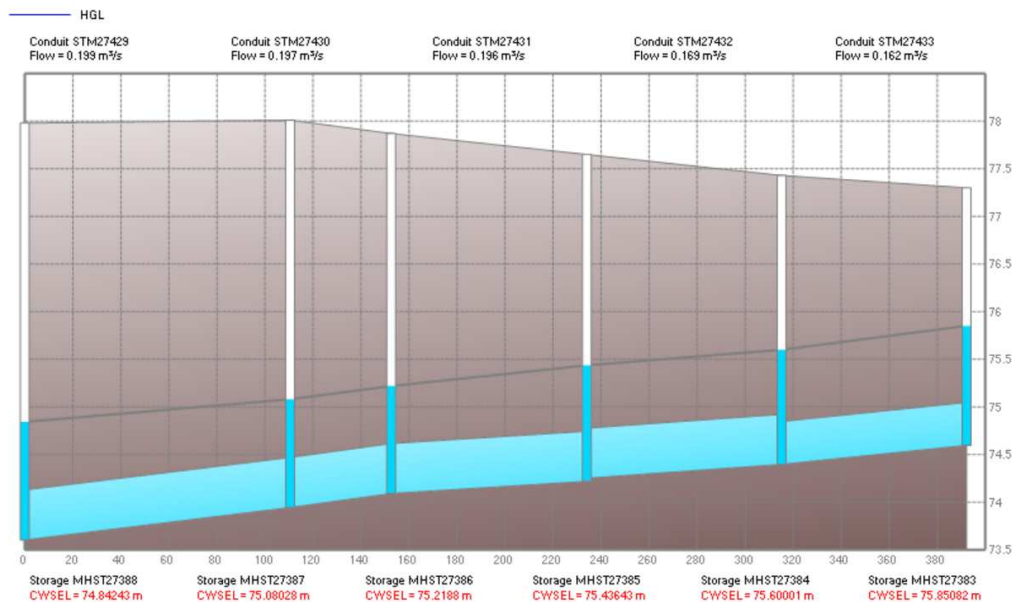
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Good morning Nishant,

1657 Carling Avenue

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Review of adequacy will need to be performed for the storm sewers and sanitary sewers within Tillbury Ave and Carling Ave.

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Expected Maximum Allowable Stormwater Release Rate = 41.74 L/s*

*(assuming control of 100y post to 2yr pre)

If you have any questions, or require additional information, please do not hesitate to reach out.

Thank you,

Kyle Herold

Civil Engineering Designer

LRL Engineering | lrl.ca

Cell: (613) 915-2988 | kherold@lrl.ca



APPENDIX G

Conceptual Site Servicing Plan



