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 3rd, 2024

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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 Tilllbury 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.

Figure 1: Arial View of Subject Lands

2 EXISTING SITE AND AVAILABLE SERVICES

The site consists of a 2-storey commercial building and an asphalt parking lot at 1657 – 1673 Carling Avenue. The site also consists of a 2-storey residential building with a paved driveway on Tillbury Avenue. There is a landscape buffer surrounding the exterior of the parcels.

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

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

serviced 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 610mm 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.

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	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure shall not exceed	552 kPa
During fire flow operating conditions pressure must not drop below	140 kPa
**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/m^2/day)
A = commercial area (m^2)
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/m^2/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 **2.14** L/s,
- Maximum daily demand is **5.35** L/s, and
- Maximum hourly demand is **11.76** 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 both Carling Avenue and Tillbury Avenue. At this stage we have requested boundary conditions for the following demands (Table 4), these will be refined further during the site plan control phase.

Table 4: Summary of Boundary Conditions

Boundary Conditions – Carling Avenue			
Design Parameter	**Anticipated Demand (L/s)**	**Min Pressure (Psi/kPa)**	**Max Pressure (Psi/kPa)**
Max Daily Demand	5.35	43.83 / 302.20	51.66 / 356.18
Max Hourly Demand	11.76	43.39 / 299.16	51.22 / 353.15
**Carling Ave, Ground Elevation assumed at 77.9m*			

Boundary Conditions – Tillbury Ave			
Design Parameter	**Anticipated Demand (L/s)**	**Min Pressure (Psi/kPa)**	**Max Pressure (Psi/kPa)**
Max Daily Demand	5.35	43.28 / 298.41	51.68 / 356.32
Max Hourly Demand	11.76	41.97 / 289.37	50.36 / 347.22
**Carling Ave, Ground Elevation assumed at 77.9m*			

As indicated in Table 4, minimum pressures in the maximum daily demand fall below the required pressure range stated in Table 1 as per City of Ottawa Design Guidelines. Means of either decreasing water demands, or increasing water service pressure mechanically, will need to be investigated and implemented to provide sufficient minimum pressure to the proposed development.

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 **11,000 L/min (183.3 L/s)**.
Through discussion & correspondence with the City of Ottawa asset management department, it was noted that, in order to operate municipal water services at a minimum pressure of 20psi, only the following fire flows were available from municipal services;

- 145 L/s from the Carling Avenue watermain
- 117 L/s from the Tillbury Avenue watermain

Based on the provided, fire flow demands from the current concept building are too great to tie to either the Carling or Tillbury watermain. To ensure that the building can be serviced by one of the watermains during detailed design, the architect will need to investigate further means of decreasing the buildings required fire flow. Fire separation/compartmentation, such as floor assemblies, wall assemblies, etc will need to further be investigated to reduce the fire flow to an acceptable demand.

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

As for aggregate flow available for fire fighting services, there are at least six (7) existing fire hydrants near the contemplated buildings that are available to provide the maximum required fire flow demands of **11,000 L/min (183.3 L/s)**.
Refer to **Appendix D** for fire hydrant locations.

Table 4 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	11,000	3	2	2	(3 x 5678) + (2 x 3785) + (2 x 2839) = 30,282

The total available fire flow from contributing hydrants is equal to **30,282 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.

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.

During this review, it is not confirmed if existing stormwater management exists on the site; 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 either the existing 225mm municipal storm sewer located on Carling Avenue or to the existing 450mm municipal storm sewer located on Tillbury Avenue. 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 release to either the Carling or Tllbury storm sewer.

Based on stormwater objectives for the subject site, the allowable release rate for the contemplated development is **±41.74 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.

Table 5 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 6, 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**

It is anticipated that approximately **109.06 m^3** 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 ditch.

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 a 150mm dual connections to either the existing 610mm watermain within Carling Ave or 152mm watermain within Tillbury Avenue.
  - Domestic demands from the proposed concept subdivision are expected to be in the range of **2.14 L/s** for the Average daily demand, **5.35 L/s** for the maximum daily and **11.76 L/s** for maximum hourly.
  - The maximum required fire flow was calculated at **11,000 L/min (183.3 L/s)** using the FUS method.
  - As per the boundary conditions provided by the City of Ottawa, minimum pressures for the maximum daily demand fall below the required pressure range. Means of either decreasing the water demand, or mechanically increasing the water service pressure, will need to be investigated.
  - In order to operate municipal water services at 20psi, fire flows of only **145 L/s** and **117 L/s** were available from the Carling and Tillbury watermains, respectively. As concept required fire flow is too large to be supported by either watermain, the architect will need to investigate further means to reduce required fire flow to acceptable levels.
  - There are at least seven (7) existing fire hydrants available for fire fighting to service the proposed development. Hydrants within ±300m will provide a combined fire flow of **30,282 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.

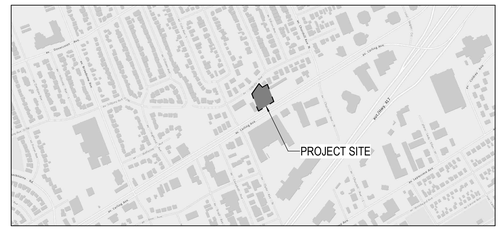
Kyle Herold
Civil Designer

Virginia Johnson, P.Eng.
Civil Engineer

APPENDIX A

Concept Plan by Project1 Studio

1 SP-01 SITE PLAN
SCALE: 1 : 200



2 SP-01 LOCATION PLAN
SCALE: NTS

SITE PLAN SYMBOLS LEGEND

- BUILDING ENTRANCE
- BUILDING EXIT
- BICYCLE PARKING
- PROPERTY LINE
- SETBACK LINE
- INTERLOCKING STONE PAVERS
- FDC — FIRE DEPARTMENT CONNECTION
- FH — FIRE HYDRANT
- UP — EXISTING UTILITY POLE TO REMAIN
- R.P. — RAISED PLANTER

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

0 2m 4m 10m 20m

SURVEY INFO
SCALE: 1 : 200

SITE PLAN NOTES

1. ASPHALT
2. EXISTING STRUCTURE TO BE DEMOLISHED
3. CONCRETE SIDEWALK
4. SOFT LANDSCAPING
5. DEPRESSED CURB
6. EXISTING RETAINING WALL
7. 2m HIGH WOOD PRIVACY FENCE
8. CANOPY/BUILDING ABOVE
9. HARD LANDSCAPING
10. RAILING AROUND PARKING RAMP PERIMETER
11. BENCH
12. PRIVATE TERRACE
13. CURB RAMP

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

LANDSCAPE ARCHITECT
XXX
XXX
XXX

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

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 conjuction 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.

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

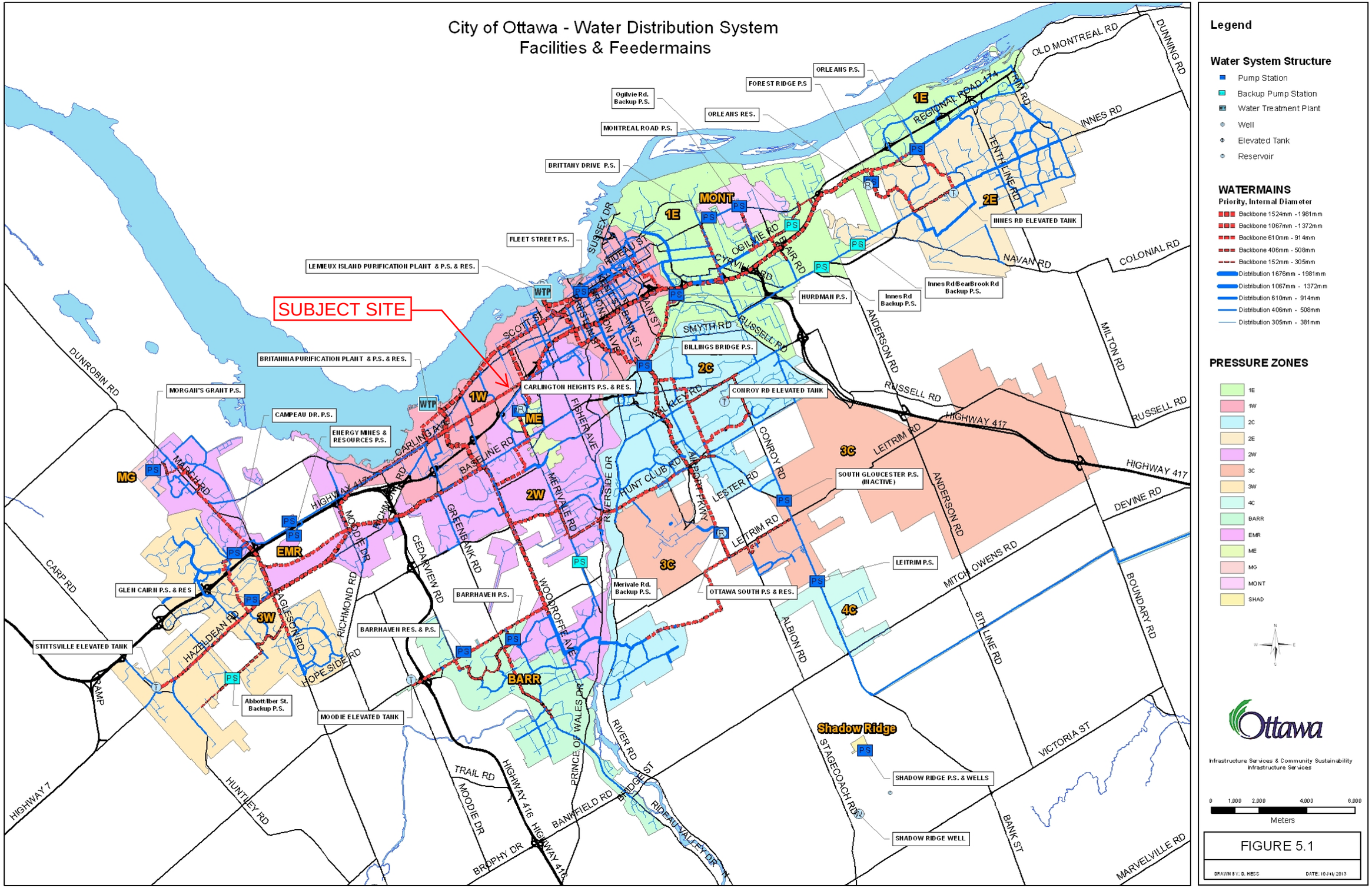
PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

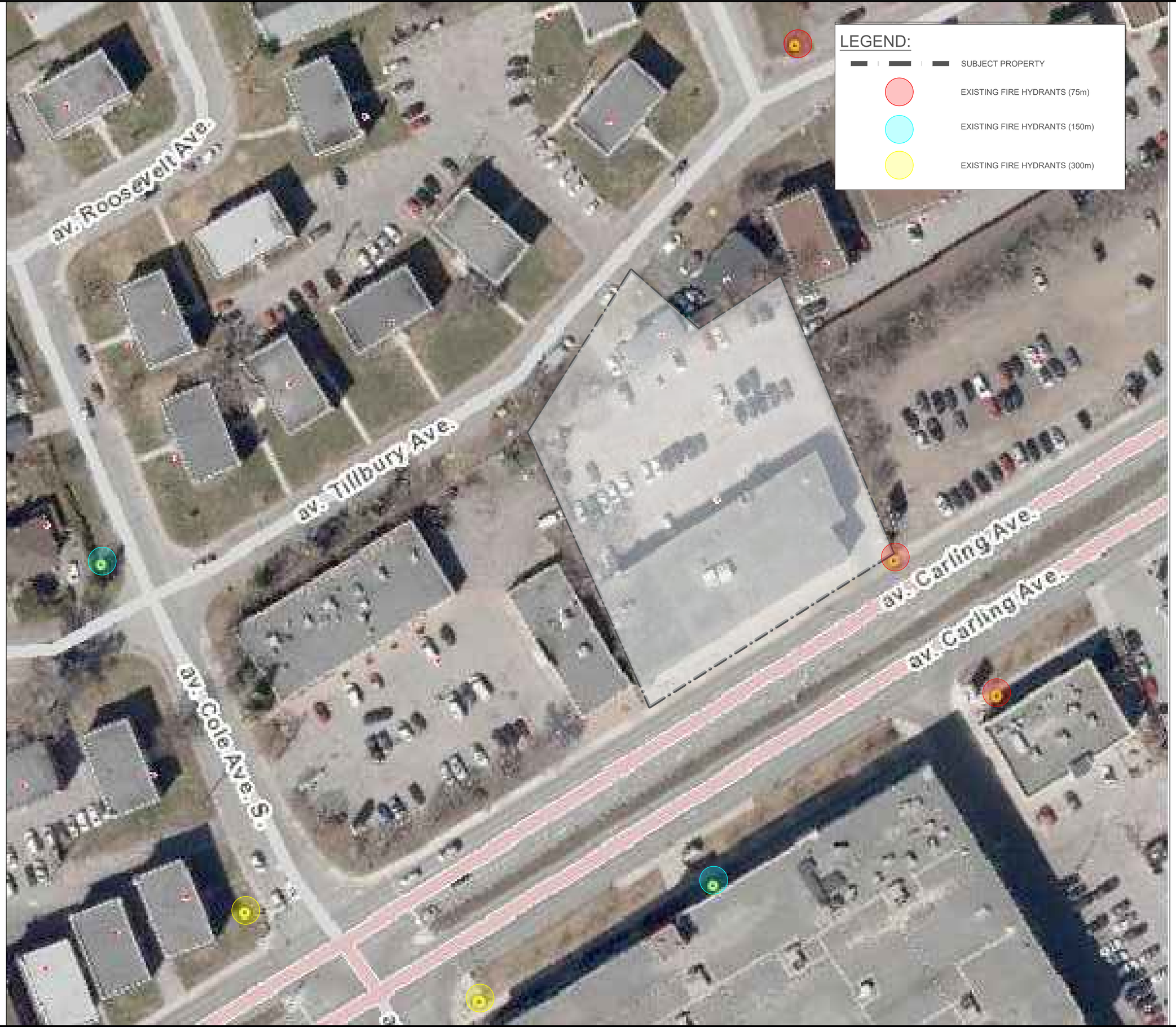
SITE PLAN

SP-01

APPENDIX B

Water Pressure Map & Fire Hydrant Locations


City of Ottawa - Water Distribution System
Facilities & Feedermains
SUBJECT SITE
LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.
BRITANNIA PURIFICATION PLANT & P.S. & RES.
CARLINGTON HEIGHTS P.S. & RES.
FLEET STREET P.S.
Ogilvie Rd. Backup P.S.
ORLEANS P.S.
FOREST RIDGE P.S
ORLEANS RES.
MONTREAL ROAD P.S.
BRITTANY DRIVE P.S.
BILLINGS BRIDGE P.S.
HURDMAN P.S.
Innes Rd Backup P.S.
Innes Rd/BearBrook Rd Backup P.S.
INNES RD ELEVATED TANK
CONROY RD ELEVATED TANK
SOUTH GLOUCESTER P.S. (INACTIVE)
LEITRIM P.S.
OTTAWA SOUTH P.S & RES.
Merivale Rd. Backup P.S.
MORGAN'S GRANT P.S.
CAMPEAU DR. P.S.
ENERGY MINES & RESOURCES P.S.
GLEN CAIRN P.S. & RES
BARRHAVEN P.S.
BARRHAVEN RES. & P.S.
STITTSVILLE ELEVATED TANK
Abbottlber St. Backup P.S.
MOODIE ELEVATED TANK
SHADOW RIDGE P.S. & WELLS
SHADOW RIDGE WELL
1E
1W
2E
2W
2C
3C
3W
4C
MONT
ME
MG
EMR
BARR
Shadow Ridge
WTP
PS
R
T
DUNROBIN RD
CARP RD
HIGHWAY 7
HUNTLEY RD
CARLING AVE
BASELINE RD
FISHER AVE
RIVERSIDE DR
HUNT CLUB RD
AIRPORT PKWY
LESTER RD
CONROY RD
LEITRIM RD
ANDERSON RD
MILTON RD
RUSSELL RD
HIGHWAY 417
DEVINE RD
MITCH OWENS RD
BOUNDARY RD
8TH LINE RD
ALBION RD
VICTORIA ST
BANK ST
MARVELVILLE RD
OLD MONTREAL RD
DUNNING RD
INNES RD
TENTH LINE RD
REGIONAL ROAD 174
COLONIAL RD
NAVAN RD
SMYTH RD
WALKLEY RD
SCOTT ST
RIDEAU ST
MAIN ST
BANK ST
SUSSEX DR
OGILVIE RD
CYRVILLE RD
BLAIR RD
MURPHY RD
RICHMOND RD
MOODIE DR
CEDARVIEW RD
GREENBANK RD
MERIVALE RD
WOODROFFE AVE
PRINCE OF WALES DR
HAZELDEAN RD
EAGLESON RD
HOPE SIDE RD
RAMP
TRAIL RD
HIGHWAY 416
BANKFIELD RD
BRIDGE ST
RIVER RD
RIDEAU VALLEY DR
MOODIE DR
BROPHY DR
STAGECOACH RD
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
Ottawa
Infrastructure Services & Community Sustainability
Infrastructure Services
0 1,000 2,000 4,000 6,000
Meters
FIGURE 5.1
DRAWN BY: D. HESS
DATE: 10 JULY 2013


LEGEND:
SUBJECT PROPERTY
EXISTING FIRE HYDRANTS (75m)
EXISTING FIRE HYDRANTS (150m)
EXISTING FIRE HYDRANTS (300m)
av. Roosevelt Ave.
av. Tillbury Ave.
av. Cole Ave S.
av. Carling Ave.
av. Carling Ave.

APPENDIX C

Water Demand & Fire Flow Calculations

Water Demand Calculations

LRL File No.	220449-01
Date	July 3, 2024
Prepared by	Kyle Herold

Residential Demand (CoO Guidelines Table 4.2)

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**

Population	616	Capita		
Average Water Consumption Rate	280	L/c/d		
Maximum Daily Peak Factor	2.5			
Maximum Hourly Peak Factor	2.2			
Average Domestic Water Demand	172,480	L/d	1.996	L/s
Maximum Daily Domestic Water Demand	431,200	L/d	4.991	L/s
Maximum Hourly Water Demand	948,640	L/d	10.980	L/s

Commercial Demand (CoO Guidelines Table 4.2)

Commercial Area	400	m^2		
Average Daily Demand	2500	L/(1000m^2/d)		
Maximum Daily Peak Factor	1.5			
Maximum Hourly Peak Factor	1.8			
Average Commercial Water Demand	1,000	L/d	0.012	L/s
Maximum Daily Commercial Water Demand	1,500	L/d	0.017	L/s
Maximum Hourly Commercial Water Demand	2,700	L/d	0.031	L/s

Total Water Demand

Average Total Water Demand	**173,480**	**L/d**	**2.008**	**L/s**
Maximum Daily Total Water Demand	**432,700**	**L/d**	**5.008**	**L/s**
Maximum Hourly Total Water Demand	**951,340**	**L/d**	**11.011**	**L/s**

Fire Flow Calculations

LRL File No. 220449-01
Project 1657 Carling Ave
Date August 31, 2023
Method Fire Underwriters Survey (FUS)
Designed by Kyle Herold

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								
2	Choose type of housing	Type of housing	Single family dwelling	0	Building - no. of units per floor	0	unit(s)	
			Townhouse - no. of units	0				
			Building - no. of units per floor	0				
3	Enter area of a unit	Enter floor space area (100% floors 1-2, 50% floors 3-10)		1	8005.0		sq.m.	
4	Obtain fire flow before reductions	Required fire flow	**Fire Flow = 220 x C x Area$^{0.5}$**				L/min	**12,000**
							L/s	200.0
Reductions or surcharge due to factors affecting burning								
5	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15		
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15			L/min	**10,200**
			Rapid burning	0.25			L/s	170.0
6	Choose reduction for sprinklers	Sprinkler reduction	Sprinklers (NFPA13)	-0.30	True	-0.3		
			Water supply is standard for both the system and fire department hose lines	-0.10	True	-0.1	L/min	**6,000**
			Fully supervised system	-0.10	True	-0.1	L/s	100.0
7	Choose separation	Exposure distance between units	North side	30.1 to 45m	0.05			
			East side	20.1 to 30m	0.1			
			South side	30.1 to 45m	0.05		L/min	**11,000**
			West side	3.1 to 10m	0.2	0.4	L/s	183.3
Net required fire flow								
8	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	**11,000**
		Minimum required fire flow rate					L/s	**183.3**
		Required duration of fire flow					hr	**2.5**

Pipe Pressure Losses Calculations

LRL File No. 220449
Project Proposed MU Development
Location: 1657 Carling Ave
Date August 31, 2023
Designed: K. Herold

Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)
p = Pressure (Pa)
γ = Specific weight (N/m3) = 9810
z = Elevation of centreline of pipe (m) = 77.9

Water Pressure on Carling			
HGL (m)		Pressure	
		kPa	psi
Minimum =	108.8	303.13	43.97
Maximum =	114.3	357.08	51.79

Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

h_f = Head loss over the length of pipe (m)
Q = Volumetric flow rate (m^3/s)
L = Length of pipe (m)
C = Pipe roughness coefficient
d = Pipe diameter (m)

Scenario 1: maximum daily demand

Q (L/s)	5.35
C	150
L (m.)	20

I.D. (mm)	100	
V (m/s)	0.68	
h_f (m)	0.09	
Head Loss (psi)	0.13	
Min. Pressure (psi)	43.83	(must not be less than 50psi)
Max. Pressure (psi)	51.66	(must not be more than 80psi)

*consider pump to accommodate required min. pressure

Scenario 2: maximum hourly demand

Q (L/s)	11.76	
C	150	
L (m.)	20	
I.D. (mm)	100	
V (m/s)	1.50	
h_f (m)	0.40	
Head Loss (psi)	0.57	
Min. Pressure (psi)	43.39	(must not be less than 40psi)
Max. Pressure (psi)	51.22	(must not be more than 80psi)

Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)

p = Pressure (Pa)

γ = Specific weight (N/m3) = 9810

z = Elevation of centreline of pipe (m) = 77.9

Water Pressure on Tillbury			
HGL (m)		Pressure	
		kPa	psi
Minimum =	108.6	301.17	43.68
Maximum =	114.5	359.05	52.08

Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

h_f = Head loss over the length of pipe (m)

Q = Volumetric flow rate (m^3/s)
L = Length of pipe (m)
C = Pipe roughness coefficient
d = Pipe diameter (m)

Scenario 1: maximum daily demand

Q (L/s)	5.35	
C	150	
L (m.)	60	
I.D. (mm)	100	
V (m/s)	0.68	
h_f (m)	0.28	
Head Loss (psi)	0.40	
Min. Pressure (psi)	43.28	(must not be less than 50psi)
Max. Pressure (psi)	51.68	(must not be more than 80psi)

*consider pump to accommodate required min. pressure

Scenario 2: maximum hourly demand

Q (L/s)	11.76	
C	150	
L (m.)	60	
I.D. (mm)	100	
V (m/s)	1.50	
h_f (m)	1.20	
Head Loss (psi)	1.71	
Min. Pressure (psi)	41.97	(must not be less than 40psi)
Max. Pressure (psi)	50.36	(must not be more than 80psi)

City of Ottawa Boundary Conditions (Multi Hydrant Analysis)

	Quantity	Max Capacity (L/min)*	Available Fire Flow** (L/min)
Fire Hydrant(s) Within 76m	3	5678	17034
Fire Hydrant(s) Within 76m to 152m	2	3785	7570
Fire Hydrant(s) Within 152m to 305m	2	2839	5678
Available Combined Fire Flow (L/min)			30282
Max Day + Fire Flow Demand (L/min)			11321

*as per Table 18.5.4.3. of ISTB-2018-02
**assumed class AA hydrants

Kyle Herold

From: Julien Hebert <hebert@project1studio.ca>
Sent: June 20, 2023 3:06 PM
To: Kyle Herold
Cc: Ryan Koolwine; Scott Alain; Bipin Dhillon; David Hunter; Jordan R. Bianconi; Taylor Hunter; Virginia Johnson
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Kyle,

1. Type I – Fire-Resistive Construction (All floors and structural elements will be 2 hours FRR concrete construction)
2. The Major Occupancies are 'C' and 'E' (shops/stores) – based on table 3, this would be '*Limited to Combustible*'.
3. The building will be sprinklered and fully supervised.

Cheers,

Julien Hébert

project1studio | 613 884-3939 x6

From: Kyle Herold <kherold@lrl.ca>
Sent: Tuesday, June 20, 2023 2:11 PM
To: Julien Hebert <hebert@project1studio.ca>
Cc: Ryan Koolwine <koolwine@project1studio.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>; Virginia Johnson <vjohnson@lrl.ca>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Good afternoon Julien,

Thank you for sending these through!

In order to complete the concept fire flow calculations as per the FUS design methodology (as per City of Ottawa requirements), we will require some further information on the building.
Can you please clarify the following?

- Type of construction? (Wood Frame, Ordinary, Non-combustible, Fire resistive construction < 2hrs, Fire resistive construction > 2hrs)
- Combustibility of contents? (Non-combustible, Limited combustible, Combustible, Free Burning, Rapid Burning)
- Sprinklered? Fully supervised system?

Please note;
Though most design standards will use the same terminology, it has been noted that the definition of certain terminology within the FUS method does vary from standard OBC-based methodologies.
I would strongly recommend reviewing the FUS while performing this exercise to ensure the correct terminology is used, based on the FUS.

Link to FUS 2020: Downloads (fireunderwriters.ca) (Water Supply for Public Fire Protection)

1) Type of Construction (refer to pages 20-21 of the FUS Water Supply for Public Fire Protection guidelines)

2) Combustibility of Contents (refer to pages 24-26 of the FUS Water Supply for Public Fire Protection guidelines)
3) Sprinklers (refer to pages 27-29 of the FUS Water Supply for Public Fire Protection guidelines)

If you have any questions, 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

From: Julien Hebert <hebert@project1studio.ca>
Sent: June 20, 2023 12:50 PM
To: Kyle Herold <kherold@lrl.ca>; Virginia Johnson <vjohnson@lrl.ca>
Cc: Ryan Koolwine <koolwine@project1studio.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Kyle,

Please see the link below for updated drawings:
https://www.dropbox.com/sh/d8g5utsoqt4y2c0/AADMO7ik_cm6L4zol_0RixJ5a?dl=0

Please note that the site plan is not finalized – we have a meeting with the city this week to discuss the vehicular access from Tillbury.
The unit matrix/area calcs are up to date, but still flexible as we continue to refine the massing of the north wing of the building.

Thanks,

Julien Hébert

project1studio | 613 884-3939 x6

From: Kyle Herold <kherold@lrl.ca>
Sent: Tuesday, June 20, 2023 12:43 PM
To: Julien Hebert <hebert@project1studio.ca>; Virginia Johnson <vjohnson@lrl.ca>
Cc: Ryan Koolwine <koolwine@project1studio.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Good afternoon Julien,

Just wanted to quickly follow-up on the status of the updated architectural drawings for 1657 Carling Ave.

If you have any questions, or anything to discuss, please do not hesitate to reach out.

Best regards,

Kyle Herold
Civil Engineering Designer
LRL Engineering | lrl.ca
Cell: (613) 915-2988 | kherold@lrl.ca

From: Julien Hebert <hebert@project1studio.ca>
Sent: June 13, 2023 11:13 AM
To: Virginia Johnson <vjohnson@lrl.ca>
Cc: Kyle Herold <kherold@lrl.ca>; Ryan Koolwine <koolwine@project1studio.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Virginia,

We will be sending updated drawings showing a 30-storey building by the end of the week.
We will have a better idea of number of units and unit types for your calcs then.

Thanks!

Julien Hébert

project1studio | 613 884-3939 x6

From: Ryan Koolwine <koolwine@project1studio.ca>
Sent: Tuesday, June 13, 2023 11:08 AM
To: Virginia Johnson <vjohnson@lrl.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>; Julien Hebert <hebert@project1studio.ca>
Cc: Kyle Herold <kherold@lrl.ca>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Virginia,

Julien Hebert (cc'd on this email), will be managing the day to day from the architectural side on this project. He will follow-up with you.

Cheers,

Ryan Koolwine

project1studio | 613 884-3939 x1

From: Virginia Johnson <vjohnson@lrl.ca>
Sent: June 13, 2023 11:00 AM
To: Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; Ryan Koolwine <koolwine@project1studio.ca>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>
Cc: Kyle Herold <kherold@lrl.ca>
Subject: RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hello Team,
I wanted to introduce Kyle to this thread who will be pushing this forward. Ryan, has there been any further advances on the Architectural plans that we should be working off of for our demand calculations?

Can you please circulate the most updated set?

Thank you,

Virginia Johnson, P. Eng.
Civil Engineering Manager/Associate
LRL Engineering | lrl.ca
Cell: (613) 915-9503 | vjohnson@lrl.ca

From: Scott Alain <alain@fotenn.com>
Sent: Wednesday, May 24, 2023 3:01 PM
To: Astrid Nielsen <astrid.nielsen@dendronforestry.ca>; Bipin Dhillon <dhillon@fotenn.com>; Ryan Koolwine <koolwine@project1studio.ca>; Andrew Harte <andrew.harte@cghtransportation.com>; John Kingsley <john.kingsley@cghtransportation.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Karyn Munch <kmunch@patersongroup.ca>; Joshua Foster <joshua.foster@gradientwind.com>; Virginia Johnson <vjohnson@lrl.ca>; Taylor Hunter <thunter@ieproperties.com>; Kevin Myers <kevin.myers@dendronforestry.ca>
Subject: 1657 Carling Avenue - ZBLA Application Update

Good afternoon team,

Subject to our review of the City of Ottawa's updated development application process, we have determined that submitting our ZBLA prior to June 5 will no longer be critical to the project timeline. We are therefore setting a new

submission date of **July 14, 2023**. This will allow time for all disciplines to contribute to a complete, comprehensive submission package.

Please continue working to advance your materials as applicable. If you have any further questions or concerns, please feel free to reach out directly. We will be in touch leading up to the submission date to ensure we are meeting key milestones.

Have a good day,

Scott Alain, RPP, MCIP (he/him)
Senior Planner

FOTENN
396 Cooper Street, Suite 300
Ottawa, ON K2P 2H7
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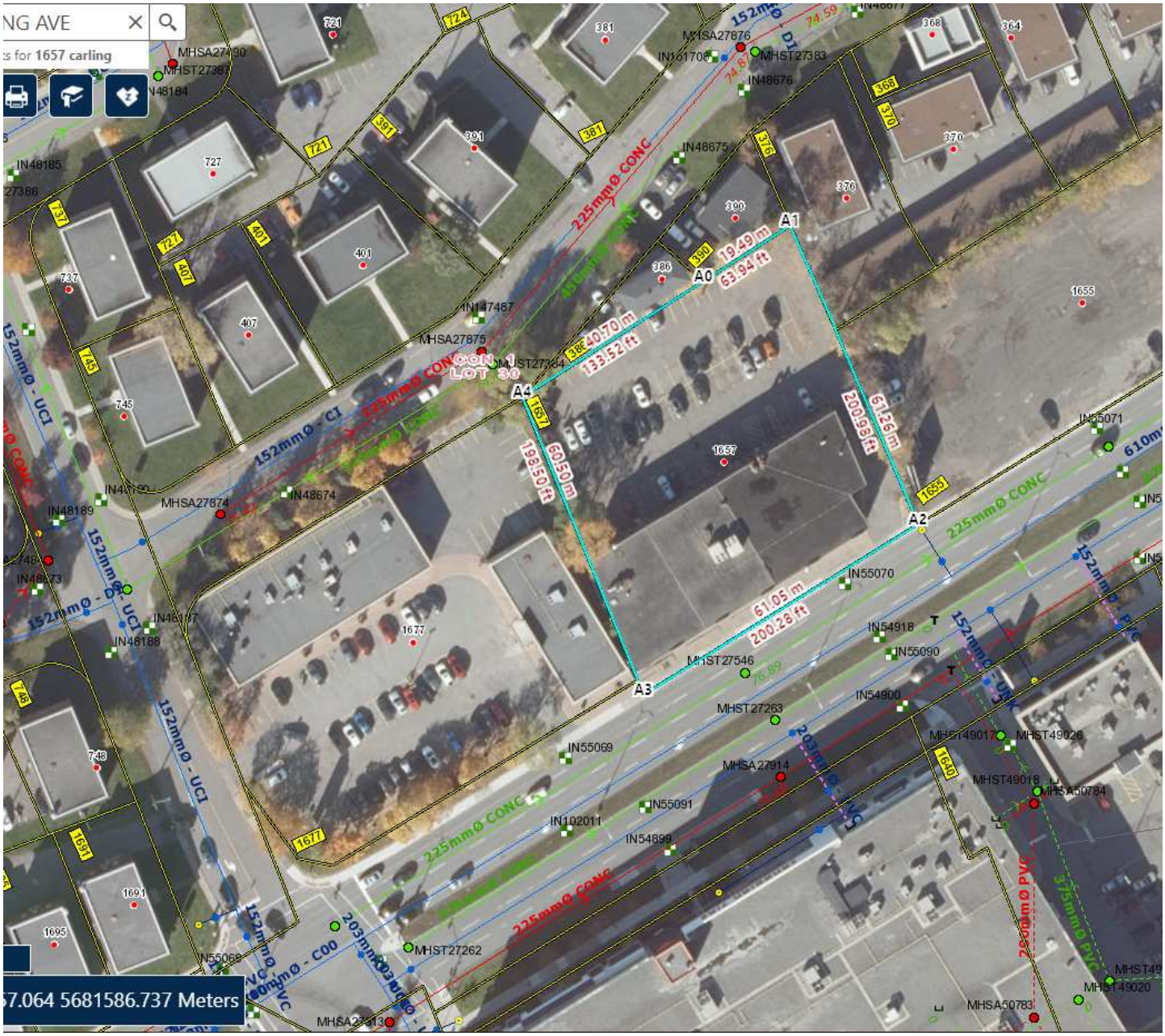
APPENDIX D

Boundary Conditions



From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: July 18, 2023 1:19 PM
To: Kyle Herold <kherold@lrl.ca>
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Hi Kyle

Available fire flow from the Carling 203mm UCI main and 152mm UCI in Tillbury is limited. Please reduce fire flow demand.

The following are boundary conditions, HGL, for hydraulic analysis at 1657 Carling Avenue, (zone 1W) assumed to be connected to BOTH the 203 mm watermain on Carling Avenue and the 152 mm on Tillbury Avenue (see attached PDF for location).

Carling Connection:

Min HGL: 108.8 m

Max HGL: 114.3 m

Available fire flow at 20 psi: 145 L/s, assuming ground elevation of 77.9 m

Tillbury Connection:

Min HGL: 108.6 m

Max HGL: 114.5 m

Available fire flow at 20 psi: 117 L/s, assuming ground elevation of 77.3 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Thanks

Nishant Jhamb, P.Eng
Project Manager |Gestionnaire de projet
Planning, Real Estate and Economic Development Department
Development Review - Central Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 23112, nishant.jhamb@ottawa.ca

From: Kyle Herold
Sent: June 27, 2023 4:11 PM
To: Kersten.Nitsche@ottawa.ca; nishant.jhamb@ottawa.ca
Subject: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Good afternoon Kersten & Nishant,

I'm hoping either of you can help me out, or at least direct me to the right contact.

We are currently working on an adequacy of servicing report for a multi-storey residential building concept to be developed at 1657 Carling Avenue.
We require the water boundary conditions at the site to proceed with our calculations.

Please use the following data to provide the require boundary conditions:
Average Total Daily Demand =2.144 L/s
Maximum Daily Demand = 5.348 L/s
Maximum Hourly Demand = 11.759 L/s

Required Fire Flow = 183.3 L/s

It is requested boundary conditions are provided at Carling Ave and Tillbury Avenue.

For your reference, I have included copies of the Water Supply Calculations, FUS Fire Flow Calculations and concept architectural plans along with this email.

Any questions or concerns, 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

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APPENDIX E

Sanitary Calculations & City Correspondance

LRL Associates Ltd.

Sanitary Sewer Design Sheet

LRL File No.: 220449
Project: Mixed-Use Development
Location: 1657-1673 Carling Ave.
Designed:
Checked:
Date: July 3, 2024
DWG. Reference:

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. AREA	ACCU. POP.	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
			(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	616.0	1.200	616.0	3.3	6.67	0.036	0.036	0.00	0.00	0.0	0.0	0.0	0.02	1.200	1.200	0.40	7.08		150	1.00%	PVC	15.23	0.86	0.47

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

Kyle Herold

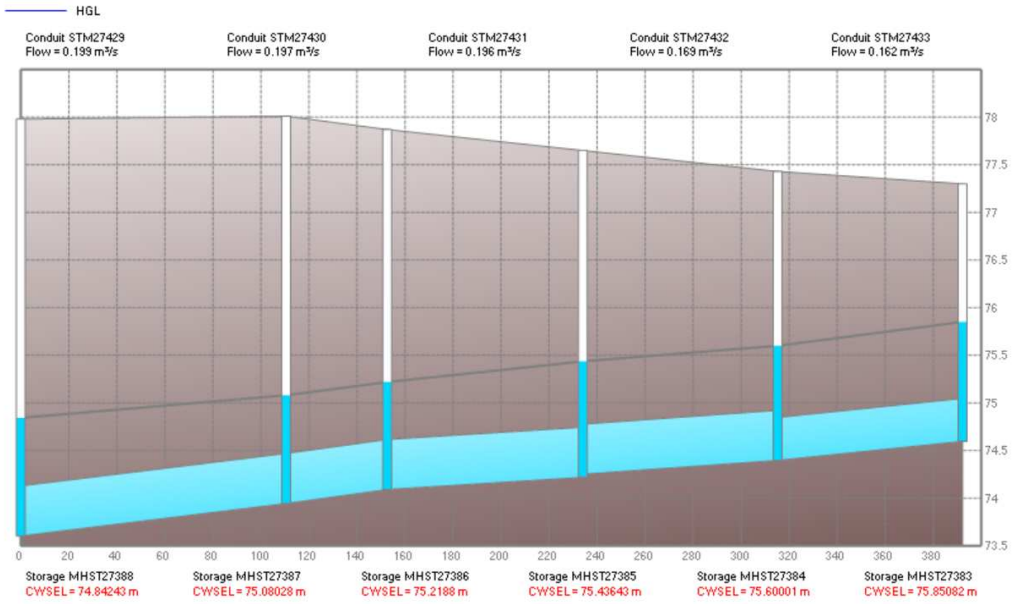
From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: August 23, 2023 10:33 AM
To: Virginia Johnson
Cc: Maxime Longtin; Kyle Herold
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

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

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 Correspondance

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: Adaquacy 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 = Rainfall intensity (mm/hr) = A / (Td + C)^{B}

A = Area (ha)

T_c = Time of concentration (min)

Pre-Development Catchments within Development Area

	Total Area =	**0.391**	**ha**	**∑R =**	**0.86**
		0.391	ha	R =	0.86
	Total Uncontrolled =	**0.391**	**ha**	**∑R =**	**0.86**

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

I_2 = 732.951 / (Td + 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	
Tc =	10	min	min 10mins as per City Guidelines
A =	0.391	ha	
100y Allowable Release Rate =	**41.74**	**L/s**	

Post-development Stormwater Management

					$\sum R_{2\&5}$	$\sum R_{100}$
	Total Site Area =	**0.391**	**ha**	**∑R =**	**0.85**	**1.00**
Controlled	WS-01	0.341	ha	R =	0.90	1.00
Uncontrolled	WS-02	0.050	ha	R =	0.48	0.60
	Total Controlled =	**0.391**	**ha**	**∑R =**	**0.85**	**1.00**

100 Year Post-development Stormwater Management

I_{100} = 1735.688 / (Td + 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 m^3

Kyle Herold

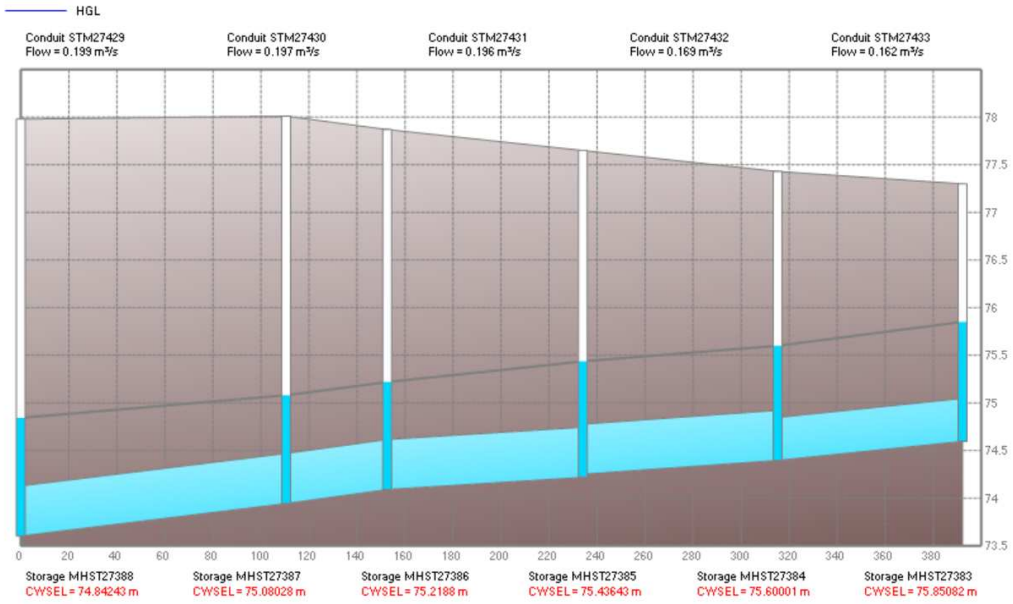
From: Jhamb, Nishant <nishant.jhamb@ottawa.ca>
Sent: August 23, 2023 10:33 AM
To: Virginia Johnson
Cc: Maxime Longtin; Kyle Herold
Subject: RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

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

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
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