david schaeffer engineering ltd

120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613) 836-0856
Fax (613) 836-7183
www.DSEL.ca

SERVICING OPTIONS AND STORMWATER MANAGEMENT REPORT

FOR

SURFACE DEVELOPMENTS 1655 CARLING AVENUE

CITY OF OTTAWA

PROJECT NO.: 19-1131
CITY APPLICATION NO.: D07-12-XX-XXXX

SEPTEMBER 2019 – REV. 1

SERVICING OPTIONS AND STORMWATER MANAGEMENT REPORT
FOR
1655 CARLING AVENUE

SURFACE DEVELOPMENTS

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

SERVICING OPTIONS AND STORMWATER MANAGEMENT REPORT
FOR
1655 CARLING AVENUE
SURFACE DEVELOPMENTS
SEPTEMBER 2019 – REV. 1

CITY OF OTTAWA
PROJECT NO.: 19-1131

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Surface Developments to prepare a Servicing Options and Stormwater Management Report in support of the application for a Zoning By-law Amendment (ZBLA) at 1655 Carling Avenue.

The subject property is located within the City of Ottawa urban boundary, in the Kitchissippi Ward. As illustrated in ***Figure 1***, below, the subject property is located west of the intersection of Carling Avenue and Churchill Avenue North. Comprised of one parcel, the subject property measures approximately ***0.35 ha*** and is zoned Artillery Main Street (AM10 H (20)).

Figure 1: Site Location

The proposed ZBLA would allow for the development of a commercial/residential building fronting onto Carling Avenue. The contemplated development would include approximately ***794 m²*** of ground level retail and underground parking, with access from Carling Avenue. The residential component is comprised of approximately ***260 units*** and ***1073 m²*** of amenity space. A copy of the ***Ground Floor Plan*** is included in ***Drawings/Figures***.

The objective of this report is to provide sufficient detail to demonstrate that the proposed re-zoning and contemplated development are both supported by existing municipal services.

1.1 Existing Conditions

The existing site consists of an asphalt parking lots and few vegetated areas. The elevations range between 77.85 m and 77.63 m, with a minimal grade change of approximately 0.25% from the Northeast to the Southwest corner of the property.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

Carling Avenue

- 203 mm diameter unlined cast iron watermain (c. 1955);
- 610 mm diameter concrete watermain (c. 1958);
- 300 mm diameter concrete sanitary sewer (c. 1952), tributary to the Cave Creek Twin Collector;
- 225/300 mm diameter concrete storm sewer (c. 1959), tributary to the Ottawa River approximately 5.0 km downstream; and
- 375 mm diameter concrete storm sewer, tributary to Ottawa River approximately 5.0 km downstream.

1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

The development is proposed to outlet sanitary to a partially separated sewer sewershed.

Section 53 of the Ontario Water Resources Act Ontario Regulation 525/98, 2. (1) Subsection 53 (1) and (3) indicate that an Environmental Compliance Approval (ECA) is not required for a property which meets the following requirements:

1. The use operation, establishment, alteration, extension or replacement of or a change in a service connection.

The subject property meets the above stated preapproval requirements; therefore, it is anticipated the an ECA through the Ministry of Environment, Conservation and Parks (MECP) will not be required. Consultation between the City of Ottawa and the local MECP representative may be required to confirm this assumption.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002****,*** October 2012.
  (City Standards)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-03*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

  - **Technical Bulletin ISDTB-2018-02**
    City of Ottawa, March 21, 2018.
    (*ISDTB-2018-02*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.
  (OBC)

- **Water Supply for Public Fire Protection**
  Fire Underwriters Survey, 1999.
  (FUS)

- **NFPA 13 – Standard for the Installation of Sprinkler Systems**
  National Fire Protection Association, 2016.
  (NFPA Standards)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 1W pressure zone, as shown by the Pressure Zone map, in ***Appendix B***. A local 203 mm diameter watermain and a 610 mm diameter watermain exist within the Carling Avenue right-of-way.

3.2 Water Supply Servicing Design

Two watermains are available to service the site: the existing 610 mm diameter watermain located in the Westbound lane of Carling Avenue and the existing 203 mm diameter watermain located in the Eastbound lane of Carling Avenue.

In accordance with City of Ottawa technical bulletin ***ISDTB-2014-02***, redundant service connections will be required due to an estimated design flow of greater than 50 m^3/day.

A connection to the existing 610 mm diameter watermain is not feasible due to the large diameter size. As a result, it is contemplated for the development to provide a dual connection to the existing 203 mm diameter watermain within Carling Avenue.

Table 1, below, summarizes the ***Water Supply Guidelines*** employed in the preparation of the preliminary water demand estimate.

Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential Average Daily Demand	280 L/d/P***
Residential Maximum Daily Demand	3.0 x Average Daily *
Residential Maximum Hourly	4.5 x Average Daily *
Commercial Retail / Amenity Space	2.5 L/m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons. -Table updated to reflect ISD-2010-2*
****Daily consumption rate to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, DSEL is submitting for a deviation from the **Water Supply Guidelines***

Table 2, below, summarizes the anticipated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines***.

Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Anticipated Demand[1] (L/min)	Boundary Condition[2] (m H_2O / kPa)
Average Daily Demand	87.0	36.7 / 360.0
Max Day + Fire Flow	256.3 + 18,000 = 18,256.3	Fire Flow @ 140kPa = 135 L/s (8100 L/min)
Peak Hour	385.9	108.9 / 308.0

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 77.5 m. See ***Appendix B.***

Fire flow requirements are to be determined in accordance with Local Guidelines (**ISDTB-2018-02**), City of Ottawa ***Water Supply Guidelines***, and the Ontario Building Code.

Using the Technical Bulletin **ISDTB-2018-02** method, a conservative estimation of fire flow had been established. As coordinated with the building architect, the following assumptions were made:

- Type of construction - Limited Combustible;
- Occupancy type –Non-Combustible; and
- Sprinkler Protection – Fully Supervised Sprinklered System.

The above assumptions result in an estimated fire flow of approximately ***18,000 L/min***, noting that actual building materials selected will affect the estimated flow.

For the purpose of estimating fire flow, the short method within the National Fire Protection Association (NFPA) standards was utilized. As indicated by Section 11.2.2 from the ***NFPA Standards***, fire flow requirements are to be determined by combining the required flow rate for the sprinkler system, along with the anticipated hose stream. As indicated by Table 11.2.2.1 and Table 11.2.3.1.2 extracted from the ***NFPA Standards*** and included in ***Appendix B***, the anticipated fire flow requirements for the sprinkler system is ***3,200 L/min*** (850 gpm) and the anticipated internal and external total combined inside and outside hose stream demand is ***950 L/min*** (250 gpm).

As a result, the total fire flow is anticipated to be ***4,150 L/min*** (1,100 gpm). Based on the boundary conditions provided by the City of Ottawa, sufficient supply is available for fire flow. 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.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water available flow during a minimum pressure scenario, as indicated by the correspondence in ***Appendix B***. As shown by ***Table 2***, above, the minimum and maximum pressures fall within the required range identified in ***Table 1,*** also above.

3.3 Water Supply Conclusion

An existing 203 mm diameter watermain within Carling Avenue is available to service the development.

The estimated water demand was submitted to the City of Ottawa for establishing boundary conditions. The City provided both the anticipated minimum and maximum water pressures. The minimum and maximum pressures fall within the required range identified in ***Table 1.*** Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range.

Fire flow requirements were estimated in accordance with ***NFPA Standards***. Based on the boundary conditions provided by the City of Ottawa, sufficient flow is available to service the development.

Per ***Table 1,*** DSEL employed a daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, DSEL is submitting for a deviation from the ***Water Supply Guidelines***.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Cave Creek Collector Sewer catchment area, as shown by the City sewer mapping, included in ***Appendix C***. An existing 300 mm diameter sanitary sewer within Carling Avenue is available to service the contemplated development. The Carling Avenue sanitary sewer is tributary to 1200 mm diameter combined sewer within Byron Avenue (referred to as the Cave Creek Collector Twin Sewer), located approximately 2.5 km downstream of the site.

4.2 Wastewater Design

There is currently one sanitary sewer available within Carling Avenue to service the development. As a result, it is anticipated that the contemplated development will be serviced via the existing 300 mm diameter sanitary sewer within Carling Avenue.

Table 3, below***,*** summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 3
Wastewater Design Criteria

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Corrector Factor 0.8
Commercial Floor Space	5 $L/m^2/d$
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 4, below, demonstrates the anticipated peak flow from the contemplated development. See ***Appendix C*** for associated calculations.

Table 4
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	1.63
Estimated Peak Dry Weather Flow	4.99
Estimated Peak Wet Weather Flow	5.09

The estimated sanitary flow based on the ***Ground Floor Plan***, provided in ***Drawings/Figures,*** anticipates a peak wet weather flow of ***5.09 L/s***.

In order to assess the available capacity, a sanitary analysis was conducted for the local municipal sanitary sewers located within Carling Avenue, across the frontage of the subject property. The catchment area serviced by the 300 mm diameter sanitary sewer was identified and evaluated by reviewing existing developments and zoning within the area. The analysis was conducted from the site to the upstream extents of the drainage area located near the intersection of Carling Avenue and Churchill Avenue North, as shown by the sanitary drainage plan ***Sanitary Drainage Plan,*** included in ***Appendix C***.

City of Ottawa Technical Bulletin ***ISTB-2018-01*** was employed to generate an estimate of the existing wastewater flow conditions within the sewer.

Based on the sanitary analysis, there is an available residual capacity of ***34.4 L/s***; detailed calculations are included in ***Appendix C***.

The analysis above indicates that sufficient capacity is available in the local sewers to accommodate the contemplated development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Cave Creek Collector Twin Sewer. Based on the above sanitary analysis, sufficient capacity is available to accommodate the anticipated ***5.09 L/s*** peak wet weather flow from the contemplated development.

The proposed wastewater design conforms to all relevant ***City Standards***.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located within the Ottawa Central sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Ottawa River watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA). Consultation with the RVCA is located in ***Appendix A***.

It was assumed that the existing development contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized in ***Table 5,*** below:

Table 5
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	63.0
5-year	85.5
100-year	174.4

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa, where the proposed development is required to:

- Meet an allowable release rate based on a Rational Method Coefficient of 0.40, employing the City of Ottawa IDF parameters for a 2-year storm with a calculated time of concentration greater than or equal to 10 minutes;
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site; and
- Quality controls are not required for the proposed development due to the site's distance from the outlet; correspondence with the RVCA is included in ***Appendix A***.

Based on the above the allowable release rate for the proposed development is ***29.8 L/s***.

5.3 Proposed Stormwater Management System

There is an existing 375 mm diameter storm sewer and an existing 300 mm diameter storm sewer available within Carling Avenue to service the contemplated development.

Both available sewers are tributary to the West Hintonburg Storm Trunk and ultimately the Ottawa River, which is approximately 5 km downstream of the site.

To meet the stormwater objectives the proposed development may contain a combination of roof top flow attenuation, along with surface and subsurface storage.

Table 6, below, summarizes post-development flow rates. The following storage requirement estimate assumes that approximately 10% 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 6
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas	5.1	0.0	10.8	0.0
Attenuated Areas	9.4	56.2	18.9	112.4
Total	**14.5**	**56.2**	**29.8**	**112.4**

It is anticipated that approximately ***112.4 m^3*** of storage will be required on site to attenuate flow to the established release rate of ***29.8 L/s***; storage calculations are contained within ***Appendix D***.

Actual storage volumes will need to be confirmed at the detailed design stage based on a number of factors, including grading constraints.

5.4 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year storm in accordance with City of Ottawa, ***City Standards***. The post-development allowable release rate was calculated as ***29.8 L/s***. It is estimated that ***112.4 m^3*** of on-site storage will be required to meet this release rate.

Based on consultation with the RVCA, stormwater quality controls are not required.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas and Hydro services currently exist within the Carling Avenue right-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

7.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Surface Developments to prepare a Servicing Options and Stormwater Management report in support of the application for a Zoning By-law Amendment (ZBLA) at 1655 Carling Avenue. The preceding report outlines the following:

- Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the contemplated development with water within the City's required pressure range;
- Fire flow requirements were estimated in accordance with ***NFPA Standards***. Based on the boundary conditions provided by the City of Ottawa, sufficient flow is available to service the development;
- The contemplated development is anticipated to have a peak wet weather flow of ***5.09 L/s***; Based on the sanitary analysis conducted, the existing municipal sewer infrastructure has sufficient capacity to support the development;
- Based on City Standards the contemplated development will be required to attenuate post development flows to an equivalent release rate of ***29.8 L/s/*** for all storms up to and including the 100-year storm event;
- It is contemplated that stormwater objectives may be met through storm water retention via roof top, surface and subsurface storage, it is anticipated that ***112.4 m^3*** of onsite storage will be required to attenuate flow to the established release rate above; and
- Based on consultation with the RVCA, stormwater quality controls are not required.

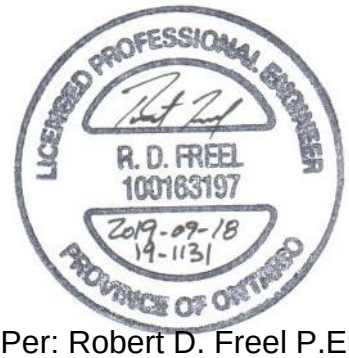
Prepared by,
David Schaeffer Engineering Ltd.

Per: Charlotte M. Kelly, EIT

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alison J. Gosling, EIT

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Robert D. Freel P.Eng

z:\projects\19-1131_surface_1655-carling-ave\b_design\b3_reports\b3-2_servicing (dsel)\2019_09_sub1\aes-2019-09-18_1655-carling_rpt.docx

APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

19-1131 09/09/2019

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☐	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	N/A
☐	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	N/A

4.2 Development Servicing Report: Water		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☐	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	N/A
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☐	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☐	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
☐	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
☐	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
☐	Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

Pre-Application Consultation Meeting Notes

1655 Carling Avenue – PC2019-0072
April 10, 2019
Ottawa City Hall, Room 4103e

Attendees:

Jakub Ulak, Surface Developments (JU)
Gary Ludington – Community Association (GL)
Brian Casagrande – Fotenn (BC)
Simon Deiaco, City of Ottawa (SD)
Christopher Moise, City of Ottawa (CM)
Sean Wessel, City of Ottawa (SW)

Regrets:

Subject: 1655 Carling Avenue

Meeting notes:

Opening & attendee introduction

- ALL - Introduction of meeting attendees
- BC - Overview of proposal:
    - Proposed 12 storey residential building (approx. 200 units) with below grade parking (approx. 100 spaces) and access from Carling Avenue.
    - Some concerns from the design team with respect to the road widening, if taken at the full amount would have a significant impact on the project. As a result, the concept is in preliminary stages until this requirement is resolved.
    - Property is designation AM10, with a height limit of 20 metres. OPA 150 has language which allows for the release of additional height in certain circumstances. Both staff and Fotenn are awaiting the final version of the OP amendments and the policy language for Arterial Mainstreets which are not yet finalized.
    - SD to follow up on the road widening requirements.

Preliminary comments and questions from staff and agencies, including follow-up actions:

- **Planning**

- The current policies of OPA 150 as adopted by Council outline conditions where additional height could be permitted. A subsequent report on the resolution of OPA 150 is expected in May 2019 based on negotiations with stakeholders.

- Based on the policies currently endorsed by Council, it is staffs opinion that it has not been demonstrated how this site would qualify for the consideration of additional height.

- The existing context and zoning suggest that a building with a 20 metre height limit is more appropriate for the site. Planning staff have significant concerns with the introduction of a 12 storey building on this parcel giving the existing zoning and planning policies. The relationship to the interior side yards also needs to be explored. The proposed 0m setbacks are a concern, along with the lack of transition to the lands to the north.

- Section 37 requirements / Community benefits – are to be determined. They may also be a required as part of the yet unresolved Arterial Mainstreet policies.

- Design guidelines – Refer to the design guidelines for Arterial Mainstreets and High Rise Buildings.

- A wind study would be required for a building greater than 10 storeys.

- The use of underground parking is encouraged, regardless of the ultimate design.

- **Urban Design**

  - Staff recommend that the applicant engage an architect as soon as possible as this proposal faces a number of challenges and due to its use, scale and configuration will require an architect's involvement.

  - Some of these challenges include:
    - Significant increase in scale from current zoning of 6 storeys to 12 storeys;
    - Impact of not adhering to the ROW protection limits and building closer to the street;
    - Building to 0m side lot line condition (both ease and west side yards);
    - Impact of height and lack of transition to R4 abutting lots to the north;

  - Additional contextual analysis is recommended to understand the relationships and impacts of the proposal and we recommend the proposal attend an Informal visit with the City's UDRP to further discuss and evaluate various scenarios of development for the site including approaches for a 6 storey, 9 storey and proposed 12 storey option.

- **Engineering**

- A 610mm dia. Conc. Watermain (c. 1955) is available on Carling Ave. in the Westbound lane.
- A 203mm dia. UCI Watermain (c. 1958) is available on Carling Ave. in the Eastbound lane.
- A 300 mm dia. Conc. Sanitary Sewer (c. 1952) is available on Carling Ave., which drains to 1200 mm dia. Combined Sewer on Byron Ave. which then flows to the Interceptor Sewer.
- A 300 mm dia. Conc. Storm Sewer (c. 1959) is available on Carling Ave. in the Westbound lane, which drains to the West Hintonburg Storm Trunk and then to the Cave Creek Storm where it outlets to the Ottawa River.
- A 375 mm dia. Conc. Storm Sewer (c. ?) is available on Carling Ave. in the Eastbound lane, which drains to the West Hintonburg Storm Trunk and then to the Cave Creek Storm where it outlets to the Ottawa River.
- The following apply to this site and any development within a combined sewer area:
- Total (San & Stm) allowable release rate will be 2 year pre-development rate.
- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.4
- TC = 20 minutes or can be calculated.
- TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100 year storm event must be detained on site.
- Two separate sewer laterals (one for sanitary and other for storm) will be required.
- As an MECP ECA will be required due to this being considered a partially separated sewer system with a downstream connection to a Combined Sewer on Byron Ave.:
- Please note that once the review has been completed and the Sr. Engineer is satisfied and ready to sign off on the application, after the PM recommendations 3 final bound copies including 3 CD Rom disks will be required to accompany the applications with MECP and for City of Ottawa records.
- Foundation drains are to be independently connected to sewermain (separated or combined) unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

- Roof drains are to be connected downstream of any incorporated ICD within the SWM system.
- **Other:**

Environmental Source Information:

City of Ottawa - Historical Land Use Inventory (HLUI)

HLUI database is currently undergoing an update. The updated HLUI will include additional sources beyond those included in the current database, making the inclusion of this record search even more important.

Although a municipal historic land use database is not specifically listed as required environmental record in O. Reg 153/04, Schedule D, Part II states the following:

Records review, specific objectives

The following are the specific objectives of a records review:

1. To obtain and review records that relate to the phase one property and to the current and past uses of and activities at or affecting the phase one property in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

2. To obtain and review records that relate to properties in the phase one study area, other than the phase one property, in order to determine if an area of potential environmental concern exists and to interpret any area of potential environmental concern.

- Further to above, it is ttherefore reasonable to request that the HLUI search be included in the Phase One ESA to meet the above objectives.
- Due to more sensitive use, a Record of Site Condition (RSC) is required. Ensure Phase I, and if applicable, Phase II ESA's speak to required RSC.
- Environmental Noise Study is required due to within 500 m of Hwy #417 and 100m proximity of the following roadways:
- Carling Avenue, Churchill Avenue, Tillbury Avenue, Melbourne Avenue and Cole Avenue.
- Stationary Noise – consultant to speak to this in their report or provide a separate report as per City NCG and NPC 300 Guidelines.
- Capital Projects - Road and Sewer work planned for Carling Ave. (East) up to and including Churchill Ave.

Moratoriums

- Mor-LN05245 - 3 years for all Road Cut and Resurfacing ending in 2021– ISD
- See Road Activity By-law Section 14 and Schedule A
- Please note that on April 10, 2019 City Council approved changes to the Road Activity By-law that will come into effect on July 1, 2019. These changes are part of the first of two phases of the review of the by-law. A copy of the staff report explaining these changes and Supporting Document 1 of the staff report is available and provides a summary of the changes.
- Water Supply Redundancy – Fire Flow:
- Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m^3 / day (0.5787 l/s per day)

Source Protection Screening:

City will provide screening information at a later date.

Where underground storage (UG) and surface ponding are being considered:

- Show all ponding for 5 and 100 year events
- Note - There must be at least 15cm of vertical clearance between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.
- Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.
- Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2 and 100 year event storage requirements.
- In regards to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.
- Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, upon request.

- Please be advised that it is the responsibility of the applicant and their representatives/consultants to verify information provided by the City of Ottawa.
- Please contact City View and Release Info Centre at Ext. 44455

- **Transportation**

  - The project team will be required to complete a TIA screening form. Please contact Wally Dubyk at Ext. 13783. The screening from will need to be completed prior to any application being submitted.

  - Right-of-way requirement will be 4.0 metres from the existing property line. The City would not be taking the full road widening requirement in this specific case.

- **Parks**

  - Cash-in-lieu of parkland dedication would be require through the site plan control process. The City will not be seeking land through this project.

- **Conservation Authority**

  - Applicant to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Provide correspondence in Report.

Questions and comments from the Community Association representative (GL)

- Question was asked about the amount of parking proposed. Approximately 100 spaces.

- Concern with the impact on traffic in the area as Carling Avenue is only a right in and right out movement. Traffic would have to turn onto Cole to get back to Churchill and Carling which is signalized.

Submission requirements and fees

1. Rezoning Application (Minor) and potential Official Plan Amendment if Arterial Mainstreet policies are not met.

2. Site Plan Control (Manager Approval, Public Consultation)

******please note that as of June 1, 2019 a new site plan control process and fees will be in place. The proposal would be considered a "complex" application under the new structure.***

Next steps

- Staff encourage applicant to discuss the proposal with Councillor, community groups and neighbours as the concept evolves.
- As noted above, the resolution of OPA 150 with respect to the Arterial Mainsteet policies are resolved.
- Minutes and submission requirements to follow (SD).
- A second meeting may be beneficial give the early stages of the projects development and the additional information required (i.e. right of way protection).

Charlotte Kelly

From: Charlotte Kelly
Sent: September 5, 2019 12:28 PM
To: 'shawn.wessel@ottawa.ca'
Cc: Alison Gosling
Subject: Boundary Condition Request - 1655 Carling Avenue
Attachments: wtr-2019-09-05_19-1131.pdf; 1655 CARLING-31JULY2019.pdf

Good Afternoon Shawn,

We would like to request water boundary conditions for Carling Avenue using the following contemplated development demands:

1. Location of Service / Street Number: 1655 Carling Avenue

2. Type of development and the amount of fire flow required for the contemplated development:

- Based on coordination with the architect the development would include approximately ***1867 m²*** of commercial/amenity space (***794 m²*** commercial and ***1,073 m²*** amenity) and a ***260 unit,*** 24-storey condominium with underground parking. Please refer to the site plan attached.
- It is anticipated that the development will have a dual connection to be serviced from the existing 203mm diameter watermain within Carling Avenue, as shown by the attached map.
- Fire demand based on Technical Bulletin ISTB-2018-02 has been used to calculate an estimate the max fire demand of ***18,000 L/min***. Refer to the attached for detailed calculations.

Additional Demand	L/min	L/s
Avg. Daily	87.0	1.45
Max Day	256.3	4.27
Peak Hour	385.9	6.43

If you have any questions, please feel free to contact me.

Thank you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

Charlotte Kelly

Subject: FW: 1655 Carling Avenue

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: September 4, 2019 1:51 PM
To: Charlotte Kelly <CKelly@dsel.ca>
Subject: 1655 Carling Avenue

Hi Charlotte,

You are correct based on the combination of factors (site design, and distance to outlet) the RVCA will not require quality control for the proposal submitted (24 storey mixed use building). Best management practices are encouraged where possible.

Thank you,

Eric Lalande, MCIP, RPP
Planner | x1137

Rideau Valley Conservation Authority

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

APPENDIX B

Water Supply

CITY OF OTTAWA - WATER DISTRIBUTION SYSTEMS FACILITIES AND FEEDERMAINS

FLEET STREET P.S.

LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.

SUBJECT SITE

TANNIA PURIFICATION PLANT & P.S. & RES.

CAMPEAU DR. P.S.

ENERGY MINES & RESOURCES P.S.

CARLINGTON HEIGHTS P.S. & RES.

1W

ME

WR

PS

WTP

PR

PS

RES

HEMLOCK

BEECHWOOD

RAMP

KING EDWARD

RIDEAU

MACKENZIE

WALLER

NICHOLAS

LAURIER

WELLINGTON

SLATER

METCALFE

O'CONNOR

ELGIN

GREENFIELD

SOMERSET

KENT

LYON

CATHERINE

ALBERT

MAIN

PARKDALE

SCOTT

GLADSTONE

PRESTON

BOOTH

BRONSON

HOLLAND

CARLING

KIRKWOOD

CHURCHILL

WOODROFFE

FAIRLAWN

BROOKFIELD

RIVERSIDE

WALKLEY

MCCARTHY

FISHER

PRINCE OF WALES

BASELINE

MEADOWLANDS

COLONNADE

CENTREPOINTE

RICHMOND

BAYSHORE

PINECREST

IRIS

305mm

406mm

610mm

914mm

1067mm

1220mm

1372mm

1524mm

762mm

457mm

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	-	0
Semi-detached	2.7	-	0
Townhouse	2.7	-	0
Apartment			0
Bachelor	1.4	-	0
1 Bedroom	1.4	166	233
2 Bedroom	2.1	94	198
3 Bedroom	3.1	-	0
Average	1.8	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	431	120.7	83.8	362.0	251.4	543.1	377.1

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5 $L/m^2/d$	794	1.99	1.4	3.0	2.1	5.4	3.7
Ammenity Space	2.5 $L/m^2/d$	1,073	2.68	1.9	4.0	2.8	7.2	5.0
Industrial - Light	35,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d	-	0.00	0.0	0.0	0.0	0.0	0.0
Total I/CI Demand			4.7	3.2	7.0	4.9	12.6	8.8
Total Demand			**125.3**	**87.0**	**369.0**	**256.3**	**555.7**	**385.9**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	21491.3	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	25801.4	L/min	
	26000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Non-Combustible	-25%	
Fire Flow	**19500.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-9750**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	10.1m-20m	30	2	60	13%	
S	Non-Combustible	30.1m-45m	25	2	50	5%	
E	Non-Combustible	10.1m-20m	26	1	26	12%	
W	Non-Combustible	10.1m-20m	27	2	54	13%	
		% Increase				**43%**	*value not to exceed 75%*

Increase	**8385.0**	**L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	18135.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	18000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA Architecture
-Calculations based on Fire Underwriters Survey - Part II

Boundary Conditions Unit Conversion

Grnd Elev 77.5

	Height (m)	m H_2O	PSI	kPa		L/s	L/min
Avg. DD	114.2	36.7	52.2	360.0	Fire Flow @ 140kF	135	8100
Fire Flow Peak Hour	108.9	31.4	44.7	308.0			

Charlotte Kelly

Subject: Boundary Condition Request - 1655 Carling Avenue
Attachments: 1655 Carling Sept 2019.pdf

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: September 9, 2019 2:04 PM
To: Charlotte Kelly <CKelly@dsel.ca>
Subject: Boundary Condition Request - 1655 Carling Avenue

Good afternoon Ms. Kelly.

Please find requested boundary conditions as per below and attached.

The following are boundary conditions, HGL, for hydraulic analysis at 1655 Carling (zone 1W) assumed to be connected to the 203mm on Carling (see attached PDF for location).

Minimum HGL = 108.9m

Maximum HGL = 114.2m

Available Flow @ 20psi = 135 L/s assuming a ground elevation of 77.5m

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.

Out of Office Notice:
Please be advised that I will be away from the office September 11, 2019 returning on the 17th.

If you require additional information or clarification, please do not hesitate to contact me anytime.

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

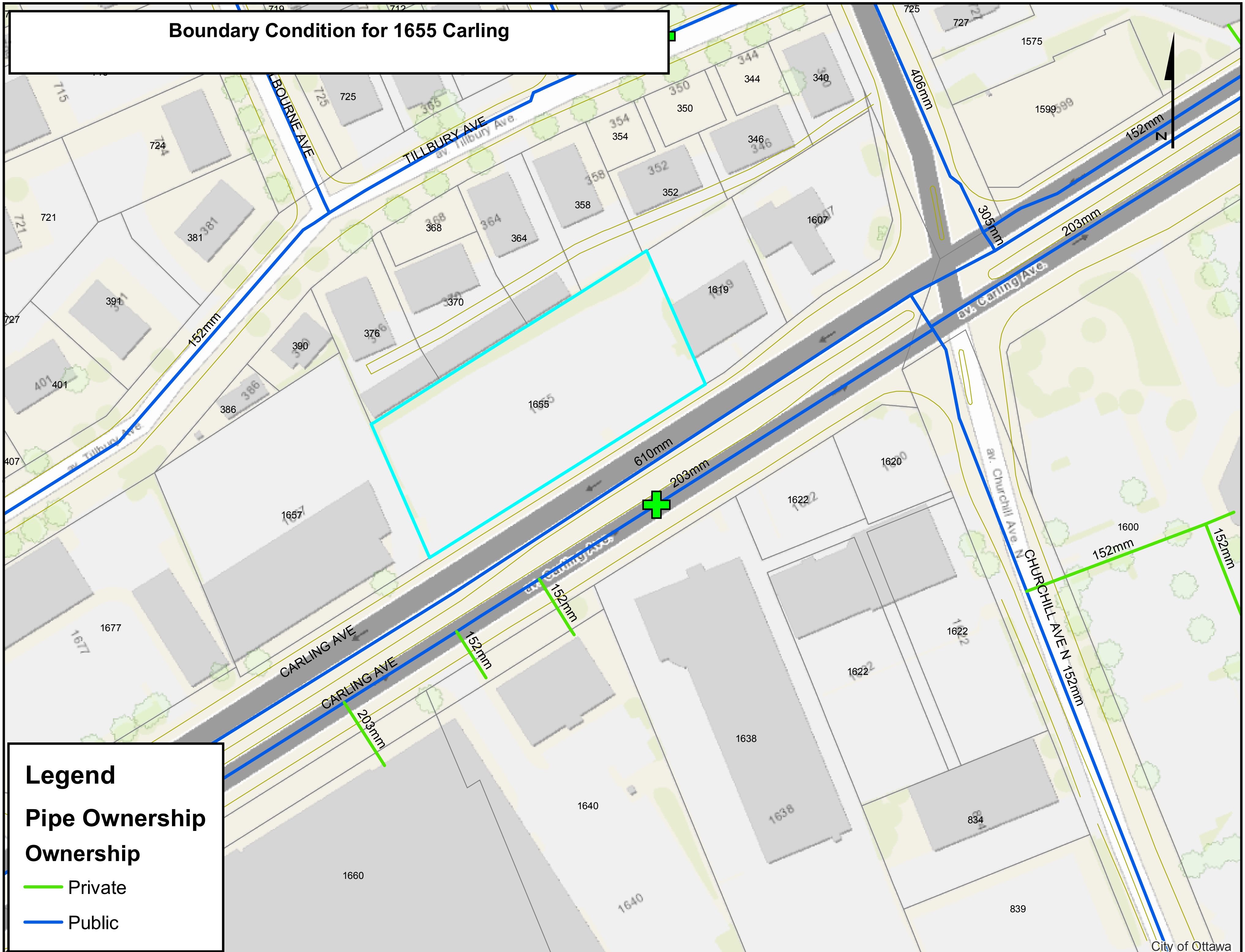
Development Review Central Branch | Direction de l’examen des projets d’aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l’infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 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

Please consider the environment before printing this email

'

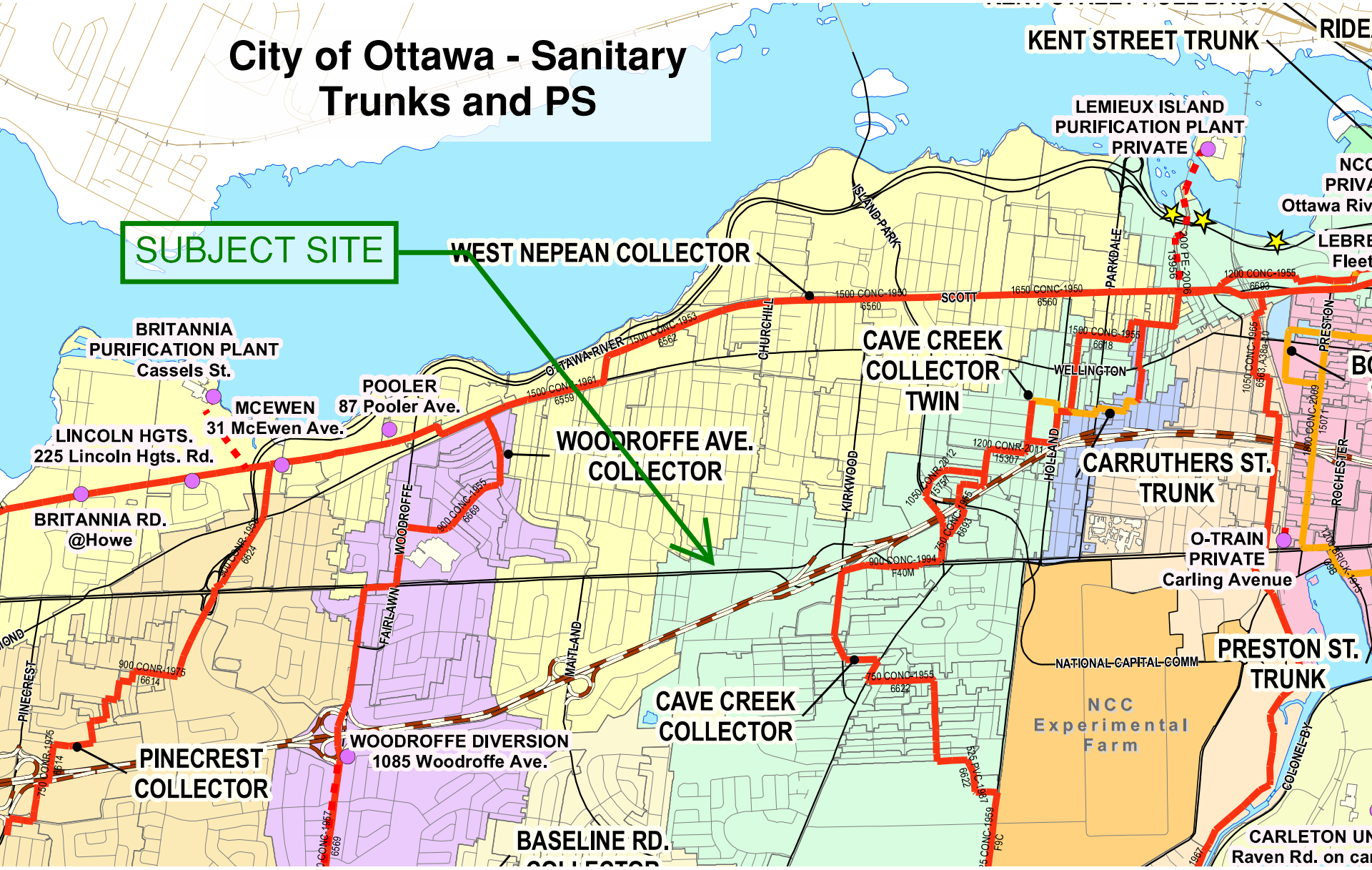
'

Boundary Condition for 1655 Carling



APPENDIX C

Wastewater Collection


City of Ottawa - Sanitary Trunks and PS
SUBJECT SITE
WEST NEPEAN COLLECTOR
KENT STREET TRUNK
LEMIEUX ISLAND PURIFICATION PLANT PRIVATE
BRITANNIA PURIFICATION PLANT Cassels St.
MCEWEN 31 McEwen Ave.
POOLER 87 Pooler Ave.
LINCOLN HGTS. 225 Lincoln Hgts. Rd.
BRITANNIA RD. @Howe
WOODROFFE AVE. COLLECTOR
CAVE CREEK COLLECTOR TWIN
CARRUTHERS ST. TRUNK
O-TRAIN PRIVATE Carling Avenue
PRESTON ST. TRUNK
CAVE CREEK COLLECTOR
WOODROFFE DIVERSION 1085 Woodroffe Ave.
PINECREST COLLECTOR
BASELINE RD.
NCC Experimental Farm
NATIONAL CAPITAL COMM
SCOTT
WELLINGTON
HOLLAND
KIRKWOOD
CHURCHILL
ISLAND PARK
PARKDALE
PRESTON
ROCHESTER
WOODROFFE
FAIRLAWN
MAITLAND
PINEGREST
COLONEL BY
OTTAWA RIVER

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.350 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.02 L/s**
Infiltration / Inflow (Wet)	**0.10 L/s**
Infiltration / Inflow (Total)	**0.12 L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	166	233
2 Bedroom	2.1	94	198
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**431**
Average Domestic Flow	**1.40 L/s**
Peaking Factor	**3.41**
Peak Domestic Flow	**4.76 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 L/m^2/d	794	0.09
Office	75 L/9.3m2/d	-	0.00
Ammenity	5 L/m^2/d	1,073	0.12
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow	**0.22**
Peak Institutional / Commercial Flow	0.22
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.22**

** assuming a 12 hour commercial operation*
*** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B*

Total Estimated Average Dry Weather Flow Rate	**1.63 L/s**
Total Estimated Peak Dry Weather Flow Rate	**4.99 L/s**
Total Estimated Peak Wet Weather Flow Rate	**5.09 L/s**

SANITARY SEWER CALCULATION SHEET

CLIENT: **Surface Developments**
LOCATION: **1655 Carling Avenue**
FILE REF: **19-1131**
DATE: **09-Sep-19**

DESIGN PARAMETERS

Avg. Daily Flow Res.	280	L/p/d	Peak Fact Res. Per Harmons: Min = 2.0, Max =4.0		Infiltration / Inflow	0.33	L/s/ha
Avg. Daily Flow Comm.	28,000	L/ha/d	Peak Fact. Comm.	1.5	Min. Pipe Velocity	0.60	m/s full flowing
Avg. Daily Flow Instit.	28,000	L/ha/d	Peak Fact. Instit.	1.5	Max. Pipe Velocity	3.00	m/s full flowing
Avg. Daily Flow Indust.	35,000	L/ha/d	Peak Fact. Indust. per MOE graph		Mannings N	0.013	

Location			Residential Area and Population									Commercial		Institutional		Industrial			Infiltration				Pipe Data							
Area ID	Up	Down	Area	Number of Units				Pop.	Cumulative		Peak.	Q_{res}	Area	Accu.	Area	Accu.	Area	Accu.	Q_{C+I+I}	Total	Accu.	Infiltration	Total	DIA	Slope	Length	$A_{hydraulic}$	R	Velocity	Q_{cap}	Q / Q full
				by type					Area	Pop.	Fact.			Area		Area		Area		Area	Area	Flow	Flow								
			(ha)	Singles	Semi's	Town's	Apt's		(ha)		(-)	(L/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(mm)	(%)	(m)	(m^2)	(m)	(m/s)	(L/s)	(-)
	M1	M2	0.270				30	54.0	0.270	54.0	4.00	0.70	6.11	6.11		0.00	0.00	0.00	5.3	6.380	6.380	1.786	7.79	300	0.19	102.0	0.071	0.075	0.60	42.2	0.18

*A conservative minimum slope of 0.19% was used for all 300 mm diamter existing sanitary sewers.

SANITARY DRAINAGE PLAN

APPENDIX D

Stormwater Management

1655 Carling Avenue
Existing Site Conditions

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2012

Existing Drainage Charateristics From Internal Site

Area	0.350	ha
C	0.84	Rational Method runoff coefficient
L	92.2	m
Up Elev	77.86	m
Dn Elev	77.35	m
Slope	0.6	%
Tc	9.9	min

	Imp.	Perv.	Total
Area	0.320	0.030	0.350
C	0.9	0.2	0.84

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1-C)L^{0.5}}{S^{0.333}}$$

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

	2-year	5-year	100-year	
i	77.1	104.7	179.4	mm/hr
Q	63.0	85.5	174.4	L/s

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Stormwater - Proposed Development
City of Ottawa Sewer Design Guidelines, 2004

Target Flow Rate

Area	0.350	ha
C	0.40	Rational Method runoff coefficient
Tc	10.0	min

	2-year	
i	76.5	mm/hr
Q	29.8	L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area	0.035	ha
C	0.50	Rational Method runoff coefficient

	5-year					**100-year**				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual}* (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10.0	104.2	5.1	5.1	0.0	0.0	178.6	10.8	10.8	0.0	0.0

Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Total Area	0.315	ha
C	0.85	Rational Method runoff coefficient

	5-year					**100-year**				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	77.5	9.4	68.1	40.9	178.6	156.2	18.9	137.3	82.4
15	83.6	62.1	9.4	52.7	47.5	142.9	125.0	18.9	106.1	95.5
20	70.3	52.2	9.4	42.8	51.4	120.0	105.0	18.9	86.1	103.3
25	60.9	45.3	9.4	35.9	53.8	103.8	90.9	18.9	72.0	107.9
30	53.9	40.1	9.4	30.7	55.2	91.9	80.4	18.9	61.5	110.7
35	48.5	36.1	9.4	26.6	56.0	82.6	72.3	18.9	53.3	112.0
40	44.2	32.9	9.4	23.4	56.2	75.1	65.8	18.9	46.8	112.4
45	40.6	30.2	9.5	20.8	56.1	69.1	60.4	18.9	41.5	112.1
50	37.7	28.0	9.5	18.5	55.6	64.0	56.0	18.9	37.1	111.2
55	35.1	26.1	9.5	16.7	55.0	59.6	52.2	18.9	33.3	109.8
60	32.9	24.5	9.5	15.0	54.1	55.9	48.9	18.9	30.0	108.0
65	31.0	23.1	9.5	13.6	53.1	52.6	46.1	18.9	27.2	105.9
70	29.4	21.8	9.5	12.4	51.9	49.8	43.6	18.9	24.7	103.6
75	27.9	20.7	9.5	11.3	50.7	47.3	41.3	18.9	22.4	101.0
80	26.6	19.8	9.5	10.3	49.3	45.0	39.4	18.9	20.5	98.2
85	25.4	18.9	9.5	9.4	47.8	43.0	37.6	18.9	18.7	95.3
90	24.3	18.1	9.5	8.6	46.3	41.1	36.0	18.9	17.1	92.2
95	23.3	17.3	9.5	7.8	44.7	39.4	34.5	18.9	15.6	88.9
100	22.4	16.7	9.5	7.2	43.0	37.9	33.2	18.9	14.3	85.6
105	21.6	16.1	9.5	6.5	41.3	36.5	31.9	18.9	13.0	82.1
110	20.8	15.5	9.5	6.0	39.5	35.2	30.8	18.9	11.9	78.5

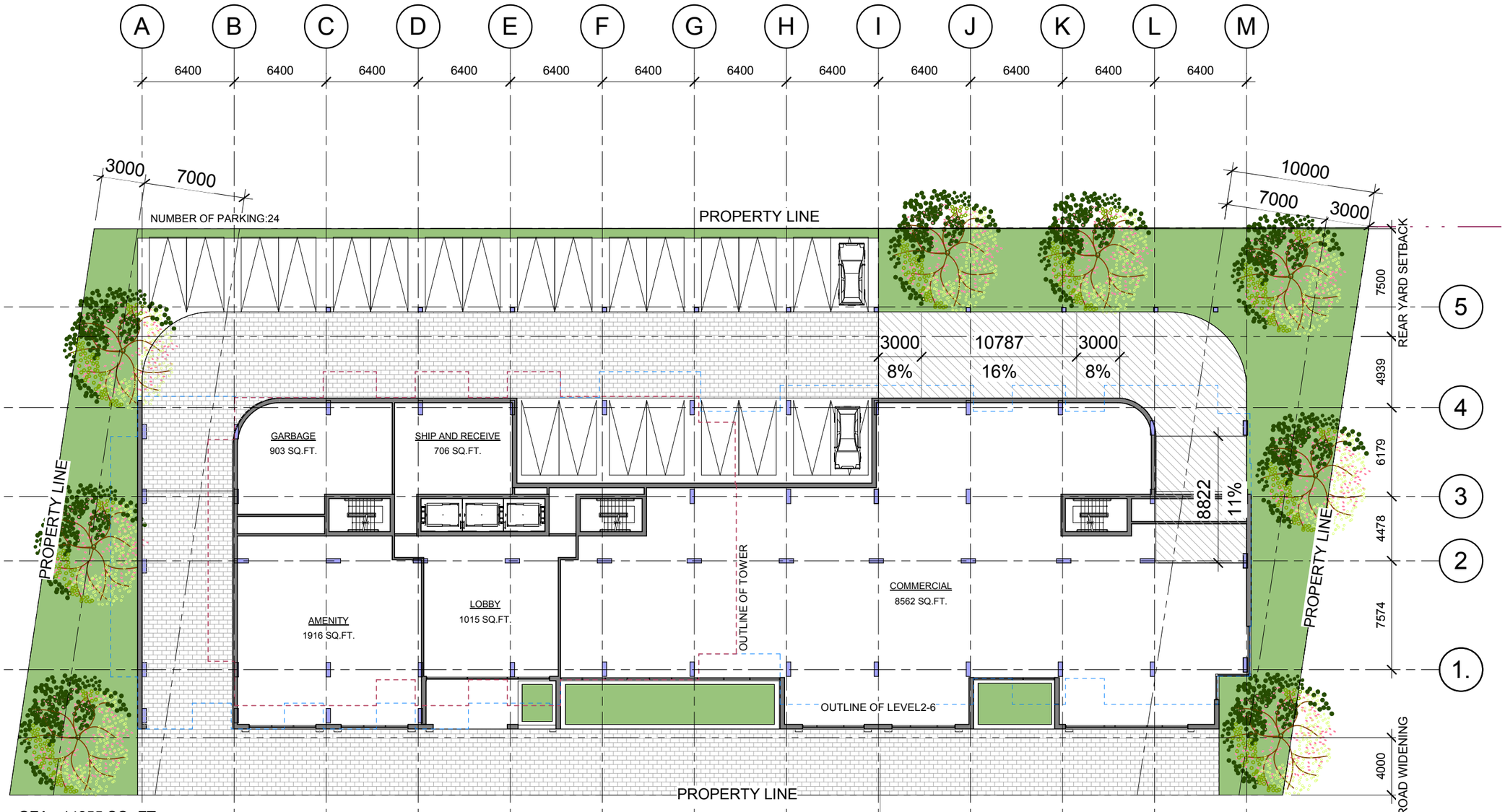
Note:
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

5-year $Q_{attenuated}$	**9.45 L/s**	**100-year $Q_{attenuated}$**	**18.91 L/s**
5-year Max. Storage Required	**56.2 m^3**	**100-year Max. Storage Required**	**112.4 m^3**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m^3)	100-Year Release Rate (L/s)	100-Year Storage (m^3)
Unattenuated Areas	5.1	0.0	10.8	0.0
Attenutated Areas	9.4	56.2	18.9	112.4
Total	**14.5**	**56.2**	**29.8**	**112.4**

DRAWINGS / FIGURES



GFA : 14255 SQ. FT.

PROJECT STATISTICS:

COMMERCIAL NFA: 85560 SQ. FT.
INTERIOR AMENITY NFA: 3700 SQ. FT.

PARKING:
U/G: 90+/-
L1: 24

L1 GFA: 14 255 SQ. FT.
L2-6 GFA: 18 180 SQ.FT.
L7 GFA: 7 385 SQ. FT.
L8-20 GFA: 8 215 SQ. FT.
L21-22 GFA: 6 000 SQ. FT.
TOTAL GFA: 231 335 SQ. FT.

UNITS: 166 1BR, 94 2BR, 260 TOTAL

rla/architecture

GROUND FLOOR PLAN
SCALE 1 : 300
08/22/2019

1655 CARLING AVENUE
OTTAWA, ONTARIO

SURFACE

SHEET # D101
PROJ# 1927

PAPER SIZE: Tabloid PLOT DATE: 9/17/2019 2:38:03 PM PLOT SCALE: 1:1