

# **ADEQUACY OF EXISTING SERVICES**

**FOR**

**TRINITY DEVELOPMENT GROUP  
900 ALBERT STREET – SITE 1**

**CITY OF OTTAWA**

**PROJECT NO.: 15-794**

**MARCH 2016 – REV 1  
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**ADEQUACY OF EXISTING SERVICES  
FOR  
TRINITY DEVELOPMENT GROUP**

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# ADEQUACY OF EXISTING SERVICES FOR TRINITY DEVELOPMENT GROUP CITY OF OTTAWA

## 1.0 INTRODUCTION

Trinity development group have retained David Schaeffer Engineering Ltd. (DSEL) to prepare an Adequacy of Existing Services in support of their re-zoning application for the contemplated development of 900 Albert Street.

The subject property is located within the City of Ottawa urban boundary. As illustrated in **Figure 1**, the subject property is located south of Albert Street and west of City Centre Avenue. The subject property measures approximately **1.44 ha** and is zoned MC[1967] S91, S292-h.



**Figure 1: Site Location**

The contemplated development by Trinity development group involves the construction of 3 new 55 storey residential towers with approximately 6 floors of retail and above grade parking. The contemplated development will include **1470** residential units, **19,800m<sup>2</sup>** of retail space and associated above and below ground parking. Please see **Drawings/Figures** for a reduced copy of the concept plan prepared by B+H Architects.

The following report is to provide an update to the previously approved Site Servicing Report prepared by IBI Group, dated January 2012. The Site Servicing Report was prepared in support of the previous owner's application to develop the lands for 3 office towers with a proposed total floorspace of **171,824m<sup>2</sup>**. The City has approved the study in the context of re-zoning and not site plan control.

The objective of this report is to provide sufficient detail with respect to the availability of existing site services to support the proposal for re-zoning.

## **1.1 Existing Conditions**

The existing site is undeveloped lands consisting of grass and treed area. The elevations range between 63.18m and 54.65m, local low points exists on-site, sloping generally exists from north and east to the south and west of the property.

Based on the Geotechnical Report prepared by Paterson Group Inc., dated January 2016, on-site material consists of varying fill material overlaying a native glacial till deposit.

Sewer system and watermain distribution mapping, along with as-recorded drawings, collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

### **Watermains:**

- 1220mm diameter HPTM watermain exists within the south portion of the site with a 20m easement
- 400mm diameter UCI watermain within City Centre Avenue

### **Sanitary Sewers:**

- 1675mm x 1675mm West Nepean Sanitary Collector (WNC) with 6m easement exists, bisecting the middle of the site from west to east
- 1050mm diameter Mooney's Bay Sanitary Sewer with 6m easement, exists connecting to the WNC at the west edge of the site
- 650mm diameter combined sewer exists within City Centre Avenue

### **Storm Sewers:**

- 1800mm diameter Nepean Bay Storm Line bisects the subject site from the south to north
- 650mm diameter combined sewer exists within City Centre Avenue

## **1.2 Required Permits / Approvals**

The proposed development is subject to the site plan control approval process.

The City of Ottawa must also approve the engineering design drawings and reports prior to the issuance of site plan control.

### 1.3 Pre-consultation

Pre-Consultation was conducted with interested parties at the City of Ottawa January 8, 2016. The proposed development application was discussed with city representatives from the transportation, public works and planning departments.

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, October 2012.  
**(City Standards)**
- **Ottawa Design Guidelines – Water Distribution**  
City of Ottawa, July 2010  
**(Water Supply 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)**
- **Site Servicing Report – LeBreton Mews**  
IBI Group  
January 2012  
**(2012 Servicing Report)**

### 3.0 WATER SUPPLY SERVICING

#### 3.1 Existing Water Supply Services

The subject property lies within the 1W pressure zone. A local 400mm diameter watermain exists within the City Centre Avenue right-of-way. In addition, a 1220mm HPTM watermain exists within the south portion of the property including a 20m easement.

An excerpt from the City of Ottawa Pressure Zone map has been included in **Appendix B**.

#### 3.2 Water Supply Servicing Design

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

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

**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	350 L/d/P
Residential Maximum Daily Demand	2.25 x Average Daily *
Residential Maximum Hourly	3.38 x Average Daily *
Commercial Average Daily Demand (Retail)	2.5 L/m <sup>2</sup> /d
Residential Maximum Daily Demand	1.5 x Average Daily
Residential Maximum Hourly	1.8 x Maximum Daily
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During Peak Hourly Demand operating pressure must remain within	275kPa and 552kPa
During fire flow operating pressure must not drop below	140kPa

\* - Residential Max. Daily and Max. Hourly peaking factors as per MOE Guidelines for Drinking-Water Systems Table 3-1 for 2001 – 3000 people.

**Table 2** summarizes the anticipated water supply demand for the contemplated development based on the **Water Supply Guidelines**.



**Table 2**  
**Water Demand and Boundary Conditions**  
**Proposed Conditions**

Design Parameter	Anticipated Water Demand (L/min)
Average Daily Demand	677.5
Max Day	1498.6
Peak Hour	2266.6

Servicing is proposed to be achieved through a dual connection to the 400mm diameter watermain within City Centre Avenue, consistent with the previously approved water servicing plan presented in the **2012 Servicing Report**.

### **3.3 Water Supply Conclusion**

As demonstrated in **Table 2**, the anticipated water demand will exceed 50m<sup>3</sup>/day, therefore, redundant connections will be required.

Dual water services are contemplated to connect to the existing 400mm watermain within City Centre Avenue, consistent with the approved **2012 Servicing Report**.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

## **4.0 WASTEWATER SERVICING**

### **4.1 Existing Wastewater Services**

The subject site lies within the West Nepean Collector (WNC) and Mooney's Bay Collector (MBC) catchments. The existing site consists of undeveloped lands and is not contributing any sanitary discharge.

### **4.2 Wastewater Design**

The concept plan proposes the WNC to be relocated along the west and south edge of the property. The MBC is proposed to connect to the re-routed WNC along the south edge of the property. The WNC is proposed to re-connect with the exiting routing on the east edge of the site. Please see **Drawings/Figures** for the proposed concept plan prepared by B+H Architects which includes concept routing of the WNC and MBC. Trinity has engaged IBI Group to relocate the services, as described above.

Anticipated wastewater flow is contemplated to discharge directly to the WNC. Connection to the MBC as per the **2012 Servicing Report** is not recommended with the re-routing proposed.

**Table 3** 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	350 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
<i>Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, 2012</i>	

**Table 4** demonstrates the anticipated peak flow from the proposed 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	13.01
Estimated Peak Dry Weather Flow	40.83
Estimated Peak Wet Weather Flow	41.23

The estimated sanitary flow based on the concept plan provide in **Drawings/Figures** anticipates a peak wet weather flow of **41.23 L/s**.

### 4.3 Wastewater Servicing Conclusions

Existing sanitary infrastructure including the Mooney's Bay Collector and West Nepean Collector are located on-site. It is contemplated to re-route the WNC and MBC to the south of the subject site.

The anticipated wet weather wastewater discharge from the contemplated development will be **41.23 L/s**.

The proposed wastewater design conforms to all relevant City guidelines.

## 5.0 STORMWATER MANAGEMENT

### 5.1 Existing Stormwater Services

The subject lands are located within Ottawa Central sub-watershed which is under the Rideau Valley Conservation Authority jurisdiction. The existing subject site consists of undeveloped lands with multiple low points, overland flow is eventually directed to the south-west corner of the site.

The existing development appears to contain no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year are summarized in **Table 5**:

**Table 5**  
**Summary of Existing Storm Peak Flow Rates**

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	61.4
5-year	83.4
100-year	178.6

### 5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were determined in the previously approved **2012 Servicing Report**, where the proposed development is required to:

- Allowable release rate based on a Rational Method Coefficient of 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a time of concentration equal to 20 minutes.
- All storms up to and including the City of Ottawa 100-year design event are to be attenuated on site.

Based on the above the allowable release rate for the proposed development is **140.5L/s**.

### 5.3 Proposed Stormwater Management System

The Nepean Bay Storm Trunk (NBST) currently bisects the property. It is contemplated to re-route the NBST along the south edge of the subject property, see **Drawings/Figures** for concept plan showing the proposed routing of the NBST. IBI Group has been retained to prepare the design of the relocation of the storm sewer.

To meet the stormwater objectives the proposed development will contain a combination of roof top flow attenuation, and cistern storage. **Table 6** summarizes the post-development flow rates.

**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 <sup>3</sup> )	(L/s)	(m <sup>3</sup> )
Unattenuated Areas	25.3	0.0	48.0	0.0
Attenuated Areas	48.9	227.4	92.5	430.0
<b>Total</b>	<b>74.2</b>	<b>227.4</b>	<b>140.5</b>	<b>430.0</b>

It is anticipated that **430m<sup>3</sup>** of rooftop and cistern storage will be required to attenuate the 100-year storm event to the allowable release rate. The controlled flow is proposed to be directed to the relocated NBST, consistent with the **2012 Servicing Report**.

Detailed storage calculations are contained within **Appendix D**.

Note that the total required storage estimate is provided for general reference only. Actual storage requirements will be dependent on final site conditions and detailed design.

#### **5.4 Stormwater Servicing Conclusions**

The existing Nepean Bay Storm Trunk bisecting the property is proposed to be relocated along the south edge of the subject site.

The proposed stormwater design conforms to all relevant City guidelines and Policies and meets the design objectives.

It is anticipated that **430m<sup>3</sup>** of rooftop and cistern storage will be required to attenuate the 100-year storm event to the allowable release rate.

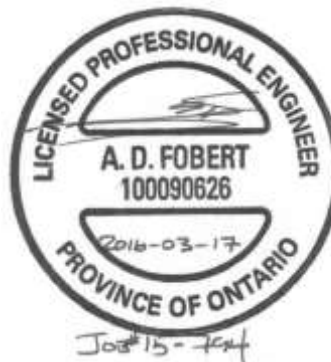
## 6.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained to prepare an Assessment of Adequacy of Public Services report in support of the application for a Zoning By-law Amendment (ZBLA) at 900 Albert Street. The preceding report outlines the following:

- Contemplated development will require a dual connection to the 400mm watermain within City Centre Avenue;
- The contemplated development is anticipated to have a peak wet weather flow of **41.23 L/s**;
- Based on the **2012 Servicing Report**, stormwater quantity controls are required to attenuate peak flow to **140.5L/s**;
- It is proposed that stormwater objectives will be met through storm water retention via rooftop and cistern storage, it is anticipated that **430m<sup>3</sup>** of onsite storage will be required to attenuate flow to the established release rate above;
- Based on consultation with the RVCA, stormwater quality controls are not required;

Prepared by,  
**David Schaeffer Engineering Ltd.**

Reviewed by,  
**David Schaeffer Engineering Ltd.**



Per: Steven L. Merrick, E.I.T.

Per: Adam D. Fobert, P.Eng

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## ***APPENDIX A***

### ***Pre-Consultation***

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# DEVELOPMENT SERVICING STUDY CHECKLIST

15-794

26/02/2016

4.1 General Content		
<input type="checkbox"/>	Executive Summary (for larger reports only).	N/A
<input checked="" type="checkbox"/>	Date and revision number of the report.	Report Cover Sheet
<input checked="" type="checkbox"/>	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
<input checked="" type="checkbox"/>	Plan showing the site and location of all existing services.	Figure 1
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
<input checked="" type="checkbox"/>	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	Section 2.1
<input checked="" type="checkbox"/>	Statement of objectives and servicing criteria.	Section 1.0
<input checked="" type="checkbox"/>	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
<input type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	Proposed phasing of the development, if applicable.	N/A
<input checked="" type="checkbox"/>	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.1
<input checked="" type="checkbox"/>	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	Drawings/Figures
4.2 Development Servicing Report: Water		
<input type="checkbox"/>	Confirm consistency with Master Servicing Study, if available	N/A
<input checked="" type="checkbox"/>	Availability of public infrastructure to service proposed development	Section 3.1
<input checked="" type="checkbox"/>	Identification of system constraints	Section 3.1
<input checked="" type="checkbox"/>	Identify boundary conditions	Section 3.1, 3.2
<input checked="" type="checkbox"/>	Confirmation of adequate domestic supply and pressure	Section 3.3

<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
<input type="checkbox"/>	Address reliability requirements such as appropriate location of shut-off valves	N/A
<input type="checkbox"/>	Check on the necessity of a pressure zone boundary modification	N/A
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	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
<input type="checkbox"/>	Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
<input checked="" type="checkbox"/>	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
<input type="checkbox"/>	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

<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
<input type="checkbox"/>	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

<input type="checkbox"/>	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/>	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/>	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
<input type="checkbox"/>	Special considerations such as contamination, corrosive environment etc.	N/A

#### 4.4 Development Servicing Report: Stormwater Checklist

<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	Analysis of available capacity in existing public infrastructure.	N/A
<input checked="" type="checkbox"/>	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input checked="" type="checkbox"/>	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
<input type="checkbox"/>	Set-back from private sewage disposal systems.	N/A
<input type="checkbox"/>	Watercourse and hazard lands setbacks.	N/A
<input checked="" type="checkbox"/>	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
<input type="checkbox"/>	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	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
<input type="checkbox"/>	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
<input type="checkbox"/>	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
<input type="checkbox"/>	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
<input type="checkbox"/>	Identification of potential impacts to receiving watercourses	N/A
<input type="checkbox"/>	Identification of municipal drains and related approval requirements.	N/A

<input checked="" type="checkbox"/>	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
<input type="checkbox"/>	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
<input type="checkbox"/>	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
<input checked="" type="checkbox"/>	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
<input type="checkbox"/>	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
<input type="checkbox"/>	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

#### 4.5 Approval and Permit Requirements: Checklist

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

#### 4.6 Conclusion Checklist

<input checked="" type="checkbox"/>	Clearly stated conclusions and recommendations	Section 7.0
<input type="checkbox"/>	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.	
<input type="checkbox"/>	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

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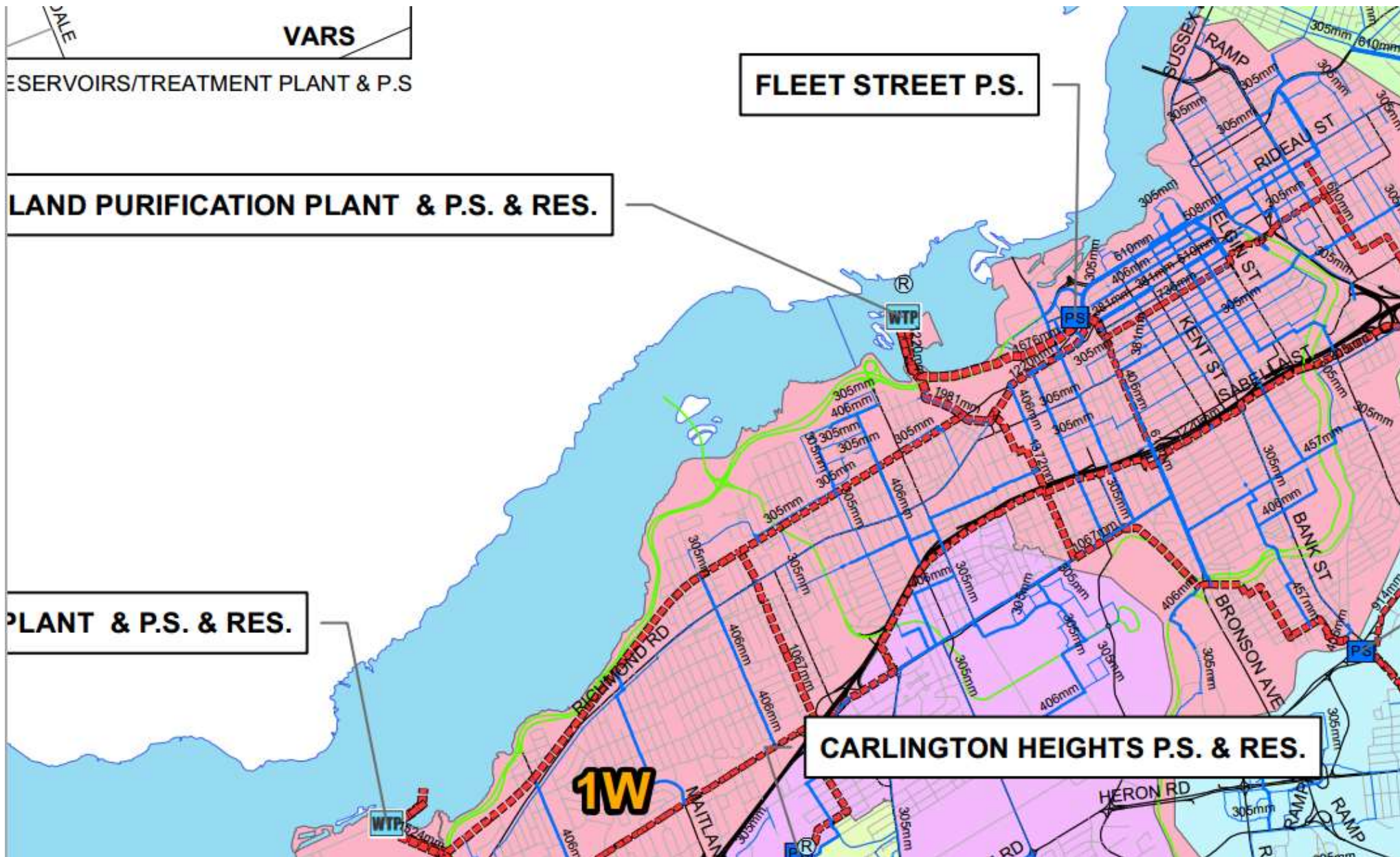
## ***APPENDIX B***

### ***Water Supply***

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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		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	1470	2646

	Pop	Avg. Daily		Max Day		Peak Hour	
		m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
<b>Total Domestic Demand</b>	2646	926.1	643.1	2083.7	1447.0	3130.2	2173.8

**Institutional / Commercial / Industrial Demand**

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
Commercial floor space	2.5 L/m <sup>2</sup> /d	19,800	49.50	34.4	74.3	51.6	133.7	92.8
Office	75 L/9.3m <sup>2</sup> /d		0.00	0.0	0.0	0.0	0.0	0.0
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
<b>Total I/CI Demand</b>			49.5	34.4	74.3	51.6	133.7	92.8
<b>Total Demand</b>			<b>975.6</b>	<b>677.5</b>	<b>2158.0</b>	<b>1498.6</b>	<b>3263.9</b>	<b>2266.6</b>



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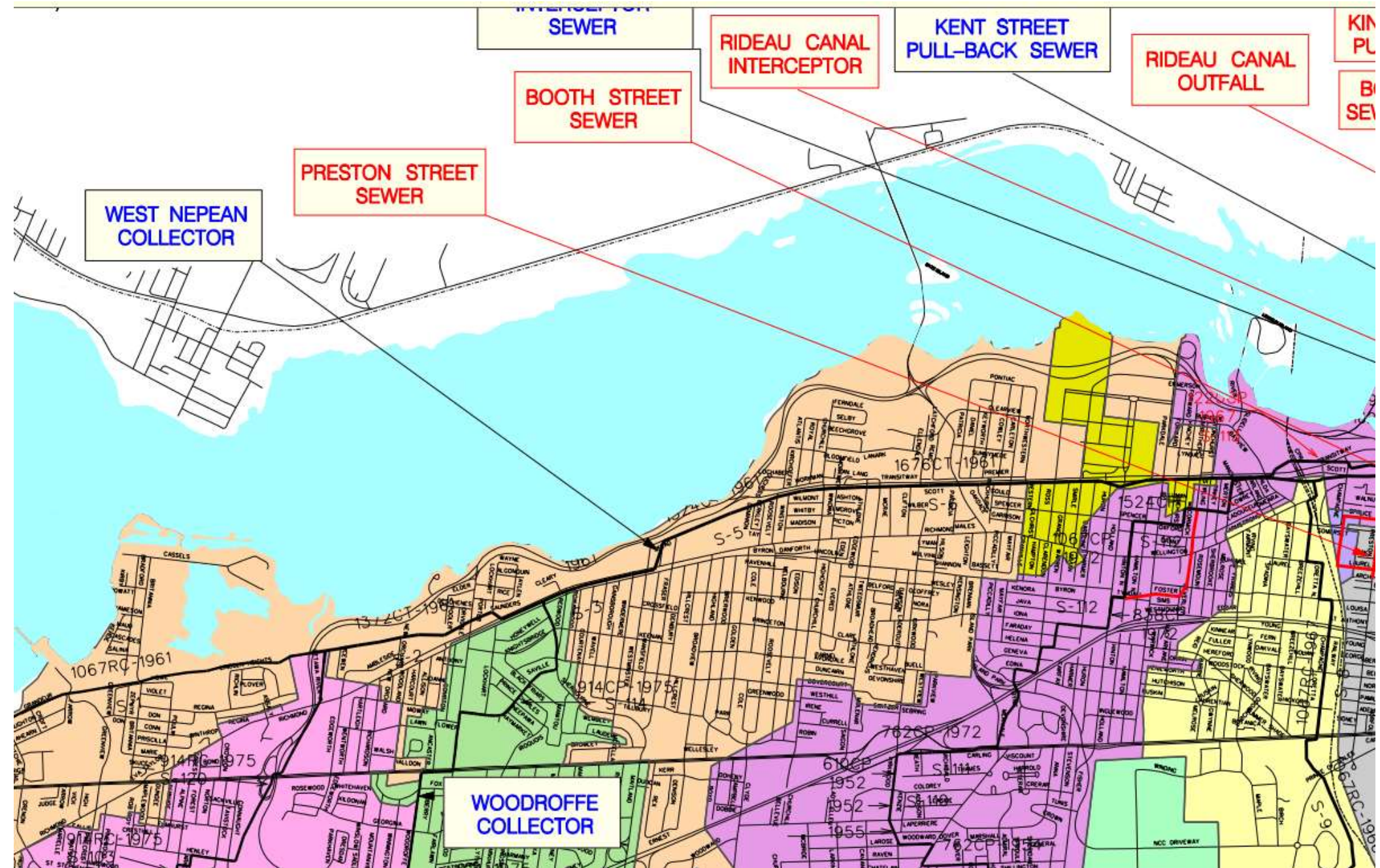
## ***APPENDIX C***

### ***Wastewater Collection***

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



Site Area 1.440 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.40 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		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8	1470	2646
Total Pop			2646

Average Domestic Flow 10.72 L/s

Peaking Factor 3.49

Peak Domestic Flow 37.39 L/s

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 L/m <sup>2</sup> /d	19,800	2.29
Hospitals	900 L/bed/d		0.00
School	70 L/student/d		0.00
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 2.29

Peak Institutional / Commercial Flow 3.44

Peak Industrial Flow\*\* 0.00

Peak I/C/I Flow 3.44

\* 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	13.01 L/s
Total Estimated Peak Dry Weather Flow Rate	40.83 L/s
Total Estimated Peak Wet Weather Flow Rate	41.23 L/s

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## ***APPENDIX D***

### ***Stormwater Management***

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**Estimated Peak Stormwater Flow Rate**  
**City of Ottawa Sewer Design Guidelines, 2012****Existing Drainage Area Characteristics**

<b>Area</b>	1.4400 ha
<b>C</b>	0.20 Rational Method runoff coefficient
<b>t<sub>c</sub></b>	10.0 min

**Estimated Peak Flow**

	<b>2-year</b>	<b>5-year</b>	<b>100-year</b>
<b>i</b>	76.8	104.2	178.6 mm/hr
<b>Q</b>	61.4	83.4	178.6 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, 2012

## Target Flow Rate

Area 1.44 ha  
C 0.50 Rational Method runoff coefficient  
t<sub>c</sub> 20.0 min

## 5-year

i 70.3 mm/hr  
Q 140.5 L/s

## Estimated Post Development Peak Flow from Unattenuated Areas

Total Area 0.14 ha  
C 0.90 Rational Method runoff coefficient

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
20.0	70.3	25.3	25.3	0.0	0.0	120.0	48.0	48.0	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 1.30 ha  
C 0.90 Rational Method runoff coefficient

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
20	70.3	227.6	48.8	178.8	214.6	120.0	431.8	92.5	339.3	407.2
25	60.9	197.3	48.8	148.5	222.7	103.8	373.8	92.5	281.3	422.0
30	53.9	174.7	48.9	125.8	226.5	91.9	330.7	92.5	238.2	428.8
35	48.5	157.2	48.9	108.3	227.4	82.6	297.3	92.5	204.8	430.0
40	44.2	143.2	49.0	94.2	226.1	75.1	270.5	92.5	178.0	427.2
45	40.6	131.6	49.0	82.6	223.1	69.1	248.6	92.5	156.1	421.4
50	37.7	122.0	49.0	73.0	218.9	64.0	230.2	92.5	137.7	413.1
55	35.1	113.8	49.1	64.7	213.7	59.6	214.6	92.5	122.1	403.0
60	32.9	106.7	49.1	57.7	207.6	55.9	201.2	92.5	108.7	391.3
65	31.0	100.6	49.1	51.5	200.8	52.6	189.5	92.5	97.0	378.3
70	29.4	95.2	49.1	46.0	193.4	49.8	179.2	92.5	86.7	364.2
75	27.9	90.4	49.1	41.2	185.5	47.3	170.1	92.5	77.6	349.2
80	26.6	86.1	49.2	36.9	177.1	45.0	162.0	92.5	69.4	333.3
85	25.4	82.2	49.2	33.0	168.4	43.0	154.6	92.5	62.1	316.8
90	24.3	78.7	49.2	29.5	159.3	41.1	148.0	92.5	55.5	299.6
95	23.3	75.5	49.2	26.3	149.9	39.4	142.0	92.5	49.4	281.8
100	22.4	72.6	49.2	23.4	140.2	37.9	136.5	92.5	43.9	263.6
105	21.6	69.9	49.2	20.7	130.3	36.5	131.4	92.5	38.9	244.9
110	20.8	67.5	49.3	18.2	120.2	35.2	126.7	92.5	34.2	225.8
115	20.1	65.2	49.3	15.9	109.8	34.0	122.4	92.5	29.9	206.3
120	19.5	63.1	49.3	13.8	99.3	32.9	118.4	92.5	25.9	186.5

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 <sub>attenuated</sub>	48.92 L/s	100-year Q <sub>attenuated</sub>	92.52 L/s
5-year Max. Storage Required	227.4 m <sup>3</sup>	100-year Max. Storage Required	430.0 m <sup>3</sup>

## Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m <sup>3</sup> )	100-Year Release Rate (L/s)	100-Year Storage (m <sup>3</sup> )
Unattenuated Areas	25.3	0.0	48.0	0.0
Attenuated Areas	48.9	227.4	92.5	430.0
<b>Total</b>	<b>74.2</b>	<b>227.4</b>	<b>140.5</b>	<b>430.0</b>



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***DRAWINGS / FIGURES***

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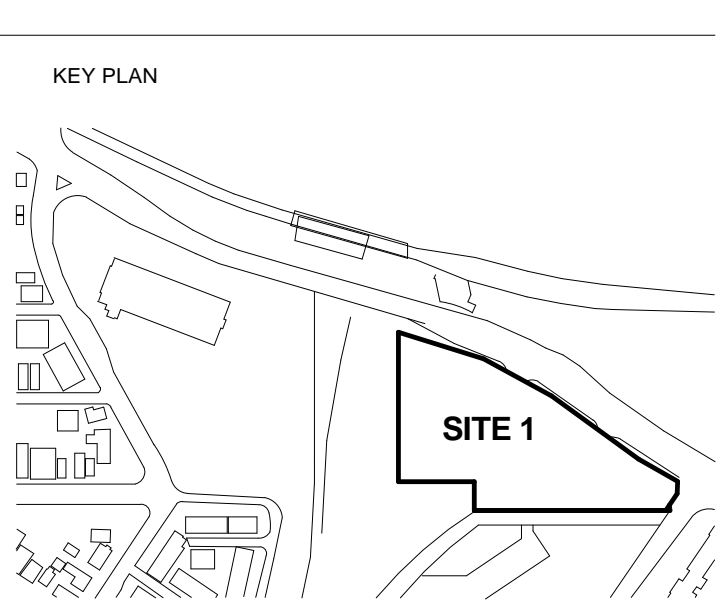
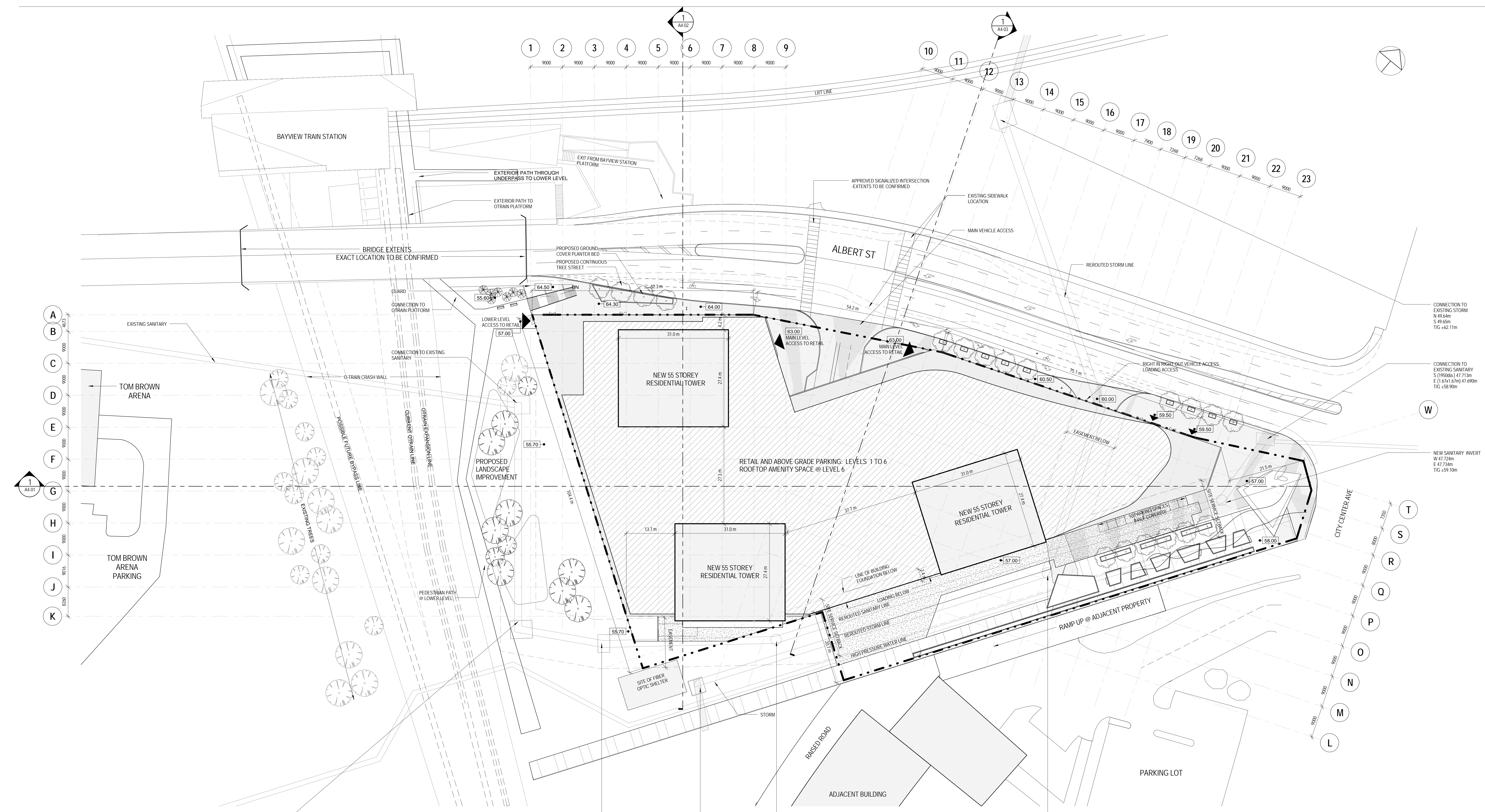
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C:\Users\jgri\kerman\Documents\111089\_BH\_Arch\_901 Albert\_BLDG\_22016\_Gavin.Barnes@bharhitects.com\11 SITE PLAN - SITE 1

01/03/2016 11:22:15 AM  
A1-01



NOT FOR CONSTRUCTION  
PRELIMINARY CONCEPT DESIGN

REVISION		
NO.	DATE	DESCRIPTION
1	26/02/2016	ISSUED FOR OPA/ZBA

PROJECT ADDRESS:  
900 ALBERT ST  
OTTAWA ON

**B+H** B+H Architects  
1223 McNeil Street Suite 100  
Ottawa, Ontario K1J 7T2  
1 613-738-2700 F 613-738-1136

**TRINITY** Trinity Development Group  
3250 Bloor Street W. #1000  
Toronto, Ontario M8V 2A9  
1 416-255-8800 1 416-222-8355

LANDSCAPE ARCHITECT :  
**B+H**  
481 University Avenue, Suite 300  
Toronto, ON M5G 2H4  
1 416-596-2299 1 416-586-0599

TRANSPORTATION:  
**PARSONS**  
1223 McNeil Street Suite 100  
Ottawa, Ontario K1J 7T2  
1 613-738-2700 F 613-738-1136

URBAN DESIGN:  
**FoTenn Consultants Inc.**  
222 McLeod Street  
Ottawa, Ontario K2P 0Z8  
1 613-738-2700 F 613-738-1136

STRUCTURAL ENGINEER:  
**ENTUITIVE**  
200 University Ave, Suite 700  
Toronto, Ontario M5H 3D5  
1 416-477-5832

SITE SERVICES/CIVIL ENGINEER :  
**David Schaeffer Engineering**  
120 Beech Road, Suite 103  
Ottawa, Ontario K2B 1E5  
1 613-836-0055 F 613-836-7183

PROJECT :  
**900 ALBERT  
OTTAWA**

SHEET CONTENTS :  
**SITE PLAN - SITE 1**

PROJECT NUMBER :  
**1411089**  
DRAWING SCALE :  
**1 : 400**  
SHEET NO :  
**A1-01**

B+H Architects 900 ALBERT ST			
RATIO	SITE 1		
	RETAIL	RESIDENTIAL	TOTAL
GROSS BUILDING AREA (M <sup>2</sup> )			207,532
SITE AREA (M <sup>2</sup> )			14,428
FSI			8.7
GROSS FLOOR AREA (M <sup>2</sup> )			125,332
NRGFA	19,800	-	19,800
Lower Level Retail	6,355	0	
Main Level Retail	5,392	337	
Upper Level Retail	8,053	0	
RGFA	-	105,532	105,532
RESIDENTIAL UNITS		1,470	1,470
RESIDENTIAL AMENITY AREA (M <sup>2</sup> )		5,328	5,328
Indoor		2,154	2,154
Outdoor		3,174	3,174
Required Amenity Area	8 sqm/unit	-	8,820
LOADING TRUCK TYPES	8	1	9
Type A	5	-	5
Type B	2	1	3
Garbage	1	1	2
PARKING PROVIDED	523	621	1,194
U/G P1	191		191
U/G P2	191		191
U/G P3	191		191
A/G P4		207	207
A/G P5		207	207
A/G P6		207	207
# of PARKING required	6	6	12
Required RETAIL Parking	None required	-	0
Required RESIDENTIAL Parking	None required	-	0
Required VISITOR Parking	None required	-	0
BIKE STORAGE	76	750	826
Outdoor	76	-	76
Ground Deaussen/P1	-	750	750
# of BIKE STORAGE required	76	735	814
Required RETAIL Bike Storage	1.0/250sqm	-	76
Required RES. Bike Storage	0.5/unit	-	735

SURVEY INFORMATION FROM TOPOLOGICAL SURVEY COMPLETED BY: STANTEC GEOMATICS LTD. (2005)  
PART OF LOT 38  
CONCESSION 1 (OTTAWA FRONT)  
AND PART OF THE ROAD ALLOWANCE  
BETWEEN  
CONCESSION 1 (OTTAWA FRONT) AND  
CONCESSION 1 (OTTAWA FRONT)  
GEOGRAPHIC TOWNSHIP OF NEPEAN  
CITY OF OTTAWA

Floor Space Index:  
Floor space index means the ratio of the gross floor area of a building to the total area of the lot on which the building is located. (By-law 2008-326)

Gross Floor Area:  
Gross floor area means the total area of each floor whether located above, at or below grade, measured from the interiors of outside walls and including floor area occupied by interior walls and floor area created by bay windows, but excluding:  
- floor area occupied by shared mechanical, service and electrical equipment that serve the building;  
- common hallways, corridors, stairwells, elevator shafts and other voids, steps and landings;  
- bicycle parking, motor vehicle parking or loading facilities;  
- common laundry, storage and washroom facilities that serve the building or tenants;  
- common storage areas that are accessory to the principal use of the building;  
- common amenity area and play areas accessory to a principal use on the lot, and  
- living quarters for a caretaker of the building.

\*All areas are preliminary and do not allow for all shafts, vertical penetrations, fire life safety/exit stairs and corridors, and Structural, Mechanical and Electrical spaces not yet designed. It is recommended that for any preliminary pro forma calculations, appropriate deduction allowances should be made for retail rentable areas, rental residential unit counts and areas, and student residence units and bed counts. All parking and loading floor areas and space counts are preliminary and subject to change due to as yet unconfirmed SHEP and parking ratio requirements for retail, rental residential and student residences. Ratio requirements are still under discussion between Trinity, the City of Ottawa and the design team.