

**ASSESSMENT OF ADEQUACY OF
PUBLIC SERVICES**

FOR

**THE RICHCRAFT GROUP OF
COMPANIES
250 PARKDALE AVENUE**

CITY OF OTTAWA

PROJECT NO.:11-545

**MAY 2014 – REV 2
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1.0 INTRODUCTION

The Richcraft Group of Companies has retained David Schaeffer Engineering Ltd. (DSEL) to prepare an Assessment of Adequacy of Public Services report in support of their application for Zoning By-Law Amendment (ZBLA).

The subject property is located within the City of Ottawa urban boundary. As illustrated in **Figure 1**, the subject properties are comprised of the following municipal addresses, 1518 Scott Street, 250/252/254/266/268/272/274 Parkdale Avenue and 9/11/13 Bullman Street. The subject properties measure approximately 0.36ha. The existing zoning for the properties is MC12F(2.0) H(19).

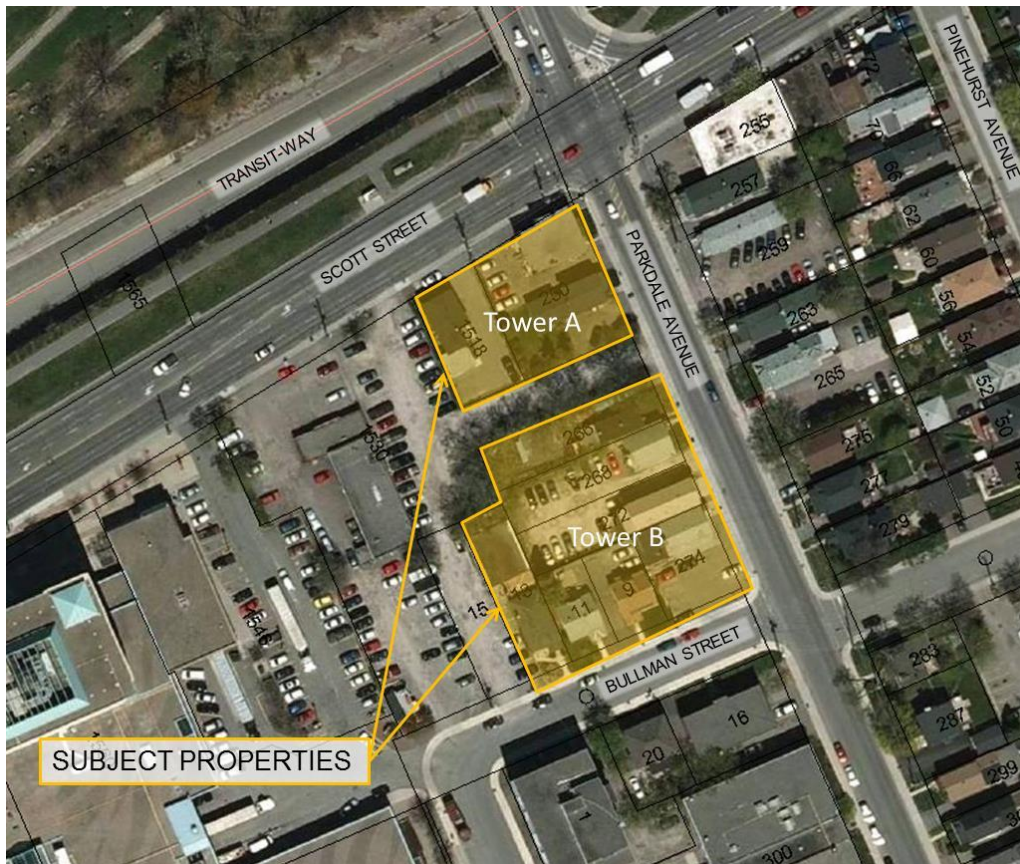


Figure 1: Site Location

The proposed development lies within the Scott Street Community Design Plan area approved by the City of Ottawa in January 2014.

The proposed development by Richcraft Group of Companies involves the construction of two towers (Towers A & B) of 25-storeys in height. The towers will be residential condominium buildings complete with at grade commercial space and underground parking. The preliminary concept plan prepared by Roderick Lahey Architects Ltd. (RLA) is included in ***Drawings/Figures***.

The objective of this report is to provide sufficient detail with respect to the availability of existing site services to support the proposal for Zoning By-Law Amendment (ZBLA).

1.1 Existing Conditions

The existing site areas include ten residential properties consisting of four 2-storey dwellings, four 2½-storey dwellings and two 1½-storey dwellings. The subject properties are predominantly gravel and asphalt parking lots with a few landscaped areas.

Annis O'Sullivan, Vollebekk Ltd, completed a topographical survey on February 6th, 2013. See ***Drawings / Figures*** for a reduction of the site survey.

Tower A is contemplated to be situated within the existing civic addresses 1518 Scott Street and 250/252/254 Parkdale Avenue. The area has elevations ranging between 62.18m and 61.89m with an approximate slope of 0.6% from the south corner to the north corner of the property.

Tower B is contemplated to be situated within the existing civic addresses 266/268/272/274 Parkdale Avenue and 9/11/13 Bullman Street properties. The area has elevations ranging between 62.01m and 61.88m from the north corner to the south corner of the property.

The subject property has separated sewers located adjacent to the site. The following services are located within the rights-of-way adjacent to the subject property:

Storm Sewers:

- 1050mm diameter storm sewer located within Scott Street
- 750mm diameter storm sewer located within Parkdale Avenue tributary to the 1050mm diameter storm sewer within Scott Street
- 450mm diameter storm sewer within Bullman

Sanitary Sewers:

- 300mm diameter sanitary sewer located within Scott Street

- 250mm diameter sanitary sewer located within Parkdale Avenue tributary to the 250mm diameter sanitary sewer within Scott Street
- 250mm diameter sanitary sewer within Bullman Street

Watermains:

- 203mm diameter watermain located within Parkdale Avenue
- 152mm diameter watermain located within Scott Street
- 203mm diameter watermain located within Bullman Street
- 1067mm diameter transmission main within Parkdale 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

Richcraft Group of Companies conducted an initial pre-consultation with City Staff and DSEL subsequently followed up via e-mail to confirm site specific release rate requirements.

City staff indicated a preference for the proposed development to be serviced from Parkdale Avenue connecting to the existing 203mm dia watermain, 750mm dia storm sewer, and 250mm dia sanitary sewer.

Based on discussion with the City of Ottawa and as constructed drawings, the combined sewer within Scott Street in the vicinity of the proposed development has recently been separated. As a result, the stormwater management criteria has been updated. The proposed development will be required to attenuate stormwater runoff to the lesser of existing conditions or a City of Ottawa 5-year design storm with a 20 minute Time of Concentration and an equivalent runoff coefficient of 0.50 as determined through the Rational Method.

Correspondence and servicing guidelines checklist are 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)
 - **Technical Bulletin ISD-2010-2**
City of Ottawa, December 15, 2010.
(ISD-2010-2)
- **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)
- **Phase I Environmental Site Assessment –250, 252, 254 Parkdale Avenue
and 1518 Scott Street, Ottawa, Ontario**
Paterson Group, June 30, 2011
(ESA)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the 1W pressure zone. An existing 152mm diameter watermain is located in the Scott Street right-of-way; additionally there are existing 203mm diameter watermains located within the Parkdale Avenue and Bullman Street right-of-ways respectively. The referred to watermains are serviced by a 1067mm diameter transmission line located within the Scott Street right-of way.

3.2 Water Supply Servicing Design

It is contemplated to service each tower individually from the existing 203mm diameter service on Parkdale Avenue, via twinned 200mm diameter services separated by isolation valves to avoid creating vulnerable service areas.

Table 1 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 Average Apartment	1.8 P/unit
Residential Average Daily Demand	350 L/d/P
Residential Maximum Daily Demand – Tower A	3.6 x Average Daily *
Residential Maximum Hourly – Tower A	5.4 x Average Daily *
Residential Maximum Daily Demand – Tower B	2.9 x Average Daily *
Residential Maximum Hourly – Tower B	4.3 x Average Daily *
Commercial Average Daily Demand (Retail)	2.5 L/m ² /d
Commercial Maximum Daily Demand	1.5 x Average Daily
Commercial 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 normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure shall not exceed	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 3-3 for 0 to 500 persons.	
** Table updated to reflect ISD-2010-2	

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in the correspondence with the City included **Appendix A**.

Table 2 and **3** summarize 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 Tower A

Design Parameter	Anticipated Demand ¹ (L/min)	Boundary Condition ² (m H ₂ O / kPa)	
Average Daily Demand	75.5	52.3	513.1
Max Day + Fire Flow	263.4 + 9000 = 9263.4	47.7	467.9
Peak Hour	396.9	45.8	449.3
1) Water demand calculation per <i>Water Supply Guidelines</i> . See <i>Appendix B</i> for detailed calculations. 2) Boundary conditions supplied by the City of Ottawa. Assumed ground elevation 62.00m. See <i>Appendix B</i> .			

Table 3
Water Demand and Boundary Conditions
Proposed Conditions Tower B

Design Parameter	Anticipated Demand ¹ (L/min)	Boundary Condition ² (m H ₂ O / kPa)	
Average Daily Demand	115.9	52.3	513.1
Max Day + Fire Flow	333.1 + 9000 = 9333.1	46.4	455.2
Peak Hour	495.0	45.8	449.3
1) Water demand calculation per <i>Water Supply Guidelines</i> . See <i>Appendix B</i> for detailed calculations. 2) Boundary conditions supplied by the City of Ottawa. Assumed ground elevation 62.00m. See <i>Appendix B</i> .			

Section 4.2.11 of the City Design guidelines for water distribution provides guidance for determining the method for estimating Fire Demand. As indicated, the requirements for levels of fire protection on private property are covered in the Ontario Building code. Section 7.2.11 of the OBC addresses the installation of water service pipes and fire service mains. Part 3 of the OBC outlines the requirement for Fire Protection, Occupant Safety, and Accessibility; and sub-section A-3.2.5.7 provides the provisions for fire fighting. Based on trained personnel responding to the emergency, and water supply being delivered through a municipal system, the required minimum provision for water supply shall not be less than 2,700L/min or greater than 9000L/min (OBC Section A.3.2.5.7, Table 2). Therefore, a conservative estimate for the required fire supply is 9000L/min. A certified fire protection system specialist shall be employed to design the building fire suppression system(s) and confirm the actual fire flow demand.

The City of Ottawa was contacted in February 2013 to obtain boundary conditions associated with anticipated water demands for the proposed development. Since this initial request, the units numbers have decreased by approximately 15%, as reflected by

the anticipated demand values in **Table 2** and **3**. It is not anticipated that this decrease will have a significant impact on the boundary conditions provided by city staff.

The maximum HGL pressure provided by the city was interpreted as being the pressure at average daily demand conditions. Therefore, the pressure at the ground floor level was estimated to be **513.1kPa** at both Tower A and B. The estimated pressure is above the desired range of 350kPa to 480Kpa. Based on the results of the City model, pressure control maybe required, a pressure check should be conducted at the completion of construction to confirm if pressure control is required.

The City provided minimum HGL pressure. The value provided was assumed to represent the available pressure during peak hour demand. During peak hour demand the simulated pressure at the building service location was found to be **449.3kPa** at both Tower A and B. The simulated pressure falls within the desired pressure range during normal operating conditions.

The City simulated available pressure during fire flow and maximum daily flow. The resulting pressure was simulated to be **467.9kPa** and **455.2kPa** at Tower A and Tower B watermain connections respectively, which exceeds the required minimum pressure of **140kPa**.

3.3 Water Supply Conclusion

Anticipated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. As demonstrated in **Table 2** and **3**, the recommended pressure range is respected during Maximum Day plus Fire Flow as well as Peak Hour demands. The average daily demand exceeds the desired operating pressure, a pressure check should be conducted at the completion of construction to confirm if pressure control is required.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

Wastewater generated from the existing site ultimately outlets to the West Nepean Collector on Scott Street via the existing 250mm diameter local sanitary sewer that runs parallel within the Scott Street right-of-way. Adjacent to the site are 250mm diameter sanitary sewers that run parallel within the Parkdale Avenue and Bullman Street right-of-way.

As noted in **Section 1.1**, the existing sites are occupied by ten residences. The proposed site for Tower A has 3 dwellings consisting of 2 single residences and 1 semi-detached duplex. The proposed site for Tower B has 7 dwellings, 4 of which are single residences. The remaining 3 properties have commercial space on the ground floor and 2-bedroom apartments above.

To estimate wastewater contributions, commercial floor space was estimated using 1k mapping provided by the City. As well, it was assumed that there were three 2-bedroom apartments overtop of the commercial spaces, two duplex residences, and six single family homes. The estimated existing peak wastewater flow contribution for both Tower A and B is **0.24 L/s** and **0.49 L/s**, respectively. The estimated peak flow wastewater contribution for both sites is **0.73 L/s**.

A sanitary analysis was conducted to evaluate the capacity of the existing sanitary sewer network as shown by **SAN-1** and the associated calculation sheet included in **Appendix C**.

The most restrictive leg of the existing sanitary sewer network occurs between nodes 1-2, along the 250mm diameter sanitary sewer in the Scott Street right-of-way between Parkdale Avenue and Pinehurst Avenue. It was estimated that the local sanitary sewer system downstream of the site has an available capacity of **22.8L/s**.

4.2 Wastewater Design

It is contemplated to service Tower A and Tower B via connections to the existing 250mm diameter sanitary sewer located within Parkdale Avenue.

Table 4 summarizes the **City Standards** employed in the design of the proposed wastewater sewer system.

Table 4
Wastewater Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 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	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
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

Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.

Table 5 demonstrates the estimated wastewater flow generation from the proposed site development. Refer to **Appendix C** for associated calculations.

Table 5
Summary of Estimated Peak Wastewater Flow

Design Parameter	Tower A Flow (L/s)	Tower B Flow (L/s)	Tower A and B Flow (L/s)
Average Dry Weather Flow Rate	1.46	2.04	3.50
Peak Dry Weather Flow Rate	5.17	7.78	12.95
Peak Wet Weather Flow Rate	5.20	7.84	13.04

The combined peak wet weather contribution from Tower A and B is **13.04 L/s**. Refer to **Appendix C** for associated calculations.

Based on the capacity analysis conducted **22.8L/s** is available within the existing sewers system, therefore, the receiving sanitary sewer has capacity to accommodate the estimated **13.0L/s** peak wastewater flow generated from the proposed development.

4.3 Wastewater Servicing Conclusions

The proposed wastewater design conforms to all relevant City guidelines. Based on a capacity analysis of the local upstream and downstream sewers there is sufficient capacity for the proposed development. The capacity analysis is summarized in the Sanitary Sewer Calculation Sheet and area map located in **Appendix C**.

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 site is serviced by a 750mm diameter storm sewer located on Parkdale Avenue which is tributary to a 1050mm diameter storm sewer on Scott Street. Adjacent to the site is a 450mm diameter storm sewer that runs within the Bullman Street right-of-way.

As noted in **Section 1.1.**, the existing sites are occupied by ten residences. The proposed sites for Tower A and B have 4 and 6 homes on each property, respectively. All of the homes have peaked roofs except the property on the corner of Scott and Parkdale. The subject properties are predominantly gravel and asphalt parking lots with few landscaped areas.

Taking this into consideration a combined runoff coefficient for each site was obtained by considering the area of the sites are composed of asphalt, hard gravel, rooftops and landscaped areas. The Time of Concentration was estimated to be 10 minutes.

Furthermore, it was determined that the existing development contained no stormwater management controls for flow attenuation. Therefore, it was assumed that the properties would contribute unattenuated stormwater to the Scott Street storm sewer system.

The estimated existing peak flows for the 2, 5, and 100-year are summarized in **Table 6**:

Table 6
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate Tower A (L/s)	Estimated Peak Flow Rate Tower B (L/s)
2-year	19.7	43.9
5-year	26.7	59.6
100-year	57.2	127.6

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 adhere to the following site criteria:

- Control the release rate to the storm sewer system to the lesser of existing conditions or a City of Ottawa 5-year design storm with a 10 minute Time of

Concentration and an equivalent runoff coefficient of 0.50 as determined by the Rational Method.

- Attenuate all storms up to and including the City of Ottawa 100-year design event on site.
- Quality controls are not anticipated for the proposed development due to the distance to the outlet and the run-off from the site being predominantly 'clean' roof flow.

Based on the above the allowable release rates for the proposed development are **16.8 L/s** and **34.4 L/s** for Tower A and Tower B respectively.

5.3 Proposed Stormwater Management System

To meet the stormwater objectives the proposed development may contain a combination of roof top storage and/or cistern storage.

Table 7 and **8** summarize the pre-development release rate, the target flow rate, the post-development flow rates and the estimated storage required.

To provide an estimate of required storage volume it is assumed that approximately 15% of the development area will be released unattenuated due to landscaped areas and potential grading constraints; this is reflected in **Table 7** and **8**. Flow from these areas would be compensated for in areas with controls.

Table 7
Stormwater Flow Rate Summary for Tower A

Design Storm Event	Pre-development Release Rate	Target Release Rate	Post-Dev Peak Rate	Estimated Required Storage
	(L/s)	(L/s)	(L/s)	(m ³)
5-year	26.7	16.8	8.8	16.2
100-year	57.2	16.8	16.8	30.6

Table 8
Stormwater Flow Rate Summary for Tower B

Design Storm Event	Pre-development Release Rate	Target Release Rate	Post-Dev Peak Rate	Estimated Required Storage
	(L/s)	(L/s)	(L/s)	(m ³)
5-year	59.6	34.4	18.1	33.2
100-year	127.6	34.4	34.4	62.8

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

5.4 Stormwater Servicing Conclusions

The proposed stormwater management target results in a reduction in peak flow from existing conditions; quality controls are not anticipated for the proposed development.

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

6.0 UTILITIES

Overhead hydro lines run along the Scott Street right-of-way adjacent to the site. Clearances in accordance with the local authority will need to be observed.

Further utility servicing will need to be coordinated with the individual utility companies prior to site development.

7.0 CONCLUSION AND RECOMMENDATIONS

The Richcraft Group of Companies has retained David Schaeffer Engineering Ltd. (DSEL) to prepare an Assessment of Adequacy of Public Services report in support of their application for Zoning By-Law Amendment (ZBLA). The preceding report outlines the following:

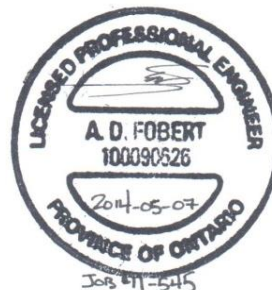
- The existing 203mm diameter watermain on Parkdale Avenue has sufficient water supply to service the contemplated development;
- The recommended pressure range is respected during Maximum Day plus Fire Flow as well as Peak Hour demands, The average daily demand exceeds the desired operating pressure, a test should be completed after construction to confirm if pressure control is required;
- The existing 250mm diameter sanitary sewer on Scott Street part of the West Nepean Sewer catchment area has adequate capacity for the wastewater generated from the contemplated development;
- The proposed stormwater management target results in a reduction in peak flow from existing conditions;
- It is estimated that approximately **63m³** of stormwater retention volume will be required to meet the release criteria;

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Per: Adam D. Fobert, P.Eng

APPENDIX A

Pre-Consultation

4. Development Servicing Study Checklist

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

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

4.1 General Content

- N/A Executive Summary (for larger reports only).
- Cover Sheet Date and revision number of the report.
- Appendix D Location map and plan showing municipal address, boundary, and layout of proposed development.
- See Figure 1 Plan showing the site and location of all existing services.
- Section 1.0 Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- Section 1.3 Summary of Pre-consultation Meetings with City and other approval agencies.
- N/A 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 1.0 Statement of objectives and servicing criteria.
- Sections 3.0 - WTR, 4.0 - SAN, 5.0 - STM Identification of existing and proposed infrastructure available in the immediate area.
- N/A 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

4.2 Development Servicing Report: Water

- N/A Confirm consistency with Master Servicing Study, if available
- Section 2.1 Availability of public infrastructure to service proposed development
- Section 2.1 Identification of system constraints
- Section 2.1, 2.2 Identify boundary conditions
- Section 2.3 Confirmation of adequate domestic supply and pressure
- Section 2.2 - OBC not FUS 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.
- N/A 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.

Section 2.3



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

N/A



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 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.

Section 2.2



Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.

N/A



Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

Section 3.2



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).

N/A



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.

Section 3.1



Description of existing sanitary sewer available for discharge of wastewater from proposed development.

Section 3.2



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)

Appendix C



Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.

N/A



Description of proposed sewer network including sewers, pumping stations, and forcemains.

- N/A 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 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.

4.4 Development Servicing Report: Stormwater Checklist

- Section 4.1 Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- Section 4.1 Analysis of available capacity in existing public infrastructure.
- Drawings and Figures A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- Section 4.2 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.
- N/A Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- Section 4.3 Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- N/A 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.
- N/A Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.

Section 4.3

Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).

N/A

Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.

Section 4.1 & 4.3

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.

N/A

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.

Section 4.3

Descriptions of how the conveyance and storage capacity will be achieved for the development.

N/A

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.

N/A

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.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- 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.)

4.6 Conclusion Checklist

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

250 Parkdale Avenue

Preferred servicing should be coming off from Parkdale Avenue which has the following infrastructures:

- 203 mmØ PVC Watermain
- 750 mmØ Storm Sewer
- 250 mmØ Sanitary Sewer

Official Plan ROW Widening is 26.0m for Parkdale Avenue(13.0m centre line of road)
Sight triangle requirement of 5.0m X 5.0m

Overall, we agree in principle with a mixed-use development on this block of land, although we feel that land consolidation with 1530 Scott Street would make for a better project. We are optimistic that through the detailed design stages we can further massage the plan in concert with you and your team to create an exciting development. With this said here are some of our comments from the meeting which will help move this concept forward:

Items to Consider on your Site Plan:

- Add a row of street trees along Scott St and Parkdale Ave;
- Road widening (please have your surveyor confirm):
 - o Parkdale – 26m or 13m from centerline
 - o Scott – 26m or 13m from centreline
- Corner triangle of 5m x 5m will be required.
- Parking along Scott and Parkdale;
- Location of parking garage entrance;
- Creating a corner feature on the site at Somerset and Breezehill;
- Street-oriented units, perhaps townhouses, facing Parkdale;
- 5m setback of tower from the west property line is too narrow;
- 3m setback of tower from the south property line is too small.

Design Considerations:

- The section of Parkdale north of Scott is planned for high-rise housing. So this building could be a nice punctuation between the high-rise environment to the north, and generally medium profile environment to the south.
- More urban design analysis, particularly about the relationship between the existing and possible future buildings and what may unfold around the subject site (i.e. 1530 Scott Street)
- The sitting of the building and its relationship with both Scott and Parkdale appears to be quite logically positioned and treated.
- The podium scale appears to be right for this context.
- Tower should set back from the podium along Parkdale;
- The blank wall on the west side requires some explanation.
- We encourage the use of curves to reduce the possible negative wind impacts

Types of Applications

Zoning By-law Amendment

http://ottawa.ca/online_services/forms/ds/Application_for_Zoning_Amendment_en.pdf

Site Plan Control, Manager Approval, Public Consultation

http://ottawa.ca/online_services/forms/ds/Application_for_Site_Plan_Control_en.pdf

Required Studies/Plans/Reports for the Site Plan Control applications:

Please see attached PDF.

Also, because you are within 75m of the LRT line, a Vibration Study will be required.

When submitting your application, please consult the Guide to Preparing Studies and Plans, this is what we will be using when deeming your application complete:

http://ottawa.ca/residents/planning/dev_review_process/guide/index_en.html

Please remember that we do not have a concurrent circulation process, so the number of copies listed on the attached are for Site Plan not Zoning.

For the Zoning circulation, we require an additional 20 copies of both the site plan and landscape plan, unless of course you combine them. Also 11x17 is sufficient for the zoning.

Guidelines to be aware of:

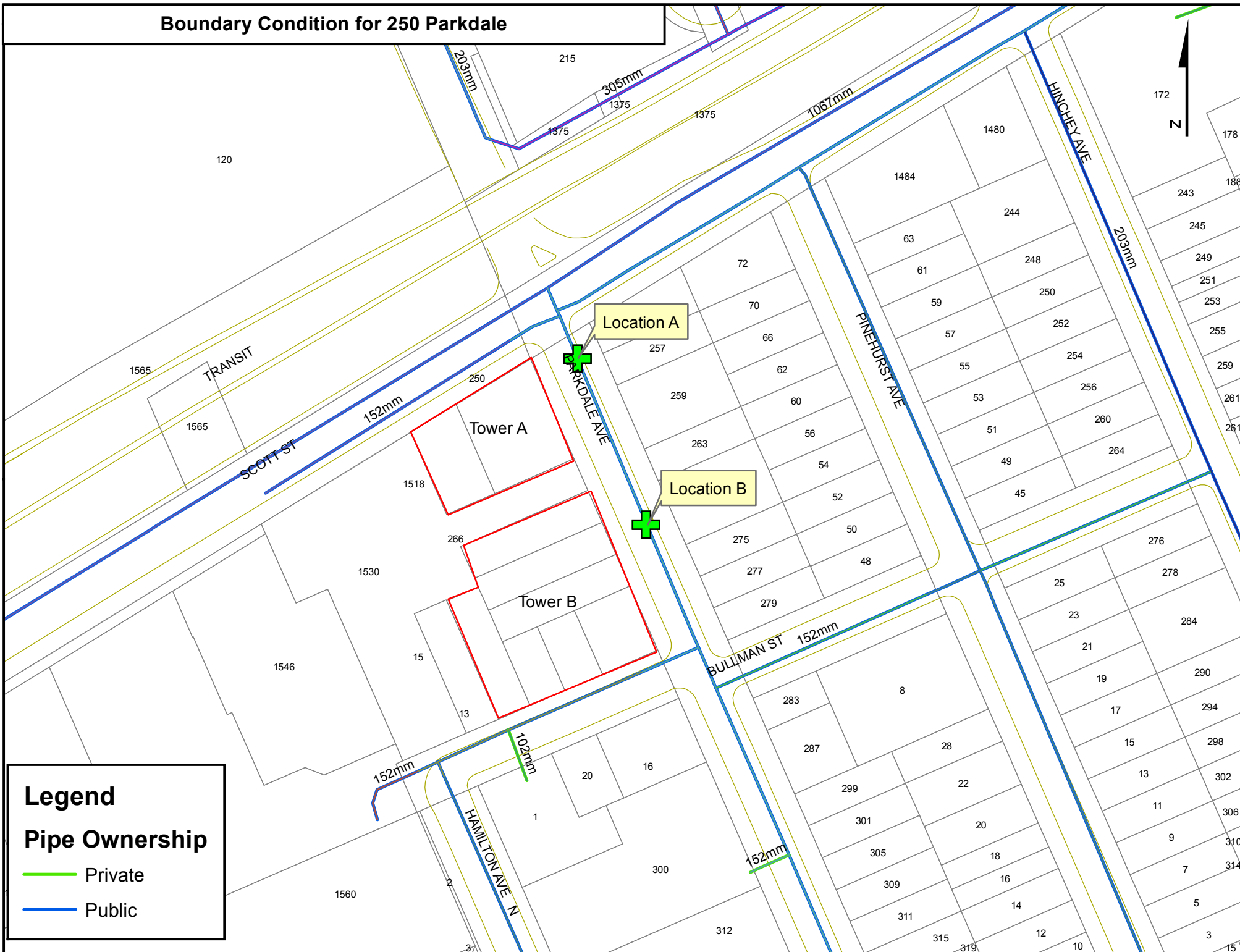
Urban Design Guidelines for High-Rise Housing

http://ottawa.ca/residents/planning/design_plan_guidelines/completed/high_rise_housing/guidelines_high_rise_housing_en.pdf

Wellington Community Design Plan

http://ottawa.ca/residents/public_consult/wellington_cdp/oh_1/cdp_en.html

Boundary Condition for 250 Parkdale



Alex Mullen

From: Wu, John [John.Wu@ottawa.ca]
Sent: Monday, March 04, 2013 11:56 AM
To: Alex Mullen
Subject: RE: 250 Pardale Ave-Watermain boundary conditions
Attachments: image001.png; 250 Parkdale Feb 2013.pdf

[Here is the result:](#)

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 250 Parkdale Ave (see attached PDF for locations).

Max Day + FF (150L/s) at Location A = 109.7m

Max Day + FF (150L/s) at Location B = 108.4m

Min HGL(same for both locations) = 107.8m

Max HGL (same for both locations) = 114.3m

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

APPENDIX B

Water Supply

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	2	7
Semi-detached	2.7	2	5
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		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	12	4.3	3.0	41.2	28.6	62.1	43.1

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d		0.00	0.0	0.0	0.0	0.0	0.0
Office	75 L/9.3m ² /d		0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125 L/seat/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
Total I/CI Demand			0.0	0.0	0.0	0.0	0.0	0.0
Total Demand			4.3	3.0	41.2	28.6	62.1	43.1

* Estimated number of seats at 1 seat per 9.3m²

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	163	294

	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	294	102.9	71.5	370.4	257.3	555.7	385.9

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d	2,350	5.88	4.1	8.8	6.1	15.9	11.0
Office	75 L/9.3m ² /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
Total I/CI Demand			5.9	4.1	8.8	6.1	15.9	11.0
Total Demand			108.8	75.5	379.3	263.4	571.5	396.9

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	7	24
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		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	24	8.4	5.8	79.8	55.4	120.1	83.4

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d	450	1.13	0.8	1.7	1.2	3.0	2.1
Office	75 L/9.3m ² /d		0.00	0.0	0.0	0.0	0.0	0.0
Restaurant*	125 L/seat/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
Total I/CI Demand			1.1	0.8	1.7	1.2	3.0	2.1
Total Demand			9.5	6.6	81.5	56.6	123.2	85.5

* Estimated number of seats at 1 seat per 9.3m²

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	260	468

	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	468	163.8	113.8	475.0	329.9	704.3	489.1

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min
Commercial floor space	2.5 L/m ² /d	1,243	3.11	2.2	4.7	3.2	8.4	5.8
Office	75 L/9.3m ² /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
Total I/CI Demand			3.1	2.2	4.7	3.2	8.4	5.8
Total Demand			166.9	115.9	479.7	333.1	712.7	495.0

APPENDIX C

Wastewater Collection

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



Site Area 0.116 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.03 L/s

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4	2	7
Semi-detached and duplex	2.7	2	6
Duplex	2.3		0
Townhouse	2.7		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop 13

Average Domestic Flow 0.05 L/s

Peaking Factor 4

Peak Domestic Flow 0.21 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		0.00
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 0.00

Peak Institutional / Commercial Flow 0.00

Peak Industrial Flow** 0.00

Peak I/C/I Flow 0.00

* 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	0.05 L/s
Total Estimated Peak Dry Weather Flow Rate	0.21 L/s
Total Estimated Peak Wet Weather Flow Rate	0.24 L/s

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



Site Area 0.116 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.03 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	163	294

Total Pop 294

Average Domestic Flow 1.19 L/s

Peaking Factor 4.00

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	2,350	0.27
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 0.27

Peak Institutional / Commercial Flow 0.41

Peak Industrial Flow** 0.00

Peak I/C/I Flow 0.41

* 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	1.46 L/s
Total Estimated Peak Dry Weather Flow Rate	5.17 L/s
Total Estimated Peak Wet Weather Flow Rate	5.20 L/s

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



Site Area 0.238 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.07 L/s

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4	4	14
Semi-detached and duplex	2.7		0
Duplex	2.3		0
Townhouse	2.7		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1	3	7
3 Bedroom	3.1		0
Average	1.8		0

Total Pop 21

Average Domestic Flow 0.09 L/s

Peaking Factor 4

Peak Domestic Flow 0.34 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	450	0.05
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 0.05

Peak Institutional / Commercial Flow 0.08

Peak Industrial Flow** 0.00

Peak I/C/I Flow 0.08

* 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	0.14 L/s
Total Estimated Peak Dry Weather Flow Rate	0.42 L/s
Total Estimated Peak Wet Weather Flow Rate	0.49 L/s

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



Site Area 0.238 ha

Extraneous Flow Allowances

Infiltration / Inflow 0.07 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	260	468

Total Pop 468

Average Domestic Flow 1.90 L/s

Peaking Factor 3.99

Peak Domestic Flow 7.56 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	1,243	0.14
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 0.14

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	2.04 L/s
Total Estimated Peak Dry Weather Flow Rate	7.78 L/s
Total Estimated Peak Wet Weather Flow Rate	7.84 L/s

SANITARY SEWER CALCULATION SHEET

PROJECT: **Richcraft**
 LOCATION: **Parkdale**
 FILE REF: **11-545**
 DATE: **23-Apr-14**

Monitoring Data

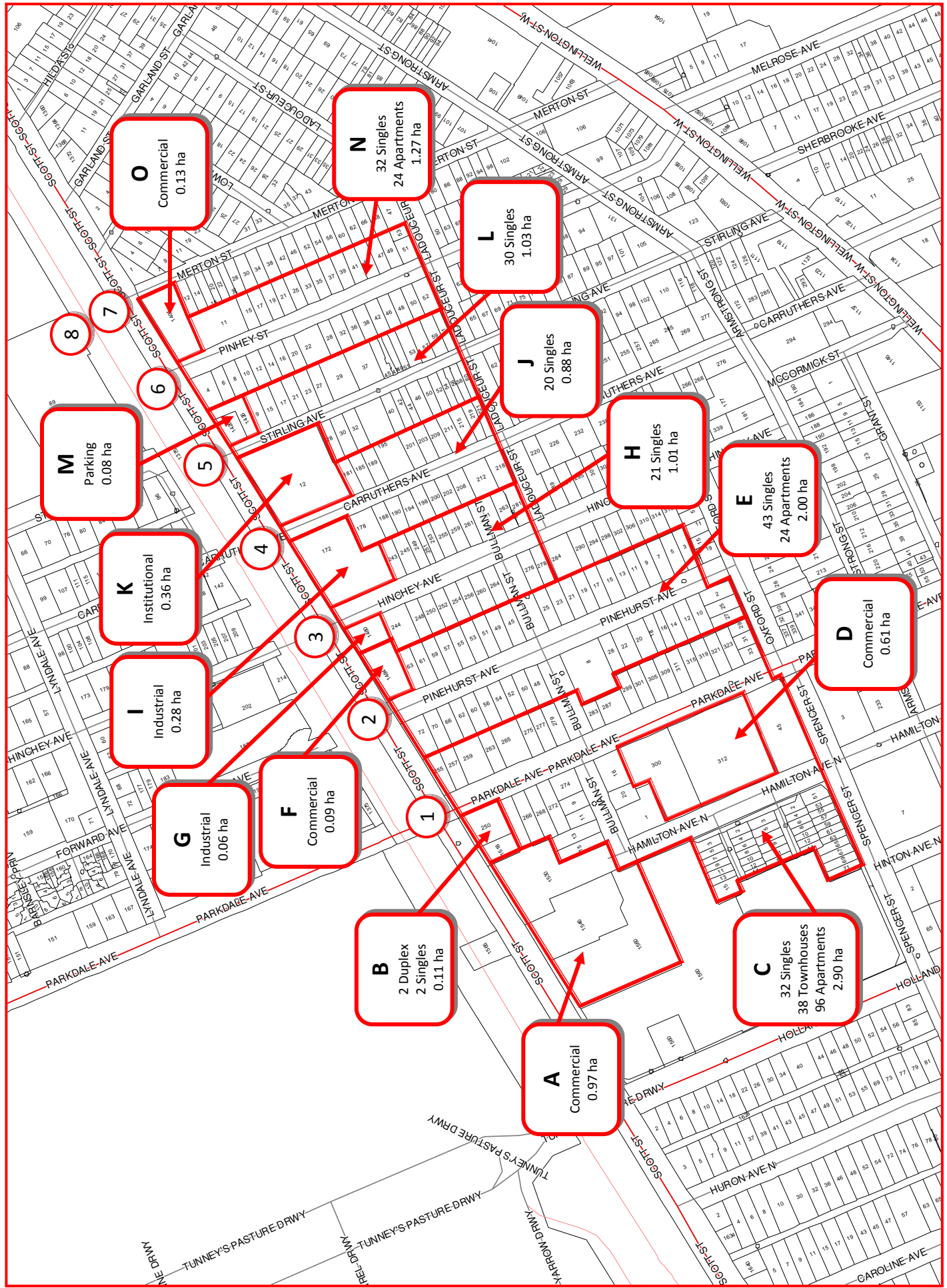
Avg. Daily Flow Res. 300 L/p/d
 Avg. Daily Flow Comm. 17,000 L/ha/d
 Avg. Daily Flow Instit. 10,000 L/ha/d
 Avg. Daily Flow Indust. 10,000 L/ha/d

Peak Fact. Res. Per Harmons: Min = 0.4 Max = 0.6
 Peak Fact. Comm. 1
 Peak Fact. Instit. 1
 Peak Fact. Indust. per MOE graph

Infiltration / Inflow 0.5 L/s/ha
 Min. Pipe Velocity 0.60 m/s full flowing
 Max. Pipe Velocity 3.00 m/s full flowing
 Mannings N 0.013



Area ID	Location		Residential Area and Population										Commercial			Institutional		Industrial		Infiltration			Pipe Data								
	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	
			(ha)	Singles	Semi's	Town's	Apt's	Area (ha)	Pop.	Fact. (-)	(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)	(-)	
A		1						0.000	0.0	3.10	0.00		0.00	0.97	0.97		0.00	0.8	0.974	0.974	0.5	1.33	300	0.30		0.071	0.075	0.75	53.0	0.03	
B-C-D	1	2	3.01	34	2	38	96	396.0	3.005	396.0	2.81	3.87	0.61	0.61	0.97		0.00	1.4	3.615	4.589	2.3	7.54	250	0.26		0.049	0.063	0.62	30.3	0.25	
E-F	2	3	2.00	43			24	189.0	5.001	585.0	2.76	5.61	0.09	0.70	0.97		0.00	1.5	2.086	6.675	3.3	10.40	300	0.29		0.071	0.075	0.74	52.1	0.20	
G-H-I	3	4	1.01	21				71.0	6.009	656.0	2.75	6.26		0.70	0.34	1.31		0.00	1.7	1.344	8.019	4.0	12.01	375	0.31		0.110	0.094	0.88	97.6	0.12
J-K	4	5	0.88	20				68.0	6.885	724.0	2.73	6.87		0.70	0.36	1.67	0.28	0.28	3.0	1.511	9.530	4.8	14.59	375	0.44		0.110	0.094	1.05	116.3	0.13
L-M	5	6	1.03	30				102.0	7.915	826.0	2.71	7.78	0.08	0.78	1.67		0.28	3.0	1.109	10.639	5.3	16.12	375	0.30		0.110	0.094	0.87	96.0	0.17	
N-O	6	7	1.27	32			24	152.0	9.183	978.0	2.68	9.11		0.78	0.13	1.80		0.28	3.1	1.401	12.040	6.0	18.28	375	3.78		0.110	0.094	3.09	340.9	0.05
	7	8						0.0	9.183	978.0	2.68	9.11		0.78	1.80		0.28	3.1	0.000	12.040	6.0	18.28	375	0.30		0.110	0.094	0.87	96.0	0.19	



APPENDIX D

Stormwater Management

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2004



Existing Drainage Area Characteristics

Area	0.116 ha
C	0.80 Rational Method runoff coefficient
t_c	10.0 min

Estimated Peak Flow

	2-year	5-year	100-year
i	76.8	104.2	178.6 mm/hr
Q	19.7	26.7	57.2 L/s

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



Target Flow Rate

Area 0.116 ha
C 0.50 Rational Method runoff coefficient
t_c 10.0 min

5-year
i 104.2 mm/hr
Q 16.8 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area 0.02 ha
C 0.90 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	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	4.5	4.5	0.0	0.0	178.6	8.6	8.6	0.0	0.0

Estimated Post Development Peak Flow from Attenuated Areas

Total Area 0.10 ha
C 0.90 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	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	25.7	4.3	21.4	12.8	178.6	48.9	8.2	40.7	24.4
15	83.6	20.6	4.3	16.3	14.7	142.9	39.1	8.2	31.0	27.9
20	70.3	17.3	4.3	13.0	15.6	120.0	32.9	8.2	24.7	29.6
25	60.9	15.0	4.3	10.7	16.1	103.8	28.4	8.2	20.3	30.4
30	53.9	13.3	4.3	9.0	16.2	91.9	25.2	8.2	17.0	30.6
35	48.5	12.0	4.3	7.6	16.1	82.6	22.6	8.2	14.5	30.4
40	44.2	10.9	4.3	6.6	15.8	75.1	20.6	8.2	12.4	29.8
45	40.6	10.0	4.3	5.7	15.4	69.1	18.9	8.2	10.8	29.0
50	37.7	9.3	4.3	5.0	14.9	64.0	17.5	8.2	9.4	28.1
55	35.1	8.7	4.3	4.3	14.3	59.6	16.3	8.2	8.2	27.0
60	32.9	8.1	4.3	3.8	13.7	55.9	15.3	8.2	7.2	25.7
65	31.0	7.7	4.3	3.3	13.0	52.6	14.4	8.2	6.3	24.4
70	29.4	7.2	4.3	2.9	12.2	49.8	13.6	8.2	5.5	23.0
75	27.9	6.9	4.3	2.5	11.4	47.3	12.9	8.2	4.8	21.5
80	26.6	6.5	4.3	2.2	10.6	45.0	12.3	8.2	4.2	20.0
85	25.4	6.3	4.3	1.9	9.8	43.0	11.8	8.2	3.6	18.4
90	24.3	6.0	4.3	1.7	8.9	41.1	11.3	8.2	3.1	16.8
95	23.3	5.7	4.3	1.4	8.0	39.4	10.8	8.2	2.6	15.1
100	22.4	5.5	4.3	1.2	7.1	37.9	10.4	8.2	2.2	13.3
105	21.6	5.3	4.3	1.0	6.2	36.5	10.0	8.2	1.8	11.6
110	20.8	5.1	4.3	0.8	5.2	35.2	9.6	8.2	1.5	9.8

5-year Q_{attenuated} 4.31 L/s 100-year Q_{attenuated} 8.16 L/s
5-year Max. Storage Required 16.2 m³ 100-year Max. Storage Required 30.6 m³

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	4.5	0.0	8.6	0.0
Attenuated Areas	4.3	16.2	8.2	30.6
Total	8.8	16.2	16.8	30.6

Estimated Peak Stormwater Flow Rate
City of Ottawa Sewer Design Guidelines, 2004



Existing Drainage Area Characteristics

Area 0.238 ha
C 0.87 Rational Method runoff coefficient
t_c 10.0 min

Estimated Peak Flow

	2-year	5-year	100-year
i	76.8	104.2	178.6 mm/hr
Q	43.9	59.6	127.6 L/s

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



Target Flow Rate

Area	0.238 ha
C	0.50 Rational Method runoff coefficient
t _c	10.0 min
5-year	
i	104.2 mm/hr
Q	34.4 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area	0.04 ha
C	0.90 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	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	9.3	9.3	0.0	0.0	178.6	17.7	17.7	0.0	0.0

Estimated Post Development Peak Flow from Attenuated Areas

Total Area	0.20 ha
C	0.90 Rational Method runoff coefficient

t _c (min)	5-year					100-year				
	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)
20	70.3	35.5	8.8	26.7	32.1	120.0	67.4	16.7	50.7	60.8
25	60.9	30.8	8.8	22.0	32.9	103.8	58.4	16.7	41.6	62.4
30	53.9	27.3	8.8	18.4	33.2	91.9	51.6	16.7	34.9	62.8
35	48.5	24.5	8.8	15.7	32.9	82.6	46.4	16.7	29.7	62.3
40	44.2	22.3	8.9	13.5	32.4	75.1	42.2	16.7	25.5	61.2
45	40.6	20.5	8.9	11.7	31.6	69.1	38.8	16.7	22.1	59.6
50	37.7	19.0	8.9	10.2	30.5	64.0	35.9	16.7	19.2	57.6
55	35.1	17.8	8.9	8.9	29.3	59.6	33.5	16.7	16.8	55.3
60	32.9	16.7	8.9	7.8	28.0	55.9	31.4	16.7	14.7	52.8
65	31.0	15.7	8.9	6.8	26.6	52.6	29.6	16.7	12.8	50.1
70	29.4	14.9	8.9	6.0	25.1	49.8	28.0	16.7	11.2	47.2
75	27.9	14.1	8.9	5.2	23.5	47.3	26.6	16.7	9.8	44.2
80	26.6	13.4	8.9	4.5	21.8	45.0	25.3	16.7	8.5	41.0
85	25.4	12.8	8.9	3.9	20.1	43.0	24.1	16.7	7.4	37.8
90	24.3	12.3	8.9	3.4	18.3	41.1	23.1	16.7	6.4	34.4
95	23.3	11.8	8.9	2.9	16.4	39.4	22.2	16.7	5.4	30.9
100	22.4	11.3	8.9	2.4	14.6	37.9	21.3	16.7	4.6	27.4
105	21.6	10.9	8.9	2.0	12.7	36.5	20.5	16.7	3.8	23.8
110	20.8	10.5	8.9	1.6	10.7	35.2	19.8	16.7	3.0	20.1
115	20.1	10.2	8.9	1.3	8.7	34.0	19.1	16.7	2.4	16.4
120	19.5	9.8	8.9	0.9	6.7	32.9	18.5	16.7	1.8	12.6

5-year Q _{attenuated}	8.84 L/s	100-year Q _{attenuated}	16.73 L/s
5-year Max. Storage Required	33.2 m ³	100-year Max. Storage Required	62.8 m ³

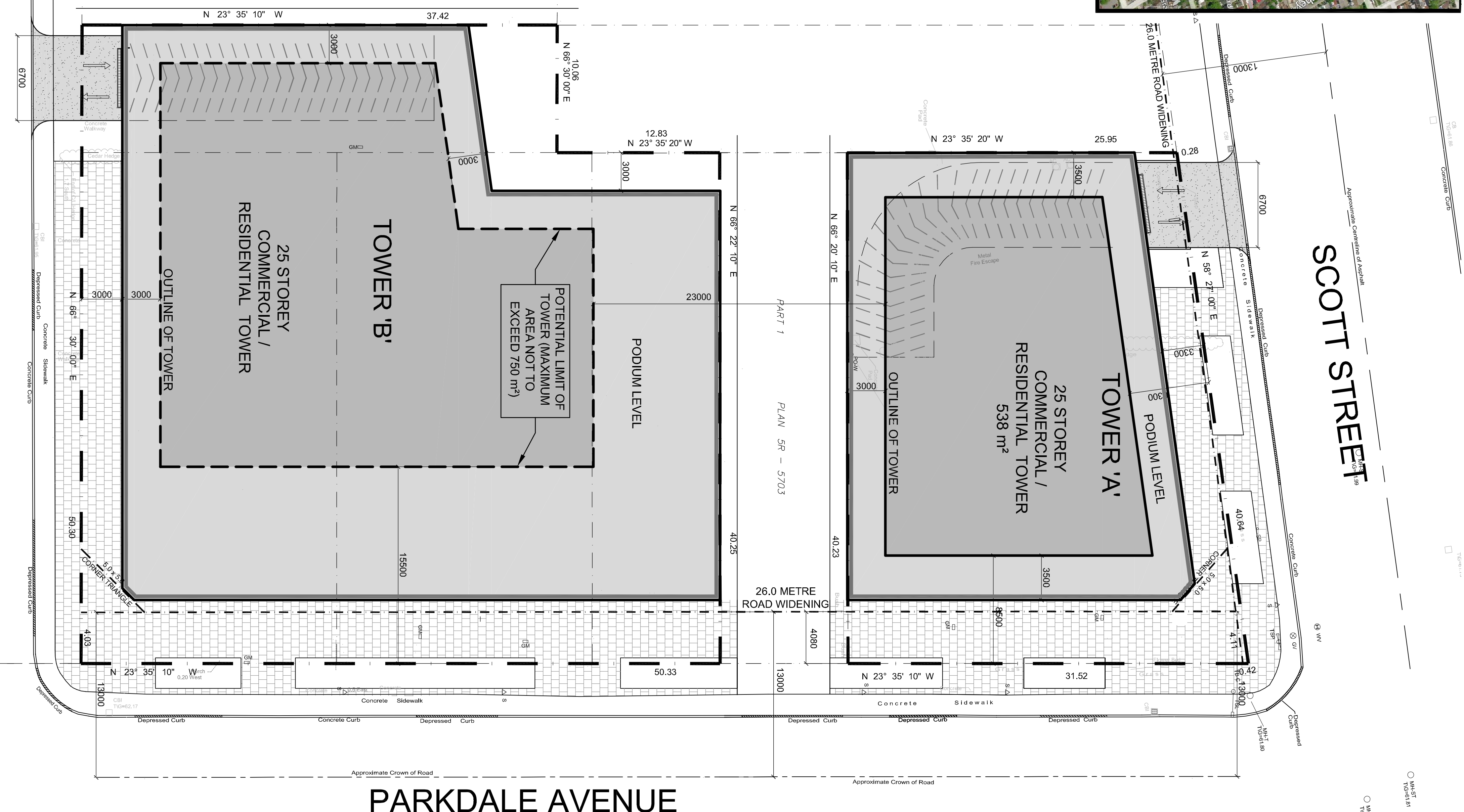
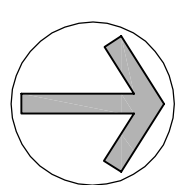
Summary of Release Rates and Storage Volumes

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	9.3	0.0	17.7	0.0
Attenuated Areas	8.8	33.2	16.7	62.8
Total	18.1	33.2	34.4	62.8

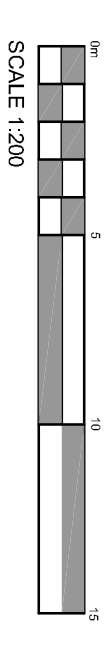
DRAWINGS / FIGURES



KEY PLAN



SITE PLAN



BULLMAN STREET

PARKDALE AVENUE

SCOTT STREET

BULLMAN STREET

TOWER 'A'
250 PARKDALE AVENUE

TOWER 'B'
274 PARKDALE AVENUE

PROJECT INFORMATION

PROJECT INFORMATION

ZONING	Zoning By-Law 2008-250	MC12 F(2.0) H(19)
SITE AREA	1,156.57 sq. m. (12,449 sq. ft.)	
GROSS BUILDING - AREAS (CITY OF OTTAWA'S DEFINITION)		
GROUND FLOOR	706.4 sq. m. (7,604) sq. ft.	
2nd FLOOR	706.4 sq. m. (7,604) sq. ft.	
TYPICAL FLOOR	23 x 490.58 sq. m. 23 x (4,835) sq. ft.	9,902.9 sq. m. (106,594) sq. ft.
TOTAL AREA (ABOVE GRADE)		11,315.7 sq. m. (121,802) sq. ft.

ZONING	Zoning By-Law 2008-250	MC12 F(2.0) H(19)
SITE AREA	2,400.0 sq. m. (25,833 sq. ft.)	
GROSS BUILDING - AREAS (CITY OF OTTAWA'S DEFINITION)		
GROUND FLOOR	1,508.6 sq. m. (16,239) sq. ft.	
2nd FLOOR	706.4 sq. m. (7,604) sq. ft.	
TYPICAL FLOOR	23 x 607.4 sq. m. 23 x (6,589) sq. ft.	13,970.7 sq. m. (150,378) sq. ft.
TOTAL AREA (ABOVE GRADE)		18,987.7 sq. m. (192,854) sq. ft.

