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ADEQUACY OF EXISTING SERVICES

FOR

TRINITY DEVELOPMENT GROUP
900 ALBERT STREET

CITY OF OTTAWA

PROJECT NO.: 15-794

MARCH 2018 – REV 2

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ADEQUACY OF EXISTING SERVICES
FOR
900 ALBERT STREET

TRINITY DEVELOPMENT GROUP

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ADEQUACY OF EXISTING SERVICES
FOR
TRINITY DEVELOPMENT GROUP
MARCH 2018 – REV 2

CITY OF OTTAWA
PROJECT NO.: 15-794

1.0 INTRODUCTION

Trinity development group has retained David Schaeffer Engineering Ltd. (DSEL) to prepare an Adequacy of Existing Services report in support of the application for a Zoning By-law Amendment (ZBLA) at 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 a 65-storey residential building, a 52-storey residential building with 12 floors

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designated to hotel use, and a 32-storey residential and commercial building with approximately 13 floors of commercial. The three towers are proposed to be connected via a retail podium. The contemplated development will include ***1,232*** residential units, ***150*** hotel rooms, and ***30,258 m²*** of retail space, as well as, associated above and below ground parking. Please see ***Drawings/Figures*** for a reduced copy of the Site Plan prepared by B+H Architects dated March 5th, 2018.

The following report is to provide an update to the previously approved Site Servicing Report (***2012 Servicing Report***) prepared by IBI Group, dated January 2012. The ***2012 Servicing Report*** was prepared in support of the previous owner's application to develop 3 office towers with a proposed total floorspace of ***171,824m².*** 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 vegetated area. The elevations range between 63.18m and 54.65m, with local low points existing on-site, and sloping running from north and east to the south and west of the property.

Based on the Geotechnical Investigation 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 Trunk Line (NBST) bisects the subject site from the south to north

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- 650mm diameter combined sewer exists within City Centre Avenue

Work is underway to realign the existing WNC and NBST to allow for development of the site to proceed.

1.2 Required Permits / Approvals

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

1.3 Pre-consultation

Pre-Consultation was conducted at the City of Ottawa on 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***.

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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*)

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

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment and Climate Change, 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)

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3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

As shown by the excerpt from the City of Ottawa Pressure Zone map included in ***Appendix B***, 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.

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^3/day.

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	2.5 x Average Daily *
Residential Maximum Hourly	5.5 x Average Daily *
Commercial Average Daily Demand (Retail)	2.5 L/m^2/d
Office Average Daily Demand	75 L/9.3m^2/d
Hotel Room	225 L/P/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 must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa
** Daily average based on Appendix 4-A and Table 4.2 from **Water Supply Guidelines*** *-Table updated to reflect ISD-2010-2*	

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

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Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Anticipated Water Demand (L/min)	Boundary Condition[2] (m H_2O / kPa)
Average Daily Demand	697.6	118.3 / 581.7
Max Day	1585.5	414,000 L/min @ 140 kPa
Peak Hour	3393.1	107.6 / 476.8

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 59m. See ***Appendix B.***

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

The City provided both the anticipated minimum and maximum water pressures, as well as, the maximum flow at 140kPa (20 PSI) indicated by the correspondence in ***Appendix B.*** Fire flow requirements are to be determined in accordance with Local Guidelines (***FUS***), City of Ottawa ***Water Supply Guidelines***, and the Ontario Building Code.

Using the ***FUS*** method a conservative estimation of fire flow had been established. The following is assumed:

- Type of construction – None-Combustible Construction
- Occupancy type – Limited Combustibility
- Sprinkler Protection – Supervised Sprinkler System

The above assumptions result in a maximum estimated fire flow of approximately ***45,000 L/min***. Actual building materials selected will affect the estimated flow (see ***Appendix B*** for detailed FUS calculations). Approximately ***414,000 L/min*** flow is available within the municipal system at minimum pressure, which is sufficient flow to service the proposed development.

Average day pressures received from the City of Ottawa exceed the maximum operating conditions, thus pressure control will be required to ensure that pressures are below 552kPa. Pressures during the Peak Hour scenario falls within the desired operating pressures.

The anticipated water demand for the site decreased by approximately 17% from the boundary conditions request. It is not anticipated to have a significant impact to the water pressures indicated in ***Table 2***.

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3.3 Water Supply Conclusion

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

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

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

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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 WNC is currently being 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 routing of the WNC and MBC. Trinity has engaged IBI Group to relocate the services 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 Average Apartment	1.8 P/unit
Residential Average Daily Demand	350 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Commercial Average Daily Demand (Retail)	2.5 L/m^2/d
Office Average Daily Demand	75 L/9.3m^2/d
Hotel Room	225 L/P/d
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, 2012	

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

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Table 4
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	13.42
Estimated Peak Dry Weather Flow	38.55
Estimated Peak Wet Weather Flow	39.23

The estimated sanitary flow based on the concept plan provide in ***Drawings/Figures*** anticipates a peak wet weather flow of ***39.23 L/s***.

4.3 Wastewater Servicing Conclusions

Existing sanitary infrastructure, including the Mooney's Bay Collector and West Nepean Collector, are located on-site. The WNC and MBC are currently being re-routed to the south of the subject site.

The anticipated wet weather wastewater discharge from the contemplated development will be ***39.23 L/s***.

The proposed wastewater design conforms to all relevant City guidelines.

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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:

- Control to an 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 15 minutes.
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site.
- Based on consultation with the RVCA, stormwater quality controls are required for parking lot areas.

Based on the above the allowable release rate for the proposed development is ***178.7 L/s***.

5.3 Proposed Stormwater Management System

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

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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^3)	(L/s)	(m^3)
Unattenuated Areas	25.3	0.0	48.0	0.0
Attenuated Areas	69.0	192.5	130.7	364.7
Total	**94.3**	**192.5**	**178.7**	**364.7**

It is anticipated that approximately ***365.0 m^3*** 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, which is 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 being relocated along the south edge of the subject site.

It is anticipated that approximately ***365.0 m^3*** of rooftop and cistern storage will be required to attenuate the 100-year storm event to the allowable release rate.

Based on consultation with the RVCA, stormwater quality controls are required for parking lot areas.

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

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6.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Trinity Development Group 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:

- Based on boundary conditions provided by the City the existing municipal water infrastructure exceeds the required pressure range for the contemplated development;
- ***414.000 L/min*** of fire flow is available, based on the FUS calculations sufficient flow is available to service the development;
- The contemplated development will require a dual connection to the 400mm watermain within the City Centre Avenue right-of-way;
- The contemplated development is anticipated to have a peak wastewater flow of ***39.23 L/s***;
- Based on the ***2012 Servicing Report***, stormwater quantity controls are required to attenuate peak flow to ***178.7 L/s;***
- It is contemplated that stormwater objectives will be met through storm water retention via rooftop and cistern storage, it is anticipated that approximately ***365.0 m^3*** 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 required for parking lot areas.

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

15-794 26/02/2016

4.1 General Content		
☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☐	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☒	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.1
☒	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		
☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

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

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

4.3 Development Servicing Report: Wastewater

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

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

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

4.4 Development Servicing Report: Stormwater Checklist

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

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

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

4.5 Approval and Permit Requirements: Checklist

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

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 7.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

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

APPENDIX B

Water Supply

900 Albert
Previously Approved Water Demands

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		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	0	0.0	0.0	0.0	0.0	0.0	0.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5	$L/m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Office	75	$L/15m^2/d$*	171,824	859.12	596.6	1288.7	894.9	2319.6	1610.9
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	859.1	596.6	1288.7	894.9	2319.6	1610.9
			Total Demand	**859.1**	**596.6**	**1288.7**	**894.9**	**2319.6**	**1610.9**

* Estimated capacity as shown in approved Site Servicing Reporrt prepared by IBI January 2012

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	1232	2218

	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	2218	776.3	539.1	1940.8	1347.7	4269.7	2965.0

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate		Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Commercial floor space	2.5	$L/m^2/d$	11,926	29.82	20.7	44.7	31.1	80.5	55.9
Office	75	$L/9.3m^2/d$	18,332	147.84	102.7	221.8	154.0	399.2	277.2
Hotel†	225	L/person/d	225	50.63	35.2	75.9	52.7	136.7	94.9
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				228.3	158.5	342.4	237.8	616.4	428.0
Total Demand				**1004.6**	**697.6**	**2283.2**	**1585.5**	**4886.0**	**3393.1**

† Assumes a rate of 1.5 persons/room

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

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

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	232270.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	84822.1	L/min	
	85000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**72250.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered	-50%	
Reduction	**-36125**	**L/min**

4. Increase for Separation Distance

N	>45m	0%	
S	30.1m-45m	5%	
E	10.1m-20m	15%	
W	>45m	0%	
	% Increase	**20%**	*value not to exceed 75% per FUS Part II, Section 4*
	Increase	**14450.0**	**L/min**

Total Fire Flow

Fire Flow	45000.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	45000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Hannah Pepper

Subject: FW: Revised information required for water boundary conditions for 900 Albert
Attachments: 900 Albert Sept 2016.pdf

From: Mottalib, Abdul [mailto:Abdul.Mottalib@ottawa.ca]
Sent: Tuesday, September 20, 2016 3:10 PM
To: Steve Merrick <SMerrick@dsel.ca>
Cc: Mottalib, Abdul <Abdul.Mottalib@ottawa.ca>
Subject: FW: Revised information required for water boundary conditions for 900 Albert

FYI

Thanks,

Abdul Mottalib, P. Eng.

From:
Sent: September 20, 2016 2:20 PM
To: Mottalib, Abdul
Subject: RE: Revised information required for water boundary conditions for 900 Albert

The following are boundary conditions, HGL, for hydraulic analysis at 900 Albert (zone 1W) assumed to be connected to the 406mm on City Centre (see attached PDF for location).

Minimum HGL = 107.6m

Maximum HGL = 118.3m, *the maximum pressure is estimated to be more than 80 psi. A pressure check at completion of construction is recommended to determine if pressure control is required*.

Available flow = 6900 L/s assuming a residual of 20 psi and a ground elevation of 59.1m

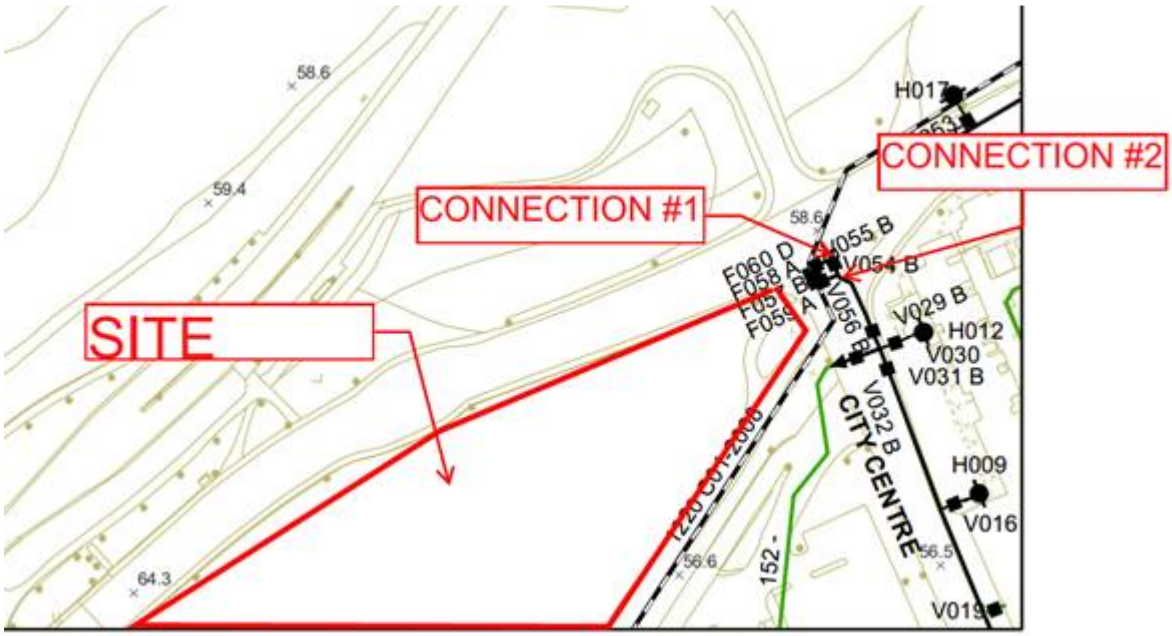
These are for current conditions and are based on computer model simulation.

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.

From: Steve Merrick [mailto:SMerrick@dsel.ca]
Sent: September 14, 2016 11:18 AM
To: Mottalib, Abdul
Cc: Adam Fobert; Buchanan, Richard
Subject: RE: Revised information required for water boundary conditions for 900 Albert

Thanks Abdul,

We have proposed a dual connection to the ex. 400mm watermain within City Centre, see sketch below. The two connections shown will be separated by at least 1 valve within City Centre to ensure the ability to isolate they system from each side.



See below revised demands based on 1470 residential units and 19,800 m^2 of commercial floorspace.

	L/min	L/s
Avg. Daily	677.5	11.29
Max Day	1659.4	27.66
Peak Hour	3630.0	60.50

We do not have sufficient architectural/mechanical information to provide a fire flow estimate as per the FUS. We you hope you can provide the maximum available flow at minimum pressure of 140 kPa

Steve Merrick, EIT.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

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

phone: (613) 836-0856 ext. 561
cell: (613) 222-7816
email: smerrick@DSEL.ca

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From: Mottalib, Abdul [mailto:Abdul.Mottalib@ottawa.ca]
Sent: Tuesday, September 13, 2016 3:25 PM
To: Steve Merrick <SMerrick@dsel.ca>
Cc: Adam Fobert <AFobert@dsel.ca>; Buchanan, Richard <Richard.Buchanan@ottawa.ca>
Subject: Revised information required for water boundary conditions for 900 Albert

Hi Steve,

I got the water demand for the 250 City Centre.

If you already finished your revised demand calculation, could you please send it to me? As I spoke with you, we will run the model concurrently for both the properties.

Regards,

Abdul

Mohammad Abdul Mottalib, M. Sc., M. Eng., P. Eng.
Sr. Engineer Infrastructure Applications
Development Review Services Branch, Urban Services Unit
Planning, Infrastructure and Economic Development Department
Services de la planification, de l'infrastructure et du développement économique
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Ottawa K1P 1J1
Tel. 613-580-2424 ext. 27798
Fax. 613-560-6006
E-mail: Abdul.Mottalib@ottawa.ca

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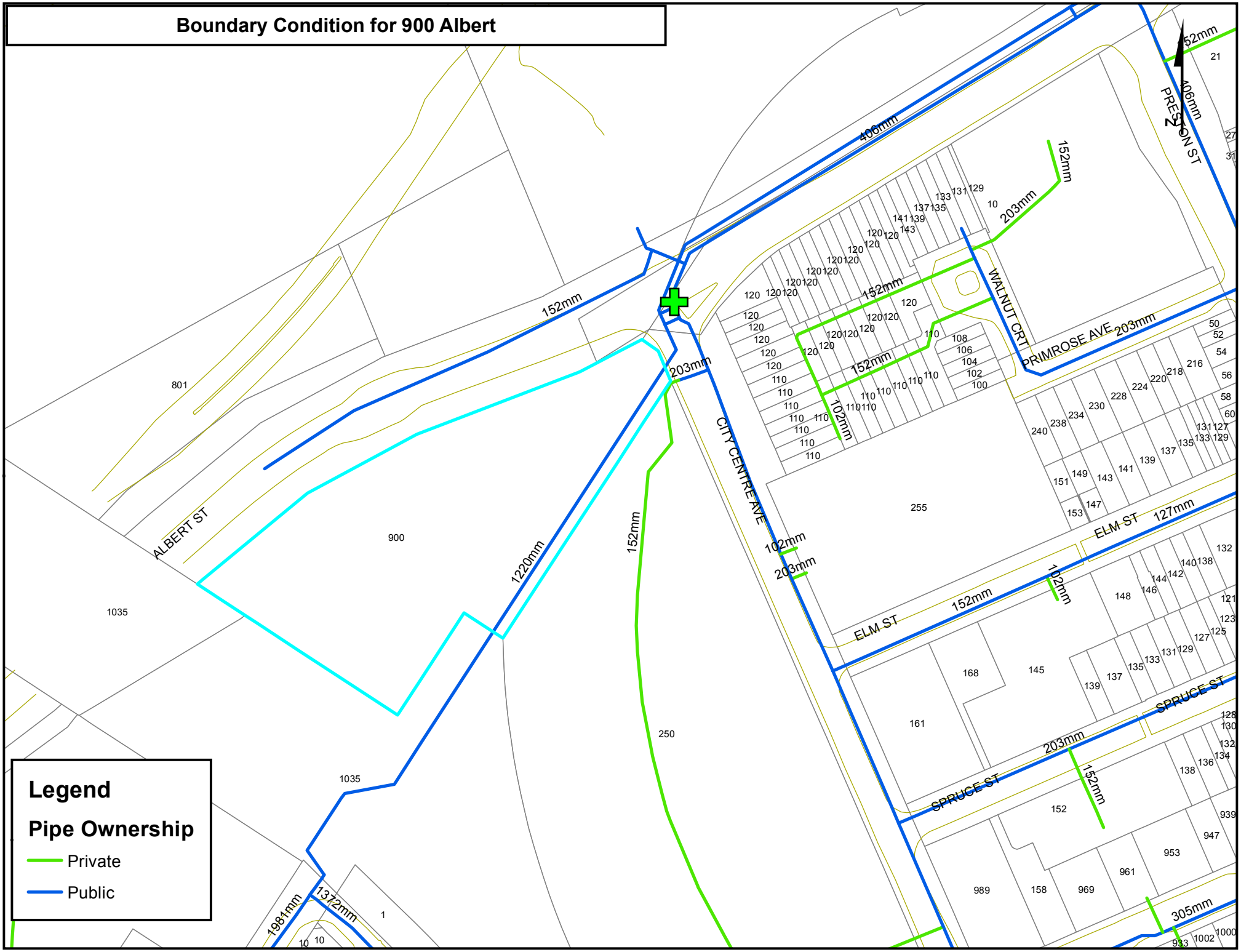
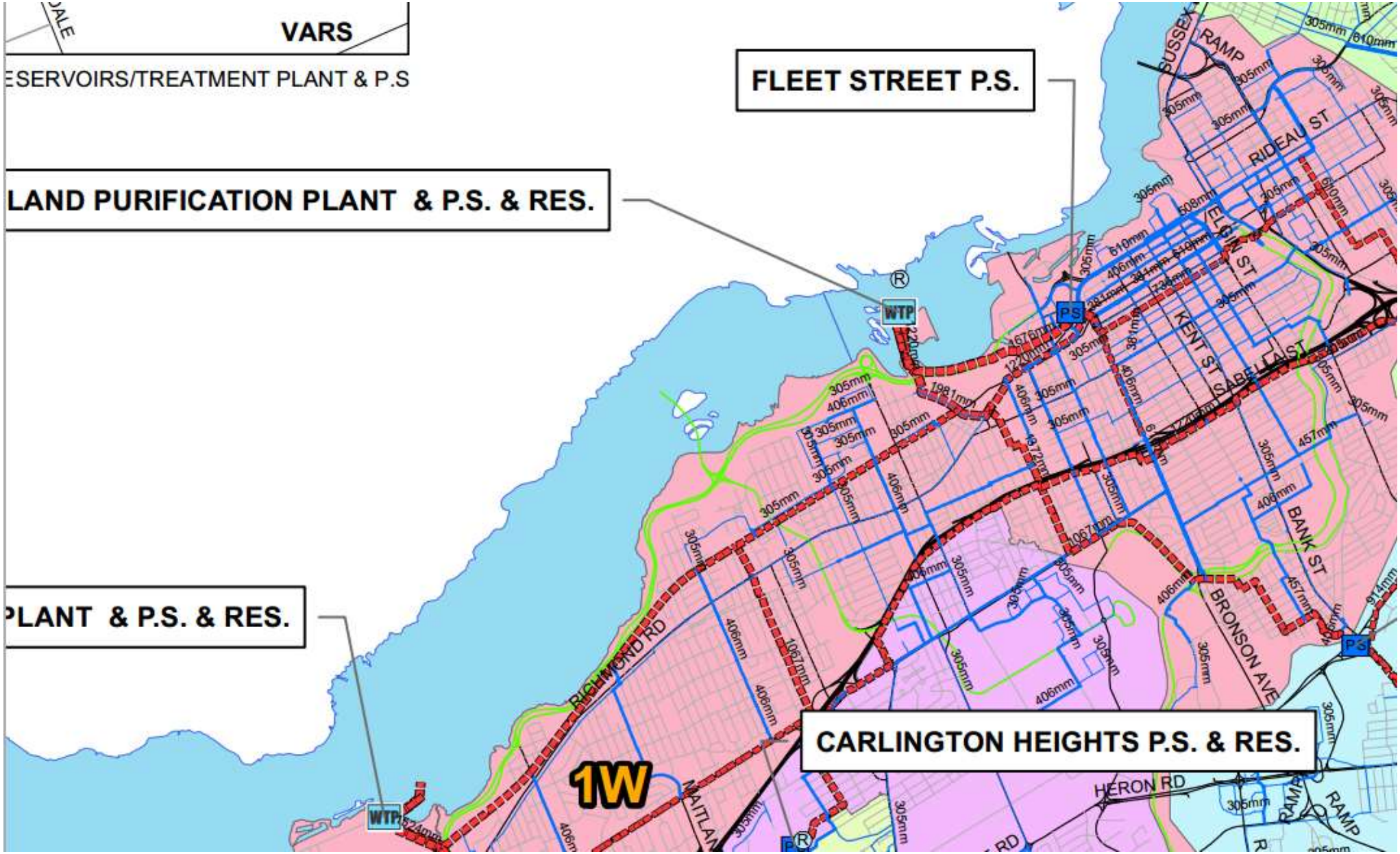
Boundary Condition for 900 Albert




VARS
ESERVOIRS/TREATMENT PLANT & P.S
FLEET STREET P.S.
LAND PURIFICATION PLANT & P.S. & RES.
PLANT & P.S. & RES.
CARLINGTON HEIGHTS P.S. & RES.
1W
WTP
PS
RIDEAU ST
KENT ST
BANK ST
BRONSON AVE
RICHMOND RD
HERON RD
RAMP

APPENDIX C

Wastewater Collection

900 Albert - Site 1b
Proposed Development

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2012

Site Area 2.430 **ha**

Extraneous Flow Allowances

Infiltration / Inflow **0.68 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	1232	2218

Total Pop **2218**

Average Domestic Flow **8.98 L/s**

Peaking Factor **3.55**

Peak Domestic Flow **31.90 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate		No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5	$L/m^2/d$	11,926	1.38
Office**	75	$L/9.3m^2/d$	18,332	2.46
Hotel†	225	L/person/d	225	0.59
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 **4.43**

Peak Institutional / Commercial Flow 6.65
Peak Industrial Flow** 0.00
Peak I/C/I Flow **6.65**

** assuming a 12 hour commercial operation*
*** office includes proposed 10,265 sq.m of Library space*
† Assumes a rate of 1.5 persons/room

Total Estimated Average Dry Weather Flow Rate	**13.42**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**38.55**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**39.23**	**L/s**

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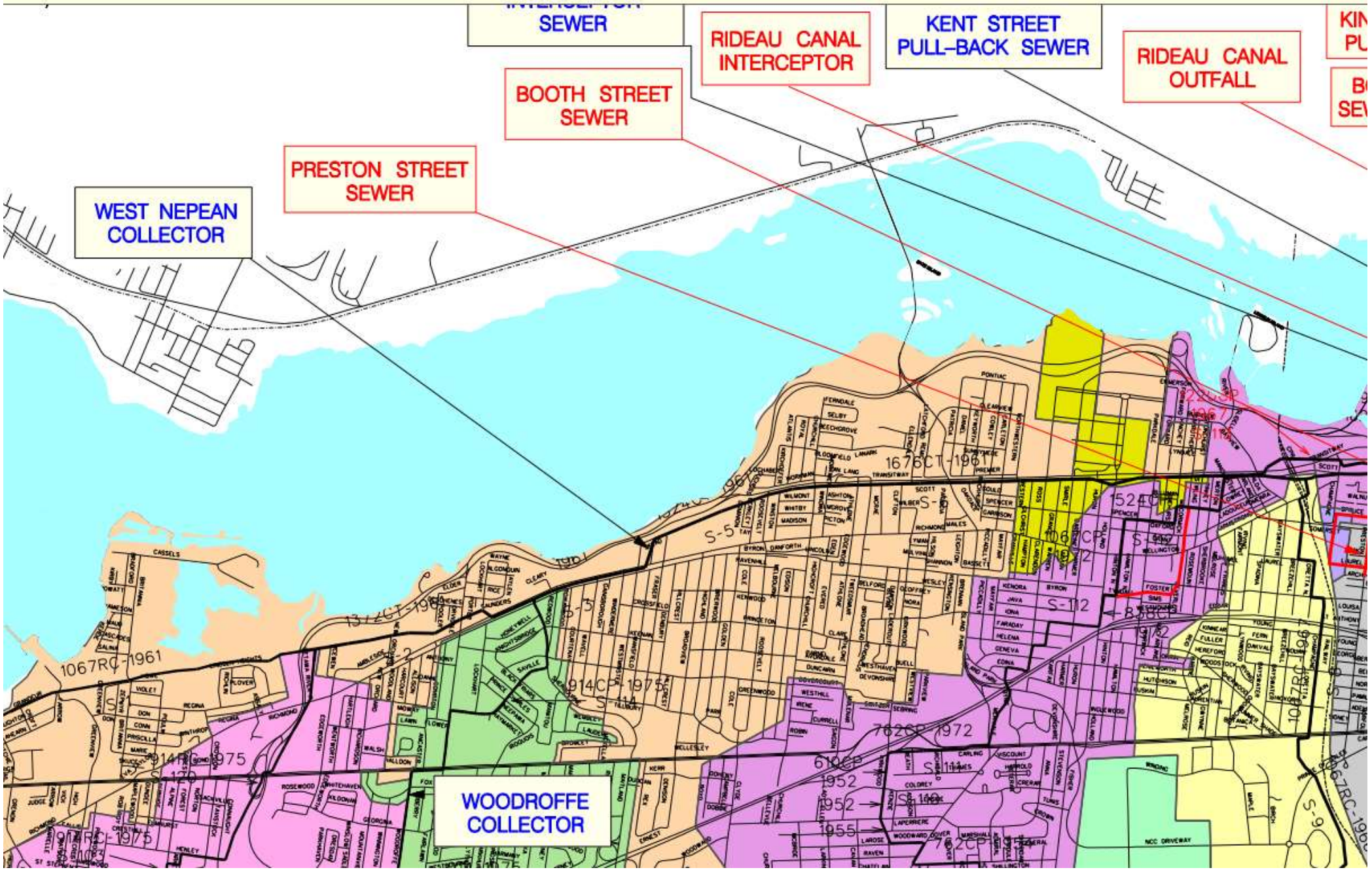
SEWER
RIDEAU CANAL INTERCEPTOR
KENT STREET PULL-BACK SEWER
RIDEAU CANAL OUTFALL
BOOTH STREET SEWER
PRESTON STREET SEWER
WEST NEPEAN COLLECTOR
WOODROFFE COLLECTOR

APPENDIX D

Stormwater Management

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

Existing Drainage Area Charateristics

Area	1.4400	ha
C	0.20	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	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_c	20.0	min

	5-year	
Q	178.7	L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area	0.14	ha
C	0.90	Rational Method runoff coefficient

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

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
20	70.3	227.6	68.9	158.7	190.5	120.0	431.8	130.7	301.1	361.3
25	60.9	197.3	69.0	128.3	192.5	103.8	373.8	130.7	243.1	364.7
30	53.9	174.7	69.1	105.7	190.2	91.9	330.7	130.7	200.0	360.0
35	48.5	157.2	69.1	88.1	185.0	82.6	297.3	130.7	166.6	349.8
40	44.2	143.2	69.2	74.0	177.6	75.1	270.5	130.7	139.8	335.5
45	40.6	131.6	69.2	62.4	168.5	69.1	248.6	130.7	117.9	318.2
50	37.7	122.0	69.3	52.7	158.2	64.0	230.2	130.7	99.5	298.5
55	35.1	113.8	69.3	44.5	146.8	59.6	214.6	130.7	83.9	277.0
60	32.9	106.7	69.3	37.4	134.6	55.9	201.2	130.7	70.5	253.8
65	31.0	100.6	69.4	31.2	121.7	52.6	189.5	130.7	58.8	229.3
70	29.4	95.2	69.4	25.8	108.2	49.8	179.2	130.7	48.5	203.8
75	27.9	90.4	69.4	20.9	94.2	47.3	170.1	130.7	39.4	177.3
80	26.6	86.1	69.5	16.6	79.7	45.0	162.0	130.7	31.2	150.0
85	25.4	82.2	69.5	12.7	64.8	43.0	154.6	130.7	23.9	122.0
90	24.3	78.7	69.5	9.2	49.6	41.1	148.0	130.7	17.3	93.3
95	23.3	75.5	69.5	6.0	34.1	39.4	142.0	130.7	11.2	64.1
100	22.4	72.6	69.5	3.0	18.3	37.9	136.5	130.7	5.7	34.4
105	21.6	69.9	69.6	0.4	2.2	36.5	131.4	130.7	0.7	4.2
110	20.8	67.5	69.6	0.0	0.0	35.2	126.7	130.7	0.0	0.0
115	20.1	65.2	69.6	0.0	0.0	34.0	122.4	130.7	0.0	0.0
120	19.5	63.1	69.6	0.0	0.0	32.9	118.4	130.7	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)

5-year $Q_{attenuated}$	**68.99**	**L/s**	**100-year $Q_{attenuated}$**	**130.72** **L/s**
5-year Max. Storage Required	**192.5**	**m^3**	**100-year Max. Storage Required**	**364.7** **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	25.3	0.0	48.0	0.0
Attenutated Areas	69.0	192.5	130.7	364.7
Total	**94.3**	**192.5**	**178.7**	**364.7**

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DRAWINGS / FIGURES

B+H Architects

900 ALBERT ST

		RETAIL	OFFICE	RESIDENTIAL	HOTEL	TOTAL
GROSS BUILDING AREA (M²)						232,270
SITE AREA (M²)						14,428
FSI						9.0
GROSS FLOOR AREA (M²)						129,716
NRDFA		11,926	18,332	-	11,592	41,851
Below Grade Retail Lobbies		545				
1st Level Retail		5,314				
2nd Level Retail		6,067				
RGFA		-		87,865		87,865
UNITS		-				
Residential Units				1,232		1,232
Hotel Rooms					150	150
RESIDENTIAL AMENITY AREA (M²)		-		7,226		7,226
Indoor		-		4,616		4,616
Outdoor		-		2,610		2,610
Required Amenity Area	6 sqm/unit	-		7,392		7,392
LOADING TRUCK TYPES		4		4		8
Type A		4				
Type B				3		
Garbage				1		
PARKING PROVIDED						1,143
P1						103
P2						103
P3						170
P4						186
P5						191
P6						191
P7						199
# of PARKING required		0	0	30	0	30
Required RETAIL Parking	None required					0
Required OFFICE Parking	None required					0
Required RESIDENTIAL Parking	None required					0
Required VISITOR Parking	30/Building			30		30
Required HOTEL Parking	None required					
BIKE STORAGE						769
Outdoor						47
P1						706
# of BIKE STORAGE required		48	73	616	12	749
Required RETAIL Bike Storage	1.0/250sqm	48				48
Required OFFICE Bike Storage	1.0/250sqm		73			73
Required RES. Bike Storage	0.5/unit			616		616
Required HOTEL Bike Storage	1.0/1,000 sqm				12	12

pace Index

pace index means the ratio of the gross floor area of a building to the total area of the lot on he building is located. (By-law 2008-326)

"floor Area

loor area means the total area of each floor whether located above, at or below grade, ed from the interiors of outside walls and including floor area occupied by interior walls and ea created by bay windows, but excluding;

reas occupied by shared mechanical, service and electrical equipment that serve the building; ion hallways, corridors, stairwells, elevator shafts and other voids; steps and landings; e parking, motor vehicle parking or loading facilities;

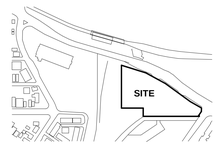
ion laundry, storage and washroom facilities that serve the building or tenants;

ion storage areas that are accessory to the principal use of the building;

ion amenity area and play areas accessory to a principal use on the lot, and quarters for a caretaker of the building.

eas are preliminary and do not allow for all shafts, vertical penetrations, final life ferit stairs and corridors, and Structural, Mechanical and Electrical spaces not yet ed. It is recommended that for any preliminary pro forma calculations, appropriate ion allowances should be made for retail rentable areas, rental residential unit counts and and student residence units and bed counts. All parking and loading floor areas and counts are preliminary and subject to change due to as yet unconfirmed SMEP and g ratio requirements for retail, rental residential and student residences. Ratio ements are still under discussion between Trinity, the City of Ottawa and the design team.

KEY PLAN

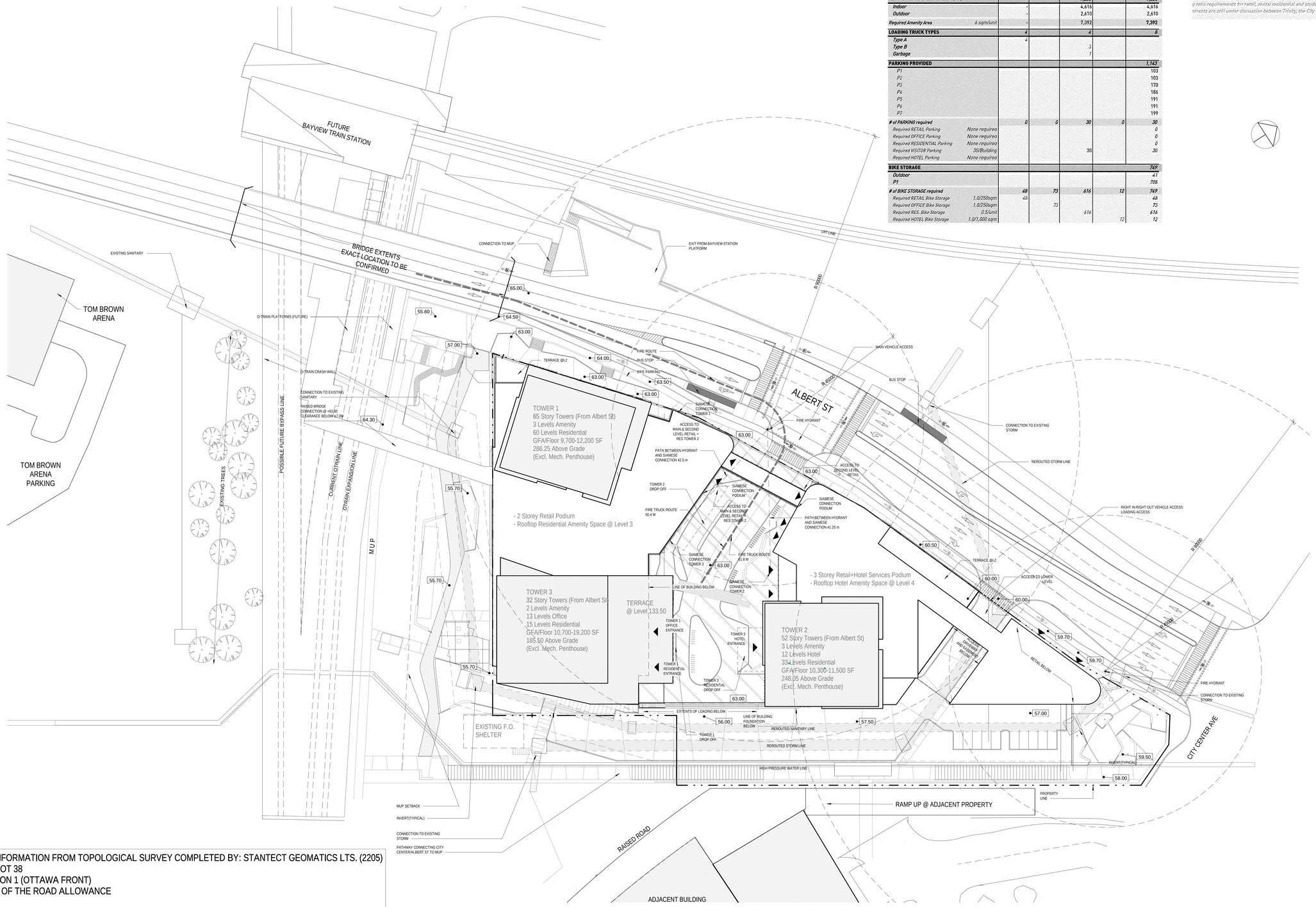


NOT FOR CONSTRUCTION

PRELIMINARY CONCEPT DESIGN

REVISION		
NO.	DATE	DESCRIPTION
1	26/02/2016	ISSUED FOR OPA/ZBA
2	01/11/2016	ISSED FOR COORDINATION
3	08/11/2016	ISSED FOR COORDINATION
4	09/11/2016	ISSUED FOR SPA
5	03/10/2017	ISSUED FOR SHORING PERMIT
6	05/03/2018	ISSUED FOR ZBA/OPA

*All areas are preliminary and do not allow for all shafts, vertical penetrations, final 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, residential unit counts and areas, and office areas. All parking and loading floor areas and space counts are preliminary and subject to change due to as yet unconfirmed SMEP and parking ratio requirements. Ratio requirements are still under discussion between Trinity, the City of Ottawa and the design team.



SURVEY INFORMATION FROM TOPOLOGICAL SURVEY COMPLETED BY: STANTECT GEOMATICS LTS. (2205)
PART OF LOT 38
CONCESSION 1 (OTTAWA FRONT)
AND PART OF THE ROAD ALLOWANCE
BETWEEN
CONCESSION a (OTTAWA FRONT) AND
CONCESSION 1 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA

PROJECT ADDRESS:
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OTTAWA ON

B+H Architects
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Toronto, On M5G 2H4
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TIP Albert GP Inc.
485 Bank St. Suite 200
Ottawa, ON K2P 1Z2
t 416.414.2761

ARCHITECT OF RECORD & LANDSCAPE ARCHITECT:
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481 University Avenue, Suite 300
Toronto, On M5G 2H4
t 416.596.2299 f 416.586.0599

ARCHITECT :
GGLO
1301 First Avenue, Suite 301
Seattle, Washington 98101
t 206.467.5828 f 206.467.0627

TRANSPORTATION:
PARSONS
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Ottawa, Ontario K1J 7T2
t 613-738-4160 f 613-739-7105

URBAN DESIGN:
FoTenn
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Ottawa, Ontario K2P 0Z8
t 613.730.5709 f 613.730.1136

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t 416.477.5832

SITE SERVICES/CIVIL ENGINEER :
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t 4.6.499.8000 f 416.499.7446

ELECTRICAL ENGINEER:
Mulvey & Banani International
44 Mobile Dr.
Toronto, Ontario, M2J 1S5
t 416.751.2520

CODE CONSULTANT:
LMDG
Suite 206, 300 North Queen Street
Toronto, Ontario M9C 5K4
t 416.646.0162 f 416.646.0165

PROJECT :
900 ALBERT
OTTAWA

SHEET CONTENTS:
SITE PLAN

PROJECT NUMBER :
1411089

DRAWING SCALE :
1 : 400

SHEET NO :
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SITE PLAN
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