Westboro Inc.

Assessment of Adequacy of Public Services

403 Richmond Road & 389 Roosevelt Avenue

City of Ottawa, Ontario

CIMA+ file number: A001046
July 10, 2020

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1. Introduction

CIMA+ was retained by Westboro Inc. to prepare an Assessment of Adequacy of Public Services Report for the proposed construction of a nine (9)-storey mixed-use (ground floor retail and 174 residential units) building with an amenity room penthouse located at 403 Richmond Road and 389 Roosevelt Avenue in Ottawa, Ontario.

The purpose of this assessment is to confirm that the proposed development can be adequately serviced by the existing municipal infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA) to allow for an increase in the number of building storeys prior to proceeding with Site Plan Control.

1.1 Site Description and Proposed Development

The site is located at the northeast quadrant of the intersection of Richmond Road and Roosevelt Avenue (refer to **Figure 1** below). 403 Richmond Road is currently comprised of a funeral home with surface parking. The funeral home shares a party wall with the adjacent property to the east (395 Richmond Rd), while 389 Roosevelt Avenue comprises a two-storey private residential building. The combined site area (403 Richmond and 389 Roosevelt) measures approximately 0.26 ha.

Generally, the site is bounded by a private residential dwelling to the north, a commercial building to the east, Richmond Road to the south, and Roosevelt Avenue to the west.

Figure 1: Site Location - Plan View.

The proposed development is a nine (9)-storey, mixed use residential and commercial tower, with 174 residential units, expected to include approximately 268 residents, two (2) underground parking levels comprising the entire site area, and an amenity room penthouse. The commercial floor space on the ground floor measures approximately 580 m² and the common areas, including amenity rooms, party room, and gym, measure approximately 670 m². Refer to **Figure 2** for a conceptual site plan of the proposed development (prepared by Roderick Lahey Architects Inc.).

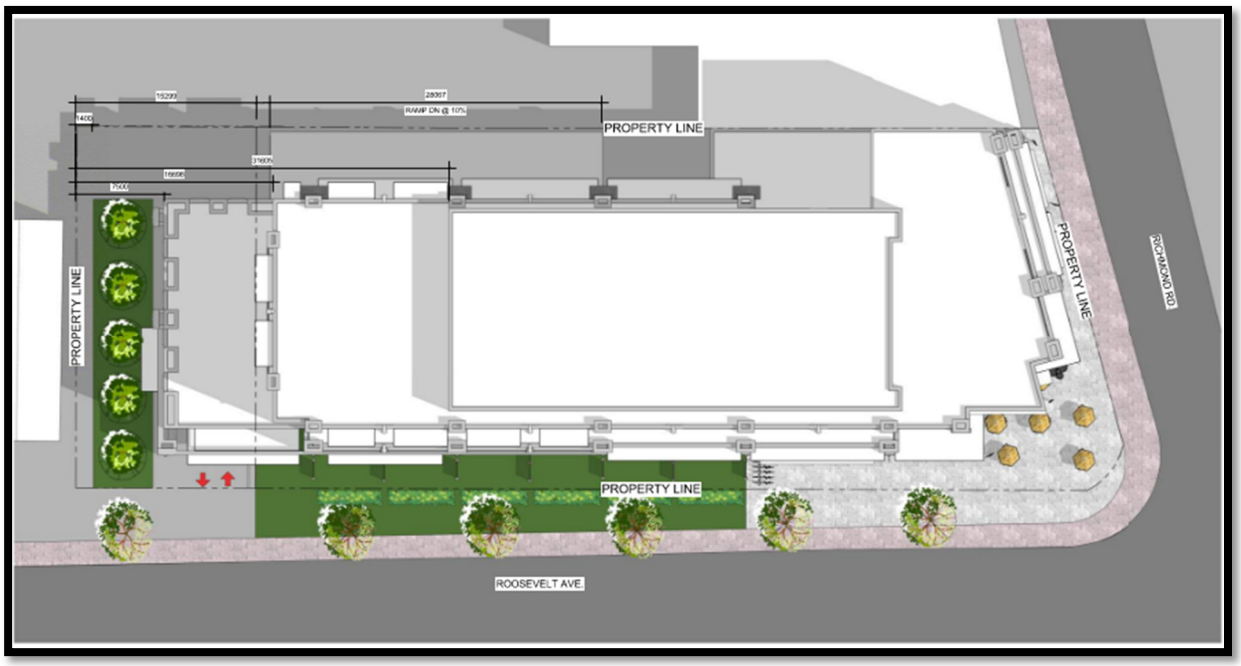

Figure 2: Conceptual Site Plan.

1.2 Review of Available Background Documentation

The following design guidelines have been used to estimate the theoretical servicing requirements for the proposed development; while geoOttawa and the available utility drawings provided by the City of Ottawa Information Centre have been used to determine the existing municipal services fronting the site. Refer to **Appendix A** for available utility plans provided by the City.

- Ottawa Sewer Design Guidelines (October 2012), including;
  - Technical Bulletins ISTB-2018-01;
- Ottawa Design Guidelines – Water Distribution (2010), including;
  - Technical Bulletins ISTB-2018-02, ISDTB-2014-02 and ISD 2010-02;
- Ministry of the Environment Design Guidelines for Sewage Works (2008);
- Ministry of the Environment Stormwater Management Planning and Design Manual (2003);
- Ministry of the Environment Design Guidelines for Drinking-Water Systems (2008); and
- Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (1999).

1.3 Existing Infrastructure

As identified using geoOttawa and the available Utility Record Drawings provided by the City of Ottawa Information Centre, the following municipal infrastructure are available within the right-of-way fronting the proposed development site (refer to **Appendix B** for Existing Conditions Plan).

Richmond Road

- 305 mm diameter PVC watermain (**preferred primary water connection point**);
- 300 mm diameter PVC sanitary sewer;
- 600 mm diameter Concrete storm sewer.

Roosevelt Avenue

- 305 mm diameter PVC watermain that reduces to a 152 mm diameter Cast Iron (UCI) watermain (**preferred secondary water connection point to 152 mm watermain**);
- 300 mm diameter Concrete sanitary sewer (**preferred sanitary connection point**);
- 300 mm diameter Concrete storm sewer that terminates approximately 40 m north of the intersection with Richmond Road (**preferred storm connection point**).

1.4 Consultation and Permits

In response to the pre-consultation requirements defined in the City's Development Servicing Study Checklist, the following agencies were consulted in support of the preparation of this report. The Development Servicing Study Checklist as well as all relevant correspondence with the consulted agencies can be found in **Appendix A**.

City of Ottawa

The City of Ottawa Information Centre was contacted to obtain any Reports, Studies, Engineering, and/or Utility Plans including sanitary sewer, storm sewer, watermain, gas, etc. within or adjacent to the site location. The available engineering plans and utility plans were provided. No existing reports or studies were available.

CIMA+ also contacted Mark Fraser from the City of Ottawa's Planning, Infrastructure and Economic Development Department to obtain any site-specific servicing and stormwater management design criteria for the proposed development. The provided comments and criteria relevant to the Assessment of Adequacy of Public Services are referenced within the appropriate sections of this report, while the remaining requirements for design will be assessed and addressed at the detailed design stage (Site Plan Control).

Rideau Valley Conservation Authority (RVCA)

The subject site falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). CIMA+ contacted Jamie Batchelor from the RVCA to identify any Natural Heritage/Hazards features that may impact the development as well as any Storm Water Management Criteria for the site and required approvals/permits. These criteria are addressed in *Section 4* of this Report.

Ministry of the Environment, Conservation and Parks (MECP)

CIMA+ has determined that the proposed development in question falls within the exemption requirements for an Environmental Compliance Approval (ECA) as per O.Reg. 525/98, section 3(a), and Ontario Water Resources Act section 53.6(c) when considering the following:

1. Currently comprised of two (2) parcels of land that are to be combined into one **(1) parcel**, the existing 0.26-ha site currently consists of a funeral home which is zoned traditional main street (TM) and a single-family home which is zoned Residential Third Density (R3S);
2. The proposed sewage works and stormwater management facility will service a single parcel of land; and
3. The property does not discharge into a combined sewer and it will not be used for industrial purposes.

Correspondence has been provided to the local district office (refer to **Appendix A**).

2. Water Servicing

2.1 Water Supply Design Criteria

The design criteria for determining the water demand requirements for the proposed development follow the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008). Namely, the following parameters have been used in determining the water demands:

Table 2-1: Water Supply Design Criteria

Design Criterion[1]	Residential Areas	Commercial Areas
Average Day Demand	350 L/capita/day	28,000 L/gross hectare/day
Maximum Daily Demand	3.9 × average daily demand[1]	1.5 × average daily demand
Maximum (Peak) Hour Demand	5.8 × average daily demand[1]	1.8 × maximum daily demand
Populations – 1 Bedroom Apartment	1.4 Persons Per Unit	N/A
Populations – 2 Bedroom Apartment	2.1 Persons Per Unit	N/A
Desired Operating Pressure under Normal Operating Conditions	50 to 70 psi	
Minimum Operating Pressure under Normal Operating Conditions	40 psi	
Maximum Operating Pressure under Normal Operating Conditions	80 psi	
Minimum Operating Pressure under Maximum Daily Demand + Fire Flow	20 psi	

[1] Note that residential peaking factors were selected from **Table 3-3** of the MECP Design Guidelines for Drinking-Water Systems for 0 to 500 persons.

In addition to those design criteria identified in **Table 2-1**, the following comments and criteria identified by the City as part of the pre-consultation must be considered in the water supply servicing strategy:

- The subject site is located within the 1W pressure zone;
- Residential buildings with a basic day demand greater than 50 m³/day (0.57 L/s) are required to be connected to a minimum of two (2) water services separated by an isolation valve to avoid a vulnerable service area. Given the subject site is on a corner lot the City will not support the installation of a new isolation valve on the City watermain to satisfy this requirement. Thus, if the basic day demand for this site exceeds 50m^3/day there shall be a primary water service to Richmond Rd. and a secondary connection to Roosevelt Ave. to provide redundant supply, utilizing the existing isolation valves to avoid a vulnerable service area;
- Fire flow demand requirements shall be based on the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999 and Technical Bulletin ISTB-2018-02;
- Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF);
- Hydrant capacity shall be assessed if relying on any public hydrants to provide fire protection, particularly if high design fire flows are being proposed, to demonstrate the Required Fire Flow (RFF) can be achieved. Identification of which hydrants are being considered to meet the RFF on a fire hydrant coverage figure is required as part of the boundary conditions request.

2.2 Proposed Water Supply Servicing and Calculations

Water Demands

The water supply demands for the proposed development are presented in **Table 2-2** below. The demands were developed utilizing the development statistics (i.e. residential units and commercial floor area) provided by Roderick Lahey Architects Inc. and those design criteria identified in *Section 2.1*. Refer to **Appendix D** for detailed calculations.

Table 2-2: Water Demands

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.09	4.23	6.30
Commercial	0.04	0.06	0.11
Total	**1.13**	**4.29**	**6.41**

Given the basic day demand exceeds 50 m³/day (or 0.57 L/s) a minimum of two (2) water service connections, separated by an isolation valve, are required to provide redundant supply and avoid a vulnerable service area.

Proposed Water Supply Connection Point(s)

In accordance with the City's request to avoid the installation of a new isolation valve on the City watermain given the development's position on a corner lot, a primary water service to Richmond Rd. and a secondary connection to Roosevelt Ave. is proposed. The existing isolation valves between the two connection points will be utilized to avoid a vulnerable service area. Refer to **Appendix C** for proposed connection points.

Required Fire Flow (RFF)

The required fire flow for the site was developed using the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999 and Technical Bulletin ISTB-2018-02. It was determined that an RFF of **6000 L/min (100 L/s)** would be required to provide adequate protection.

It was assumed that multiple municipal hydrants would be required to meet the fire flow requirements and a fire hydrant coverage figure was prepared is support of the boundary conditions request from the City.

Refer to **Appendix D** for detailed calculations, including supporting figures for exposure distances and hydrant coverage.

Municipal Boundary Conditions

Using the proposed demands, required fire flow and supporting figures the City provided boundary conditions for hydraulic analysis for current conditions, based on computer model simulation. The boundary conditions are as follows:

Table 2-3: Watermain Boundary Conditions

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m)	
	Richmond Rd. 305 mm dia.	Roosevelt Ave. 152 mm dia.
Minimum HGL	108.5	108.5
Maximum HGL	115.0	115.0

A Multi-Hydrant Analysis was performed by the City utilizing the two nearest available hydrants on Roosevelt Ave. as identified on the Hydrant Coverage Figure prepared by CIMA+ (refer to **Appendix D**). The total available flow from these hydrants is as follows:

Table 2-4: Available Hydrant Flows

Hydrant ID	Available Flow (L/s)
362027H067	85
362028H045	30
Total	115

Hydraulic Analysis – Water Supply Adequacy

A hydraulic analysis was completed utilizing the boundary condition information provided by the City for the proposed development in order to confirm that there is adequate flow and pressure in the water distribution system to meet the required water demands. The following Table summarizes the available flow and pressure in the system under each demand scenario:

Table 2-5: Water Supply Adequacy - Hydraulic Analysis

Demand Type	Proposed Demand (L/s)	Available Flow/Pressure		Desired Flow/Pressure Objective	Flow/Pressure Objective Achieved?
		Design Operating Pressure (Relative Head) (m)	Design Operating Pressure (psi)		
Average Daily Demand	1.13	47.6	68	50 to 70 psi	Yes
Maximum Day Demand + Fire Flow	104.29	115 L/s @ 20 psi		≥ 20 psi	Yes
Maximum (Peak) Hour Demand	6.41	41.1	58	50 to 70 psi	Yes

NOTES:

1. Required fire flow demand was calculated as **6,000 L/min (100 L/s)**.
2. The minimum HGL elevation at Connection Points 1 and 2 is **108.5 m** and the maximum HGL elevation is **115.0 m**.
3. Boundary conditions for Connection 1 to Richmond Road assumes a ground elevation of 67.40 m.
4. Boundary conditions for Connection 2 to Roosevelt Avenue assumes a ground elevation of 67.40 m.

2.3 Water Supply Summary and Conclusions

The water supply design for the proposed development follows the parameters outlined in the Ottawa Design Guidelines – Water Distribution (2010) and associated technical bulletins, as well as the MOE Design Guidelines for Drinking-Water Systems (2008).

There is adequate flow and pressure in the water distribution system to meet the required water demands for the proposed development.

3. Sanitary Servicing

3.1 Sanitary Servicing Design Criteria

The design criteria for determining the sanitary peak flow rates for the proposed development follow the parameters outlined in the City of Ottawa Sewer Design Guidelines, 2012 and City of Ottawa Technical Bulletin ISTB-2018-01. Namely, the following parameters have been used in determining the peak sanitary flow rates:

Table 3-1: Sanitary Peak Flow Determination Design Criteria

Design Criterion	Residential Areas	Commercial Areas
Base Flow	280 L/capita/day	28,000 L/gross hectare/day
Populations – 1 Bedroom Apartment	1.4 Persons Per Unit	N/A
Populations – 2 Bedroom Apartment	2.1 Persons Per Unit	N/A
Peaking Factor	Determined by Harmon Equation $P.F. = 1 + \left[\frac{1}{4 + \left(\frac{P}{1{,}000}\right)^{\frac{1}{2}}}\right] \times 0.8$ (P = population; P.F. = peaking factor) Maximum P.F. = 4.0 Minimum P.F. = 2.0	1.5 if Commercial Contribution > 20% 1.0 if Commercial Contribution < 20%
Dry Weather Infiltration Rate	0.05 L/s/effective gross hectare (for all areas)	
Wet Weather Infiltration	0.28 L/s/effective gross hectare (for all areas)	
Total Infiltration Allowance	0.33 L/s/effective gross hectare (for all areas)	

3.2 Proposed Sanitary Servicing and Calculations

Proposed Sanitary Peak Flows

The estimated peak flows from the proposed development based on the design criteria listed in **Table 3-1** are outlined in the following Table.

Table 3-2: Peak Sanitary Flows

Flow Type	Total Flow Rate (L/s)
Total Estimated Average Dry Weather Flow Rate	0.91
Total Estimate Peak Dry Weather Flow Rate	3.06
Total Estimate Peak Wet Weather Flow Rate	3.13

Refer to **Appendix E** for detailed calculations.

Proposed Sanitary Service Connection Point

The proposed sanitary service will connect to the existing 300 mm diameter Concrete sanitary sewer within the right-of-way of Roosevelt Ave. Wastewater flows to the West Nepean Trunk Collector sewer system. Refer to **Appendix C** for proposed connection points.

3.3 Sanitary Servicing Summary and Conclusions

The sanitary servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, and Technical Bulletin ISTB-2018-01.

Peak wastewater demands were provided to the City, who confirmed that there is adequate residual capacity in the city system to accommodate the proposed wastewater flow (refer to **Appendix E**).

4. Storm Servicing and Stormwater Management

4.1 Background

As previously mentioned, the subject site of 403 Richmond Road currently occupies a funeral home with surface parking. Based on available recent survey information the site is relatively flat and generally follows the gradient along Roosevelt Avenue sloping gently from south to north with an approximate change in gradient of 350 mm across the site. The site is nearly entirely impervious with no existing stormwater measures on site (i.e. catch basins, sewers, etc.) and it is thus assumed that there are no current stormwater management controls on site. As such storm runoff generally sheet flows and outlets to Roosevelt Avenue at the northwest site entrances. A small portion of unattenuated flow outlets to Richmond Road at the southernmost entrance. Refer to Pre-development Drainage Area Map in **Appendix F**.

The portion of the site located at 389 Roosevelt occupies a single-family dwelling, with asphalt driveway, stone pathway, wooden shed and grasses lawn area. Again, it appears that there are no current stormwater management controls on site. Based on the available topographic information the direction of major overland flow is unclear with a minimum elevation of 67.130 m at the rear lot line and a minimum elevation of 67.190 m at Roosevelt Avenue. Given there are no rear lot drainage features identified on geoOttawa it is expected that the outlet for this site area is also to Roosevelt Ave. at the driveway location.

Considering there are no current stormwater systems on site and that it is assumed that there are no flow attenuation controls the anticipated peak flows for the existing site are as follows (refer to **Appendix F**):

Table 4-1: Pre-Development Peak Release Flows – Existing Site

Storm Event	Release Flow (L/s)
2-year	43.27
5-year	58.70
100-year	122.50

Ultimately storm runoff from the site enters the municipal system along Roosevelt Ave. Stormwater drains to the Dominion Overflow trunk sewer system prior to discharging to the Ottawa River approximately 650 m downstream from the site. Refer to **Appendix F** for sketch demonstrating the flow path to the ultimate outlet.

The site is located in an older sewer system area of the City, which is uncontrolled and is subject to surcharge for events greater than the 2-year storm. The stormwater management solution must account for the impacts of the receiving system's hydraulic grade line when surcharged, specifically where underground storage is proposed.

4.2 Storm Servicing Strategy and Design Criteria

The design of the major and minor storm systems must ensure that the following criteria are upheld under post-development conditions, in keeping with the requirements of the City and the Rideau Valley Conservation Authority (refer to **Appendix A**).

- The allowable release rate for the site shall coincide with the 2-year storm event under pre-development conditions;
- The allowable release rate shall take into consideration any increase in uncontrolled runoff from the boulevard being converted to a hard surface (concrete, interlocking paving stone, etc.).
- The pre-development runoff coefficient (C) shall be a maximum equivalent 'C' of 0.50, or the actual existing site runoff coefficient, whichever is less;
- The pre-development Time of Concentration (Tc) shall be calculated using an appropriate method and must not be less than 10 minutes;
- A Tc of 10 minutes shall be used for all post-development calculations;
- Storm runoff in excess of the allowable 2-year pre-development release rate, up to and including the 100-year storm event, must be detained on site;
- Where an underground storage tank or cistern is proposed and calculated utilizing the Modified Rational Method an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume to account for fluctuating head and release rate;
- Given the receiving storm sewer is subject to surcharge, the hydraulic grade line under surcharged conditions must be considered in the design of underground retention;
- Overland flow will generally be directed to Roosevelt Avenue;
- In order to address concerns about roadway drainage spilling into the underground parking, the entrance to the underground parking will be a minimum of 300 mm higher than the spill point to the street;
- Considering no surface parking spots are being proposed and rainwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat, the RVCA would not require any additional onsite water quality control measures save and except best management practices;
- Raingardens and alternative low impact development would be strongly encouraged by RVCA to meet the best management practice requirement;
- RVCA's typical trigger for onsite water quality control via mechanical separation would be six (6) surface parking spaces or greater.

4.3 Proposed Storm Servicing and Stormwater Management Design and Calculations

Proposed Storm Service Connection Point

Based on communications with the City, it is understood that the preferred and anticipated stormwater connection from the proposed development will discharge to the existing 300 mm concrete storm sewer on Roosevelt Avenue. Refer to **Appendix C** for proposed connection points.

Pre-development (Allowable) Release Rates

The pre-development release rates are summarized in the following Table:

Table 4-2: Pre-development (Allowable) Release Rate (2-year event)

Catchment ID	Area (ha)	Runoff Coefficient (C)	Time of Concentration (Tc) (minutes)	Rainfall Intensity (mm/hr)	Release Rate (L/s)
Subject Site	0.26	0.50	10	76.81	**27.7**

The storm runoff under post-development conditions for the site area must be controlled to the allowable 2-year pre-development release rate of **27.7 L/s**, up to and including the 100-year storm event.

Post Development Flow Rates and Stormwater Quantity Control

The anticipated post-development flow rates and required storage when controlled to the allowable pre-development release rate are summarized in the following Table.

Table 4-3: Post-development Flow Rate and Storage Summary

Control Area	100-year Release Rate (L/s)	100-year Surface Storage Volume (m^3)	Modified 100-year Release Rate for Underground Retention (L/s)	100-year Underground Retention Storage Volume (m^3)
Attenuated Areas	25.9	68.4	12.95	93.4
Unattenuated Areas	1.80	0	-	0
Total	27.7	68.4	-	93.4

The total post development release rate takes into consideration the increase in uncontrolled runoff from the boulevard (unattenuated areas) being converted to a hard surface (concrete,

interlocking paving stone, etc.). Thus, the remaining allowable release rate for the attenuated site area is **25.9 L/s**.

When underground storage is used (such as an internal cistern) the release rate will fluctuate as the head rises within the cistern, which can have a significant impact on the storage requirements. To account for this fluctuation the City requests that storage volumes be calculated using 50% of the peak flow rate when using the Modified Rational Method or using a dynamic computer model. For this preliminary design phase, the Modified Rational Method is utilized, using a modified release rate of **12.95 L/s** for the determination of underground storage requirements.

As demonstrated in **Table 4-3** an anticipated storage volume of **93.4 m³** shall be required on-site via underground storage (internal cistern) to restrict stormwater discharge to the allowable release rate of **27.7 L/s**. Refer to **Appendix F** for detailed stormwater storage calculations.

Actual storage volumes will be finalized at the detailed design stage considering the following factors:

- Further analysis will be completed at detailed design addressing the stage-storage relationship within the proposed cistern using a dynamic model. The use of a submersible pump will also be considered to ensure a constant release rate;
- Hydraulic grade line (HGL) analysis along the existing municipal storm system during a surcharge event and the impacts on available storage within the cistern will be considered;
- Cistern details and information including detailed cross-section, HWLs, release rate, volume, location, size (dimensions), control device, emergency flow outlet and backflow protection, etc. An appropriate emergency overflow location will need to be determined and documented. Backup power supply will also be necessary if pump controlled.
- Opportunities for surface and/or roof retention will also be considered at the detailed design stage once grading restrictions, available ponding areas, roof drain locations, drain types and scupper locations have been addressed.

Stormwater Quality Control

Rainwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat. Furthermore, no surface parking is proposed as part of the development.

Through consultation with the Rideau Valley Conservation Authority (RVCA) (refer to **Appendix A**) it was confirmed that they would not require any additional onsite water quality control measures save and except best management practices.

RVCA also confirmed that a mechanical separator for hydrocarbon removal will not be required as the typical trigger for on site water quality control via mechanical separation is six (6) surface parking spaces or greater.

Raingardens and alternative low impact development measures will be considered to meet best management practices for quality control of surface runoff. An internal cistern will also provide quality control via sedimentation and the removal of suspended solids during detention times.

4.4 Storm Servicing and Stormwater Management Summary and Conclusions

The storm servicing design for the proposed development conforms to the requirements of the City of Ottawa Sewer Design Guidelines, 2012, and associated Technical Bulletins.

An anticipated storage volume of **93.4 m³** shall be required on-site via underground storage (internal cistern) to restrict stormwater discharge to the allowable release rate of **27.7 L/s**.

Raingardens and alternative low impact development measures will be considered to meet best management practices for quality control of surface runoff. An internal cistern will also provide quality control via sedimentation and the removal of suspended solids during detention times.

5. Conclusion

The purpose of this assessment is to confirm that the proposed development can be adequately serviced using the existing municipal infrastructure (water, sanitary, and storm) surrounding the site. This assessment shall be used in support of a Zoning By-law Amendment (ZBLA) to allow for the construction of one (1) nine (9)-storey residential tower with ground floor commercial space and an amenity penthouse.

The important information and findings as a result of this assessment are as follows:

- The proposed mixed-use commercial and residential building is expected to include 174 apartment units with a population of approximately 268 persons and have a total commercial area of approximately 1,250 m² (including amenity areas, party area, and gym). There will be two (2) levels of underground parking spanning the majority of the site area;
- The proposed development falls within the exemption requirements for an Environmental Compliance Approval (ECA) as per O.Reg. 525/98, section 3(a), and Ontario Water Resources Act section 53.6(c);
- The anticipated water demands for the proposed site are **1.13 L/s** (average day), **104.29 L/s** (max day + fire flow), and **6.41 L/s** (peak hour). The boundary conditions received from the City of Ottawa indicate that the existing watermain network can provide the required water demands for the proposed site;
- The estimated sanitary flow for the proposed development is **0.91 L/s** (average dry weather), **3.06 L/s** (peak dry weather), and **3.13 L/s** (peak wet weather). The City of Ottawa has indicated that the existing sanitary sewer network near the proposed site can accept the peak wet weather sanitary flow of the proposed development;
- Storm runoff in excess of the allowable 2-year pre-development release rate, up to and including the 100-year storm event, will be detained on site via an internal cistern prior to being discharged to the municipal storm sewer system;
- The allowable stormwater release rate for the proposed site is **27.7 L/s**. It is expected that this will be achieved by means of underground retention (cistern). To achieve this release rate, a storage volume of **93.4 m³** is required on-site.
- The existing site is nearly entirely impervious with no existing stormwater measures on site (i.e. catch basins, sewers, etc.) and it is thus assumed that there are no current stormwater management controls on site. Thus, stormwater flows from the redeveloped site are anticipated to be considerably less than the stormwater flows from the existing site;

- Raingardens and alternative low impact development measures will be considered to meet best management practices for quality control of surface runoff. An internal cistern will also provide quality control via sedimentation and the removal of suspended solids during detention times;
- As a result of the conclusions drawn by the previous points, it is expected that the proposed development can be serviced by the existing municipal services network surrounding the site.

We trust this Assessment of Adequacy of Public Services Report is to your satisfaction. If you have any questions regarding this report, please do not hesitate to contact any of the signatories.

A

Appendix A
Pre-consultation Correspondence

Servicing Study Guidelines for Development Applications

4. Development Servicing Study Checklist

4.1 General Content

	Required Content	Reference Location
☐	Executive Summary (for larger reports only).	N/A
☑	Date and revision number of the report.	Cover Sheet
☑	Location map and plan showing municipal address, boundary, and layout of proposed development.	Report Figures
☑	Plan showing the site and location of all existing services.	Appendix B
☑	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	Section 1.1
☑	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.4
☑	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 1.2 & 1.4
☑	Statement of objectives and servicing criteria.	Section 1.0, 2.1, 3.1 & 4.2
☑	Identification of existing and proposed infrastructure available in the immediate area.	Section 1.3 & Appendix B
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☐	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	N/A
☐	All preliminary and formal site plan submissions should have the following information: - Metric scale; - North Arrow (including construction North); - Key Plan; - Name and contact information of applicant and property owner; - Property limits including bearings and dimensions; - Existing and proposed structures and parking areas; - Easements, road widening and rights-of-way; - Adjacent street names.	N/A

4.2 Development Servicing Report: Water

	Required Content	Reference Location
☐	Confirm consistency with Master Servicing Study, if available	N/A
☑	Availability of public infrastructure to service proposed development	Section 1.3 & Appendix B
☑	Identification of system constraints	Section 2.1 & 2.2
☑	Identify boundary conditions	Section 2.2
☑	Confirmation of adequate domestic supply and pressure	Section 2.2 & 2.3
☑	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 2.2 & 2.3
☐	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	Section 2.2 & Appendix C
☐	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	Table 2-5
☐	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 2.3
☐	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

Required Content		Reference Location
☑	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 3.1
☐	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 1.3, 3.2 & Appendix
☑	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 3.3
☑	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 3.2 & Appendix E
☑	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 3.2
☐	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
☐	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

Required Content		Reference Location
☑	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.	Section 4.1
☑	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Appendix C & G
☑	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 4.2
☑	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.2
☑	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3, 4.4 & Appendix C
☐	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 4.3 & Appendix F
☐	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 4.1
☐	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

Servicing Study Guidelines for Development Applications		
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A
☑	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.3 and 4.4
☐	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.	N/A
4.5 Approval and Permit Requirements: Checklist		
Required Content		**Reference Location**
☐	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.	N/A
☐	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		
Required Content		**Reference Location**
☑	Clearly stated conclusions and recommendations	Section 5.0
☐	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	

From:	Fraser, Mark
To:	Tim Kennedy
Cc:	Christian Lavoie-Lebel
Subject:	RE: 403 Richmond Road - Servicing Requirements and Design Criteria
Date:	Monday, June 08, 2020 3:36:38 PM
Attachments:	image001.jpg image002.jpg PC_403 Richmond Rd. and 389 Roosevelt Ave..msg

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Hi Tim,
Please see the attached email for servicing and SWM criteria. An Assessment of Adequacy of Public Services Report with a conceptual servicing and SWM plan will be required in support of an application for OPA and ZBLA at 403 Richmond Rd. and 389 Roosevelt Ave.
If you have any questions or require any clarification on the information provided in the attached email please let me know.
Regards,

Mark Fraser, P. Eng.
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca
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From: Tim Kennedy
Sent: June 08, 2020 6:49 AM
To: Fraser, Mark
Cc: Christian Lavoie-Lebel
Subject: 403 Richmond Road - Servicing Requirements and Design Criteria

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Good morning Mark,
I was given your contact information by my colleague Christian who noted you would be the planner on file for this project. I will be assisting with the civil design and I am hoping you have some availability this week to discuss the servicing requirements and design criteria for the above mentioned development. Also I understand you are looking for a servicing and SWM report for the zoning application and I am wondering what exactly you will require at this stage.
My availability this week is generally between 9:30 and 1:30. Could you let me know which day and time works best on your end?
Looking forward to collaborating on this one.

Regards,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Notice to our customers on the COVID-19

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'

From: Fraser, Mark
To: O"Connor, Ann
Subject: PC_403 Richmond Rd. and 389 Roosevelt Ave.
Attachments: image001.png
image002.jpg
2020-05-27 - Concept.pdf
200601_403 Rich_Prelim Servicing.pdf
Servicing Report Template Final Version.docx

Hi Ann,

Please forward the below information to the applicant regarding a development proposal at **403 Richmond Rd. and 389 Roosevelt Ave.** for a 10-storey mixed-use building (ground floor retail and 174 residential units). Note that the information is considered preliminary and the assigned Development Review Project Manager may modify and/or add additional requirements and conditions upon review of an application if deemed necessary.

Comments:

- An application to consolidate the parcels of land will be required otherwise the proposed stormwater works will be servicing more than one parcel of land and thus does not meet the exemption set out in O.Reg. 525/98. This would mean an ECA would be required regardless of who owns the parcels.
- Concerns about roadway drainage spilling into the underground parking garage. Please make sure that the entrance to the underground garage is 0.30m higher than the spill point on the street. Entrance should not be located within a sag (low point) in the road.
- A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/structures. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.)will not have an impact on any adjacent buildings and infrastructure.
- A **Record of Site Condition (RSC)** in accordance with O.Reg. 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change in property use from commercial to residential. Subsection 11(2) of O. Reg. 153/04 stipulates that the term "change in use" does not include a reference to the zoning of the property under municipal by-law and therefore refers to a change in the actual use of the property.

  Changes of use, s. 168.3.1 (1) (b) of the Act

  14. *A person shall not change the use of property for the purposes of clause 168.3.1 (1) (b) of the Act in any of the following manners:*

  5. *A change from commercial use to more than one type of property use including any or all of the following types of property use:*
     i. *Agricultural or other use*
     ii. *Institutional use*
     iii. *Parkland use*
     iv. ***Residential use***
- Development to be serviced from Roosevelt Ave. (local street). Location and construction of the proposed services shall not impact the existing street trees that have identified to be retained (4.5m setback required). Location of the services will be subject to review.

General:

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area to avoid any conflict with utilities. The location of existing utilities and services shall be documented on an Existing Conditions Plan.

- All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles and/or future road widening protection limits.
- Please note that the proposed servicing design and site works shall be in accordance with the following documents:
    - Ottawa Sewer Design Guidelines (October 2012)
    - Technical Bulletin PIEDTB-2016-01
    - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
    - Ottawa Design Guidelines - Water Distribution (2010)
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
    - City of Ottawa Environmental Noise Control Guidelines (January 2016)
    - City of Ottawa Accessibility Design Standards (November 2015) (City recommends development be in accordance with these standards on private property)
    - Ottawa Standard Tender Documents (latest version)
    - Ontario Provincial Standards for Roads & Public Works (2013)
    - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455). **Include copies in the Appendix of the report as supporting documentation.**

Disclaimer:

The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only.

Stormwater Management Criteria (Quantity and Quality Control) and Information:

- This site is located in an older sewer system area of the City.
- The storm sewer system in this area was designed to a **2-year level of service** not a 5-year system.
- **Water Quantity Control:** In the absence of area specific SWM criteria please control post-development runoff, up to and including the 100-year storm event, to a **2-year pre-development level**. The pre-development runoff coefficient will need to be determined **using the smaller of a runoff coefficient of C=0.5 or the actual existing site runoff coefficient**. The time of concentration used to determine the pre-development condition will be the larger of 10min. or the calculated time of concentration. [*Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; T_c of 10 minutes shall be used for all post-development calculations*].
- Any storm events greater than the calculated **2-year allowable release rate**, up to and including the 100-year storm event, shall be detained on-site by appropriate SWM measures to avoid impact on the downstream sewer system.
- Compare pre-development flows to post-developments flows in the SWM report.
- The receiving storm sewer system is uncontrolled therefore subject to surcharge (HGL will be elevated for events greater than the 2-year). The impact from the receiving system HGL will need to be considered if proposing underground storage The SWM solution will need to be designed accordingly.

- If rooftop control and storage is considered as part of the SWM solution sufficient details (Cl. 8.3.8.4) shall be discussed and documented in the report and on the plans. A roof drainage plan and detailed roof drain summary table with supporting drain manufacturer information will be required. The roof drainage plan will need to document roof drain type, flow rates, emergency scupper locations and spill over elevations and ponding areas.
- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria and requirements prior to submission of an application. It is consultant's responsibility to check with the RVCA for quality control issues and include this information in the SWM report. Please contact RVCA for further information and provide correspondence in the Appendix of the report.
- Please note that the HGL within the receiving sewer system will need to be assessed if underground storage (cistern) is proposed as part of the stormwater management solution to ensure the system does not become surcharged and thereby ineffective do to a loss in available storage.
- **Underground Storage: Underground storage volumes are to be based on 50% peak flow rates or use dynamic compute model.** The Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

  When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**

  In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

  Note that the above will added to upcoming revised Sewer Design Guidelines to account for underground storage, which is now widely used.
- If a storage tank (internal cistern) is considered as part of the SWM solution sufficient details and system information will need to be provided. A detailed cross-section of such system with sufficient details and information (HWLs, release rate, volume, location, size (dimensions), control device, emergency flow outlet and backflow protection, etc.) will need to be provided. An appropriate emergency overflow location will need to be determined and documented. Backup power supply necessary if pump controlled.
- Please include a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution. Positive drainage away from the building shall be achieved and exiting grades along the property line are to be maintain. Runoff to any adjacent lands will not be permitted.
- The allowable release rate shall take into consideration any increase in uncontrolled runoff from the boulevard being converted to a hard surface (concrete, interlocking paving stone, etc.).

Storm Sewer:

- The sewer system in this area is uncontrolled and therefore it can surcharge.

A 300mm dia. Conc. storm sewer is available within Roosevelt Ave. The site shall be serviced from this sewer system (local road). Stormwater drains to the Dominion Overflow trunk sewer system and discharged to the Ottawa River.

- For concrete sewer pipe, maintenance manholes shall be installed when the service is greater than 50% of the diameter of the mainline concrete pipe.
- A storm sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices* as the site will have a commercial component with the residential development.
- As-built drawings of the existing services within the vicinity of the site are available and to be reviewed in order to determine proper servicing and SWM plan for the subject site(s).
- Foundation drainage system details are to be discussed in the report and document how the system will be integrated into the servicing design. Please note that foundation drain is to be independently connected to sewermain unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention.

Sanitary Sewer:

- A 300mm dia. Conc. sanitary sewer is located within Roosevelt Ave. The site shall be serviced from this sewer system (local road). Wastewater flows to the West Nepean Trunk Collector sewer system.
- For concrete sewer pipe, maintenance manholes shall be installed when the service is greater than 50% of the diameter of the mainline concrete pipe. The sanitary service should be located in an area that will allow for a perpendicular connection to the sewer and have no bends in the pipe. The proposed location of the sanitary service will not allow for a structure to be installed due to the watermain crossing.
- An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided. It is suggested to **calculate the total peak wastewater demand for the proposed development and send it to the City as soon as possible in advance of a submission of an application, as an initial step to determine whether or not there is enough capacity in the city system to accommodate the proposed wastewater flow.** Please note that it takes approx. 10 business days to get a response back from the internal circulation.
- The sanitary sewer criteria shall reflect the new *Technical Bulletin PIEDTB-2018-01.*
- A sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices* as the site will have a commercial component with the residential development.
- A backwater valve is required on the sanitary service for protection (mandatory now anyways) as this area has experience flooding in the past due to surcharging of the West Nepean Collector sewer.
- If the groundwater is found to be contaminated and treatment is determined to be required it is a requirement per the Sewer Use By-law that remediated groundwater is to be directed to the sanitary sewer.

Water:

- A 152mm dia. UCI watermain is located within Roosevelt Ave. and a 305mm dia. PVC watermain is located within Richmond Rd.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than $50m^3$/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration. This proposed development will required*

two (2) separate water service connections if the basic day demand for this site exceeds $50m^3$/day. There shall be a primary water service (Richmond Rd) and a secondary connection (Roosevelt Ave.). This is a corner lot so we will not support the installation of a new isolation valve on the City watermain to satisfy this requirement.

- Include a **hydrant coverage figure** and **demonstrate there is adequate fire protection** for the building per *Technical Bulletin ISTB-2018-02* . Multiple municipal hydrants will be required for fire protection.
- **Boundary conditions**, HGL, shall be requested and a hydraulic analysis completed to show that there is adequate flow and pressure in the water distribution system to meet the required water demands. **Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons.** provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address (Street Number and Name)
    - Location of service(s).
    - A plan showing the proposed water service connection locations.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Required Fire Flow** (L/min) **FUS calculations are to be provided with request for boundary conditions.**
      [*Fire flow demand requirements shall be based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection*
      1999 and Technical Bulletin ISTB-2018-02]
      Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).
      Fire flow demands will be inputted as point loads at each connection separately unless otherwise noted. A multi-hydrant analysis can be requested if necessary.
    - If fire protection is provided by existing municipal hydrants, hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Identify which hydrants are being considered to meet the RFF on a **fire hydrant coverage figure** as part of the boundary conditions request.
- Hydrant capacity shall be assessed if relying on any public hydrants to provide fire protection particularly if high design fire flows are being proposed to demonstrate the RFF can be achieved. ***Refer to Table 1: Maximum flow to be considered from a given hydrant in Appendix I of Technical Bulletin ISTB-2018-02***.Appropriate fire protection mitigation measures shall be investigated/proposed to lower the RFF for the site to an appropriate level.
- The subject site is located within the 1W Pressure Zone.

Permits and Approvals:

- The consultant shall determine if this project will be subject to an Environmental Compliance Approval (ECA) for Private Sewage Works. It shall be determined if the exemptions set out in Ontario Regulation 525/98: *Approval Exemptions* are satisfied. All regulatory approvals shall be documented and discussed in the report.

Source Protection Policy Screening:

- The address lies within the Mississippi-Rideau Source Protection Region and is subject to the policies of the Mississippi-Rideau Source Protection Plan.
- **The entire property lies within the Surface Water Intake Protection Zone** (IPZ) for the Ottawa River (Lemieux) Intake, IPZ-2 (vulnerability score of 8.1) where significant threat policies apply. Policies are only applicable for significant drinking water threat activities as outlined in the *Clean Water Act*.
    - The *Clean Water Act* Tables of Circumstances identify circumstances under which certain activities would be considered a significant threat to drinking water within certain designated vulnerable area, and the Mississippi-Rideau Source Protection Plan contains policies related to significant drinking water threat activities to protect the drinking water supply.
    - Activities that may be considered a significant drinking water threat within the IPZ-2 (score 8.1) include the following:
        - Untreated stormwater from a stormwater retention pond
            - Note that a stormwater management facility is only considered a significant drinking water threat within this zone if the facility drains more than 100 ha of industrial/commercial land.
        - Sewage treatment plant effluent discharges
        - Combined sewer discharge from a stormwater outlet
        - Sewage treatment plant bypass discharge
        - Industrial effluent discharge
        - Waste disposal site
        - Agricultural activities (application or storage of manure or chemical fertilizers or pesticides, or use of land for livestock grazing)
    - Based on the information provided in your email, **the proposed activity does not meet the circumstances to be considered a significant drinking water threat, thus there are <u>no applicable legally-binding source protection policies</u>**.
- The area is <u>not</u> within a Wellhead Protection Area (WHPA).
- The area is located within a Highly Vulnerable Aquifer (HVA). Note that there are <u>no legally binding policies</u> under the Mississippi-Rideau Source Protection Plan for activities within Highly Vulnerable Aquifers.
- The area is <u>not</u> within a Significant Groundwater Recharge Area.

Capital Woks:

- As per GeoOttawa no capital works are proposed on Roosevelt Ave. or Richmond Rd (at this location).

Sight Triangle and Any Road widening Requirement (By Transportation Project Manager Mike Giampa)

Required Engineering Plans and Studies in Support of OPA and ZBLA applications:

PLANS:

- Conceptual Servicing and SWM Plan
- Legal Survey

REPORTS:

- Assessment of Adequacy of Public Services
- Geotechnical Study
- Noise Feasibility Study
- Phase I ESA (in accordance with Ontario Regulation 153/04)
- Phase II ESA (Depending on recommendations of Phase I ESA)

Wind Study

Required Engineering Plans and Studies in Support of SPC application:

PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Pre-Development Drainage Area Plan
- Post-Development Drainage Area Plan
- Roof Drainage Plan w/ Roof Drain Summary Table (if rooftop SWM storage is being considered)
- Stormwater Storage System Detail (Cistern Details from the Mechanical Engineer if being considered)
- Foundation Drainage System Details
- Legal Survey Plan
- Site Lighting Plan, Photometric Plan and Site Lighting Certification Letter

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study/Investigation
- Detailed Noise Study (Transportation Noise Assessment and Stationary Noise Assessment)
- Phase I ESA (in accordance with Ontario Regulation 153/04)
- Phase II ESA (Depending on recommendations of Phase I ESA)
- An Record of Site Condition (RSC) is required (due to more sensitive land use). Phase I and Phase II (if necessary) shall speak to RSC requirement.
- Wind Study (Type 1 Wind Analysis)

Servicing Report Template and Guidelines:

Please find attached the Servicing Report Template & Study Guidelines" and prepare the servicing study accordingly. For capacity issue, please see section 3.2.1 page 3-3 and follow this section. A completed checklist with corresponding references from the servicing study is mandatory for the completeness of the study. Please add a completed checklist in the report. Please ensure you are using current guidelines, by-laws and standards.

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**
https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

Phase One Environmental Site Assessment (Official Plan Section 4.8.4):

- A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 (not per CSA standards) in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required in accordance with Ontario Regulation 153/04.
- The Phase I ESA, and if applicable Phase II ESA shall discuss requirement to file a RSC with the Ministry. A **Record of Site Condition (RSC)** in accordance with O.Reg. 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change in property use from commercial (less sensitive) to residential (more sensitive). As per the Official Plan (4.8.4) we do not consider an RSC acknowledged by the Ministry until either its has been confirmed that it will not be audited or it has passed the Ministry audit.
- Please also note that in the event soil and/or groundwater contamination is identified on this site

and the proposal is for a more sensitive land use, the MECP will require approximately 1-1.5 years to review the RSC. PIED will apply appropriate conditions, based on Environmental Protection Act (Section 168.3.1 (1)) and O.Reg. 153/04 (Parts IV and V) regarding requirements for RSC prior to building permit issuance. Dependent on the levels/types of contamination, timelines for building permit issuance may be longer than expected and we recommend applicant speak to Building Code Services, at the earliest convenience, so as to discuss these timelines in more detail, if deemed applicable.

- Environmental Risk Information Services (ERIS) report is required to be included as part of the Phase I ESA.
  https://www.ontario.ca/page/guide-completing-phase-one-environmental-site-assessments-under-ontario-regulation-15304
  https://www.ontario.ca/laws/regulation/040153#BK43

Geotechnical Investigation (Official Plan Section 4.8.3):

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Discuss and investigate the impact if any on the lowering of the groundwater level has on any adjacent properties as reducing the groundwater level can lead to potential damages to surrounding structures due to excessive differential settlements of the ground.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.
  https://documents.ottawa.ca/sites/default/files/documents/cap137602.pdf

Noise Study:

- A **Transportation Noise Assessment** will be required as the subject development is located within 100m of Richmond Road (arterial road/transit priority corridor identified on Schedule D) and Byron Ave. (collector road), proximity to Sir John A. McDonald Parkway (freeway) and within 300m of the proposed LRT corridor.
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.
- Noise Study shall be consistent with the City's **Environmental Noise Control Guidelines**.
  https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Wind Study:

- 10-storeys or more or a proposed building is more than twice the height of adjacent existing buildings and is greater than five storeys in height is subject to the submission of a Wind Study.
  https://documents.ottawa.ca/sites/documents/files/torwindanalysis_en.pdf

Exterior Site Lighting:

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Site Lighting Plan, Photometric Plan and Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

Please note that these comments are considered preliminary based on the information available to date

and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant and their representatives/consultants to verify information provided by the City. The applicant may contact me for any follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

If you have any questions or require any clarification please let me know.

Regards,

Mark Fraser, P. Eng.
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca

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From:	ISD Information Centre / Centre Information
To:	Tim Kennedy
Subject:	RE: 20-0571 - 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - Information Request
Date:	Friday, June 12, 2020 4:03:00 PM
Attachments:	2179p&p1.pdf 13695p&p01.pdf L9-1.pdf 20-0571 Richmond & Roosevelt.dwg 20-0571 Work Order.xlsx

---

Good afternoon Tim,

Attached are the plans and work order for the locations requested.

The City of Ottawa's Financial Services Branch will send out an invoice at the end of the month. The work orders will no longer be included with the invoice. Please retain the attached work order for your records.

For any additional information regarding this information, please contact the Information Centre.

Thank you.
Nick Havelock

Geospatial Analytics Technology & Solutions, Information Centre:
Phone: 613-580-2424 Ext 44455
Email: informationcentre@ottawa.ca

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: June 11, 2020 3:16 PM
To: ISD Information Centre / Centre Information <informationcentre@ottawa.ca>
Subject: Re: 20-0571 - 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - Information Request

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Nick,

Thanks for this and yes please proceed.

Tim

Sent from my iPhone

On Jun 11, 2020, at 2:02 PM, ISD Information Centre / Centre Information <informationcentre@ottawa.ca> wrote:

Good afternoon Tim,

Your estimate for the UCC portion of this request is ACAD .dwg – 1 x $143.00.

Your estimate for the drawings showing existing infrastructure: 3 x $16.00.

Please let us know if you would like to proceed or if you have any questions or concerns.

Thank you,
Nick Havelock
GIS & Data Management Branch - Information Centre
Phone: 613-580-2424 x 44455
Email: informationcentre@ottawa.ca

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: June 10, 2020 8:40 AM
To: ISD Information Centre / Centre Information <informationcentre@ottawa.ca>
Cc: Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>; Anne-Julie Cardinal <Anne-Julie.Cardinal@cima.ca>
Subject: 20-0571 - 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - Information Request

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

We are working with a client on a servicing capacity assessment for zoning bylaw amendment at 403 Richmond Rd. and 389 Roosevelt Ave (see attached key plan).

Our client is considering a servicing connection for the proposed development to Roosevelt and/or Richmond Road. Could you please provide any available background information for the existing services and utilities that may be present at these locations, including but not limited to watermain, storm, and sanitary sewer, gas, hydro, street lighting, Bell, Rogers, etc. If you could provide a list of any information you have on file and the associated fees for obtaining these it would be much appreciated.

Also CAD of available utility plans would be preferable.

Thanks,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

Notice to our customers on the COVID-19

<image001.jpg>

<image002.jpg>

Do you really need to print this email? Let's protect the environment!

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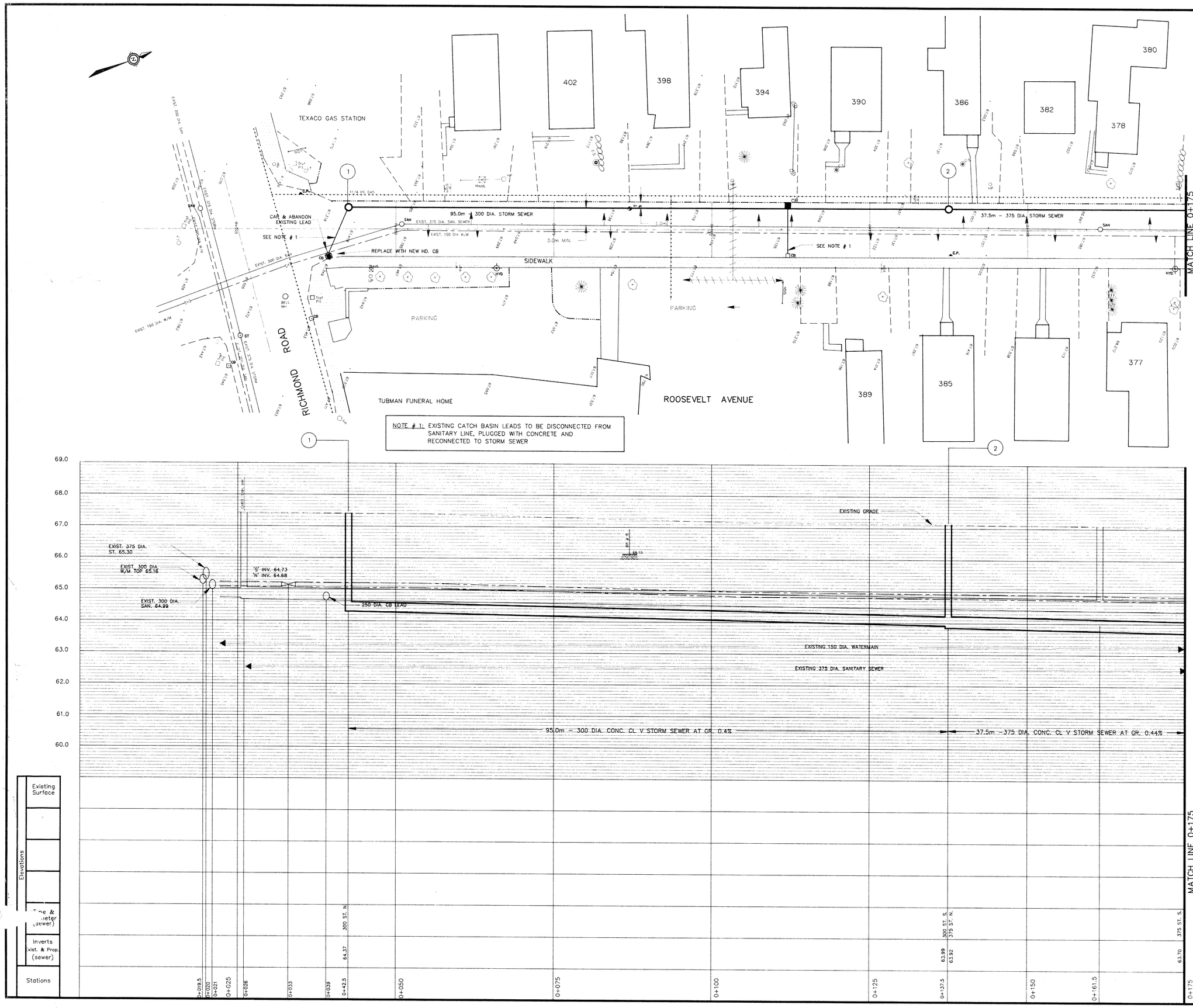
2179 5 of 11



City Of Ottawa
Department Of Engineering & Works
Engineering And Surveys Branch

Notes:

- .Utilities shown are taken from best available records. Contractor is requested to check with all utility companies before digging.
- .Soil information shown is not guaranteed and contractors are advised to collect additional soils information as deemed necessary.
- .Reference bench mark:
- .Proposed storm and sanitary sewers may be constructed in a common trench provided that a minimum horizontal distance of 460mm is maintained between outside barrels of pipe.
- .All pipes shall conform to the American Society for Testing and Materials (A.S.T.M.)
- C.76 reinforced concrete sewer pipe with approved rubber gaskets (W.A.R.G.)
- .A minimum of 460mm vertical clearence to be maintained between sewers and watermains where practical
- .Borehole soil descriptions are not based on seive analysis but on visual inspection only, except where otherwise noted.
- .Soil information taken from:
- .Date of television inspection:
- .This plan supercedes (in whole or in part) plan no:
- .Actual rock line recorded during construction of existing sewer.
- .Registered plan no:
- .See additional notes on sheet # 1.

Legend:

	EXISTING	PROPOSED
.STORM SEWER		
.SANITARY SEWER		
.STREET LINE		
.LOT LINE		
.ROADS & DRIVEWY'S: Curbs		
Asphalt or Concrete		
Surface Treated		
.WALKS: Concrete or Asphalt		
Gravel, Cinder or Dirt		
.DEPRESSED ACCESS: On Curb		
On Sidewalk		
.WATERMAIN		
.GASMAIN & VALVE		
.BELL		
.HYDRO		
.TRAFFIC		
.FIRE ALARM		
.CABLEVISION		
.STEAM LINE		
.HYDRANT		
.WATER VALVE		
.STAND PIPE		
.WATER VALVE CHAMBER		
.SEWER, TRAFFIC, HYDRO & BELL MANHOLES(may be labelled for clarification)		
.TRAFFIC HANDHOLE		
.GUARD RAIL		
.RETAINING WALL		
.FENCE		
.HYDRO POLE		
.HYDRO POLE & LIGHT		
.BELL POLE		
TRAFFIC LIGHT		
.LIGHT STANDARD		
.TRAFFIC SIGN		
.STREET SIGN		
.CULVERT & DITCH		
.STANDARD CATCH BASIN & LEAD		
.HEAVY DUTY CATCH BASIN & LEAD		
.CATCH BASIN TO BE REMOVED & REPLACED WITH STANDARD C.B.		
.HEAVEY DUTY CATCH BASIN TO BE REMOVED & REPLACED WITH HEAVY DUTY CATCH BASIN		
.HOUSE or CATCH BASIN CONNECTION TAKEN FROM T.V. INSPECTION		
.HOUSE or CATCH BASIN CONNECTION TAKEN FROM RECORDS		
.RELOCATION		
.REMOVAL		
.SQUARE IRON BAR		
.STANDARD IRON BAR		
.ROUND IRON BAR		
.TREE, SHRUB & HEDGE		
.BOREHOLE		
.ROCK		

.IN PLAN SEWERS 600mm & ABOVE ARE SHOWN AS DOUBLE LINE, TO SCALE USING SAME LINE WEIGHT
.UTILITIES X-OUT ARE ABANDONED, BELL PLANT SO MARKED MAY BECOME ACTIVE

Revisions:

No	Date	Description	Drawn By	Appr'd By

Designed By J.N.SAWARNA	Date	Structural Check By	Date
Survey Detail By	Date	Checked By	Date
Drafting By T.MARTIN	Date	Checked By	Date

Final Measurements:

Construction Type	Contractor
Work Commenced	Inspector
Work Completed	Instrumentman
Designer	Field Book #
Drafting Revisions	Date
	Checked By

Design And Construction Division
1355 BANK STREET OTTAWA ONTARIO K1H 8K7

Commissioner C.Sim P.Eng.	Branch Director W.R. Cole P.Eng.
Chief Design & Constr. Eng	Senior Design & Constr. Eng / Senior Const. Coord.

STORM SEWER
ROOSEVELT AVENUE
0+025 TO 0+175

Contract No:	Survey Runs:	Scale:	Plan No:
88-52	OMM 88-6510	HOR. 1:250 VERT. 1:50	2179 Sheet 5 of 11

LEGEND

- PROPOSED CURB INLET CATCHBASIN
- PROPOSED ROADSIDE CATCHBASIN
- PROPOSED CATCHBASIN/MANHOLE
- PROPOSED DECORATIVE LUMINAIRE
- PROPOSED BELL DUCT
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- 428 / 426.17 — CIVIC ADDRESS/BASEMENT ELEVATION
- EXISTING SANITARY SERVICE CONNECTION AS PER CCTV INSPECTION
- EXISTING WATER SERVICE CONNECTION

BOREHOLE LEGEND

- ASPHALTIC CONCRETE
- BEDROCK
- CONCRETE
- CRUSHED STONE
- FILL
- SAND
- SILTY SAND
- GLACIAL TILL

BH BR-1 — BOREHOLE BY JOHN D. PATERSON & ASSOCIATES LTD. (REPORT No. S8560-1)

NOTE: SERVICE LOCATIONS AT BUILDINGS ARE APPROXIMATE

REGISTERED PROFESSIONAL ENGINEER — J.G. RIDDELL — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — R.S. CEBRYK — PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD. — ENGINEERS & PLANNERS

Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email novainfo@novatech-eng.com

NO.	REVISIONS	BY	DATE
1.	ISSUED FOR COMMENTS	ERD	11/25/03
2.	FINAL DESIGN CIRCULATION	DHI	03/05/04
3.	ISSUED FOR TENDER	DHI	03/08/04
4.	ISSUED FOR M.O.E. APPROVAL	DHI	03/08/04
5.	ISSUED FOR CONSTRUCTION	DHI	04/08/04
6.	T/GRADE ELEV. FOR CB21	DHI	05/17/04
7.	AS-BUILT	DHI	03/10/06

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

RICHMOND ROAD
REHABILITATION
ROOSEVELT AVENUE TO TWEEDSMUIR AVENUE

GRADING AND DRAINAGE
STATION 1+465 TO STATION 1+575

R. G. HEWITT, P.ENG. — Director Infrastructure Services

W. NEWELL, P.ENG. — Manager Construction Services - West

Dwn: KLM | Chkd: DHI | Des: DHI | Chkd: RSC

Ottawa

CONTRACT NO. ISB04-5006

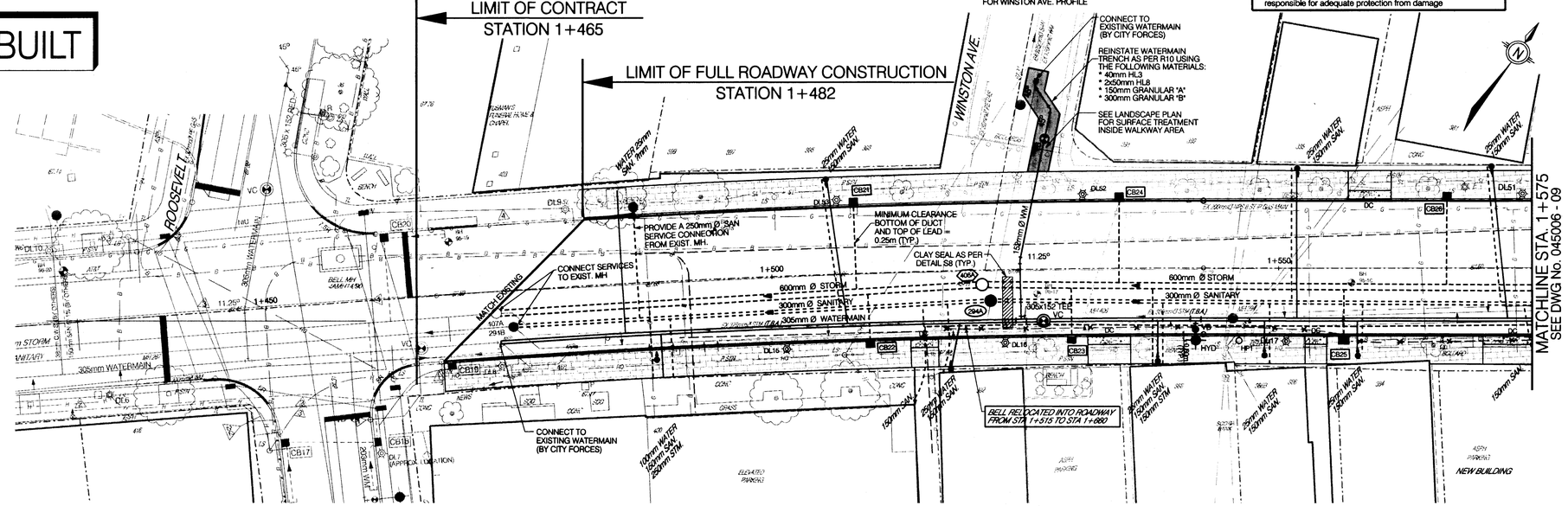
DWG. NO. 045006-08

SHEET 08 OF 38

Date: NOVEMBER 2003

Scale: HORIZONTAL 1:250 (0m 2.5 5 10); VERTICAL 1:50 (0m 0.5 1 2)

AS-BUILT



CATCH BASIN DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
CB21	1+508.29	6.65 LT	OPSD-705.010	67.378*	65.78
CB22	1+509.47	6.65 RT	OPSD-705.010	67.447*	66.05
CB23	1+529.48	6.65 RT	OPSD-705.010	67.507*	66.11
CB24	1+534.32	6.65 LT	OPSD-705.010	67.450*	65.85
CB25	1+566.40	6.65 RT	OPSD-705.010	67.587*	65.19
CB26	1+568.58	6.65 LT	OPSD-705.010	67.551*	65.96

OFFSETS ARE FROM BASELINE TO FACE OF CURB FOR CATCH BASINS
* - CURB INLET ELEV.

STORM MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
406A	1+520.6	1.5 RT	OPSD-701.010	67.58	~~65.24~~ 65.24#

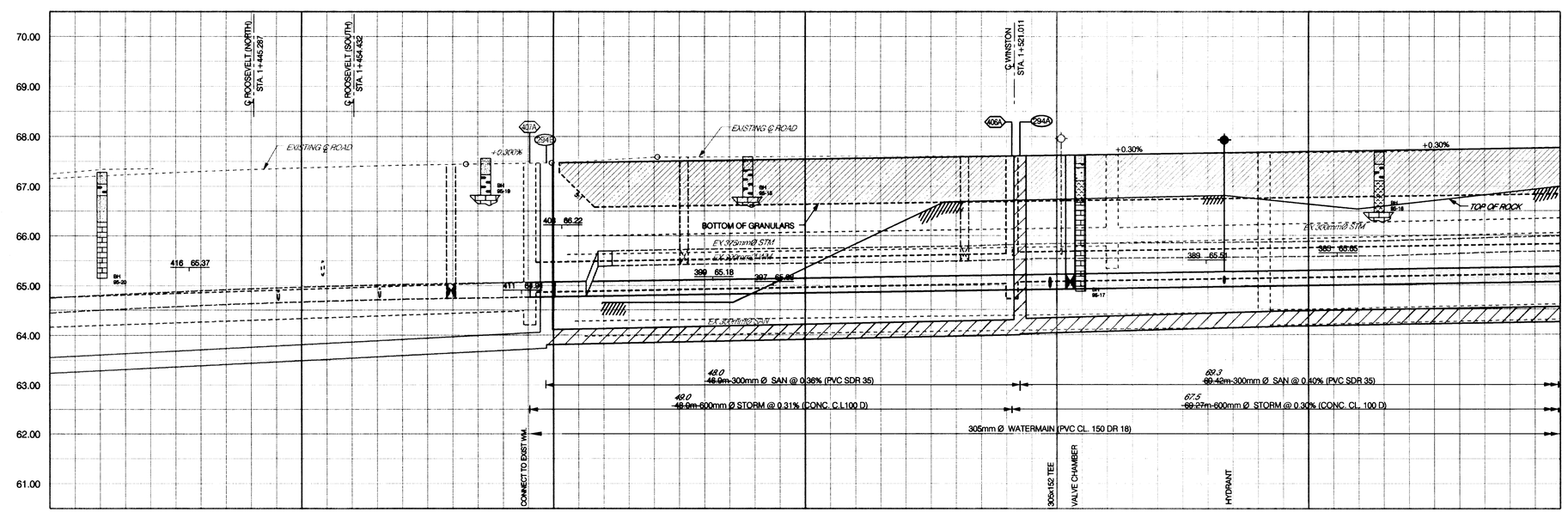
OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE

STORM SEWER DATA					
SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
406A TO 408A	600	CONC.CL.100D	~~48.0~~ 67.5#	~~65.24~~ 65.24#	~~65.05~~ 65.05#
408A TO 407A	600	CONC.CL.100D	~~49.0~~ 49.0#	~~65.24~~ 64.94#	~~64.93~~ 64.93#

SANITARY MANHOLE DATA					
NO.	STATION	OFFSET	TYPE	ELEVATION T/GRATE	ELEVATION LOW/INV.
294A	1+521.6	3.2 RT	OPSD-701.010	67.55	~~65.24~~ 65.24#

OFFSETS ARE FROM BASELINE TO CENTRE OF STRUCTURE

SANITARY SEWER DATA					
SEWER	DIA.	TYPE	LENGTH	INVERT ELEVATION UP STR.	INVERT ELEVATION DOWN STR.
293B TO 294A	300	PVC SDR 35	~~48.0~~ 68.3#	~~64.25~~ 64.25#	~~64.03~~ 64.03#
294A TO 294B	300	PVC SDR 35	~~48.0~~ 48.0#	~~64.25~~ 64.08#	~~63.81~~ 63.81#



℄ PROFILE	67.154	67.208	67.257	67.301	67.340	67.374	67.403	67.427	67.446	67.461	67.476	67.491	67.521	67.536	67.551	67.566	67.581	67.596	67.611	67.626	67.641	67.656	67.671	67.686	67.701	67.716	67.731	67.746	67.761	67.776
TOP OF WATERMAIN										65.26			65.08				65.16			65.10	65.24			65.26				65.31			
STATION		1+430		1+440		1+450		1+460		1+470	1+471.5	1+475	1+480		1+490		1+500		1+510		1+520	1+524.5	1+525	1+526.5	1+530		1+540	1+541.8	1+550		1+560		1+570	1+575

NOTES:

GENERAL

1. BOREHOLE LOCATIONS ARE APPROXIMATE ONLY. FOR FURTHER INFORMATION, REFER TO GEOTECHNICAL INFORMATION IN THE REPORT PREPARED BY JOHN D. PATERSON & ASSOCIATES LTD. (REPORT No. S8560-1)
2. EXISTING TREES IN THE CONSTRUCTION ZONE AREA TO BE PRESERVED AND PROTECTED DURING THE CONSTRUCTION PERIOD.
3. LIMITS OF GRADING MAY VARY FROM THAT INDICATED, DEPENDING ON FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
4. WHERE AVAILABLE, EXISTING SERVICING INFORMATION TO PRIVATE PROPERTY HAS BEEN SHOWN.
5. SIGNS AND PAVEMENT MARKING TO BE REMOVED AND INSTALLED BY OTHERS.

STORM AND SANITARY SEWERS

1. WHERE REQUIRED, EXISTING COMBINED SEWER IS TO BE REMOVED AND REPLACED BY SEPARATE STORM AND SANITARY SEWERS AS SPECIFIED, WITHOUT SERVICE INTERRUPTION.
2. ALL STORM AND SANITARY SERVICES SHALL BE REPLACED TO PROPERTY LINE, OR FURTHER AS REQUIRED. TIE-IN LOCATION BEYOND PROPERTY LINE TO BE APPROVED BY ENGINEER. WHERE NEW STORM LATERALS ARE TO BE PLACED TO PROPERTY LINE, THEY SHALL BE CAPPED WITH A WATER TIGHT SEAL.
3. ALL CATCHBASINS TO HAVE A SUMP OF 0.6m (MIN.), STORM MANHOLES TO HAVE 0.3m SUMP.
4. ALL SEWERS TO HAVE CLASS "B" BEDDING AND APPROVED BACKFILL MATERIAL AS SPECIFIED. SEE TRENCH DETAIL.
5. SUBDRAIN OUTLETS INTO MANHOLES AND CATCHBASINS SHALL BE LOCATED TO SUIT FIELD CONDITIONS.
6. **THE CONTRACTOR WILL BE REQUIRED TO LOCATE AND VERIFY THE STATUS OF EXISTING** SERVICE PIPES. DYE TESTING OR OTHER METHODS (TO THE SATISFACTION OF THE ENGINEER) SHALL BE USED TO DETERMINE THE STATUS (ABANDONED, IN USE, SANITARY, STORM) AND/OR THAT THE EXISTING SERVICES ARE CONNECTED TO BUILDINGS.
7. ACCESS INTO ALL CITY OF OTTAWA MH'S WILL BE AVAILABLE AT ALL TIMES. DURING THE PAVING PROCESS THERE IS TO BE NO CITY OWNED COVERS OF ANY TYPE TO BE PAVED OVER PREVENTING ACCESS.
8. EXISTING MH STRUCTURES THAT ARE TO REMAIN IN USE SHALL BE UPDATED TO CITY STANDARDS. (i.e. REPLACE ACCESS HOLES & COVERS AND LADDER RINGS)

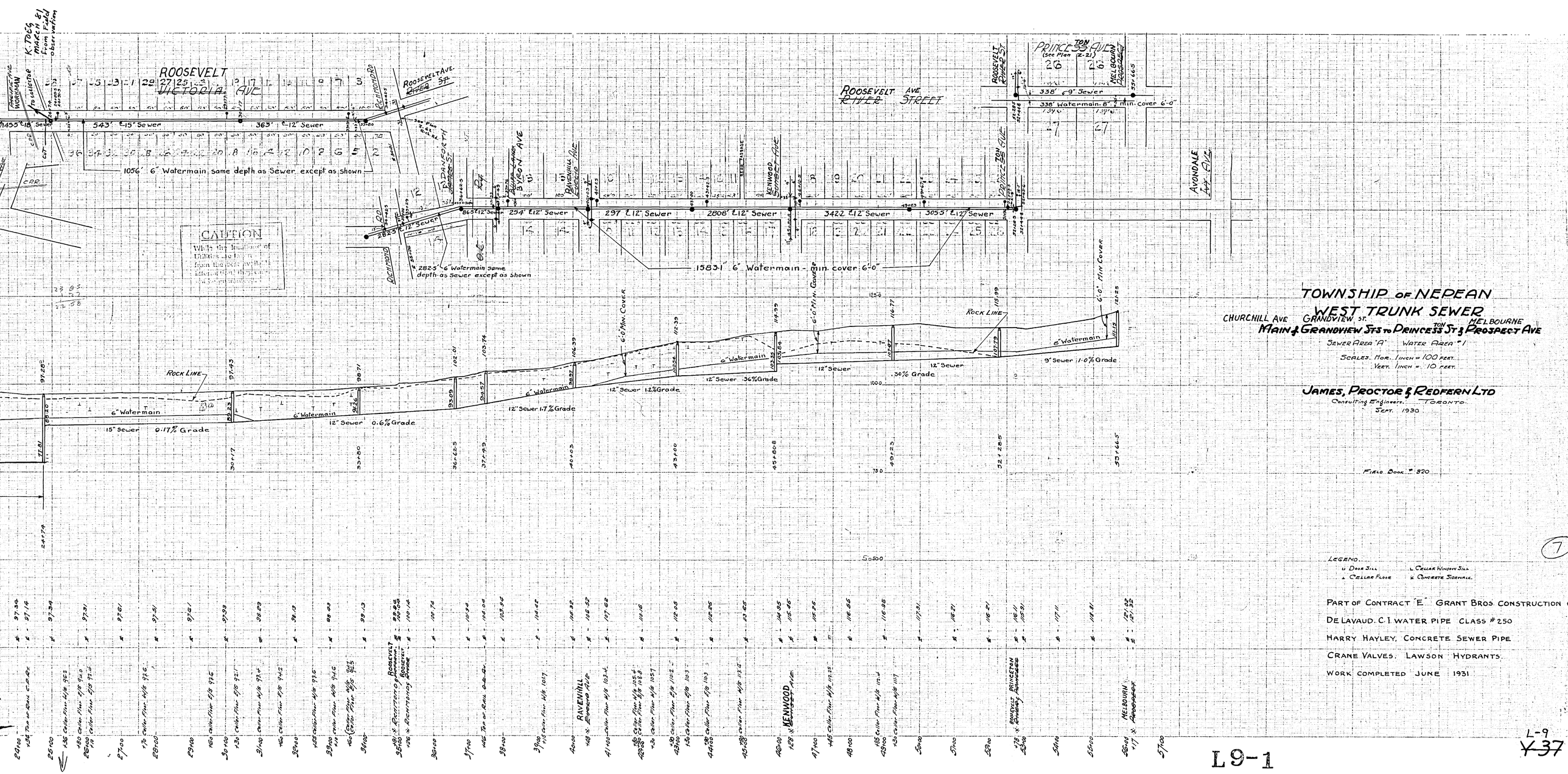
WATERPLANT

1. ALL WATERMAIN MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.
2. ALL CONNECTIONS TO EXIST. SERVICES INCLUDING REINSTATEMENT SHALL BE DONE BY THE CONTRACTOR. ALL CONNECTIONS OF NEW WM TO EXISTING WM AND ALL BLANKINGS SHALL BE PERFORMED BY CITY FORCES.
3. RESTRAINING RINGS AND THRUST BLOCKING SHALL BE UTILIZED ON ALL BENDS, TEES AND PLUGS IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.
4. A MINIMUM 2m SEPARATION IS REQUIRED BETWEEN ALL NEW WATER SERVICES AND CATCHBASINS OR OPEN STRUCTURES AND SHALL BE INSULATED PER CITY SPECIFICATION WSD-23 AS APPLICABLE.
5. A MINIMUM 2m SEPARATION IS REQUIRED BETWEEN ALL NEW HYDRANTS AND CATCHBASINS OR OPEN STRUCTURES AND SHALL BE INSULATED PER CITY SPECIFICATION WSD-23 AS APPLICABLE.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE VIA EXCAVATION THE EXACT LOCATION AND ELEVATION OF THE EXISTING WATERMAINS AS REQUIRED FOR ALL CONNECTIONS, RELOCATIONS AND BLANKING.

M:\1998\98002\CAD Dwgs\AS-BUILT\Roosevelt to Tweedsmuir\045006-08.dgn Updated By: KLM 6/1/2006 2:13:50 PM

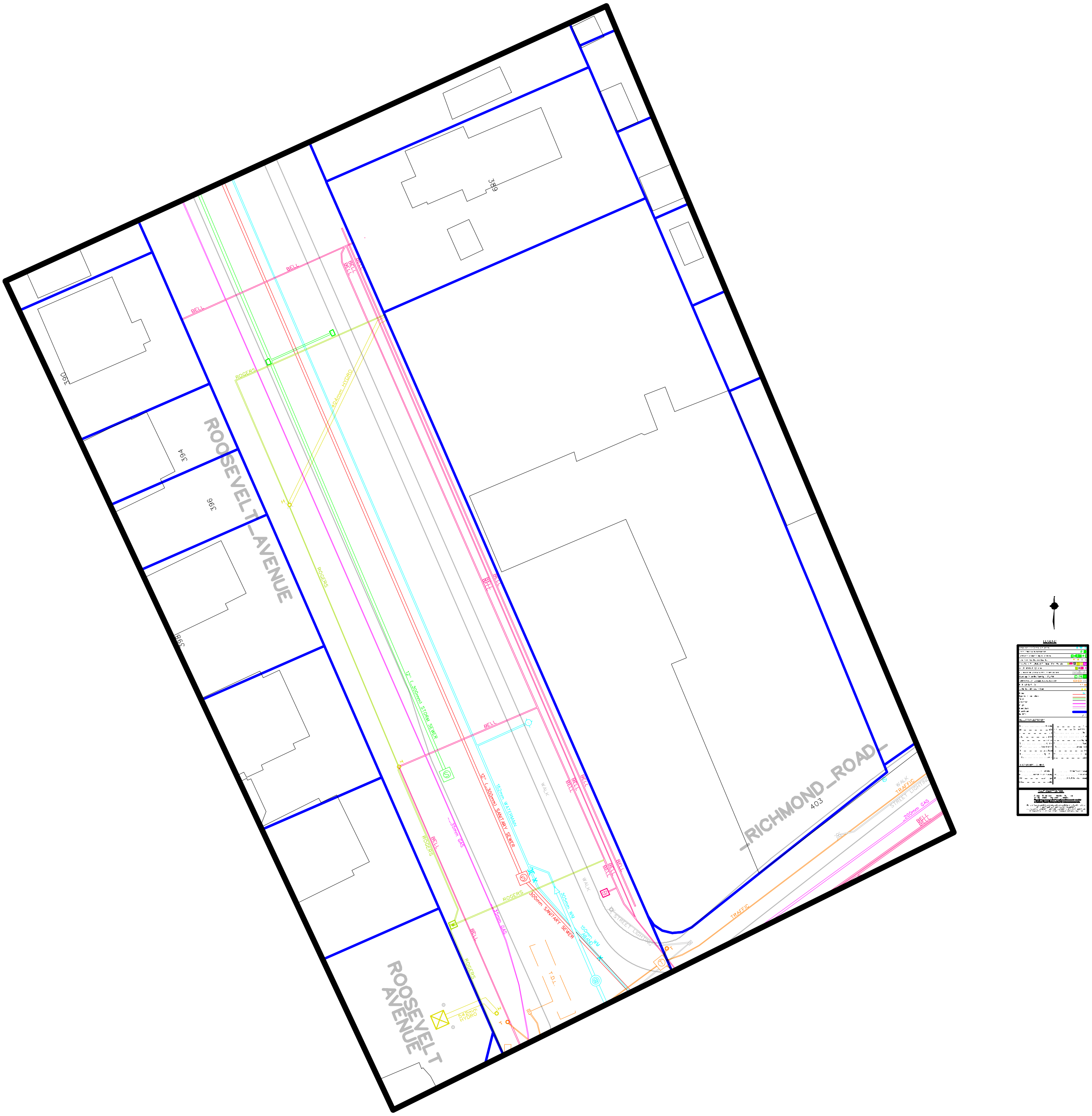
045006-08.dgn 6/1/2006 2:13:50 PM

13695


TOWNSHIP OF NEPEAN
WEST TRUNK SEWER
CHURCHILL AVE GRANDVIEW ST. TOWN LINE MELBOURNE
MAIN & GRANDVIEW STS TO PRINCESS ST & PROSPECT AVE
SEWER AREA "A" WATER AREA "1"
SCALES. HOR. 1 INCH = 100 FEET.
VERT. 1 INCH = 10 FEET.
JAMES, PROCTOR & REDFERN LTD
CONSULTING ENGINEERS. TORONTO.
SEPT. 1930
FIELD BOOK # 320
LEGEND.
U DOOR SILL
L CELLAR WINDOW SILL
⊥ CELLAR FLOOR
X CONCRETE SIDEWALK.
PART OF CONTRACT "E" GRANT BROS CONSTRUCTION
DE LAVAUD. C.I. WATER PIPE CLASS # 250
HARRY HAYLEY. CONCRETE SEWER PIPE
CRANE VALVES. LAWSON HYDRANTS.
WORK COMPLETED JUNE 1931
ROOSEVELT VICTORIA AVE
ROOSEVELT AVE RIVER STREET
PRINCESS AVE
AVONDALE AVE
RAVENHILL
KENWOOD
MELBOURNE
543' 15" Sewer
363' 12" Sewer
1056' 6" Watermain same depth as Sewer except as shown
254' 12" Sewer
297' 12" Sewer
2806' 12" Sewer
3422' 12" Sewer
3053' 12" Sewer
338' 9" Sewer
338' Watermain 8" min. cover 6'-0"
1583' 6" Watermain - min. cover 6'-0"
282.5' 6" Watermain same depth as Sewer except as shown
CAUTION
ROCK LINE
6" Watermain
15" Sewer 0.17% Grade
12" Sewer 0.6% Grade
12" Sewer 1.7% Grade
12" Sewer 1.2% Grade
12" Sewer .36% Grade
12" Sewer .30% Grade
9" Sewer 1.0% Grade
6'-0" MIN. COVER

L9-1

L-9
Y-37


ROOSEVELT AVENUE
ROOSEVELT AVENUE
RICHMOND ROAD
389
394
396
398
400
403
BELL
WALK
TRAFFIC
STREET LIGHTS
SANITARY SEWER
STORM SEWER
GAS

From:	Tim Kennedy
To:	Eastern Ottawa (MECP)
Cc:	Jaymeson Adams; Christian Lavoie-Lebel; MOECCOttawaSewage@ontario.ca
Subject:	RE: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - MECP Pre-consult
Date:	Thursday, July 02, 2020 6:13:00 PM
Attachments:	image001.jpg image002.jpg

Good evening Jéhanne,

To further clarify we are not looking for a formal pre-consult but rather just wanted to inform the MECP of the project and to confirm that it has been determined that the proposed development qualifies for the ECA exemption under Reg. 525/98 of OWRA.

Best Regards,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure
T 613 860-2462 ext. 6620 **M** 613 462-3627
CIMA+

From: Eastern Ottawa (MECP) <Environment.Ottawa@ontario.ca>
Sent: Tuesday, June 23, 2020 3:17 PM
To: Tim Kennedy <Tim.Kennedy@cima.ca>
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>; Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>
Subject: RE: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - MECP Pre-consult

Good afternoon,

Please fill out the Pre-Submission Consultation Form attached and send back to the specified email in the form (MOECCOttawaSewage@ontario.ca).

Once we receive your form we will be able to move forward with your pre-consult.

Thank you,

Jéhanne Hurlbut
Administrative Assistant | Drinking Water & Environmental Compliance Division
Ministry of the Environment, Conservation and Parks
2430 Don Reid Drive, Unit 103, Ottawa ON
jehanne.hurlbut@ontario.ca
(613) 301-4160

From: Tim Kennedy <Tim.Kennedy@cima.ca>

Sent: June 22, 2020 11:48 AM
To: Eastern Ottawa (MECP) <Environment.Ottawa@ontario.ca>
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>; Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>
Subject: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - MECP Pre-consult

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

To whom it may concern,

We are currently performing an Adequacy of Public Services Report in support of a zoning by-law amendment application for a proposed development located at 403 Richmond Road and 389 Roosevelt Ave in Ottawa, Ontario (See attached key plan). The proposed development involves the construction of a 10-storey mixed-use residential and commercial building. The subject site is located within the Ottawa River West subwatershed.

We have determined that the proposed development in question falls within the exemption requirements for an Environmental Compliance Approval (ECA) as per O.Reg. 525/98, section 3(a), and Ontario Water Resources Act section 53.6(c) when considering the following:

1. Currently comprised of two (2) parcels of land that are to be combined into one **(1) parcel**, the existing 0.21-ha site currently consists of a funeral home which is zoned traditional mainstreet (TM) and a single family home which is zoned Residential Third Density (R3S);
2. The proposed sewage works and stormwater management facility will service a single parcel of land;
3. The property does not discharge into a combined sewer and it will not be used for industrial purposes.

Would you be able to confirm our assumption that the proposed development is indeed exempt and a no further pre-submission consultation is required.

Please feel free to contact me if you have any questions, need to discuss, or require further information.

Best regards,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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From: Jamie Batchelor
To: Tim Kennedy
Cc: Jaymeson Adams; Christian Lavoie-Lebel; Eric Lalande
Subject: RE: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - RVCA Pre-consult
Date: Thursday, July 02, 2020 1:27:33 PM
Attachments: image005.jpg
image006.jpg
image001.jpg

Good Afternoon Tim,

Based on our understanding of the project, no surface parking spots are being proposed. Rainwater from landscaping and rooftop drainage is considered to be clean for the purpose of protecting water quality and aquatic habitat. Therefore, the RVCA would not require any additional onsite water quality control measures save and except best management practices. The raingardens and alternative low impact development would be strongly encouraged to meet the best management practice requirement.

The RVCA's typical trigger for onsite water quality control via mechanical separation would be 6 surface parking spaces or greater.

The RVCA will defer all stormwater issues related to quantity control to the City for comment in this instance as stormwater will be discharging to an existing storm sewer.

Jamie Batchelor, MCIP, RPP
Planner, ext. 1191
Jamie.batchelor@rvca.ca

From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: Thursday, July 2, 2020 11:01 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>; Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>
Subject: RE: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - RVCA Pre-consult

Hi Jamie,

Just following up on my email below. Did you get a chance to look at these items?

We are planning to complete the SWM design first thing next week so we can submit our report to the City by end of next week. If we could get your input by end of this week that would be greatly appreciated.

Thanks,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure
T 613 860-2462 ext. 6620 **M** 613 462-3627
CIMA+

From: Tim Kennedy
Sent: Monday, June 22, 2020 11:13 AM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Jaymeson Adams <Jaymeson.Adams@cima.ca>; Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>
Subject: 403 Richmond Rd. and 389 Roosevelt Ave - Servicing Capacity Assessment - RVCA Pre-consult

Hello Jamie,

We are currently performing an Adequacy of Public Services Report in support of a zoning by-law amendment application for a proposed

development located at 403 Richmond Road and 389 Roosevelt Ave in Ottawa, Ontario (See attached key plan). The proposed development involves the construction of a 10-storey mixed-use residential and commercial building.

I wanted to get your input on Natural Heritage/Hazards features that may impact the development as well as any Storm Water Management Criteria for the site and required approvals/permits.

A few specific items for your consideration as follows:

1. The stormwater collected from the site travels approximately 650 m to the Ottawa River. The flow path is highlighted in the attached key plan.
2. The development will connect to the existing 300 mm Ø storm sewer within Roosevelt Avenue and will discharge primarily rooftop stormwater.
    a. Will quality control for rooftop areas be required?
    b. Considering parking will be underground, with limited exterior hard surface at the ground level would a mechanical separator still be required for hydrocarbon removal?
    c. Would the use of raingardens or alternative low impact development stormwater measures meet RVCA's requirements for enhanced quality control for this site?
    d. Should an internal/underground storage tank be required and provided with detention time for settlement of suspended solids would this meet the requirement for enhanced quality control for this site?

Please do not hesitate to contact me if you have any questions, want to discuss or need clarification.

Thank you,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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B

Appendix B
Existing Conditions Plan

LEGEND - EXISTING MUNICIPAL SERVICES:

- EX. WATERMAIN
- EX. SANITARY
- EX. STORM

ABBREVIATIONS:
PVC = POLYVINYL CHLORIDE
UCI = UNLINED CAST IRON
CONC = CONCRETE

NOTE: EXISTING MUNICIPAL INFRASTRUCTURE INFORMATION, INCLUDING SIZE, MATERIAL TYPE, AND INVERTS, WERE DERIVED FROM GEOOTTAWA AND THE AVAILABLE RECORD DRAWINGS PROVIDED THE CITY OF OTTAWA INFORMATION CENTRE.

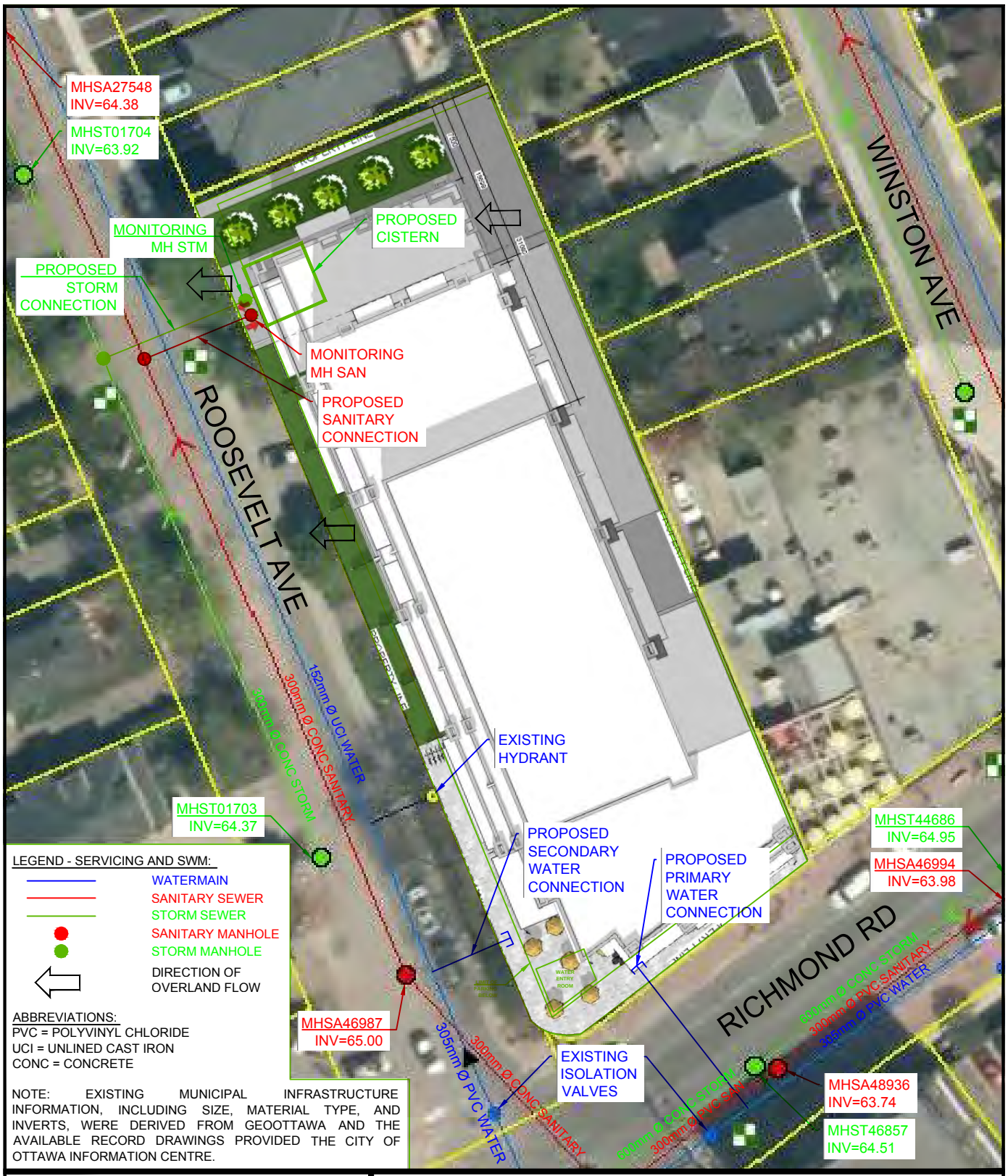
CIMA+
T: 613-560-2452
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

EXISTING CONDITIONS PLAN

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/07/06	A001046	1 of 1	EXIST - 1

C

Appendix C
Conceptual Site Servicing and Stormwater Management Plan



CIMA+
T: 613-560-2452
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

CONCEPTUAL SITE SERVICING AND STORMWATER MANAGEMENT PLAN

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/07/10	A001046	1 of 1	SERV - 1

D

Appendix D
Water Supply Design Calculations

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WATER CONSUMPTION CALCULATIONS

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISTB-2018-02, ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

RESIDENTIAL AND COMMERCIAL WATER DEMANDS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Day Demand:	350	L/c/day
Maximum Day Peaking Factor:	3.9	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	5.8	x Average Daily Demand

Per Unit Populations:

Table 4.1 Per Unit Populations

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

EQUIVALENT POPULATION :

Unit Type	Number of Units	Persons Per Unit	Population
Studio Apartments	11	1.4	15
1 Bedroom Apartments	120	1.4	168
1 Bedroom + Den Apartments	8	1.4	11
2 Bedroom Apartments	35	2.1	74
Total	**174**		**268**

COMMERCIAL DESIGN CRITERIA:

Contributing Commercial Area:	0.125	gross ha (including amenity areas, party room and gym)
Commercial Average Day Demand:	28,000	L/gross ha/d
Maximum Day Peaking Factor:	1.5	x Average Daily Demand
Maximum (Peak Hour) Peaking Factor:	1.8	x Maximum Daily Demand

WATER DEMANDS:

Demand Type	Average Daily Demand (L/s)	Maximum Daily Demand (L/s)	Maximum (Peak) Hour Demand (L/s)
Residential	1.09	4.23	6.30
Commercial	0.04	0.06	0.11
Total	**1.13**	**4.29**	**6.41**

NOTES:

1. Maximum Day and Maximum Hour residential peaking factors determined using Table 3-3 of the MOE Design Guidelines for Drinking-Water System for 0 to 500 persons.

2. Given basic day demand greater than 50 m3/day (0.57 L/s), two connections, separated by an isolation valve required. Furthermore given location on corner lot, City will not support the addition of an isolation valve on the main line, thus one connection to Richmond Rd and one connection to Roosevelt Ave. required.

Prepared by: Jaymeson Adams, EIT Date: 2020/06/15

Verified by: Tim Kennedy, P.Eng. Date: 2020/06/17
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

APPLICABLE DESIGN GUIDELINES:

1. Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999
2. Ottawa Design Guidelines - Water Distribution (2010) including Appendix H per ISTB-2018-02
3. City of Ottawa Technical Bulletin ISTB-2018-02
4. MOE Design Guidelines for Drinking-Water Systems

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

Type of Construction	Coefficient (C)	Value Selected (C)
Fire-resistive Construction (> 3 hours)	**0.6**	**0.6**
Non-combustible Construction	0.8	
Ordinary Construction	1	
Wood Frame Construction	1.5	

STEP B - DETERMINE THE FLOOR AREA

Floor/Level	Floor Area Per Level (sq. ft.)	Floor Area Per Level (m2)	Fire Resistive Building	Protected Openings (one hour rating)	Area of Structure Considered (m2)
Gross Floor Area (GFA) Ground Level:	15,381	1,429	YES	YES	-
GFA Level 2:	16,482	1,531			383
GFA Level 3:	16,840	1,564			1,564
GFA Level 4:	16,840	1,564			391
GFA Level 5:	13,847	1,286			-
GFA Level 6:	13,847	1,286			-
GFA Level 7:	13,847	1,286			-
GFA Level 8:	13,847	1,286			-
GFA Level 9:	13,847	1,286			-
GFA Level Mechanical Penthouse	7,702	716			-
TOTAL FLOOR AREA (A):	**142,480**	**13,237**			**2,338**

STEP C - DETERMINE THE HEIGHT IN STOREYS

Floor/Level	Number of Storeys	Percent of Floor Area Considered
Ground Level:	1	-
Level 2:	1	25%
Level 3:	1	100%
Level 4:	1	25%
Level 5:	1	-
Level 6:	1	-
Level 7:	1	-
Level 8:	1	-
Level 9:	1	-
Mechanical Penthouse	1	-
HEIGHT IN STOREYS:	**10**	

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

$$F = 220C\sqrt{A}$$

Where:

F is the required fire flow in L/min

C is the coefficient related to the type of construction, and;

A is the total floor area of the building in m^2

Coefficient Related to Type of Construction (C) = **0.6**

Floor Area Considered (A) = **2,338 m^2**

REQUIRED (BASE) FIRE FLOW (F) = **6000** **L/min** (Rounded to Nearest 1,000 L/min)

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

Occupancy Class	Occupancy Factor	Value Selected (C)
Non-combustible	0.75	
Limited combustible	0.85	
Combustible	**1.00**	**1.00**
Free burning	1.15	
Rapid burning	1.25	

REQUIRED (BASE) FIRE FLOW (F) =	**6000**	**L/min** (Not rounded)

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Sprinkler System Design	Sprinkler Design Charge	Value Selected (C)	Total Charge
Automatic sprinkler system conforming to NFPA standards	-30%	Yes	-30%
Standard water supply	-10%	Yes	-10%
Fully supervised system	-10%	No	0%
TOTAL CHARGE FOR SPRINKLER SYSTEM			**-40%**

DECREASE FOR SPRINKLER PROTECTION =	**-2400**	**L/min** (Not rounded)

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

Façade	Separation Distance (m)	Length-height Factor of Exposed Wall (m-storeys)	Assumed Construction of Exposed Wall of Adjacent	Total Charge
North Façade	6	40	Wood Frame	18%
East Façade (fire/party wall)	0	N/A	N/A	10%
South Façade	25	80	Fire Resistive or Ordinary with Unprotected Openings	8%
West Façade	27	18	Wood Frame	8%
TOTAL CHARGE FOR EXPOSURES				**44%**

INCREASE FOR EXPOSURES =	**2640**	**L/min** (Not rounded)

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

TOTAL REQUIRED FIRE FLOW (RFF) =	**6000**	**L/min** (Rounded to Nearest 1,000 L/min)
	100	**L/s**
	1585	**USGPM**

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

FIRE FLOW ASSESSMENT

NOTES/COMMENTS:

STEP A - DETERMINE THE TYPE OF CONSTRUCTION

1. No notes or comments

STEP B - DETERMINE THE FLOOR AREA

1. Assumed vertical openings and exterior vertical communications are properly protected (one hour rating), thus only the area of the largest floor plus 25% of each of the two immediately adjoining floors accounted for per Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999
2. Per the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999, Note E: Fire Walls - In determining floor areas, a fire wall that meets or exceeds the requirements of the current edition of the National Building Code of Canada (provided this necessitates a fire resistance rating of 2 or more hours) may be deemed to subdivide the building into more than one area or may, as a party wall, separate the building from an adjoining building. It is assumed that the party wall to the east will have a fire-resistance rating of at least two hours.

STEP C - DETERMINE THE HEIGHT IN STOREYS

1. Two levels of underground parking not considered as they are at least 50% below grade (note F of Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999)

STEP D - DETERMINE BASE FIRE FLOW (ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

STEP E - DETERMINE THE INCREASE OR DECREASE FOR OCCUPANCY AND APPLY TO STEP D (STEP D x STEP E, DO NOT ROUND)

1. Occupancy selected assuming commercial establishment will fall under C-3 occupancy type.

STEP F - DETERMINE THE DECREASE, IF ANY, FOR AUTOMATIC SPRINKLER PROTECTION AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes sprinkler system will not be fully supervised.

STEP G - DETERMINE THE TOTAL INCREASE FOR EXPOSURES AND APPLY TO VALUE IN STEP D ABOVE (DO NOT ROUND)

1. Assumes adjoining wall to east is an unpierced party wall considered to form a boundary when determining floor areas warranting a 10% exposure charge per Note E of the Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection, 1999

STEP H - DETERMINE FIRE FLOW INCLUDING ALL INCREASES AND REDUCTIONS ((STEP E + STEP F + STEP G, ROUND TO NEAREST 1,000 L/min)

1. No notes or comments.

Prepared by: Jaymeson Adams, EIT Date: 2020/06/15

Verified by: Tim Kennedy, P.Eng. Date: 2020/06/24
PEO# 100173201

Z:\Cima-C10\Ott_Projects\A\A001000-A001499\A001046_403 Richmond - Servicing Report\300\360_Civil\200615_Adequacy of Servicing Calculations\03_WM\[200703_Water Demands and Analysis.xlsx]Water Demands

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110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

PROPOSED WATER SERVICE CONNECTION LOCATION(S)

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/06/23	A001046	1 of 1	1

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T: 613-560-2482
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

EXPOSURE SEPARATION DISTANCES

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/06/23	A001046	1 of 1	2

CIMA+
T: 613-560-2452
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

FIRE HYDRANT COVERAGE

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/06/23	A001046	1 of 1	3

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

HYDRAULIC ANALYSIS - WATER

APPLICABLE DESIGN GUIDELINES:

1. Ottawa Design Guidelines - Water Distribution (2010)
2. City of Ottawa Technical Bulletin ISDTB-2014-02 and ISD-2010-02
3. MOE Design Guidelines for Drinking-Water Systems

MUNICIPAL BOUNDARY CONDITIONS

HYDRAULIC BOUNDARY CONDITIONS (PROVIDED BY THE CITY OF OTTAWA):

Hydraulic Condition (HGL = Hydraulic Grade Line)	Boundary Condition (Head) (m)	
	Richmond Rd. 305 mm dia.	Roosevelt Ave. 152 mm dia.
Minimum HGL	108.5	108.5
Maximum HGL	115.0	115.0
Maximum Day + Fire Flow	N/A	N/A

AVAILABLE HYDRANT FLOWS - MULTI-HYDRANT ANALYSIS (PROVIDED BY THE CITY OF OTTAWA):

Hydrant ID	Available Flow (L/s)
362027H067	85
362028H045	30
Total	**115**

HYDRAULIC ANALYSIS - WATER SUPPLY ADEQUACY (FLOW AND PRESSURE)

DESIGN CRITERIA - WATERMAIN PRESSURE AND DEMAND OBJECTIVES:

Demand Type	Minimum Pressure (psi)	Desired Minimum Pressure (psi)	Desired Maximum Pressure (psi)	Maximum Pressure (psi)
Average Daily Demand	40.0	50.0	70.0	80.0
Maximum Daily Demand + Fire Flow	20.0			
Maximum (Peak) Hour Demand	40.0			

WATERMAIN PRESSURE AND DEMAND ANALYSIS SUMMARY - PROPOSED DEVELOPMENT:

Demand Type	Proposed Demand (L/s)	Available Flow/Pressure		Flow/Pressure Objective Achieved?
		Design Operating Pressure[1] (Relative Head) (m)	Design Operating Pressure (psi)	
Average Daily Demand	1.13	47.6	68	YES
Maximum Daily Demand + Fire Flow	104.29	115 L/s @ 20 psi		YES
Maximum (Peak) Hour Demand	6.41	41.1	58	YES

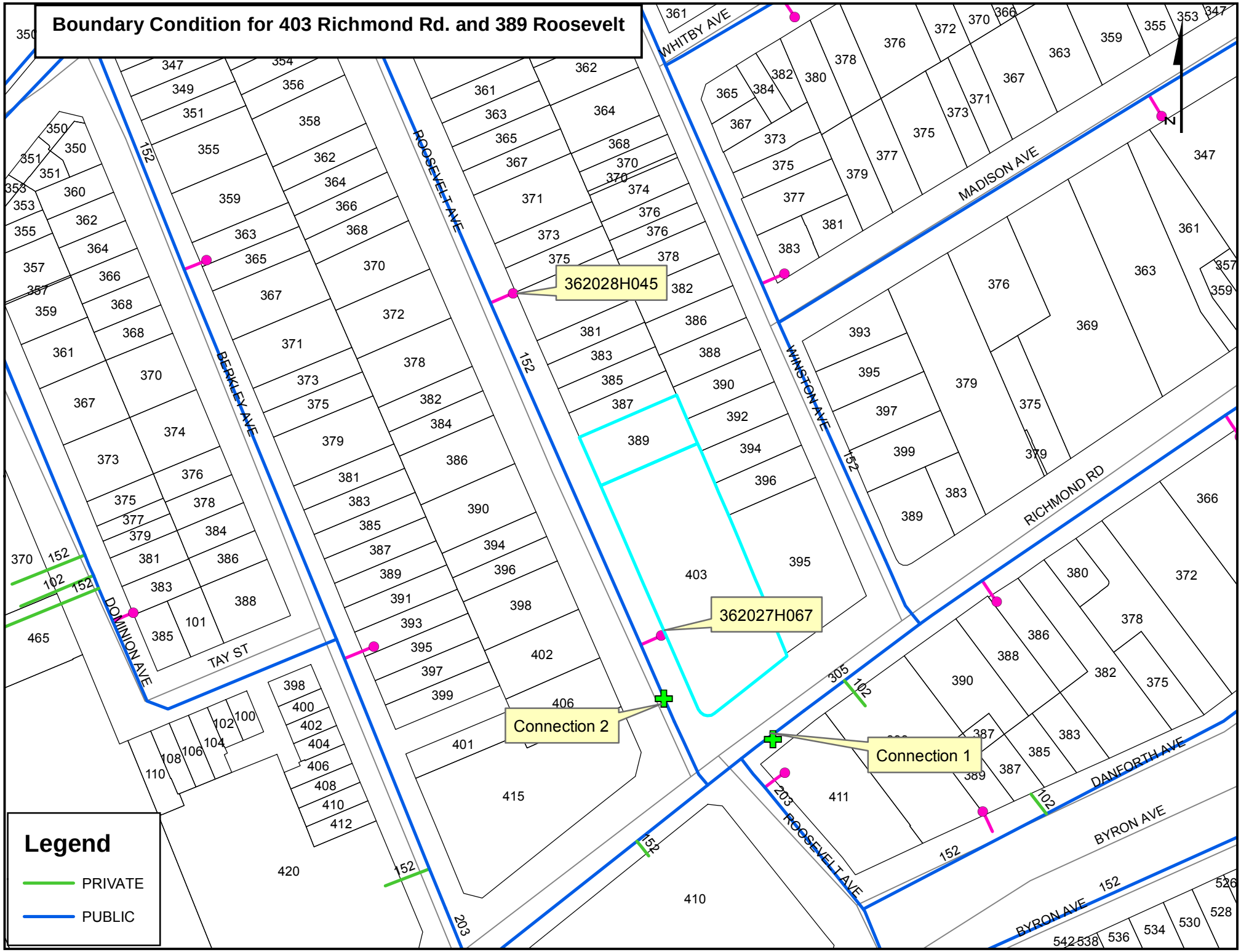
1. Assumed ground elevation for connections 1 and 2 (m) = 67.4

NOTES:

Prepared by: Jaymeson Adams, EIT Date: 2020/07/03

Verified by: Tim Kennedy, P.Eng. Date: 2020/07/03
PEO# 100173201

Boundary Condition for 403 Richmond Rd. and 389 Roosevelt



From:	Fraser, Mark
To:	Tim Kennedy
Cc:	Christian Lavoie-Lebel; Jaymeson Adams
Subject:	RE: 403 Richmond Rd. and 389 Roosevelt Ave. - Water Demands - Boundary Condition Request
Date:	Tuesday, June 30, 2020 1:45:52 PM
Attachments:	403 Richmond Rd - 389 Roosevelt June 2020.pdf 1_200625_Water Demands and Fire Flow_R1.pdf 2_200624_Fire Flow.pdf 3_200623_Figure 1 - Connections.pdf 4_200623_Figure 2 - Exposure Separation.pdf 5_200623_Figure 3 - Hydrant Coverage.pdf

---

Hi Tim,

Please find below boundary conditions, HGL, for hydraulic analysis at **403 Richmond Rd. and 389 Roosevelt Ave.** (zone 1W) assumed to be connected to the 305mm dia. watermain on Richmond Rd. and 152mm dia. watermain on Roosevelt Ave. (see attached PDF for location).

Domestic and Fire Flow Demands:
Type of Development: The proposed development involves the construction of one (1) 10-storey mixed-use building (residential and ground floor commercial space). A total of 174 residential units are being proposed.
Average Day Demand = 1.13 L/s
Maximum Day Demand = 4.29 L/s
Peak Hour Demand = 6.41 L/s
Fire Flow Demand = 6,000 L/min

Please include a memorandum from the Architect in the Report as supporting documentation regarding building construction to confirm the parameters and assumptions applied in the FUS method RFF calculation are accurate and confirming the unit type breakdown and commercial area of the building applied to the domestic water demand calculations are accurate.

Minimum HGL = 108.5m
Maximum HGL = 115.0m
A **Multi-Hydrant Analysis** was performed with the two available hydrants identified by the consultant (see attached PDF for the hydrant locations). **The total available flow (115 L/s) from these two fire hydrants exceeds the required fire flow (100 L/s).**

Hydrant	Available Flow
362027H067	85 L/s
362028H045	30 L/s
Total	**115 L/s**

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.

Let us know if you have any questions.

Regards,

Mark Fraser, P. Eng.
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca

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-
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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: June 25, 2020 7:01 AM
To: Fraser, Mark <Mark.Fraser@ottawa.ca>
Cc: Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: RE: 403 Richmond Rd. and 389 Roosevelt Ave. - Water Demands - Boundary Condition Request

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Hi Mark,

Apologies but small correction to the demands below and attached.

Regards.

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure
T 613 860-2462 ext. 6620 **M** 613 462-3627

CIMA+

From: Tim Kennedy
Sent: Thursday, June 25, 2020 6:33 AM
To: Fraser, Mark <Mark.Fraser@ottawa.ca>
Cc: Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 403 Richmond Rd. and 389 Roosevelt Ave. - Water Demands - Boundary Condition Request

Good morning Mark,

We would like to kindly request boundary conditions for the proposed development at **403 Richmond Road and 389 Roosevelt Ave**. Please find the proposed development information below and detailed calculations and associated figures attached (including: (1) Water Demand Calculations, (2) Fire Flow Calculations, (3) Figure 1 - Proposed Water Service Connection Locations, (4) Figure 2 - Exposure Separation Distances, (5) Figure 3 - Fire Hydrant Coverage and (6) Architectural Concept Plans for reference):

1. **Type of Development and Units:** The proposed development involves the construction of one (1) 10-storey mixed-use building (residential and ground floor commercial space). There is a total of **174 residential units**. An underground 2-level parking garage extending the footprint of the site is also proposed.
2. **Site Address:** 403 Richmond Rd. and 389 Roosevelt Ave.
3. **Location of Services:** Please see attached Figure 1.
    a. Richmond Road – 305 mm diameter PVC watermain.
    b. Roosevelt Avenue – 305 mm diameter PVC watermain reducing to 152 mm diameter UCI watermain.
4. **Plan showing Proposed Water Connections:** Please see attached Figure 1.
    a. Primary connection to Richmond Road 305 mm dia. watermain;
    b. Secondary connection to Roosevelt Avenue 152 mm dia. watermain.
5. **Average Daily Demand:** 1.13 L/s
6. **Maximum Daily Demand:** ~~4.84 L/s~~ 4.29 L/s
7. **Peak Hour Demand:** ~~7.27 L/s~~ 6.41 L/s
8. **Required Fire Flow (RFF):** 6,000 L/min

If you have any questions or concerns please do not hesitate to contact me.

Best regards,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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E

Appendix E
Sanitary Servicing Design Calculations

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

2. City of Ottawa Technical Bulletin ISTB-2018-01

DOMESTIC CONTRIBUTIONS:

RESIDENTIAL DESIGN CRITERIA:

Residential Average Flow: (1) 280 L/c/day

Residential Peak Factor (P.F.): Harmon Equation (Min 2.0 and Max 4.0)

$$P.F. = 1 + \left(\frac{14}{4 + \left(\frac{P}{1000} \right)^{\frac{1}{2}}} \right) * K$$

where:

P=Population

K=Correction Factor =0.8

Per Unit Populations:

Table 4.2 Per Unit Populations

Unit Type	Persons Per Unit
Single Family	3.4
Semi-detached	2.7
Duplex	2.3
Townhouse (row)	2.7
Apartments:	
Bachelor	1.4
1 Bedroom	1.4
2 Bedroom	2.1
3 Bedroom	3.1
Average Apt.	1.8

AVERAGE FLOW - DOMESTIC:

Unit Type	Number of Units	Persons Per Unit	Population	Average Flow (L/s)
Studio Apartments	11	1.4	15	0.05
1 Bedroom Apartments	120	1.4	168	0.54
1 Bedroom + Den Apartments	8	1.4	11	0.04
2 Bedroom Apartments	35	2.1	74	0.24
Total	174		268	**0.87**

PEAK FLOW - DOMESTIC:

Population: (2)	268	persons
Average Dry Weather Flow: (3) = (1) x (2)	0.87	L/s
Peaking Factor (P.F.): (4)	3.48	
Peak Domestic Flow: (5) = (3) x (4)	**3.02**	L/s

COMMERCIAL & INSTITUTIONAL CONTRIBUTIONS:

COMMERCIAL AND INSTITUTIONAL DESIGN CRITERIA:

Commercial Average Flow: (6)	28,000	L/gross ha/d
Commercial Peak Factor:	1.5	if commercial contribution >20%, otherwise use 1.0

AVERAGE FLOW - COMMERCIAL:

Contributing Commercial Area: (7)	0.125	gross ha (including amenity areas, party room and gym)
Average Dry Weather Flow: (8) = (6) x (7)	0.04	L/s

PEAK FLOW - COMMERCIAL:

Percent Commercial Area Contribution:	9%	(GFA/Commercial Floor Area)
Peaking Factor: (9)	1.00	
Peak Commercial Flow: (10) = (8) x (9)	**0.04**	L/s

EXTRANEOUS FLOW CONTRIBUTION - INFLOW AND INFILTRATION:

EXTRANEOUS DESIGN CRITERIA:

Dry Weather Infiltration:	0.05	L/s/effective gross ha (for all areas)
Wet Weather Infiltration:	0.28	L/s/effective gross ha (for all areas)

PEAK FLOW - EXTRANEOUS:

Effective Gross Area: (11)	0.21	ha
Total Infiltration Allowance: (12)	0.33	L/s/effective gross ha (for all areas)
Peak Extraneous Flow: (13) = (11) x (12	**0.07**	L/s

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

WASTEWATER PEAK FLOW DETERMINATION

Total Estimated Avg. Dry Weather Flow Rate:	**0.91**	**L/s**
Total Estimated Peak Dry Weather Flow Rate:	**3.06**	**L/s**
Total Estimated Peak Wet Weather Flow Rate:	**3.13**	**L/s**

Prepared by: Jaymeson Adams, EIT Date: 2020/06/15

Verified by: Tim Kennedy, P.Eng. Date: 2020/06/16
PEO# 100173201

C:\Users\tim.kennedy\Desktop\A001046 - Background Review\1_Sanitary\[200616_Sanitary Flow_revuTK.xlsx]Sheet1

From:	Fraser, Mark
To:	Tim Kennedy
Cc:	Christian Lavoie-Lebel; Jaymeson Adams
Subject:	RE: 403 Richmond Rd. and 389 Roosevelt Ave. - Peak Wastewater Demand - Capacity Confirmation
Date:	Thursday, June 25, 2020 9:56:53 AM
Attachments:	image001.jpg image002.jpg 200616_Sanitary Flow_revuTK.pdf 2020-05-27 - Concept.pdf

---

Hi Tim,

The Water Resources Assets Unit has reviewed the proposed peak wastewater flow of 3.13 L/s estimated to be generated from the subject redevelopment proposal and have no issues.

Regards,

Mark Fraser, P. Eng.
Project Manager, Planning Services
Development Review Central Branch
City of Ottawa | Ville d'Ottawa
Planning, Infrastructure and Economic Development Department
110 Laurier Avenue West. 4th Floor, Ottawa ON, K1P 1J1
Tel:613.580.2424 ext. 27791
Fax: 613-580-2576
Mail: Code 01-14
Email: Mark.Fraser@ottawa.ca

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From: Tim Kennedy <Tim.Kennedy@cima.ca>
Sent: June 17, 2020 12:40 PM
To: Fraser, Mark <Mark.Fraser@ottawa.ca>
Cc: Christian Lavoie-Lebel <Christian.Lavoie-Lebel@cima.ca>; Jaymeson Adams <Jaymeson.Adams@cima.ca>
Subject: 403 Richmond Rd. and 389 Roosevelt Ave. - Peak Wastewater Demand - Capacity Confirmation

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We would like to kindly submit the anticipated sanitary demands for the proposed development at **403 Richmond Road and 389 Roosevelt Ave**. Please find the proposed development information below and detailed calculations attached (I have also attached the Architectural Concept Plans for reference):

1. **Type of Development and Units:** The proposed development involves the construction of one (1) 10-storey mixed-use building (residential and commercial space). There is a total of **174 residential units**. An underground 2-level parking garage extending the footprint of the site is also proposed.
2. **Site Address:** 403 Richmond Road and 389 Roosevelt Ave.
3. **Location of Services:** connection to existing 300 mm diameter concrete sanitary sewer on Roosevelt Avenue with new maintenance hole on sewer main anticipated.
4. **Total Estimated Average Dry Weather Flow Rate:** 0.91 L/s
5. **Total Estimated Peak Dry Weather Flow Rate:** 3.06 L/s
6. **Total Estimated Peak Wet Weather Flow Rate:** 3.13 L/s

Could you please confirm if there is enough capacity in the City system to accommodate the proposed wastewater flow. Note that I will be out of the office next week, however you can contact Christian or Jaymeson (cc'd above) if you require anything further while I am away.

Best regards,

TIM KENNEDY, P.Eng.
Project Manager / Infrastructure

T 613-860-2462 ext. 6620 **M** 613-462-3627 **F** 613-860-1870
110–240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

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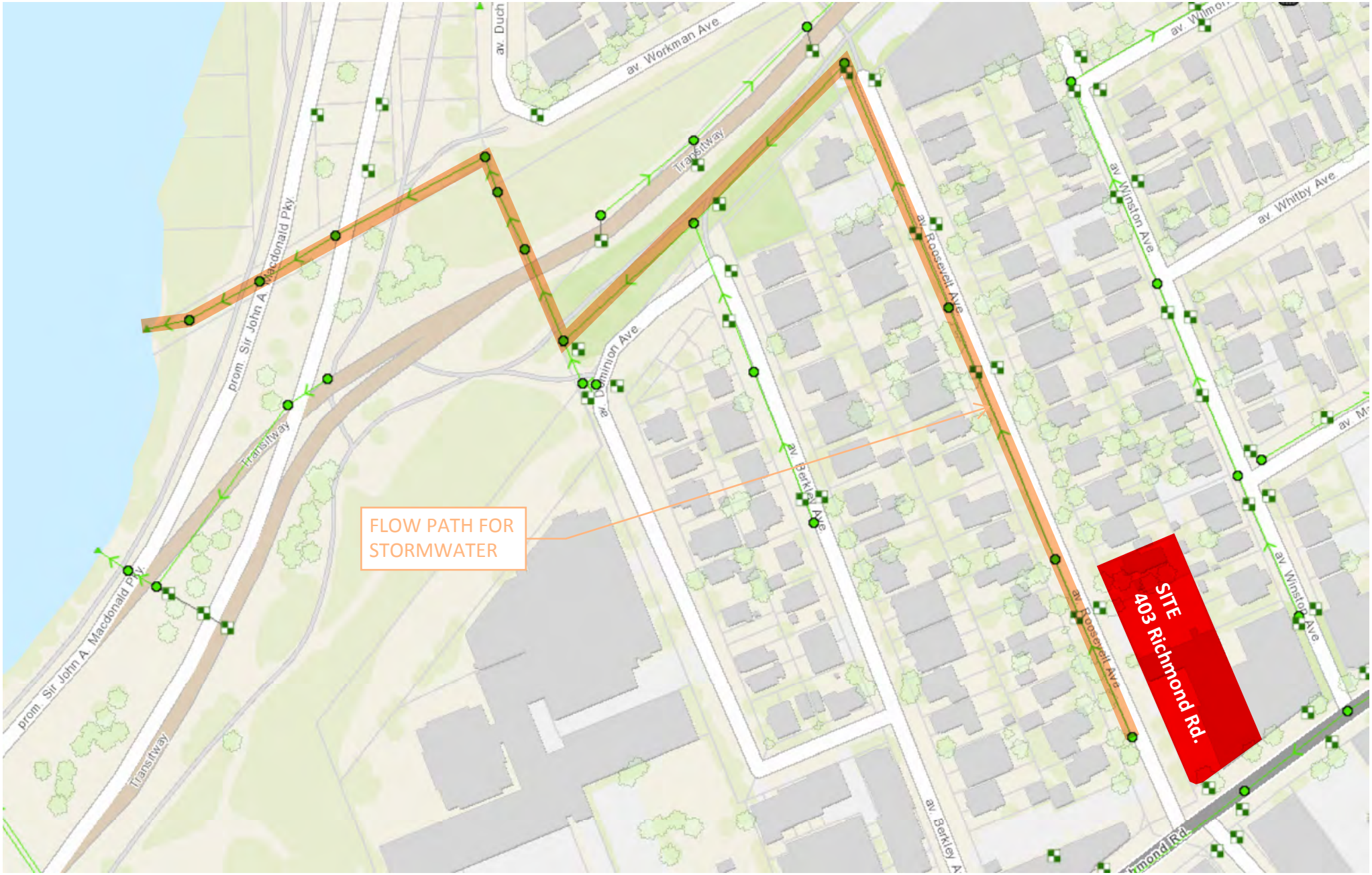
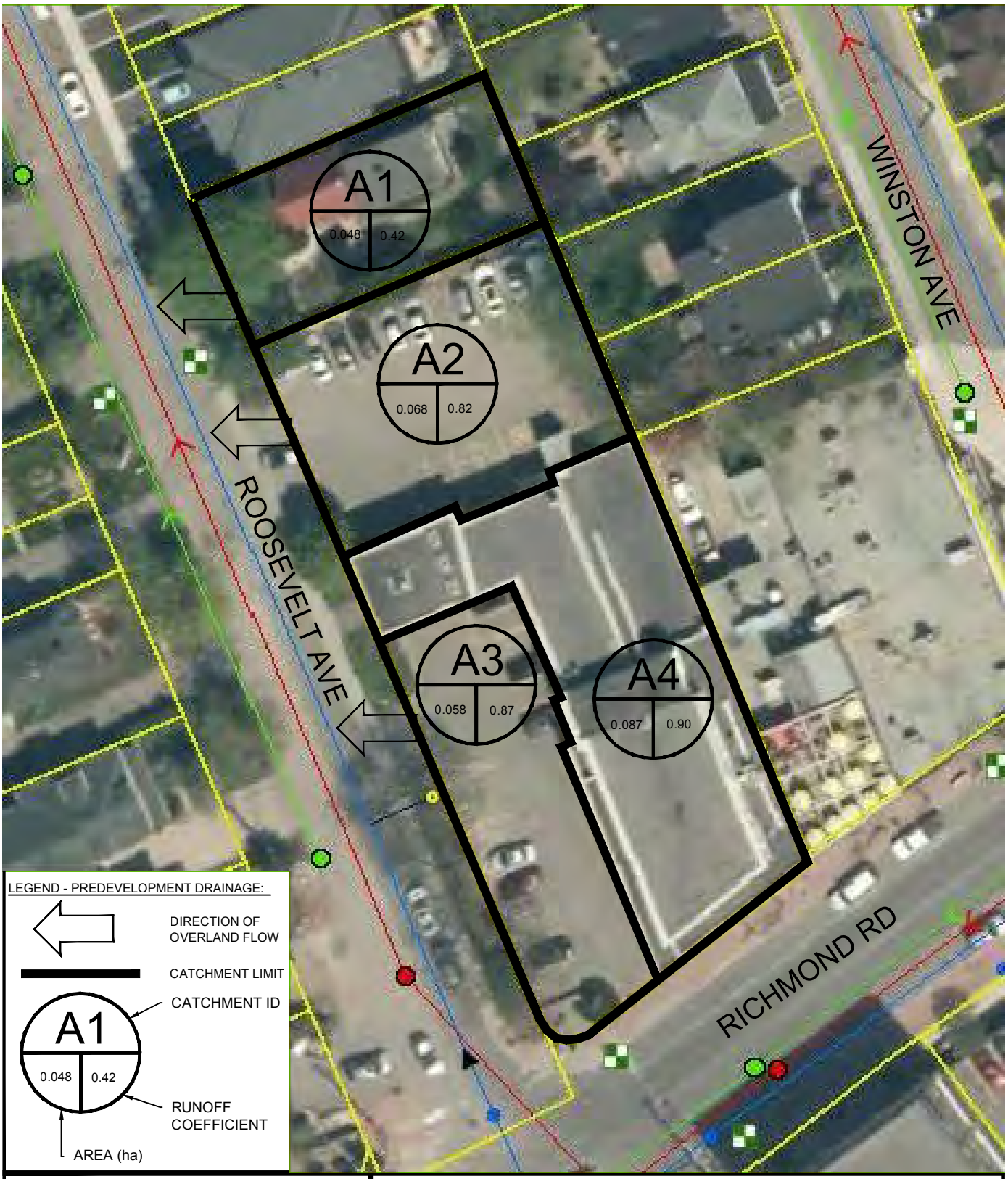
F

Appendix F
Storm Servicing and Stormwater Management Calculations



JAYMESON ADAMS, EIT
A001046
2020-06-30



CIMA+

T: 613-560-2452
110-240 Catherine Street, Ottawa, ON K2P 2G8 CANADA

PRE-DEVELOPMENT DRAINAGE AREAS

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE:	DATE:	PROJECT No:	SHEET No:	FIGURE No:
T. Kennedy	----	T. Kennedy	NTS	2020/07/06	A001046	1 of 1	EXIST - 2

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (PRE-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (2-year)	Weighted Runoff Coefficient (100-year)
Attenuated Areas	456	0.20	2154	0.90	2610	**0.78**	**0.95**
Unattenuated Areas	204	0.20	120	0.90	324	**0.46**	**0.57**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 7/8/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/9/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE-DEVELOPMENT FLOW

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT FLOW DETERMINATION:

DESIGN CRITERIA:

Design Storm (year):	2	
IDF Regression Constants: (a) **(b)** **(c)**	732.951 6.199 0.810	
IDF Curve Equation (mm/hr):	I = a / (Time in min + b)^c	
Rational Formula (L/s):	Q = 2.78C*I*A	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

ALLOWABLE RELEASE RATE - SUMMARY:

Catchment ID	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Allowable Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
Subject Site	0.26	0.50	10	76.81	**27.74**	**106.67**

NOTES:

1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 7 min. Minimum Tc of 10 min used per City Standard..
2. Calculated runoff coefficient (C) equal to 0.78 for 2-year event. Maximum C of 0.50 used per City Standard.
3. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

Prepared by: Jaymeson Adams, EIT Date: 7/8/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/8/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE-DEVELOPMENT FLOW - EXISTING SITE FLOWS

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE-DEVELOPMENT FLOW DETERMINATION - 2-YEAR EVENT:

DESIGN CRITERIA:

Design Storm (year):	2	
IDF Regression Constants: (a)	732.951	
(b)	6.199	
(c)	0.810	
IDF Curve Equation (mm/hr):	I = a / (Time in min + b)^c	
Rational Formula (L/s):	Q = 2.78C*I*A	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

ALLOWABLE RELEASE RATE - SUMMARY:

Catchment ID	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
Subject Site	0.26	0.78	10	76.81	**43.27**	**166.41**

PRE-DEVELOPMENT FLOW DETERMINATION - 5-YEAR EVENT:

DESIGN CRITERIA:

Design Storm (year):	5
IDF Regression Constants: (a)	998.071
(b)	6.053
(c)	0.814

ALLOWABLE RELEASE RATE - SUMMARY:

Catchment ID	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
Subject Site	0.26	0.78	10	104.19	**58.70**	**225.75**

PRE-DEVELOPMENT FLOW DETERMINATION - 100-YEAR EVENT:

DESIGN CRITERIA:

Design Storm (year):	100
IDF Regression Constants: (a)	1735.688
(b)	6.014
(c)	0.820

ALLOWABLE RELEASE RATE - SUMMARY:

Catchment ID	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
Subject Site	0.26	0.95	10	178.56	**122.51**	**471.20**

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE-DEVELOPMENT FLOW - EXISTING SITE FLOWS

NOTES:

1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 7 min. Minimum Tc of 10 min used per City Standard.
2. Calculated runoff coefficient (C) equal to 0.78 for 2-year event and 0.95 for 100-year event.
3. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

Prepared by: Jaymeson Adams, EIT Date: 7/8/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/8/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM RUNOFF COEFFICIENT DETERMINATION (POST-DEVELOPMENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

POST-DEVELOPMENT RUNOFF COEFFICIENT DETERMINATION:

Area	Pervious Area m²	Pervious Area Runoff Coefficient	Impervious Area m²	Impervious Area Runoff Coefficient	Total Area m²	Weighted Runoff Coefficient (2-year)	Weighted Runoff Coefficient (100-year)
Attenuated Areas	222	0.20	2388	0.90	2610	**0.84**	**0.95**
Unattenuated Areas	159	0.20	165	0.90	324	**0.56**	**0.70**

NOTES:

For 25 year storms add 10% to C value
For 50 year storms add 20% to C value
For 100 year storms add 25% to C value

Prepared by: Jaymeson Adams, EIT Date: 7/8/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/9/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

STORM PRE- VS POST DEVELOPMENT FLOW - UNATTENUATED AREAS (100-YEAR)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

PRE- vs POST-DEVELOPMENT FLOW DETERMINATION FOR UNATTENUATED AREAS:

DESIGN CRITERIA:

Design Storm (year):	100	
IDF Regression Constants: (a)	1735.688	
(b)	6.014	
(c)	0.820	
IDF Curve Equation (mm/hr):	$I = a / (\text{Time in min} + b)^c$	
Rational Formula (L/s):	Q = 2.78C*I*A	where: Q = Flow (L/s) C = Runoff Coefficient I = Rainfall Intensity (mm/hr) A = Area (hectares)

RELEASE RATE SUMMARY - UNATTENUATED AREAS - PRE- vs POST-DEVELOPMENT (100-year):

Design Event	Area (A) ha	Runoff Coefficient (C)	Time of Concentration (tc) min	Intensity (I) mm/hr	Allowable Release Rate (Q) L/s	Release Flow Per Unit Area (Q/ha) L/s/ha
Pre-development	0.03	0.57	10	178.56	**8.5**	**284.74**
Post-development	0.03	0.70	10	178.56	**10.4**	**345.02**
Variance (Post minus Pre)					**1.8**	

NOTES:

1. Calculated Time of Concentration (tc) using Bransby Williams (C > 0.4) is 7 min. Minimum Tc of 10 min used per City Standard..
2. IDF Parameters per City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier International Airport)

Prepared by: Jaymeson Adams, EIT Date: 7/8/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/9/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR ATTENUATED SITE AREA (100-YEAR EVENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	99.23 L/s/ha
Area (A):	0.26 ha
Runoff Coefficient (C):	0.95
Rainfall Event:	100 year
Release Rate (Q):	0.0259 m³/s
Discharge Factor (K):	1

Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

Required Retention Volume: 68.4 m³

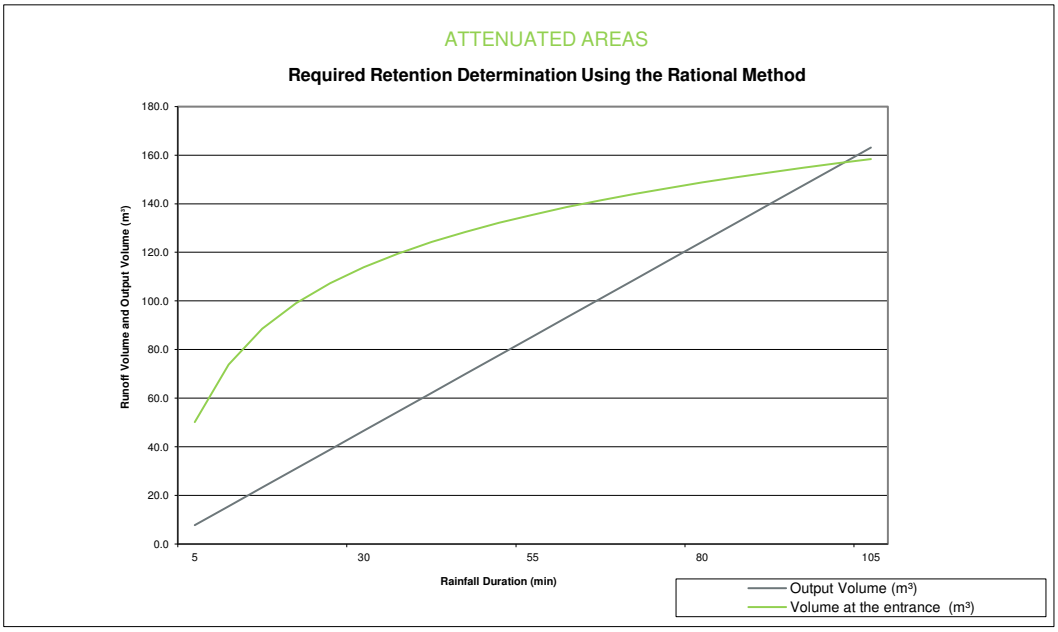
Rainfall Duration (min) *T* (1)	**Rainfall Intensity** (mm/h) *I* (2)	**Runoff Volume** (m³) *CIAT* (3)	**Output Volume** (m³) *kQT* (4)	**Retention Volume** (m³) *(3)-(4)* (5)
5.0	242.7	50.1	7.8	42.4
10.0	178.6	73.8	15.5	58.2
15.0	142.9	88.6	23.3	65.3
20.0	120.0	99.1	31.1	68.1
25.0	**103.8**	**107.3**	**38.9**	**68.4**
30.0	91.9	113.9	46.6	67.3
35.0	82.6	119.4	54.4	65.0
40.0	75.1	124.2	62.2	62.1
45.0	69.1	128.4	69.9	58.5
50.0	64.0	132.1	77.7	54.4
55.0	59.6	135.5	85.5	50.0
60.0	55.9	138.6	93.2	45.4
65.0	52.6	141.4	101.0	40.4
70.0	49.8	144.0	108.8	35.2
75.0	47.3	146.5	116.6	29.9
80.0	45.0	148.7	124.3	24.4
85.0	43.0	150.9	132.1	18.8
90.0	41.1	152.9	139.9	13.0
95.0	39.4	154.8	147.6	7.2
100.0	37.9	156.6	155.4	1.2
105.0	36.5	158.4	163.2	-4.8
Design Volume:				**68.4**

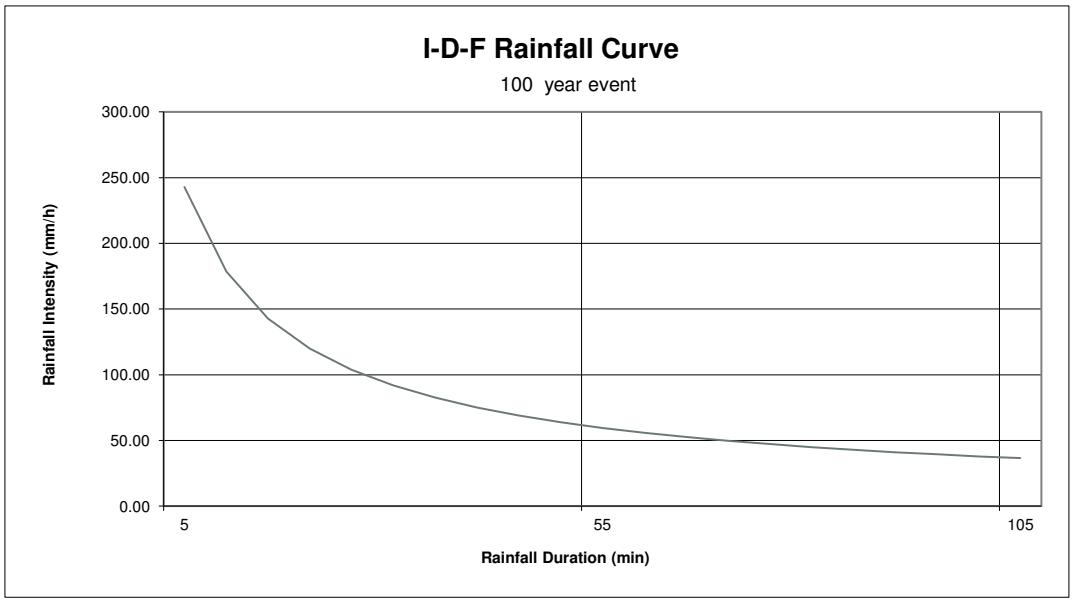
PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

RETENTION CALCULATIONS FOR ATTENUATED SITE AREA (100-YEAR EVENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012





Prepared by: Jaymeson Adams, EIT Date: 7/7/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/9/2020
PEO# 100173201

PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

MODIFIED RETENTION CALCULATIONS FOR UNDERGROUND STORAGE TANK (100-YEAR EVENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012

REQUIRED STORAGE VOLUME DETERMINATION:

DESIGN CRITERIA:

Rainfall Station:	City of Ottawa Sewer Design Guidelines, 2012 (Macdonald-Cartier Airport)
Release Rate Per Unit Area (Q/ha):	49.62 L/s/ha
Area (A):	0.26 ha
Runoff Coefficient (C):	0.95
Rainfall Event:	100 year
Release Rate (Q):	0.01295 m³/s
Discharge Factor (K):	1

Regression Constants	2 year	5 year	10 year	25 year	50 year	100 year
A	732.951	998.071	1174.184	1402.844	1569.58	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.82	0.82

Required Retention Volume:	**93.4 m³**

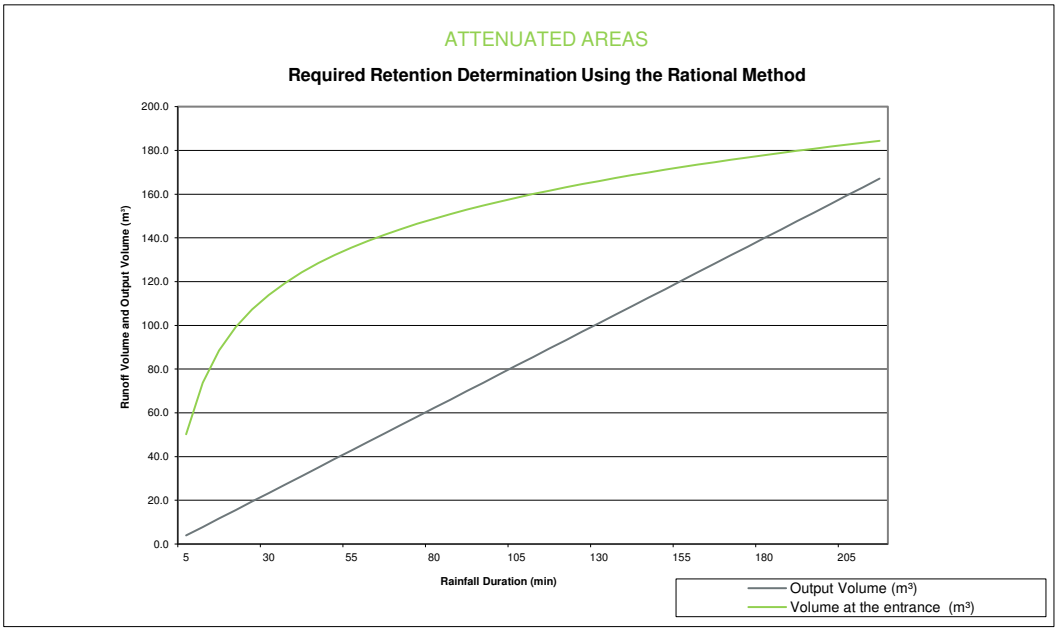
Rainfall Duration (min) *T* (1)	**Rainfall Intensity** (mm/h) *I* (2)	**Runoff Volume** (m³) *CIAT* (3)	**Output Volume** (m³) *kQT* (4)	**Retention Volume** (m³) *(3)-(4)* (5)
5.0	242.7	50.1	3.9	46.3
10.0	178.6	73.8	7.8	66.0
15.0	142.9	88.6	11.7	76.9
20.0	120.0	99.1	15.5	83.6
25.0	103.8	107.3	19.4	87.9
30.0	91.9	113.9	23.3	90.6
35.0	82.6	119.4	27.2	92.2
40.0	75.1	124.2	31.1	93.1
45.0	**69.1**	**128.4**	**35.0**	**93.4**
50.0	64.0	132.1	38.9	93.3
55.0	59.6	135.5	42.7	92.8
60.0	55.9	138.6	46.6	92.0
65.0	52.6	141.4	50.5	90.9
70.0	49.8	144.0	54.4	89.6
75.0	47.3	146.5	58.3	88.2
80.0	45.0	148.7	62.2	86.6
85.0	43.0	150.9	66.0	84.8
90.0	41.1	152.9	69.9	83.0
95.0	39.4	154.8	73.8	81.0
100.0	37.9	156.6	77.7	78.9
105.0	36.5	158.4	81.6	76.8
110.0	35.2	160.0	85.5	74.6
115.0	34.0	161.6	89.4	72.3
120.0	32.9	163.1	93.2	69.9
125.0	31.9	164.6	97.1	67.5
130.0	30.9	166.0	101.0	65.0
135.0	30.0	167.3	104.9	62.5
140.0	29.2	168.7	108.8	59.9
145.0	28.4	169.9	112.7	57.3
150.0	27.6	171.2	116.6	54.6
155.0	26.9	172.3	120.4	51.9
160.0	26.2	173.5	124.3	49.2
165.0	25.6	174.6	128.2	46.4
170.0	25.0	175.7	132.1	43.6
175.0	24.4	176.8	136.0	40.8
180.0	23.9	177.8	139.9	37.9
185.0	23.4	178.8	143.7	35.1
190.0	22.9	179.8	147.6	32.2
195.0	22.4	180.7	151.5	29.2
200.0	22.0	181.7	155.4	26.3
205.0	21.6	182.6	159.3	23.3
210.0	21.1	183.5	163.2	20.3
215.0	20.8	184.4	167.1	17.3
Design Volume:				**93.4**

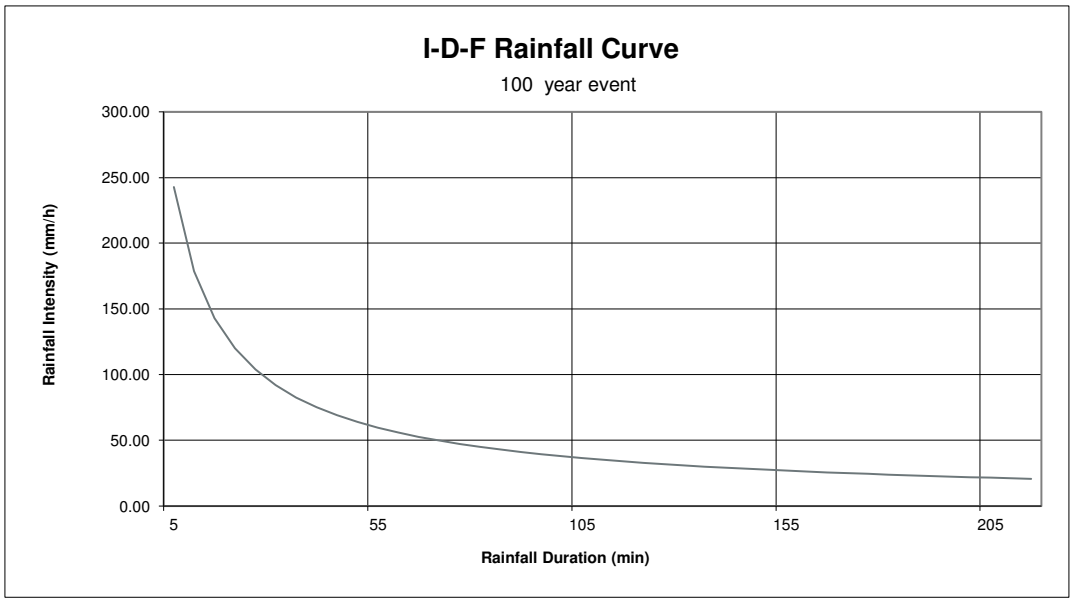
PROJECT NAME:	403 Richmond Road and 389 Roosevelt Avenue Multi-use Development (Commercial/Residential)
CIMA+ PROJECT NUMBER:	A001046
CLIENT:	Westboro Inc.
PROJECT STATUS:	Preliminary Design (Assessment of Adequacy of Public Services)

MODIFIED RETENTION CALCULATIONS FOR UNDERGROUND STORAGE TANK (100-YEAR EVENT)

APPLICABLE DESIGN GUIDELINES:

1. City of Ottawa Sewer Design Guidelines, 2012





Prepared by: Jaymeson Adams, EIT Date: 7/7/2020

Verified by: Tim Kennedy, P.Eng. Date: 7/9/2020
PEO# 100173201