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335 Roosevelt Avenue
Ottawa, ON

Site Servicing & Stormwater Management Report

Engineering excellence. Planning progress. Liveable landscapes.

335 ROOSEVELT AVENUE

SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared for:

UNIFORM URBAN DEVELOPMENTS LTD.
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Prepared By:

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June 27, 2025

Novatech File: 110098
Ref: R-2025-48

June 27, 2025

City of Ottawa
Planning and Growth Management Department
Development Review (Urban Services - Central) Branch
Infrastructure Approvals Division
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: **Shawn Wessel, A.Sc.T.,rcji**
Project Manager

Reference: **335 Roosevelt Avenue**
Site Servicing and Stormwater Management Report
Novatech File No.: 110098

Novatech has prepared this Site Servicing and Stormwater Management Report of behalf of Uniform Urban Developments for 335 Roosevelt Avenue.

This report provides an analysis of sewer capacity (sanitary, storm), water distribution, and stormwater management for the proposed development site.

Contact the undersigned with any question or comments.

Yours truly,

NOVATECH

Lucas Wilson, P. Eng.
Project Engineer | Land Development

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1.0 INTRODUCTION

1.1 Background

This report addresses the approach to site servicing and stormwater management for the development at 335 Roosevelt Avenue (Subject Site), which is being proposed by Uniform Urban Developments Ltd. (Developer).

The Subject Site is located to the north of the Wilmont Avenue and Winston Avenue intersection, as shown on **Figure 1.1** – Key Plan. The site is bound to the north by the LRT Transit Corridor, to the west by Roosevelt Avenue, to the south by existing residences fronting Winston Avenue and Wilmont Avenue, and to the east by an existing apartment building.

The existing land usage consists of vacant land, as shown on **Figure 1.2** – Existing Conditions Plan. The Subject Site is relatively flat.

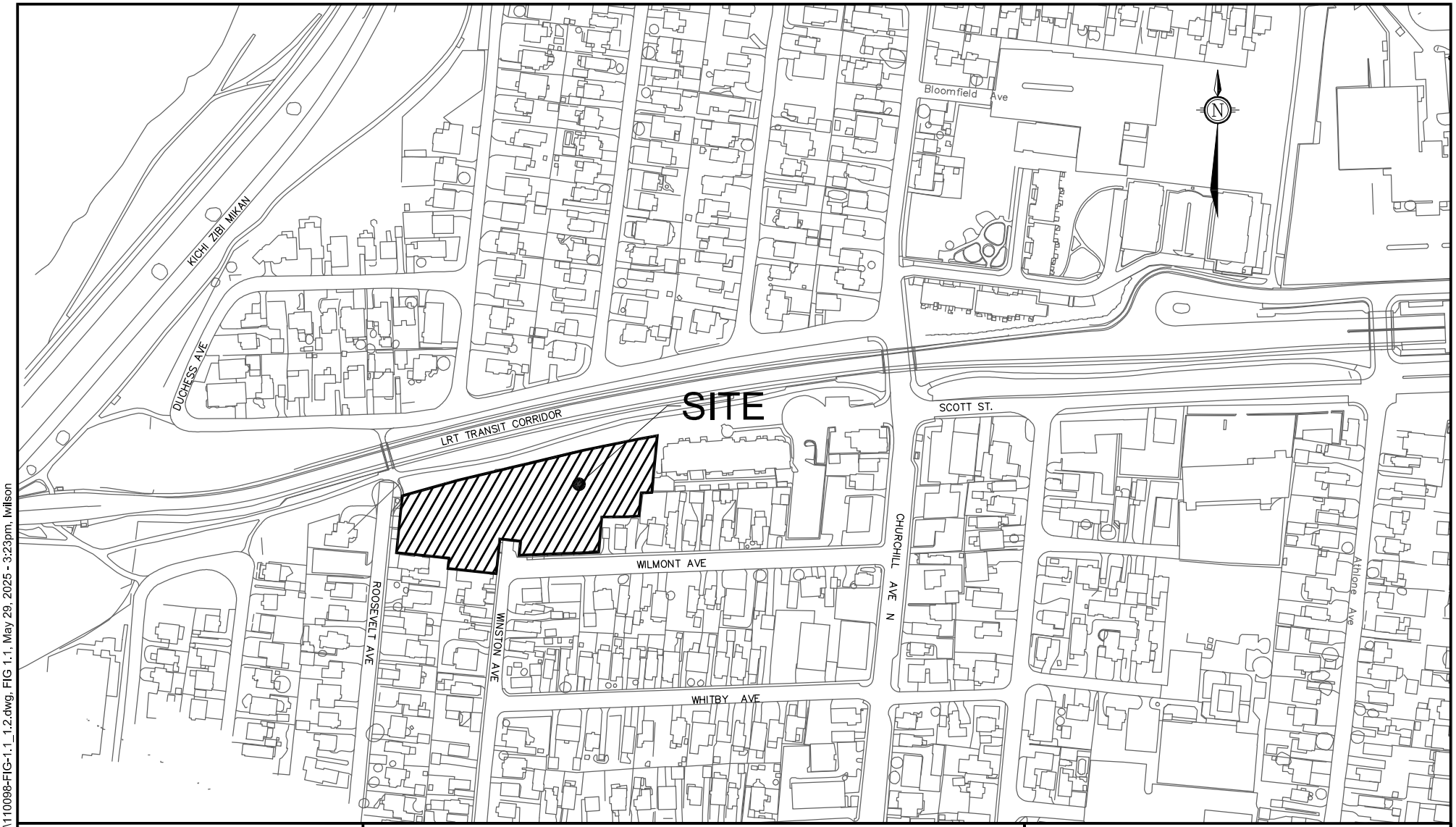
1.2 Proposed Development

The Subject Site has an area 0.71ha, and the proposed development will be comprised of two condominium towers. The west building consists of 14 floors with a total of 157 units and the east building consists of 13 floors with a total of 160 units as shown in **Table 1.1**. The development will include three levels of underground parking that encompass the majority of the site, with access off Roosevelt Avenue at the west side of the site, as well as access from Wilmont Avenue at the south side of the site. The proposed site plan is shown on **Figure 1.3** – Site Plan. A portion of the site (0.072 ha) will be transferred to the City of Ottawa as a public park; the area of the park is based on 10% of the total site area.

The development will be constructed in two separate phases. The west building will be constructed as part of Phase 1 while the east building will be completed as part of Phase 2.

Table 1.1: Development Land Use Breakdown

Unit Type	Number of Units
Condominium Tower - Building #1 (West)	157
Condominium Tower - Building #2 (East)	160
Total	317



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CITY OF OTTAWA
335 ROOSEVELT AVE

KEY PLAN

SCALE		
NOT TO SCALE		
DATE JUNE 2025	JOB 110098	FIGURE 1.1

SHT8X11.DWG - 216mmx279mm

M:\2010\110098\CAD\Design\Figures\Design Brief\110098-FIG-1.1_1.2.dwg, FIG 1.1, May 29, 2025 - 3:23pm, lwilson

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CITY OF OTTAWA
335 ROOSEVELT AVE

EXISTING CONDITIONS

SCALE		
NOT TO SCALE		
DATE JUNE 2025	JOB 110098	FIGURE 1.2

SHT8X11.DWG - 216mmx279mm

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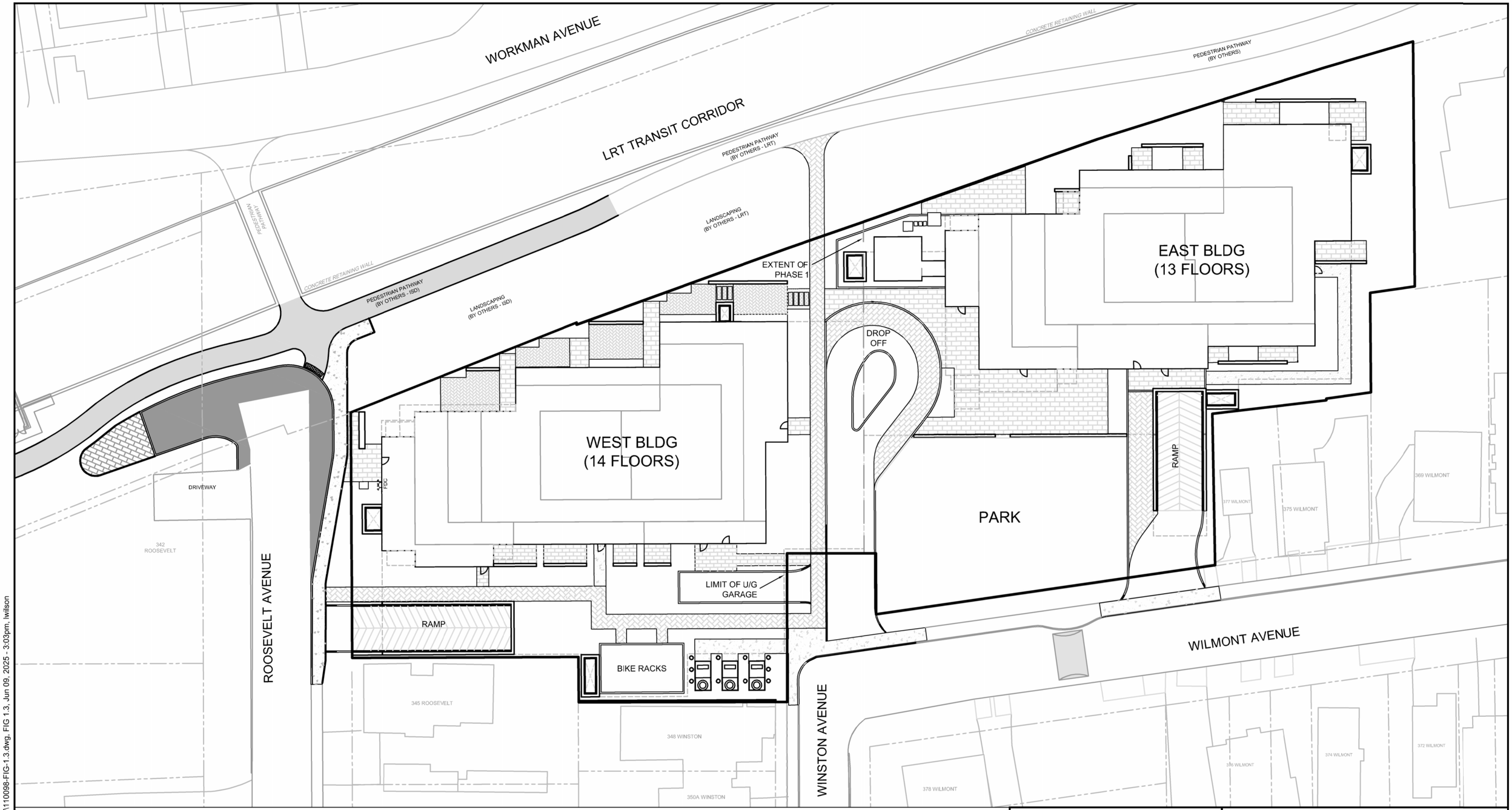

M:\2010\110098\CAD\Design\Figures\Design Brief\110098-FIG-1.3.dwg, FIG 1.3, Jun 09, 2025 - 3:03pm, lwilson

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CITY OF OTTAWA
335 ROOSEVELT AVANUE

CONCEPT PLAN

SCALE	JOB	FIGURE
1 : 500 (0, 5m, 10m, 20m)	110098	1.3
DATE JUNE 2025		

SHT11X17.DWG - 279mmX432mm

2.0 GEOTECHNICAL INVESTIGATION

Paterson Group Inc. (Paterson) conducted a geotechnical investigation in support of the proposed residential development:

Geotechnical Investigation – Proposed High-Rise Development 335 Roosevelt Avenue, Ottawa, Ontario; Report No. PG2178-1 (revision 4), Paterson Group Inc., May 28, 2025.

Based on the geotechnical study, it is not anticipated that there will be any significant geotechnical concerns with respect to servicing and developing the site. It should be noted that protection and monitoring of the existing 1200mm diameter watermain and the West Nepean Collector, running parallel to the northern property line of the Subject Site, will be required during the bedrock removal (refer to the geotechnical study for further details). A summary of the geotechnical report findings is provided in **Table 2.1** below.

Table 2.1: Summary of Geotechnical Servicing and Grading Considerations

Parameter	Summary
Sub-Soil Conditions	Silty sand, silty sand with some gravel and clay, silty clay or silt, and bedrock
Grade Raise Restriction	N/A
Groundwater Considerations	Low groundwater level (3.1m to 6.5m depths). It is anticipated that groundwater infiltration into the excavations should be relatively low to moderate, and controllable using open sumps.
Bedrock	Shallow bedrock encounter at boreholes (0.5m to 3m depths) Line drilling of the perimeter in conjunction with controlled rock blasting and/or hoe ramming expected.
Pipe Bedding / Backfill	Pipe Bedding 150 mm Granular A Pipe Cover 300 mm Granular A Backfill Native Material
Pavement Structure (Car Only Parking Areas)	50mm Wear Course (SuperPave 12.5) 150mm Base (Granular A) 300mm Subbase (Granular B Type II)
Pavement Structure (Access Lanes)	40mm Wear Course (SuperPave 12.5) 50mm Binder Course (SuperPave 19.0) 150mm Base (Granular A) 400mm Subbase (Granular B Type I or II)

3.0 STORM SEWER SYSTEM AND STORMWATER MANAGEMENT

3.1 Storm Servicing

There is an existing 450mm diameter storm sewer within Wilmont Avenue.

The proposed development will be serviced with two (2) 250mm diameter storm services connected to the existing 450mm diameter storm sewer in Wilmont Avenue which ultimately outlets to the West Transit Storm and outlets to the Ottawa River near Onigam Street. Each building will include a separate cistern that will be pumped to the proposed 250mm diameter storm services.

Refer to **Figure 3.1** – Proposed Servicing Layout Plan for an illustration of the proposed storm service, and existing storm sewers.

Foundation Flows

Flows from the foundation drainage system will be pumped to the proposed storm services from the building sump pit. The foundation drain connection will be made downstream of any proposed stormwater controls. The exact details of the foundation drain connection will be provided by the mechanical consultant.

3.2 Stormwater Management Criteria

The Subject Site is located within the Ottawa River West subwatershed, which falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). The following stormwater management criteria has been developed based on the criteria in the Ottawa Sewer Design Guidelines, subsequent Technical Bulletins, and the pre-consultation meeting discussions. As such, the City will require that on-site stormwater quantity control be implemented to control post-development stormwater discharge for any storm events greater than the 5-year, up to and including the 100-year event. No on-site stormwater quality control is required for the site.

3.3 Pre-Development Conditions

The Subject Site is currently vacant land. The topographical survey plan prepared by Annis O'Sullivan Vollebekk Ltd indicates that under existing conditions, the site sheet drains to the north towards the LRT Transit Corridor. There is currently no storm sewer system on-site, as such, the majority of the site drainage was previously collected in the existing low area/swale located within the Transitway property limits (LRT Transit Corridor). Refer to **Figure 1.2** – Existing Conditions.

3.4 Allowable Release Rates

The existing 450mm storm sewer in Wilmont Avenue was not designed to accommodate runoff from the entire site area of 0.71 ha. The allowable release rate of 29.2 L/s is based on an area of 0.39 ha, a runoff coefficient (C) of 0.45 and a rainfall intensity of 59.92 mm/hr. Refer to **Appendix B** for the MOE Certificate of Approval, the storm sewer design sheet, and the Drainage Area Plan for the existing 450mm storm sewer in Wilmont Avenue.

3.5 Stormwater Quantity Control

Stormwater runoff from the Subject Site will consist of both uncontrolled and controlled flows. Stormwater quantity control will be provided using two (2) cisterns, one for each Phase. Phase 1 will be directed to cistern #1 while Phase 2 will be directed to cistern #2. The cisterns will be located within the underground parking garage, extending from P1 down to P3.

SWM Modelling

PCSWMM was used to confirm the required storage volumes for each storm event and ensure the allowable release rate is met.

The SWM modelling was completed using the 3-hour Chicago Storm Distribution (10-minute time step). The design storms were generated using IDF curves from the City of Ottawa Sewer Design Guidelines (October 2012).

Calculation Parameters

Refer to drawing **110098-STM** – Post-Development Storm Drainage Area Plan and **Appendix B** for details on the drainage areas. A description of each area is as follows:

B-01 and B-02: Areas consist of landscape areas along the site boundary. These areas will remain uncontrolled and drain to the existing catch basins within Roosevelt Avenue and the LRT corridor per existing conditions. The calculated post-development flows are a significant decrease compared to the entire existing site sheet draining uncontrolled, thus the small uncontrolled release rate should not adversely affect the downstream public sewers, refer to **Appendix B** for details.

B-03: Area consists of an access road to the underground parking garage ramp below the east building (Phase 2). This area will flow uncontrolled and drain to the existing catch basins within Wilmont Avenue. The flow from this area will be included in the minor system allowable release rate to the Wilmont storm sewer.

A-01 to A-03: Areas consist of the west building rooftop, parking/access road and landscaped areas. These areas will be directed internally to cistern #1 as part of Phase 1. Cistern #1 will include a pump discharging flows to the Wilmont storm sewer.

A-04 and A-05: Areas consist of the east building rooftop, access road and landscaped areas. These areas will be directed internally to cistern #2 as part of Phase 2. Cistern #2 will include a pump discharging flows to the Wilmont storm sewer.

A-06: Area consists of public park land. This area will be captured by CB3 complete with an inlet control device (ICD) and directed to the Wilmont storm sewer.

Cistern Design

Flows from both cisterns will be controlled by pump which will convey flows to the proposed storm services that drain by gravity to the existing storm sewer system in Wilmont Avenue. Storage will be provided for storms up to and including the 100-year+20% event within the cisterns. Both cisterns will include a 150mm internal overflow located above the 100-yr+20% water elevation, and vented lids are proposed on the tanks for maintenance access and emergencies which will convey flows directly to the Wilmont Avenue right-of-way. The proposed pump and back-up power system will be designed by the mechanical consultant. The pumps will be designed to convey flows at a constant rate of **11.4L/s** for cistern #1 and **6.9 L/s** for cistern #2. Refer to drawing **110098-GP** – General Plan of Service for details on the cisterns.

Table 3.1 below summarizes the total post-development flow (uncontrolled + controlled) from the Subject Site for the 5-year and 100-year design events, and storage required / provided for each cistern.

Table 3.1: Stormwater Management Summary

Area ID	Area (ha)	1:5 Year Weighted Cw	5-Year Storm Event		100-Year Storm Event		Provided Vol (cu.m)
			Release (L/s)	Req'd Vol (cu.m)	Release (L/s)	Req'd Vol (cu.m)	
Controlled Flow							
A-01 to A-03 (Cistern #1)	0.296	0.78	11.4	51.3	11.4	121.0	181.6
A-04, A-05 (Cistern #2)	0.225	0.77	6.9	57.4	6.9	88.3	194.7
A-06 (Park)	0.072	0.40	5.8	1.0	6.1	11.0	-
Total Controlled Flow to Wilmont Ave			**24.1**	**109.7**	**24.4**	**220.3**	**376.3**
Uncontrolled Flow							
B-03	0.010	0.76	2.6	-	4.8	-	-
Total Uncontrolled Flow to Wilmont Ave			**2.6**	**-**	**4.8**	**-**	**-**
Total Flow to Wilmont Ave			**26.7**	**-**	**29.2**	**-**	**-**
Allowable Flow to Wilmont Ave			**29.2**	-	**29.2**	-	-

As shown in the table above, both cisterns provide sufficient volume to contain the 100-year storm event. Additional volume has been provided to contain the 100-year + 20% storm event, refer to **110098-GP** for cistern details and water elevations for the 2-year and 100-year + 20% events.

3.6 Site Grading & Emergency Overland Flow

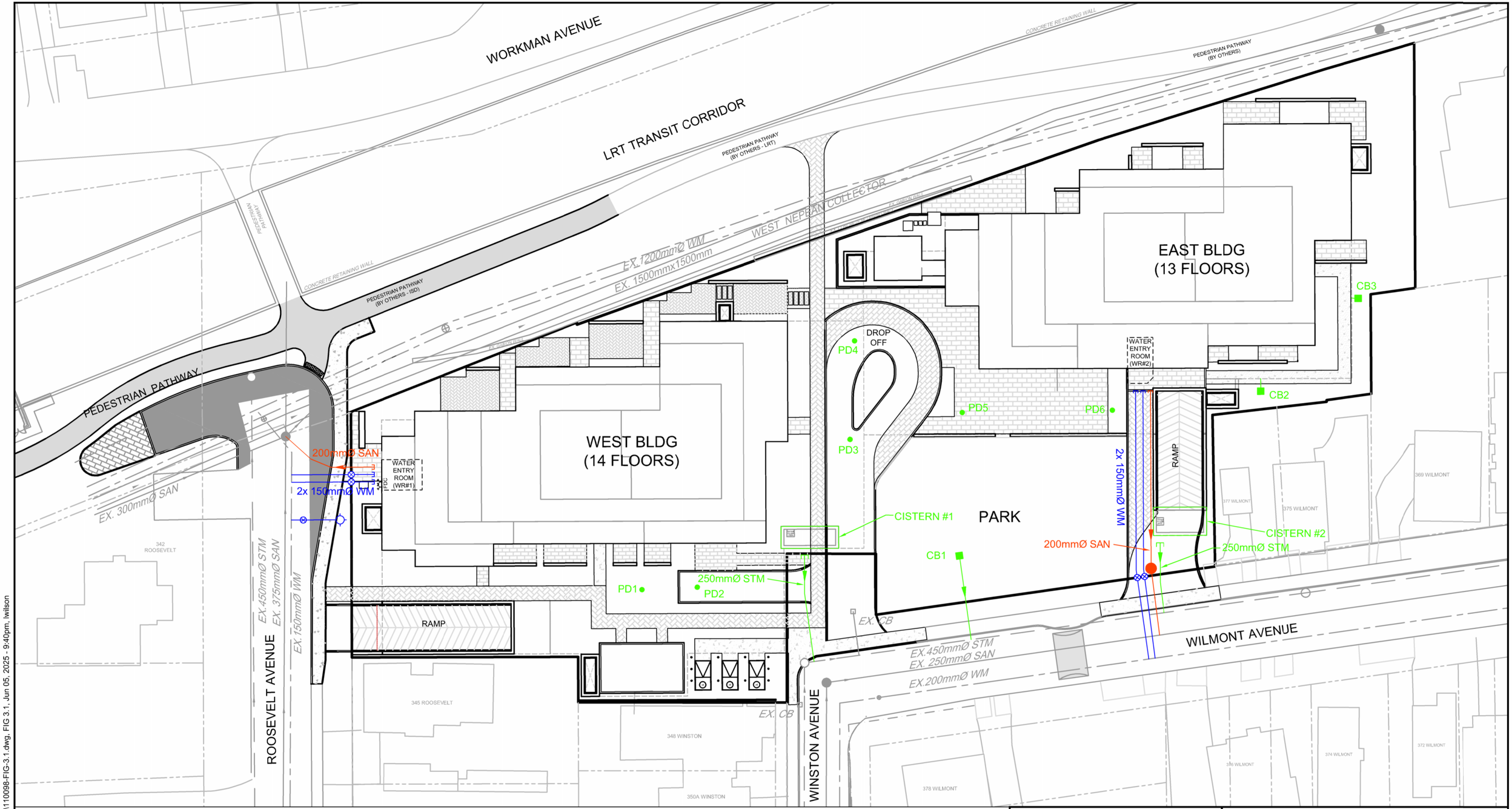
As described above the existing site is currently graded to direct runoff north towards the low area/swale within the landscape area between the proposed site and LRT corridor. The proposed design intent for the site is to contain and direct all stormwater runoff to the on-site area drains while minimizing uncontrolled direct runoff from the site. The site has two accesses to the underground garage, one from Roosevelt Avenue and one from Wilmont Avenue. Elevations along the existing edge of roadways will be matched into, thus minimizing any disturbances to the surrounding roadways.

In the case of a major rainfall event exceeding the design storms or blockage of the area drains, stormwater will pond to a maximum depth of 0.30m before cascading off-site towards Wilmont/Winston Avenue or the LRT corridor. The emergency overland flow route is shown on **110098-STM** – Post-Development Storm Drainage Area Plan.

Refer to **110098-GR** - Grading Plan for proposed site grading, grading tie-ins, spill elevations, and the emergency overland flow route.

3.7 Assessment of Storm Infrastructure

As outlined in the above sections, all post-development runoff in excess of the allowable will be stored and controlled on-site prior to being released into the Wilmont Avenue sewer. This will be done using cisterns located in the underground parking garage adjacent to Wilmont Avenue.



LEGEND

- EXISTING WATERMAIN
- EXISTING HYDRANT
- PROPOSED WATERMAIN
- PROPOSED HYDRANT
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

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CITY OF OTTAWA
335 ROOSEVELT AVANUE

PROPOSED SERVICING LAYOUT PLAN

SCALE	DATE	JOB	FIGURE
1 : 500 (0, 5m, 10m, 20m)	JUNE 2025	110098	3.1

SHT11X17 DWG - 279mmX432mm

M:\2010\110098\CAD\Design\Figures\Design Brief\110098-FIG-3.1.dwg, FIG 3.1, Jun 05, 2025 - 9:40pm, lwilson

4.0 SANITARY SEWER SYSTEM

4.1 Sanitary Infrastructure

The proposed development will be serviced with two (2) 200mm diameter sanitary services. The west building sanitary service will be connected to the existing SANMH 115 in Roosevelt Avenue, directing flows to an existing 450mm sanitary sewer which outlets to the West Nepean Collector. The east building sanitary service will be connected to the existing 250mm sanitary sewer in Wilmont Avenue.

Refer to **Figure 3.1** – Proposed Servicing Layout Plan for an illustration of the proposed sanitary service, and existing sanitary sewers.

4.2 Sanitary Design Parameters

The peak design flow parameters in **Table 4.1** have been used in the sewer capacity analysis. Unit and population densities and all other design parameters are specified in the OSDG.

Table 4.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population: Single Family Semi-detached/Row Townhome Average Apartment	 3.4 people/unit (used for existing) 2.7 people/unit (used for existing) 1.8 people/unit
Residential Flow Rate: Design	 280 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0)
Harmon Correction Factor: Design	 0.8
Extraneous Flow Rate: Design	 0.33 L/s/ha
Minimum Pipe Size	200 mm (Res)
Minimum Velocity[1]	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.5 m (Unless frost protection provided)

4.3 Sanitary Sewer Analysis

4.3.1 West Building (Phase 1)

Existing sanitary flows upstream of City of Ottawa SANMH 115 in Roosevelt Avenue were analyzed to determine available capacity for additional flows from the proposed development. Two existing sanitary sewers enter SANMH 115, the 375mm diameter sewer from Roosevelt Avenue and the 300mm diameter sewer from Berkley Avenue. The analysis includes Roosevelt Street, Danforth Avenue, Berkley Avenue, Dominion Avenue, Tay Street and a portion of Richmond Road. Flows from Richmond Road were taken from the 2003 Richmond Road rehabilitation project design sheet located in **Appendix C**. Refer to **Figure 4.1** - Sanitary Drainage Area Plan below for reference.

Sanitary flow from Phase 1 is calculated to be 3.3 L/s. The sanitary flows entering SANMH115 from Berkley Avenue and Roosevelt Avenue are 90 L/s.

Combining the wastewater flow entering City of Ottawa SANMH 115, the total flow conveyed through the existing 450mm diameter sewer connecting to the West Nepean Collector will be 93.3 L/s (3.3 L/s + 90.0 L/s). A 450mm diameter storm sewer at a minimum design slope of 0.2% has a capacity of 133.0 L/s, which exceeds the projected total flows (existing and proposed) to the 450mm diameter sewer discharging to the West Nepean Collector. Refer to **Appendix C** for detailed calculations.

4.3.2 East Building (Phase 2)

The Wilmont sanitary sewer and downstream sanitary system was analyzed as part of the Churchill Avenue/Scott Street Rehabilitation Project. The analysis included sanitary flows from 335 Roosevelt Avenue based on an overall area of 0.56 ha and a population of 403.2 ppl resulting in a total flow of 6.7 L/s. Sanitary flows from Phase 2 is calculated to be 3.4 L/s, a reduction of 3.3 L/s. The previous analysis included a 225mm sanitary sewer within Wilmont Avenue running at 71% capacity directly downstream of the 335 Roosevelt Avenue sanitary connection. As part of the Road and Sewer Renewal project recently completed for Wilmont Avenue, the sanitary sewer within Wilmont has been increased to a 250mm sanitary sewer, providing increased capacity. Refer to **Appendix C** for detailed calculations and previous report excerpts.

LRT TRANSIT CORRIDOR

1500Ø SAN TRUNK SEWER

PHASE II

SAN2
WILMONT
0.38 | 288

PHASE II CONNECTION

SAN1
115-117
0.33 | 283

PHASE I CONNECTION

PHASE I

WILMONT AVENUE

335 ROOSEVELT AVE
PROPOSED SITE

1500Ø SAN TRUNK SEWER

BERKLEY AVENUE

SAN4
115-117
1.60 | 140

ROOSEVELT AVENUE

SAN3
115-117
2.16 | 215

WINSTON AVENUE

WHITBY AVENUE

CHURCHILL AVENUE

WHITBY AVENUE

WINONA AVENUE

SAN5
115-117
1.88 | 591

DOMINION AVENUE

MADISON AVENUE

TAY STREET

RICHMOND ROAD

SAN6
115-117
1.06 | 0

DESIGN FLOW FROM 2003 RICHMOND ROAD REHABILITATION PROJECT = 78.1L/s

DANFORTH AVENUE

BYRON AVENUE

LEGEND

SAN1 / 101-103 / 0.60 | 37.8	AREA ID
	MANHOLE TO MANHOLE
	POPULATION EQUIVALENT
	AREA IN HECTARES
	SANITARY DRAINAGE AREA
	EXISTING SANITARY DRAINAGE AREA
	PROPOSED SANITARY SEWER, MANHOLE, AND FLOW DIRECTION
482	EXISTING SANITARY SEWER, MANHOLE, AND FLOW FLOW DIRECTION

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335 ROOSEVELT AVENUE

SANITARY DRAINAGE AREA PLAN

SCALE	DATE	JOB	FIGURE
1 : 2000 (0, 20, 40, 60, 80)	JUNE 2025	110098	4.1

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SHT11X17.DWG - 279mmX432mm

5.0 WATER SUPPLY SYSTEM

5.1 Water Infrastructure

The proposed development will be serviced with four (4) 150mm diameter watermains. The west building will have two connections to the existing 150mm diameter watermain in Roosevelt Avenue and the east building will have two connections to the existing 200mm diameter watermain in Wilmont Avenue.

Refer to **Figure 3.1** – Proposed Servicing Layout Plan for an illustration of the proposed watermain services, and existing watermains.

5.2 Watermain Design Parameters and Demands

The domestic and fire fighting demand design parameters, and system pressure design criteria are outlined in **Table 5.1** below. Unit and population densities and all other design parameters and system pressure design criteria are specified in the Ottawa Water Distribution Guidelines. The system pressure design criteria are based on a conservative approach that considers three possible scenarios.

Table 5.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	Design Parameters
Unit Population: Average Apartment	 1.8 people/unit
Average Day Residential Demand (AVDY)	280 L/c/d
Maximum Day Demand (MXDY)	2.5 x AVDY
Peak Hour Demand (PKHR)	2.2 x MXDY
Fire Demand Design	**Design Flows**
Fire Demand (FF)	83 L/s per FUS
System Pressure Criteria Design Parameters	**Criteria**
Maximum Pressure (AVDY) Condition	< 80 psi occupied areas (552 kPa) < 100 psi unoccupied areas (690 kPa)
Minimum Pressure (PKHR) Condition	> 40 psi (276 kPa)
Minimum Pressure (MXDY + FF) Condition	> 20 psi (138 kPa)

5.2.1 Domestic Demands

Based on the above parameters, the theoretical water demands from the proposed development were calculated and are as follows:

- Population = 282.6 persons (Phase 1), 288 persons (Phase 2)
- Average Day Demand = 0.916 L/s (Phase 1), 0.933 L/s (Phase 2)
- Maximum Day Demand = 2.29 L/s (Phase 1), 2.333 L/s (Phase 2)
- Peak Hour Demand = 5.037 L/s (Phase 1), 5.133 L/s (Phase 2)

Refer to **Appendix D** for water demand calculations.

5.2.2 Fire Demands

The required fire demand for the Subject Site was calculated using the Fire Underwriters Survey (FUS). The fire flow supply required was calculated to be 83 L/s for both buildings.

Refer to **Appendix D** for a copy of the FUS fire flow calculations.

5.3 Hydraulic Analysis

This water demand information was submitted to the City and boundary conditions provided from the City's water model. The boundary conditions were used to complete a hydraulic analysis to confirm the existing water infrastructure has capacity for the proposed development. The hydraulic analysis was completed using EPANET, to confirm that the existing water infrastructure will meet the required pressures in the average day and peak hour conditions under domestic use and during maximum day plus fire flow conditions. Refer to **Table 5.2** and **Table 5.3** for the results of the hydraulic analysis for the domestic demands.

Table 5.2 Summary of Hydraulic Model Results – Peak Hour Demand

Operating Condition	Maximum Pressure	Minimum Pressure
10.17 L/s through system	407.70 kPa (WR1)	407.02 kPa (WR2)

Table 5.3 Summary of Hydraulic Model Results – Max Pressure Check

Operating Condition	Maximum Pressure	Minimum Pressure
1.849 L/s through system	470.59 kPa (WR1)	468.53 kPa (WR2)

Therefore, the existing watermain along Roosevelt Avenue and Wilmont can provide adequate pressures for domestic demands. Note that due to the size of the buildings, booster pumps will be required to provide adequate service pressure on the upper floor levels.

For fire fighting purposes, the proposed buildings are to be sprinklered with fire department connections (FDC). In addition to the FDC connections, there are three existing fire hydrants in the vicinity of the site; located at 335 Roosevelt Avenue, 349 Winston Ave, and 364 Wilmont Avenue and one (1) proposed hydrant located at the entrance off Wilmont Avenue and Winston Avenue. Refer to **Table 5.4** for the results of the hydraulic analysis for fire fighting demands.

Table 5.4 Summary of Hydraulic Model Results – Max Day + Fire Flow

Operating Condition	83 L/s at West Building	83 L/s at East Building
4.623 L/s through system	356.40 kPa (WR1)	333.44 kPa (WR2)

Therefore, based on the boundary condition information provided by the City, the existing watermain infrastructure can provide adequate flow and pressure for domestic demand and fire protection for the proposed development. Refer to **Appendix D** for water demands, fire flow calculations, and boundary conditions.

6.0 EROSION AND SEDIMENT CONTROL AND DEWATERING MEASURES

Erosion and sediment control measures will be implemented in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987). Details will be provided on an Erosion and Sediment Control Pla. Erosion and sediment control measures will include:

- Placement of filter fabric under all catch basin and maintenance hatches;
- Tree protection fence around the trees to be maintained;
- Silt fence around the area under construction placed as per OPSS 577 / OPSD 219.110;
- Mud mats located at site entrances.

The erosion and sediment control measures will need to be installed to the satisfaction of the engineer, the City, the Ontario Ministry of Environment Conservation and Parks (MECP), and the RVCA, prior to construction and will remain in place during construction until vegetation is established. The erosion and sediment control measure will also be subject to regular inspection to ensure that measures are operational.

Prior to construction, a Permit-To-Take-Water (PTTW) or Environmental Activity and Sector Registry (EASR) application will be submitted to the Ministry of the Environment, Conservation and Parks (MECP). The permit will outline the water taking quantity, and location/quality of the discharge.

7.0 MISSISSIPPI-RIDEAU SOURCE PROTECTION PLAN

The Mississippi-Rideau Source Protection Plan has been implemented in order to oversee the source protection program in the Mississippi-Rideau Source Protection Region, in which the proposed development is located. Please refer to the Source Protection figures provided in **Appendix E** and the Source Protection policy screening correspondence provided in **Appendix A**. Although the location of the Subject Site is within the Surface Water Intake Protection Zone for the Ottawa River (Britannia) Intake and the Highly Vulnerable Aquifer source protection areas, the proposed development is not considered to cause a significant drinking water threat.

8.0 SUMMARY AND CONCLUSIONS

This report demonstrates that the proposed development can be adequately serviced with storm and sanitary sewers and watermain. Key findings are summarized below:

Stormwater Management:

- The proposed development will be serviced with two 250mm diameter storm services (one service per cistern) connected to the existing 450mm diameter storm sewer in Wilmont Avenue. The existing storm sewers have adequate capacity to service the proposed development.

- Flows from the foundation drainage system will be pumped to the proposed storm services from the building sump pit. The foundation drain connection will be made downstream of any proposed stormwater controls.

- Stormwater management will be provided to adhere to the allowable release rates. Quantity control will be achieved via separate cisterns for the west and east buildings. Quality control is not required.

Wastewater Collection System:

- Each building will be serviced with a 200mm diameter sanitary service. The west building (Phase 1) will be connected to the existing SANMH 115 directly upstream of the 450mm diameter sanitary sewer within Roosevelt Avenue. The east building (Phase 2) will be connected to the existing 250mm sanitary sewer in Wilmont Avenue. The existing sanitary sewers have adequate capacity to service the proposed development.

Water Supply System

- Each building will be serviced with two 150mm diameter watermains. The west building will be connected to the existing 150mm diameter watermain in Roosevelt Avenue. The east building will be connected to the existing 200mm diameter watermain in Wilmont Avenue.

- The existing water supply system has adequate capacity to meet system pressure for the developments domestic and fire demands.

- Fire fighting protection is provided by the existing hydrants, an automated sprinkler system, and the fire department connections.

Erosion and Sediment Control

- Erosion and sediment control measures will be implemented in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987).

This report is respectfully submitted for review and subsequent approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Lucas Wilson, P.Eng.
Project Engineer I Land Development

Reviewed by:

Mark Bissett, P.Eng.
Senior Project Manager | Land Development

Appendix A
Correspondence

File No.: PC2024-0041

March 11, 2024

Jacob Bolduc
Fotenn Planning + Design
Via email: bolduc@fotenn.com

Subject: Phase 2 Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 335 & 339 Roosevelt / 344 Winston / 379 & 389 Wilmont

Note: Official Plan and Zoning By-law Amendment requirement identified during Phase 2 discussion. See Planning Comments 1 & 2.

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on February 28, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the materials submitted for the above-noted pre-consultation has been undertaken and staff are satisfied that the information is consistent with previous direction provided and sufficient to move to a Phase 3 pre-consultation.

2. Please note that if your development proposal changes significantly in scope, design, or density between the Phase 2 pre-consultation review and Phase 3 pre-consultation submission, you may be required to repeat the Phase 2 pre-consultation process.

3. In your Phase 3 pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein. Please note the comments below concerning a Phase 3 for the OPA/ZBLA and the subsequent Phase 3 for the Site Plan.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been further identified and/or confirmed, during this phase of pre-consultation, as required (R) or advised (A) as part of a future complete application submission.

    a. Note: Separate study and plan identification lists have been provided for the respective OPA/ZBLA and Site Plan applications.

    b. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Planning

1. Process/Applications:

    a. Zoning By-law Amendment and Official Plan Amendment Applications are required to address the proposed increased heights.

    b. Please proceed with a Phase 3 submission for the ZBA/OPA based on the attached SPIL specific to the ZBA/OPA.

    c. Once the Zoning and OPA is final and binding, you will submit your Phase 3 for the Site Plan.

2. Official Plan and Zoning By-law Amendment applications.

    a. During the meeting, the applicant team expressed concern with the requirement of another Official Plan and Zoning by-law amendment given the file history, and the notion that this is only being required to accommodate the City's request to take parkland as opposed to cash-in-lieu.

    b. **Staff direction:** Staff appreciate the collobration and response to the Phase 1 pre-consultation as it relates to the requirement for parkland. Appreicating that the development of the site has been through four OMB/OLT hearings, all with Council approval, this matter was discussed internal and it has been decided that the OPA/ZBLA applications will be City-intiated. Authorization on this approach has been confirmed with the Diretor of Planning. However, as noted above, the submission requirements are subject to a phase 3 pre-consultation, and all supporitng material for these applications are to be completed and provided by the applicant team. The City will not start the city-initated applcations until this is complete.

3. Surface Parking Lot Comments:

    a. The low-rise buildings, especially the one that was located on the southwestern side, offered built form transition to the low-rise developments to the south. The Secondary Plan has language that requires built form transition or some form of natural or built buffer.

    Presently, the current surface parking lot configuration does not appear to beachieving that objective. We'd ask that you consider removing this parking lot in favour of at-grade amenity with trees along southern property line.

    b. Please provide a sidewalk connection between north Wilmont sidewalk and what is presently shown as a surface parking area, to Winston.

4. Ramp/Park Comments:

    a. Regarding the ramp on Wilmont, we ask that you consider some alternative locations/configurations, such as internal to the site. We're looking for a park that is connected to both the community and proposed development, and a ramp location that supports those objectives while being compatible with the adjacent low-rise.

    b. Please consider sightlines of vehicles exiting the ramp - especially considering it is located adjacent to a park.

5. Other Comments:

    a. Please provide short-term bike parking options at-grade.

    b. We are concerned with the number of parking spaces being proposed, especially for a development who's heights were rationalized through its proximity to the LRT station. Staff fail to find rationale in further increasing the amount of parking via a surface parking area, at the detriment of the site's aesthetics.

    c. We note on the submitted plans that there is a large reduction in bike parking. However, at the information session there was mention of a 1:1 commitment. Please revise plans to reflect that and provide detail. With the City-initiated zoning, we would be recommending an increase in the bicycle parking rate to reflect the 1:1.

<u>Urban Design</u>

Comments:

6. The following elements of the preliminary design are appreciated:

a. Addition of the parkland.

b. Location of the additional height on the west tower.

7. The following elements of the preliminary design are of concern:

   a. Location and interface of the ramp adjacent to the City park.

   b. Shadow impacts of additional heights.

   c. Vegetative screening around both ramps when located adjacent to residential properties.

   d. Potential conflict with pedestrian movement between buildings from the MUP to the north and the community to the south with access to the future City park.

<u>Engineering</u>

Comments:

8. The Stormwater Management Criteria, for the subject site, is to be based on the following:

   Water Quantity Control: In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the **100-year storm event**, to **a pre-development level of 5-year.** The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. [**If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5**]. The time of concentration (T_c) used to determine the pre-development condition should be calculated. *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 established **5-year allowable** release rate, up to and including the **100-year storm event**, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.

   Water Quality Control: Not required if there will be no surface drainage capture/control infrastructure such as a catch basin, catch basin with ICD.

9. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

a. Location of service

Type of development and the amount of fire flow required (as per FUS).

Average daily demand: ___ l/s.

Maximum daily demand: ___l/s.

Maximum hourly daily demand: ___ l/s.

10. Water

A 152 mm dia. UCI watermain (1931) is available within Roosevelt Ave.

A 152 mm dia. UCI watermain (1931) is available within Winston Ave & Wilmont Ave.

a. Water Supply Redundancy: Residential buildings with a basic day demand greater than 50m3/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. The basic day demand for this site not expected to exceed 50m3/day.
b. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.
c. Existing residential service(s) to be blanked at the main.

11. Sewer (sanitary and storm)

A 450 mm dia. CONC Sanitary sewer (1930) is available within Roosevelt Ave.

A 450 mm dia. CONC Storm sewer (UNK) is available within Roosevelt Ave.

A 225 mm dia. CONC Sanitary sewer (1989) is available within Winston Ave.

A 375 mm dia. CONC Storm sewer (UNK) is available within Winston Ave.

A 225 mm dia. CONC Sanitary sewer (1932) is available within Wilmont Ave.

A 450 mm dia. CONC Storm sewer (1989) is available within Wilmont Ave.

Please see below for additional sewer and stormwater requirements:

a. **Capacity – Please provide proposed sanitary demands to verify for any capacity constraints.**

b. 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.

c. 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.

d. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

e. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s to reduce the likelihood of plugging.

f. Please provide 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.

g. Post-development site grading shall match existing property line grades to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.

h. There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

i. **Underground Storage:** Please note that 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.

j. 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.

k. If 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.

l. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.

m. Regarding all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

n. Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

o. If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a Roof Drain Plan as part of the submission.

12. Grading

Post-development site grading shall match existing property line grades to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans. Please provide a grading plan for the proposed park block to ensure that site grades tie into the park block accordingly.

13. Geotechnical Study

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

The geotechnical study is required to include the following:

- Please also note that all high transmission WMs are to be monitored when within, but not limited to, 15m of any foundation, particularly when blasting, piling,

shoring, rock anchoring, hoe ramming, pile (sheet) driving, or any other source of vibration could cause injury to the WM. In addition, a $25M insurance, separate from the $5M General Aggregate Insurance (Naming City of Ottawa) is required along with a emergency plan to isolate the flows and protect the LRT and Bus rapid transit (BRT).

-Impact of rock anchors on abutting City of Ottawa infrastructure (if applicable).

-Support of excavation plan to verify excavation activities will not impact nearby City infrastructure.

14. Pre-construction Survey

Pre-Construction (Piling/Hoe Ramming or in proximity to City Assets) and/or Pre-Blasting Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.

15. CCTV sewer inspection

CCTV sewer inspection required for pre and post construction conditions to ensure no damage to City Assets surrounding site.

16. Snow Storage

Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patters or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, catch basins, catch basin maintenance hole, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

17. Road Reinstatement

Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By- Law 2003-445 and City Standard Detail Drawing R10. The amount of overlay will depend on condition of roadway and width of roadway(s).

18. Gas pressure regulating station

A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow

routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

19. Phase One Environmental Site Assessment

    a. A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 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.
    b. The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
    c. Official Plan Section 10.1.6
    d. Based on the results of the Phase 1 ESA and Phase 2 ESA may be requested.

Please see comments for the phase one and phase two ESA submitted for the ZBLA & OPA. Comments are required to be addressed in the submission for site plan.

<u>Phase One ESA – Paterson, 2020</u>

- The report indicates the historical presence of “Globe Oil” at the eastern portion of 335 Roosevelt Ave and “Sun Oil” at “approximately 120 m downgradient of of the site”. The report has not considered any of these as PCAs causing APECs on the phase one ESA property. However, according to the 1948 FIP, these two oil companies were in operation at 335 Roosevelt Ave and 2100 Scott St, respectively, and each had oil tanks on-site. Specifically, the historical oil tanks of Globe Oil were located close to the northeast corner of the proposed development site. The phase one ESA needs to be revised to include the oil tanks as an on-site PCA which requires further investigation.

<u>Phase Two ESA – Paterson, 2020</u>

- As the phase one ESA missed including the Globe Oil tanks as a PCA located close to the northeast corner of the site, the phase two ESA has not investigated this area for the potential soil and groundwater petroleum contamination. Further investigation in this regard is required.
- Further, based on the identified groundwater flow direction towards northwest, the northern property boundary is considered the downgradient of any potential contamination on-site. Therefore, in my opinion, there is no sufficient

and recent groundwater quality data along the northern property boundary to ensure off-site migration of contamination has not occurred.

- There have been no duplicate samples collected / analyzed for soil samples. Therefore, the report is not in compliance with the O. Reg. 153/04 mandatory requirements.

General Recommendations

- The ESA reports need to be revised & resubmitted as per the comments above.
- Given the presence of soil and groundwater contamination on-site, a remedial action plan needs to be submitted.
- Upon completion of the remedial activities, the phase two ESA needs to be revised / resubmitted with a remediation report appended.
- Given the proposed land use change to a more sensitive use (i.e. industrial / commercial to residential), filing an RSC is required prior to issuing a building permit as per the OP/ O. Reg. 153/04 requirements (as a condition of approval).
- Given the potential for an off-site migration of contamination, I would recommend inclusion of an Off-Site Management Agreement as a condition of approval.

20. 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 **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

21. Record of Site condition

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 to a more sensitive property use.

22. General

a. It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.

b. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided, and all easements shall be shown on the engineering plans.

c. 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.

d. **Construction approach** – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy File Lead on this request.

23. Easement

A 9m wide easement over the high-pressure watermain and West Nepean collector sanitary sewer is required. The easement shall extend 4.5m on each side from the centerline of high-pressure water main or centerline of trunk sewer main whichever is closer. Please confirm that no structures are proposed within 4.5m from centerline of high-pressure watermain or trunk sanitary sewer (which ever is closer) for this development.

24. Watermain contingency plan

A systematic strategy to address and mitigate potential disruptions to the high-pressure watermain. Include procedures and resources for identifying and responding to water main breaks, leaks, or other emergencies. Key components of the plan may involve rapid detection of issues, communication protocols to notify relevant stakeholders, coordination of repair and maintenance efforts, and steps to ensure continued water supply to affected areas.

Feel free to contact Amy Whelan, Infrastructure Project Manager for follow-up questions.

Noise

1. Noise

a. A **Transportation Noise Assessment** is required as the subject development is within 100m of transit corridor.

b. A **Stationary Noise Assessment** is required 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.

c. A **Vibration Study** is required as the subject development is within 75m of an existing or proposed light rail transit corridor.

Feel free to contact Amy Whelan, Infrastructure Project Manager for follow-up questions.

Transportation

Comments:

2. Private Accesses

   The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process. Depressed sidewalks are to be extend across all the proposed accesses, also signage to indicate private parking for the above ground parking entrance.

3. Right-of-way protection.

   b. See Schedule C16 of the Official Plan.

   c. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

4. The details of the phasing have not been finalized and will be confirmed during the future Site Plan Control application.

5. The consultant is to finalize the TIA report and submit with the future Site Plan Control application for the City's circulation and review process. Further comments will be provided during the Site Plan application.

6. This proposed development abuts the integrate road, sewer and watermain project on Wilmont St slated to occur between 1-2 years. Further details on these works can be provided upon request.

7. Why is the access being shifted east from the current north leg of the T-intersection? Seems non-standard.

8. Will this mean the Wilmont stop bar has to be set back for WBL and will that create sightline issues? 34 .This info will assist with refining the traffic calming plan for Wilmont.

9. The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.

10. Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be in safe, secure places near main entrances and preferably protected from the weather.

11. Signs related to the development site are to be placed in accordance with the applicable sign by-law https://ottawa.ca/en/search?searchfield=sign+by+law. (Permanent Signs on Private Property By-law No. 2016-326). (Temporary Signs on Private Property By-law No. 2004-239). (Signs on City Roads By-law No. 2003-520). An Encroachment Agreement will be required for any signage on the road allowance.

Feel free to contact Wally Dubyk, Transportation Project Manager, for follow-up questions.

Forestry

Deficiencies:

12. A Tree Conservation Report will be required for Site Plan – see Phase 1 PC comments for details

13. Tree planting must be demonstrated on the Landscape Plan - see Phase 1 PC comments for details

Feel free to contact Mark Richardson, Planning Forester, for follow-up questions.

Parkland – Mike Russet

Deficiencies:

14. Parks and Facilities Planning (PFP) would like to acknowledge and thank the applicant for including the park block in the Stage 2 pre-con stage.

15. Parks and Facilities Planning (PFP) requests that the park block extend to the east and abut directly with the residential property line (377 Wilmont Ave).

16. PFP requests an understanding on how the design, while incorporating with the open space and amenity area(s) of the new development, shall be delineated from public parkland.

17. PFP prefers some form of boundary definition between public and private space and would like to work with the applicant to determine border definition conditions are softer than a standard chainlink fence or other hard delineation.

Feel free to contact Mike Russet, Parks Planner, for follow-up questions.

We look forward to further discussing your project with you.

Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Jean-Charles Renaud, RPP, MCIP

Ben Sweet

From: Gauthier, Steve <Steve.Gauthier@ottawa.ca>
Sent: Tuesday, July 14, 2020 12:00 PM
To: Jacob Bolduc
Subject: FW: 335 Roosevelt AVe

FYI

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: July 14, 2020 9:52 AM
To: Gauthier, Steve <Steve.Gauthier@ottawa.ca>
Subject: FW: 335 Roosevelt AVe

For the applicant
Thanks

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

Thank you

Regards,

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

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

*****Please note that, while my work hours may be affected by the current situation, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

From: Di Iorio, Tessa <tessa.diiorio@ottawa.ca>
Sent: July 13, 2020 11:04 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Subject: RE: 335 Roosevelt AVe

Hello Shawn,

Thank you for contacting me for a Source Protection policy screening for the *Planning Act* application at **335 Roosevelt**.

Source Protection Policy Screening:

1. The address lies within the Mississippi-Rideau Source Protection Region and is subject to the policies of the Mississippi-Rideau Source Protection Plan.

2. The western portion of the property (west of Winston Avenue) lies within the Surface Water Intake Protection Zone for the Ottawa River (Britannia) Intake, IPZ-2 (vulnerability score of 8.1) where significant threat policies apply. Policies are only applicable for specific significant drinking water threat activities and policies are only applicable within the area identifies as IPZ-2 (vulnerability score 8.1).

    - The *Clean Water Act* Tables of Circumstances identify circumstances under which certain activities would be considered a significant threat to drinking water, 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
        - 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)
    - If any of the above activities are proposed within the western portion of the property (west of Winston Avenue), then please follow up with me to determine if the activity meets the circumstance to be a significant drinking water threat.
    - If none of the activities listed above are proposed within the IPZ-2 (the western portion of the property), then there are no applicable Source Protection policies related to the IPZ-2.

3. The area is not within a Wellhead Protection Area (WHPA).

4. The area located within a Highly Vulnerable Aquifer (HVA). Note that there are no legally binding policies under the Mississippi-Rideau Source Protection Plan for activities within Highly Vulnerable Aquifers.

5. The area is not within a Significant Groundwater Recharge Area.

Please follow up with confirmation if the above highlighted activities are proposed within the IPZ-2 (western portion of the property, west of Winston Avenue).
And feel free to contact me directly if you have any questions.

Kind Regards,
Tessa

Tessa Di Iorio, M.Sc., P.Geo.
Risk Management Official/Inspector, Hydrogeologist
Infrastructure Services – Asset Management Branch
Planning, Infrastructure and Economic Development
City of Ottawa | Ville d'Ottawa
(613) 580-2424 ext./poste 17658
tessa.diiorio@ottawa.ca

Please note: Due to the current pandemic, I will be working from home until further notice. Contact by email is preferred; I will be checking my voicemail less frequently.

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: July 10, 2020 1:52 PM
To: Di Iorio, Tessa <tessa.diiorio@ottawa.ca>
Subject: 335 Roosevelt AVe

Good afternoon Tessa

May I request Source Protection Screening for this site.

Have a nice weekend! ☺

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

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Project Manager - Infrastructure Approvals

Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Infrastructure and Economic Development Department | Direction générale de la planification de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

Please consider the environment before printing this email

*****Please note that, while my work hours may be affected by the current situation, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

Appendix B
Stormwater Management Calculations

335 Roosevelt Avenue (110098)
Pre-Development Peak Flow Calculations (Sheet Flow to LRT)

NOVATECH
Engineers, Planners & Landscape Architects

EXISTING CONDITIONS (Site Sheet Draining to LRT Corridor)

Time-of-Concentration (Uplands Method)

Flow Classification (Land Use)	Length (m)	Elevation		Slope (%)	Velocity[1] (m/s)	Time-of-Concentration (min)
		U/S (m)	D/S (m)			
Site	50	66.5	66.0	1.0%	0.60	1.4
TOTAL	**50**	**66.5**	**66.0**	**1.0%**	**0.60**	**10.0**

[1] *Refer to Uplands Velocity Chart.* **Min 10-minutes.*

Existing Catchment Parameters

Catchment ID	Areas (ha)			Runoff Coefficient		%Imperv.
	Total	Hard Surfaces (C=0.90)	Soft Surfaces (C=0.20)	C_{avg}	C_{100yr}[1]	
TOTAL	**0.710**	**0.254**	**0.456**	**0.45**	**0.52**	**35.7%**

[1] *Runoff coefficient increases by 25%, up to a maximum value of 1.00, for the 100-year event.*

Pre-Development Peak Flows

Catchment ID	Rainfall Intensity (mm/hr)[1]			Peak Flows (L/s)		
	2-year	5-year	100-year	2-year	5-year	100-year
Site Boundary (existing conditions)	76.81	104.19	178.56	68.2	92.5	182.5

[1] *Tc is based on Uplands Method.*

Notes:

Rainfall Intensity from City of Ottawa Sewer Design Guidelines (Oct. 2012)
- 100 year Intensity = $1735.688 / (Tc + 6.014)^{0.820}$
- 5 year Intensity = $998.071 / (Tc + 6.053)^{0.814}$
- 2 year Intensity = $732.951 / (Tc + 6.199)^{0.810}$

Q(peak flow) = 2.78 x C x I x A
- C is the runoff coefficient
- I is the rainfall intensity
- A is the total drainage area

Date: 5/29/2025
M:\2010\110098\DATA\Calculations\SWM\110098-PrevsPost-dev flows.xlsx

335 Roosevelt Avenue (110098)
Post-Development Peak Flow Calculations (Sheet Flow to LRT)

NOVATECH
Engineers, Planners & Landscape Architects

POST DEVELOPMENT CONDITIONS (B-01 & B-02 Sheet Draining to LRT Corridor)

Time-of-Concentration (Uplands Method)

Flow Classification (Land Use)	Length (m)	Elevation U/S (m)	Elevation D/S (m)	Slope (%)	Velocity[1] (m/s)	Time-of-Concentration (min)
Uncontrolled (B-01, B-02)	10	66.9	66.7	2.0%	0.90	0.2
TOTAL	**10**	**66.9**	**66.7**	**2.0%**	**0.90**	**10.0**

[1] *Refer to Uplands Velocity Chart.* **Min 10-minutes.*

Existing Catchment Parameters

Catchment ID	Areas (ha) Total	Areas (ha) Hard Surfaces (C=0.90)	Areas (ha) Soft Surfaces (C=0.20)	Runoff Coefficient C_{avg}	Runoff Coefficient C_{100yr}[1]	%Imperv.
TOTAL	**0.114**	**0.047**	**0.067**	**0.49**	**0.56**	**41.4%**

[1] *Runoff coefficient increases by 25%, up to a maximum value of 1.00, for the 100-year event.*

Pre-Development Peak Flows

Catchment ID	Rainfall Intensity (mm/hr)[1] 2-year	5-year	100-year	Peak Flows (L/s) 2-year	5-year	100-year
Site Boundary (existing conditions)	76.81	104.19	178.56	11.9	16.2	31.7

[1] *Tc is based on Uplands Method.*

Notes:

Rainfall Intensity from City of Ottawa Sewer Design Guidelines (Oct. 2012)
- 100 year Intensity = $1735.688 / (Tc + 6.014)^{0.820}$
- 5 year Intensity = $998.071 / (Tc + 6.053)^{0.814}$
- 2 year Intensity = $732.951 / (Tc + 6.199)^{0.810}$

Q(peak flow) = 2.78 x C x I x A
- C is the runoff coefficient
- I is the rainfall intensity
- A is the total drainage area

Date: 5/29/2025
M:\2010\110098\DATA\Calculations\SWM\110098-PrevsPost-dev flows.xlsx

Calculation of Peak Flows

$$Q_p = 2.78\ x\ C\ x\ I\ x\ A$$

**Rational Method Equation*

Where:

Q_p = Peak Flow (L/s)
C = Runoff Coefficient (increases by 25% for a 100-year event; max 1.0)
I = Rainfall Intensity (mm)
**Based on City of Ottawa IDF data using a 10-minute time-of-concentration (T_c)*
A = Drainage Area (ha)

Sample Calculation for 100-year Storm Event:

Drainage Area = 2.280 ha
Runoff Coefficient = 0.36 (100-year)
Rainfall Intensity = 170.13 mm/hr (based on 11-minute Tc; City of Ottawa IDF data)

$$Q_p = 2.78\ x\ 0.36\ x\ 170.13 mm/hr\ x\ 2.280 ha$$
$$Q_p = 385.1\ L/s$$

335 Roosevelt (110098)
Uplands Velocity Chart

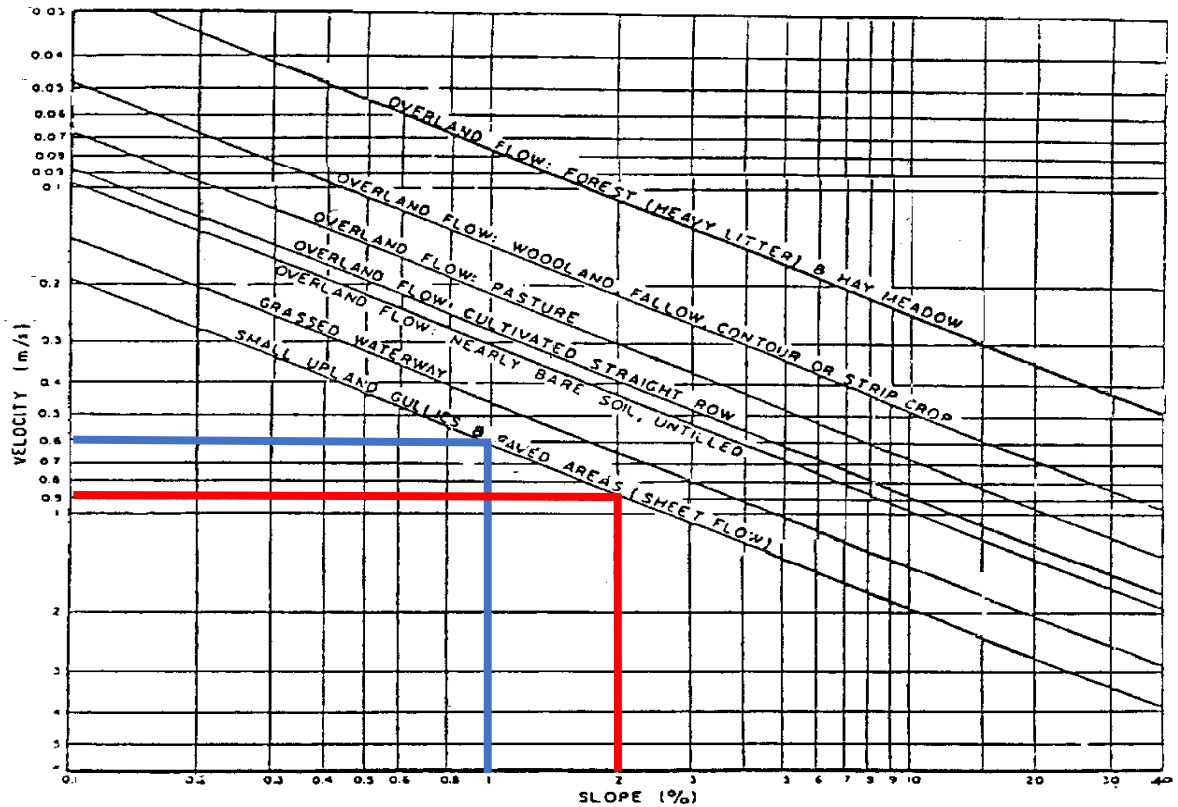

Figure A.5.2: Upland Method for Estimating Time of Concentration
(SCS National Engineering Handbook, 1971)

Date: 5/29/2025
M:\2010\110098\DATA\Calculations\SWM\110098-PrevsPost-dev flows.xlsx

Ministry of the Environment / Ministère de l'Environnement

Ontario

Certificate of Approval (Sewage)
Certificat d'autorisation (eaux usées)

Number / *Numéro* 3-2058-88-006

Whereas / *Attendu que* CITY OF OTTAWA

XXXX

has applied in accordance with Section 24 of the Ontario Water Resources Act for approval of:
a fait, conformément à l'article 24 de la loi sur les ressources en eau de l'Ontario, une demande d'autorisation:
sewers and appurtenances to be constructed in the City of Ottawa, as follows:

Street	From	To
Storm Sewers		
Roosevelt Avenue	Richmond Road	Approx. 290m north of Richmond Road
Winston Avenue	Approx. 35m north of Richmond Road	Wilmont Avenue
Wilmont Avenue	Winston Avenue	Churchill Avenue
Churchill Avenue	Wilmont Avenue	Scott Street
Scott Street	Churchill Avenue	Winona Avenue
Easement (Roosevelt Avenue)	Approx. 290m north of Richmond Road	Approx. 145m west to Dominion Avenue

including stub sewer connections and building sewers from the main sewer to the street line, all in accordance with the plans prepared by Oliver, Mangione, McCalla & Associates Ltd., Consulting Engineers, at a total estimated cost, including engineering and contingencies, of TWO HUNDRED AND FORTY FIVE THOUSAND DOLLARS ($245,000.00).

237177

CITY OF OTTAWA
DEPARTMENT OF ENGINEERING & WORKS
Rec'd NOV 1 1988
TO: ENG
FILE NO.: EW-1530-27/R 99(88-52)
FILE NO.:

Now therefore this is to certify that after due enquiry the said proposed works have been approved under Section 24 of the Ontario Water Resources Act.
Le présent document *certifie qu'après vérification en bonne et due forme la construction dudit projet d'ouvrages a été approuvée aux termes de l'article 24 de la loi sur les ressources en eau de l'Ontario.*

DEPT. of CITY CLERK
Record Unit
Depot des documents
File no. / No du dossier
31 10- 88-
to Archives / Eng.

DATED AT TORONTO this 25th day of October, 1988
DATÉ À TORONTO ce jour d

Attn: J.R. Cyr, Clerk, City of Ottawa
cc: Ms. G. Brown, Clerk, R.M. of Ottawa-Carleton
D. Guscott, MOE SE, Reg. Dir.
Oliver, Mangione, McCalla & Assoc. Ltd.

Description of Works
Description des ouvrages

Application is hereby made to the Director for
Le demandeur adresse au directeur par la présente une demande d'autorisation

City of Ottawa
Department of Engineering & Works

Approval to Construct (Describe type of sewers, pumping stations and miscellaneous structures.)
de construire (décrire le type d'égouts, de postes de pompage et d'ouvrages divers).

Storm sewers

And Sewage Treatment Works (Describe type and capacity of major works.)
ainsi que les ouvrages d'épuration des eaux usées suivants (décrire le type et la capacité des principaux ouvrages).

Location of Proposed Sewage Works
Emplacement des ouvrages

Roosevelt Avenue, Winston Avenue, Wilmont Avenue
Churchill Avenue & Scott Street, City of Ottawa,
Regional Municipality of Ottawa-Carleton

Lot, Concession, Municipality & County, District or Region
Lot, concession, municipalité et comté, district ou région

Works will Outlet to (Sewer system, name of receiving stream or lake.)
Les eaux traitées se déverseront dans (réseau d'égouts ou nom du cours d'eau ou du lac récepteur).

1) existing 675 mm dia. storm sewer on Dominion Avenue
2) existing 900 mm dia. storm sewer on Scott Street

This application is made under the provisions of Section 24, Ontario Water Resources Act, R.S.O. 1980, and such other statutes as relate to sewage works.

The applicant agrees that no changes in or deviations from the approved plans and specifications will be made except with the consent and approval of the Director, and agrees, if requested, to submit as-built drawings and cost figures to the Director upon completion of the project.

La présente demande est faite aux termes des dispositions de l'article 24 de la Loi sur les ressources en eau de l'Ontario, L.R.O. de 1980, et des autres lois qui se rapportent aux ouvrages d'adduction et de purification de l'eau.

Le demander s'engage à n'apporter aucune modification aux plans et cahier des charges approuvés, saut s'il obtient le consentement et l'autorisation du directeur, et s'engage, sur demande, à remettre les plans des ouvrages tels qu'ils ont été construits ainsi que la ventilation détaillée du coût de construction au directeur à la fin des travaux.

Signatures Required
Signatures requises

Applicant
Demandeur

Signature / *Signature*: H.W. Parent

Name (Print or Type) / *Nom (en lettres moulées)*: Corporation of the City Ottawa

Date / *Date*: Sept. 27/88

Mailing Address / *Adresse*: 1355 Bank Street, Ottawa, Ontario, K1H 8K7

Telephone / *N° de téléphone*: 564-1858

Municipality (If not applicant)
Municipalité (À remplir si le demandeur n'est pas la municipalité.)

Signature / *Signature*:

Name & Title of Municipal Authority / *Nom et titre du responsable municipal*:

Date / *Date*:

Mailing Address / *Adresse*:

Telephone / *N° de téléphone*:

Engineer
Ingénieur

Eng. Documents Certified by Signature
Préparation des documents techniques certifiés par signature de l'ingénieur autorisé

Name of Engineer or Firm / *Nom de l'ingénieur ou de la firme d'ingénierie*: Oliver, Mangione, McCalla & Assoc. Ltd.

Date / *Date*: Sept. 1988

Mailing Address / *Adresse*: 154 Colonnade Road South, Nepean, Ontario, K2E 7J5

Telephone / *N° de téléphone*: 225-9940

REGISTERED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

Operating Authority (If not applicant)
Exploitant (À remplir si l'exploitant n'est pas le demandeur.)

Signature / *Signature*:

Name of Operating Authority / *Nom de l'exploitant*:

Date / *Date*:

Mailing Address / *Adresse*:

Telephone / *N° de téléphone*:

Cost Summary
Sommaire des coûts

Sewers and Appurtenances *Égouts et accessoires*	$	225,000.
Building Sewer Connections *Raccords de branchements d'égouts*	$	---
Pumping Stations and Forcemains *Postes de pompage et conduites de refoulement*	$	---
Treatment Works and Outfalls *Usines d'épuration et exutoires*	$	---
Engineering and Contingencies *Ingénierie et imprévus*	$	20,000.
Land Charges *Frais fonciers*	$	---
Total *Total*	$	245,000.

Financing *Financement* Payment by (cash, debentures, loans, etc.) *Paiement (comptant, débentures, emprunts, etc.)*	Source of Financing (municipal, private, government) *Source de financement (municipal, privé, gouvernemental)*
cash	municipal

Scheduling *Calendrier* Construction Start Date *Date de début des travaux*	Construction Period (years, months) *Durée des travaux (années, mois)*
as soon as possible	one (1) month

File Number of Ministry of Municipal Affairs *Numéro de dossier du ministère des Affaires municipales*	**or Registered Plan Number** (if applicable) *ou numéro de plan enregistré (s'il y a lieu)*
	N/A

The certificate of approval will be issued to the applicant. Copies will be sent to the clerks of any affected municipalities which are not applicants. List names and addresses below for any other recipients.

Le certificat d'autorisation sera délivré au demandeur et une copie du certificat envoyée aux secrétaires de toutes les municipalités intéressées qui n'ont pas signé la demande. Indiquer ci-dessous les noms et adresses de tout autre destinataire.

Oliver, Mangione, McCalla & Associates Limited
154 Colonnade Road South
Nepean, Ontario
K2E 7J5

Ministry Use Only
Réservé au ministère
Application Checked by
Demande vérifiée par

☐ **Application Recommended for Approval**
Autorisation de la demande recommandée
Supervisor, Environmental Approvals Section — Date
Superviseur, Section des approbations environnementales — *Date*

JNS

Ministry of the Environment / Ministère de l'Environnement
Ontario

Certificate of Approval (Sewage)
Certificat d'autorisation (eaux usées)

Number / Numéro 3-2058-88-006

OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED
OCT 31 1988
RECEIVED

#6510

Whereas / *Attendu que* CITY OF OTTAWA

XXXX

has applied in accordance with Section 24 of the Ontario Water Resources Act for approval of:
a fait, conformément à l'article 24 de la loi sur les ressources en eau de l'Ontario, une demande d'autorisation:
sewers and appurtenances to be constructed in the City of Ottawa, as follows:

Street	From	To
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Roosevelt Avenue	Richmond Road	Approx. 290m north of Richmond Road
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Wilmont Avenue	Winston Avenue	Churchill Avenue
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Scott Street	Churchill Avenue	Winona Avenue
Easement (Roosevelt Avenue)	Approx. 290m north of Richmond Road	Approx. 145m west to Dominion Avenue

including stub sewer connections and building sewers from the main sewer to the street line, all in accordance with the plans prepared by Oliver, Mangione, McCalla & Associates Ltd., Consulting Engineers, at a total estimated cost, including engineering and contingencies, of TWO HUNDRED AND FORTY FIVE THOUSAND DOLLARS ($245,000.00).

THIS IS A TRUE COPY OF THE ORIGINAL CERTIFICATE MAILED
ON OCT 26 1988
(Signed)

Now therefore this is to certify that after due enquiry the said proposed works have been approved under Section 24 of the Ontario Water Resources Act.
Le présent document certifie qu'après vérification en bonne et due forme la construction dudit projet d'ouvrages a été approuvée aux termes de l'article 24 de la loi sur les ressources en eau de l'Ontario.

DATED AT TORONTO this / *DATÉ À TORONTO le* 25th day of / *jour de* October, 1988

Attn: D.R. Cyr, Clerk, City of Ottawa
cc: ... G. Brown, Clerk, R.M. of Ottawa-Carleton
... Guscott, MOE SE, Reg. Dir.
Oliver, Mangione, McCalla & Assoc. Ltd.

OLIVER, MANGIONE, McCALLA & ASSOCIATES LIMITED

STORM SEWER COMPUTATION SHEET

JOB: City of Ottawa - Winston Avenue to Winona Avenue Storm Sewer

PROJECT: No: 2179 Contract No: 88-52

Ottawa Rainfall Curves
5 Year Frequency
Q = 2.78 RIA

MANHOLE		AREA HECTARES		RUNOFF COEFFICIENT			FLOW TIME (MIN.)				PROFILE				MISC.
Fr	To	Increment	A ha Total	Increment	Adjustment of Coefficient	I Adjusted	To Upper End	In Section	R Rainfall mm/hr	Q Flow l/sec	Pipe Dia. mm	Grade %	Velocity m/sec	Length m	Capacity l/sec.
WINSTON AVENUE															
	MH2		0.40			0.45	20	1.09	66.29	33.17	300	0.4	.87	57.0	63.8
	MH3	0.50	0.90			0.45	21.09	1.24	64.02	72.08	375	0.4	1.01	75.0	115.7
	MH4	0.50	1.40			0.45	22.33	1.37	61.71	108.08	375	0.4	1.01	83.0	115.7
WILMONT STREET															
	MH5	0.65	2.05			0.45	23.70	1.15	59.92	153.67	450	0.3	0.99	68.5	162.9
	MH6	0.65	2.70			0.45	24.85	1.09	58.34	197.06	450	0.45	1.22	80	199.5

REGISTERED PROFESSIONAL ENGINEER
J. N. Sawarna
PROVINCE OF ONTARIO

OLIVER, MANGIONE, McCALLA & ASSOCIATES LIMITED

STORM SEWER COMPUTATION SHEET

WORK: City of Ottawa - Winston Avenue to Winona Avenue Storm Sewer

PROJECT No: 2179 Contract No: 88-52

Ottawa Rainfall Curves
5 Year Frequency
Q = 2.78 RIA

MANHOLE		AREA HECTARES		RUNOFF COEFFICIENT			FLOW TIME (MIN.)				PROFILE				MISC.
From	To	Increment	A ha Total	Increment	Adjustment of Coefficient	Adjusted I	To Upper End	In Section	R Rainfall mm/hr	Q Flow ℓ/sec	Pipe Dia. mm	Grade %	Velocity m/sec	Length m	Capacity l/sec.
[illegible] STREET															
[illegible]	MH7	0.55	3.25			0.45	25.94	1.15	56.77	230.81	525	0.30	1.10	76.0	245.8
[illegible]HILL AVENUE															
[illegible]	MH8	4.70	7.95			0.45	27.09	0.49	56.13	558.24	600	1.30	2.50	73.5	730.4
[illegible]TT STREET															
[illegible]	MH9	0.50	8.45			0.45	27.58	0.62	55.34	585.00	600	0.90	2.08	77.5	607.7
[illegible]	exist. MH [illegible] Winona	-	8.45			0.45	28.20	0.05	55.28	584.36	600	2.00	3.10	10.0	905.90

REGISTERED PROFESSIONAL ENGINEER
J. N. Sawarna
PROVINCE OF ONTARIO

STORM SEWER COMPUTATION SHEET

JOB: City of Ottawa - Roosevelt Avenue to Dominion Avenue Storm Sewer

PROJECT: No: 2179 Contract No: 88-52

Ottawa Rainfall Curves
5 Year Frequency
Q = 2.78 RIA

MANHOLE		AREA HECTARES		RUNOFF COEFFICIENT			FLOW TIME (MIN.)				PROFILE				MISC.
From	To	Increment	A ha Total	Increment	Adjustment of Coefficient	I Adjusted	To Upper End	In Section	R Rainfall mm/hr	Q Flow l/sec	Pipe Dia. mm	Grade %	Velocity m/sec	Length m	Capacity l/sec.
ROOSEVELT AVENUE															
MH1	MH2		0.70			0.45	20	1.82	64.93	56.86	300	0.40	0.87	95	63.80
MH2	MH3	0.80	1.50			0.45	21.82	1.57	63.91	119.93	375	0.44	1.06	100	121.30
MH3	MH4	0.80	2.30			0.45	23.39	1.42	59.98	172.58	450	0.40	1.15	98	188.1
PARK															
MH4	MH5	0.10	2.40			0.45	25.81	1.20	58.24	174.86	450	0.40	1.15	82.5	188.1
MH5	MH6	3.10	5.50			0.45	26.01	0.79	57.15	393.22	600	0.40	1.39	86.0	405.1
	outlet @ Dominion Avenue														

REGISTERED PROFESSIONAL ENGINEER
J. N. Sawarna
PROVINCE OF ONTARIO

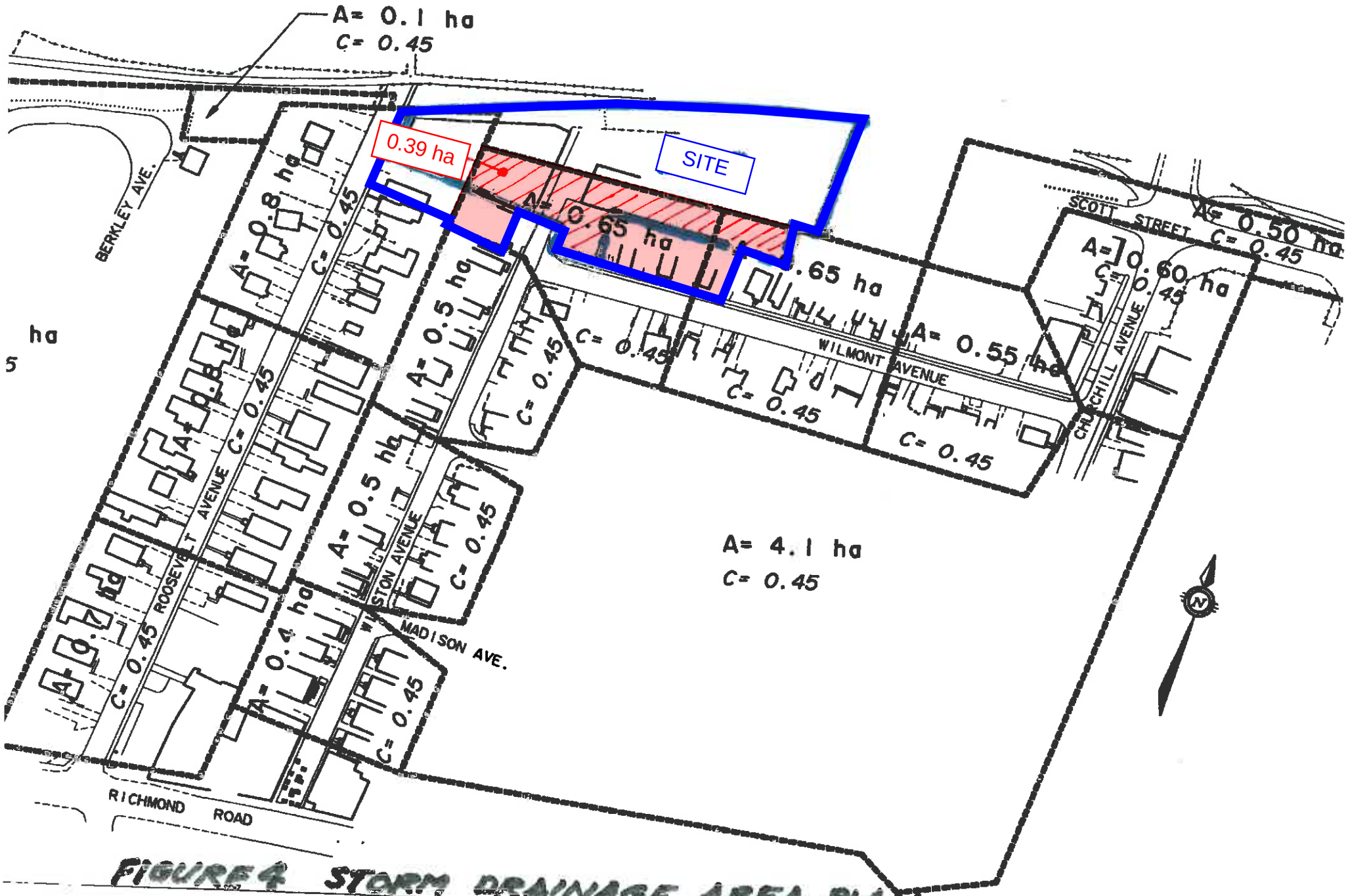


FIGURE 4 STORM DRAINAGE AREA PLAN

335 ROOSEVELT STREET
WILLMONT AVENUE STORM SEWER: HYDRAULIC GRADE LINE ANALYSIS (5-YEAR EVENT)
ORIGINAL DESING + SITE@ C=0.20

This spreadsheet uses the Darcy-Weisbach equation to calculate hydraulic losses through a pipe network with a specified flow rate. Minor losses are accounted for including both pipe bend losses and structure losses.
The spreadsheet returns the upstream hydraulic grade line if surcharged, or the pipe obvert if free flow conditions exist. The slope of the HGL is calculated and the minimum USF elevations can be established +0.30m above the HGL.

LOCATION	MANHOLE		INVERT ELEVATION		GROUND ELEVATION	COVER	PIPE PARAMETERS			TOTAL FLOW	Q_{cap}	Q_{in}/Q_{cap}	COMPUTATIONAL COLUMNS					HEAD LOSS	SURCHARGE	HGL			PIPE SLOPE	MIN. USF ELEVATION
	Upstream	Downstream	U/S (m)	D/S (m)	Upstream (m)	Upstream (m)	Dia (mm)	Length (m)	"n"	(m^3/s)	(m^3/s)		Pipe Area (m^2)	L/D	Friction Factor (f)	Velocity V (m/s)	$V^2/2g$	HL (m)	Upstream (m)	U/S (m)	D/S (m)	SLOPE (%)	(%)	Upstream (m)
																				63.10	<- OUTLET TO RICHMOND SEWER			
WILMONT	28522	28523	62.84	62.58	66.23	2.865	525	84.50	0.013	0.235	0.249	0.94	0.223	161	0.02610	1.05	0.06	0.26	0.00	63.37	63.11	0.31	0.31	63.67
	28521	28522	63.27	62.91	66.56	2.840	450	78.60	0.013	0.201	0.201	1.00	0.164	175	0.02747	1.22	0.08	0.39	0.03	63.75	63.37	0.49	0.46	64.05
	28520	28521	63.54	63.28	66.59	2.600	450	68.70	0.013	0.159	0.183	0.87	0.164	153	0.02747	0.97	0.05	0.29	0.05	64.04	63.75	0.42	0.38	64.34
WINSTON	28519	28520	63.86	63.62	66.69	2.455	375	81.60	0.013	0.108	0.099	1.09	0.114	218	0.02920	0.95	0.05	0.31	0.11	64.34	64.04	0.37	0.29	64.64
	28518	28519	64.20	63.91	66.81	2.235	375	76.60	0.013	0.072	0.113	0.64	0.114	204	0.02920	0.63	0.02	0.13	0.00	64.58	64.34	0.30	0.38	64.88
	28517	28518	65.86	64.23	68.45	2.290	300	57.90	0.013	0.033	0.169	0.19	0.073	193	0.03145	0.45	0.01	0.07	0.00	66.16	64.58	2.74	2.82	66.46

DESIGN PARAMETERS

DOWNSTREAM WATER LEVEL at Outlet = 67.57m (EPA SWMM MAX HGL)
RETURN FREQUENCY = 5 YEAR
MINIMUM VELOCITY= 0.80 m/s
MANNING'S n= 0.013
MIN. HGL CLEARANCE 0.30m

HGL=Major + Minor Losses
Major Loss= Pipe Friction (Darcy-Weisbach)
Minor Loss= Head loss correction for flow through MH, changes in pipe size, and pipe bends
Friction Factor= 8g/c^2, where c=(1/n)*(D/4)^1/6

Designed: MS

Checked: RSC

Dwg. Reference:

PROJECT:
335 ROOSEVELT AVENUE

CLIENT:
UNIFORM URBAN DEVELOPMENTS

Date: June 15, 2011

335 ROOSEVELT STREET
WILLMONT AVENUE STORM SEWER: HYDRAULIC GRADE LINE ANALYSIS (5-YEAR EVENT)
ORIGINAL DESING + SITE @ C=0.45

This spreadsheet uses the Darcy-Weisbach equation to calculate hydraulic losses through a pipe network with a specified flow rate. Minor losses are accounted for including both pipe bend losses and structure losses.
The spreadsheet returns the upstream hydraulic grade line if surcharged, or the pipe obvert if free flow conditions exist. The slope of the HGL is calculated and the minimum USF elevations can be established +0.30m above the HGL.

LOCATION	MANHOLE		INVERT ELEVATION		GROUND ELEVATION	COVER	PIPE PARAMETERS			TOTAL FLOW	Q_{cap}	Q_{in}/Q_{cap}	COMPUTATIONAL COLUMNS					HEAD LOSS	SURCHARGE	HGL			PIPE SLOPE	MIN. USF ELEVATION
	Upstream	Downstream	U/S (m)	D/S (m)	Upstream (m)	Upstream (m)	Dia (mm)	Length (m)	'n'	(m^3/s)	(m^3/s)		Pipe Area (m^2)	L/D	Friction Factor (f)	Velocity V (m/s)	$V^2/2g$	HL (m)	Upstream (m)	U/S (m)	D/S (m)	SLOPE (%)	(%)	Upstream (m)
WILMONT	28522	28523	62.84	62.58	66.23	2.865	525	84.50	0.013	0.262	0.249	1.05	0.223	161	0.02610	1.17	0.07	0.32	0.06	63.10	<- OUTLET TO RICHMOND SEWER			
	28521	28522	63.27	62.91	66.56	2.840	450	78.80	0.013	0.234	0.201	1.16	0.164	175	0.02747	1.43	0.10	0.52	0.23	63.42	63.11	0.38	0.31	63.72
	28520	28521	63.54	63.28	66.59	2.600	450	68.70	0.013	0.186	0.183	1.02	0.164	153	0.02747	1.13	0.07	0.39	0.35	63.95	63.42	0.67	0.46	64.25
WINSTON	28519	28520	63.86	63.62	66.69	2.455	375	81.60	0.013	0.108	0.099	1.09	0.114	218	0.02920	0.95	0.05	0.31	0.41	64.34	63.95	0.57	0.38	64.64
	28518	28519	64.20	63.91	66.81	2.235	375	76.60	0.013	0.072	0.113	0.64	0.114	204	0.02920	0.63	0.02	0.13	0.20	64.65	64.34	0.37	0.29	64.95
	28517	28518	65.86	64.23	68.45	2.290	300	57.90	0.013	0.033	0.169	0.19	0.073	193	0.03145	0.45	0.01	0.07	0.00	64.77	64.65	0.17	0.38	65.07
																				66.16	64.77	2.40	2.82	66.46

DESIGN PARAMETERS

DOWNSTREAM WATER LEVEL at Outlet = 67.57m (EPA SWMM MAX HGL)
RETURN FREQUENCY = 5 YEAR
MINIMUM VELOCITY= 0.80 m/s
MANNING'S n= 0.013
MIN. HGL CLEARANCE 0.30m

HGL=Major + Minor Losses
Major Loss= Pipe Friction (Darcy-Weisbach)
Minor Loss= Head loss correction for flow through MH, changes in pipe size, and pipe bends
Friction Factor= 8g/c^2, where c=(1/n)*(D/4)^1/6

Designed: MS

Checked: RSC

Dwg. Reference:

PROJECT:
335 ROOSEVELT AVENUE

CLIENT:
UNIFORM URBAN DEVELOPMENTS

Date: June 15, 2011

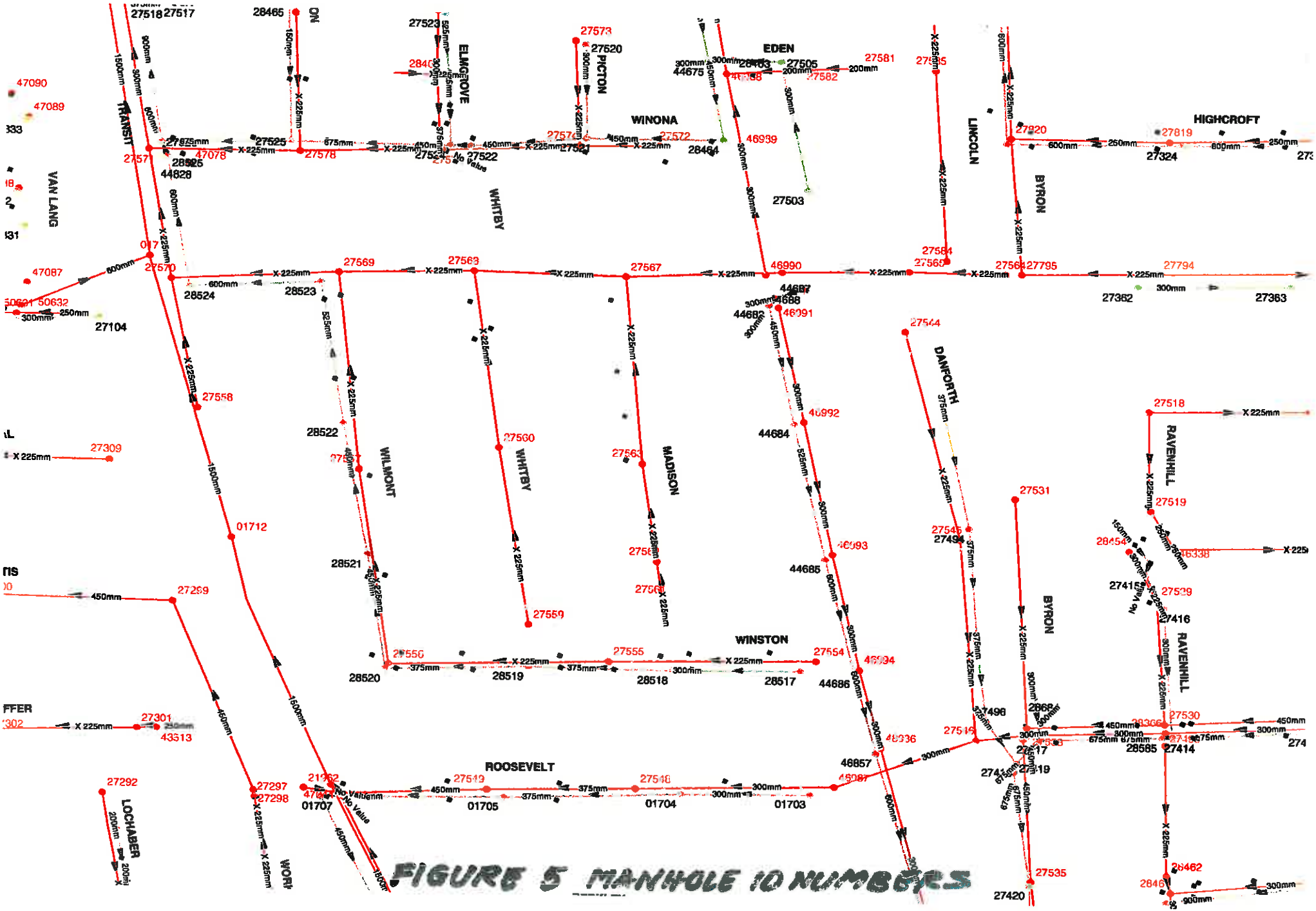


FIGURE 5 MANHOLE ID NUMBERS

PROJECT #:110098
PROJECT NAME: 335 Roosevelt Avenue
LOCATION: City of Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: May 29, 2025

Allowable Flows

Outlet Options	Area (ha)	"C"	Intensity (5yr)	$Q_{5\ Year}$ (L/s)	Q_{ALLOW} (L/s)
Wilmont (450mm Sewer)	0.390	0.45	59.92	**29.2**	**29.2**

Time of Concentration	Tc=	25.62	min
Intensity (5 Year Event)	I_5=	59.92	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

C is the runoff coefficient
Flow Equation
Q = 2.78 x C x I x A
Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

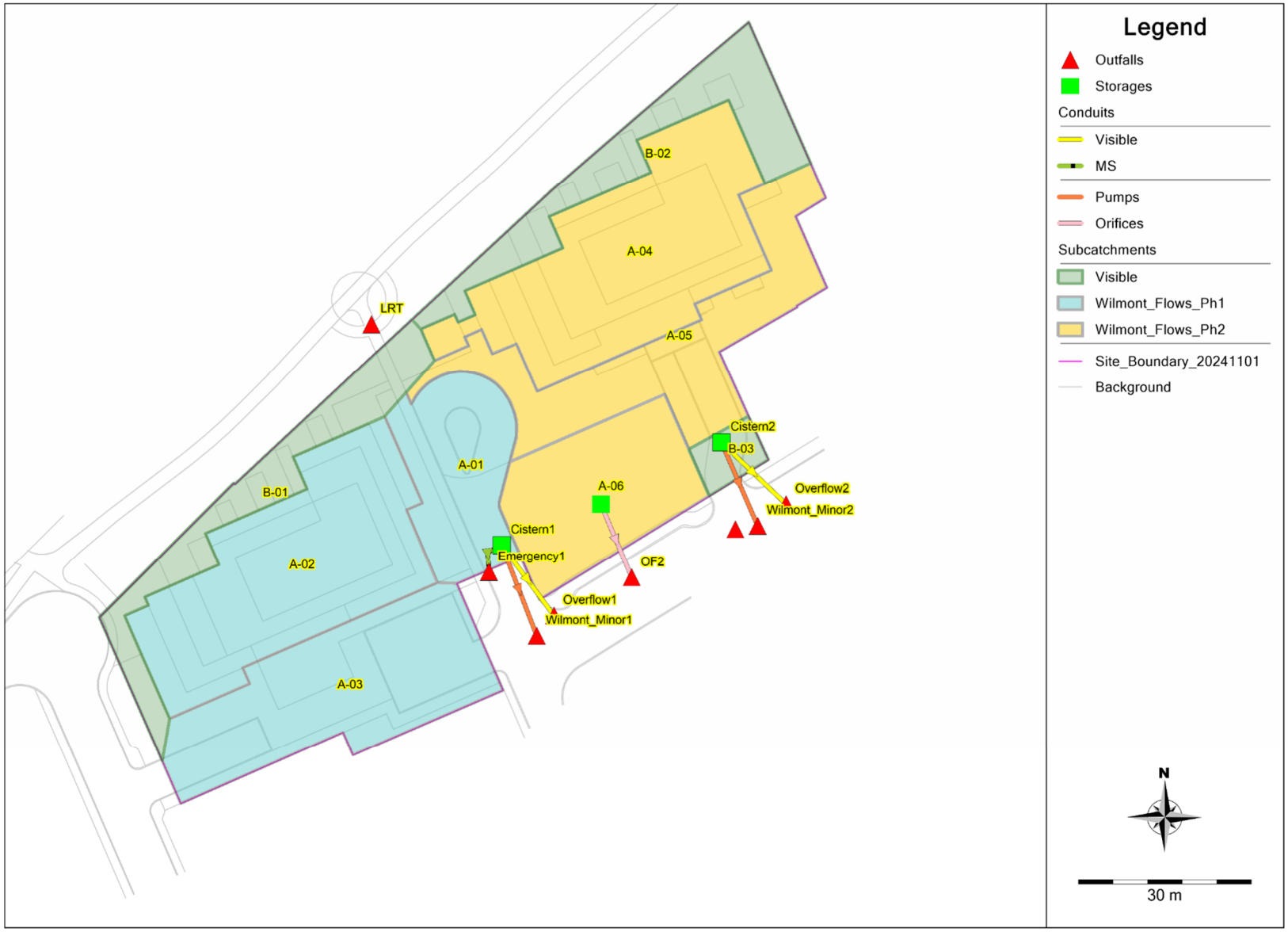
335 Roosevelt Avenue
Subcatchment Parameters

Area ID	Area (ha)	Width (m)	Flow Length (m)	Slope (%)	Runoff Coeff.	Imperv. (%)	Zero Imperv (%)
Wilmont Avenue							
A-01	0.06	20	30	2.0	0.73	75.4	0
A-02	0.13	26	50	0.5	0.90	100	95
A-03	0.11	19	55	2.0	0.66	65.7	0
A-04	0.14	25	55	0.5	0.90	100	95
A-05	0.09	15	60	2.0	0.58	53.6	0
A-06	0.07	48	15	2.0	0.40	28.6	0
B-03	0.01	5	20	2.0	0.76	80	0
Roosevelt Avenue/LRT Corridor							
B-01	0.06	55	10	2.0	0.49	41.4	0
B-02	0.06	59	10	2.0	0.48	40	0

335 Roosevelt Avenue (110098)
PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

Overall Model Schematic



Date: 2025-05-29
M:\2010\110098\DATA\Calculations\SWM\Model Schematic.docx

335 Roosevelt Avenue (110098)
PCSWMM Model Output
100yr 3-hour Chicago Storm

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
  --------------------------------------------------------------


  *************
  Element Count
  *************
  Number of rain gages ...... 1
  Number of subcatchments ... 9
  Number of nodes ........... 11
  Number of links ........... 6
  Number of pollutants ...... 0
  Number of land uses ....... 0


  ****************
  Raingage Summary
  ****************
                                                   Data       Recording
  Name                 Data Source                 Type       Interval
  ----------------------------------------------------------------------
  RG-1                 C3h-100yr                   INTENSITY   10 min.


  ********************
  Subcatchment Summary
  ********************
  Name                       Area     Width   %Imperv    %Slope Rain Gage            Outlet
  ------------------------------------------------------------------------------------------------------
---
  A-01                       0.06     19.67     75.40    2.0000 RG-1                 Tank1
  A-02                       0.13     26.20    100.00    0.5000 RG-1                 Tank1
  A-03                       0.11     19.27     65.70    2.0000 RG-1                 Tank1
  A-04                       0.14     24.55    100.00    0.5000 RG-1                 Tank2
  A-05                       0.09     15.00     53.60    2.0000 RG-1                 Tank2
  A-06                       0.07     48.00     28.60    2.0000 RG-1                 SU2
  B-01                       0.06     55.00     41.40    2.0000 RG-1                 OF1
  B-02                       0.06     59.00     40.00    2.0000 RG-1                 OF1
  B-03                       0.01      5.00     80.00    2.0000 RG-1                 OF8


  ************
  Node Summary
  ************
                                          Invert      Max.    Ponded    External
  Name                 Type                Elev.     Depth      Area    Inflow
  ----------------------------------------------------------------------------
  OF1                  OUTFALL             66.00      0.00       0.0
  OF2                  OUTFALL             63.00      0.00       0.0
  OF3                  OUTFALL             63.95      0.00       0.0
  OF4                  OUTFALL             64.72      0.49       0.0
  OF5                  OUTFALL             66.70      1.00       0.0
  OF6                  OUTFALL             63.95      0.00       0.0
  OF7                  OUTFALL             64.36      0.27       0.0
  OF8                  OUTFALL             65.00      0.00       0.0
  SU2                  STORAGE             64.90      2.40       0.0
  Tank1                STORAGE             54.86     11.70       0.0
  Tank2                STORAGE             54.86     11.00       0.0


  ************
  Link Summary
  ************
  Name             From Node        To Node          Type            Length    %Slope Roughness
  ----------------------------------------------------------------------------------------------
  C1               Tank1            OF4              CONDUIT            6.0    0.8334    0.0130
  C2               Tank1            OF5              CONDUIT            3.0    6.6815    0.0150
  C3               Tank2            OF7              CONDUIT            6.0    0.8334    0.0130
  P1               Tank1            OF3              TYPE2 PUMP
  P2               Tank2            OF6              TYPE2 PUMP
  OR1              SU2              OF2              ORIFICE


  *********************
  Cross Section Summary
  *********************
                                      Full     Full     Hyd.     Max.   No. of     Full
  Conduit          Shape             Depth     Area     Rad.    Width  Barrels     Flow
  ----------------------------------------------------------------------------------------
  C1               CIRCULAR           0.15     0.02     0.04     0.15        1    13.90
  C2               RECT_OPEN          1.00     3.00     0.60     3.00        1 36778.58
  C3               CIRCULAR           0.15     0.02     0.04     0.15        1    13.90


  ****************
  Analysis Options
  ****************
  Flow Units ............... LPS
  Process Models:
    Rainfall/Runoff ........ YES
    RDII ................... NO
    Snowmelt ............... NO
    Groundwater ............ NO
    Flow Routing ........... YES
    Ponding Allowed ........ NO
    Water Quality .......... NO
  Infiltration Method ...... HORTON
  Flow Routing Method ...... DYNWAVE
  Surcharge Method ......... EXTRAN
  Starting Date ............ 11/01/2024 00:00:00
  Ending Date .............. 11/02/2024 00:00:00
  Antecedent Dry Days ...... 0.0
  Report Time Step ......... 00:01:00
  Wet Time Step ............ 00:05:00
  Dry Time Step ............ 00:05:00
  Routing Time Step ........ 5.00 sec
  Variable Time Step ....... YES
  Maximum Trials ........... 8
  Number of Threads ........ 1
  Head Tolerance ........... 0.001524 m


  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m            mm
  **************************     ---------       -------
  Total Precipitation ......         0.051        71.667
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         0.010        13.409
  Surface Runoff ...........         0.042        58.489
  Final Storage ............         0.000         0.550
  Continuity Error (%) .....        -1.092


  **************************        Volume        Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.042         0.419
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.000         0.000
  External Outflow .........         0.042         0.419
  Flooding Loss ............         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Exfiltration Loss ........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.000         0.000
  Continuity Error (%) .....         0.000


  ***************************
  Time-Step Critical Elements
  ***************************
  None


  *********************************
  Highest Flow Instability Indexes
  *********************************
  All links are stable.


  **********************************
  Most Frequent Nonconverging Nodes
  **********************************
  Convergence obtained at all time steps.


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     4.50 sec
  Average Time Step           :     5.00 sec
  Maximum Time Step           :     5.00 sec
```

```
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.01
  Time Step Frequencies       :
      5.000 -  3.155 sec      :   100.00 %
      3.155 -  1.991 sec      :     0.00 %
      1.991 -  1.256 sec      :     0.00 %
      1.256 -  0.792 sec      :     0.00 %
      0.792 -  0.500 sec      :     0.00 %
```

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
A-01	71.67	0.00	0.00	10.93	53.07	7.17	60.24	0.04	27.48	0.841
A-02	71.67	0.00	0.00	0.00	72.21	0.00	72.21	0.09	64.15	1.008
A-03	71.67	0.00	0.00	15.60	46.34	9.31	55.65	0.06	44.01	0.777
A-04	71.67	0.00	0.00	0.00	72.21	0.00	72.21	0.10	65.86	1.008
A-05	71.67	0.00	0.00	21.46	37.78	12.13	49.91	0.04	32.57	0.696
A-06	71.67	0.00	0.00	31.95	20.07	20.28	40.35	0.03	27.44	0.563
B-01	71.67	0.00	0.00	25.95	29.05	17.35	46.40	0.03	23.88	0.647
B-02	71.67	0.00	0.00	26.58	28.07	17.74	45.80	0.03	25.47	0.639
B-03	71.67	0.00	0.00	8.82	56.23	6.08	62.31	0.01	4.79	0.869

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
OF1	OUTFALL	0.00	0.00	66.00	0 00:00	0.00
OF2	OUTFALL	0.00	0.00	63.00	0 00:00	0.00
OF3	OUTFALL	0.00	0.00	63.95	0 00:00	0.00
OF4	OUTFALL	0.00	0.00	64.72	0 00:00	0.00
OF5	OUTFALL	0.00	0.00	66.70	0 00:00	0.00
OF6	OUTFALL	0.00	0.00	63.95	0 00:00	0.00
OF7	OUTFALL	0.00	0.00	64.36	0 00:00	0.00
OF8	OUTFALL	0.00	0.00	65.00	0 00:00	0.00
SU2	STORAGE	0.08	1.58	66.48	0 01:23	1.58
Tank1	STORAGE	0.78	7.14	62.00	0 01:45	7.14
Tank2	STORAGE	0.62	4.60	59.46	0 01:55	4.60

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
OF1	OUTFALL	49.36	49.36	0 01:10	0.0525	0.0525	0.000
OF2	OUTFALL	0.00	6.10	0 01:23	0	0.029	0.000
OF3	OUTFALL	0.00	11.40	0 00:50	0	0.189	0.000
OF4	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
OF5	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
OF6	OUTFALL	0.00	6.90	0 00:46	0	0.142	0.000
OF7	OUTFALL	0.00	0.00	0 00:00	0	0	0.000 ltr
OF8	OUTFALL	4.79	4.79	0 01:10	0.00623	0.00623	0.000
SU2	STORAGE	27.44	27.44	0 01:10	0.0291	0.0291	0.249
Tank1	STORAGE	135.64	135.64	0 01:10	0.189	0.189	-0.015
Tank2	STORAGE	98.43	98.43	0 01:10	0.142	0.142	-0.012

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
SU2	0.000	0.3	0.0	0.0	0.011	11.2	0 01:23	6.10
Tank1	0.012	7.2	0.0	0.0	0.110	66.7	0 01:45	11.40
Tank2	0.012	6.2	0.0	0.0	0.088	45.9	0 01:55	6.90

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	12.34	4.93	49.36	0.053
OF2	12.07	2.78	6.10	0.029
OF3	20.97	10.44	11.40	0.189
OF4	0.00	0.00	0.00	0.000
OF5	0.00	0.00	0.00	0.000
OF6	25.43	6.48	6.90	0.142
OF7	0.00	0.00	0.00	0.000
OF8	11.79	0.61	4.79	0.006
System	10.32	25.23	78.43	0.419

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C3	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
P1	PUMP	11.40	0 00:50		1.00	
P2	PUMP	6.90	0 00:46		1.00	
OR1	ORIFICE	6.10	0 01:23			1.00

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl

```
  ---------------------------------------------------------------------------
  C1                      1.00   1.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
  C2                      1.00   1.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
  C3                      1.00   1.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00


  *************************
  Conduit Surcharge Summary
  *************************

  No conduits were surcharged.


  ***************
  Pumping Summary
  ***************

  -----------------------------------------------------------------------------------------------------------
-
                                                  Min       Avg       Max     Total     Power    % Time
Off
                        Percent   Number of      Flow      Flow      Flow    Volume     Usage    Pump
Curve
  Pump                 Utilized   Start-Ups       LPS       LPS       LPS  10^6 ltr     Kw-hr    Low
High
  -----------------------------------------------------------------------------------------------------------
-
  P1                      20.97           1      0.00     10.44     11.40     0.189      2.60    0.0
41.3
  P2                      25.43           1      0.00      6.48      6.90     0.142      2.52    0.0
0.0


  Analysis begun on:  Thu May 29 22:01:05 2025
  Analysis ended on:  Thu May 29 22:01:05 2025
  Total elapsed time: < 1 sec
```

Appendix C
Sanitary Sewer Design Sheets and Sanitary Calculations

NOVATECH ENGINEERING CONSULTANTS LTD.

SANITARY SEWER DESIGN SHEET

RICHMOND ROAD REHABILITATION
BROADVIEW AVE. to ROOSEVELT AVE.
CITY OF OTTAWA

Flow for Zoning = City of Ottawa Guidelines
Peak Factor M = City of Ottawa Guidelines
Weeping Tile Flow Allowance 1.0 L/ha/s
Infiltration Flow Allowance = 0.2 L/ha/s

Manning Coefficient n = 0.013

Location			Individual												Sewer Data						
Street	From	To	Area No.	Zone Type	Ave. Flow for Zoning (L/s/ha)	Area (ha)	Incr. Flow (L/s)	Area in Run (ha)	Flow in Run (L/s)	Peak Factor M	Peak Flow (L/s)	Extr. Flow (L/s)		Design Flow (L/s)	Type of Pipe	Pipe Size (mm)	Pipe Length (m)	Grade %	Capacity Full (L/s)	Velocity Full (m/s)	Velocity Actual (m/s)
WESTERLY, Churchill to Berkley:																					
Richmond Rd. [FUTURE]	307A	293A	A1	C1	3.00	0.55	1.7	0.55	1.7	6.00	10.2	0.7	*	10.9	PVC	250	67.92	0.44	41.2	0.8	0.6
Richmond Rd. [FUTURE]	293A	293B	A2	C1	3.00	0.65	2.0	1.20	3.6	6.00	21.6	1.4	*	23.0	PVC	250	79.07	0.44	41.2	0.8	0.7
Richmond Rd. [FUTURE]	293B	294A	A3	C1	3.00	0.51	1.5	1.71	5.1	6.00	30.6	2.1	*	32.7	PVC	300	69.42	0.40	63.8	0.9	0.8
Richmond Rd. [FUTURE]	294A	294B	A4	C1	3.00	0.37	1.1	2.08	6.2	6.00	37.2	2.5	*	39.7	PVC	300	46.90	0.40	63.8	0.9	0.8
Richmond Rd.	294B	295A	A5	C1	3.00	0.75	2.3	2.83	8.5	6.00	51.0	3.4	*	54.4	PVC	300	114.50	1.00	100.9	1.4	1.2
EASTERLY, Golden to Berkley:																					
			A7	R6	2.90	0.83	2.4														
Richmond Rd.	295B	295A	A6	C1	3.00	0.51	1.5	1.34	3.9	6.00	23.4	0.3		23.7	PVC	300	60.99	0.50	71.3	1.0	0.7
Berkley Ave.	295A	EXIST	—	—	—	—	—	—	—	—	—	—		78.1	EXIST	375	107.00	0.20	81.8	0.7	0.7

REGISTERED PROFESSIONAL ENGINEER
W. HERNBERGER
June 3/03
PROVINCE OF ONTARIO

4.17

* Includes Weeping Tile Flow Allowance

Design: W. Hernberger	Project: Richmond Road Rehabilitation Broadview Ave. to Roosevelt Ave.
Checked:	
Date: June, 2003	Client: City of Ottawa

SANITARY DRAINAGE AREAS	
DRAINAGE AREA	AREA (HA)
A1	0.55
A2	0.65
A3	0.51
A4	0.37
A5	0.75
A6	0.51

LEGEND

- DRAINAGE BOUNDARY
- SUB-DRAINAGE BOUNDARY
- PROPOSED SANITARY
- EXISTING SANITARY

No.	REVISIONS	BY	DATE
1.	ISSUED FOR [illegible]	[illegible]	[illegible]

NOVATECH

NOTE:
THE LOCATION OF THE UTILITIES IS APPROX[illegible]
SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES
AND UTILITY COMPANIES CONCERNED.
THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES
RESPONSIBLE FOR PRIVATE PROTECTION [illegible]

RICHARD ROAD
ROAD REHABILITATION PROJECT
BROADVIEW AVENUE TO ROOSEVELT

SANITARY DRAINAGE AREAS

P.ENG. V. NEWELL, P.ENG.

Ottawa

CONTRACT NO. 19803-50
DWG. NO. 11971-SA
SHEET OF

...\sam-11971-sanREV.dgn 3/9/2007 9:18:51 AM

2171 4 of 11

NOTE # 1: EXISTING CATCH BASIN LEADS TO BE DISCONNECTED FROM SANITARY LINE, PLUGGED WITH CONCRETE AND RECONNECTED TO STORM SEWER

OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED
Consulting Engineers

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

372 370 366 364 358 354 350 342 377 371 365 361 357 349 345 339 335

CON'T ON DWG. NO 3
MATCH LINE 0+175

REPLACE WITH NEW HD CB
SEE NOTE # 1
SEE NOTE # 2
SEE NOTE # 3
62.5m – 375 DIA. STORM SEWER
96.0m – 450 DIA. STORM SEWER
EX. 375 mm SAN
EX. 300 mm SAN
EX. 450 mm SAN
MH 47644
WEST NEPEAN COLLECTOR
SITE
SIDEWALK
ROOSEVELT AVENUE

NOTE # 2: REMOVE & REPLACE EXISTING SANITARY WITH NEW CONCRETE SANITARY

NOTE # 3: EXCAVATE TO SPRING LINE, PLACE CONCRETE ARCH AND BACKFILL

Existing Surface
Elevations
Type & Diameter (sewer)
Inverts Grad. & Prop. (sewer)
Stations

0+175 0+200 0+225 0+250 0+275 0+300 0+325 0+350

EXISTING GRADE
EXISTING 375 DIA. SANITARY SEWER
EXISTING 150 DIA. WATERMAIN
87.5m – 1200 DIA. CONC. CL IV STORM SEWER AT GR. 0.44%
EXISTING 450 DIA. SANITARY SEWER
96.0m – 450 DIA. CONC. CL IV STORM SEWER AT GR. 0.4%
EXISTING 150 DIA. WATERMAIN
375 ST. N.
450 ST. N.
450 ST. N.
450 ST. N.

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 450mm 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.S.C)
A minimum of 450mm vertical clearance to be maintained between sewers and watermains where practical
Borehole soil descriptions are not based on valve crumpts but on visual inspection only, except where otherwise noted.
Soil information taken from:
Date of Geotech Inspection:
This plan supersedes (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 & DRIVEWAYS: Asphalt, Surface or Concrete, Surface Treated		
WALKS: Concrete or Asphalt, Gravel, Cinder or Dirt		
DEPRESSED ACCESS: On Curb, On Sidewalk		
WATERMAIN		
GATEMAIN & VALVE		
WELL		
HYDRO		
TRAFFIC		
FIRE ALARM		
CABLEVISION		
STEAM LINE		
HYDRANT		
WATER VALVE		
STAND PIPE		
WATER VALVE CHAMBER		
SEWER, TRAFFIC, HYDRO & BELL (manholes may be shaded by outlines)		
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.		
HEAVY DUTY CATCH BASIN TO BE REMOVED & REPLACED WITH HEAVY DUTY CATCH BASIN		
JOINING OF CATCH BASIN CONNECTION TAKEN FROM I.S. REPORTS		
JOINING OF 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 900mm & ABOVE ARE SHOWN AS DOUBLE LINE. TO SCALE USING BASE LINE WEIGHT
UTILITIES X-OUT ARE ABANDONED, WELL PLANT SO MARKED MAY BECOME ACTIVE

Revisions:

No.	Date	Description	Drawn By	Appr'd By

Drawn by: J.M.SAMARIKA
Checked By:
Checked By: T. MARTIN
Checked By:

Final Measurements:

Contractor
Inspector
Architect/Engineer
Field Book #
Date
Checked By

Design And Construction Division
C.Sim P.Eng. — W.R. Cole P.Eng.
Manager, Design — Manager, Water Design & Geotch. Eng. — Sewer Const. Coord.

STORM SEWER
ROOSEVELT AVENUE
CHAINAGE 0+175 TO CHAINAGE 3+50

Contract No. 86-32
Survey Book OWM 89-63H0
Scale HOR. 1:200 VERT. 1:50
Plan No. 2171
Sheet 4 of 11

KEY PLAN
N.T.S.

LEGEND

- 0.79ha / 27554-27555 / 16 43.4 — AREA IN HECTARES; MANHOLE TO MANHOLE; POPULATION EQUIVALENT; NUMBER OF UNITS
- SANITARY DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- 209 — PROPOSED SANITARY SEWER AND MANHOLE
- EXISTING MANHOLE NOT LOCATED DURING FIELD INVESTIGATION
- AREAS CONTRIBUTING EXTRANEOUS STORM FLOWS TO CHURCHILL SANITARY SYSTEM
- FLAT ROOF UNIT
- REVERSE SLOPE DRIVEWAY

CHURCHILL AVE
CARLING TO SCOTT
SCOTT STREET
CHURCHILL TO WINONA

SANITARY DRAINAGE AREA
STA. 10+000 TO 10+570.82

BRUCE MASON, P.Eng.	TODD PENFOUND, CET.
Manager - Division	*Project Manager*

LICENSED PROFESSIONAL ENGINEER
M.J. PETEPIECE
100079354
PROVINCE OF ONTARIO

Ottawa

Contract No. ISB08-5000	Dwg. No. SAN1
Sheet 02 of 24	
Asset No.	
Asset Group: ISB	
Des: NTQ	Chk'd:
Dwn: RCH	Chk'd:
Utility Circ. No.:	
Const. Inspector:	
Scale: 0 5 10 15 20 25 metres 1 : 1000	

NOTE:
The location of 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.

NOVATECH ENGINEERS & CONSULTANTS LTD.
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
E-mail novatech@novatech-eng.com

REVISIONS

No.	Description	By	Date
1.	ISSUED FOR PRELIMINARY DESIGN CIRCULATION	ERD	07/10/09
2.	ISSUED FOR MOE APPROVAL	ERD	07/24/09
3.	RE-ISSUED FOR MOE APPROVAL	ERD	09/04/09

TITLE FRAME: 708mm x 534mm City of Ottawa 2008

Drawing:M:\2008\08058\CAD\design\ISB08-5000-san.dwg Layout:SAN1 Updated APR 17, 2009 at 2:09pm by rhillier

A1 - SANITARY SEWER DESIGN SHEET
CHURCHILL AVENUE - SCOTT OUTLET
JOB# 108058

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION				RESIDENTIAL AREA AND POPULATION						COMMERCIAL/INSTITUTIONAL				INFILTRATION					OTHER EXTRANEOUS FLOWS				FLOW								
	MANHOLE ID's			Area	Pop.	Cumulative		Peak	Peak	Area	Accu.	Peak	Peak	Total	Infiltration	Foundation Drain	Combined	Accumulated	Rev. Slope	Flat	Combined	Accumulated	Total	Type of Pipe	Length	Diameter	Diameter	SLOPE	Velocity	Capacity	Ratio
STREET	FROM	TO	AREA ID	(ha)		Area (ha)	Pop.	Factor	Flow (l/s)	(ha)	Area (ha)	Factor	Flow (l/s)	Area (ha)	Flow (l/s)	allowance (l/s)	additional flow (l/s)	Flow (l/s)	Driveways (l/s)	Roofs (l/s)	Ext Flows (l/s)	Flow (l/s)	Flow (l/s)		(m)	Actual (mm)	Nominal (mm)		(Full) (m/s)	(Full) (l/s)	Q/Qfull (%)
Churchill	209	207	209-207(A)	0.07	25.2	0.07	25.2			0	0	1.5	0.00	0.07	0.02	0.00	0.02	0.02	0	0	0	0									
			209-207 (B)	0.18	129.6	0.25	154.8			0	0	1.5	0.00	0.18	0.05	0.00	0.05	0.07	0	0	0	0									
			209-207 (C)	0.08	57.6	0.33	212.4			0	0	1.5	0.00	0.08	0.02	0.00	0.02	0.09	0	0	0	0									
			209-207 (ROW)	0.13	0	0.46	212.4	4.00	3.44	0	0	1.5	0.00	0.13	0.04	0.00	0.04	0.13	0	0	0	0	3.57	PVC	65.00	254	250	2.15	1.80	91.0	4%
	207	205	207-205 (A)	0.23	82.8	2.6	1114.5			0	0	1.5	0.00	0.23	0.06	0.00	0.06	2.98	0	0	0	0.95									
			207-205 (B)	0.22	158.4	2.82	1272.9			0	0	1.5	0.00	0.22	0.06	0.00	0.06	3.04	0	0	0	0.95									
			207-205 (C)	0.2	144	3.02	1416.9			0	0	1.5	0.00	0.2	0.06	0.00	0.06	3.10	0	0	0	0.95									
			207-205 (ROW1)	0.08	0	3.1	1416.9			0	0	1.5	0.00	0.18	0.05	0.00	0.05	3.15	0	0	0	0.95									
			207-205 (ROW2)	0.14	0	3.24	1416.9	3.70	21.22	0	0	1.5	0.00	0.14	0.04	0.00	0.04	3.19	0	0	0	0.95	25.36	PVC	79.09	254	250	0.39	0.77	38.8	65%
	205	203	205-203 (A)	0.24	86.4	4.83	1644.4			0	0	1.5	0.00	0.24	0.07	0.00	0.07	8.33	0	0	0	4.87									
			205-203 (B)	0.24	172.8	5.07	1817.2			0	0	1.5	0.00	0.24	0.07	0.00	0.07	8.40	0	0	0	4.87									
			205-203 (C)	0.2	144	5.27	1961.2			0	0	1.5	0.00	0.2	0.06	0.00	0.06	8.45	0	0	0	4.87									
			205-203 (ROW)	0.15	0	5.42	1961.2	3.59	28.54	0	0	1.5	0.00	0.15	0.04	0.00	0.04	8.50	0	0	0	4.87	41.91	PVC	77.58	305	300	0.34	0.80	58.4	72%
	203	201	203-201 (A)	0.12	43.2	8.96	2927.8			0	0	1.5	0.00	0.12	0.03	0.00	0.03	18.74	0	0	0	4.87									
			203-201 (B)	0.12	86.4	9.08	3014.2			0	0	1.5	0.00	0.12	0.03	0.00	0.03	18.77	0	0	0	4.87									
			203-201 (C)	0.23	165.6	9.31	3179.8			0	0	1.5	0.00	0.23	0.06	0.00	0.06	18.83	0	0	0	4.87									
			203-201 (ROW)	0.15	0	9.46	3179.8	3.42	44.06	0	0	1.5	0.00	0.15	0.04	0.00	0.04	18.88	0	0	0	4.87	67.81	PVC	82.08	305	300	0.65	1.11	81.0	84%
Scott	201	253A		0	0	9.95	3439	3.39	47.25	0	0	1.5	0.00	0	0.00	0.00	0.00	19.01	0	0	0	4.87	71.13	PVC	10.75	305	300	0.84	1.26	92.2	77%
	253A	253B	201-253 (A)	0.19	136.8	10.14	3575.8			0	0	1.5	0.00	0.19	0.05	0.00	0.05	19.07	0	0	0	4.87									
			201-253 (ROW)	0.13	0	10.27	3575.8	3.38	48.91	0	0	1.5	0.00	0.13	0.04	0.00	0.04	19.10	0	0	0	4.87	72.88	PVC	65.22	305	300	1.15	1.48	108.1	67%
	253	255	253-259 (A)	0.37	266.4	14.01	4895.2			0	0	1.5	0.00	0.37	0.10	0.00	0.10	20.15	0	0	0	4.87									
			253-259 (B)	0.33	59.4	14.34	4954.6			0	0	1.5	0.00	0.33	0.09	0.00	0.09	20.24	0	0	0	4.87									
			253-259 (ROW)	0.14	0	14.48	4954.6	3.25	65.20	0	0	1.5	0.00	0.14	0.04	0.00	0.04	20.28	0	0	0	4.87	90.36	CONC	60.00	457	450	0.25	0.91	148.6	61%
	255	257				14.48	4954.6	3.25	65.20	0	0	1.5	0.00	0	0.00	0.00	0.00	20.28	0	0	0	4.87	90.36	CONC	57.17	457	450	0.26	0.93	152.2	59%
	257	259				14.48	4954.6	3.25	65.20	0	0	1.5	0.00	0	0.00	0.00	0.00	20.28	0	0	0	4.87	90.36	CONC	5.00	457	450	0.40	1.14	188.0	48%
	259	1710				14.48	4954.6	3.25	65.20	0	0	1.5	0.00	0	0.00	0.00	0.00	20.28	0	0	0	4.87	90.36	PVC	10.00	381	375	1.70	2.09	238.3	38%
Madison	*27561*	*27562*	*27561-27562 (A)*	*0.07*	*10.2*	*0.07*	*10.2*			*0*	*0*	*1.5*	*0.00*	*0.07*	*0.02*	*0.35*	*0.37*	*0.37*	*0*	*0*	*0*	*0*									
			27561-27562 (B)	*0.06*	*43.2*	*0.13*	*53.4*			*0*	*0*	*1.5*	*0.00*	*0.06*	*0.02*	*0.00*	*0.02*	*0.39*	*0*	*0*	*0*	*0*									
			27561-27562 (C)	*0.12*	*86.4*	*0.25*	*139.8*			*0*	*0*	*1.5*	*0.00*	*0.12*	*0.03*	*0.00*	*0.03*	*0.42*	*0*	*0*	*0*	*0*									
			27561-27562 (ROW)	*0.1*	*0*	*0.35*	*139.8*	*4.00*	*2.27*	*0*	*0*	*1.5*	*0.00*	*0.1*	*0.03*	*0.00*	*0.03*	*0.45*	*0.95*	*0*	*0.95*	*0.95*	*3.66*	*PVC*	*23.23*	*229*	*225*	*0.90*	*1.08*	*44.5*	*8%*
	27562	*27563*	*27562-27563 (A)*	*0.18*	*25.5*	*0.53*	*165.3*			*0*	*0*	*1.5*	*0.00*	*0.18*	*0.05*	*0.90*	*0.95*	*1.40*	*0*	*0*	*0*	*0.95*									
			27562-27563 (B)	*0.23*	*165.6*	*0.76*	*330.9*			*0*	*0*	*1.5*	*0.00*	*0.23*	*0.06*	*0.00*	*0.06*	*1.46*	*0*	*0*	*0*	*0.95*									
			27562-27563 (C)	*0.25*	*180*	*1.01*	*510.9*			*0*	*0*	*1.5*	*0.00*	*0.25*	*0.07*	*0.00*	*0.07*	*1.53*	*0*	*0*	*0*	*0.95*									
			27562-27563 (ROW)	*0.11*	*0*	*1.12*	*510.9*	*3.97*	*8.22*	*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*1.56*	*0*	*0*	*0*	*0.95*	*10.73*	*PVC*	*62.02*	*229*	*225*	*0.71*	*0.96*	*39.4*	*27%*
	27563	*265*	*27563-207 (A)*	*0.2*	*20.4*	*1.32*	*531.3*			*0*	*0*	*1.5*	*0.00*	*0.2*	*0.06*	*1.00*	*1.06*	*2.62*	*0*	*0*	*0*	*0.95*									
			27563-207 (B)	*0.21*	*151.2*	*1.53*	*682.5*			*0*	*0*	*1.5*	*0.00*	*0.21*	*0.06*	*0.00*	*0.06*	*2.68*	*0*	*0*	*0*	*0.95*									
			27563-207 (C)	*0.19*	*136.8*	*1.72*	*819.3*			*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.00*	*0.05*	*2.73*	*0*	*0*	*0*	*0.95*									
			27563-207 (ROW)	*0.19*	*0*	*1.91*	*819.3*	*3.85*	*12.79*	*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.00*	*0.05*	*2.78*	*0*	*0*	*0*	*0.95*	*16.53*	*PVC*	*86.22*	*229*	*225*	*0.35*	*0.67*	*27.6*	*60%*
	265	207		0	0	1.91	819.3	3.85	12.79	0	0	1.5	0.00	0	0.00	0.00	0.00	2.78	0	0	0	0.95	16.53	PVC	23.50	254	250	0.50	0.86	43.8	38%
Whitby	*27559*	*27560*	*27559-27560 (A)*	*0.31*	*45.9*	*0.31*	*45.9*			*0*	*0*	*1.5*	*0.00*	*0.31*	*0.09*	*1.55*	*1.64*	*1.64*	*0*	*0*	*0*	*0*									
			27559-27560 (B)	*0.29*	*35.7*	*0.6*	*81.6*			*0*	*0*	*1.5*	*0.00*	*0.29*	*0.08*	*1.45*	*1.53*	*3.17*	*0*	*0*	*0*	*0*									
			27559-27560 (ROW)	*0.23*	*0*	*0.83*	*81.6*	*4.00*	*1.32*	*0*	*0*	*1.5*	*0.00*	*0.23*	*0.06*	*0.00*	*0.06*	*3.23*	*1.9*	*0*	*1.90*	*1.9*	*6.45*	*PVC*	*102.52*	*229*	*225*	*0.46*	*0.77*	*31.7*	*20%*
	27560	*205*	*27560-205 (A)*	*0.18*	*34*	*1.01*	*115.6*			*0*	*0*	*1.5*	*0.00*	*0.18*	*0.05*	*0.90*	*0.95*	*4.18*	*0*	*0*	*0*	*1.9*									
			27560-205 (B)	*0.16*	*25.5*	*1.17*	*141.1*			*0*	*0*	*1.5*	*0.00*	*0.16*	*0.04*	*0.80*	*0.84*	*5.03*	*0*	*0*	*0*	*1.9*									
			27560-205 (ROW)	*0.18*	*0*	*1.35*	*141.1*	*4.00*	*2.29*	*0*	*0*	*1.5*	*0.00*	*0.18*	*0.05*	*0.00*	*0.05*	*5.08*	*0*	*2.02*	*2.02*	*3.92*	*11.28*	*PVC*	*80.03*	*229*	*225*	*0.35*	*0.67*	*27.7*	*41%*
	263	205		0	0	1.35	141.1	4.00	2.29	0	0	1.5	0.00	0	0.00	0.00	0.00	5.08	0	0	0	3.92	11.28	PVC	24.00	254	250	1.79	1.64	83.0	14%
Winston	*27554*	*27555*	*27554-27555 (A)*	*0.07*	*10.2*	*0.07*	*10.2*			*0*	*0*	*1.5*	*0.00*	*0.07*	*0.02*	*0.35*	*0.37*	*0.37*	*0*	*0*	*0*	*0*									
			27554-27555 (B)	*0.09*	*64.8*	*0.16*	*75*			*0*	*0*	*1.5*	*0.00*	*0.09*	*0.03*	*0.00*	*0.03*	*0.39*	*0*	*0*	*0*	*0*									
			27554-27555 (C)	*0.12*	*86.4*	*0.28*	*161.4*			*0*	*0*	*1.5*	*0.00*	*0.12*	*0.03*	*0.00*	*0.03*	*0.43*	*0*	*0*	*0*	*0*									
			27554-27555 (D)	*0.21*	*35.7*	*0.49*	*197.1*			*0*	*0*	*1.5*	*0.00*	*0.21*	*0.06*	*1.05*	*1.11*	*1.54*	*0*	*0*	*0*	*0*									
			27554-27555 (E)	*0.13*	*93.6*	*0.62*	*290.7*			*0*	*0*	*1.5*	*0.00*	*0.13*	*0.04*	*0.00*	*0.04*	*1.57*	*0*	*0*	*0*	*0*									
			27554-27555 (ROW)	*0.15*	*0*	*0.77*	*290.7*	*4.00*	*4.71*	*0*	*0*	*1.5*	*0.00*	*0.15*	*0.04*	*0.00*	*0.04*	*1.62*	*0*	*0*	*0*	*0*	*6.33*	*PVC*	*114.08*	*229*	*225*	*1.61*	*1.45*	*59.4*	*11%*
	27555	*27556*	*27555-27556 (A)*	*0.1*	*15.3*	*0.87*	*306*			*0*	*0*	*1.5*	*0.00*	*0.1*	*0.03*	*0.50*	*0.53*	*2.14*	*0*	*0*	*0*	*0*									
			27555-27556 (B)	*0.18*	*30.6*	*1.05*	*336.6*			*0*	*0*	*1.5*	*0.00*	*0.18*	*0.05*	*0.90*	*0.95*	*3.09*	*0*	*0*	*0*	*0*									
			27555-27556 (C)	*0.4*	*71.4*	*1.45*	*408*			*0*	*0*	*1.5*	*0.00*	*0.4*	*0.11*	*2.00*	*2.11*	*5.21*	*0*	*0*	*0*	*0*									
			27555-27556 (ROW)	*0.15*	*0*	*1.6*	*408*	*4.00*	*6.61*	*0*	*0*	*1.5*	*0.00*	*0.15*	*0.04*	*0.00*	*0.04*	*5.25*	*0*	*0*	*0*	*0*	*11.86*	*PVC*	*120.82*	*229*	*225*	*0.31*	*0.64*	*26.2*	*45%*
Wilmont	*27556*	*27557*	*27556-27557 (A)*	*0.25*	*35.7*	*1.85*	*443.7*			*0*	*0*	*1.5*	*0.00*	*0.25*	*0.07*	*1.25*	*1.32*	*6.57*	*0*	*0*	*0*	*0*									
			27556-27557 (B)	*0.21*	*30.6*	*2.06*	*474.3*			*0*	*0*	*1.5*	*0.00*	*0.21*	*0.06*	*1.05*	*1.11*	*7.68*	*0*	*0*	*0*	*0*									
			27556-27557 (C)	*0.56*	*403.2*	*2.62*	*877.5*			*0*	*0*	*1.5*	*0.00*	*0.56*	*0.16*	*0.00*	*0.16*	*7.83*	*0*	*0*	*0*	*0*									
			27556-27557 (ROW)	*0.18*	*0*	*2.8*	*877.5*	*3.84*	*13.64*	*0*	*0*	*1.5*	*0.00*	*0.18*	*0.05*	*0.00*	*0.05*	*7.88*	*0*	*0*	*0*	*0*	*21.52*	*PVC*	*114.97*	*229*	*225*	*0.42*	*0.74*	*30.2*	*71%*
	27557	*261*	*27557-203 (A)*	*0.24*	*25.5*	*3.04*	*903*			*0*	*0*	*1.5*	*0.00*	*0.24*	*0.07*	*1.20*	*1.27*	*9.15*	*0*	*0*	*0*	*0*									
			27557-203 (B)	*0.19*	*20.4*	*3.23*	*923.4*			*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.95*	*1.00*	*10.15*	*0*	*0*	*0*	*0*									
			27557-203 (ROW)	*0.19*	*0*	*3.42*	*923.4*	*3.82*	*14.30*	*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.00*	*0.05*	*10.21*	*0*	*0*	*0*	*0*	*24.50*	*PVC*	*88.00*	*229*	*225*	*0.35*	*0.68*	*27.8*	*88%*
	261	203		0	0	3.42	923.4	3.82	14.30	0	0	1.5	0.00	0	0.00	0.00	0.00	10.21	0	0	0	0	24.50	PVC	26.00	254	250	1.12	1.29	65.5	37%
--	*Site*	*201*	*Site-201 (A)*	*0.36*	*259.2*	*0.36*	*259.2*			*0*	*0*	*1.5*	*0.00*	*0.36*	*0.10*	*0.00*	*0.10*	*0.10*	*0*	*0*	*0*	*0*									
			Site-201 (ROW)	*0.13*	*0*	*0.49*	*259.2*	*4.00*	*4.20*	*0*	*0*	*1.5*	*0.00*	*0.13*	*0.04*	*0.00*	*0.04*	*0.14*	*0*	*0*	*0*	*0*	*4.34*	*PVC*	*81.80*	*229*	*225*	*1.09*	*1.19*	*48.8*	*9%*

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A = Area in hectares (ha)
i = Rainfall intensity (mm/hr) = 104.2mm/hr (City of Ottawa, 5yr stm, 10min tc)
c = Runoff Coefficient = 0.9 (Impervious Surfaces)

Sanitary Design: Novatech Engineering Consultants Ltd.

PROJECT:	Churchill Avenue Reconstruction	Designed:	NTQ
CLIENT:	City of Ottawa	Checked:	
Date:	October 14, 2009	Dwg. Reference:	
Revised	January 7, 2009		

A1 - SANITARY SEWER DESIGN SHEET
CHURCHILL AVENUE - SCOTT OUTLET
JOB# 108058

NOVATECH ENGINEERING CONSULTANTS LTD.

LOCATION				RESIDENTIAL AREA AND POPULATION						COMMERCIAL/INSTITUTIONAL				INFILTRATION					OTHER EXTRANEOUS FLOWS				FLOW								
	MANHOLE ID's			Area	Pop.	Cumulative		Peak	Peak	Area	Accu.	Peak	Peak	Total	Infiltration	Foundation Drain	Combined	Accumulated	Rev. Slope	Flat	Combined	Accumulated	Total	Type of Pipe	Length	Diameter	Diameter	SLOPE	Velocity	Capacity	Ratio
STREET	FROM	TO	AREA ID	(ha)		Area (ha)	Pop.	Factor	Flow (l/s)	(ha)	Area (ha)	Factor	Flow (l/s)	Area (ha)	Flow (l/s)	allowance (l/s)	additional flow (l/s)	Flow (l/s)	Driveways (l/s)	Roofs (l/s)	Ext Flows (l/s)	Flow (l/s)	Flow (l/s)		(m)	Actual (mm)	Nominal (mm)		(Full) (m/s)	(Full) (l/s)	Q/Qfull (%)
Winona	*27572*	*27574*	*27572-27574 (A)*	*0.11*	*79.2*	*0.11*	*79.2*			*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*0.03*	*0*	*0*	*0*	*0*									
			27572-27574 (ROW)	*0.05*	*0*	*0.16*	*79.2*	*4.00*	*1.28*	*0*	*0*	*1.5*	*0.00*	*0.05*	*0.01*	*0.00*	*0.01*	*0.04*	*0*	*0*	*0*	*0*	*1.33*	*PVC*	*44.00*	*229*	*225*	*0.77*	*1.00*	*41.1*	*3%*
	27574	*27576*	*27574-27576 (ROW)*	*0.1*	*0*	*0.91*	*471.6*	*3.99*	*7.62*	*0*	*0*	*1.5*	*0.00*	*0.1*	*0.03*	*0.00*	*0.03*	*0.25*	*0*	*0*	*0*	*0*	*7.87*	*PVC*	*75.30*	*229*	*225*	*2.86*	*1.93*	*79.1*	*10%*
	27576	*27578*	*27576-27578 (A)*	*0.1*	*36*	*2.15*	*817.2*			*0*	*0*	*1.5*	*0.00*	*0.1*	*0.03*	*0.00*	*0.03*	*0.60*	*0*	*0*	*0*	*0*									
			27576-27578 (ROW)	*0.11*	*0*	*2.26*	*817.2*	*3.85*	*12.76*	*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*0.63*	*0*	*0*	*0*	*0*	*13.39*	*PVC*	*79.40*	*229*	*225*	*0.57*	*0.86*	*35.2*	*38%*
	27578	*253*	*27578-253 (A)*	*0.04*	*14.4*	*3.26*	*1053*			*0*	*0*	*1.5*	*0.00*	*0.04*	*0.01*	*0.00*	*0.01*	*0.91*	*0*	*0*	*0*	*0*									
			27576-253 (ROW)	*0.11*	*0*	*3.37*	*1053*	*3.79*	*16.15*	*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*0.94*	*0*	*0*	*0*	*0*	*17.09*	*PVC*	*80.30*	*229*	*225*	*0.59*	*0.87*	*35.8*	*48%*
Picton	*27573*	*27574*	*27573-27574 (A)*	*0.13*	*46.8*	*0.13*	*46.8*			*0*	*0*	*1.5*	*0.00*	*0.13*	*0.04*	*0.00*	*0.04*	*0.04*	*0*	*0*	*0*	*0*									
			27573-27574 (B)	*0.48*	*345.6*	*0.61*	*392.4*			*0*	*0*	*1.5*	*0.00*	*0.48*	*0.13*	*0.00*	*0.13*	*0.17*	*0*	*0*	*0*	*0*									
			27573-27574 (ROW)	*0.04*	*0*	*0.65*	*392.4*	*4.00*	*6.36*	*0*	*0*	*1.5*	*0.00*	*0.04*	*0.01*	*0.00*	*0.01*	*0.18*	*0*	*0*	*0*	*0*	*6.54*	*PVC*	*62.80*	*229*	*225*	*0.51*	*0.81*	*33.4*	*20%*
Elmgrove	*27575*	*28408*	*27575-28408 (A)*	*0.2*	*72*	*0.2*	*72*			*0*	*0*	*1.5*	*0.00*	*0.2*	*0.06*	*0.00*	*0.06*	*0.06*	*0*	*0*	*0*	*0*									
			27575-28408 (B)	*0.19*	*68.4*	*0.39*	*140.4*			*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.00*	*0.05*	*0.11*	*0*	*0*	*0*	*0*									
			27575-28408 (C)	*0.46*	*82.8*	*0.85*	*223.2*			*0*	*0*	*1.5*	*0.00*	*0.46*	*0.13*	*0.00*	*0.13*	*0.24*	*0*	*0*	*0*	*0*									
			27575-28408 (ROW)	*0.02*	*0*	*0.87*	*223.2*	*4.00*	*3.62*	*0*	*0*	*1.5*	*0.00*	*0.02*	*0.01*	*0.00*	*0.01*	*0.24*	*0*	*0*	*0*	*0*	*3.86*	*PVC*	*36.70*	*305*	*300*	*0.74*	*1.18*	*86.5*	*4%*
	28408	*27576*	*28408-27576 (A)*	*0.11*	*39.6*	*0.98*	*262.8*			*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*0.27*	*0*	*0*	*0*	*0*									
			28408-27576 (B)	*0.13*	*46.8*	*1.11*	*309.6*			*0*	*0*	*1.5*	*0.00*	*0.13*	*0.04*	*0.00*	*0.04*	*0.31*	*0*	*0*	*0*	*0*									
			28408-27576 (ROW)	*0.03*	*0*	*1.14*	*309.6*	*4.00*	*5.02*	*0*	*0*	*1.5*	*0.00*	*0.03*	*0.01*	*0.00*	*0.01*	*0.32*	*0*	*0*	*0*	*0*	*5.34*	*PVC*	*43.80*	*381*	*375*	*0.02*	*0.24*	*27.6*	*19%*
Ashton	*27577*	*27578*	*27577-27578 (A)*	*0.19*	*68.4*	*0.19*	*68.4*			*0*	*0*	*1.5*	*0.00*	*0.19*	*0.05*	*0.00*	*0.05*	*0.05*	*0*	*0*	*0*	*0*									
			27577-27578 (B)	*0.16*	*57.6*	*0.35*	*126*			*0*	*0*	*1.5*	*0.00*	*0.16*	*0.04*	*0.00*	*0.04*	*0.10*	*0*	*0*	*0*	*0*									
			27577-27578 ©	*0.53*	*95.4*	*0.88*	*221.4*			*0*	*0*	*1.5*	*0.00*	*0.53*	*0.15*	*0.00*	*0.15*	*0.25*	*0*	*0*	*0*	*0*									
			27577-27578 (ROW)	*0.08*	*0*	*0.96*	*221.4*	*4.00*	*3.59*	*0*	*0*	*1.5*	*0.00*	*0.08*	*0.02*	*0.00*	*0.02*	*0.27*	*0*	*0*	*0*	*0*	*3.86*	*PVC*	*81.40*	*229*	*225*	*0.45*	*0.77*	*31.6*	*12%*

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Sanitary Design: Novatech Engineering Consultants Ltd.
PROJECT: Churchill Avenue Reconstruction — Designed: NTQ
CLIENT: City of Ottawa — Checked:
Date: October 14, 2009 — Dwg. Reference:
Revised January 7, 2009

CHURCHILL AVENUE - RICHMOND & BYRON OUTLETS
JOB# 108058

LOCATION				RESIDENTIAL AREA AND POPULATION						COMMERCIAL/INSTITUTIONAL				INFILTRATION					OTHER EXTRANEOUS FLOWS				FLOW								
	MANHOLE ID's			Area	Pop.	Cumulative		Peak	Peak	Area	Accu.	Peak	Peak	Total	Infiltration	Foundation Drain	Combined	Accumulated	Rev. Slope	Flat	Combined	Accumulated	Total	Type of Pipe	Length	Diameter	Diameter	SLOPE	Velocity	Capacity	Ratio
STREET	FROM	TO	AREA ID	(ha)		Area (ha)	Pop.	Factor	Flow (l/s)	(ha)	Area (ha)	Factor	Flow (l/s)	Area (ha)	Flow (l/s)	allowance (l/s)	additional flow (l/s)	Flow (l/s)	Driveways (l/s)	Roofs (l/s)	Ext Flows (l/s)	Flow (l/s)	Flow (l/s)		(m)	Actual (mm)	Nominal (mm)		(Full) (m/s)	(Full) (l/s)	Q/Qfull (%)
RICHMOND OUTLET																															
Lincoln	*Dead End*	*213*	*Dead End-213 (ROW)*	*0.11*	*0*	*0.11*	*0*	*4.00*	*0.00*	*0*	*0*	*1.5*	*0.00*	*0.11*	*0.03*	*0.00*	*0.03*	*0.03*	*0*	*0*	*0*	*0*	*0.03*	*PVC*	*-*	*152*	*150*	*-*	*-*	*-*	*-*
Churchill	213	211	213-211 (A)	0.09	69.8	0.2	69.8			0	0	1.5	0.00	0.09	0.03	0.00	0.03	0.06	0	0	0	0									
			213-211 (B)	0.1	72	0.3	141.8			0	0	1.5	0.00	0.1	0.03	0.00	0.03	0.08	0	0	0	0									
			213-211 (ROW A)	0.06	0	0.36	141.8			0	0	1.5	0.00	0.06	0.02	0.00	0.02	0.10	0	0	0	0									
			213-211 (ROW B)	0.28	0	0.64	141.8	4.00	2.30	0	0	1.5	0.00	0.28	0.08	0.00	0.08	0.18	0	0	0	0	2.48	CONC	47.78	305	300	5.99	3.38	246.6	1%
	211B	211A	211-46990 (A)	0.17	122.4	0.81	264.2			0	0	1.5	0.00	0.17	0.05	0.00	0.05	0.23	0	0	0	0									
			211-46990 (B)	0.16	115.2	0.97	379.4			0	0	1.5	0.00	0.16	0.04	0.00	0.04	0.27	0	0	0	0									
			211-46990 (ROW)	0.12	0	1.09	379.4	4.00	6.15	0	0	1.5	0.00	0.12	0.03	0.00	0.03	0.31	0	0	0	0	6.45	CONC	27.10	305	300	2.84	2.33	169.9	4%
	211A	46990		0	0	1.09	379.4	4.00	6.15	0	0	1.5	0.00	0	0.00	0.00	0.00	0.31	0	0	0	0	6.45	CONC	23.15	305	300	2.85	2.33	170.2	4%
	46990	46989																													
BYRON OUTLET																															
Churchill	217	215A	217-215 (A)	0.14	20.4	0.14	20.4			0	0	1.5	0.00	0.14	0.04	0.70	0.74	0.74	0	0	0	0									
			217-215 (B)	0.76	163.2	0.9	183.6			0	0	1.5	0.00	0.76	0.21	3.80	4.01	4.75	0	0	0	0									
			217-215 (ROW)	0.18	0	1.08	183.6	4.00	2.98	0	0	1.5	0.00	0.18	0.05	0.00	0.05	4.80	0	0	0	0	7.78	PVC	69.65	254	250	1.36	1.43	72.4	11%
	215A	215B		0	0	1.08	183.6	4.00	2.98	0	0	1.5	0.00	0	0.00	0.00	0.00	4.80	0	0	0	0	7.78	PVC	9.50	254	250	0.95	1.19	60.3	13%
Byron	215B	27820		0	0	1.08	183.6	4.00	2.98	0	0	1.5	0.00	0	0.00	0.00	0.00	4.80	0	0	0	0	7.78	PVC	76.80	229	225	1.15	1.22	50.1	16%

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Sanitary Design: Novatech Engineering Consultants Ltd.
PROJECT: Churchill Avenue Reconstruction — Designed: NTQ
CLIENT: City of Ottawa — Checked:
Date: October 14, 2009 — Dwg. Reference:
Revised January 7, 2009

SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 110098
Project Name: 335 Roosevelt Avenue
Date: 5/29/2025
Input By: Lucas Wilson
Reviewed By: Mark Bissett
Drawing Reference: 110098-GP, Figure 4.1

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Annual Cell Output
- Calculated Rare Cell Output

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Demand																		Design Capacity							
				Residential Flow										Industrial / Commercial / Institutional (ICI) Flow						Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design							
Street	Area ID	From MH	To MH	Singles	Semis / Towns	Apts	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Commercial / Institutional Area (ha.)	Cumulative Commercial / Institutional Area (ha.)	Average Design Commercial / Institutional Flow (L/s)	Commercial / Institutional Peaking Factor	Cumulative ICI Area (ha.)	Peak Design ICI Flow Q (ici) (L/s)	Cumulative Extraneous Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity Vfull (m/s)	Q(D) / Qfull
PHASE 1																													
West Building	SAN1	Stub	Existing			157	0.283	0.283	0.92	3.47	3.18	0.330	0.330	0.000	0.000	0.00	1.00	0.000	0.00	0.330	0.11	3.3	13.3	200 PVC	0.203	0.013	1.00	34.2	1.06	9.6%
	Existng Flows																												
Richmond Road	Design Flow from 2003 Project (Richmond Rd Rehab)																					78.1							
Danforth Avenue	SAN6						0.000	0.000	0.00	3.80	0.00	0.000	0.000	0.550	0.550	0.18	1.50	0.550	0.27	1.060	0.35	0.6								
Roosevelt Avenue	SAN3			7	32	58	0.215	0.215	0.70	3.51	2.44	2.100	2.100	0.060	0.060	0.02	1.00	0.060	0.02	2.160	0.71	3.2								
Berkeley Avenue	SAN4			7	43		0.140	0.140	0.45	3.56	1.61	1.600	1.600	0.000	0.000	0.00	1.00	0.000	0.00	1.600	0.53	2.1								
Tay Street	SAN5				9		0.024	0.024	0.08	3.69	0.29	0.250	0.250	0.000	0.000	0.00	1.00	0.000	0.00	0.250	0.08	0.4								
Dominion Avenue	SAN5			7	7	291	0.567	0.567	1.84	3.36	6.16	1.630	1.630	0.000	0.000	0.00	1.00	0.000	0.00	1.630	0.54	6.7								
Total Flow	-						0.000	1.228	3.98	3.19	12.70	5.910	5.910	0.000	0.610	0.20	1.00	0.610	0.20	7.030	2.32	**93.3**	5.7	450 PVC	0.457	0.013	0.20	133.0	0.81	70.2%
PHASE 2																													
East Building	SAN2	Stub	Existing			160	0.288	0.288	0.93	3.47	3.24	0.360	0.360	0.000	0.000	0.00	1.00	0.000	0.00	0.360	0.12	3.4	13.3	200 PVC	0.203	0.013	1.00	34.2	1.06	9.8%

Demand Equation / Parameters

1. **Q(D), Q(A), Q(R) =** Q(p) + Q(fd) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 L/per person/day (design)
   200 L/per person/day (annual and rare)
4. **M = Harmon Formula (maximum of 4.0)**
5. **K =** 0.8 (design)
   0.6 (annual and rare)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4 single unit equivalent / park ha (~ 3,600 L/ha/day)
7. **Q(fd) =** 0.45 L/s/unit
8. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
9. **Q(e) =** 0.33 L/s/ha (design)
   0.30 L/s/ha (annual)
   0.55 L/s/ha (rare)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(A) = Peak Annual Flow (L/s)
Q(R) = Peak Rare Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

	Singles	Semis / Towns	Apts
P = Residential Population =	3.4	2.7	1.8

q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor
Typ. Service Diameter (mm) = 135
Typ. Service Length (m) = 15 15
I/I Pipe Rate (L/mm dia/m/hr) = 0.007
Q(fd) = Foundation Flow (L/s)
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Institutional / Commercial / Industrial	Industrial	Commercial / Institutional	
Design =	35000	28000	L/gross ha/day
Annual / Rare =	10000	17000	L/gross ha/day
ICI Peak *			
Design =	1.0	1.5	* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)
Annual / Rare =		1.0	

Capacity Equation

Q full = (1/n) Ap R^(2/3) So^(1/2)

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
Ap = Pipe flow area (m^2)
R = Wetted perimeter (m)
So = Pipe slope/gradient

Appendix D
Boundary Conditions, Water Demands and FUS Calculations

Lucas Wilson

From: Wessel, Shawn <shawn.wessel@ottawa.ca>
Sent: Wednesday, June 4, 2025 3:54 PM
To: Lucas Wilson
Cc: Mark Bissett
Subject: RE: 335 Roosevelt Avenue - Hydraulic Boundary Conditions
Attachments: 335 Roosevelt Avenue May 2025 .pdf

Hello Lucas

I don't recall if you received the BC you requested.

Here is the response to my recent request, attached and below

The following are boundary conditions, HGL, for hydraulic analysis at 335 Roosevelt Avenue (zone 1W) assumed to be connected via two separate dual connections for each building to the 152mm watermain on Roosevelt Avenue and to the 203mm watermain on Wilmont Avenue (see attached PDF for location).

Roosevelt Ave – Connection 1 (Building West demand)
Minimum HGL= 108.6 m
Maximum HGL= 115.0 m
Max Day + Fire Flow (83 L/s) = 105.2 m

Wilmont Ave – Connection 2 (Building East demand)
Minimum HGL= 108.5 m
Maximum HGL= 114.7m
Max Day + Fire Flow (83 L/s) = 105.1 m

These are for current conditions and are based on computer model simulation.
Disclaimer:
The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.
"The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update."

Regards,

Shawn Wessel, A.Sc.T.,rcji
Pronouns: he/him | Pronom: il
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
Planning, Development & Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bàtiment (DGSPAB)
City of Ottawa | Ville d'Ottawa
110 Laurier Ave. W. | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
(613) 580 2424 Ext. | Poste 33017
Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca
Please consider the environment before printing this email

Une Ville, deux langues
One City, two languages

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Lucas Wilson <l.wilson@novatech-eng.com>
Sent: Tuesday, May 20, 2025 3:24 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Mark Bissett <m.bissett@novatech-eng.com>
Subject: 335 Roosevelt Avenue - Hydraulic Boundary Conditions

Hi Shawn,

Could you please provide water boundary conditions for the above noted site based on the info provided below. If you have any question, or require additional information, let me know. Also let me know if this should be directed to someone else.

Roosevelt Ave – Connection 1 (Building West demand)

i. The water connection will be made at Roosevelt Ave (connection 1 – 150mm WM), see figure attached.
ii. Residential development with required fire flow: 83 L/s see FUS calcs attached.
iii. Average daily demand: 0.916 L/s.
iv. Maximum daily demand: 2.29 L/s.
v. Maximum hourly daily demand: 5.037 L/s.

Wilmont Ave – Connection 2 (Building East demand)

i. The water connection will be made at Wilmont Ave (connection 2 – 200mm WM), see figure attached.
ii. Residential development with required fire flows: 83 L/s see FUS calcs attached.
iii. Average daily demand: 0.933 L/s.
iv. Maximum daily demand: 2.333 L/s.
v. Maximum hourly daily demand: 5.133 L/s.

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

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Pronouns: he/him | Pronom: il
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
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Une Ville, deux langues
One City, two languages

From: Wessel, Shawn
Sent: Tuesday, May 20, 2025 5:29 PM
To: Lucas Wilson <l.wilson@novatech-eng.com>
Cc: Mark Bissett <m.bissett@novatech-eng.com>
Subject: RE: 335 Roosevelt Avenue - Hydraulic Boundary Conditions

Thank you, Lucas,

Request sent to the Water Dept.

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

Thank you

Regards,

Shawn Wessel, A.Sc.T.,rcji
Pronouns: he/him | Pronom: il
Project Manager - Infrastructure Approvals
Gestionnaire de projet – Approbation des demandes d'infrastructures

Development Review Central Branch | Direction de l'examen des projets d'aménagement, Centrale
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Int. Mail Code | Code de Courrier Interne 01-14
shawn.wessel@ottawa.ca

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*****Please also note that, while my work hours may be affected by the current situation and am working from home, I still have access to email, video conferencing and telephone. Feel free to schedule video conferences and/or telephone calls, as necessary.*****

Une Ville, deux langues
One City, two languages

From: Lucas Wilson <l.wilson@novatech-eng.com>
Sent: Tuesday, May 20, 2025 3:24 PM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Mark Bissett <m.bissett@novatech-eng.com>
Subject: 335 Roosevelt Avenue - Hydraulic Boundary Conditions

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Hi Shawn,

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iii. Average daily demand: 0.933 L/s.
iv. Maximum daily demand: 2.333 L/s.
v. Maximum hourly daily demand: 5.133 L/s.

Thanks,

Lucas Wilson, P.Eng., Project Manager | Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON K2M 1P6 | Tel: 613.254.9643 Ext: 282
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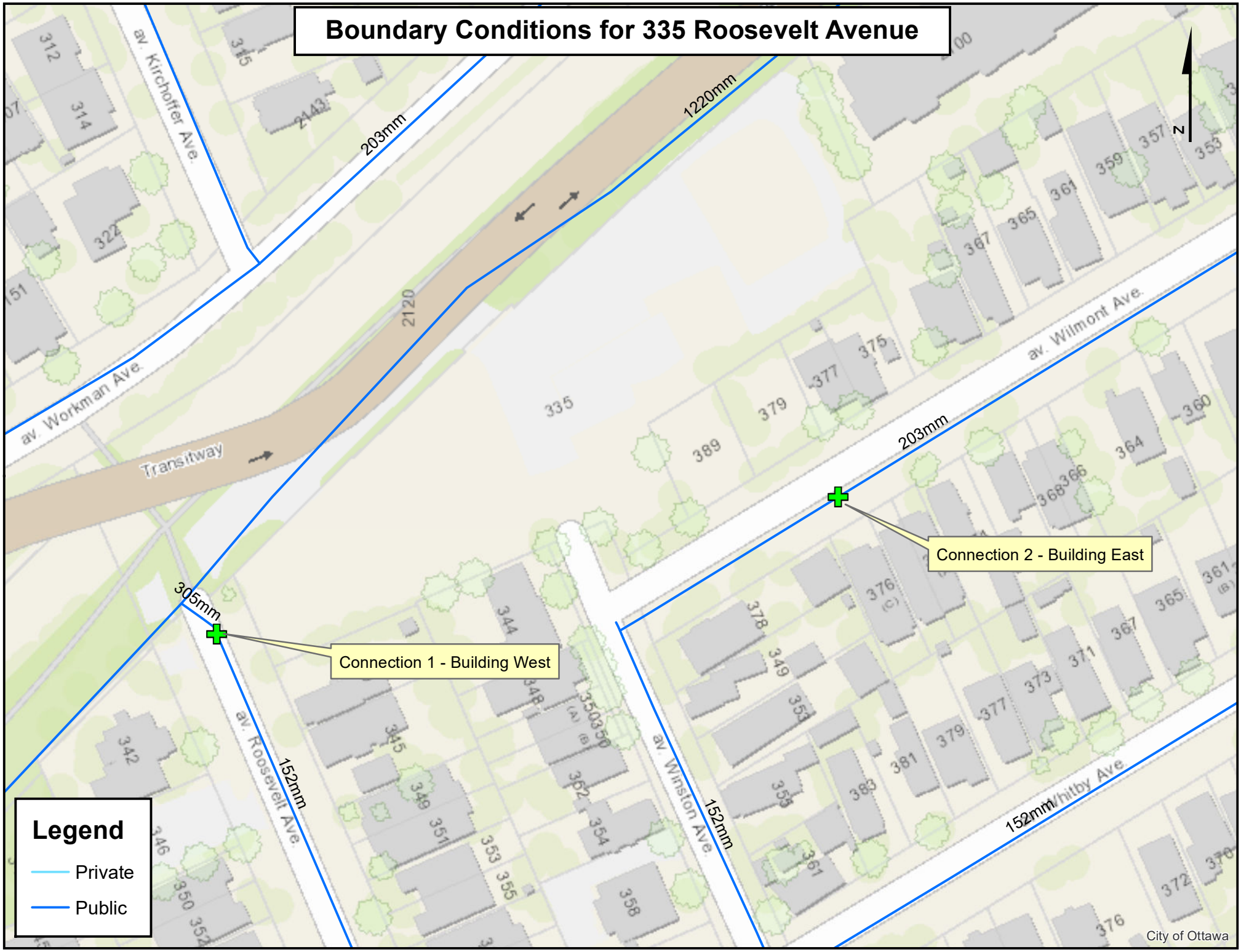
Boundary Conditions for 335 Roosevelt Avenue



335 Roosevelt Avenue Water Demand						
	Area (ha)	Units	Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
West Building (WR#1)	N/A	157	283	0.916	2.290	5.037
East Building (WR#2)	N/A	160	288	0.933	2.333	5.133
Total	**0.00**	**317**	**571**	**1.849**	**4.623**	**10.170**

Water Demand Parameters

Apartment Unit	1.8	ppl/unit
Residential Demand	280	L/c/day
Residential Max Day	2.5	x Avg Day
Residential Peak Hour	2.2	x Max Day
Residential Fire Flow	83	L/s

335 Roosevelt Avenue: Watermain Analysis

Network Table - Nodes - (Peak Hour)

Node ID	Elevation m	Demand LPS	Head m	Pressure m	Pressure kPa	Pressure psi
Junc WR1	67.0	5.04	108.56	41.56	407.70	59.13
Junc WR2	67	5.13	108.49	41.49	407.02	59.03
Resvr RES1	108.6	-8.46	108.6	0	0.00	0.00
Resvr RES2	108.5	-1.71	108.5	0	0.00	0.00

Network Table - Links - (Peak Hour)

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe P1	12	150	100	-8.46	0.48	3.16	0.041
Pipe P2	115	150	100	3.43	0.19	0.59	0.046
Pipe P3	40	150	100	-1.71	0.10	0.16	0.051

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335 Roosevelt Avenue: Watermain Analysis

Network Table - Nodes - (Max Pressure Check)

Node ID	Elevation m	Demand LPS	Head m	Pressure m	Pressure kPa	Pressure psi
Junc WR1	67.0	0.92	114.97	47.97	470.59	68.25
Junc WR2	67	0.93	114.76	47.76	468.53	67.95
Resvr RES1	115	-7.29	115	0	0.00	0.00
Resvr RES2	114.7	5.45	114.7	0	0.00	0.00

Network Table - Links - (Max Pressure Check)

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe P1	12	150	100	-7.29	0.41	2.40	0.041
Pipe P2	115	150	100	6.38	0.36	1.87	0.042
Pipe P3	40	150	100	5.45	0.31	1.39	0.043

335 Roosevelt Avenue: Watermain Analysis

Network Table - Nodes - (Max Day + FF) West Building 83 L/s FF

Node ID	Elevation m	Demand LPS	Head m	Pressure m	Pressure kPa	Pressure psi
Junc WR1	67.0	85.29	103.33	36.33	356.40	51.69
Junc WR2	67	2.33	104.55	37.55	368.37	53.43
Resvr RES1	105.2	-68.95	105.2	0	0.00	0.00
Resvr RES2	105.1	-18.67	105.1	0	0.00	0.00

Network Table - Links - (Max Day + FF)

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe P1	12	150	100	-68.95	3.90	153.56	0.030
Pipe P2	115	150	100	-16.34	0.92	10.67	0.037
Pipe P3	40	150	100	-18.67	1.06	13.66	0.036

335 Roosevelt Avenue: Watermain Analysis

Network Table - Nodes - (Max Day + FF) East Building 83 L/s FF

Node ID	Elevation m	Demand LPS	Head m	Pressure m	Pressure kPa	Pressure psi
Junc WR1	67.0	2.29	104.74	37.74	370.23	53.70
Junc WR2	67	85.33	100.99	33.99	333.44	48.36
Resvr RES1	105.2	-32.15	105.2	0	0.00	0.00
Resvr RES2	105.1	-55.47	105.1	0	0.00	0.00

Network Table - Links - (Max Day + FF)

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe P1	12	150	100	-32.15	1.82	37.38	0.033
Pipe P2	115	150	100	29.86	1.69	32.60	0.034
Pipe P3	40	150	100	-55.47	3.14	102.63	0.031

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FUS - Fire Flow Calculations

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Novatech Project #:	110098	**Legend:**	Input by User
Project Name:	335 Roosevelt Avenue		No Input Required
Date:	5/20/2025	**Reference:**	Fire Underwriter's Survey Guideline (2020)
Input By:	Lucas Wilson		Formula Method
Reviewed By:	Mark Bissett		
Drawing Reference:			

Building Description: West Building
Type I - Fire resistive construction (2 hrs)

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Type V - Wood frame		1.5	0.6	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)	Yes	0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1262			
		Total Floors/Storeys (Podium)	7			
		Tower Footprint (m^2)	1140			
		Total Floors/Storeys (Tower)	7			
		Protected Openings (1 hr)	Yes			
		A, Total Effective Floor Area (m^2)			**1,893**	
	F	**Base fire flow without reductions**				**6,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,100**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,032**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m²)	16750	100%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge per**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**2,040**
		East Side	10.1 - 20 m		15%	
		South Side	10.1 - 20 m		15%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**5,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**83**
				or	USGPM	1,321

FUS - Fire Flow Calculations

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Engineers, Planners & Landscape Architects

Novatech Project #:	110098	**Legend:**	Input by User
Project Name:	335 Roosevelt Avenue		No Input Required
Date:	5/20/2025	**Reference:**	Fire Underwriter's Survey Guideline (2020)
Input By:	Lucas Wilson		Formula Method
Reviewed By:	Mark Bissett		
Drawing Reference:			

Building Description: East Building
Type I - Fire resistive construction (2 hrs)

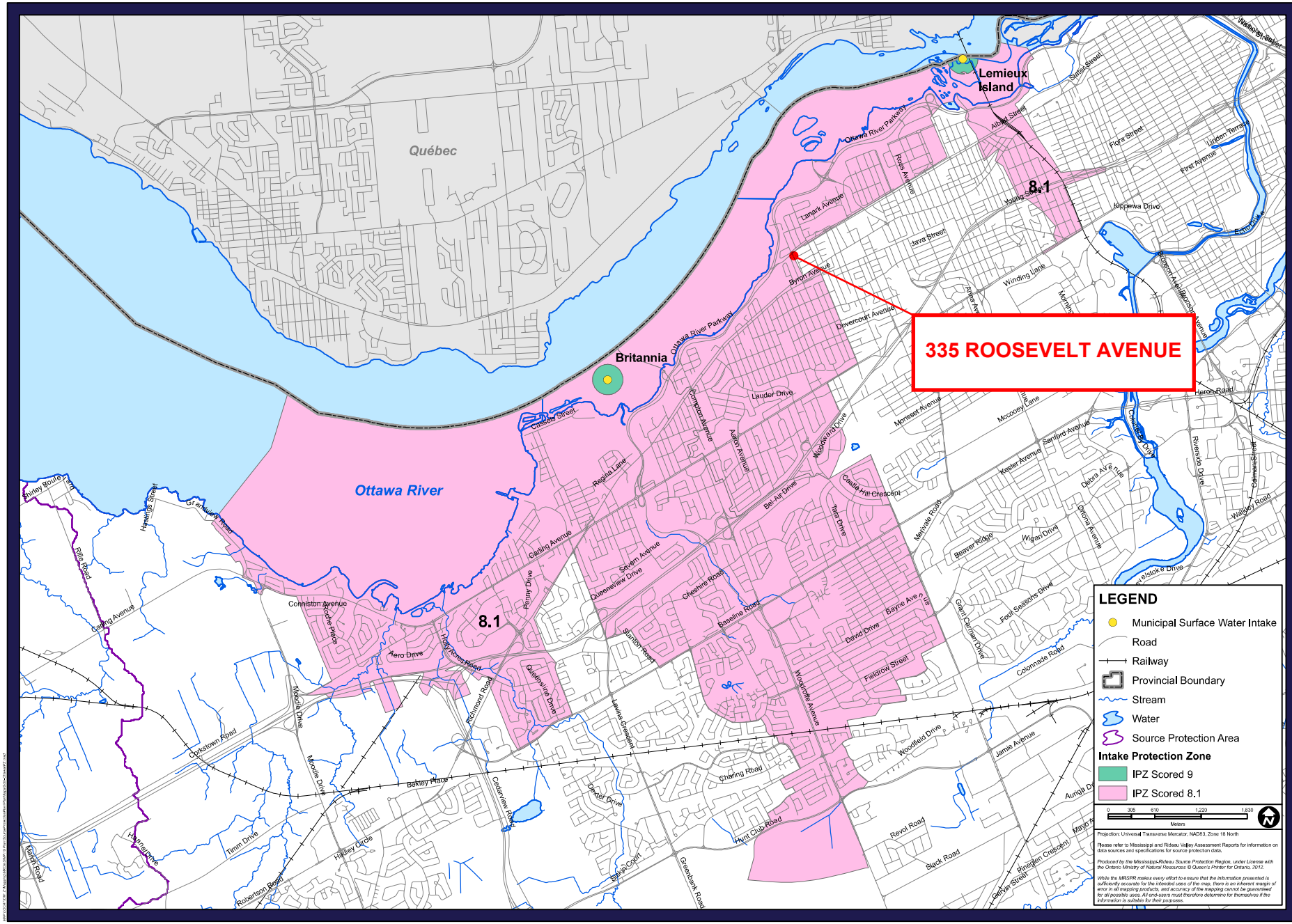
Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Type V - Wood frame		1.5	0.6	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)	Yes	0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1307			
		Total Floors/Storeys (Podium)	7			
		Tower Footprint (m^2)	1140			
		Total Floors/Storeys (Tower)	6			
		Protected Openings (1 hr)	Yes			
		A, Total Effective Floor Area (m^2)			**1,961**	
	F	**Base fire flow without reductions**				**6,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,100**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,041**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m²)	16000	100%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge per**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**2,295**
		East Side	10.1 - 20 m		15%	
		South Side	10.1 - 20 m		15%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**45%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**5,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**83**
				or	USGPM	1,321

Appendix E
Mississippi-Rideau Source Protection Plan

Mississippi-Rideau Source Protection Plan 2013

Ottawa Intake Protection Zones

Schedule I



LEGEND

- Municipal Surface Water Intake
- Road
- Railway
- Provincial Boundary
- Stream
- Water
- Source Protection Area

Intake Protection Zone

- IPZ Scored 9
- IPZ Scored 8.1

0 305 610 1,220 1,830 Meters

Projection: Universal Transverse Mercator, NAD83, Zone 18 North

Please refer to Mississippi and Rideau Valley Assessment Reports for information on data sources and specifications for source protection data.

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While the MRSPR makes every effort to ensure that the information presented is sufficiently accurate for the intended uses of the map, there is an inherent margin of error in all mapping products, and accuracy of the mapping cannot be guaranteed for all possible uses. All end-users must therefore determine for themselves if the information is suitable for their purposes.

Mississippi-Rideau Source Protection Plan 2013

Mississippi-Rideau Source Protection Region Significant Groundwater Recharge Areas

Schedule M

This map is for reference only. No policies apply within the Significant Groundwater Recharge Areas. See section 2.2 of this plan for more information

335 ROOSEVELT AVENUE

BONNECHERE VALLEY
ADMASTON/BROMLEY
HORTON
REN FREW
MCNAB/BRAESIDE
COUNTY OF RENFREW
GREATER MADAWASKA
MISSISSIPPI MILLS
OTTAWA
CARLETON PLACE
COUNTY OF LANARK
BECKWITH
LANARK HIGHLANDS
COUNTY OF LENNOX AND ADDINGTON
ADDINGTON HIGHLANDS
NORTH FRONTENAC
DRUMMOND/NORTH ELMSLEY
MONTAGUE
NORTH DUNDAS
NORTH GRENVILLE
SOUTH DUNDAS
PERTH
SMITHS FALLS
TAY VALLEY
MERRICKVILLE-WOLFORD
COUNTY OF FRONTENAC
CENTRAL FRONTENAC
UNITED COUNTIES OF LEEDS AND GRENVILLE
ELIZABETHTOWN-KITLEY
AUGUSTA
WESTPORT
RIDEAU LAKES
ATHENS
BROCKVILLE
TWEED
STONE MILLS
SOUTH FRONTENAC
New York State
Québec
Ottawa River

Fitzroy Harbour, Arnprior, Galetta, Dunrobin, Kinburn, Marathon, Carp, Pakenham, Almonte, Appleton, Ashton, Carleton Place, Munster, Dwyer Hill, Richmond, Manotick, Greely, Metcalfe, Clarence Creek, Kars, Osgoode, North Gower, Kemptville, Bedell, Burritts Rapids, Oxford Mills, Merrickville, Bishops Mills, Garretton, South Branch, North Augusta, Greenbush, Addison, Forfarton, Fairfield, Maitland, Brockville, Lanark, McDonalds Corner, Balderson, Perth, Glen Tay, Port Elmsley, Smiths Falls, De Witts Corners, Scotch Line, Maberly, Stanleyville, Sharbot Lake, Bolingbroke, Crow Lake, Oconto, Tichborne, Parham, Westport, Newboro, Crosby, Portland, Elgin, Plevna

17, 417, 416, 43, 7, 36, 15, 42, 38, 401

LEGEND

- City/Town
- Major Road
- Lower/Single Tier Municipalities
- Upper Tier Municipalities
- Water
- Source Protection Area
- Significant Groundwater Recharge Areas

0 3 6 12 18 Kilometres

Projection: Universal Transverse Mercator, NAD83, Zone 18 North

Please refer to Mississippi and Rideau Valley Assessment Reports for information on data sources and specifications for source protection data.

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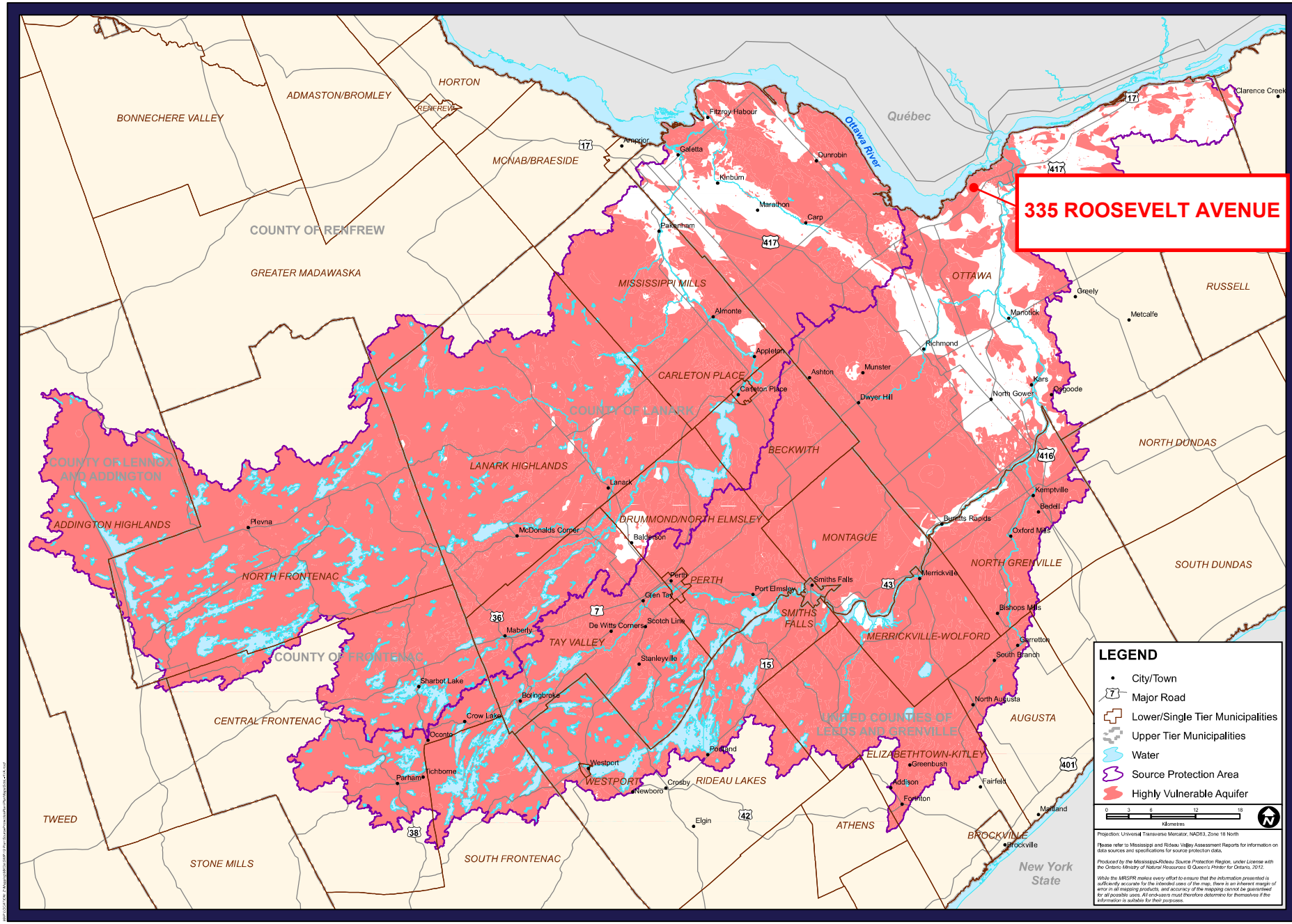
Mississippi-Rideau Source Protection Plan 2013

Mississippi-Rideau Source Protection Region Highly Vulnerable Aquifers

Schedule L