

SERVICING & STORMWATER MANAGEMENT REPORT

398-406 ROOSEVELT AVENUE, OTTAWA



Building Perspective Prepared by RLA

Project No.: CCO-22-3302

City File No.: D07-12-17-0171

Prepared for:

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April 6th, 2022

McINTOSH PERRY

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by ML Westboro Realty Investments Inc to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control application processes for the proposed development located at 398-406 Roosevelt Avenue within the City of Ottawa.

The main purpose of this report is to present a servicing and stormwater management design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City), the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CCO-22-3302, C101 – Grading and Drainage Plan
- CCO-22-3302, C102 – Site Servicing Plan
- CCO-22-3302, C103 – Erosion and Sediment Control Plan
- CCO-22-3302, PRE – Pre-Development Drainage Area Plan (Appendix E)
- CCO-22-3302, POST – Post-Development Drainage Area Plan (Appendix F)

1.2 Site Description

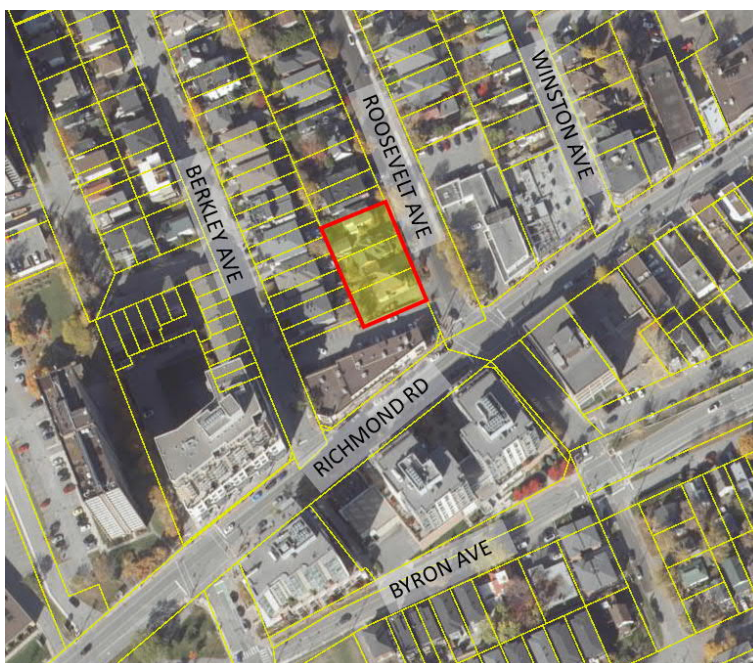


Figure 1: Site Map

The subject property, herein referred to as the site, is located at 398-406 Roosevelt Avenue within the Kitchissippi Ward. The site covers approximately 0.14 ha and is located north of the Roosevelt Avenue and Richmond Road intersection. The site is zoned for Residential Fifth Density use (R5B). See Site Location Plan in Appendix A for more details.

1.3 Proposed Development and Statistics

The proposed development consists of a 6-storey residential building. The building will contain 28 residential units. Underground parking will be provided with access from Roosevelt Avenue. Refer to Site Plan prepared by Roderick Lahey Architects (RLA) in Appendix B for further details.

1.4 Existing Conditions and Infrastructures

The site currently contains three single family homes with asphalt & interlock driveways and landscaped areas. The site currently drains from the northeast to southwest corner of the site.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal rights-of-way(s):

- ❖ Roosevelt Road
 - 150 mm diameter unlined cast iron watermain,
 - 300 mm diameter concrete sanitary sewer tributary to the West Nepean Trunk collector sewer, and
 - A 300 mm diameter concrete storm sewer tributary to the Ottawa River approximately 633 m downstream.

1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control process. Site plan control requires the City to review, provided concurrence and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Compliance Approval (ECA) through the Ministry of Environment, Conservation and Parks (MECP) is not required for the development since the parcels of land are anticipated to be amalgamated into a single parcel. As a result, the stormwater management system meets the exemption requirements under O.Reg 525/90. DSEL pre-consulted with the MECP on December 17th, 2017, confirming that the subject site is exempt from sections 53(1) and (30) of the Ontario Water Resources Act under Ontario Regulation 525/98.

2.0 BACKGROUND STUDIES, STANDARDS, AND REFERENCES

2.1 Background Reports / Reference Information

As-built drawings of existing services, provided by the City of Ottawa Information centre, within the vicinity of the proposed site were reviewed in order to identify infrastructure available to service the proposed development.

A topographic survey (19693-17) of the site was completed by Annis, O'Sullivan, Vollebekk Ltd and dated October 18th, 2017.

The Site Plan (SP-1) was prepared by Roderick Lahey Architects and dated March 5, 2022 (Site Plan).

The initial engineering application was prepared by DSEL (17-986) and was submitted to City staff in December 2017. Pre-consultation requirements have been applied to the current engineering site design.

2.2 Applicable Guidelines and Standards

City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (Ottawa Sewer Guidelines)
 - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (ISTB-2014-01)
 - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. (PIEDTB-2016-01)
 - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (ISTB-2018-01)
 - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (ISTB-2018-03)
 - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. (ISTB-2019-01)
 - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (ISTB-2019-02)
- ◆ Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (Ottawa Water Guidelines)
 - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (ISD-2010-2)
 - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
 - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (ISTB-2018-03)

Ministry of Environment, Conservation and Parks:

- ◆ Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. (MECP Stormwater Design Manual)
- ◆ Design Guidelines for Sewage Works, Ministry of the Environment, 2008. (MECP Sewer Design Guidelines)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was held with City staff on October 2nd, 2017 regarding the proposed site servicing. Specific design parameters to be incorporated within this design include the following:

- Pre-development and post-development flows shall be calculated using a time of concentration (T_c) no less than 10 minutes.
- Control 5 through 100-year post-development flows to the 5-year pre-development flows with a combined C value to a maximum of 0.50.
- Quality control are not required for this site due to the development design, as per RVCA requirements.

4.0 WATERMAIN

4.1 Existing Watermain

There is an existing 152 mm diameter UCI watermain within Roosevelt Avenue. The site is located within the 1W pressure zone, as per the Water Distribution System mapping included in Appendix C. There are two municipal fire hydrants along Roosevelt Avenue and one hydrant along Berkley Avenue (west) available to service the development.

4.2 Proposed Watermain

It is proposed to service the development via a 150 mm diameter service with a water valve located at the property line. The watermain is designed to have a minimum of 2.4 m cover. Refer to drawing C102 for a detailed servicing layout.

The Fire Underwriters Survey 1999 (FUS) method was utilized to estimate the required fire flow for the site. Fire flow requirements were calculated per City of Ottawa Technical Bulletin ISTB-2018-03. The following parameters were coordinated with the architect:

- ❖ Type of construction – Non-Combustible Construction
- ❖ Occupancy Type – Limited Combustibility
- ❖ Sprinkler Protection – Supervised Sprinkler System

The results of the calculations yielded a required fire flow of 10,000 L/min (166.7 L/s). The detailed calculations for the FUS can be found in Appendix C.

The water demands for the proposed building have been calculated to adhere to the Ottawa Water Guidelines and can be found in Appendix C. The results have been summarized below:

Table 1: Water Supply Design Criteria and Water Demands

Site Area	0.137 ha
Residential	280 L/person/day
1 Bedroom Apartment	1.4 persons/unit
2 Bedroom Apartment	2.1 persons/unit
2 Bedroom Apartment + Den	3.1 persons/unit
Maximum Daily Peaking Factor	9.5 x avg day
Maximum Hour Peaking Factor	14.3 x max day
Average Day Demand (L/s)	0.21
Maximum Daily Demand (L/s)	1.97
Peak Hourly Demand (L/s)	2.97
FUS Fire Flow Requirement (L/s)	166.67 (10,000 L/min)

In accordance with Section 4.3.1 of the Ottawa Water Guidelines, service areas with a basic day demand greater than 50 m³/day require a dual connection to the municipal system. The basic day demand for the development is estimated to be 18.1 m³/day, therefore a dual connection is not required.

The City provided the estimated water pressures at both for the average day scenario, peak hour scenario and the max day plus fire flow scenario for the demands indicated by the correspondence in Appendix C. The resulting pressures for the boundary conditions results are shown in Table 2, below.

Table 2: Boundary Conditions Results

Scenario	Proposed Demands (L/s)	Connection 1 HGL (m H ₂ O)* /kPa
Average Day Demand	0.27	47.8 / 468.9
Maximum Daily + Fire Flow Demand	168.64	82 L/s at 140 kPa
Peak Hourly Demand	2.97	41.4 / 406.1
*Adjusted for an estimated ground elevation of 67.2m above the connection point.		

The normal operating pressure range is anticipated to be 406 kPa to 469 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi).

National Fire Protection Association (NFPA) standards were utilized to estimate the required fire flow demand for a development with a sprinkler system. In accordance with Section 11.2.2 of the NFPA, fire flow demand requirements are calculated by combining the required flow rate for the sprinkler system and the anticipated hose stream demand. Table 11.2.2.1 and table 11.2.3.1.2 from the NFPA are included in Appendix C. The anticipated flow rate for the sprinkler system is 3,200 L/min (850 gpm) and the anticipated internal and external combined hose stream demand is 950 L/min (250 gpm). Therefore, it is anticipated that a total fire flow demand of 4,150 L/min (69.2 L/s) is required to support the proposed development.

The City indicated that the available fire flow demand at 140 kPa is 82 L/s (4,920 L/min). Based on the NFPA criteria, noted above, a fire flow demand of 69.2 L/s is anticipated for the proposed development sprinkler system indicating that the municipal system can accommodate the development. Actual fire demand will need to be reviewed and confirmed by a fire protection consultant.

To confirm the adequacy of fire flow to protect the proposed development, public fire hydrants within 150 m of the proposed building were analysed per City of Ottawa ISTB 2018-02 Appendix I Table 1. Based on City guidelines (ISTB-2018-03), the existing hydrants can provide adequate fire protection to the proposed development. The results are summarized below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min.)
398-406 Roosevelt Ave	10,000 (FUS) 4,150 (NFPA)	2 (FH#1, #2)	1 (FH#3)	15,000

Based on City guidelines (ISTB-2018-03), the existing hydrants can provide adequate fire protection to the proposed development.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

There is an existing 300 mm diameter sanitary sewer within Roosevelt Avenue, fronting the subject site. The subject site currently contributes wastewater to the Roosevelt Avenue sewer system tributary to the West Nepean trunk sewer.

5.2 Proposed Sanitary Sewer

A new 200 mm diameter gravity sanitary service will be connected to the existing 300 mm diameter sanitary sewer. Refer to drawing C102 for a detailed servicing layout.

Table 4, below, summarizes the wastewater design criteria identified by the Ottawa Sewer Guidelines.

Table 4: Sanitary Design Criteria

Design Parameter	Value
Site Area	0.136 ha
Residential	280 L/person/day
1 Bedroom Apartment	1.4 persons/unit
2 Bedroom Apartment	2.1 persons/unit
2 Bedroom + Den	3.1 persons/unit
Residential Peaking Factor	3.61
Extraneous Flow Allowance	0.33 L/s/ha

Table 5, below, summarizes the estimated wastewater flow from the proposed development. Refer to Appendix D for detailed calculations.

Table 5: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/s)
Total Estimated Average Dry Weather Flow	0.21
Total Estimated Peak Dry Weather Flow	0.76
Total Estimated Peak Wet Weather Flow	0.80

As noted above, the development is proposed to be serviced via the existing 300 mm diameter sanitary sewer within Roosevelt Avenue.

Capacity of the municipal system was reviewed to demonstrate that the receiving system could accommodate development. Per the wastewater analysis included in Appendix D, the constraining leg of the Roosevelt Avenue sanitary sewer (D to C) is estimated to be at 2.04% capacity and can accommodate an additional 61.71 L/s of wastewater drainage. Therefore, the proposed 0.80 L/s can be collected by the local sewer system. Due to the complexity of the downstream network the City will need to advise of any downstream constraints.

The full flowing capacity of a 200 mm diameter service at a 1% slope is estimated to be 32.8 L/s. Per Table 5, a peak wet weather flow of 0.80 L/s will be conveyed within the 200 mm diameter service, therefore the proposed system is sufficient sized for the development.

6.0 STORM SEWER DESIGN

6.1 Existing Storm Sewers

Stormwater runoff from the site is currently tributary to the Ottawa River within the Ottawa Central sub-watershed. There is an existing 300 mm diameter storm sewer within Roosevelt Avenue that is available to service the site. The existing sewer is tributary to the Ottawa River approximately 633 m downstream (outlet ID OUT04490).

6.2 Proposed Storm Sewers

A new 250 mm diameter storm service is proposed to be extended from the existing 300 mm diameter storm sewer within Roosevelt Avenue. The sewer system will provide flow attenuation for the roof area, side yard (north), and private terraces (west) by an internal cistern storage unit complete with a Tempest MHF-A ICD or an approved equivalent. Storage unit details to be provided by building designers.

Foundation drainage is proposed to be conveyed without flow attenuation via the 250 mm diameter storm service.

See CCO-22-3302 - POST include in Appendix F of this report for more details. The Stormwater Management design for the subject property will be outlined in Section 7.0 of this report.

7.0 PROPOSED STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the proposed site will be maintained through the use of an internal storage unit and will collect runoff from the at-grade areas within the site. The flow will be directed to the existing 300 mm diameter storm sewer within Roosevelt Avenue.

In summary, the following design criteria have been employed in developing the stormwater management design for the site as directed by the City and the RVCA:

Quality Control

- Based on coordination with the RVCA, quality controls are not required for this site. Refer to Appendix B for pre-consultation with the RVCA.

Quantity Control

- Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.
- Post-development to be restricted to the 5-year storm event, based on a calculated time of concentration greater than 10 minutes and a rational method coefficient of 0.50. Refer to Section 7.2 for further details.

7.2 Runoff Calculations

Runoff calculations presented in this report are derived using the Rational Method, given as:

$$Q = 2.78CIA \text{ (L/s)}$$

Where:

C	= Runoff coefficient
I	= Rainfall intensity in mm/hr (City of Ottawa IDF curves)
A	= Drainage area in hectares

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any SWM facility sized using this method is expected to function as intended. The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Undeveloped and Grass	0.20

As per the City of Ottawa - Sewer Design Guidelines, the 5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

7.3 Pre-Development Drainage

It has been assumed that the site contains no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized below in Table 6. See CCO-22-3302 - PRE in Appendix E and Appendix G for calculations.

Table 6: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Q (L/s)	
		5-Year	100-Year
A1	0.136	25.24	50.95

7.4 Post-Development Drainage

To meet the stormwater objectives the development will contain flow attenuation via internal cistern storage.

Based on the criteria listed in Section 7.2.1, the development will be required to restrict flow to the 5-year storm event. It is estimated that the target release rate during the 100-year event will be 19.76 L/s.

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-22-3302 - POST in Appendix F of this report for more details. A summary of the post-development runoff calculations can be found below.

Table 7: Post-Development Runoff Summary

Drainage Area	Area (ha)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)	100-year Storage Required (m ³)	100-year Storage Available (m ³)
B1	0.128	8.81	16.81	29.73	29.73
B2	0.009	1.51	2.95	-	-
Total	0.136	10.32	19.76	29.73	29.73

Runoff for area B1 will be collected by roof drains (uncontrolled) and surface drains and conveyed to the internal cistern. The 29.73 m³ internal storage unit is anticipated to pump stormwater to the outlet, complete with a Tempest MHF A ICD, at a maximum flow rate of 16.81 L/s. Flows in excess of the 100-year storm event will need to be directed towards Roosevelt Avenue via a cistern overflow. Storage unit details to be provided by building designers. Detailed calculations are included in Appendix G.

Foundation drainage is proposed to be conveyed without flow attenuation via the 250 mm storm service, downstream of cistern controls.

8.0 EROSION AND SEDIMENT CONTROL

8.1 Temporary Measures

Before construction begins, temporary silt fence, straw bale or rock flow check dams will be installed at all-natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The rock flow, straw bale & silt fence check dams and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required. Fibre roll barriers are to be installed at all existing curb inlet catch basins and filter fabric is to be placed under the grates of all existing catch basins and manholes along the frontage of the site and any new structures immediately upon installation. The measures for the existing/proposed structures is to be removed only after all areas have been paved. Care shall be taken at the removal stage to ensure that any silt that has accumulated is properly handled and disposed of. Removal of silt fences without prior removal of the sediments shall not be permitted.

Although not anticipated, work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the City and/or Conservation Authority to review the site conditions and determine the appropriate course of action. As the ground begins to thaw, the Contractor shall place silt fencing at all required locations as soon as ground conditions warrant. Please see the Site Grading, Drainage and Sediment & Erosion Control Plan for additional details regarding the temporary measures to be installed and their appropriate OPSD references.

8.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

9.0 SUMMARY

- A 6-storey residential building is proposed to be constructed at 398-406 Roosevelt Avenue.
- A single 150 mm diameter water service is proposed to be connected to the existing 152 mm diameter watermain within Roosevelt Avenue.
- A new 200 mm sanitary service is proposed to service the development via the 300 mm diameter sanitary sewer within Roosevelt Avenue tributary to the West Nepean trunk.
- A new 250 mm storm service for rooftop, surface, and foundation drainage is proposed to service the development. The storm service will connect to the 300 mm diameter storm sewer within Roosevelt Avenue, tributary to the Ottawa River approximately 633 m downstream.
- Storage for the 5- through 100-year storm events will be provided through internal cistern attenuation.
- Quality controls are not required for the development, as confirmed by the RVCA.

10.0 RECOMMENDATION

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management report in support of the proposed development at 398-406 Roosevelt Avenue.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.



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A handwritten signature in cursive script that reads "Alison Gosling".

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11.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of ML Westboro Realty Investments Inc. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Parks and Climate Change, City of Ottawa and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A KEY PLAN



LEGEND

- Site Location
- Local Road
- Major Road
- ~ Watercourse
- Waterbody
- Wooded Area

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2021.

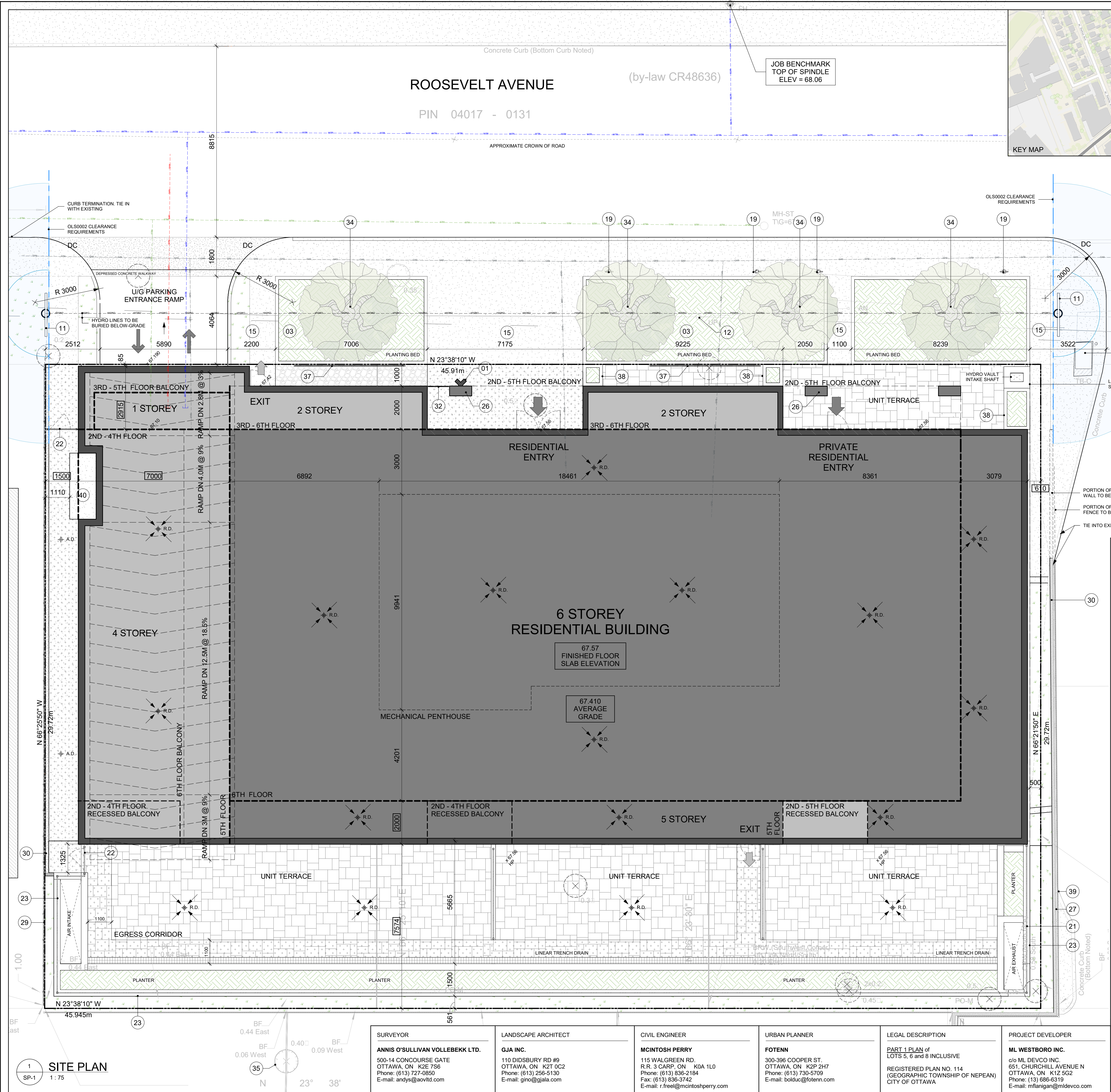
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Scale 1:25,000 Metres

CLIENT: ML WESTBORO REALTY INVESTMENTS INC.	
PROJECT: 398-406 ROOSEVELT AVENUE, OTTAWA, ON	
TITLE: SITE LOCATION	
PROJECT NO: CCO-22-3302	
Date	Dec., 07, 2021
GIS	EU
Checked By	AG
FIGURE: 1	

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APPENDIX B

BACKGROUND DOCUMENTS



PROJECT INFORMATION

ZONING	R5B (2472) H2(1)
SITE AREA	1,365 sq. m. (14,692.7) sq. ft.
BUILDING HEIGHT	20.490m (6 STOREYS)
AMENITY AREA (REQUIRED)	6m² PER UNIT

PROJECT STATISTICS

SITE AREA	1,364.5 sq. m.
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GROSS BUILDING FLOOR AREAS

(CITY OF OTTAWA DEFINITION)

PARKING LEVELS (2 LEVELS U/G)	0.0 sq. m. (000) sq. ft.
GROUND FLOOR	462.8 sq. m. (4,982) sq. ft.
2ND FLOOR	722.3 sq. m. (7,775) sq. ft.
3RD FLOOR	685.2 sq. m. (7,375) sq. ft.
4th FLOOR	686.1 sq. m. (7,385) sq. ft.
5th FLOOR	580.5 sq. m. (6,249) sq. ft.
6th FLOOR	466.3 sq. m. (5,019) sq. ft.
MECHANICAL PH FLOOR	0.0 sq. m. (000) sq. ft.
TOTAL AREA	3,603.2 sq. m. (38,786) sq. ft.

UNIT STATISTICS

STUDIO UNIT	0
1 BEDROOM UNIT	12
1 BEDROOM + DEN UNIT	0
2 BEDROOM UNIT	15
2 BEDROOM + DEN UNIT	5
TOTAL	29
COMMERCIAL RETAIL	N/A

AMENITY AREA

AMENITY AREA - REQUIRED

TOTAL REQUIRED	6m² PER UNIT	174 sq. m. (29 UNITS) (1,873 sq. ft.) (29 UNITS)
REQUIRED COMMUNAL		N/A [2472]

AMENITY AREA - PROVIDED

COMMUNAL AMENITY	GROUND FLOOR AMENITY	67.8 sq. m. (730) sq. ft.
PRIVATE AMENITY	GRIND FLOOR - TERRACES	259.7 sq. m. (2,795) sq. ft.
	2ND FLOOR - TERRACES	38.5 sq. m. (414) sq. ft.
	2ND FLOOR - BALCONIES	26.9 sq. m. (290) sq. ft.
	3RD FLOOR - TERRACES	68.3 sq. m. (735) sq. ft.
	3RD FLOOR - BALCONIES	20.8 sq. m. (224) sq. ft.
	4TH FLOOR - BALCONIES	94.7 sq. m. (1,019) sq. ft.
	5TH FLOOR - TERRACES	78.6 sq. m. (848) sq. ft.
	5TH FLOOR - BALCONIES	65.7 sq. m. (707) sq. ft.
	6TH FLOOR - TERRACES	96.3 sq. m. (1,037) sq. ft.
	6TH FLOOR - BALCONIES	88.4 sq. m. (952) sq. ft.

TOTAL COMMUNAL =	67.8 sq. m. (730) sq. ft.
TOTAL AMENITY (INCL. COMMUNAL) =	905.7 sq. m. (9,749) sq. ft.

LOT COVERAGE - AREA

PAVED SURFACE =	0.7 sq. m. 0.05%
BUILDING FOOTPRINT =	885.4 sq. m. 65.62%
LANDSCAPE OPEN SPACE =	485.4 sq. m. 34.28%
TOTAL =	468.4 sq. m. 100.0%

BICYCLE PARKING

<u>REQUIRED</u>			
RESIDENCE	+ 0.5 PER UNIT	29 UNITS * 0.5 = 14.5	15
TOTAL =			15
<u>PROVIDED</u>			
INTERIOR - P1 PARKING LEVEL			16
TOTAL =			16

CAR PARKING - TOTAL SITE

<u>MINIMUM REQUIRED BY ZONING BY-LAW</u>			
TOWER - RESIDENTIAL	29 UNITS	0.5 PER UNIT AFTER 12	8
TOWER - RESIDENTIAL VISITOR	29 UNITS	0.1 PER UNIT AFTER 12	2

MAXIMUM ALLOWED BY ZONING BY-LAW

ZONING BY-LAW SECTION 103 (AREA B)		
PARKING - RESIDENTIAL & VISITOR (COMBINED PARKING COUNT)	1.75 PER DWELLING UNIT (1.75 * 29 UNITS)	50

TOTAL =	50
PROVIDED	
UNDERGROUND PARKING - RESIDENTIAL	47
UNDER GROUND PARKING - VISITORS	2
TOTAL =	49

SITE PLAN SYMBOLS

BUILDING OUTLINE	
CONCRETE WALK	
SOFT LANDSCAPING	
UNIT PAVERS	
HEATED WALKWAY	
BICYCLE PARKING	
TWO-WAY VEHICLE CIRCULATION	
MAIN ENTRANCE	
SERVICE DOOR/ FIRE EXIT	
PROPERTY LINE	
BUILDING ROOF DRAINS	

SP-1 - SITE PLAN NOTES

NO.	DESCRIPTION
01	FIRE DEPARTMENT CONNECTION
02	LANDSCAPED PLANTING BED
04	EXISTING HYDRO PEDESTAL
11	EXISTING UTILITY POLE TO REMAIN
12	EXISTING UTILITY POLE TO BE RELOCATED
15	PROPOSED CONCRETE SIDEWALK
19	BOLLARD-POST BICYCLE PARKING (2)
21	1.8m HIGH PRIVACY SCREEN
22	1.8m HIGH PRIVACY SCREEN w/ ACCESS GATES. SEE LANDSCAPE.
23	RETAINING WALL w/ PRIVACY SCREEN.
24	COORDINATE W/ LANDSCAPE AND CIVIL.
26	BUILDING COLUMN
27	EXISTING CONCRETE WALL
29	EXISTING CHAIN LINK FENCE TO REMAIN
30	CONCRETE CURB RETAINING WALL FLUSH w/ WALKWAY.
32	SUNSHADE & PRIVACY SCREEN
34	PROPOSED NEW TREE. SEE LANDSCAPE.
35	EXISTING TREE TO REMAIN. REFER TO TREE CONSERVATION REPORT AND COORDINATE REQUIREMENTS FOR ROOT PROTECTION w/ LANDSCAPE.
37	NEW ALUMINUM PRIVACY SCREEN MOUNTED ON CONCRETE PEDESTALS.
38	RAISED PLANTER. SEE LANDSCAPE.
39	EXISTING WOOD FENCE TO REMAIN
40	1200x3050 CONCRETE PAD AND GAS EQUIPMENT. SEE CIVIL.

SITE PLAN
SP-1
1:75

SURVEYOR
ANNIS O'SULLIVAN VOLLEBEKK LTD.
500-14 CONCURSE GATE
OTTAWA, ON K2E 7S6
Phone: (613) 727-0850
E-mail: andys@aoavld.com

LANDSCAPE ARCHITECT
GJA INC.
110 DIDSBURY RD #9
OTTAWA, ON K2T 9C2
Phone: (613) 836-2184
E-mail: gino@gjala.com

CIVIL ENGINEER
MCINTOSH PERRY
115 WALGREEN RD.
R.R. 3 CARP, ON K0A 1L0
Phone: (613) 836-2184
Fax: (613) 836-3742
E-mail: r.freel@mcintoshperry.com

URBAN PLANNER
FOTENN
300-396 COOPER ST.
OTTAWA, ON K2P 2H7
Phone: (613) 730-5709
E-mail: bolduc@fotenn.com

LEGAL DESCRIPTION
PART 1 PLAN of
LOTS 5, 6 and 8 INCLUSIVE
REGISTERED PLAN NO. 114
(GEOGRAPHIC TOWNSHIP OF NEPEAN)
CITY OF OTTAWA

PROJECT DEVELOPER
ML WESTBORO INC.
c/o ML DEVCO INC.
651 CHURCHILL AVENUE N
OTTAWA, ON K1Z 5G2
Phone: (13) 686-6319
E-mail: mflanigan@mldevco.com

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.
ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.
THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.
DO NOT SCALE DRAWINGS.
COPYRIGHT RESERVED.

SITE PLAN

DRAWN: L.M.	CHECKED: R.V.
SCALE: 1 : 75	SHEET No: SP-1
PROJECT No: 2122	

SURVEYOR'S REAL PROPERTY REPORT
PART 1 Plan of
LOTS 5, 6 and 8
REGISTERED PLAN 114
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebakk Ltd.

Scale 1 : 150
6 4.5 3 1.5 0 3 6 Metres

Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND
CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate

- I CERTIFY THAT:
- This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
 - The survey was completed on the 18th day of October, 2017.

Oct 18/17
Date
V. Andrew Sheip
Ontario Land Surveyor

PART 2
THIS PLAN MUST BE READ IN CONJUNCTION WITH
SURVEY REPORT DATED 18 OCTOBER 2017

ANNIS, O'SULLIVAN, VOLLEBEKK LTD. grants to
Domicile Developments Inc.
mortgages, and other related parties, permission to use original, signed, sealed
copies of the Surveyor's Real Property Report in transactions involving The Client.

Notes & Legend

Denotes	Survey Monument Planted
—	Survey Monument Found
SIB	Standard Iron Bar
SSIB	Short Standard Iron Bar
IB	Iron Bar
CC	Cut Cross
CP	Concrete Pin
*	Survey Monument 0.3 metres Long
(WIT)	Witness
Meas.	Measured
Prop.	Proportioned
(AOG)	Annis, O'Sullivan, Vollebakk Ltd.
(P1)	Registered Plan 114
(P2)	Plan 4R-21825
(P3)	Plan 5R-14189
(P4)	Plan 4R-30347
(P5)	(1236) Plan April 15, 1998
(P6)	(647) Plan December 19, 1975
○ MH-ST	Maintenance Hole (Storm Sewer)
○ MH-S	Maintenance Hole (Sanitary)
○ FH	Fire Hydrant
○ CHW	Overhead Wires
○ UP	Utility Pole
○ AN	Anchor
○ VC	Valve Chamber (Watermain)
T/G	Top of Grate
○ GM	Gas Meter
CLF	Chain Link Fence
BF	Board Fence
○ AC	Air Conditioner
○	Diameter
+ 66.00	Location of Elevations
+ 66.00	Top of Wall Elevations
+ 66.00	Top of Curb Elevations
C/L	Centreline
—	Property Line
○	Deciduous Tree
★	Coniferous Tree
□ TB-C	Cable Terminal Box
— G	Underground Gas
— TV	Underground Cable
— B	Underground Bell
○ M-W	Monitoring Well
BRW	Brick Retaining Wall
CRW	Concrete Retaining Wall
WRW	Wooden Retaining Wall
○ PO-M	Metal Pole
Fdn	Foundation
□ HH	Handhole

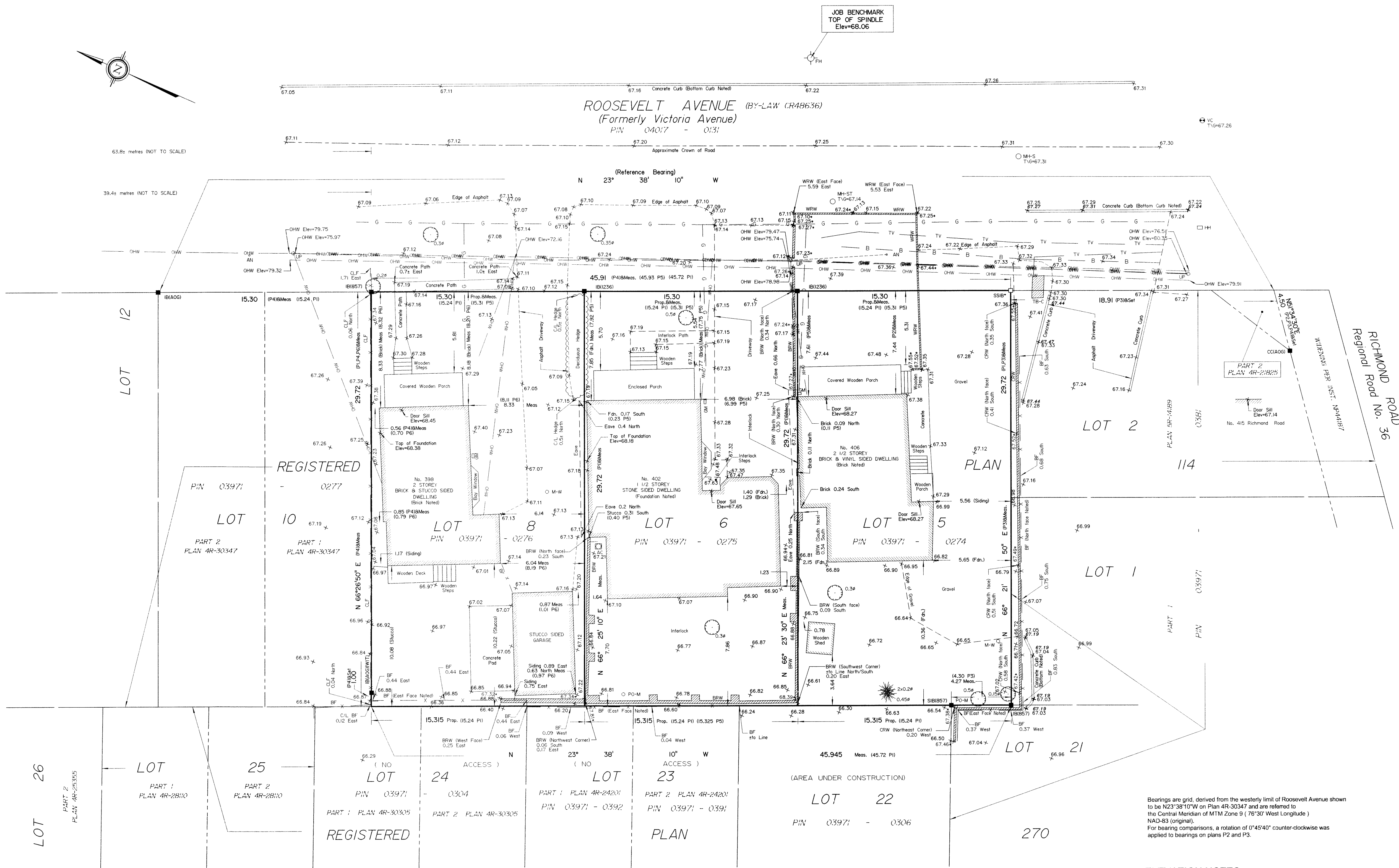
Bearings are grid, derived from the westerly limit of Roosevelt Avenue shown to be N23°38'10"W on Plan 4R-30347 and are referred to the Central Meridian of MTM Zone 9 (76°30' West longitude) NAD-83 (original).
For bearing comparisons, a rotation of 0°45'40" counter-clockwise was applied to bearings on plans P2 and P3.

ELEVATION NOTES

- Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
- It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

- This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
- Only visible surface utilities were located.
- A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating, etc.
- Gas, Cable and Bell underground utilities are shown as marked on ground by others.



Alison Gosling

Subject: RE: 22-3302 - 398-406 Roosevelt - Quality Control Requirement

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: December 6, 2021 3:43 PM
To: Alison Gosling <a.gosling@mcintoshperry.com>
Subject: RE: 22-3302 - 398-406 Roosevelt - Quality Control Requirement

Hi Alison,

Based on the proposed site plan, the RVCA shall not require any additional quality control protections. It is still encouraged that best management practices be integrated into the design where possible.

Thank you,

Eric Lalande, MCIP, RPP
Planner, RVCA
613-692-3571 x1137

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: Monday, December 6, 2021 3:34 PM
To: Eric Lalande <eric.lalande@rvca.ca>
Subject: 22-3302 - 398-406 Roosevelt - Quality Control Requirement

Good afternoon Eric,

We wanted to touch base with you regarding the development at 398-406 Roosevelt Ave.

The development involves the construction of a 6-storey residential building with underground parking and above-grade private terraces. Drainage will be collected and conveyed to the 300mm dia storm sewer within Roosevelt Ave. As shown by the attached figure, water travels approximately 633m to the Ottawa River (Outlet ID #04490). Drainage will be collected by roof drains and surface drains within the terraces which will be connected to the internal mechanical system.

Quality controls were previously reviewed by DSEL and Jamie (December 2017). The application proposed a rear yard parking lot at the time of the application. The site design has since changed by removing surface parking and asphalt areas. It is anticipated that quality controls are no longer required. Can you please review and confirm?

Please let me know if you have any questions.

Thank you,

Alison Gosling, P.Eng.
Project Engineer, Land Development
115 Walgreen Road, Carp, ON, K0A 1L0
T. 613.714.4629
a.gosling@mcintoshperry.com | www.mcintoshperry.com

APPENDIX C WATERMAIN CALCULATIONS

CITY OF OTTAWA WATER DISTRIBUTION SYSTEM FACILITIES & FEEDERMAINS

LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.

FLEET STREET P.S.

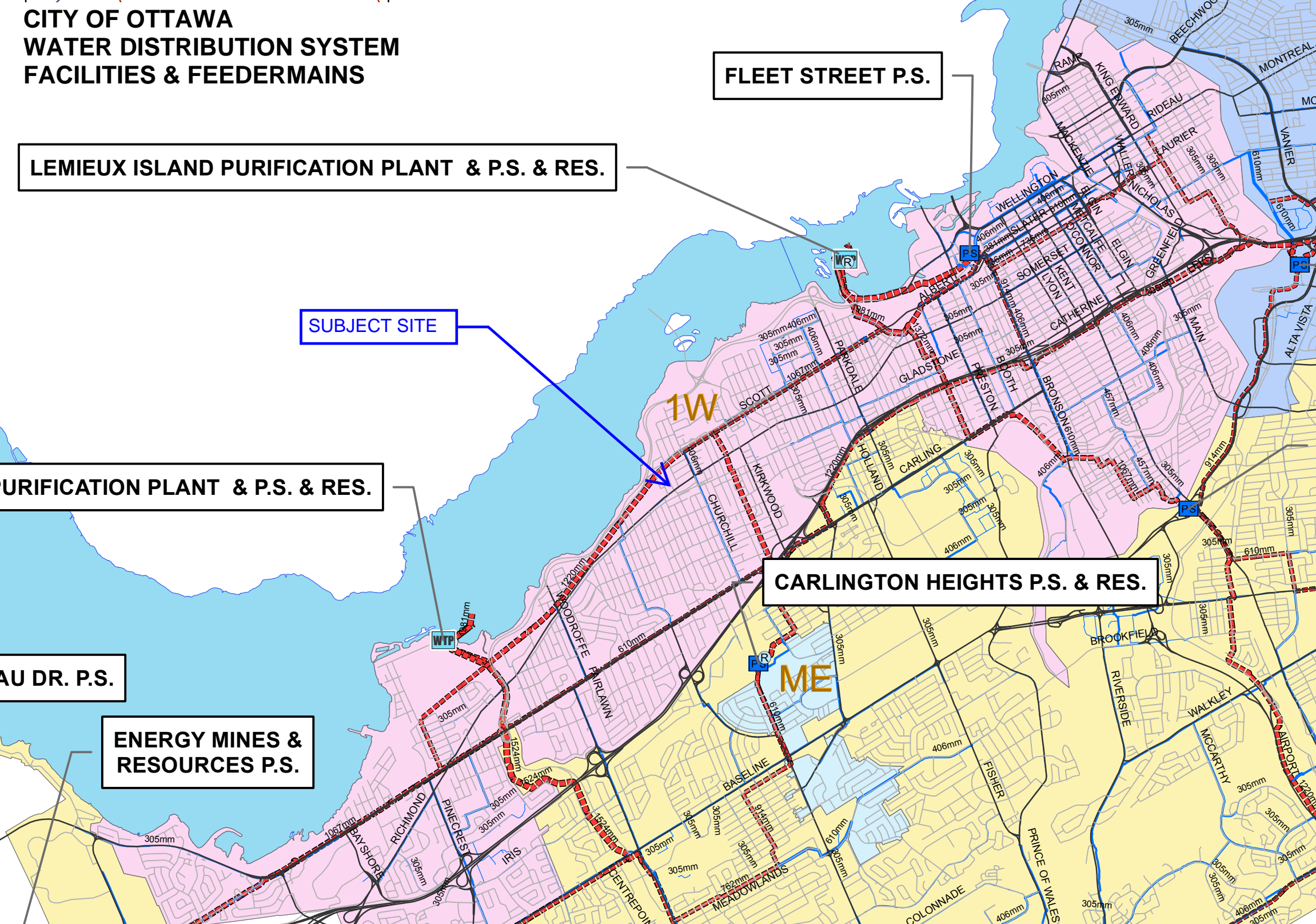
SUBJECT SITE

PURIFICATION PLANT & P.S. & RES.

CARLINGTON HEIGHTS P.S. & RES.

LAURENCE DR. P.S.

ENERGY MINES &
RESOURCES P.S.



McINTOSH PERRY

CCO-22-3302 - 398-406 Roosevelt - Water Demands

Project:	398-406 Roosevelt
Project No.:	CCO-22-3302
Designed By:	AJG
Checked By:	RDF
Date:	March 31, 2022
Site Area:	0.1365 gross ha

Residential	NUMBER OF UNITS	UNIT RATE	
1 Bedroom Apartment	12 units	1.4	persons/unit
2 Bedroom Apartment	15 units	2.1	persons/unit
2 Bedroom Apartment + Den	5 units	3.1	persons/unit

Total Population 64 persons

Commercial	m2
Industrial - Light	m2
Industrial - Heavy	m2

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m ² /d	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	L/(Space/d)	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	Residential	0.21	L/s
	Commerical/Industrial/ Institutional	0.00	L/s

McINTOSH PERRY

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	9.5	x avg. day	L/c/d
Industrial	1.5	x avg. day	L/gross ha/d
Commercial	1.5	x avg. day	L/gross ha/d
Institutional	1.5	x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	1.97	L/s
	Commerical/Industrial/ Institutional	0.00	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	14.3	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	2.97	L/s
	Commerical/Industrial/ Institutional	0.00	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT

CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.21	L/s
MAXIMUM DAILY DEMAND	1.97	L/s
MAXIMUM HOUR DEMAND	2.97	L/s

McINTOSH PERRY

CCO-22-3302 - 398-406 Roosevelt - Fire Underwriters Survey

Project: 398-406 Roosevelt
Project No.: CCO-22-3302
Designed By: AJG
Checked By: RDF
Date: March 31, 2022

From the Fire Underwriters Survey (1999)

From Part II – Guide for Determination of Required Fire Flow Copyright I.S.O.:
Updated per City of Ottawa Technical Bulletin ISTB-2018-02

A. BASE REQUIREMENT (Rounded to the nearest 1000 L/min)

$F = 220 \times C \times \sqrt{A}$ Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type Non-Combustible Construction

C

0.8

A 3,603.2 m²

Calculated Fire Flow

10,564.7 L/min

11,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From note 2, Page 18 of the Fire Underwriter Survey:

Limited Combustible

-15%

Fire Flow

9,350.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered

-50%

Reduction

-4,675.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons. of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length- Height Factor	
Exposure 1	3.1 to 10	Non-Combustible	14	2.5	35.0	18%
Exposure 2	20.1 to 30	Ordinary (Unprotected)	50	1	50.0	7%
Exposure 3	10.1 to 20	Ordinary (Unprotected)	54	2	108.0	14%
Exposure 4	3.1 to 10	Wood frame	7	1	7.0	17%
% Increase*						56%

Increase*

5,236.0 L/min

E. Total Fire Flow (Rounded to the Nearest 1000 L/min)

Fire Flow

9,911.0 L/min

Fire Flow Required**

10,000.0 L/min

*In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

**In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-3302 - 398-406 Roosevelt - Boundary Condition Unit Conversion

Project: 398-406 Roosevelt

Project No.: CCO-22-3302

Designed By: AJG

Checked By: RDF

Date: March 31, 2022

Boundary Conditions Unit Conversion

ROOSEVELT AVENUE

Scenario	Height (m)	Elevation (m)	m H ₂ O	PSI	kPa
Avg. DD	115.0	67.2	47.8	68.0	468.9
Fire Flow (82 L/s or 4,920 L/min)	88.2	67.2	21.0	29.9	206.0
Peak Hour	108.6	67.2	41.4	58.9	406.1

398-406 Roosevelt Avenue Hydrant Coverage Figure

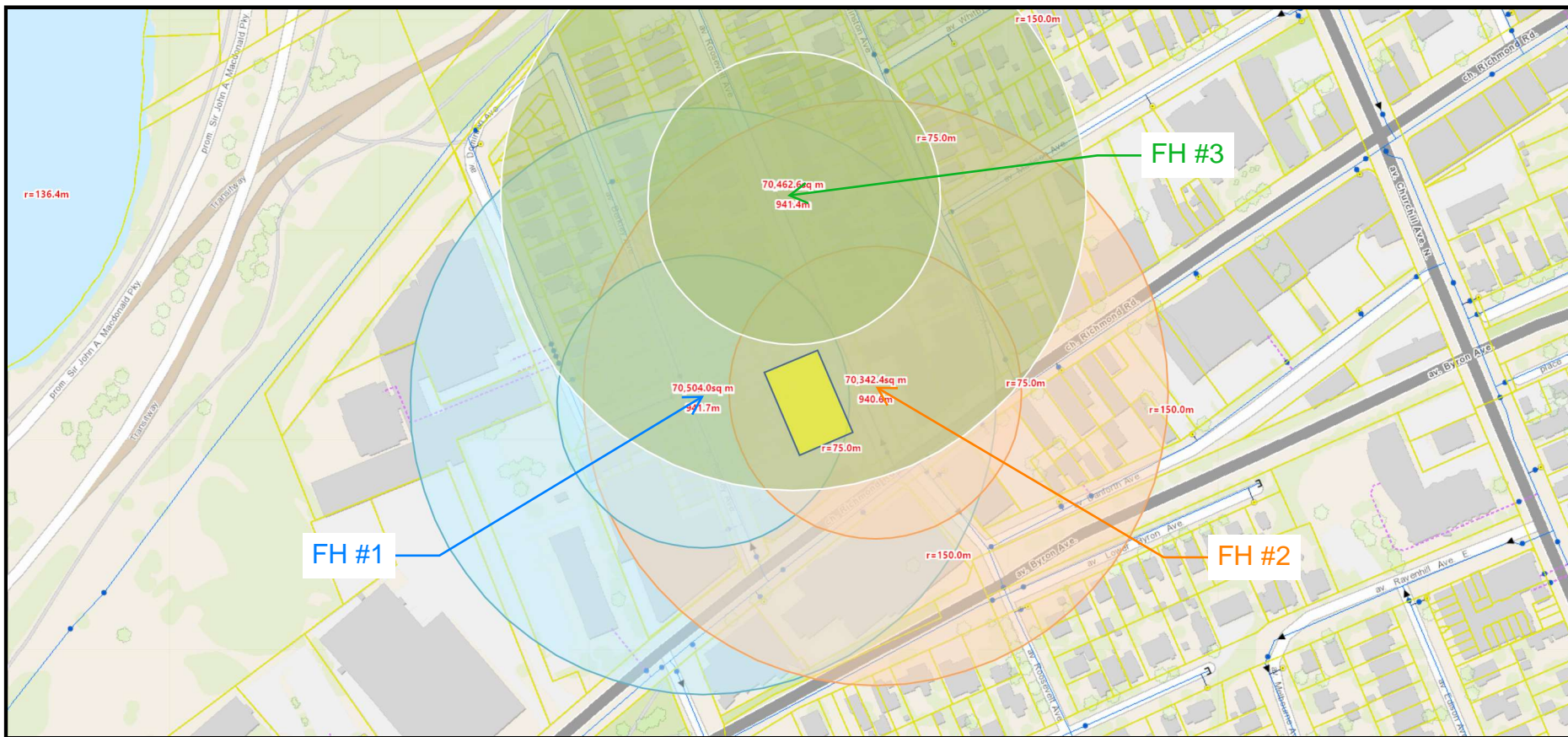


Table 11.2.2.1 Water Supply Requirements for Pipe Schedule Sprinkler Systems

Occupancy Classification	Minimum Residual Pressure Required		Acceptable Flow at Base of Riser (Including Hose Stream Allowance)		Duration (minutes)
	psi	bar	gpm	L/min	
Light hazard	15	1	500–750	1900–2850	30–60
Ordinary hazard	20	1.4	850–1500	3200–5700	60–90

Table 11.2.3.1.2 Hose Stream Allowance and Water Supply Duration Requirements for Hydraulically Calculated Systems

Occupancy	Inside Hose		Total Combined Inside and Outside Hose		Duration (minutes)
	gpm	L/min	gpm	L/min	
Light hazard	0, 50, or 100	0, 190, or 380	100	380	30
Ordinary hazard	0, 50, or 100	0, 190, or 380	250	950	60–90
Extra hazard	0, 50, or 100	0, 190, or 380	500	1900	90–120

Alison Gosling

To: Wessel, Shawn
Subject: RE: 22-3302 - 398-406 Roosevelt - Boundary Condition Request

Hi Allison.

Please find boundary conditions for this site, as requested, attached and below:

The following are boundary conditions, HGL, for hydraulic analysis at 398-406 Roosevelt Avenue (zone 1W) assumed to be connected to the 152 mm watermain on Roosevelt Ave (see attached PDF for location).

Minimum HGL: 108.6 m

Maximum HGL: 115.0 m

Max Day + FF (69.2 L/s): 88.2 m

Available FF at 20 psi: 82 L/s, assuming a ground elevation of 67.2 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.

Enjoy your 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



*****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.*****

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: December 02, 2021 10:28 AM
To: Wessel, Shawn <shawn.wessel@ottawa.ca>
Cc: Robert Freel <r.freel@mcintoshperry.com>
Subject: 22-3302 - 398-406 Roosevelt - Boundary Condition Request

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

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

Good morning Shawn,

We would like to request boundary conditions for the proposed development at 398-406 Roosevelt Avenue. The proposed development consists of a 6-storey residential building with 28 residential units. The proposed connection (single) will be to the existing 152mm dia. watermain within Roosevelt Ave. Connection figure attached for your reference.

- The estimated fire flow is 10,000 L/min based on the FUS
- The estimated fire flow is 4,150 L/min based on the NFPA
- Average daily demand: 0.27 L/s
- Maximum daily demand: 2.59 L/s
- Maximum hourly daily demand: 3.89 L/s

Attached is a map showing the proposed connection location along with the calculations prepared for the demands listed above.

Please let me know if you have any questions.

Thank you,
Alison

Alison Gosling, P.Eng.

Project Engineer, Land Development
115 Walgreen Road, Carp, ON, K0A 1L0

APPENDIX D SANITARY CALCULATIONS

McINTOSH PERRY

CCO-22-3302 - 398-406 Roosevelt Avenue - Sanitary Demands

Project:	398-406 Roosevelt Avenue
Project No.:	CCO-22-3302
Designed By:	R.R.R.
Checked By:	A.J.G.
Date:	March 31, 2022

Site Area	0.137	Gross ha	
1 Bedroom	12		1.40 Persons per unit
2 Bedroom	15		2.10 Persons per unit
2 Bedroom	5		3.10 Persons per unit
Total Population	64	Persons	*2 Bedroom + Den
Commercial Area	0.00	m ²	
Amenity Space	0.00	m ²	

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1	
Residential Peaking Factor	3.63	* Using Harmon Formula = $1 + (14 / (4 + P^{0.5})) * 0.8$ where P = population in thousands, Harmon's Correction Factor = 0.8
Mannings coefficient (n)	0.013	
Demand (per capita)	280	L/day
Infiltration allowance	0.33	L/s/Ha

EXTRANEEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.01
Wet	0.04
Total	0.05

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	64	0.21
Industrial - Light**	35,000	L/gross ha/d		0
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial / Amenity	2,800	L/(1000m ² /d)		0
Hospital	900	L/(bed/day)		0
Schools	70	L/(Student/d)		0
Trailer Parks no Hook-Ups	340	L/(space/d)		0
Trailer Park with Hook-Ups	800	L/(space/d)		0
Campgrounds	225	L/(campsite/d)		0
Mobile Home Parks	1,000	L/(Space/d)		0
Motels	150	L/(bed-space/d)		0
Hotels	225	L/(bed-space/d)		0
Office	75	L/7.0m ² /d		0
Tourist Commercial	28,000	L/gross ha/d		0
Other Commercial	28,000	L/gross ha/d		0

McINTOSH PERRY

AVERAGE RESIDENTIAL FLOW	0.21	L/s
PEAK RESIDENTIAL FLOW	0.75	L/s
AVERAGE ICI FLOW	0.00	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.00	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.00	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.21	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	0.76	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	0.80	L/s

SANITARY SEWER DESIGN SHEET

PROJECT:398-406 Roosevelt Avenue

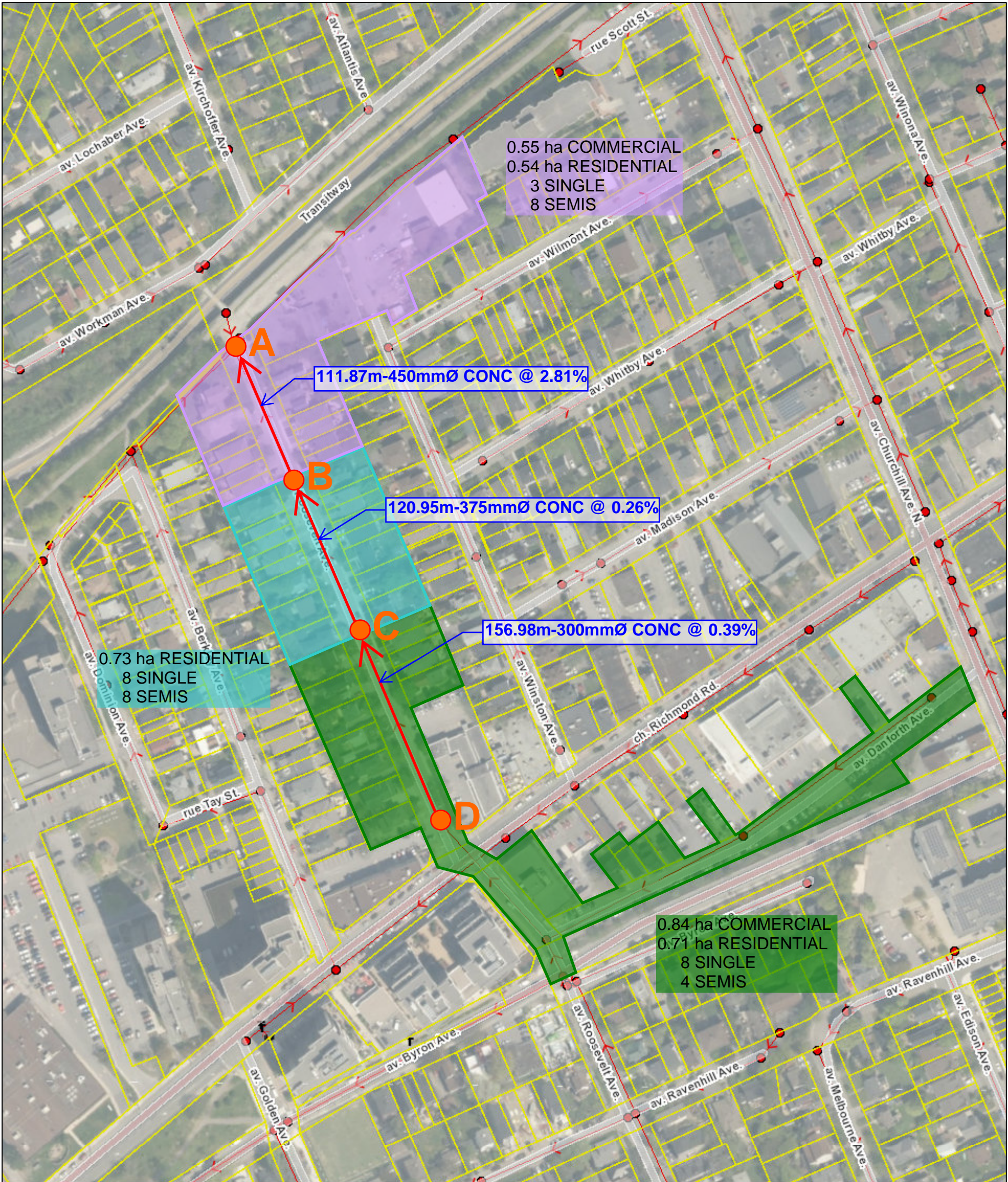
LOCATION:Ottawa, Ontario

CLIENT:ML Westboro



LOCATION				RESIDENTIAL								ICI AREAS								INFILTRATION ALLOWANCE			FLOW	SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY			
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								IND	CUM	L/s	(%)
				IND	CUM	IND	CUM	IND	CUM	IND			CUM	IND	CUM	IND	CUM	L/s		(%)												
Roosevelt Ave		D	C	8	4			0.71	30.8	30.8	3.68	0.37		0.00	0.84	0.84		0.00	0.41	1.55	1.55	0.51	1.29	63.00	156.98	300	0.39	0.863	61.71	97.96		
		C	B	8	8			0.73	40.0	70.8	3.63	0.83		0.00		0.84		0.00	0.41	0.73	2.28	0.75	1.99	93.27	120.95	375	0.26	0.818	91.27	97.86		
		B	A	3	8			0.54	26.5	97.3	3.60	1.13		0.00	0.55	1.39		0.00	0.68	1.09	3.37	1.11	2.92	498.59	111.87	450	2.81	3.037	495.67	99.41		
Design Parameters:				Notes:								Designed:				AJG				No.	Revision								Date			
Residential				ICI Areas																1.	City Submission #1								2021-12-10			
SF	3.4	p/p/u																														
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day																											
APT	2.3	p/p/u	COM	28,000	L/Ha/day																											
Other	60	p/p/Ha	IND	35,000	L/Ha/day																											
				MOE Chart																												

SANITARY SEWER ANALYSIS



December 18, 2017

Property Parcels

Road Names

Road Centrelines

Provincial Highway

City Freeway

Arterial

Major Collector

Collector

Federally Owned

Local

Transit

Open to Traffic

Commence Work

Sewer Fittings / Raccords

Cap / bouchon

Tee / raccord en T

Sanitary Manholes / Regards d'égout domestique

Sanitary Pipes / Conduites d'égout domestique

Private / Branchement privé

Public / Branchement public

Sanitary Pump Stations and Treatment Plants / Installations d'infrastructure

Sanitary Pump Station / Station de pompage des eaux usées

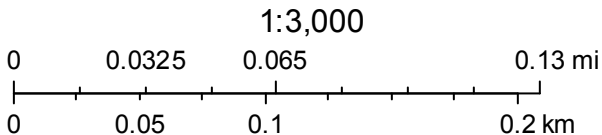
Wastewater Treatment Plant / Usine d'épuration des eaux usées

Combined Manholes / Regards d'égout unitaire

Combined Pipes / Conduites d'égout unitaire

Private / Branchement privé

Public / Branchement public

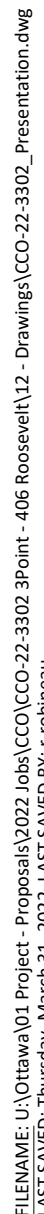


City of Ottawa

2018-11-28 Rev 2021-12

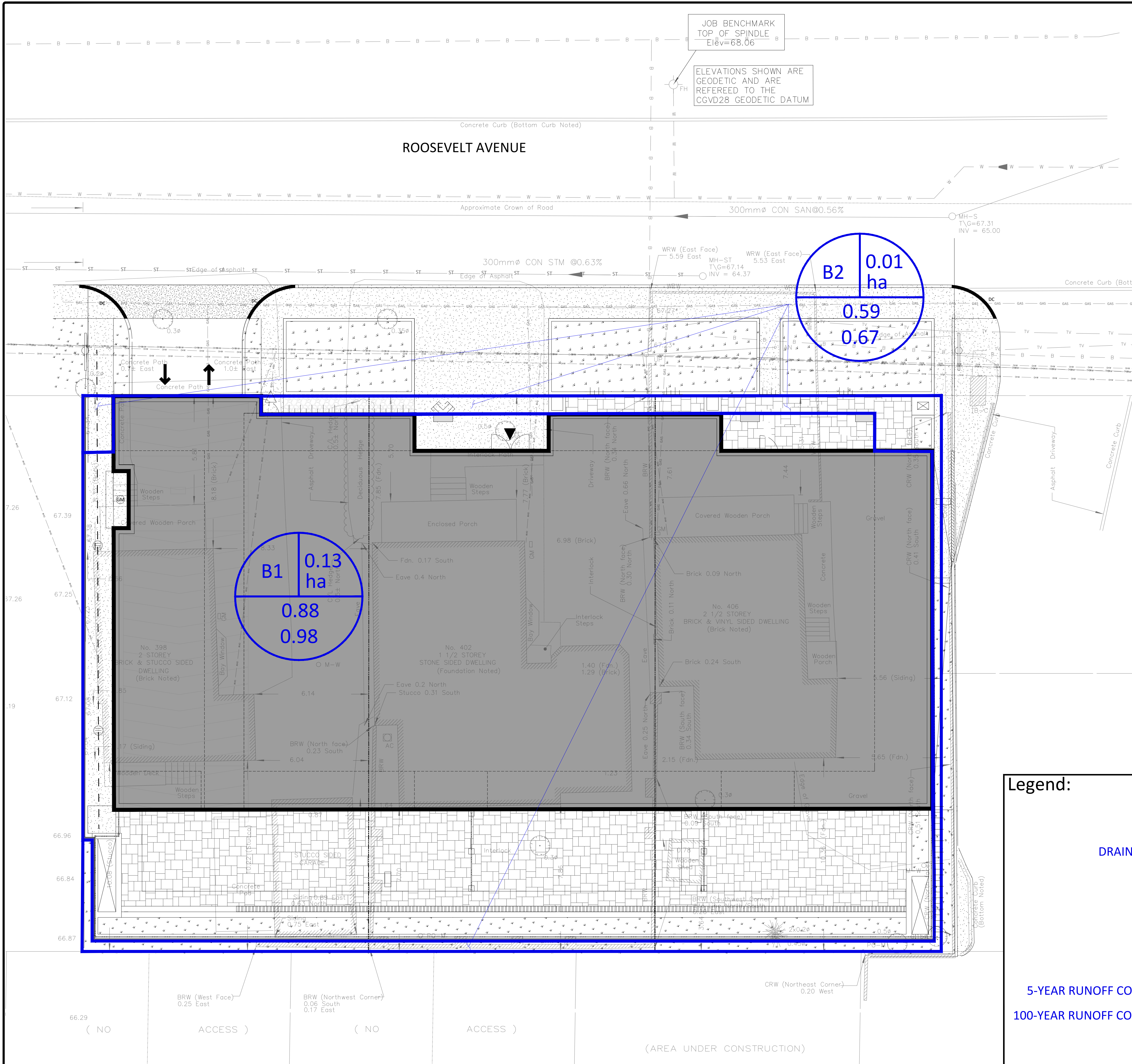
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APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

#18647

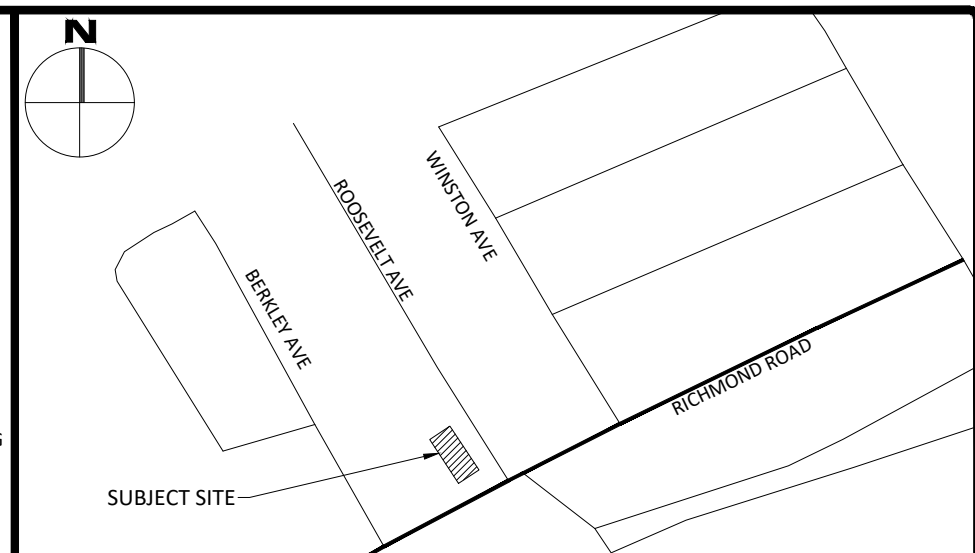
APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

FILENAME: I:\Ottawa\01 Project - Proposals\2022\06\CCO-22-3302-2\01 - 406 Roosevelt\12 - Drawing\CCO-22-3302_Preview.dwg
LAST SAVED: Thursday, March 31, 2022 1:51 PM
LAST MODIFIED: Wednesday, April 06, 2022 10:11 AM
LAST PLOTTED: Wednesday, April 06, 2022 10:11 AM



GENERAL NOTES

1. THE ORIGINAL TOPOGRAPHY, GROUND ELEVATION AND SURVEY DATA SHOWN ARE SUPPLIED FOR INFORMATION PURPOSES ONLY, AND IMPLY NO GUARANTEE OF ACCURACY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
2. THIS PLAN IS NOT A CADASTRAL SURVEY SHOWING LEGAL PROPERTY BOUNDARIES AND EASEMENTS. THE PROPERTY BOUNDARIES SHOWN HEREON HAVE BEEN DERIVED FROM INFORMATION SUPPLIED BY (OR SHOWN ON) ANNS, O'SULLIVAN, VOLLEBEKK LTD. JOB NO. 19693-17 AND CANNOT BE RELIED UPON TO BE ACCURATE OR COMPLETE. THE PRECISE LOCATION OF THE CURRENT PROPERTY BOUNDARIES AND EASEMENTS CAN ONLY BE DETERMINED BY AN UP-TO-DATE LAND TITLES SEARCH AND A SUBSEQUENT CADASTRAL SURVEY PERFORMED AND CERTIFIED BY AN ONTARIO LAND SURVEYOR.
3. THE CONTRACTOR IS TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY BEFORE COMMENCING CONSTRUCTION.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
5. THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
6. RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
7. EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURBING AND DEBRIS, OFF SITE AS DIRECTED BY THE ENGINEER AND THE CITY.
8. TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN FILL TO BE PLACED IN FILL AREAS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
9. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION, AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS.
11. DO NOT ALTER GRADING OF THE SITE WITHOUT PRIOR APPROVAL OF THE CITY.
12. ALL ROADWAY, PARKING LOT, AND GRADING WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH CITY STANDARDS AND SPECIFICATIONS. THE CONTRACTOR IS TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING.
13. CONTACT THE CITY FOR INSPECTION OF ROUGH GRADING OF PARKING LOTS, ROADWAYS AND LANDSCAPED AREAS PRIOR TO PLACEMENT OF ASPHALT AND TOPSOIL. ALL DEFICIENCIES NOTED SHALL BE RECTIFIED TO THE CITY SATISFACTION PRIOR TO PLACEMENT OF ANY ASPHALT, TOPSOIL, SEED & MULCH AND/OR SOD.
14. ALL DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION, IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
15. ELECTRICAL, GAS, TELEPHONE AND TELEVISION SERVICE LOCATIONS ARE SUBJECT TO THE INDIVIDUAL AGENCY.
 - ELECTRICAL SERVICE - HYDRO OTTAWA,
 - GAS SERVICE - ENBRIDGE,
 - TELEPHONE SERVICE - BELL CANADA,
 - TELEVISION SERVICE - ROGERS.
16. INSTALLATION TO BE IN ACCORDANCE WITH CURRENT CODES AND STANDARDS OF APPROVAL AGENCIES.
17. ALL EXISTING REDUNDANT PRIVATE APPROACHES FRONTING THIS DEVELOPMENT MUST BE REMOVED TO THE SATISFACTION OF THE CITY.
18. NO EXCESS DRAINAGE, EITHER DURING OR AFTER CONSTRUCTION, IS TO BE DIRECTED TOWARDS NEIGHBORING PROPERTIES.
19. NO ALTERATION OF EXISTING GRADES AND DRAINAGE PATTERNS ON PROPERTY BOUNDARIES.



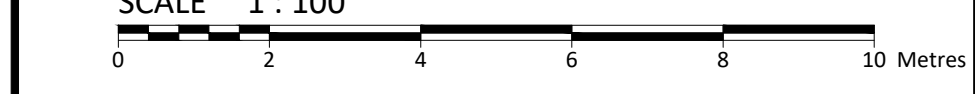
LEGEND

DC	BARRIER CURB & CURB DEPRESSION	---	CENTRELINE OF SWALE
PA	PROPOSED ASPHALT	---	CENTRELINE OF DITCH
LA	CONCRETE WALKWAY	---	SLOPING AT 3:1 UNLESS SPECIFIED
LA	LANDSCAPE AREA	---	PROPOSED ELEVATION EXISTING ELEVATION
MH-S	STORM MANHOLE	---	SWALE ELEVATION
CB	CATCHBASIN, CURB INLET OR DITCH INLET	---	TOP/BOTTOM WALL FACE ELEVATIONS
MH-A	SANITARY MANHOLE	---	EMERGENCY OVERLAND FLOW ROUTE
PP	PERFORATED PIPE	---	SILT FENCE BARRIER PER OPSD 219.110
WV	WATER VALVE/CHAMBER	---	BUILDING ENTRANCE BUILDING EXIT
FH	FIRE HYDRANT	---	REDUCER
PW	PROPOSED WALL	---	REMOTE WATER METER
TD	PROPOSED TRENCH DRAIN	---	WATER METER
		---	GAS METER LOCATION

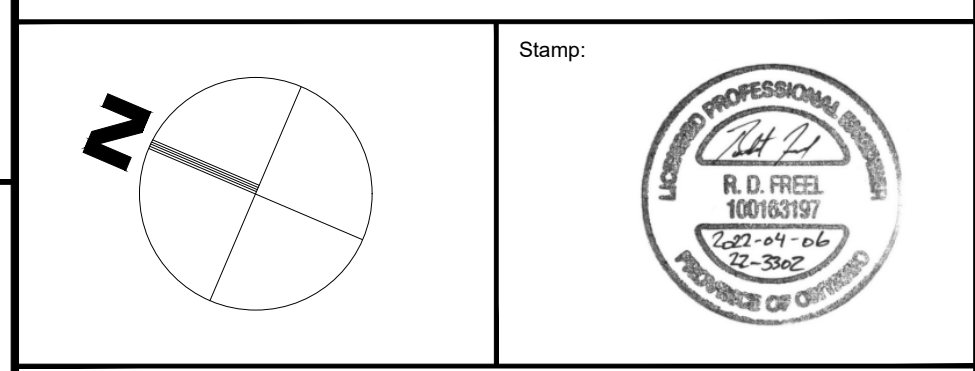
SUBJECT TO APPROVAL

2	ISSUED FOR REVIEW	APR 6, 2022
1	ISSUED FOR REVIEW	DEC 10, 2021
No.	Revisions	Date

Check and verify all dimensions before proceeding with the work. Do not scale drawings.



McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com



Client: **ML WESTBORO REALTY INVESTMENTS INC**
651 CHURCHILL AVE NORTH
OTTAWA, ON K1Z 5G2

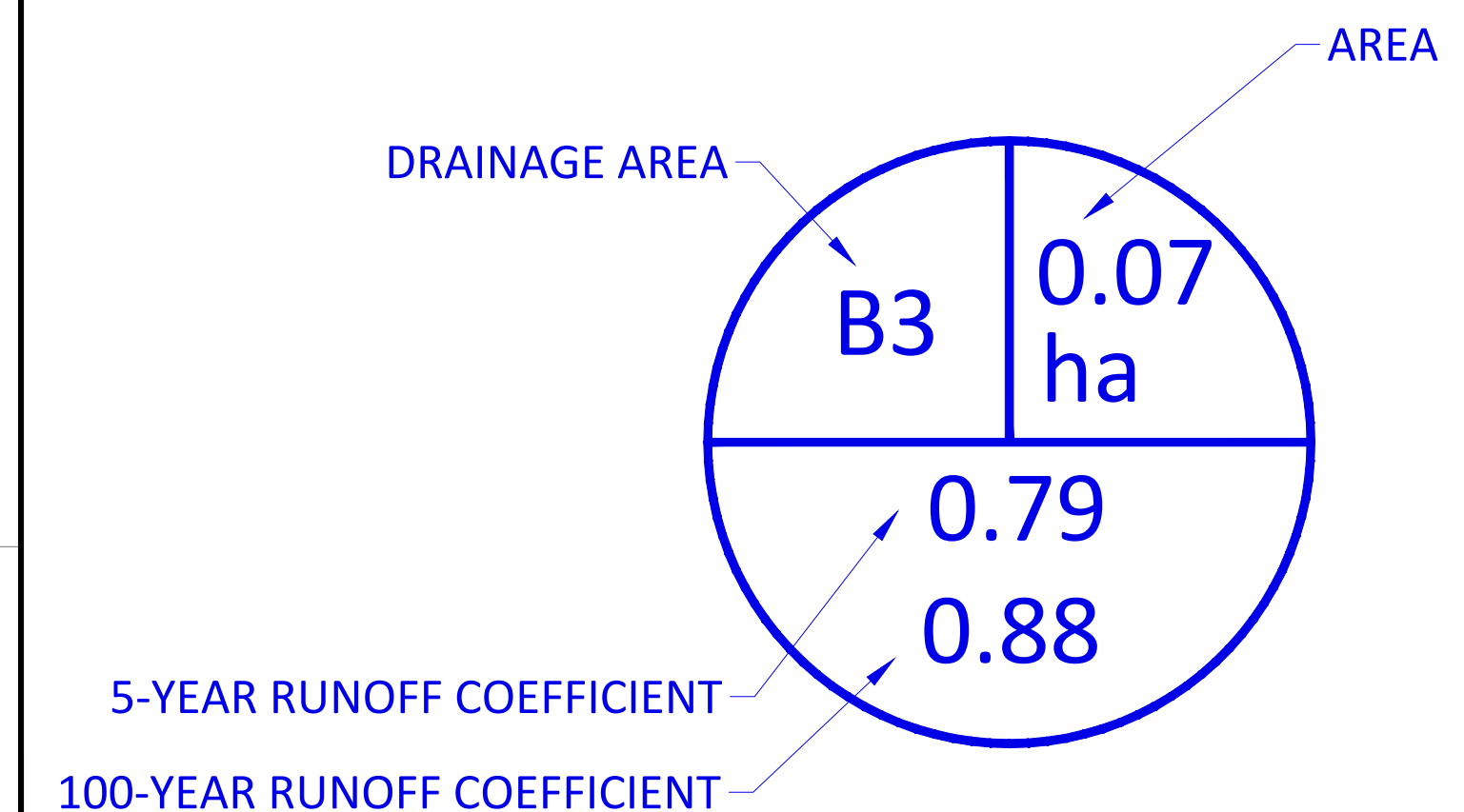
Project: **6-STOREY RESIDENTIAL BUILDING**
406 ROOSEVELT

OTTAWA ON

Drawing Title: **POST DEVELOPMENT DRAINAGE PLAN**

Scale:	1:100	Project Number:	CCO-22-3302
Drawn By:	R.R.R.	Drawing Number:	POST
Checked By:	A.J.G.		
Designed By:	A.J.G.		

Legend:



D07-12-17-0171

APPENDIX G

STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CCO-22-3302 - 406 Roosevelt - Runoff Calculations

1 of 3

Pre-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m ²)	C	Gravel Area (m ²)	C	Pervious Area (m ²)	C	C _{AVG} 5-Year	C _{AVG} 100-Year
A1	0.136	503.98	0.90	614.52	0.60	245.99	0.20	0.64	0.75

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	I (mm/hr)			Q (L/s)	
					2-Year	5-Year	100-Year	5-Year	100-Year
A1	0.136	0.64	0.75	10	76.8	104.2	178.6	25.24	50.95
Total	0.136							25.24	50.95

Post-Development Runoff Coefficient

Drainage Area	Area (ha)	Impervious Area (m ²)	C	Gravel Area (m ²)	C	Pervious Area (m ²)	C	C _{AVG} 5-Year	C _{AVG} 100-Year
B1	0.128	1,234.89	0.90	0.00	0.60	41.60	0.20	0.88	0.98
B2	0.009	45.28	0.90	6.78	0.60	35.94	0.20	0.59	0.67

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 2/5-Year	C 100-Year	Tc (min)	I (mm/hr)		Q (L/s)	
					5-Year	100-Year	5-Year	100-Year
B1	0.128	0.88	0.98	10	104.2	178.6	32.43	61.82
B2	0.009	0.59	0.67	10	104.2	178.6	1.51	2.95
Total	0.136						33.94	64.76

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	I (mm/hr)	Q (L/s)
				5-Year	5-Year
A1	0.136	0.50	10	104.2	19.76
Total	0.136				19.76

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/s)		Restricted Flow (L/s)		Storage Required (m ³)		Storage Provided (m ³)		
	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year	
B1	32.43	61.82	8.81	16.81	15.67	29.73	15.67	29.73	Restricted
B2	1.51	2.95	1.51	2.95					Unrestricted
Total	33.94	64.76	10.32	19.76	15.67	29.73	15.67	29.73	

McINTOSH PERRY

CCO-22-3302 - 406 Roosevelt - Runoff Calculations

Storage Requirements for Area B1

2 of 3

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	32.43	8.81	23.62	14.17
15	83.6	26.01	8.81	17.20	15.48
20	70.3	21.87	8.81	13.06	15.67
25	60.9	18.96	8.81	10.15	15.22
30	53.9	16.79	8.81	7.98	14.36

Maximum Storage Required 5-year = 15.7 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	61.82	16.81	45.01	27.00
12	162.1	56.13	16.81	39.32	28.31
14	148.7	51.49	16.81	34.68	29.13
16	137.5	47.62	16.81	30.81	29.58
18	128.1	44.34	16.81	27.53	29.73
20	120.0	41.53	16.81	24.72	29.66
22	112.9	39.08	16.81	22.27	29.39
24	106.7	36.93	16.81	20.12	28.97
26	101.2	35.03	16.81	18.22	28.42
28	96.3	33.33	16.81	16.52	27.75

Maximum Storage Required 100-year = 29.7 m³

5-Year Storm Event Storage Summary

Storage Available (m³) = 15.7 *

Storage Required (m³) = 15.7

100-Year Storm Event Storage Summary

Storage Available (m³) = 29.7 *

Storage Required (m³) = 29.7

McINTOSH PERRY

CCO-22-3302 - 406 Roosevelt - Runoff Calculations

4 of 3

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	26	1.76	6	3

*Therefore, a Tc of 10 can be used

$$T_c = (3.26(1.1 - c)L^{0.5}/S^{0.33})$$

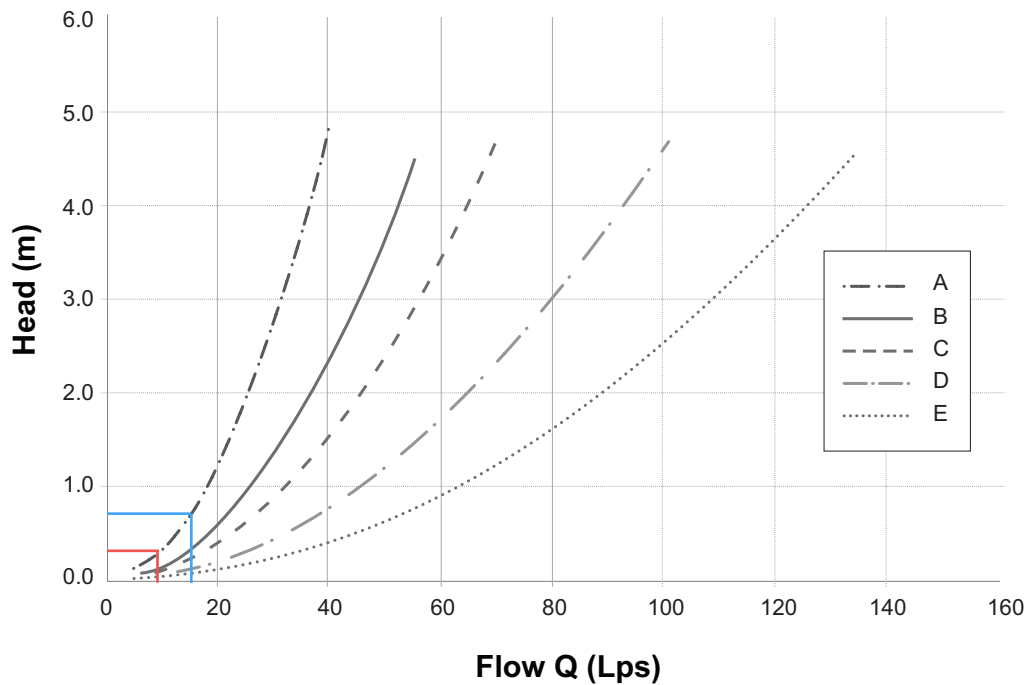
c= Balanced Runoff Coefficient

L= Length of Drainage Area

S= Average Slope of Watershed

Cistern ICD Sizing

Chart 3: HF & MHF Preset Flow Curves



- 5-Year Storm Scenario
- 100-Year Storm Scenario

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

4. Development Servicing Study Checklist

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

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

4.1 General Content

Criteria	Location (if applicable)
<input type="checkbox"/> Executive Summary (for larger reports only).	N/A
<input type="checkbox"/> Date and revision number of the report.	On Cover
<input type="checkbox"/> Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
<input type="checkbox"/> Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
<input type="checkbox"/> Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
<input type="checkbox"/> Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
<input type="checkbox"/> Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
<input type="checkbox"/> Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

<input type="checkbox"/> Identification of existing and proposed infrastructure available in the immediate area.	N/A
<input type="checkbox"/> Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Site Grading Plan (C101)
<input type="checkbox"/> Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Site Grading Plan (C101)
<input type="checkbox"/> Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
<input type="checkbox"/> Proposed phasing of the development, if applicable.	N/A
<input type="checkbox"/> Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
<input type="checkbox"/> All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names 	Site Grading Plan (C101)

4.2 Development Servicing Report: Water

Criteria	Location (if applicable)
<input type="checkbox"/> Confirm consistency with Master Servicing Study, if available	N/A
<input type="checkbox"/> Availability of public infrastructure to service proposed development	N/A
<input type="checkbox"/> Identification of system constraints	N/A
<input type="checkbox"/> Identify boundary conditions	Appendix C
<input type="checkbox"/> Confirmation of adequate domestic supply and pressure	N/A
<input type="checkbox"/> Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Appendix C
<input type="checkbox"/> Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
<input type="checkbox"/> Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
<input type="checkbox"/> Address reliability requirements such as appropriate location of shut-off valves	N/A
<input type="checkbox"/> Check on the necessity of a pressure zone boundary modification.	N/A
<input type="checkbox"/> Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Appendix C, Section 4.2

<input type="checkbox"/> Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Site Servicing Plan (C101)
<input type="checkbox"/> Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
<input type="checkbox"/> Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
<input type="checkbox"/> Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

Criteria	Location (if applicable)
<input type="checkbox"/> Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	N/A
<input type="checkbox"/> Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
<input type="checkbox"/> Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
<input type="checkbox"/> Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2 Proposed Sanitary Sewer

<input type="checkbox"/> Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 5.3 Proposed Sanitary Design
<input type="checkbox"/> Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N/A
<input type="checkbox"/> Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 5.2 Proposed Sanitary Sewer
<input type="checkbox"/> Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A
<input type="checkbox"/> Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/> Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/> Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
<input type="checkbox"/> Special considerations such as contamination, corrosive environment etc.	N/A

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Analysis of available capacity in existing public infrastructure.	N/A
<input type="checkbox"/> A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
<input type="checkbox"/> Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5-year event (dependent on the receiving sewer design) to 100-year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Set-back from private sewage disposal systems.	N/A
<input type="checkbox"/> Watercourse and hazard lands setbacks.	N/A
<input type="checkbox"/> Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
<input type="checkbox"/> Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
<input type="checkbox"/> Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

<input type="checkbox"/> Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Site Grading Plan (C101)
<input type="checkbox"/> Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 7.0 Proposed Stormwater Management Appendix G
<input type="checkbox"/> Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
<input type="checkbox"/> Identification of potential impacts to receiving watercourses	N/A
<input type="checkbox"/> Identification of municipal drains and related approval requirements.	N/A
<input type="checkbox"/> Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
<input type="checkbox"/> 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Site Grading Plan (C101)
<input type="checkbox"/> Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

<input type="checkbox"/> Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 8.0 Sediment & Erosion Control
<input type="checkbox"/> Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
<input type="checkbox"/> Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Clearly stated conclusions and recommendations	Section 9.0 Summary Section 10.0 Recommendations
<input type="checkbox"/> Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	All are stamped
<input type="checkbox"/> All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped