SERVICING & STORMWATER MANAGEMENT REPORT RESIDENTIAL BUILDING – 214 SOMERSET STREET

Project No.: CCO-24-0450

City File No.: NA

Prepared for:

CSV Architects
190 O'Connor Street, Suite 100
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Prepared by:

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December 10, 2024

McINTOSH PERRY
egis

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by CSV Architects to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed four-storey residential building, located at 214 Somerset Street East within the City of Ottawa.

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the City of Ottawa (City). 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-24-0450, C101 – Site Grading and Drainage Plan, and
- CCO-24-0450, C102 – Site Servicing Plan, AND
- CCO-24-0450, REM – Removals Plan.

1.2 Site Description

The property is located at 214 Somerset Street East within the Neighbourhood of Sandy Hill. It is described as Plan 45224, Part of Lot E, Broken Front D (Rideau Front), Geographic Township of Nepean, City of Ottawa. The land in question covers approximately 0.05 ha and is located between Henderson Avenue and Nelson Street. The development area for the proposed works is approximately 0.05 ha.

See Site Location Plan in Appendix 'A' for more details.

The existing site is currently developed with 6 townhomes and a rear yard space. The existing site has sanitary and water services, however, there are no storm services connected to the City sewer.

The proposed development consists of a 275 m², four-storey community housing residential building. Pathways to building entrances will be provided throughout the site along with landscaping. The rear yard will also consist of amenity space, general storage, and bike storage.

Figure 1: Site Map

2.0 BACKROUND STUDIES

Background studies that have been completed for the proposed site include City of Ottawa as-built drawings and a topographical survey.

As-built drawings of existing services within the vicinity of the proposed site were reviewed in order to determine accurate servicing and stormwater management designs for the site.

A topographic survey of the site was completed by Farley, Smith & Denis Surveying Ltd.

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on April 6th, 2023, regarding the proposed site. Specific design parameters to be incorporated within this design include the following:

- Pre-development flows shall be calculated using a time of concentration (Tc) of no less than 10 minutes and post-development flows shall use a Tc of 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. (Further correspondence has been had with the City. See Section 7.0).
- Quality control is required to be provided for this site as per RVCA requirements.
- Storm service to connect to 675mm diameter concrete storm sewer on Somerset St. E.

- Sanitary service to connect to 250mm diameter PVC sanitary sewer on Somerset St. E.
- Sanitary sewer monitoring maintenance hole is to be installed on the private side of the property line.
- A backwater valve is required on the sanitary service for protection.
- Water service to connect to 406mm diameter PVC watermain on Somerset St. E.

The notes from the City of Ottawa can be found in Appendix 'B'.

4.0 WATERMAIN

4.1 Existing Watermain

There is an existing 406mm diameter PVC watermain within Somerset St. E. The watermain is located in the 1W pressure zone and services multiple adjacent properties and multiple fire hydrants southwest and northeast of the proposed development on Somerset St. E.

4.2 Proposed Watermain

A new 100mm diameter PVC watermain is proposed to service the site complete with a water valve located at the property line and will be connected to the existing 406mm diameter watermain within Somerset St. E. The watermain is designed to have a minimum of 2.4m cover.

The Ontario 2006 Building Code Compendium (OBC) method was utilized to determine the required fire flow for the site per ISTB-2021-03. The Building Group Classification was Group C for Residential Occupancies. The water supply coefficient ('K' value) was deemed to be 23, under the conservative assumption that the building is of combustible construction. The spatial coefficient ('Stot' value) accounting for the surrounding buildings was 2.0, and the total building volume ('V' value) for the OBC calculation was determined to be 3,025 m^3. The results of the calculations yielded a required fire flow of 4,500 L/min. A fire flow of 8,000 L/min was calculated using the Fire Underwriters Survey (FUS) requirements. The detailed calculations for the FUS and OBC can be found in Appendix 'C'.

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

Table 1: Water Demands

Site Area	0.05 ha
Residential	280 L/c/d
Average Day Demand (L/s)	0.11
Maximum Daily Demand (L/s)	1.02
Peak Hourly Demand (L/s)	1.54

OBC Fire Flow Requirement (L/s)	75.00
FUS Fire Flow Requirement (L/s)	133.33

Boundary conditions have been provided by the City of Ottawa for the current conditions and are available in Appendix 'C'. The results determined that the proposed 406mm watermain can adequately service the proposed development and provide sufficient fire flow. Refer to drawing for more details.

The normal operating pressure range is anticipated to be 450 kPa to 550 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi). The proposed watermain will meet the minimum required 20 psi (140 kPa) at the ground level under maximum day demand and fire flow conditions. The results are available in Appendix 'C' of this report.

Table 2: Water Pressure at Junctions per Scenario

Junction	Average Day (psi)	Peak Hourly (psi)	Max. Day + Fire Flow (psi)
J-1 (BLDG)	78.7	65.4	69.9

To confirm the adequacy of fire flow to protect the proposed development, public and private fire hydrants within 75 m of the proposed building were analyzed per City of Ottawa ISTB 2018-02 Appendix I Table 1. The results are demonstrated below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Combined Fire Flow (L/min.)
214 Somerset St. E.	4,500	4	22,800

A hydrant cover figure can be found in Appendix 'C'.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

There is an existing 250mm diameter PVC sanitary collection sewer within Somerset St. E. The existing sanitary sewer drains to the Somerset Trunk Sewer.

5.2 Proposed Sanitary Sewer

A new 150mm diameter gravity sanitary service will be connected to the existing 250mm diameter sanitary sewer within Somerset St. E. Due to space constraints, a monitoring port will be provided within the building for monitoring purposes as per the City of Ottawa – Sewer Design Guidelines, October 2012, Clause 4.4.4.7 and City of Ottawa Sewer-Use By-Law 2003-514 (14).

The subject site is a proposed four-storey residential building with 22 apartment units. The peak design flows for the proposed building were calculated using criteria from the City of Ottawa – Sewer Design Guidelines, October 2012. The proposed site development will generate a peak flow of 0.41 L/s.

The proposed 150 mm diameter gravity sanitary sewers will be installed to service the subject property with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. Design parameters for the site include an infiltration rate of 0.33 l/s/ha.

The proposed service for the site will be connected to existing 250mm diameter sanitary sewer within Somerset St. E. The sanitary flow for the proposed development is expected to be comparable to the existing conditions, therefore it is anticipated that there will be no issues with capacity constraints within the proposed lateral or within the existing sanitary main within Somerset St. E. City staff to confirm if there are any capacity concerns within the municipal system.

See Sanitary Sewer Design Sheet in Appendix 'D' of this report for more details.

6.0 STORM SEWER DESIGN

6.1 Existing Storm Sewers

The subject property is currently serviced by surface runoff to the city stormwater system by way of catchbasins on Nelson St. and Somerset St. E. A portion of the surface runoff is unrestricted into the rear yard.

6.2 Proposed Storm Sewers

Runoff from the proposed site will be collected and stored on the roof of the proposed building. A proposed storm sewer with a diameter of 150mm will be installed directing the flow from the roof drains to the existing 675mm diameter storm sewer within Somerset St. E.

The minor storm sewers will be sized for the 5-year flow without any restriction. A storm sewer design sheet was created using the rational method and City of Ottawa 5-year storm event. Storm flows will be controlled by roof storage to limit flows to the specified allowable release rate.

A second 150mm diameter storm sewer is also proposed for the outlet of the sump pump to the existing 675mm diameter storm sewer within Somerset St. E. In the event of storm sewer surcharging, a backwater valve will safeguard the building, while a sump pump will discharge the stormwater overland, which is to be directed to the municipal right-of-way where it will reach municipal system via overland flow. This serviced is sized by others.

The storm design sheet calculates the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was used to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is

based on a 10-minute inlet time at the uppermost sewer run. Within the design sheet, pipe capacities and associated full flow velocities have been calculated.

See CCO-24-0450 - POST in Appendix 'F' and Storm Sewer Design Sheet in Appendix 'G' of this report for more details. The Stormwater Management design for the subject property will be outlined in Section 7.0.

7.0 PROPOSED STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the proposed site will be maintained through positive drainage away from the proposed building and by roof drains that will direct storm water to the sewer as described above. The remainder of the restricted flow will surface drain to catch basins on Somerset St. E. and Nelson St. The unrestricted area is located in the rear-yard and will include permeable pavers and a grassed area. The quantitative and qualitative properties of the storm runoff for both the pre- and post-development flows are further detailed below. Stormwater Best Management Practices (SWM BMP's) will be implemented at the "Lot level", "Conveyance" and "End of Pipe" locations. These concepts will be explained further in Section 7.6.

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

Quality Control

- The site has been designed with Best Management Practices (BMPs) and it is anticipated that clean stormwater will be leaving the site.

Quantity Control

- Post-development runoff directed to the right-of-way and from the roof is be restricted to the 5-year pre-development flows to the right-of-way with C=0.5. The rear yard area is to decrease the runoff from existing conditions.

7.2 Runoff Calculations

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

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

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
Gravel	0.60
Permeable areas/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.

As per the pre-consultation meeting with the City of Ottawa the time of concentration (Tc) used for pre-development shall be calculated using a Tc of 10 minutes and post-development flows shall be calculated using a Tc of 10 minutes.

7.3 Pre-Development Drainage

The existing site drainage limits are demonstrated on the Pre-Development Drainage Area Plan. A summary of the Pre-Development Runoff Calculations can be found below.

Table 4: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (2/5-Year)	Runoff Coefficient (100-Year)	5-year Peak Flow (L/s)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)
A1	0.04	0.90	1.00	7.71	10.50	20.00
A2	0.01	0.70	0.78	1.96	2.67	5.13
Total	0.05			9.67	13.17	25.12

See CCO-24-0450 - PRE in Appendix 'E' and Appendix 'G' for calculations.

7.4 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-24-0450 - POST in Appendix 'F' of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 5: Post-Development Runoff Summary

Drainage Area	Area (ha)	Runoff Coefficient (2/5-Year)	Runoff Coefficient (100-Year)	5-year Peak Flow (L/s)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)
B1	0.03	0.90	1.00	5.28	7.19	13.69
B2	0.02	0.47	0.55	1.53	2.08	4.17
B3	0.01	0.60	0.70	1.34	1.82	3.60
Total	0.05			8.15	11.09	21.47

See Appendix 'G' for calculations. Runoff from area B1 will be restricted by roof drains before outletting to the existing storm system within Somerset St. E. Runoff for areas B2 and B3 will be unrestricted. Runoff from area B2 will drain towards Nelson Street and Somerset St E. Runoff from area B3 will match the pre-development drainage conditions in the rear-yard. This quantity and quality control will be further detailed in Sections 7.5 and 7.6.

7.5 Quantity Control

Under current conditions, the rear yard sheet runoff goes into neighboring properties from Area A2. Due to the large existing slopes in the rear yard, directing stormwater toward the Nelson St or Somerset St. right-of-Ways is not viable for Area B2. The proposed works are to significantly reduce the quantity that runs off to adjacent properties with the addition of permeable pavers and a landscaped area. Further, a clear stone trench with a perforated subdrain is proposed in the landscape where additional storage is to take place for an additional measure.

After discussing the stormwater management criteria for the site with City staff, the total post-development runoff for this site has been restricted to match the 5-year pre-development flow rate with a combined C value of 0.50. These values create the following allowable release rates for the site. See Appendix 'B' for pre-consultation notes.

Drainage Area	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
				2-Year	5-Year	100-Year
A1	0.50	0.50	10		5.83	
A2	0.70	0.78	10	1.96	2.67	5.13

See Appendix 'G' for calculations.

Reducing site flows will be achieved using flow restrictions and creating onsite storage. Runoff from areas B1 to B3 will be restricted as shown in the table below.

Table 6: Post-Development Restricted Runoff Summary

Drainage Area	Post Development Unrestricted Flow (L/s)		Post Development Restricted Flow (L/s)		
	5-Year	100-Year	5-Year	100-Year	
B1	7.19	13.69	0.72	1.32	Restricted - Roof Drains
B2	2.08	4.17	2.08	4.17	Unrestricted to ROW
Total Toward ROW	9.27	17.87	2.80	5.49	
B3	1.82	3.60	1.82	3.60	Unrestricted
Total	11.09	21.47	4.62	9.09	

See Appendix 'G' for calculations.

Runoff from Area B1 will be restricted through two (2) roof drains before discharging to the new storm sewer connection out letting to Somerset St. E. The total flow leaving the roof will be 0.72 L/s and 1.32 L/s during the 5 and 100-year storm events, respectively. This will result in ponding depths of 30 and 55 mm for 5 and 100-year storm events, respectively. All of the storage required for this area will be located on the proposed roof, and emergency roof scuppers will be installed to ensure ponding does not exceed the proposed ponding limits.

See below table for details of the required and provided storage volumes.

Table 7: Storage Summary

Drainage Area	Depth of Ponding (m)	Storage Required (m^3)	Storage Available (m^3)	Depth of Ponding (m)	Storage Required (m^3)	Storage Available (m^3)
	5-Year			100-Year		
B1	0.030	5.6	6.2	0.055	10.8	11.3

See Appendix 'G' for calculations.

7.6 Quality Control

The development of this lot will employ Best Management Practices (BMP's) wherever possible. The intent of implementing stormwater BMP's is to ensure that water quality and quantity concerns are addressed at all stages of development. Lot level BMP's typically include temporary retention of the parking lot runoff, minimizing ground slopes and maximizing landscaped areas. Some of these BMP's cannot be provided for this site due to site constraints and development requirements.

As the majority of the runoff from the site will be captured and conveyed through roof drains to the existing sewer system, it can be assumed that this is clean water leaving the site. The runoff from additional areas of the site is mainly from pervious areas in the rear yard, which can also be considered clean water. Therefore, it is believed that quality control is achieved.

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.

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 catchbasins and filter fabric is to be placed under the grates of all existing catchbasins 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

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip rapped area. Additional rip rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / City or Conservation Authority.

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 new 275m^2 four-storey residential building will be constructed along the property line at 214 Somerset St. E.
- A new watermain, ranging in diameter from 100 mm watermain will be installed to service the site, connecting to the watermain on Somerset St. E.
- A new 150mm sanitary sewer will be installed to service the proposed residential building and connect to Somerset St. E.
- Two proposed storm sewers with diameters of 150mm, will be installed directing the flow from the residential building's roof drains, and sump pump to the existing storm sewer on Somerset St. E.
- Storage for the 5- through 100-year storm events will be provided by roof drains on the proposed building.

10.0 RECOMMENDATION

Based on the information presented in this report, we recommend that the City of Ottawa approve this Servicing and Stormwater Management Report in support of the proposed four-storey residential building.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.

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11.0 STATEMENT OF LIMITATIONS

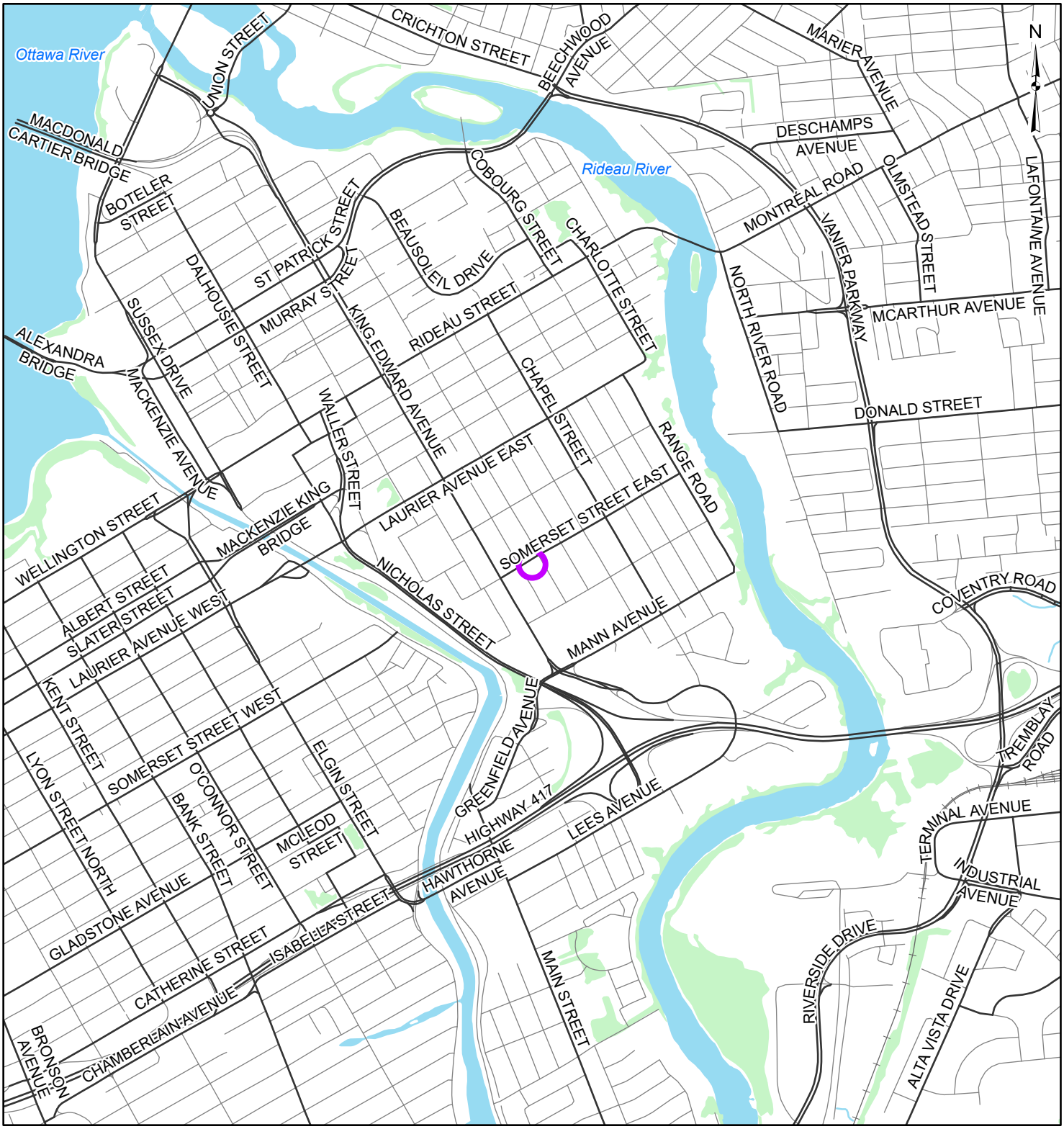
This report was produced for the exclusive use of CSV Architects. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, 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

McINTOSH PERRY



600 300 0 600

Scale 1:20,000

Metres

LEGEND

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

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2023.

CLIENT: CSV ARCHITECTS

PROJECT: 214 SOMERSET ST E

TITLE: SITE LOCATION

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO: CCO-24-0450		FIGURE:
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APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY

Robbie Pickard

From:	Bernier, John <John.Bernier@ottawa.ca>
Sent:	Monday, May 1, 2023 2:57 PM
To:	Jessie Smith
Cc:	McMahon, Patrick; Kadri, Nader; Bakhit, Reza; Smith, Jack; Jessie Smith; John Verbaas; leaning@csv.ca; freeman@fotenn.com; alain@fotenn.com; Dylan Bennett; Barron Meyerhoffer; Gauthier, Steve; Richardson, Mark
Subject:	214 Somerset Ste E - Preconsult - Follow-up
Attachments:	214 Somerset Street_TOR Design Brief.pdf; Plans and Study list_214 Somerset.pdf

Good afternoon,

Sorry for the delay in getting these notes to you regarding your Somerset Street proposal. Please refer to the below [and/or attached notes] regarding the Pre-Application Consultation (pre-con) Meeting held on April 6, 2023 for the proposed development which includes demolition of existing rooming houses and replacement with new 4-storey, 22-unit apartment building with common amenity space. I have attached the required Plans & Study List for application submission.

Below [or attached] are staff's preliminary comments based on the information available at the time of pre-con meeting:

Planning Comments – John Bernier:

Official Plan: Downtown Core Transect, designated Minor Corridor (Sec 6.2)
Secondary Plan: Central and East Downtown Core Secondary Plan

- Designated 'Corridor' on Schedule B
- Permits four storey, all-residential buildings
- Concerned with the provison in this secondary plan that requires an active frontage on the corridor:

  "2) Development will provide a continuity of active frontages along the ground floor fronting all corridors. This includes functional main entrances that are directly accessible from the public realm for each unit on the ground floor. For further specification, this includes residential, retail and commercial units."

Zoning: R4UC[480]-c, which permits a Rooming House, the provisions of a low-rise apartment would apply, I encourage you to examine the UC subzone provisions closely - Sec 161, but will mention a few key points.

General Comments :

- Concerns with the deep wells proposed for the ground floor. What type of barrier will be used (OBC requirement) to protect people and how will this become a visual barrier along a fairly important frontage?

- Waste management does not appear to have been considered here. Please provide details regarding the garbage room (dimensions of the room and doorways) ,the bins intended for use, and the path and staging area for the containers. See Sec 143

- Consider a completely fenced rear yard with controlled access for safety purposes.

- Encourage light fixtures to be included in on the initial plan.

Zoning Comments:

- 30% of the lot area must be provided as landscaped area for a lot containing an apartment low rise

The front facade must comprise at least 25 per cent windows, and furthermore

- Any part of the rear yard not occupied by drive aisles, pathways accessory structures, must be softscaped.
  - 50% of rear yard must be softscaped.
- Based on the size of the building, 25% of units must be two-bedroom
- Front and corner yards shall include permanent fixtures that prevent illegal parking - such as: planters, benches, bollards, trees, ornamental fencing, raised planters, etc.
- Accessory buildings subject to Sec. 55 - specifically, maximum of two accessory structures are permitted. So you'll need to unify these structures.
- Alternative setbacks apply - see Sec 144.

Vehicular Circulation/ Parking:

- The site is located within Area X and therefore parking is required. 0.25 spaces per rooming unit. However, I would be supportive of a variance given the proposed use.

Bicycle Parking:

- A variance or zoning amendment would need to be supported by a rationale as to why the reduction is appropriate. I would suggest that you include a 1:1 ratio of units to bicycle lockups.
- Provide enclosed and covered locations (required for multi-unit dwellings).
- Should not include racks near the public realm. Locate these in easy to access and highly visible areas.
- See Sec. 111 for further information on the specs required.

Applications:

- Site Plan Control Application (complex)
- Minor Variance or Zoning By-law Amendment

Urban Design Comments – Nader Kadri:

- Design Brief required – TOR attached.
- Please ensure that there is sufficient light access for units. Windows appear to be very small and narrow.
- Please explore the potential for active entrances along public streets.
- Please explore the potential for additional tree planting.
- Please ensure that there is sufficient bike parking for the development.
- Please explore the use of materials that are prevalent within the area.
- Staff understand that the building will excel relative to modern day sustainability practices, please provide additional details as part of your submission.
- Indoor and outdoor amenity needed to support the number of small units within the building.

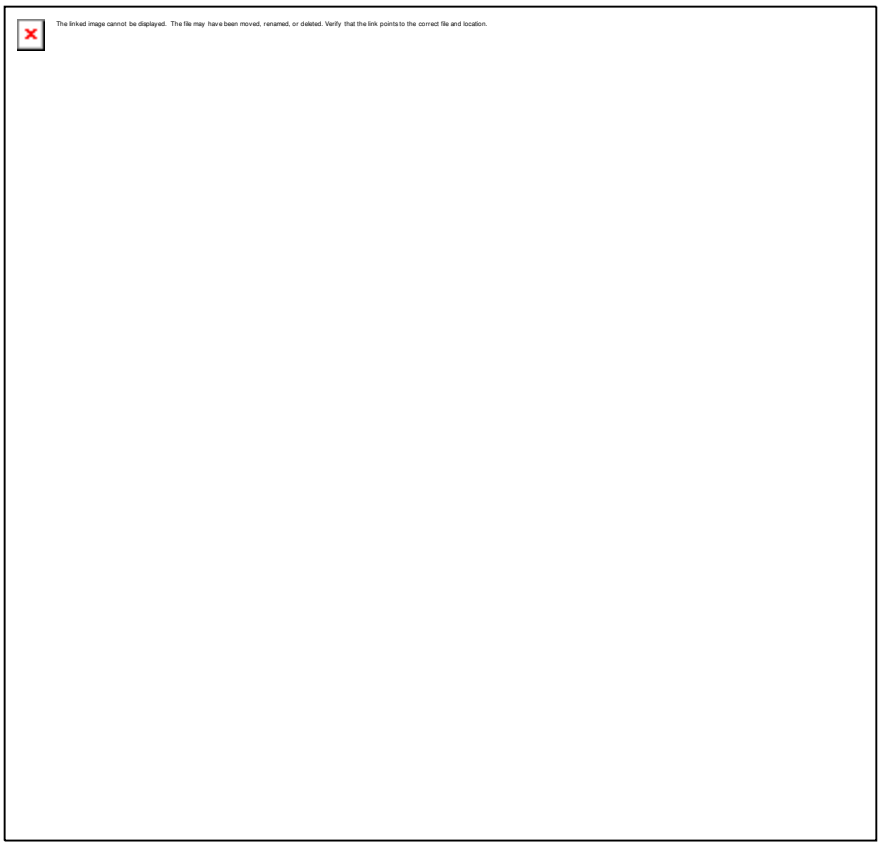
Engineering Comments – Reza Bakhit:

General:

- 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**.
- 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.
- **Concern** about the slope stability of the site as it appears that the site has slopes (existing or proposed) steeper than 5 horizontals to 1 vertical (i.e., 11 degree inclination from horizontal). The geotechnical engineer should investigate the stability of the slope.
- **Concern** about protection of 610mm backbone watermain on Nelson Street. Vibration and settlement monitoring plan will be required. Details of the Vibration Monitoring plan will depend on the depth of any underground levels for the development and the shoring method.

- Reference documents for information purposes :
  - Ottawa Sewer Design Guidelines (October 2012)
  - Technical Bulletin PIEDTB-2016-01
  - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
  - Ottawa Design Guidelines - Water Distribution (2010)
  - Technical Bulletin ISTB-2021-03
  - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
  - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
  - City of Ottawa Environmental Noise Control Guidelines (January 2016)
  - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
  - Ottawa Standard Tender Documents (latest version)
  - Ontario Provincial Standards for Roads & Public Works (2013)
  - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).

Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.



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

Stormwater Management Criteria and Information:

- **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 5-year pre-development level.** 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*].

- Considering the size of the site, it would be acceptable to control the roof portion only **(100-year storm event, to a 2-year pre-development level**) and leave the remainder of the site uncontrol as long as the uncontrolled portion is directed towards the right of way. This approach should be discussed in the SWM report. Also, the grading plan should clearly demonstrate that the runoff from the uncontrolled portion of the site will be directed towards the ROW

- 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.

- Please note that 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.**
- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- Please note that as per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 5-year storm rainfall event**.
- **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.
  When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**
  In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.
  Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?
  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.

  Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.

  In regard to 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.
  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.

- 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** in order to reduce the likelihood of plugging.

- Post-development site grading shall match existing property line grades in order 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 **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**.
- **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.
- If **Window wells** are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.
- 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.
- Rear yard on grade parking to be permeable pavement. Refer to City Standard Detail Drawings SC26 (maintenance/temp parking areas), SC27 or permeable asphalt materials. No gravel or stone dust parking areas permitted.

Storm Sewer:

- A 675mm dia. CONC storm sewer (1992) is available within Somerset St E**.**

Note : A 1800mm Brick Combined collector Sewer is located within the Nelson Street. No connection is permitted to this pipe.

Sanitary Sewer:

- A 250mm dia. PVC Sanitary sewer (1992) is available within Somerset St E**.**
- Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity. An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided. Needs to be demonstrated that there is adequate capacity to support any increase in wastewater flow.
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01.*
- 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*.
- A backwater valve is required on the sanitary service for protection.

Note: There is a 610mm backbone water main is located within Nelson Street . No connection is permitted to this pipe . Also , a Vibration and settlement monitoring plan will be required .

Water :

- A 406 mm dia. PVC watermain (1996) is available within Somerset St E**.**
- Existing residential service to be blanked at the main.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m^3/day (0.57 L/s) are required to be connected to a minimum of two water services

separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.*

- Please **review Technical Bulletin ISTB-2018-0**, 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.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address
    - A plan showing the proposed water service connection location.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Fire Flow** (L/min)

[*Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS)** Water Supply for Public Fire Protection 1999*]
[Fire flow demand requirements shall be based on ISTB-2021-03]
Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used.
Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).

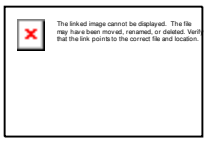
- **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved**. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

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, 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).

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.



Regarding Quantity Estimates:

Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities.In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

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).

Required Engineering Plans and Studies:
PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Roof Drainage Plan
- Topographical survey

REPORTS:

- Site Servicing and Stormwater Management Report
- Geotechnical Study/Investigation
- Slope Stability Assessment Reports (Please see the requirements below)
- Noise Control Study
- Phase I ESA
- Phase II ESA (Depending on recommendations of Phase I ESA)
- Site lighting certificate
- Vibration and settlement monitoring plan for 610mm watermain

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**
Specific information has been incorporated into both the Guide to Preparing Studies and Plans for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.
Added to the general information for servicing and grading plans is a note that an O.L.S. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an O.L.S. for development projects is emphasized.

Phase One Environmental Site Assessment:

- 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.

- 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.
- Official Plan Section 4.8.4:

https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety

Geotechnical Investigation:

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.

https://documents.ottawa.ca/sites/documents/files/geotech_report_en.pdf

Slope Stability Assessment Reports

- A report addressing the stability of slopes, prepared by a qualified geotechnical engineer licensed in the Province of Ontario, should be provided wherever a site has slopes (existing or proposed) steeper than 5 horizontal to 1 vertical (i.e., 11 degree inclination from horizontal) and/or more than 2 metres in height.
- A report is also required for sites having retaining walls greater than 1 metre high, that addresses the global stability of the proposed retaining walls.
  https://documents.ottawa.ca/en/document/slope-stability-guidelines-development-applications

Noise Study:

- A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of an Arterial or collector Road
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Vibration and settlement monitoring on Backbone Watermain:

- A 610mm dia. backbone watermain is located within Nelson Street. Please note that to ensure the integrity of the nearby watermain the applicant may be required to develop a Vibration and Settlement Monitoring Program. A Vibration and settlement Monitoring Specialist Engineer shall undertake monitoring, develop a vibration and settlement monitoring plan, and prepare a protection plan, an emergency response plan, ensure conformance and shall issue certificates of conformance. The Vibration and settlement Monitoring Specialist Engineer shall be a licensed engineer in the Province of Ontario with a minimum of five years of experience in the field of Vibration and settlement monitoring. Vibration and settlement monitors are to be to be placed directly on the watermain. The maximum peak particle velocities are to be in accordance with Table 1 of the City of Ottawa Specification F-1201.

Note: In addition to requirement of a vibration specialist engineer required to design and monitor vibration, a certificate of liability insurance shall be submitted to the City wherein the Owner is the named insured and the City of Ottawa is an additional insured. The limits of the policy shall be in the amount of $25,000,000 and shall be kept in full force and effect for the term of the construction work.

https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

Exterior Site Lighting:

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

Fourth (4th) Review Charge:

Please be advised that additional charges for each review, after the 3rd review, will be applicable to each file. There will be no exceptions.

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.

Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the City. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

Forestry Comments – Mark Richardson

1. **Please note that all process for reviewing and approving TCRs are changing at the City – in order to effectively review your submission in a timely manner the Planning Forester will need to ensure that all TCR requirements have been addressed**
2. If there are trees on site, or if there are trees with a critical root zone that extends onto the development site, a Tree Conservation Report (TCR) must be supplied
    a. an approved TCR is a requirement of Site Plan approval.
3. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
4. The TCR must contain 2 separate plans:
    a. Plan/Map 1 - show existing conditions with tree cover information
    b. Plan/Map 2 - show proposed development with tree cover information
    c. Please ensure retained trees are shown on the landscape plan
5. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
6. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
    a. Compensation may be required for the removal of city owned trees.

7. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
8. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
    a. the location of tree protection fencing must be shown on the plan
    b. show the critical root zone of the retained trees
9. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
10. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

Planning Forester LP tree planting requirements:

Please note that all process for reviewing and approving LP tree planting has changed at the City – in order to effectively review your submission in a timely manner the Planning Forester will need to ensure that all the bullets listed below have been addressed

1) Minimum Setbacks
    - Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    - Maintain 2.5m from curb
    - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
    - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
2) Tree specifications
    - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
    - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
    - Plant native trees whenever possible
    - No root barriers, dead-man anchor systems, or planters are permitted.
    - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
3) Hard surface planting
    - Curb style planter is highly recommended
    - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
    - Trees are to be planted at grade
4) Soil Volume
    - Please document on the LP that adequate soil volumes can be met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9

Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Transportation Comments – Patrick McMahon:

- A TIA is not required.
- As this is a spine route with future planned infrastructure works, a 3mx3m corner triangle is requested at Nelson/Somerset St. E.
- Noise Impact Study is required at site plan for road noise given the proximity to Somerset St E.
- On site plan:
  - Dimension all pathways. The main connection to the building needs to meet AODA requirements, however pathways widths of at least 1.5m are recommended throughout the site.
- Ensure that at least the minimum number of bicycle parking stalls are provided. A ratio of one per unit is recommended to justify the reduction in vehicular parking.
- The applicant is encouraged to review and complete the TDM checklists on Ottawa.ca and to provide as many measures as possible to support sustainable transportation modes.

Other

You are encouraged to contact the Councillor Plante to discuss the proposal.

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

John Bernier, MCIP, RPP
Planner II | ***Urbaniste II***
Development Review, Central | *Examen des projets d'aménagement, Central*
Planning, Real Estate and Economic Development Department | Direction générale de la planification, des biens immobiliers et du développement
City of Ottawa | *Ville d'Ottawa*

110 Laurier Avenue West. Ottawa, ON | *110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1*
613.580.2424 ext./poste 21576
ottawa.ca/planning / ottawa.ca/urbanisme

Please note that during the current public health emergency I am working remotely. Email is the easiest and most reliable way of reaching me at this time. Thank you for your cooperation.

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APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-24-0450 - 214 Somerset St E - Water Demands

Project:	214 Somerset St E
Project No.:	CCO-24-0450
Designed By:	RP
Checked By:	AB
Date:	August 2, 2023
Site Area:	0.05 gross ha

Residential	NUMBER OF UNITS		UNIT RATE	
Single Family		homes	3.4	persons/unit
Semi-detached		homes	2.7	persons/unit
Townhouse		homes	2.7	persons/unit
Bachelor Apartment		units	1.4	persons/unit
1 Bedroom Apartment	23	units	1.4	persons/unit
2 Bedroom Apartment		units	2.1	persons/unit
3 Bedroom Apartment		units	3.1	persons/unit
Average Apartment		units	1.8	persons/unit

Total Population 33 persons

Commercial	71	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/(1000m² /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	0.11	L/s
	Commercial/ Industrial / Institutional	0.00	L/s

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	1.02	L/s
	Commercial/ 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	1.53	L/s
	Commercial/ Industrial / Institutional	0.01	L/s

WATER DEMAND DESIGN FLOWS PER UNIT COUNT
CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010

AVERAGE DAILY DEMAND	0.11	L/s
MAXIMUM DAILY DEMAND	1.02	L/s
MAXIMUM HOUR DEMAND	1.54	L/s

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info@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

CCO-24-0450 - 214 Somerset St E - OBC Fire Calculations

Project:	214 Somerset St E
Project No.:	CCO-24-0450
Designed By:	RP
Checked By:	RRR
Date:	August 2, 2023

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting - Residential Building

Building is classified as Group : C (from table 3.2.2.55)

Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

Stot = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

Stot = 1.0 + [Sside1+Sside2+Sside3+..etc.]

K	23	(from Table 1 pg A-31) (Worst case occupancy {E / F2} 'K' value used)
V	3,025	(Total building volume in m³.)
Stot	2.0	(From figure 1 pg A-32)
Q =	139,150.00 L	

From Figure 1 (A-32)

Snorth	2.5	m	0.5
Seast	1.5	m	0.5
Ssouth	2.1	m	0.5
Swest	1.5	m	0.5

* approximate distances

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

4500 L/min if Q > 135,000 L and < 162,000 L

1189 gpm

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info@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

CP-24-0450 - 214 Somerset St E - Fire Underwriters Survey

Project:	214 Somerset St E
Project No.:	CP-24-0450
Designed By:	RP
Checked By:	AB
Date:	August 2, 2023

From the Fire Underwriters Survey (2020)

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

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

F = 220 x C x √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: Ordinary Construction

C	1	A	1,235.0 m^2	
	Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area)		1,235.0 m^2	* Unprotected Vertical Openings

Calculated Fire Flow	7,731.4 L/min
	8,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible	-15%	
Fire Flow		6,800.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered	0%	
Reduction		0.0 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	Fire Resistive - Non Combustible (Unprotected Openings)	10.6	2	21.2	7%
Exposure 2	20.1 to 30	Wood frame	9.1	2	18.2	0%
Exposure 3	0 to 3	Fire Resistive - Non Combustible (Unprotected Openings)	10.22	3	30.7	11%
Exposure 4	20.1 to 30	Fire Resistive - Non Combustible (Unprotected Openings)	13.8	3	41.4	1%
					% Increase*	19%

Increase*	1,292.0 L/min

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

Fire Flow	8,092.0 L/min
Fire Flow Required**	8,000.0 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

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info@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

CCO-24-0450 - 214 Somerset St E - Boundary Condition Unit Conversion

Project:	214 Somerset St E
Project No.:	CCO-24-0450
Designed By:	RP
Checked By:	AB
Date:	August 11, 2023

Boundary Conditions Unit Conversion

Somerset St E

Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	115.3	60.0	55.3	78.7	542.5
Fire Flow (75 L/s or 4500 L/min)	109.1	60.0	49.1	69.9	481.7
Peak Hour	106.0	60.0	46.0	65.4	451.3

214 Somerset St. E.
1W Pressure Zone

BRITTANY DRIVE P.S.

FLEET STREET P.S.

T & P.S. & RES.

HURDMAN P.S.

Innes Rd Backup P.S.

BILLINGS BRIDGE P.S.

CARLINGTON HEIGHTS P.S. & RES.

CONROY RD ELEVATED TANK

Approximate Site Location

1W

2E

1E

ME

HEMLOCK
BEECHWOOD
MONTREAL, CHEMIN DE
MCARTHUR
ST-LAURENT BOULEVARD
VANIER
CUMMINGS
OGILVIE
BLAIR
JOSEPH
INNES
COVENTRY
TREMBLAY
INDUSTRIAL
ALTA VISTA
SMYTH
RUSSELL
HAWTHORNE
RAMP
KING EDWARD
MACKENZIE
RIDEAU
LAURIER
WALLER
NICHOLAS
WELLINGTON
SLATER
MCLAREN
MCCAFFREY
O'CONNOR
ELGIN
GREENFIELD
SOMERSET
KENT
LYON
CATHERINE
MAIN
PARKDALE
GLADSTONE
PRESTON
BOOTH
BRONSON
SCOTT
CARLING
HOLLAND
KIRKWOOD
CHURCHILL
WOODROFFE
FAIRLAWN
BROOKFIELD
RIVERSIDE
WALKLEY
MCCARTHY
AIRPORT
FISHER
BASELINE
PINECREST
JOHNSTON
HUNT CLUB
CONROY
LEITRIM

214 Somerset St. E.
Hydrant Cover Figure

4 Hydrants present within 75m

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-24-0450 - 214 Somerset St E - Sanitary Demands

Project:	214 Somerset St E		
Project No.:	CCO-24-0450		
Designed By:	R.P.		
Checked By:	C.M.		
Date:	October 2, 2024		
Site Area	0.05	Gross ha	
1 Bedroom	23	1.40	Persons per unit
Total Population	33	Persons	
Commercial Area	0.00	m^2	
Amenity Space	71.31	m^2	

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	
Residential Peaking Factor	3.68	* 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

EXTRANEOUS FLOW ALLOWANCES

Infiltration / Inflow	Flow (L/s)
Dry	0.00
Wet	0.02
Total	0.02

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	33	0.11
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)	71.31	0.002
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

AVERAGE RESIDENTIAL FLOW	0.11	L/s
PEAK RESIDENTIAL FLOW	0.39	L/s
AVERAGE ICI FLOW	0.002	L/s
PEAK INSTITUTIONAL/ COMMERCIAL FLOW	0.003	L/s
PEAK INDUSTRIAL FLOW	0.000	L/s
TOTAL PEAK ICI FLOW	0.003	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.11	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	0.40	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	0.41	L/s

SANITARY SEWER DESIGN SHEET

PROJECT:
LOCATION: 214 Somerset
CLIENT: CSV Architects

McINTOSH PERRY

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	
				1-Bed	2-Bed	APT	TH		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								L/s	(%)
													IND	CUM	IND	CUM	IND	CUM											
Somerset St E	A-1	Building	Connection	23				0.05	32.2	32.2	3.68	0.38	0.01	0.01		0.00		0.00	0.003	0.05	0.05	0.02	0.41	16.05	15.24	150	1.02	0.880	15.64	97.48

Design Parameters:

Residential			ICI Areas			
						Peak Factor
1-Bed	1.4	p/p/u				
2-Bed	2.1	p/p/u	INST	28,000	L/Ha/day	1.5
APT	1.8	p/p/u	COM	28,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5)*0.8)
where P = population in thousands

Designed: RP

Checked: AB

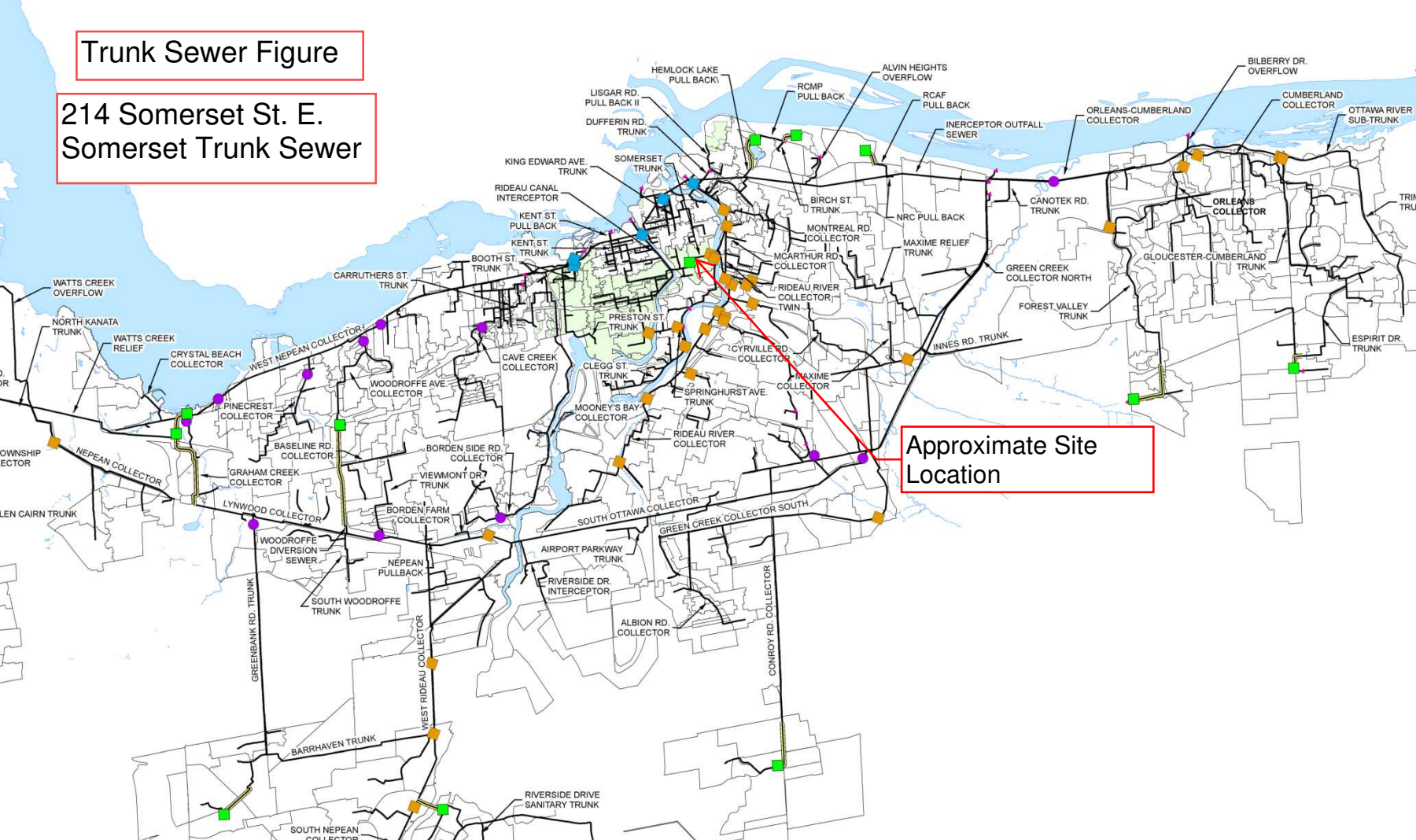
Project No.: CCO-24-0450

No.	Revision	Date
1.	City Submission No. 1	10/2/2024

Sheet No:
1 of 1

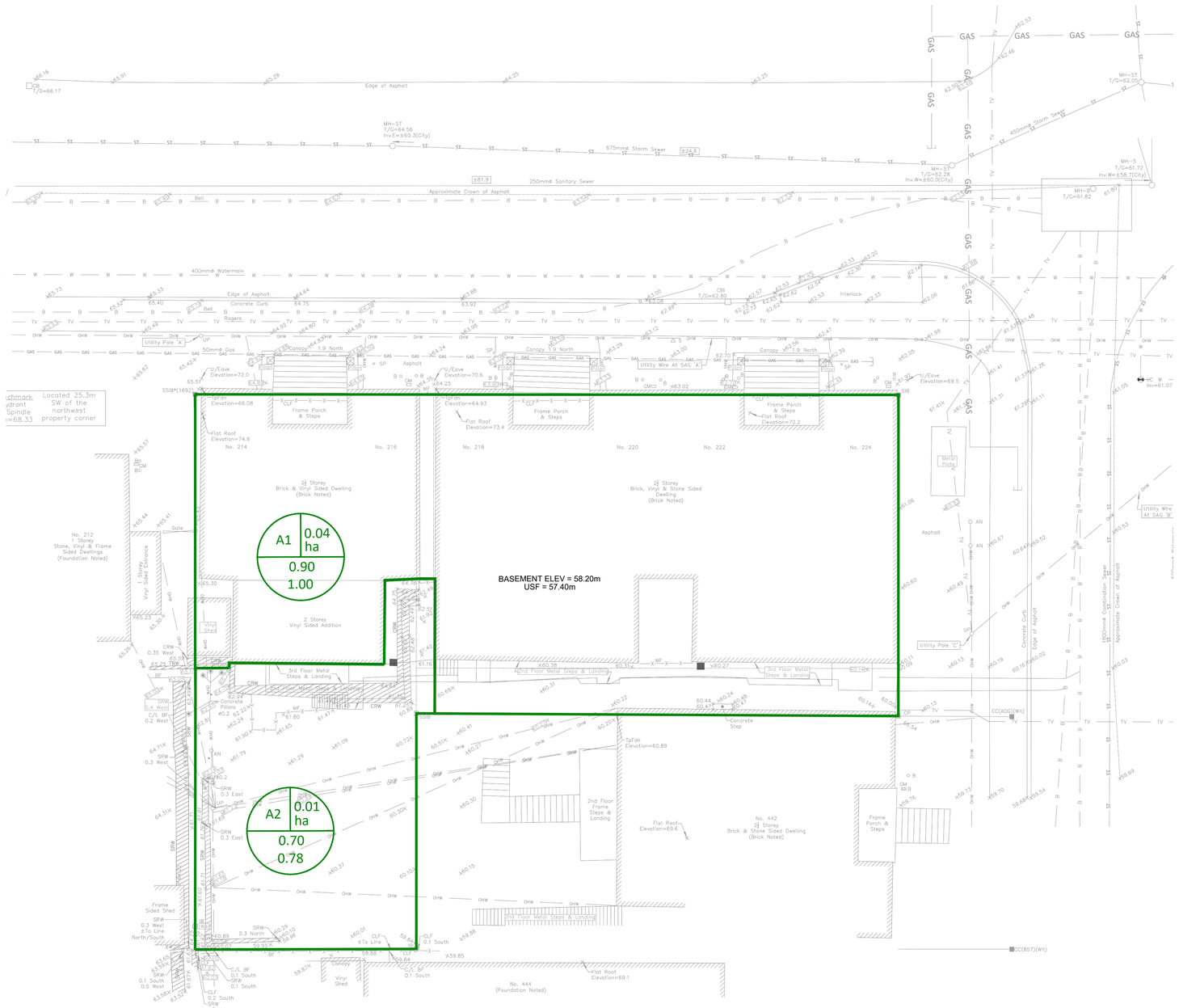
Trunk Sewer Figure

214 Somerset St. E.
Somerset Trunk Sewer



APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



GENERAL NOTES

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2. THIS PLAN IS NOT A CADASTRAL SURVEY SHOWING LEGAL PROPERTY BOUNDARIES AND EASEMENTS. THE PROPERTY BOUNDARIES SHOWN HEREON HAVE BEEN DERIVED INFORMATION SUPPLIED BY FARLEY, SMITH AND DENNIS SURVEYING LTD. (JOB NO. 432-75) 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. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE SPECIFIED.
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18. ALL PROPOSED CURB TO BE CONCRETE BARRIER CURB UNLESS OTHERWISE SPECIFIED.

THIS PLAN MUST BE READ IN CONJUNCTION WITH THE GEOTECHNICAL INVESTIGATION

LEGEND

- PROPERTY LINE
- CONCRETE BARRIER CURB
- CONCRETE WALKWAY
- PROPOSED ASPHALT
- LSCB# LANDSCAPING CATCHBASIN
- CBMH# T/G CATCHBASIN MANHOLE
- CBI# T/G CATCHBASIN
- SMHA T/G SANITARY SEWER MANHOLE
- HYD# INVT FIRE HYDRANT
- WATER VALVE
- WATER METER
- ROOF DRAIN
- LIMIT OF CONSTRUCTION
- DRAINAGE SWALE
- DRAINAGE DITCH
- SLOPING AT 3:1 UNLESS SPECIFIED
- 95.50 SURFACE ELEVATION
- 95.50 'SS' SWALE ELEVATION
- T/W 95.50 B/W 94.25 TOP OF WALL ELEVATION BOTTOM OF WALL ELEVATION
- OVERLAND FLOW ROUTE
- SILT FENCE BARRIER
- STRAW BALE CHECK DAM
- MUD MAT

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No.	Revisions	Date
01	ISSUED FOR REVIEW	08/03/2023

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SCALE 1 : 100

0 2 4 6 8 10 Metres

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Client:
CSV ARCHITECTS
190 O'CONNNOR STREET, SUITE 100
OTTAWA, ON, K2P 2R3

Project:
RESIDENTIAL BUILDING
214 SOMERSET ST E
OTTAWA ON

Drawing Title:
PRE-DEVELOPMENT DRAINAGE PLAN

Scale: 1:100	Project Number: CCO-24-0450
Drawn By: R.P.	
Checked By: A.B.	Drawing Number: PRE
Designed By: R.P.	

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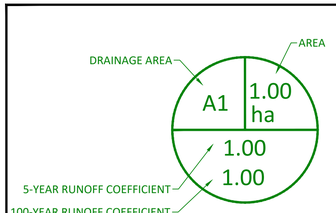

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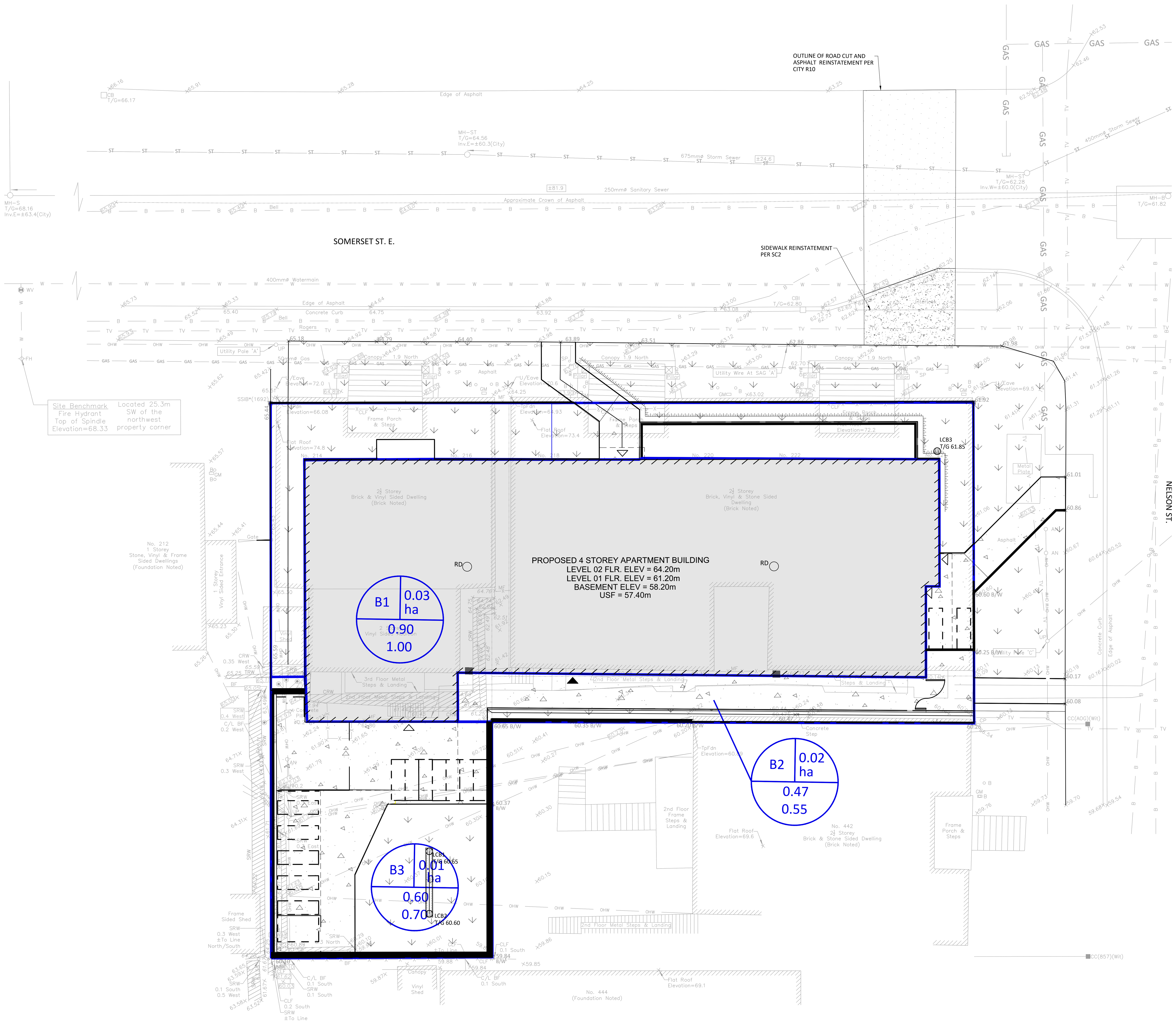
LAST SAVED: Tuesday, August 29, 2023 LAST SAVED BY: r.pickard
LAST PLOTTED: Wednesday, October 02, 2024 CTB FILE USED: MP-CV-STANDARD.ctb

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



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THIS PLAN MUST BE READ IN CONJUNCTION WITH THE GEOTECHNICAL INVESTIGATION

LOCATION PLAN

LEGEND

PROPERTY LINE	LIMIT OF CONSTRUCTION
CONCRETE BARRIER CURB	DRAINAGE SWALE
CONCRETE WALKWAY	DRAINAGE DITCH
PROPOSED ASPHALT	SLOPING AT 3:1 UNLESS SPECIFIED
LSCB# LANDSCAPING CATCHBASIN	95.50 SURFACE ELEVATION
CBMH# T/G CATCHBASIN MANHOLE	95.50 (S) SWALE ELEVATION
CB# T/G CATCHBASIN	T/W 95.50 B/W 94.25 TOP OF WALL ELEVATION BOTTOM OF WALL ELEVATION
MH#A T/G SANITARY SEWER MANHOLE	OVERLAND FLOW ROUTE
HYD B/F FIRE HYDRANT	SILT FENCE BARRIER
WATER VALVE	STRAW BALE CHECK DAM
WATER METER	MUD MAT
ROOF DRAIN	

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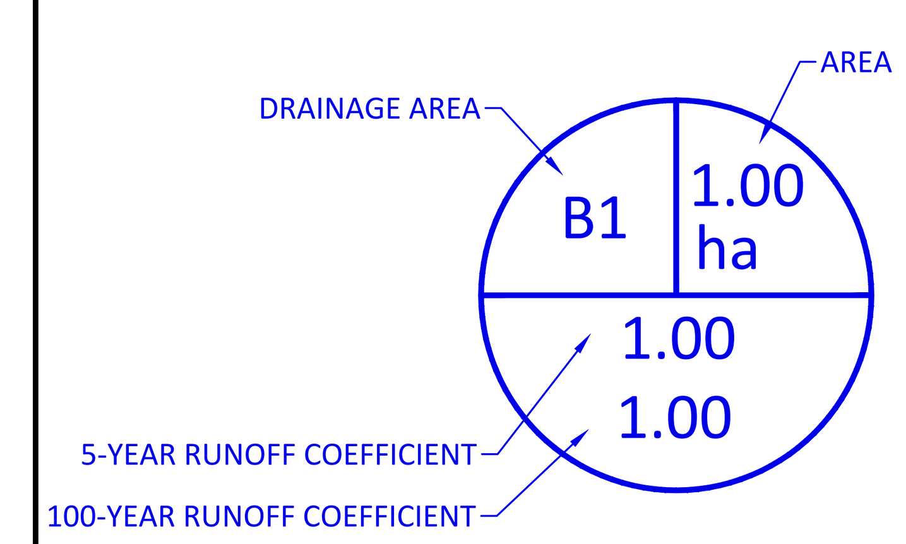
NOT FOR CONSTRUCTION

No.	Revisions	Date
01	ISSUED FOR REVIEW	08/03/2023

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

SCALE 1 : 100 (0 2 4 6 8 10 Metres)



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Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Stamp:

Client: CSV ARCHITECTS, 190 O'CONNOR ST, SUITE 100, OTTAWA, ON, K2P 2R3

Project: RESIDENTIAL BUILDING, 214 SOMERSET ST E, OTTAWA, ON

Drawing Title: POST-DEVELOPMENT DRAINAGE PLAN

Scale:	1:100	Project Number:	CCO-24-0450
Drawn By:	R.P.		
Checked By:	A.B..	Drawing Number:	POST
Designed By:	R.P.		

D07-12-XX-XXXX

#XXXXX

FILENAME: U:\Ottawa\01 Project - Proposals\2024 Jobs\CCO\CCO-24-0450 CSV_OCH Housing_214 Somerset Street East\12 - Drawings\CCO-23-0450_PRESENTATION.dwg
LAST SAVED BY: rpalard
LAST PLOTTED: Tuesday, October 01, 2024 CTB FILE USED: MP-CV-STANDARD.ctb

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CO-24-0450 - 214 Somerset St E - SWM Calculations

Tc (min)	Intensity (mm/hr) 2-Year	5-Year	100-Year	
10	76.5	104.2	178.6	PRE-DEVELOPMENT
10	76.5	104.2	178.6	POST-DEVELOPMENT

C-Values	
Impervious	0.90
Gravel/ Pavers	0.60
Pervious	0.20

Pre-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (2-year)	Average C (5-year)	Average C (100-year)
A1	403	0	0	0.90	0.90	1.00
A2	94	0	38	0.70	0.70	0.78

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 2-Year	C 5-Year	C 100-Year	Tc (min)	Q (L/s) 2-Year	5-Year	100-Year
A1	0.040	0.90	0.90	1.00	10	7.71	10.50	20.00
A2	0.013	0.70	0.70	0.78	10	1.96	2.67	5.13
Total	0.05					9.67	13.17	25.12

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel/ Permeable Pavers (m^2)	Pervious Area (m^2)	Average C (2-year)	Average C (5-year)	Average C (100-year)
B1	276	0	0	0.90	0.90	1.00
B2	46	22	86	0.47	0.47	0.55
B3	48	21	35	0.60	0.60	0.70

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 2-Year	C 5-Year	C 100-Year	Tc (min)	Q (L/s) 2-Year	5-Year	100-Year	
B1	0.028	0.90	0.90	1.00	10	5.28	7.19	13.69	Restricted
B2	0.015	0.47	0.47	0.55	10	1.53	2.08	4.17	Unrestricted to ROWs
B3	0.010	0.60	0.60	0.70	10	1.34	1.82	3.60	Unrestricted rear yard
Total	0.05					8.15	11.09	21.47	

Required Restricted Flow

Drainage Area	Area (ha)	C 2-Year	C 5-Year	C 100-Year	Tc (min)	Q (L/s) 2-Year	5-Year	100-Year	
A1	0.040	0.50	0.50	0.50	10	4.28	5.83	10.00	Toward ROW
A2	0.013	0.70	0.70	0.78	10	1.96	2.67	5.13	Rear Yard Runoff
Total	0.05					6.24	8.50	15.12	

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow 2-year	5-year	100-Year	Restricted Flow 2-Year	5-Year	100-Year	Storage Required (m^3) 2-Year	5-Year	100-Year	Storage Provided (m^3) 2-Year	5-Year	100-Year
Directed to City of Ottawa ROW												
B1	5.28	7.19	13.69	0.60	0.72	1.32	4.0	5.6	10.8	5.2	6.2	11.3
B2	1.53	2.08	4.17	1.53	2.08	4.17						
Total Toward ROW	6.81	9.27	17.87	2.13	2.80	5.49	4.00	5.65	10.77	5.16	6.19	11.34
B3	1.34	1.82	3.60	1.34	1.82	3.60						
Total	8.15	11.09	21.47	3.47	4.62	9.09	4.00	5.65	10.77	5.16	6.19	11.34

* Overall Post-Development runoff is approximately 35% of Pre-Development, the section directed toward the ROWs is below the pre-development 5-year flow with C=0.5
* Post-Development rear-yard runoff is less than Pre-Development conditions.

2-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	76.8	5.30	0.60	4.70	2.82
30	40.0	2.76	0.60	2.16	3.89
50	28.0	1.93	0.60	1.33	4.00
70	21.9	1.51	0.60	0.91	3.83
90	18.1	1.25	0.60	0.65	3.51
Maximum Storage Required 5-year =				4.0	m^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	7.19	0.72	6.47	3.88
30	53.9	3.72	0.72	3.00	5.40
50	37.7	2.60	0.72	1.88	5.65
70	29.4	2.03	0.72	1.31	5.50
90	24.3	1.68	0.72	0.96	5.17
Maximum Storage Required 5-year =				5.6	m^3

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	13.70	1.32	12.38	7.43
20	120.0	9.20	1.32	7.88	9.46
30	91.9	7.05	1.32	5.73	10.31
40	75.1	5.76	1.32	4.44	10.66
50	64.0	4.91	1.32	3.59	10.77
60	55.9	4.29	1.32	2.97	10.68
70	49.8	3.82	1.32	2.50	10.50
80	45.0	3.45	1.32	2.13	10.23
90	41.1	3.15	1.32	1.83	9.89
100	37.9	2.91	1.32	1.59	9.52

Maximum Storage Required 100-year =	10.8	m^3

2-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Roof	206.25	0.025	5.16

Storage Available (m^3) =	5.16
Storage Required (m^3) =	4.00

5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Roof	206.25	0.030	6.19

Storage Available (m^3) =	6.19
Storage Required (m^3) =	5.65

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Roof	206.25	0.055	11.34

Storage Available (m^3) =	11.34
Storage Required (m^3) =	10.77

* Area is 75% of the total roof area

Roof Drain Flow (B1)

Roof Drains Summary			
Type of Control Device	Watts Drainage - Accutrol Weir		
Number of Roof Drains	2		
	2-Year	5-Year	100-Year
Rooftop Storage (m^3)	5.16	6.19	11.34
Storage Depth (m)	0.025	0.030	0.055
Flow (Per Roof Drain) (L/s)	0.30	0.36	0.66
Total Flow (L/s)	0.60	0.72	1.32

Flow Rate Vs. Build-Up (One Weir)	
Depth (mm)	Flow (L/s)
15	0.18
20	0.24
25	0.30
30	0.36
35	0.42
40	0.48
45	0.54
50	0.60
55	0.66

* Roof Drain model to be Accutrol Weirs, See attached sheets
* Roof Drain Flow information taken from Watts Drainage website

CALCULATING ROOF FLOW EXAMPLES

1 roof drain during a 5 year storm
elevation of water = 25mm
Flow leaving 1 roof drain = (1 x 0.30 L/s) = 0.30 L/s

1 roof drain during a 100 year storm
elevation of water = 50mm
Flow leaving 1 roof drain = (1 x 0.60 L/s) = 0.60 L/s

4 roof drains during a 5 year storm
elevation of water = 25mm
Flow leaving 4 roof drains = (4 x 0.30 L/s) = 1.20 L/s

4 roof drains during a 100 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

Roof Drain Flow		
Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
0.18	15	0.36
0.24	20	0.48
0.30	25	0.60
0.36	30	0.72
0.42	35	0.84
0.48	40	0.96
0.54	45	1.08
0.60	50	1.20
0.66	55	1.32
0.72	60	1.44
0.78	65	1.56
0.84	70	1.68
0.90	75	1.80
0.96	80	1.92
1.02	85	2.04
1.08	90	2.16
1.14	95	2.28
1.20	100	2.40
1.26	105	2.52
1.32	110	2.64
1.38	115	2.76
1.44	120	2.88
1.50	125	3.00
1.56	130	3.12
1.62	135	3.24
1.68	140	3.36
1.74	145	3.48
1.80	150	3.60

Note: The flow leaving through a restricted roof drain is based on flow vs. head information

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	35	10.00	2	1

Therefore, a Tc of 10 can be used

Tc= (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

STORM SEWER DESIGN SHEET

PROJECT:
LOCATION: 214 Somerset St E
CLIENT: CSV Architects

McINTOSH PERRY

LOCATION				CONTRIBUTING AREA (ha)				RATIONAL DESIGN 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
STREET	AREA ID	FROM MH	TO MH	C-VALUE	AREA	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
																					DIA	W	H			(L/s)	(%)
Somerset St E	B1	Building	Connection	0.90	0.03	0.02	0.02	10.00	0.24	10.24	104.19	122.14	178.56	7.19	8.43	12.32		7.19	15.89	12.73	150			1.00	0.871	8.70	54.74%

Definitions:
Q = 2.78CIA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed:
R.P.

Checked:
A.B.

Project No.:
CCO-23-0450

No.	Revision	Date
1.	City Submission No. 1	10/2/2024

Date:
2023.01.12

Sheet No:
1 of 1

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

McINTOSH PERRY

City of Ottawa

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)
☐ Executive Summary (for larger reports only).	N/A
☐ Date and revision number of the report.	On Cover
☐ Location map and plan showing municipal address, boundary, and layout of proposed development.	Appendix A
☐ Plan showing the site and location of all existing services.	Site Servicing Plan (C102)
☐ 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
☐ Summary of pre-consultation meetings with City and other approval agencies.	Appendix B
☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	1.1 Purpose 1.2 Site Description 6.0 Stormwater Management
☐ Statement of objectives and servicing criteria.	3.0 Pre-Consultation Summary

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Site Grading Plan (C101)
☐ 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)
☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐ Proposed phasing of the development, if applicable.	N/A
☐ Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
☐ All preliminary and formal site plan submissions should have the following information: ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names	Site Grading Plan (C101)

4.2 Development Servicing Report: Water

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

☐ 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)
☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☐ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
☐ 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)
☐ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	N/A
☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☐ Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 5.2 Proposed Sanitary Sewer

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

4.4 Development Servicing Report: Stormwater Checklist

Criteria	Location (if applicable)
☐ 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
☐ Analysis of available capacity in existing public infrastructure.	N/A
☐ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Pre & Post-Development Plans
☐ 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
☐ 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
☐ 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
☐ Set-back from private sewage disposal systems.	N/A
☐ Watercourse and hazard lands setbacks.	N/A
☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	N/A
☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☐ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5-year return period) and major events (1:100-year return period).	Appendix G

☐ 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
☐ 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
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ 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
☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐ Identification of potential impacts to receiving watercourses	N/A
☐ Identification of municipal drains and related approval requirements.	N/A
☐ 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
☐ 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)
☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A

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

4.5 Approval and Permit Requirements: Checklist

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

4.6 Conclusion Checklist

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