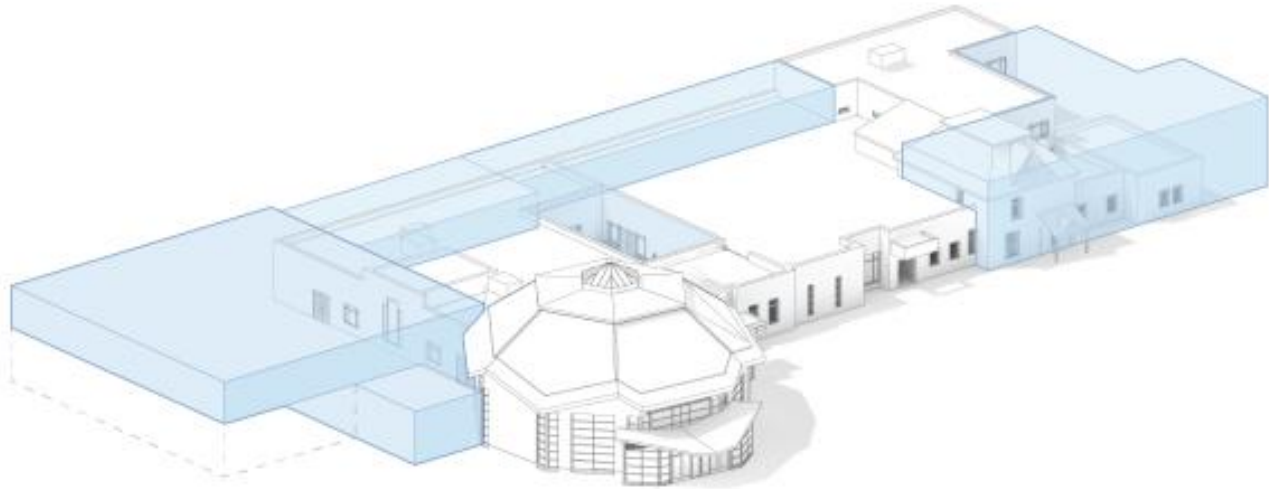


BEECHWOOD CEMETERY BUILDING EXPANSION



Project No.: CCO-24-2954

City File No.: PC2025-0262

Prepared for:

RMA+SH Architects
216 Pretoria Avenue
Ottawa, ON K1S 1X2

Prepared by:

Egis Canada
750 Palladium Drive, Suite 310
Kanata, Ontario, K2V 1C7

2026/08/21



Table of Content

1.0	PROJECT DESCRIPTION	1
1.1	Purpose	1
1.2	Site Description	1
1.3	Proposed Development and Statistics	2
1.4	Existing Conditions and Infrastructure	2
1.5	Approvals	2
2.0	BACKGROUND STUDIES, STANDARDS, AND REFERENCES	3
2.1	Background Reports / Reference Information	3
2.2	Applicable Guidelines and Standards	3
3.0	WATER SERVICING	4
3.1	Existing Watermain	4
3.2	Proposed Water Servicing	4
4.0	SANITARY SERVICING	5
4.1	Existing Sanitary Sewers	5
4.2	Proposed Sanitary Servicing	5
5.0	STORM SEWER SERVICING	6
5.1	Existing Storm Sewers	6
5.2	Proposed Storm Servicing	7
6.0	PROPOSED STORMWATER MANAGEMENT	8
6.1	Design Criteria and Methodology	8
6.2	Runoff Calculations	8
6.3	Pre-Development Drainage	9
6.4	Post-Development Drainage	9
6.5	Quantity Control	10
6.6	Quality Control	10

7.0 EROSION AND SEDIMENT CONTROL..... 11

7.1 Temporary Measures..... 11

7.2 Permanent Measures..... 11

8.0 SUMMARY 12

9.0 RECOMMENDATIONS 13

10.0 STATEMENT OF LIMITATIONS 14

Appendices

- Appendix A: Background Information
- Appendix B: Watermain Calculations
- Appendix C: Sanitary Calculations
- Appendix D: Pre-Development Drainage Plan
- Appendix E: Post-Development Drainage Plan
- Appendix F: Stormwater Management Calculations
- Appendix G: City of Ottawa Design Checklist



1.0 PROJECT DESCRIPTION

1.1 Purpose

Egis Canada (Egis) has been retained by RMA+SH Architects to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the development located at 280 Beechwood Avenue 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), the Rideau Valley Conservation Authority (RVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary, and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

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

- CCO-24-2954, C101 – Grading & Servicing Plan
- CCO-24-2954, PRE – Pre-Development Drainage Area Plan (Appendix D)
- CCO-24-2954, POST – Post-Development Drainage Area Plan (Appendix E)

1.2 Site Description

Figure 1: Site Map



The subject property, herein referred to as the site, is located at 280 Beechwood Avenue within the Rideau-Vanier Ward. The site covers approximately 1.17 ha and is located within the Beechwood Cemetery property. The site is zoned for cemetery use (L1B). See Site Location Plan in Appendix A for more details.

1.3 Proposed Development and Statistics

The proposed development consists of two separate additions onto the existing 2,247 m², two storey mixed-use building. The additions include 345 m² to the west and 390 m² to the east. A partial demolition is also proposed to a section of the existing building to facilitate the new addition to the west. Parking and drive aisles will be altered throughout the site along with landscaping. The main entrance from Beechwood Avenue will be maintained.

1.4 Existing Conditions and Infrastructure

The site is currently developed containing a parking lot and a 2,247 m² two storey mixed-use building. The site contains a 250 mm stormwater subdrain and a catch basin network within the parking lot. In addition, the site contains a 200 mm sanitary service lateral, and two separate PVC water services sized 150 and 200 mm which service the existing building and private hydrants.

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

➤ BEECHWOOD AVENUE

- 305 mm diameter ductile iron watermain
- 600 mm diameter concrete sanitary sewer within Beechwood Ave connects to a 2400 mm diameter concrete trunk sanitary sewer which runs from west to east across 280 Beechwood Ave
- 525 mm and 2100 mm diameter concrete storm sewer

➤ LAVERGNE STREET

- 152 mm diameter PVC watermain
- 250 mm diameter PVC sanitary sewer
- 375 mm diameter concrete storm sewer

1.5 Approvals

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

An Environmental Compliance Approval (ECA) through the Ministry of Environment, Conservation and Parks (MECP) is not anticipated to be required since the proposed storm sewer system services one parcel of land, does not propose industrial use, and does not outlet to a combined sewer.

2.0 BACKGROUND STUDIES, STANDARDS, AND REFERENCES

2.1 Background Reports / Reference Information

- Roberston Martin Architects Inc, Funeral Home and Sanctuary Addition As-built Drawings, 2008
- Simmering & Associates Consulting Engineers, Site Servicing and Grading Plan, 2007
- Paterson Group, Geotechnical Investigation, 2025
- Sewerteks Inc., Beechwood Cemetery Storm & Sanitary Inspection, 2026

The following reports have previously been completed and are available under separate cover:

- A topographic survey of the site was completed by Callon Dietz Inc. and dated November 21st, 2025.
- The Site Plan was prepared by RMA+SH Architects and dated August 21st, 2026.

2.2 Applicable Guidelines and Standards

City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG004, December 2025. (**Ottawa Sewer Guidelines**)
 - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (**ISTB-2014-01**)
 - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. (**PIEDTB-2016-01**)
 - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (**ISTB-2018-01**)
 - Technical Bulletin ISTB-2018-04 City of Ottawa, March 2018. (**ISTB-2018-04**)
 - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (**ISTB-2019-02**)
- ◆ Ottawa Design Guidelines – Water Distribution, City of Ottawa, WDG001, July 2010. (**Ottawa Water Guidelines**)
 - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (**ISD-2010-2**)
 - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (**ISDTB-2014-02**)
 - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (**ISTB-2018-02**)
 - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. (**ISTB-2021-03**)

Ministry of Environment, Conservation and Parks:

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

Other:

- ◆ Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (**FUS Guidelines**)
- ◆ Ontario Building Code (**OBC**)

3.0 WATER SERVICING

3.1 Existing Watermain

There is an existing 305 mm diameter ductile iron watermain along Beechwood Avenue. The building located at 280 Beechwood Avenue is currently serviced off this main via a 203 mm diameter PVC water service. A second 152 mm diameter PVC water service runs from the main building to a secondary building on the property.

3.2 Proposed Water Servicing

The existing 200 mm water service is to remain in place with the exception of a small section nearest the building, which is to be realigned to enter the proposed addition at a new location. An additional fire hydrant is proposed at east side of the site. This hydrant will be serviced via a 150mm hydrant lead which is to connect to the existing 152mm PVC water service to west. The section of newly installed watermain is designed to have a minimum of 2.4 m cover.

The Fire Underwriters Survey 2020 (FUS) method was utilized to determine the required fire flow for the site. The 'C' factor (type of construction) for the FUS calculation was determined to be 1.0 (ordinary construction). The total floor area ('A' value) for the FUS calculation was determined to be 3,031 m². The results of the calculations yielded a required fire flow of 8,000 L/min. A fire flow of 9,000 L/min was calculated using the Ontario Building Code (OBC) criteria. The detailed calculations for the FUS and OBC can be found in Appendix B.

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 in **Table 1**, below.

Table 1: Water Supply Design Criteria and Water Demands

Site Area	1.17 ha
Commercial	28,000 L/gross ha/day
Maximum Daily Peaking Factor	1.5 x avg day
Maximum Hour Peaking Factor	1.8 x avg day
Average Day Demand (L/s)	0.09
Maximum Daily Demand (L/s)	0.14
Peak Hourly Demand (L/s)	0.25

FUS Fire Flow Requirement (L/s)	133 (8,000 L/min)
--	-------------------

To confirm the adequacy of fire flow to protect the proposed development, public fire hydrants within 150 m of the proposed building were analysed per City of Ottawa **ISTB 2018-02** Appendix I Table 1. Based on City guidelines (**ISTB-2018-02**), the existing and proposed hydrants on-site can provide adequate fire protection to the development. The results are summarized in **Table 2**, below.

Table 2: Fire Protection Confirmation

Building	Fire Flow Demand (L/min)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)	Combined Fire Flow (L/min)
280 Beechwood Ave	8,000	2 each	1	15,200

4.0 SANITARY SERVICING

4.1 Existing Sanitary Sewers

An existing 250 mm diameter PVC sanitary sewer is located within Lavergne Street. The building located at 280 Beechwood Avenue is currently serviced off this main via a 200 mm diameter PVC sanitary lateral.

4.2 Proposed Sanitary Servicing

The existing 200 mm diameter PVC sanitary lateral will remain in place.

The subject site includes two proposed additions onto the existing 2,247 m² building. The total area of the new development is 2,801 m². 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 area (1.17 ha) will generate a flow of 0.52 L/s.

The existing sanitary lateral was found to have a full flow velocity of 1.05 m/s. This velocity falls within the minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a maximum full flow velocity of 3.0 m/s. Design parameters for the site include an infiltration rate of 0.33 l/s/ha, consistent with City of Ottawa requirements.

Table 2: Sanitary Design Criteria

Design Parameter	Value
Site (Development) Area	1.17 ha
Commercial/Amenity	2,800 L/(1000m ² /day)
Institutional/Commercial Peaking Factor	1.5
Extraneous Flow Allowance	0.33 L/s/ha

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

Table 3: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/s)
Total Estimated Average Dry Weather Flow	0.15
Total Estimated Peak Dry Weather Flow	0.19
Total Estimated Peak Wet Weather Flow	0.52

The capacity of the existing sanitary lateral is 33.69 L/s at an assumed slope of 1.00%. Therefore, the building lateral is sufficiently sized to accommodate the development. Refer to Appendix C for the sanitary sewer design sheets.

5.0 STORM SEWER SERVICING

5.1 Existing Storm Sewers

There are existing 525 mm and 2,100 mm concrete storm sewers within Beechwood Avenue. There is also a 375 mm concrete storm sewer within Lavergne Street to the south of the property. Stormwater runoff from the site is currently draining toward the southwest portion of the site via overland flow and a small pipe network in the east parking lot which also outlets to the southwest.

Refer to **Appendix D** for the *Pre-Development Drainage Plan*.

5.2 Proposed Storm Servicing

Minor changes are proposed to the existing storm system. Changes will be limited to a section near the southeast corner of the building, which will be rerouted to distance it from proposed east addition. This new section of storm will be extended south from the existing CBMH and connected to a new storm manhole. A run of storm pipe is proposed along the south of the building which will tie into the existing storm pipe on the new alignment. A landscape catch basin is proposed where the existing and proposed storm pipe meet. The new pipe network will continue to collect storm flows from east portion of the site. The downspout from the building will be connected to the existing storm pipe running along the south of the building.

The proposed 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.

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 utilized 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. The design flow (peak flow) was checked against the theoretical capacity to ensure that each storm sewer pipe can convey the 5-year unrestricted flow.

Runoff collected on the roof of the proposed additions will be stored and controlled internally using roof drains. Roof drains will be used to limit the flow from the roof to the specified allowable release rate. For calculation purposes a Watts Accutrol roof drain was used to estimate a reasonable roof flow. Other products maybe specified at detailed design so long as release rates and storage volumes are respected.

Refer to **Appendix E** for the *Post-Development Drainage Plan* and *Storm Sewer Design Sheet*. The Stormwater Management design for the subject property will be outlined in Section 6.0.

6.0 PROPOSED STORMWATER MANAGEMENT

6.1 Design Criteria and Methodology

Stormwater management for the proposed site will be maintained through rooftop attenuation and positive drainage away from the building and into the existing storm sewer system. The storm system will capture the east parking lot runoff and direct the flow to the southwest corner of the site. The quantitative properties of the storm runoff for both the pre- and post-development flows are further detailed below.

In summary, the following design criteria have been employed in developing the stormwater management design for the site:

Quality Control

- No addition surface parking is proposed, therefore quality control is not required as per the pre-consultation meeting.

Quantity Control

- Post-development flows 2/100-year are to match the pre-development flows 2/100-year with a maximum C value of 0.50.

6.2 Runoff Calculations

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

$$Q = 2.78CIA$$

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
Undeveloped and Grass	0.20

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

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 minimum Tc of 10 minutes and post-development flows shall be calculated using a Tc of 10 minutes.

6.3 Pre-Development Drainage

The estimated pre-development peak flows for the 5, and 100-year events are summarized below in **Table 6**. See the SWM Calculations in **Appendix F**.

Table 4: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Q (L/s)	
		5-Year	100-Year
A1	0.38	64.87	125.84
A2	0.56	91.49	177.88
A3	0.23	59.83	113.93

6.4 Post-Development Drainage

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan found in **Appendix E** of this report. 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)	2-year Peak Flow (L/s)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)
B1	0.36	0.58	0.66	44.88	61.12	118.69
B2	0.52	0.63	0.72	70.51	96.02	185.58
B3	0.08	0.90	1.00	16.14	21.98	41.85
B4	0.20	0.95	1.00	39.53	53.83	97.05
Total	1.17			171.07	232.95	443.16

6.5 Quantity Control

The total post-development runoff for this site has been restricted to match the required release rate of 417.65 L/s (pre- to post-development release rate with a C value of less than 0.5 as per the pre-consultation meeting). Post development drainage will be restricted to a maximum release rate of 158.77, 215.77 and 410.91 L/s during the 2-, 5- and 100-year storm events. Runoff from area B3 will be restricted as shown in the table below.

Table 6: Post-Development Restricted Runoff Summary

Drainage Area	Unrestricted Flow (L/s)			Restricted Flow (L/s)			100-year Storage Required (m ³)	100-year Storage Available (m ³)
	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year		
B1	44.88	61.12	118.69	44.88	61.12	118.69	-	-
B2	70.51	96.02	185.58	70.51	96.02	185.58	-	-
B3	16.14	21.98	41.85	3.84	4.80	9.60	22.2	31.6
B4	39.53	53.83	97.05	39.53	53.83	97.05	-	-
Total	171.07	232.95	443.16	158.77	215.77	410.91	22.2	31.6

See **Appendix F** SWM for calculations.

Area B3 has a restricted rate of 3.84, 4.80 and 9.60 L/s for the 2-, 5- and 100-year storm events, respectively. Runoff from area B3 will be stored on the roof of the proposed additions before discharging into the storm sewer at two locations downstream of MH1. Flow will be restricted using 16 Watts Accutrol roof drains (or equivalent product), providing up to 31.6 m³ of storage during the 100-year storm event. The volume of stormwater to be retained on the roof is approximately 12.6 and 15.8 m³ for the 2-year and 5-year storm events, respectively.

Area B1 will sheet drain without attenuation towards the southwest portion of the site. Existing flow patterns are to remain.

Areas B2 and B4 are unrestricted, with the stormwater being conveyed via overland flow, catch basins, and pipes.

6.6 Quality Control

The development of this site 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.

The proposed storm manhole, MH1, will incorporate a sump below the outlet pipe invert to provide additional stormwater quality control. The sump is intended to capture and retain coarse sediment, grit, and other settleable materials conveyed by the storm drainage system, reducing the amount of suspended solids discharged to the downstream municipal storm sewer.

7.0 EROSION AND SEDIMENT CONTROL

7.1 Temporary Measures

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

Silt fences will be installed where shown on the final engineering plans, specifically along the downstream property limits. The Contractor, at their discretion or at the instruction of the City, Conservation Authority or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way off site. The rock flow, straw bale & silt fence check dams and barriers shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required. Fibre roll barriers are to be installed at all existing curb inlet 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.

7.2 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.

8.0 SUMMARY

- The proposed development consists of two separate additions onto the existing building located at 280 Beechwood Avenue.
- The existing 200 mm water service is to remain in place with the exception of a small section nearest the building, which is to be realigned to enter the proposed addition at a new location.
- A new hydrant is proposed at the east side of the site. The 150mm lead for this hydrant is to be connected to the existing 152mm water service on-site.
- The existing 200 mm sanitary service, connecting to the sanitary sewer within Lavergne Street, is to remain.
- Newly proposed storm sewer will be limited to a section near the southeast corner of the building, which will be rerouted to distance it from proposed east addition. The storm system will continue to outlet at the southwest of the site.
- Post-development stormwater flows for the 100-year storm event are to be restricted to be no greater than 417.65 L/s. Storage on the roofs of the proposed additions will restrict the flow to 410.91 L/s for the 100-year storm event.

9.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management Brief in support of the proposed Beechwood Cemetery Building Expansion.

This report is respectfully being submitted for approval.

Regards,

Egis Canada Ltd.



Robert Pickard, P.Eng.
Project Engineer, Land Development
T: 613.808.3427
E: robert.pickard@egis-group.com

A handwritten signature in black ink, appearing to read "Johnathan Rivington".

Johnathan Rivington
Engineering Graduate, Land
Development
E: johnathan.rivington@egis-group.com

u:\ottawa\01 project - proposals\2024 jobs\cco\cco-24-2954 rma+sh_beechwood cemetery expansion_280 beechwood avenue\03 - servicing\report\cco-24-2954_servicing report egis.docx

10.0 STATEMENT OF LIMITATIONS

This report was produced for the exclusive use of RMA+SH 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. Egis Canada reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by Egis Canada 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. Egis Canada 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, Egis Canada should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A BACKGROUND INFORMATION

October 29, 2025

Kristy Wells
RMA+SM Architects
Via email: kristy.wells@rma-sh.com

**Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 280 Beechwood Avenue**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on October 21, 2025.

Pre-Consultation Preliminary Assessment

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. For your next submission, please submit the required Application Form, together with the necessary studies and/or plans to planningcirculations@ottawa.ca, copy (cc:) to the file lead and planning support.
2. In your subsequent pre-consultation or application submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed is requested with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.
3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.
4. If the Urban Design Review Panel (UDRP) Report is listed as a required submission material in the Study and Plan Identification List, the applicant must visit the UDRP prior to formally submitting the planning application. The UDRP report is required for the application to be considered complete.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on [Ottawa.ca](https://ottawa.ca). These ToR and Guidelines outline

the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. Subject site:
 - a. The subject site is known municipally as 280 Beechwood Avenue and is located in the Beechwood Cemetery neighbourhood. The site is an irregular shape with approximately 624,743 square metres in area and has 83.29 metres of frontage along Beechwood Avenue.
 - b. The site is occupied by the Beechwood Cemetery and its associated accessory buildings including a reception centre and mausoleum.
 - c. The reception area subject to the proposal is located in the south-west corner of the site.
2. Proposal:
 - a. This is a Phase 1 Pre-consultation for a Site Plan Control application to facilitate the expansion of an existing reception centre to improve functionality and operations, including additional space for events, storage etc.. The proposal presented included a partial demolition of the existing building and two additions, including 345m² on the west side and 390m² on the east side (total 735m²). Changes to the associated parking lots and entry roads were also proposed.
3. Please be advised of the applicable policy and regulatory framework:
 - i. Provincial Planning Statement 2024
 - ii. Official Plan:
 - Located in the Inner Urban Transect (see OP [Schedule A - Transect Policy Areas | Annexe A Secteurs stratégiques du transect](#))

- Subject property located along the Corridor – Mainstreet designation (Beechwood Avenue and St. Laurent Boulevard) (see OP [schedule b2 op bil.pdf](#))
- Subject property is part Neighbourhood designation (see OP [schedule b2 op bil.pdf](#)) as outlined in Section 6.2.1(1) of the Official Plan:

1) Corridors are shown as linear features in the B-series of schedules. The Corridor designation applies to any lot abutting the Corridor, subject to:

a) Generally, a maximum depth of:

i) In the case of Mainstreet Corridors, a maximum depth of 220 metres from the centreline of the street identified as a Mainstreet Corridor;

ii) In the case of Minor Corridors, a maximum depth of 120 metres from the centreline of the street identified as a Minor Corridor;

iii) Where part of a lot lies beyond the maximum depths specified in Policies i) and ii), that part of the lot is excluded from the Corridor designation

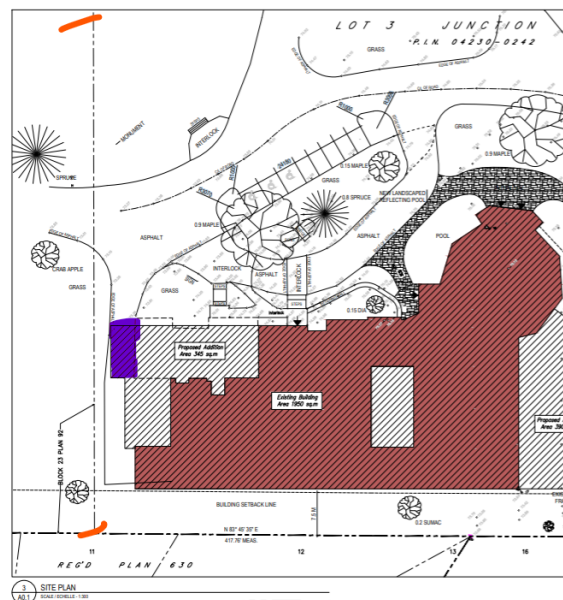
- Located along a Transit Priority Corridor (see OP [Schedule C2 - Transit Network | Annexe C2 Réseau de Transport](#))
 - Located along an Arterial – Existing (Beechwood Avenue) roadway (see OP [Schedule C4 - Urban Road Network | Annexe C4 Réseau routier urbain](#))
 - The subject property contains the Tommy Douglas Memorial and Poet's Hill within the Beechwood Viewshed Area (see OP [Schedule C6-A - Views, Viewsheds, and View Sequences of the Parliament Buildings and other National Symbols | Annexe C6-A - Vues principales, Zones de visibilité et séquence de vues édifices du Parlement et autres symboles nationaux](#))
 - The subject site contains a Natural Heritage Features Overlay and Watercourse (see OP [Schedule C11-C - Natural Heritage System \(East\) I](#))
- iii. Zoning: L1B S238 – Community Leisure Facility Zone, Subzone B, Schedule 238 ([L1 – Community Leisure Facility Zone \(Sections 173-174\)](#))

4. Please be advised of the following *Planning Act* application and submission requirements:

- a. As the building is more than 460 square metres (916 m²) and the size of the addition is over 600 square metres (735 m²) Site Plan is triggered per Section 5(2)(c)(i)(2) of the Site Plan Control By-law.
- b. As the proposed building is to be over 1,860 metres square (1,954 m²) the Site Plan Control application will be Complex.
- c. Changes to a previously approved site plan after more than 3 years shall be treated as a new application.
- d. Please refer to [Site Plan Control | City of Ottawa](#) for further information.

5. A Site Plan is a required plan for this formal site plan control application.

- a. Please review and prepare the Site Plan in accordance with the [Site Plan Terms of Reference](#).
- b. Of note, please clarify the following on the Site Plan:
 - i. Please clearly delineate the area of works proposed within the overall 280 Beechwood Ave property. Please clarify the extent and location of all changes to the parking lots associated with this proposal. The current concept plan does not fully encapsulate the parking lots associated with the proposed development. The access to the parking lot on the western side of the building is encumbered by the western addition as shown highlighted in purple below. Please address.



- ii. Ensure all lot lines are shown. The current plans show what appear to be a lot line within in the property limits of 280 Beechwood Avenue as shown in the image above between the orange marks.
 - iii. Thank you for incorporating a key plan into the site plan drawing. In future submissions please encapsulate the entirety of the subject property into the key plan.
- 6. Generally, staff appreciate the architectural and site design (e.g. wood paneling, lighting, landscape features) of the proposal. Staff appreciate that this proposal aims to improve the functionality and operations of the Cemetery; however, note that Heritage Staff have specific concerns with the demolition proposed (please see Heritage Comments).
- 7. Please consider an increase in bicycle parking, including secure bike storage and hygiene facilities to promote cycling as a viable commute option for staff.
- 8. Please consider ways to optimize loading operations and how the proposed loading turnaround will impact parking on the western parking lot.
- 9. Zoning Analysis:
 - a. A zoning confirmation report is a requirement for formal site plan control application. Please prepare the [Zoning Confirmation Report](#) in accordance with the applicable Terms of Reference.
 - b. Please confirm existing and proposed vehicle parking totals. The submitted plans show 87 parking spaces yet the 'zoning analysis' table provided notes 125.
 - c. Please confirm bicycle parking requirements as per the [Bicycle Parking Space Rates and Provisions \(Section 111\)](#). Note the rate is 1 per 250 m² GFA for office and 1 per 1500 m² GFA for all other non-residential uses.
 - d. Confirm the height of the building. Note the zoning permits a building height of 11 metres. Please confirm that the proposed building additions are outside Area A on Schedule 238 and that the proposal conforms to Schedule 238 as it pertains to the above noted viewshed area.
 - e. Please confirm the existing and proposed land uses in order for staff to evaluate if the proposal is in conformity with the Zoning By-law:
 - i. The pre-con application form states the following as it pertains to the proposal: *"increasing reception/event spaces, lounges, offices, washrooms, storage, and garage capacity. It will better separate public and private functions and offer potential as an event space."*

Please confirm that a Place of Assembly (defined below) is not being proposed here:

Place of assembly means a place designed and used to accommodate gatherings of people such as clubs, karaoke bars, escape rooms, reception halls, conference centres, legion halls, assembly halls and lodges, and for events such as trade shows, banquets, and political or other conventions. (lieu de rassemblement) (By-law 2017-148)

Note: the L1B S238 Zone does not permit a Place of Assembly.

- ii. If the proposal seeks to permit the proposed uses as accessory to the cemetery (principal use), staff will require confirmation that the proposed uses are in fact accessory to the principal use in accordance with Section 55(1):
 - (a) it is on the same lot as the principal use to which it is accessory; and
 - (b) it exists to aid and contribute to the principal use to carry out the function of that principal use
- iii. If any of the proposed land uses are not permitted by the zoning by-law, then further *Planning Act* applications may be required (e.g. Zoning By-law Amendment).

Feel free to contact Spencer Mulvaney, Planner I, Development Review Central for follow-up questions.

Heritage

Comments:

- 10. Beechwood Cemetery is a National Historic Site as identified by Parks Canada under the Historic Site and Monuments Act. The City's Official Plan Policy 4.5.2.4) states:

Ottawa is the site of the Rideau Canal World Heritage Site, many National Historic Sites, and both privately- and publicly-owned buildings designated by the Federal Heritage Buildings Review Office. Development including or adjacent to these sites shall have regard for their cultural heritage value, as defined in Federal designation documentation and the City may require demonstration that development does not adversely impact these resources.

- 11. Heritage Planning staff are concerned that the proposal will have a negative impact on the cultural heritage value identified in the National Historic Site

Statement of Significance, which can be found here:

https://www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=1942.

12. Specifically, staff have concerns with the proposed demolition of the Beechwood Cemetery Residence/Office, which is specifically referenced as a Character Defining Element in the Statement of Cultural Heritage Value.
13. A preliminary review of the property indicates it may merit designation under Part IV of the Ontario Heritage Act. Heritage Staff have compiled the following information on the property:

The superintendent's residence at Beechwood Cemetery was constructed around 1873. Built in the Queen Anne vernacular style, the residence features a truncated hipped roof with a central gabled dormer window and stone chimney. The front façade features sash windows with plain stone sills and voussoirs, as well as a gabled entrance with decorative wood posts. The residence was constructed with limestone quarried from the cemetery grounds.

The buildings at Beechwood Cemetery were designed by Scottish architect James Mather, whose impressive career in Ottawa began in 1873. The superintendent's residence and other cemetery buildings were among Mather's earliest works in the city. Mather went on to design prominent buildings such as Laurier House, First Baptist Church, and the original Byward Market building. He also designed many commercial blocks, residences, and schools including contributions to Lisgar Collegiate and the Ottawa Normal School (now the Heritage Building at City Hall). Mather later served on the Beechwood Cemetery board of directors, including as its president.

The superintendent's residence was one of several staff buildings constructed at Beechwood. As of 1875, it also served as the cemetery office. It is unclear whether the office portion of the residence (the flat-roofed limestone structure on the east side of the residence) was part of the original structure or built as an addition.

Originally located in Gloucester Township, the cemetery grounds were selected based on city council's 1873 determination that burial grounds must be located outside city limits. Since then, the cemetery has grown to meet the community's needs, adding a mausoleum and later a larger office and visitors' centre. The superintendent's residence has withstood this growth and remains one of the focal points visitors to Beechwood Cemetery see upon arrival.

14. Staff strongly encourage the retention of the building and the incorporation of the historic building into the new design. The new building should be sensitive to the historic structure.
15. Heritage Planning staff will be looking for additional details about the expansion of the parking lot and any associated landscape impacts. Landscape impacts should be minimized.

16. A Heritage Impact Assessment (HIA), with a Cultural Heritage Evaluation Report for the Superintendent's Residence and a Conservation Plan will be required for this proposal. It should be undertaken by a heritage professional who is a member of the Canadian Association of Heritage Professionals. The HIA should be undertaken in accordance with the City's Terms of Reference, which can be found [here](#). The HIA should also address any potential impacts on nearby heritage resources such as the Rockcliffe Park Heritage Conservation District.

Feel free to contact Anne Fitzpatrick, Heritage Planner, for follow-up questions.

Urban Design

17. Submission Requirements:

- a. Site Plan
- b. Landscape Plan
- c. Elevations
- d. Floor Plans (conceptual)

Preliminary Design Comments:

18. Ensure that loading and new parking is well screened from internal roadways, also ensure that it is well screened and separated from homes to the rear.
19. Any additional parking should be located away and well screened from roadways.
20. It is unclear how the ground floor under the cantilever on the east side will look and function. Please ensure that the ground floor elevation is animated and that public entrances are highlighted through architecture.
21. Look for opportunities to provide additional tree planting on the site. Please provide additional planting along the homes to the rear.

Feel free to contact Lisa Stern, Planner III, Urban Design, for follow-up questions.

Engineering

Comments:

22. General Information:

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

- b. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A legal survey plan shall be provided and all easements shall be clearly detailed on appropriate engineering plans.
- c. Deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Construction activities (excavation, dewatering, vibrations associated with construction, etc.) shall not impact on any adjacent buildings and infrastructure.
- d. All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.
- e. 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).

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

- a. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
- b. For separated sewer systems built up until 2016, the design of the storm sewers were based on a 5-year storm; storm systems after such time are, generally, based on a 2-year level-of-service.
- c. In separated areas, the pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).
- d. A calculated time of concentration (cannot be less than 10 minutes).
- e. Storm sewer outlets should not be submerged.
- f. The quantity control criteria (100-year post-development to 2-year pre-development **or** $c = [##]$ **or** some other criteria). Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site.
- g. Quality control is only required should additional surface parking be proposed - 80% TSS removal as per City of Ottawa, MOE and Rideau Valley Conservation Authority. 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.

24. Deep Services (Storm, Sanitary and/or Water Supply)

- a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts where applicable.
- b. Connections to trunk sewers and easement sewers are typically not permitted.
- c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).
- d. Sewer connections to be made above the springline of the sewermain as per:
 - i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.
 - ii. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain,
 - iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,
 - iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

25. Water

- a. It is understood that the proposed development will utilize the existing private water service.
- b. Water Data Card (future requirement)
- c. ISTB-2021-03: Industrial, commercial, institutional service areas with a basic day demand greater than 50 m³/day (0.57 L/s) and residential areas serving 50 or more dwellings shall be connected with a minimum of two

watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area.

- d. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:
 - i. Location of service
 - ii. Type of development
 - iii. The amount of fire flow required (per OBC or FUS).
 - iv. Average daily demand: ____ l/s.
 - v. Maximum daily demand: ____ l/s.
 - vi. Maximum hourly daily demand: ____ l/s.

26. Sewer (sanitary and storm)

- a. Detail existing site services on site servicing plans.

27. Stormwater

- a. A Stormwater Management Report (SWM) shall be provided based on the Stormwater Management Criteria detailed above.

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 modelers in the Water Resources Group.

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

With regards 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.

Rooftop Storage:

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.

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.

28. Geotechnical

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. See the Studies Plans and Identification List for more information.

If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum

addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City.

<https://ottawa.ca/en/city-hall/planning-and-development/community-plans-and-design-guidelines/design-and-planning/completed-guidelines/tree-planting-sensitive-marine-clay-soils-2017-guidelines>

29. Grading

- a. Post-development site grading shall match existing property line grades to minimize disruption to the adjacent residential properties. A topographical plan of survey shall be provided as part of the submission and a note provided on the plans.
- b. Encroachment or alteration will not be permitted within any easements including but not limited to drainage easements, access easements, utility easements or any other easements without authorization from easement owner.
- c. No adverse alterations of existing grading and drainage patterns are permitted
- d. No excess drainage to be directed towards adjacent properties

30. Fire-fighting flow rate(s)

- a. Please review Technical Bulletin ISTB-2024-05, 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.
- b. Fire flow demand requirements shall be based on IWSTB-2024-05. Please note that the FUS method should only be used if the OBC method indicates more than 9,000 L/min.
- c. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF) (*only if applicable as per 17.b.
- d. 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.

31. CCTV

- a. CCTV sewer inspections documenting the pre and post construction conditions of City owned Infrastructure will be required for any new connections to City sewers.

32. Road Reinstatement

- a. Where the proposed development requires three or more road cuts, 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).

33. Erosion and Sediment Control Plan is required.

34. 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.

35. 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>

Please feel free to contact Brett Hughes, Infrastructure Project Manager, for follow-up questions.

Transportation

Comments:

36. Given the scope of the proposed work and its location internal to the site, no road widenings are required.

37. Road resurfacing targeted to start 1-2 years.

LN50190

Forecast ID LN50190

Type of Work Road Resurfacing

Project Type Renewal

STATUS Planned

Construction Year 1-2 Years

Delivered By IS

CLIENT Asset Management Service - Roads Infra Renewal (IWSD)

Construction Contract Not Available

Project Manager Not Available

Ward Description Rawlson King - 13, Stéphanie Plante - 12

Inventory ID1200012370

38. The Screening Form has indicated that no TIA Triggers have been met. This development would not generate sufficient traffic to warrant a TIA report. The consultant is to address how they plan to enable and encourage travel by sustainable modes (i.e., to make walking, cycling, transit, carpooling and telework more convenient, accessible, safe, and comfortable). Please complete the City of Ottawa's TDM Measures Checklist.

39. Beechwood Avenue is designated as an Arterial Road within the City's Official Plan.

40. Minimum lane width for fire trucks is 6.0 metres. A fire truck three-point turn as it relates to the proposed lane configurations is to be confirmed by the Fire Chief.

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

42. The impacts on traffic will depend on the frequency, duration, and time of day these conflicts may happen, ie. during peak periods.

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

Environment

Comments:

43. There are no triggers for an Environmental Impact Study for this building expansion.
44. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements, where feasible. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here:
https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf
45. Please consider if there are features that can be added reduce the urban heat island effect (see OP 10.3). For example, this impact can be reduced by adding large canopy trees, green rooves or vegetation walls, or incorporating building with low heat absorbing materials.

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

Forestry

Comments:

46. A Tree Conservation Report will be required if there is any construction proposed within the CRZ of a protected tree (10 cm in diameter or greater for private trees). Trees that are in proximity to the construction area but will not have their CRZ impacted need to be protected with tree protection fencing. The fencing should be shown on the LP. Construction fencing (e.g. moduloc) would be acceptable. This can be shown on the LP.
- a. If it can be shown no protected trees will be impacted by the development, a TCR will not be required. For example, photos of the trees, showing their diameter(s), can be provided to verify there are no protected trees requiring removal.
47. A Landscape Plan must be provided. Please provide large canopy native trees wherever feasible.

48. Thank you for clarifying there will be no parking lot expansion or grading within the existing parking lots. Please consider options for reconfiguring the existing parking lots to support your needs without removing soft landscaping. Here are two examples of well suited areas for tree planting that should be prioritized:



49. The canopy cover calculation for the LP can be based on the construction limit for the project or the area shown by the Parks department during the pre-consultation. Keep the scale of the project boundaries consistent.
50. Maintain the buffer of trees between the existing building and the residential lots. Consider expanding the buffer of trees behind 271 and 273 Michel Circle.
51. Can the conifers east of the building addition be retained? If its justified why this is not feasible, consider transplanting them. Alternatively, replacement plantings would be required.
52. Tree Conservation Report requirements. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca
- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - Any tree 10 cm in diameter or greater and 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.
 - The TCR must contain 2 separate plans/maps:

- i. Plan/Map 1 - show existing conditions with tree cover information.
- ii. Plan/Map 2 - show proposed development with tree cover information.
- d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.
- e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
- f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
- g. The removal of trees on a property line will require the permission of both property owners.
- h. 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
- i. 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.
- j. Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

53. Landscape Plan (LP) requirements:

- a. Landscape Plan Terms of Reference must be adhered to for all tree planting: [Click Here](#). For more information on these requirements please contact hayley.murray@ottawa.ca

54. Additional Elements for Tree Planting in the Right of Way:

- a. Please ensure any retained trees are shown on the LP.
- b. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- c. Soil Volume - Please demonstrate as per the Landscape Plan Terms of Reference that the available soil volumes for new plantings will meet or exceed the minimum soil volumes requested.

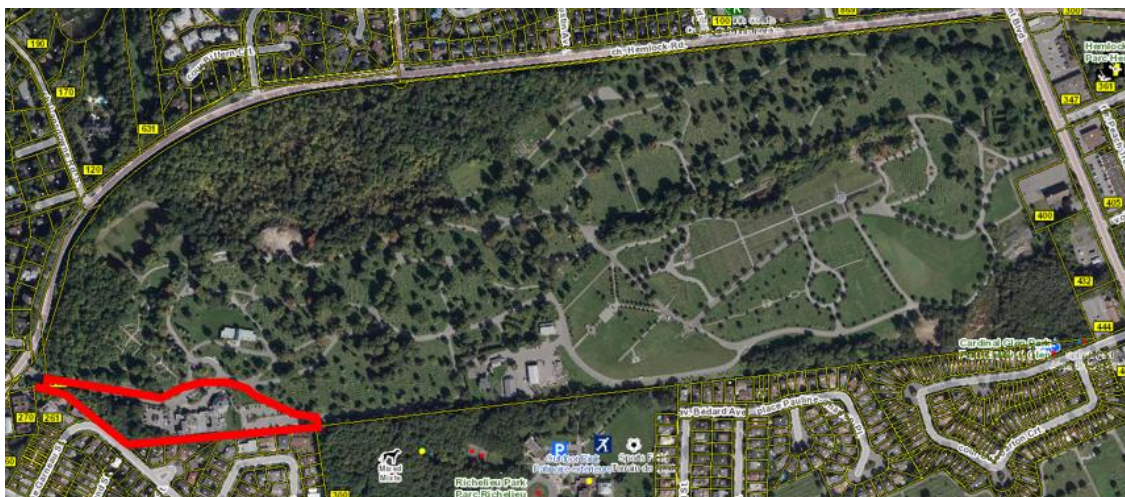
- d. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- e. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.
- f. Minimum Setbacks:
 - i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
 - ii. Maintain 2.5m from curb.
 - iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
 - iv. 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.
 - v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
- g. Tree specifications:
 - i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
 - ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
 - iii. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
 - iv. No root barriers, dead-man anchor systems, or planters are permitted.
 - v. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

Comments:

55. Cash-in-lieu of Parkland(CILP) will be required at a rate of two(2) percent of a portion of land to be determined by applying the percentage of Gross Floor Area increase on the below portion of land associated with the funeral home use:



56. Should CILP has previously been paid, a credit will apply.

Feel free to contact steve.gauthier@ottawa.ca for follow-up questions.

Community issues

Vanier Community Association (VCA) Comments:

57. The VCA has noted the importance of maintaining a buffer area between the new additions and possibly extensions in the current parking area from adjacent residential properties along Laverne and possibly Michel Circle. This could include landscaping including trees and other foliage, suitable building setbacks and stepbacks, taking into account also potential changes among those properties as a result of a redevelopment based on the proposed new comprehensive zoning bylaw. The VCA also noted the current character of the building including the heritage house, the original structure serving the cemetery as part of the cemetery's Historic site designation. The VCA took note of indications that materials of the heritage building could be used as part of the new addition to maintain the building's existing character, but it is understood that the heritage building would likely be the subject of a Heritage Impact Assessment. The VCA looks forward to collaborating with the applicant and the City, together with other interested community associations neighbouring the cemetery. The VCA supports that the Applicant also approach ward councillors, both in Ward 13 as well as Ward 12, where the cemetery is currently located, and undertake community public consultations.

Other

58. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.

- a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.
- b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

59. Under the Affordable Housing Community Improvement Plan, a Tax Increment Equivalent Grant (TIEG) program was created to incentivize the development of affordable rental units. It provides a yearly fixed grant for 20 years. The grant helps offset the revenue loss housing providers experience when incorporating affordable units in their developments.

- a. To be eligible for the TIEG program you must meet the following criteria:
 - i. the greater of five units OR 15 per cent of the total number of units within the development must be made affordable
 - ii. provide a minimum of 15 per cent of each unit type in the development as affordable
 - iii. enter into an agreement with the city to ensure the units maintain affordable for a minimum period of 20 years at or below the city-wide average market rent for the entire housing stock based on building form and unit type, as defined by the Canada Mortgage and Housing Corporation
 - iv. must apply after a formal Site Plan Control submission, or Building Permit submission for projects not requiring Site Plan Control, and prior to Occupancy Permit issuance
- b. Please refer to the TIEG information at [Affordable housing community improvement plan](#) / [Plan d'améliorations communautaires pour le logement abordable](#) for more details or contact the TIEG coordinator via email at affordablehousingcip@ottawa.ca.

Submission Requirements and Fees

1. Site Plan Control – Complex Application.
 - a. Additional information regarding fees related to planning applications can be found [here](#).
2. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
3. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

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

Yours Truly,

Spencer Mulvaney, Planner I

Encl. Studies and Plans Identification List (SPIL)
ADS Site Plan Checklist
HPDS Example Checklist
HPDS Overview for Applicants
Supplementary Development Information
List of Technical Agencies

c.c. Ann O'Connor, Planner III
Eric Forhan, Planner II
Shawn Wessel, Infrastructure Project Manager
Brett Hughes, Infrastructure Project Manager
Lisa Stern, Urban Design Planner III
Wally Dubyk, Transportation Project Manager
Steve Gauthier, Parks Planner III
Hayley Murray, Planning Forester
Matthew Hayley, Environmental Planner III
Amy MacPherson, Environmental Planner II
Anne Fitzpatrick, Heritage Planner III

Chris Greenshield, Vanier Community Association
Dave Shymanski, Vanier Community Association

RIVINGTON Johnathan

From: PICKARD Robert
Sent: July 31, 2026 10:06 AM
To: RIVINGTON Johnathan
Subject: Fw: Beechwood Additions - SWM Strategy

Data sensitivity - Internal

From: Hughes, Brett <brett.hughes@ottawa.ca>
Sent: Friday, May 1, 2026 3:56 PM
To: PICKARD Robert <robert.pickard@egis-group.com>
Cc: MELANSON Curtis <curtis.melanson@egis-group.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: Beechwood Additions - SWM Strategy

!! Courriel externe - Merci d'être prudent avec les liens et les pièces jointes !! External email - Please be careful with links and attachments !!

Rob,
Thanks for following up. Your summary is accurate with one minor revision. See below.

Regards,
Brett Hughes
Project Manager, Infrastructure Approvals
Development Review Central
PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS)
110 Laurier Ave West | 4th Floor | Ottawa, ON | K1P 1J1
City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext./poste 76665

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

From: PICKARD Robert <Robert.PICKARD@egis-group.com>
Sent: April 30, 2026 11:36 AM
To: Wu, John <John.Wu@ottawa.ca>; Hughes, Brett <brett.hughes@ottawa.ca>
Cc: MELANSON Curtis <curtis.melanson@egis-group.com>
Subject: Beechwood Additions - SWM Strategy

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.
ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Brett, John,

Thanks again for meeting with us.

To confirm, our understanding of the key points discussed is:

- A comparison between pre- and post-development storm events for the project area will suffice, provided that the ~~pre~~post-development condition is demonstrated to be better than the ~~post~~pre-development scenario for the 2, 5 and 100 year storm events.
- The proposed approach of utilizing roof storage and then outlet to overland flow is acceptable.
- Submission of a stormwater management brief will be acceptable for this application.
- Water quality treatment will not be required, as the new flow is exclusively from roof areas.

Please let us know if the above accurately reflects your expectations as well.

Regards,



Robert PICKARD

Junior Project Engineer Sustainable Cities

750 Palladium Drive - Suite 310

Kanata K2V 1C7 | CA

Tel. +1 343-317-6702 | Mobile +1 613-808-3427

robert.pickard@egis-group.com | www.egis-group.com

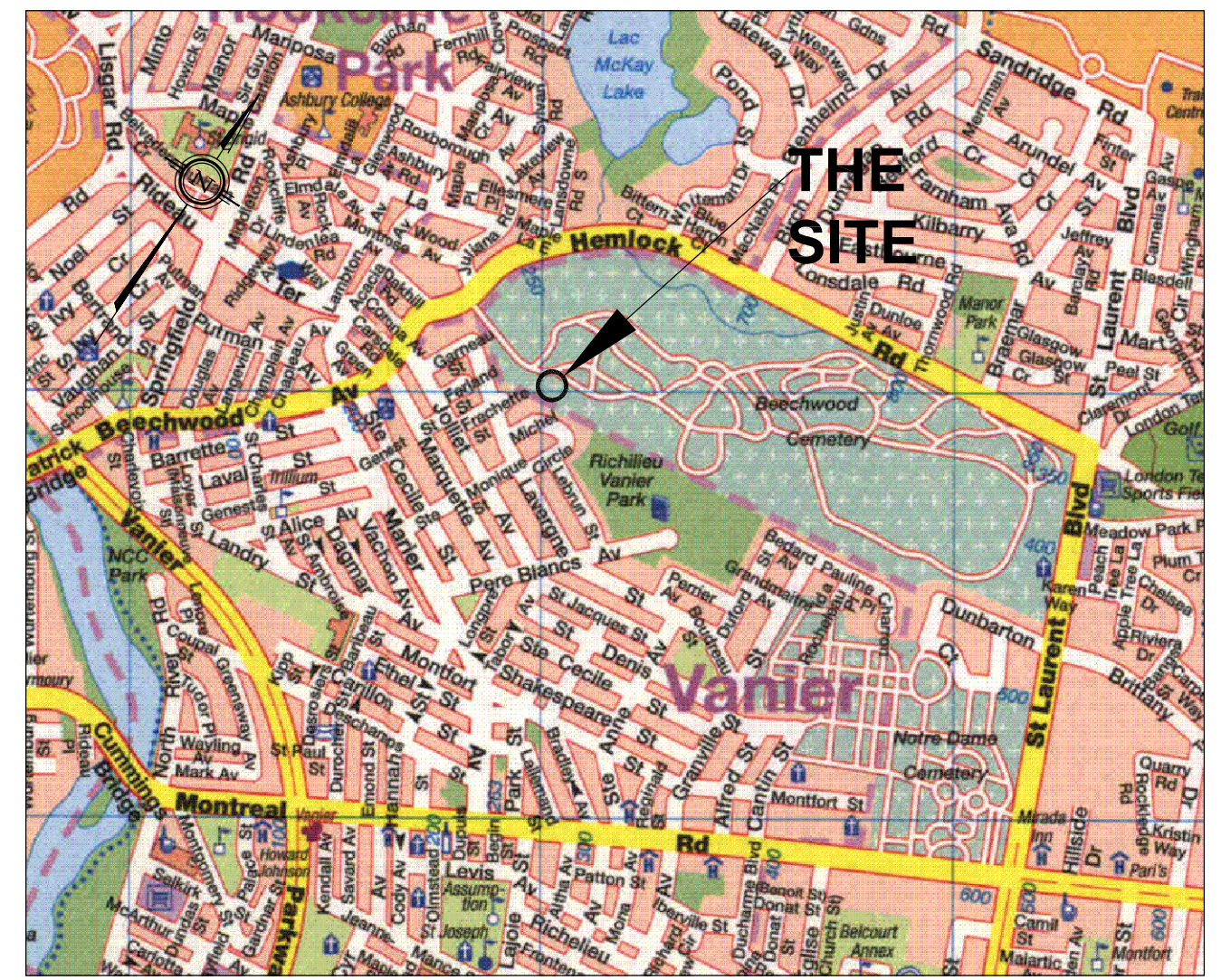
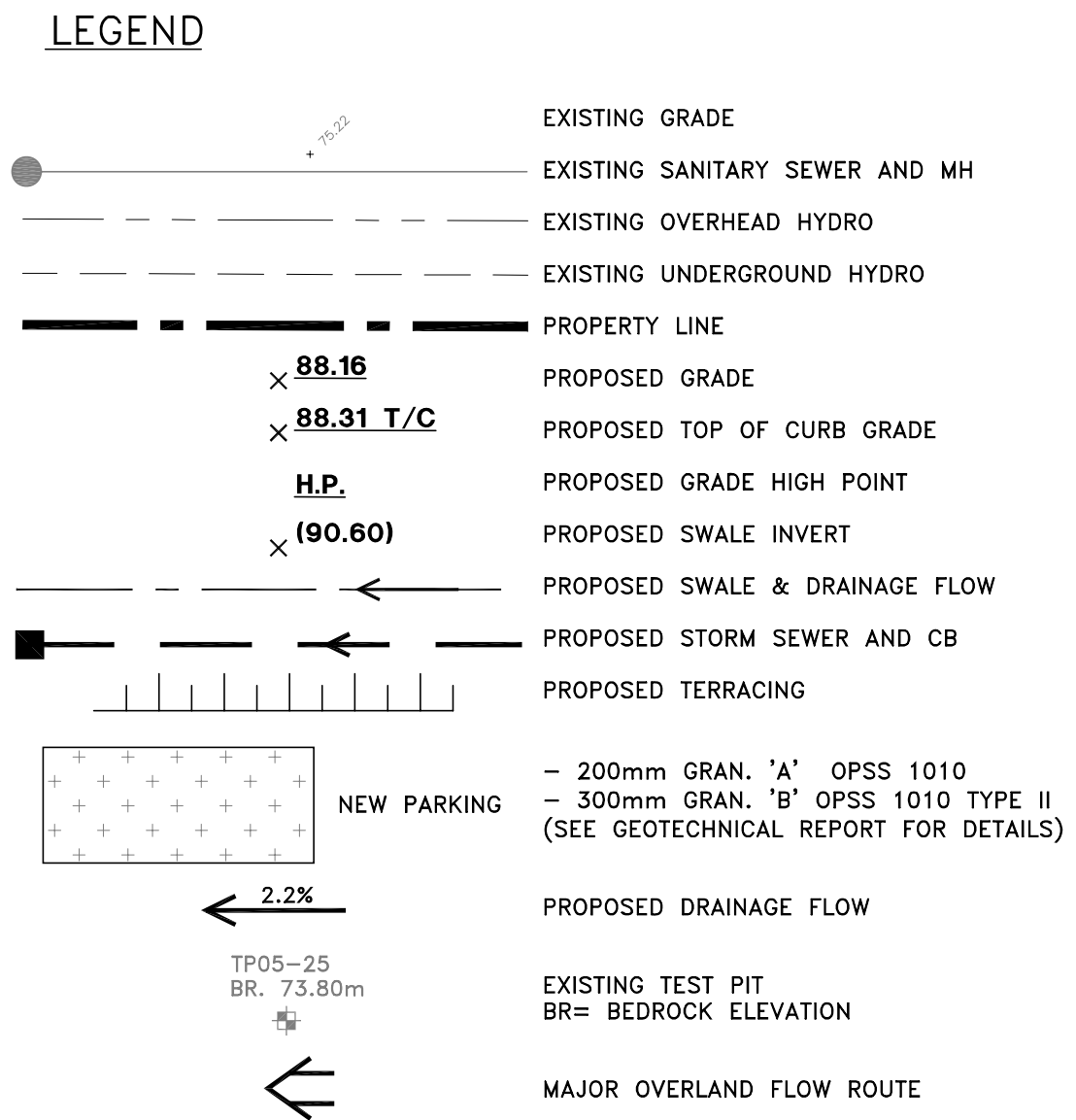
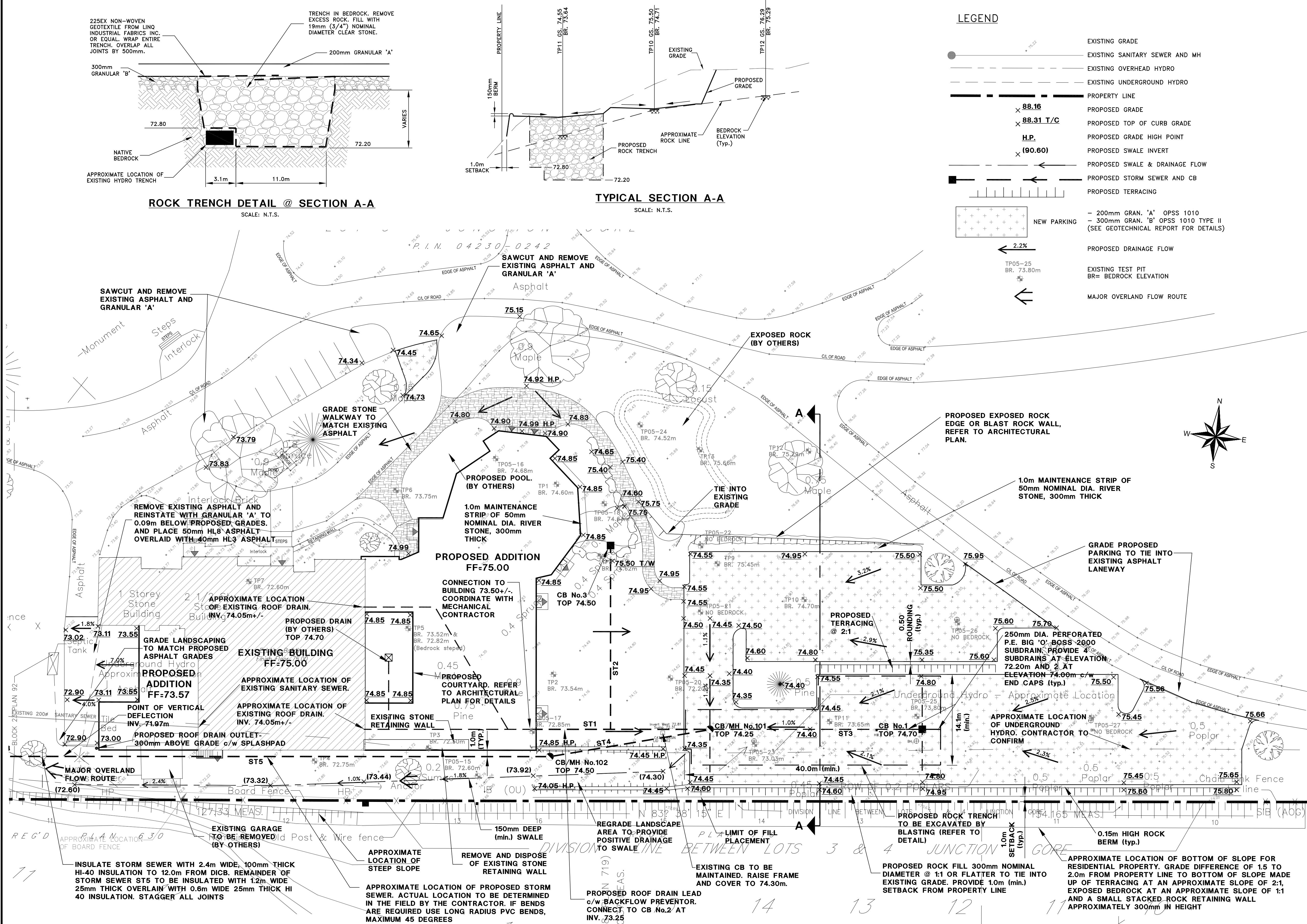


Data sensitivity - Internal

This message and its attachments may contain confidential or privileged information that may be protected by law; they should not be distributed, used or copied without authorisation. If you have received this email in error, please notify the sender and delete this message and its attachments. As emails may be altered, Egis is not liable for messages that have been modified, changed or falsified. Thank you.

Ce message et ses pièces jointes peuvent contenir des informations confidentielles ou privilégiées et ne doivent donc pas être diffusés, exploités ou copiés sans autorisation. Si vous avez reçu ce message par erreur, merci de le signaler à l'expéditeur et le détruire ainsi que les pièces jointes. Les messages électroniques étant susceptibles d'altération, Egis décline toute responsabilité si ce message a été altéré, déformé ou falsifié. Merci.

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you. Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.



KEY PLAN
SCALE: N.T.S.

- General Notes:**
- 1) Construction shall be in accordance with City of Ottawa standards and specifications and Ontario Provincial Standard drawings and specifications where applicable. Ontario Provincial Standards shall apply where no City standards are available. All drawings to be checked for confirmation with applicable building codes. No alteration or grading of site is to occur prior to approval by City.
 - 2) The contractor is responsible for all removals necessary to satisfy engineering and landscape works. Contractor to visit site prior to tendering and confirm site conditions. Contractor is responsible for obtaining all permits required and bear cost of same.
 - 3) Location of services are not all shown. Location of utilities and underground works that are shown are approximate. Contractor to verify location and elevations of all services, utilities and underground structures prior to any construction and provide to consultant. The contractor is responsible for protection and reinstatement.
 - 4) The contractor shall construct storm sewers in accordance with OPSS 802.010, 802.013 and 802.014. During construction, protect pipes from heavy construction equipment as per OPSS 808.01. Bedding and backfill shall be 95% SPMDD. Proposed sewer trenches to be excavated to reach undisturbed soil and replaced with granular 'A' crushed stone bedding and initial backfill to 300mm above pipe compacted to a min. of 95% SPMDD.
 - 5) The contractor shall implement Best Management Practices during construction activities. These practices are required to ensure no sediment and/or associated pollutants are released to the receiving watercourse. These practices include installation of sediment barriers on all catch basin and maintenance holes and a silt fence barrier (as per OPSS 219.110 and associated specifications) along all other areas that sheet drain off site. The contractor acknowledges that failure to implement appropriate erosion and sediment control measures may be subject to penalties imposed by any applicable regulatory agency.
 - 6) All disturbed areas to be reinstated to equal or better condition. Pavement reinstatement for cuts shall be in accordance with R10. All new work shall blend into existing (to be approved by consultant).
 - 7) All dimensions are in metres unless otherwise stated. Drawings should not be scaled by the contractor. Any missing or questionable dimensions are to be confirmed with the consultant in writing.
 - 8) Site works contractor is responsible for all works, utility and service connections to the building. Connections to be coordinated with building contractor.
 - 9) Pavement markings and specification as per Site & Landscape Plans (reference plan for grade locations and site dimensions).
 - 10) Stripping and subgrade preparation shall be performed with an excavator equipped with a smooth mouthed bucket to minimize disturbance. Exposed subgrade soil shall be graded to allow effective drainage during construction.
 - 11) The contractor shall ensure that these drawings are supplemented for architectural, and structural heating/air conditioning, and electrical, requirements to suit municipal, and provincial requirements.
 - 12) Side slope of excavations should be sloped in accordance with the requirements of Ont. Reg. 213/91 under the Occupational Health and Safety Act.
 - 13) Refer to landscape and architectural plan for finishes and fencing details and locations.
 - 14) Refer to Soil Investigation prepared by Golder Associates Ltd., Reports 001-2108, 851-2422 and 05-1120-173, dated August 2000, October 1985 and December 2005 respectively.
 - 15) Refer to Report on Stormwater Management by Golder Associates Ltd., dated November 2005.
 - 16) Proposed rock trench dimensions based on a bedrock hydraulic conductivity of 500m/day/m2. Contractor shall excavate by blasting 5.0m3 of bedrock and supply 1000 lgal of water for an infiltration test prior to excavation of the infiltration trench. Contractor shall advise the consultant 24 hours in advance of the test.

- Inspection Notes**
1. Contractor to advise the consultant a minimum of 72 hours (3 Working Days) prior to proceeding with any on-site works.
 2. The contractor shall advise the consultant a minimum of 24 hours prior to the following work schedule:
 - a) Prior to backfilling, the Contractor to advise consultant when the installation of all services are complete.
 - b) Excavation for catch basins and manholes shall be completed and ready for placement of granular bedding. Contractor shall arrange to have bedding placed and compacted and catch basins and manholes installed during the inspection.
 - c) Subgrade Preparation
 - c) Subgrade shall be shaped and compacted to grade and ready for placement of Granular 'b'. Compaction tests must be completed prior to the inspection.
 - d) Granular 'b' shall be shaped and compacted to grade and ready for placement of Granular 'A'. Compaction tests must be completed prior to the inspection.
 - e) Granular 'A' shall be shaped and compacted to grade and ready for placement of asphalt. Compaction tests must be completed prior to the inspection.
 - f) Curbs and Sidewalks
 - f) The contractor shall advise the consultant prior to the construction of concrete curbs and sidewalks for verification of grades.
 - g) Asphalt
 - g) The contractor shall advise the consultant prior to the construction of asphalt parking areas and accesses.
 - h) Other Works
 - h) As required at the direction of the consultant.
 3. All costs from additional inspections resulting from contractors lack of coordination or failed inspections to be borne by contractor.

Manhole/Catch Basin Reference Table		
New Manhole Number	Ontario Provincial Standard Drawing Number	Details
CB No.1 (Storm)	OPSD 705.010, 400.020 Frame and Cover and 600mm sump.	Top = 74.70 Subdrain Inv. = 72.20 (250mm#) Subdrain Inv. = 74.00 (250mm#)
CB No.3 (Storm)	OPSD 705.010, 400.020 Frame and Cover and 600mm sump.	Top = 74.50 S Inv. = 73.60 (200mm#)
CB/MH No. 101 (Storm)	OPSD 701.010, 400.020 Frame and Cover and 600mm sump. Install Hydrox valve sized for 14.0 L/s at a head of 2.06m in outlet pipe.	Top = 74.25 Subdrain Inv. = 72.20 (250mm#) W Inv. = 73.25 (200mm#) SW Inv. = 72.20 (200mm#)
CB/MH No. 102 (Storm)	OPSD 701.010, 400.020 Frame and Cover and 600mm sump.	Top = 74.50 E Inv. = 72.15 (200mm#) W Inv. = 72.12 (200mm#)
DICB (Storm)	OPSD 705.030, 403.010, Grating (Type A) at 3:1 slope and 600mm sump.	Grate = 71.50 E Inv. = 71.53 (200mm#)

Pipe Reference Table	
Pipe Number	Description
ST1	28.0m-200mm# PVC SDR35 STORM SEWER @ 0.6% (min.)
ST2	27.0m-200mm# PVC SDR35 STORM SEWER @ 0.6% (min.)
ST3	32.0m-250mm# PERFORATED P.E. BIG 'O' BOSS 2000 SUBDRAIN
ST4	25.0m-200mm# PVC SDR35 STORM SEWER @ 0.2% (min.)
ST5	87.0m-200mm# PVC SDR35 STORM SEWER @ 0.2% (min.)

*NOTE: INSULATE ST1 AND ST2 WITH 50mm HI-40 STYROFOAM, 1.2m WIDE CENTERED 300mm ABOVE TOP OF PIPE.

SURVEY AND TOPOGRAPHICAL INFORMATION PROVIDED BY: M.E. RENAUD OLS. REF No.: 1-92 DATED: APRIL 2005

PROPOSED BASE PLAN PROVIDED BY: ROBERTSON MARTIN ARCHITECTS INC. DWG: SITE-OVERLAYDWG DATED: AUGUST 2005

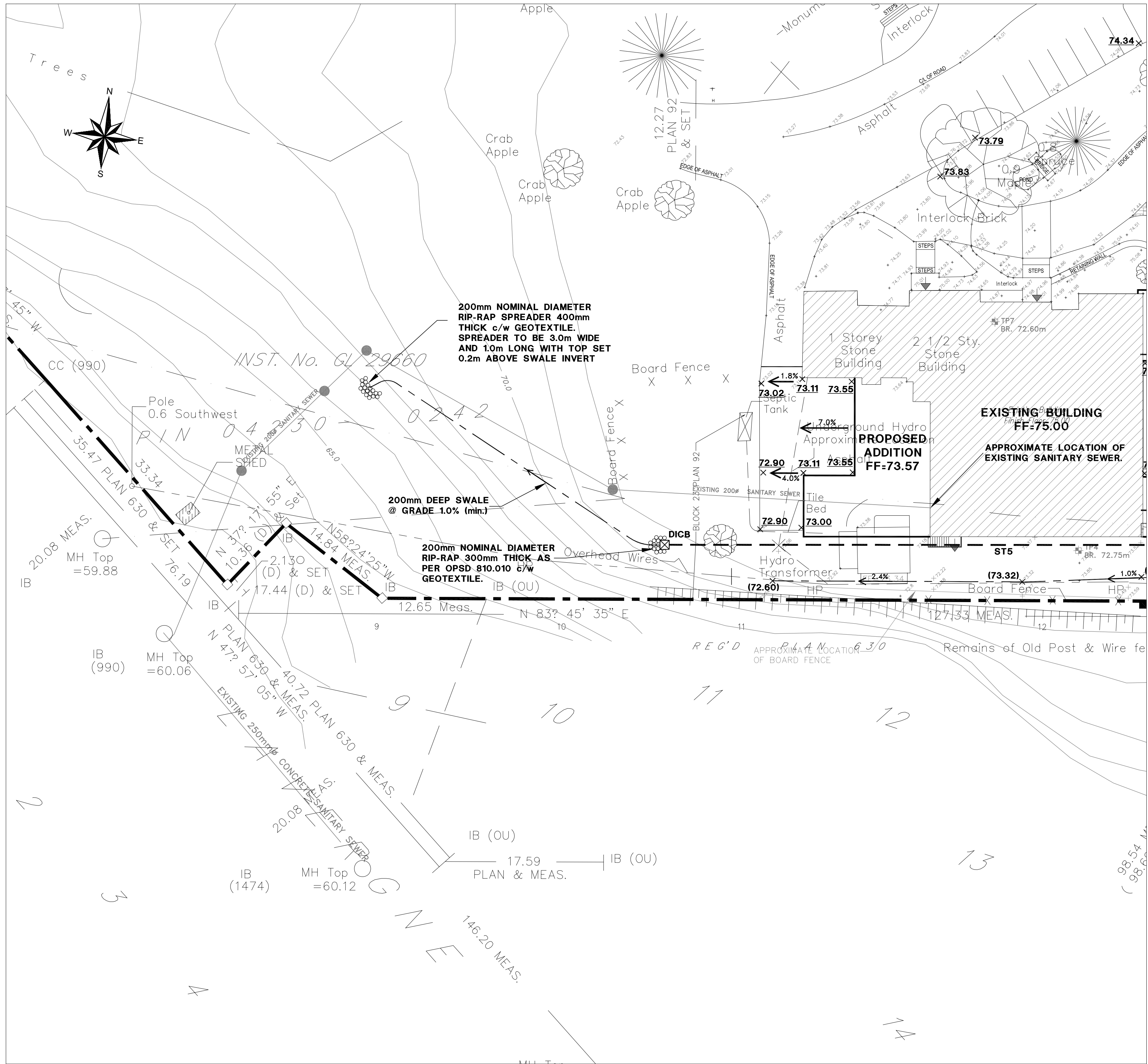
NO.	REVISIONS	DATE	INITIAL	ENG.
6	REVISED SWM FACILITY	19/07/07		M.L.F.
5	GENERAL REVISION	24/10/06		M.L.F.
4	REVISED AS PER CITY COMMENTS	17/10/06		M.L.F.
3	ISSUED FOR FOUNDATION PERMIT / TENDER	20/09/06		M.L.F.
2	SITE PLAN RE-SUBMISSION	19/07/06		M.L.F.
1	ISSUED FOR SITE PLAN APPROVAL	04/01/06		M.L.F.

Approved
6

TO BE READ IN CONJUNCTION WITH SITE SERVICING AND GRADING PLAN, DWG. 05-1607-SS2

CLIENT BEECHWOOD CEMETERY 280 BEECHWOOD AVENUE, OTTAWA, ONTARIO		PROJECT PROPOSED NATIONAL MEMORIAL CENTER	
DRAWING TITLE SITE SERVICING AND GRADING PLAN		SCALE: 1:300 DATE: 05/12/05 DESIGN: S.W.T. CHECKED: D.V.K. DRAWN: M.L.F. PLOT: 1 = 1	
CAD FILE NO. SS1DA051120915.DWG		DWG. 05-1607-SS1 GAL No.: 05-1120-915	
REV. 6			





KEY PLAN
SCALE: N.T.S.

LEGEND

- EXISTING GRADE
- EXISTING SANITARY SEWER AND MH
- EXISTING OVERHEAD HYDRO
- EXISTING UNDERGROUND HYDRO
- PROPERTY LINE
- PROPOSED GRADE
- PROPOSED TOP OF CURB GRADE
- PROPOSED GRADE HIGH POINT
- PROPOSED SWALE INVERT
- PROPOSED SWALE & DRAINAGE FLOW
- PROPOSED STORM SEWER AND CB
- PROPOSED TERRACING
- NEW PARKING
- PROPOSED DRAINAGE FLOW
- EXISTING TEST PIT
- BR= BEDROCK ELEVATION
- MAJOR OVERLAND FLOW ROUTE

TO BE READ IN CONJUNCTION
WITH SITE SERVICING AND
GRADING PLAN,
DWG. 05-1607-SS1

SURVEY AND TOPOGRAPHICAL
INFORMATION PROVIDED BY:
M.E. RENAUD OLS.
REF No.: 1-92 DATED: APRIL 2005

PROPOSED BASE PLAN PROVIDED BY:
ROBERTSON MARTIN ARCHITECTS INC.
DWG: SITE-OVERLAY/DWG DATED: AUGUST 2005

						Approved		CLIENT BEECHWOOD CEMETERY 280 BEECHWOOD AVENUE, OTTAWA, ONTARIO PROJECT PROPOSED NATIONAL MEMORIAL CENTER DRAWING TITLE: SITE SERVICING AND GRADING PLAN		SIMMERING & ASSOCIATES CONSULTING ENGINEERS (a division of Golder Associates Ltd.) SCALE: 1:300 DATE: 24/07/07 DESIGN: S.W.T. CHECKED: D.V.K. DRAWN: N.B.H.S. PLOT: 1 = 1 CAD FILE NO. SS1DA051120915.dwg DWG. 05-1607-SS2 GAL No.: 05-1120-915				REV. 1	
1	REVISED SWM FACILITY	24/07/07	NBHS												
NO.	REVISIONS	DATE	INITIAL	ENG.											

APPENDIX B

WATERMAIN CALCULATIONS

CCO-24-2954 - Beechwood Cemetery Building Expansion - Water Demands

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026
Site Area:	1.17 gross ha

Commercial/Amenity 2,811 m²

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	280	L/c/d
Industrial - Light	35,000	L/gross ha/d
Industrial - Heavy	55,000	L/gross ha/d
Shopping Centres	2,500	L/(1000m ² /d
Hospital	900	L/(bed/day)
Schools	70	L/(Student/d)
Trailer Park with no Hook-Ups	340	L/(space/d)
Trailer Park with Hook-Ups	800	L/(space/d)
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motels	150	L/(bed-space/d)
Hotels	225	L/(bed-space/d)
Tourist Commercial	28,000	L/gross ha/d
Other Commercial	28,000	L/gross ha/d
AVERAGE DAILY DEMAND Residential	0.00	L/s
AVERAGE DAILY DEMAND Commercial/Industrial/Institutional	0.09	L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	9.5	x avg. day
Industrial	1.5	x avg. day
Commercial	1.5	x avg. day
Institutional	1.5	x avg. day
MAXIMUM DAILY DEMAND Residential	0.00	L/s
MAXIMUM DAILY DEMAND Commercial/Industrial/Institutional	0.14	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	14.3	x avg. day
Industrial	1.8	x max. day
Commercial	1.8	x max. day
Institutional	1.8	x max. day
MAXIMUM HOUR DEMAND Residential	0.00	L/s
MAXIMUM HOUR DEMAND Commercial/Industrial/Institutional	0.25	L/s

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

AVERAGE DAILY DEMAND	0.09	L/s
MAXIMUM DAILY DEMAND	0.14	L/s
MAXIMUM HOUR DEMAND	0.25	L/s

CCO-24-2954 - Beechwood Cemetery Building Expansion - OBC Fire Calculations - Existing Inc. West Addition

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

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

Water Supply for Fire-Fighting - Institutional/Commercial Building

Building is classified as Group : **A2** (from table 3.2.2.55)

Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2.

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

(a) $Q = K \times V \times Stot$

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	18	(from Table 1 pg A-31)
V	16,144	(Total building volume in m³.)
Stot	1.0	(From figure 1 pg A-32)
Q =	290,592.00 L	

			From Figure 1 (A-32)
Snorth	81	m	0.0
Seast	Firewall	m	0.0
Ssouth	12	m	0.0
Swest	108	m	0.0

*approximate distances

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

9,000 L/min if Q > 270,000 L
2378 gpm

CCO-24-2954 - Beechwood Cemetery Building Expansion - OBC Fire Calculations - East Addition

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

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

Water Supply for Fire-Fighting - Institutional/Commercial Building

Building is classified as Group : **A2** (from table 3.2.2.55)

Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2.

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

(a) $Q = K \times V \times Stot$

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	18	(from Table 1 pg A-31)
V	3,568	(Total building volume in m³.)
Stot	1.0	(From figure 1 pg A-32)
Q =	64,219.50 L	

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

2,700 L/min if Q < 108,000 L
713 gpm

			From Figure 1 (A-32)
Snorth	99	m	0.0
Seast	100	m	0.0
Ssouth	16	m	0.0
Swest	Firewall	m	0.0

*approximate distances

CCO-24-2954 - Beechwood Cemetery Building Expansion - Fire Underwriters Survey - Existing Inc. West Addition

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

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	1.0	A	3,031.0 m ²
Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area)		3,031.0 m ²	*Unprotected Vertical Openings

Calculated Fire Flow	12,112.0 L/min
	12,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:
 Combustible 0%

Fire Flow	12,000.0 L/min
-----------	----------------

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered 30%

Reduction	8,400.0 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	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 2	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 3	10.1 to 20	Ordinary - Mass Timber (Unprotected)	68	1 & 2	392.0	10%
Exposure 4	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
% Increase*						10%

Increase*	1,200.0 L/min
-----------	---------------

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

Fire Flow	8,400.0 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

CCO-24-2954 - Beechwood Cemetery Building Expansion - Fire Underwriters Survey - East Addition

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

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	1.0	A	804.0 m ²	
Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area)			804.0 m ²	*Unprotected Vertical Openings

Calculated Fire Flow	6,238.1 L/min
	6,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:
 Combustible 0%

Fire Flow	6,000.0 L/min
-----------	---------------

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered 30%

Reduction	4,200.0 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	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 2	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
Exposure 3	10.1 to 20	Ordinary - Mass Timber (Unprotected)	14	2	126.0	10%
Exposure 4	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%
% Increase*						10%

Increase*	600.0 L/min
-----------	-------------

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

Fire Flow	4,200.0 L/min
Fire Flow Required**	4,000.0 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

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

AVAILABLE FIRE FLOWS BASED ON HYDRANT SPACING
BASED ON CITY OF OTTAWA TECHNICAL BULLITEN ISTB-2018-02

An aerial photograph of a water treatment facility. The image shows several large circular tanks, a central building with a hexagonal roof, and various pipes and structures. Labels include:

- 2400mm Ø CONC (red dashed line)
- 152mm Ø - PVC (purple dashed line)
- 56.5m (green line)
- 152mm Ø - PVC (blue line)
- 21.5m (red line)
- 152mm Ø - PVC (blue line)
- 200mm Ø PVC (red dashed line)
- MHSA65254 (red dot)
- MHSA65253 (red dot)
- 200mm Ø PVC (red dashed line)
- 200mm Ø - PEX (red dashed line)

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026

AVAILABLE FIRE FLOWS BASED ON HYDRANT SPACING
BASED ON CITY OF OTTAWA TECHNICAL BULLITEN ISTB-2018-02

An aerial photograph of a university campus with overlaid engineering plans for water main installation. The plan shows several proposed pipe segments: a red dashed line labeled "51mm Ø - PEX" running diagonally across the top; a thick red solid line labeled "2400mm Ø CONC" crossing the center; a green solid line segment labeled "800.5m" connecting two points; a blue solid line segment labeled "95.4m"; and several purple dashed lines labeled "152mm Ø - PVC". One section at the bottom left is labeled "200mm Ø PVC". The background shows a large building with a prominent octagonal roof, surrounding green spaces with trees, and parking areas with cars. The identifier "SA65254" is visible in the bottom left corner.

APPENDIX C SANITARY CALCULATIONS

CCO-24-2954 - Beechwood Cemetery Building Expansion - Sanitary Demands

Project:	Beechwood Cemetery Building Expansion
Project No.:	CCO-24-2954
Designed By:	JR
Checked By:	RP
Date:	August 21, 2026
Site Area	1.17 Gross ha
Commercial Area	2801.00 m ²

DESIGN PARAMETERS

Institutional/Commercial Peaking Factor	1.5	
Residential Peaking Factor	3.80	* 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	0.06
Wet	0.33
Total	0.39

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	350	L/c/d		0
Industrial - Light**	35,000	L/gross ha/d		0
Industrial - Heavy**	55,000	L/gross ha/d		0
Commercial	28,000	L/gross ha/d	0.28	0.09
Restaurant	125	L/(9.2m ² /d)		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	0.00	L/s
PEAK RESIDENTIAL FLOW	0.00	L/s
AVERAGE ICI FLOW	0.09	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.14	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.14	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.15	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	0.19	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	0.52	L/s

SANITARY SEWER DESIGN SHEET

PROJECT: CCO-24-2954
LOCATION: 280 Beechwood Ave, Ottawa, ON
Client: RMA+SH Architects

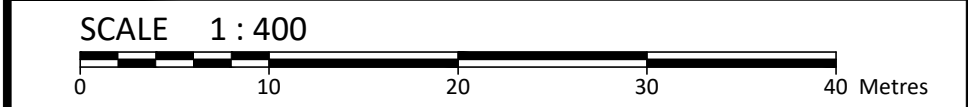
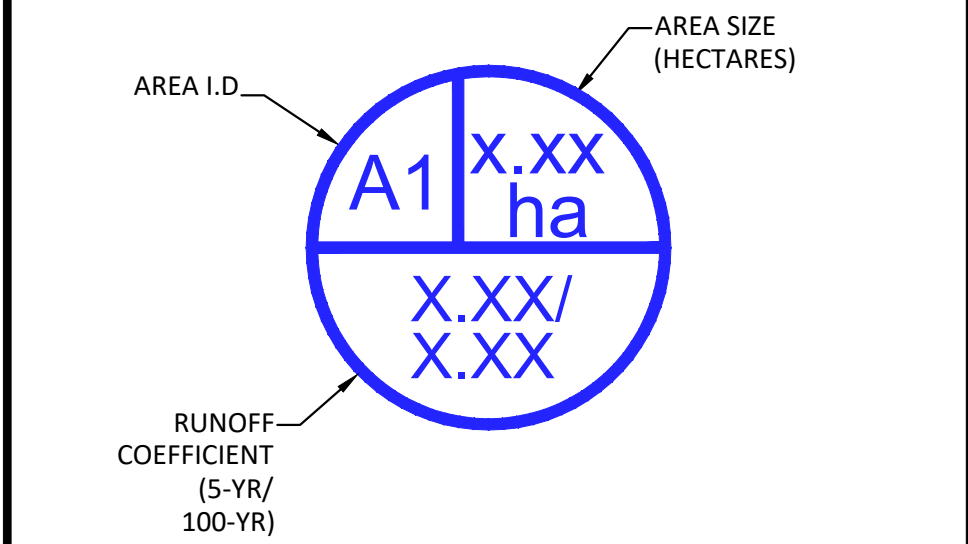
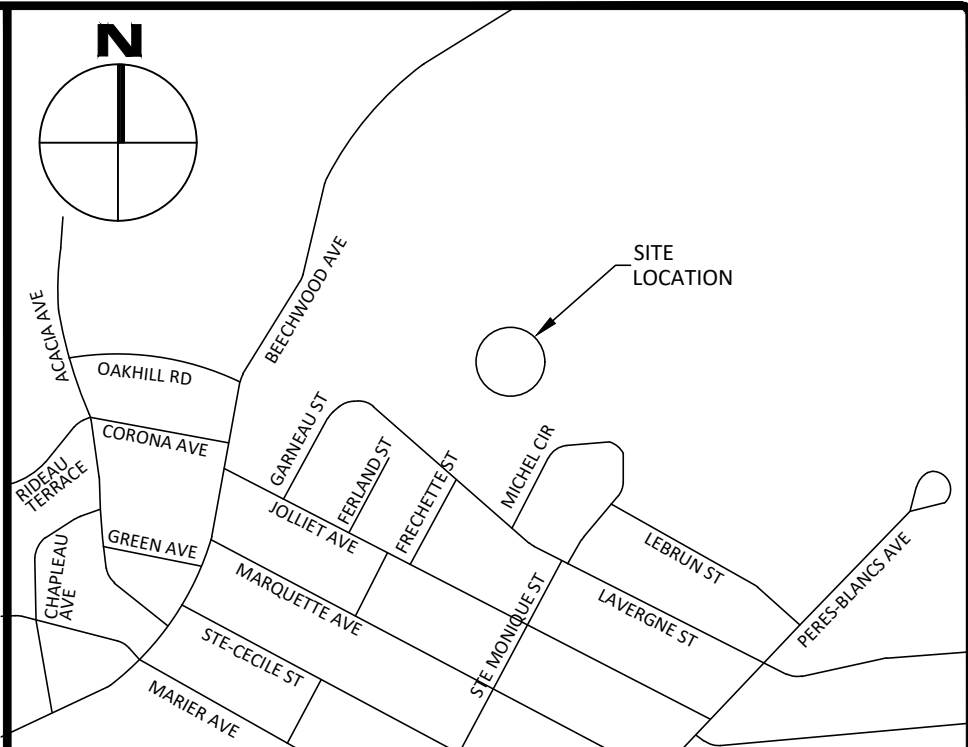
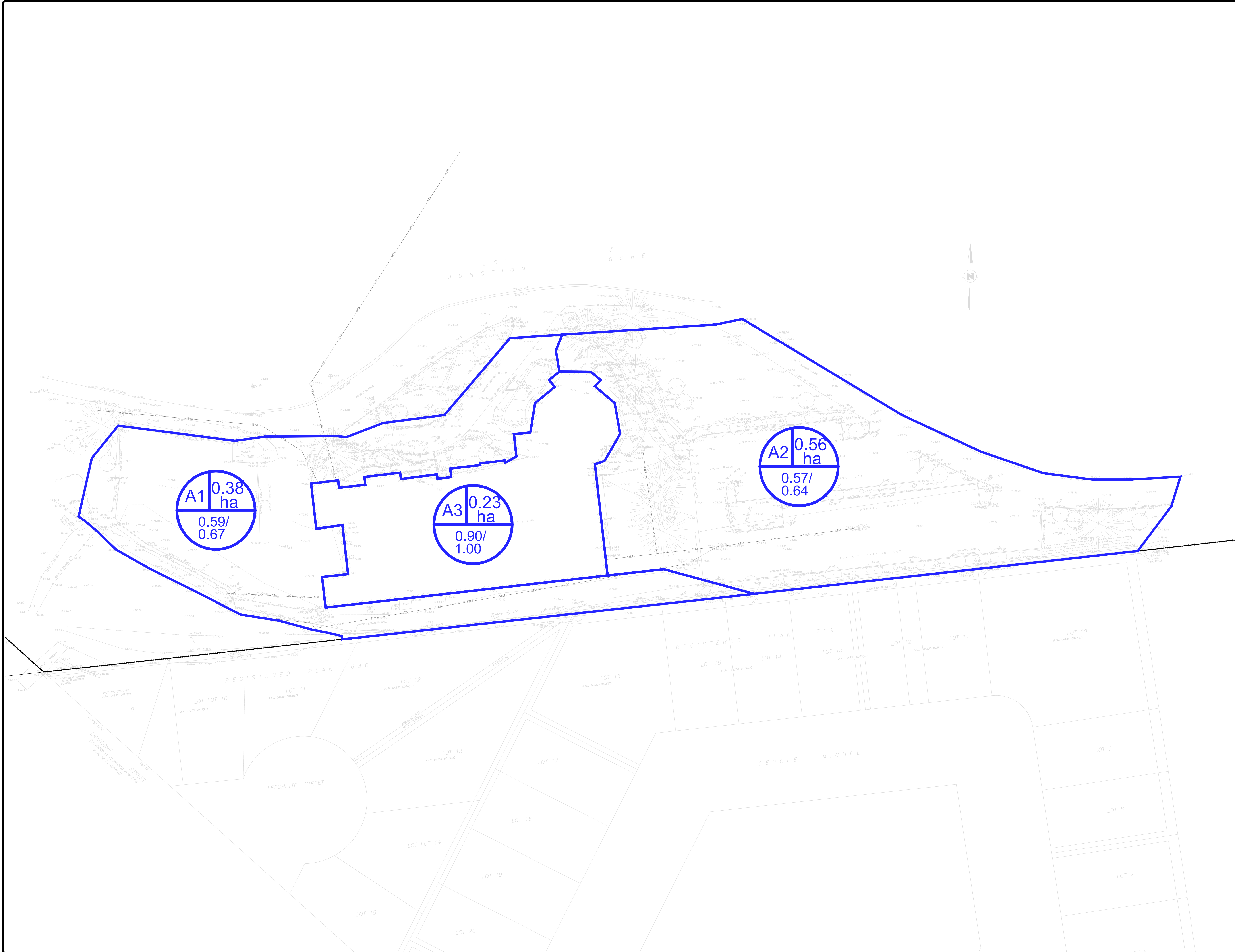


LOCATION				RESIDENTIAL								ICI AREAS								INFILTRATION ALLOWANCE			FLOW		SEWER DATA											
1		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
STREET		FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (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	3-Bed	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								IND	CUM	L/s	(%)	L/s	(%)		
N/A		BLDG	EX. MH						0	0	3.80	0.00		0.00	0.28	0.28		0.00	0.14	1.17	1.17	0.39	0.52	34.22	23.45	200	1.00	1.055	33.69	98.47						
Design Parameters: Residential 1-Bed1.4p/p/u2-Bed2.1p/p/u3-Bed3.1p/p/uAPT2.3p/p/uOther60p/p/u ICI Areas INST28,000L/Ha/dayCOM28,000L/Ha/dayIND35,000L/Ha/day Peak Factor1.5				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: JR Checked: RP Project No.: CCO-24-2954								No.	Revision										Date					
																				1.	ISSUED FOR SITE PLAN CONTROL										2026.08.21					

APPENDIX D

PRE-DEVELOPMENT DRAINAGE PLAN

FILENAME: (\\Ottawa\\01 Project - Proposals\\2024\\01\\CCO-24-2954\\RMA+SH\\Beechwood Cemetery Expansion_280 Beechwood Avenue\\13 - Drawings\\CCO-24-2954 - Design.dwg
LAST SAVED: Tuesday, August 25, 2026 1:05:10 PM
LAST PRINTED: Tuesday, August 25, 2026 1:05:10 PM
DRAWN BY: J. RIVINGTON
CHECKED BY: J. RIVINGTON
DESIGNED BY: J. RIVINGTON
DATE: 2026-08-25 1:05:10 PM
SCALE: 1:400
PROJECT: 280 BEECHWOOD AVENUE
SHEET: 13 OF 13
CITY OF OTTAWA



1	ISSUED FOR SITE PLAN CONTROL	AUG 21, 2026

No.	Revision/Issue	Date

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



750 PALLADIUM DRIVE, SUITE 310, KANATA, ON K2V1C7
Tel: 613-836-2184 Fax: 613-836-3742

	Stamp:
	

Client:
RMA+SH ARCHITECTS
216 PRETORIA AVE

Project:
280 BEECHWOOD AVENUE
BEECHWOOD CEMETERY EXPANSION

OTTAWA ONTARIO

Drawing Title:
PRE-DEVELOPMENT DRAINAGE PLAN

Scale: 1:400	Project Number: CCO-24-2954
Drawn by: JR	
Checked By: RP	Drawing Number:
Designed By: RP	PRE

APPENDIX E

POST-DEVELOPMENT DRAINAGE PLAN

APPENDIX F

STORMWATER MANAGEMENT CALCULATIONS

CO-24-2954 - Beechwood Expansion - SWM Calculations

1 of 6

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	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	2,115	0	1,680	0.59	0.59	0.67
A2	2,917	0	2,666	0.57	0.57	0.64
A3	2,295	0	1	0.90	0.90	1.00

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	0.38	0.59	0.59	0.67	10	47.64	64.87	125.84	*WEST PARKING UNCONTROLLED
A2	0.56	0.57	0.57	0.64	10	67.19	91.49	177.88	*EAST PARKING CONTROLLED
A3	0.23	0.90	0.90	1.00	10	43.94	59.83	113.93	*EXISTING ROOF
Total	1.17					158.76	216.19	417.65	

Post-Development Runoff Coefficient

Drainage Area	Impervious	Gravel	Pervious Area	Average C	Average C	Average C
B1	1,973	0	1,672	0.58	0.58	0.66
B2	3,242	0	1,986	0.63	0.63	0.72
B3	843	0	0	0.90	0.90	1.00
B4	2,065	0	0	0.95	0.95	1.00

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	0.36	0.58	0.58	0.66	10	44.88	61.12	118.69	*WEST PARKING
B2	0.52	0.63	0.63	0.72	10	70.51	96.02	185.58	*EAST PARKING
B3	0.08	0.90	0.90	1.00	10	16.14	21.98	41.85	*ADDITION ROOFS
B4	0.20	0.95	0.95	1.00	10	39.53	53.83	97.05	*EXISTING ROOF
Total	1.17					171.07	232.95	443.16	

Required Restricted Flow

Drainage Area	Area (ha)	Q (L/s) 2-Year	Q (L/s) 5-Year	Q (L/s) 100-Year
A1	0.38	47.64	64.87	125.84
A2	0.56	67.19	91.49	177.88
A3	0.23	43.94	59.83	113.93
Total	1.17	158.76	216.19	417.65

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow			Restricted Flow			Storage Required (m ³)			Storage Provided (m ³)		
	2-year	5-year	100-Year	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year
B1	44.88	61.12	118.69	44.88	61.12	118.69						
B2	70.51	96.02	185.58	70.51	96.02	185.58						
B3	16.14	21.98	41.85	3.84	4.80	9.60	8.40	12.1	22.2	12.6	15.8	31.6
B4	39.53	53.83	97.05	39.53	53.83	97.05						
Total	171.07	232.95	443.16	158.77	215.77	410.91	8.40	12.07	22.23	12.65	15.81	31.61

CO-24-2954 - Beechwood Expansion - SWM Calculations

Storage Requirements for Area B2

3 of 6

2-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	76.0	16.03	3.84	12.19	7.31
15	61.0	12.87	3.84	9.03	8.12
20	51.4	10.84	3.84	7.00	8.40
25	44.5	9.39	3.84	5.55	8.32
30	39.5	8.33	3.84	4.49	8.08

Maximum Storage Required 2-year = 8 m³

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	21.98	4.80	17.18	10.31
15	83.6	17.63	4.80	12.83	11.55
20	70.3	14.83	4.80	10.03	12.03
25	60.9	12.84	4.80	8.04	12.07
30	53.9	11.37	4.80	6.57	11.82

Maximum Storage Required 5-year = 12 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	41.86	9.60	32.26	19.35
15	142.9	33.49	9.60	23.89	21.50
20	120.0	28.12	9.60	18.52	22.23
25	103.8	24.33	9.60	14.73	22.09
30	91.9	21.54	9.60	11.94	21.49
35	82.6	19.36	9.60	9.76	20.49
40	75.1	17.60	9.60	8.00	19.20
45	69.1	16.19	9.60	6.59	17.80
50	64.0	15.00	9.60	5.40	16.20
55	59.6	13.97	9.60	4.37	14.41

Maximum Storage Required 100-year = 22 m³

2-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	632.25	0.020	12.65

Storage Available (m³) = 12.65

Storage Required (m³) = 8.40

5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	632.25	0.025	15.81

Storage Available (m³) = 15.81

Storage Required (m³) = 12.07

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m ³)
Roof	632.25	0.050	31.61

Storage Available (m³) = 31.61

Storage Required (m³) = 22.23

*Area is 75% of the total roof area

CO-24-2954 - Beechwood Expansion - SWM Calculations

4 of 6

Roof Drain Flow (B2)

Roof Drains Summary			
Type of Control Device	Watts Drainage - Accutrol Weir		
Number of Roof Drains	16		
	2-Year	5-Year	100-Year
Rooftop Storage (m ³)	12.65	15.81	31.61
Storage Depth (m)	0.020	0.025	0.050
Flow (Per Roof Drain) (L/s)	0.24	0.30	0.60
Total Flow (L/s)	3.84	4.80	9.60

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 = $(1 \times 0.30 \text{ L/s}) = 0.30 \text{ L/s}$

1 roof drain during a 100 year storm

elevation of water = 50mm

Flow leaving 1 roof drain = $(1 \times 0.60 \text{ L/s}) = 0.60 \text{ L/s}$

4 roof drains during a 5 year storm

elevation of water = 25mm

Flow leaving 4 roof drains = $(4 \times 0.30 \text{ L/s}) = 1.20 \text{ L/s}$

4 roof drains during a 100 year storm

elevation of water = 50mm

Flow leaving 4 roof drains = $(4 \times 0.60 \text{ L/s}) = 2.40 \text{ L/s}$

Roof Drain Flow		
Flow (l/s)	Storage Depth (mm)	Drains Flow (l/s)
0.18	15	2.88
0.24	20	3.84
0.30	25	4.80
0.36	30	5.76
0.42	35	6.72
0.48	40	7.68
0.54	45	8.64
0.60	50	9.60
0.66	55	10.56
0.72	60	11.52
0.78	65	12.48
0.84	70	13.44
0.90	75	14.40
0.96	80	15.36
1.02	85	16.32
1.08	90	17.28
1.14	95	18.24
1.20	100	19.20
1.26	105	20.16
1.32	110	21.12
1.38	115	22.08
1.44	120	23.04
1.50	125	24.00
1.56	130	24.96
1.62	135	25.92
1.68	140	26.88
1.74	145	27.84
1.80	150	28.80

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

CO-24-2954 - Beechwood Expansion - SWM Calculations

6 of 6

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	112	3.30	12	10

Therefore, a Tc of 10 can be used

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

c = Balanced Runoff Coefficient

L = Length of drainage area

S = Average slope of watershed

STORM SEWER DESIGN SHEET

PROJECT:CCO-24-2954

LOCATION:280 Beechwood Ave, Ottawa, ON

CLIENT:RMA+SH Architects

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)	(%)
	B2	EX. CBMH	MH1	0.63	0.52	0.33	0.33	10.00	0.01	10.01	104.19	122.14	178.56	95.40	111.84	163.49		95.40	139.06	1.60	300			1.90	1.906	43.65	31.39%
	B2	MH1	LSCB1	0.90	0.04	0.04	0.37	10.01	0.85	10.86	104.12	122.05	178.43	105.76	123.97	181.23	9.60	105.00	160.17	49.80	450			0.29	0.976	55.17	34.44%

APPENDIX G

CITY OF OTTAWA DESIGN CHECKLIST

4. Development Servicing Study Checklist

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

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

4.1 General Content

Criteria	Location (if applicable)
☐ 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.	N/A
☐ 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 Storm Sewer Design
☐ 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 defensible design criteria.	1.1 Purpose 1.2 Site Description 6.0 Storm Sewer Design
☐ 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).	N/A
☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐ Proposed phasing of the development, if applicable.	N/A
☐ Reference to geotechnical studies and recommendations concerning servicing.	N/A
☐ All preliminary and formal site plan submissions should have the following information: - o Metric scale - o North arrow (including construction North) - o Key plan - o Name and contact information of applicant and property owner - o Property limits including bearings and dimensions - o Existing and proposed structures and parking areas - o Easements, road widening and rights-of-way - o Adjacent street names	N/A

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 Proposed Water Servicing

☐ 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 feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☐ 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 Servicing

☐ 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 5.2 Proposed Sanitary Servicing
☐ 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 Servicing
☐ 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 Storm Sewer Servicing & 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 Storm Sewer Servicing & 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 Storm Sewer Servicing & 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 Storm Sewer Servicing & 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 (C101)
☐ 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.	Appendix G, Section 7.0 Proposed Stormwater Management
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Storm Sewer Servicing & 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 Storm Sewer Servicing & 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 Storm Sewer Servicing & 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