

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES 5872, 5880, 5884 HAZELDEAN ROAD AND 7 SAVAGE DRIVE



Project No.: CCO-25-3864

City File No.:

Prepared for:

Hazeldean Heights Inc.

5872, 5880, 5884 Hazeldean Road and 7 Savage Drive

Prepared by:

Egis Canada

115 Walgreen Road

Carp, ON K0A 1L0

July 11, 2025

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	PRE-CONSULTATION SUMMARY	4
4.0	WATER SERVICING	5
4.1	Existing Watermain	5
4.1.1	Hazeldean Road	5
4.1.2	Savage Drive	5
4.2	Proposed Water Servicing	5
5.0	SANITARY SERVICING	8
5.1	Existing Sanitary Sewer	8
5.2	Proposed Sanitary Sewer	8
6.0	STORM SEWER & STORMWATER MANAGEMENT DESIGN	10
6.1	Existing Storm Sewers	10
6.1.1	Hazeldean Road	10
6.1.2	Savage Drive	10
6.2	Proposed Storm Sewers	10
7.0	STORMWATER MANAGEMENT	11
7.1	Design Criteria and Methodology	11
7.2	Runoff Calculations	11

7.3	Site Drainage	12
8.0	SUMMARY	13
9.0	RECOMMENDATIONS	14
10.0	STATEMENT OF LIMITATIONS	15

List of Tables

Table 1: Water Supply Design Criteria and Water Demands	6
Table 2: Boundary Conditions Results	6
Table 3: Fire Protection Confirmation	7
Table 4: Sanitary Design Criteria	8
Table 5: Summary of Estimated Sanitary Flow	9
Table 6: Pre-Development Runoff Summary	12
Table 7: Post Development Flow Rate and Storage Requirements	13

Appendices

Appendix A: Site Location Plan

Appendix B: Background Documents

Appendix C: Watermain Calculations

Appendix D: Sanitary Calculations

Appendix E: Stormwater Management Calculations

Appendix F: City of Ottawa Design Checklist

1.0 PROJECT DESCRIPTION

1.1 Purpose

Egis has been retained by Hazeldean Heights Inc. to prepare this Assessment of Adequacy of Public Services Report in support of the Zoning By-law Amendment (ZBLA) application process for the contemplated development at 5872, 5880, 5884 Hazeldean Road and 7 Savage Drive, within the City of Ottawa.

The main purpose of this report is to demonstrate that the proposed servicing and stormwater management design for the development follows the recommendations and guidelines provided by the City of Ottawa (City), the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address access to water, sanitary and storm servicing for the site, ensuring that existing services will adequately service the proposed development.

1.2 Site Description

Figure 1: Site Map



The subject property, herein referred to as the site, is located at 5872, 5880, 5884 Hazeldean Road and 7 Savage Drive in Stittsville in the City of Ottawa. The site covers approximately 0.59 ha and is located at the southeast corner of the Hazeldean Road and Savage Drive intersection. Additional details are included on the Site Location Plan included in Appendix B.

1.3 Proposed Development and Statistics

The contemplated development consists of a three residential building including a 4-storey building (Building C), a 19-storey residential tower (Building A), and a 25-storey residential tower (Building B). The Site Plan proposes 456 residential units, and 248 parking spaces, which are all underground. The site access will be from Hazeldean Road. Refer to the Site Plan prepared by Figurr Architects Collective in Appendix B for further details.

1.4 Existing Conditions and Infrastructure

The site was previously occupied by a single-family residential dwelling as well as a car dealership. Currently, the site is developed and has existing services which will require removals/abandonment.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

- Hazeldean Road
 - 305 mm diameter PVC watermain;
 - 762mm diameter Steel watermain;
 - 450mm diameter concrete sanitary sewer;
 - 350 mm diameter asbestos sanitary sewer; and a
 - 2400 mm diameter concrete storm sewer.
- Savage Drive
 - 203 mm diameter ductile iron watermain; and a
 - 450 mm diameter asbestos cement sanitary sewer which is a tributary to the Hazeldean Pump Station ;

1.5 Approvals

The contemplated development is subject to the City of Ottawa zoning by-law amendment approval process.

To allow construction to proceed, the proposed development will be subsequently subject to the City of Ottawa site plan control approval process. Site plan control requires the City to review, provided concurrence and approve the engineering design package. Permits to construct can be requested once the City has issued a site plan agreement.

An Environmental Compliance Approval (ECA) through the Ministry of Environment, Conservation and Parks (MECP) is not anticipated to be required for the development. The stormwater management system is anticipated to meet the exemption requirements under O.Reg. 525/90 since the development is located within a single parcel, to be amalgamated through site plan, is not tributary to a combined sewer system, and does not propose industrial usage.

2.0 BACKGROUND STUDIES, STANDARDS, AND REFERENCES

2.1 Background Reports / Reference Information

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

2.2 Applicable Guidelines and Standards

City of Ottawa:

- ◆ Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. (Ottawa Sewer Guidelines)
 - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014. (ISTB-2014-01)
 - Technical Bulletin PIEDTB-2016-01 City of Ottawa, September 2016. (PIEDTB-2016-01)
 - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018. (ISTB-2018-01)
 - Technical Bulletin ISTB-2018-04 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, 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)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on September 27th, 2024, regarding the contemplated development at 5872, 5880, 5884 Hazeldean Road and 7 Savage Drive. Specific design parameters to be incorporated within this design include the following.

- All Site Servicing and SWM design shall meet the design criteria set in Phase 1 Feedback form dated October 8, 2024.
- Post-development to be restricted to 5 year pre-development flows. The pre-development runoff coefficient will be limited to 0.5 unless sufficient backup is provided. Times of concentration will be calculated and limited to 10 minutes.
- Overland flow is to be provided for runoff of storm events greater than a 100 year storm.
- Confirm boundary conditions with City of Ottawa staff.
- Confirm sanitary capacity with City of Ottawa staff.

The notes from the City of Ottawa pre-consultation can be found in Appendix B.

4.0 WATER SERVICING

4.1 Existing Watermain

The subject site is located within the 3W pressure zone, as shown by the Water Distribution figure located in Appendix C. The following subsections outline the water infrastructure that exists within Hazeldean Road and Savage Road.

4.1.1 Hazeldean Road

There is an existing 305 mm diameter PVC watermain within Hazeldean Road. In addition, there is an existing fire hydrant on the northwest corner of the site at the Hazeldean Road and Savage Drive intersection.

4.1.2 Savage Drive

There is an existing 203 mm diameter ductile iron watermain within Savage Drive. In addition, there is an existing fire hydrant southeast of the proposed development on the south side of Savage Drive.

4.2 Proposed Water Servicing

In accordance with Section 4.3.1 of the Ottawa Water Guidelines, service areas with a basic day demand greater than 50 m³/day require a dual connection to the municipal system. A dual connection will be required to service the contemplated development, based on the site statistics provided by the Site Plan. It is anticipated that the dual connection will be to Savage Drive.

The Fire Underwriters Survey 2020 (FUS) method was utilized to estimate the required fire flow for the site. Fire flow requirements were calculated per City of Ottawa Technical Bulletin ISTB-2018-02. The following parameters were provided by the building architect:

- Type of construction – Non-Combustible Construction
- Occupancy type – Limited Combustibility
- Sprinkler Protection – Standard Water Supply Sprinklered

The results of the calculations yielded a required fire flow of 15,000 L/min (250.0 L/s). The detailed calculations for the FUS can be found in Appendix C.

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

Table 1: Water Supply Design Criteria and Water Demands

Site Area	0.59 ha
Residential	280 L/day/person
Studio Apartment (20 units)	1.4 persons/unit
1 Bedroom Apartment (274 units)	1.4 persons/unit
2 Bedroom Apartment (162 units)	2.1 persons/unit
Average Day Demand (L/s)	2.44 L/s
Maximum Daily Demand (L/s)	6.09 L/s
Peak Hourly Demand (L/s)	13.53 L/s
FUS Fire Flow Requirement (L/s)	250.0 L/s (15,000 L/min)

The City provided the estimated water pressures for the average day scenario, peak hour scenario and the max day plus fire flow scenario for the demands indicated by the correspondence in Appendix C. The resulting pressures for the boundary conditions results are shown in Tables 2 and 3, below. Boundary conditions have been provided for the current pressure zone (3W).

Table 2: Boundary Conditions Results

Scenario	Connection 1 – Hazeldean Road		Connection 2 – Savage Drive	
	Estimated Demands (L/s)	HGL (m H ₂ O)*/kPa	Estimated Demands (L/s)	HGL (m H ₂ O)**/kPa
Average Day Demand	2.44	55.2 / 541.2	2.44	53.2 / 521.6
Maximum Daily + Fire Flow Demand	6.09	50.4 / 494.1	6.09	42.7 / 418.6
Peak Hourly Demand	13.53	50.4 / 494.1	13.53	48.4 / 474.5
*Adjusted for an estimated ground elevation of 106.0m above the connection point.				
**Adjusted for an estimated ground elevation of 108.0m above the connection point.				

The normal operating pressure range for the current zone is anticipated to be 418.6 kPa to 541.25 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi). The watermain will meet the minimum required 20 psi (140 kPa) from the Ottawa Water Guidelines at the ground level under maximum day demand and fire flow conditions.

To confirm the adequacy of fire flow to protect the proposed development, public and private fire hydrants within 150 m of the proposed building were accounted for per ISTB 2018-03 Appendix I Table 1. The results are summarized below in Table 4.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min.)
1034 McGarry Terrace	15,000 L/min – FUS	2 public	1 public	15,200

Based on City guidelines (ISTB-2018-02), it is anticipated that the existing municipal hydrants can provide adequate fire coverage to the contemplated development. A hydrant coverage figure can be found in Appendix C.

5.0 SANITARY SERVICING

5.1 Existing Sanitary Sewer

There is an existing 450 mm diameter concrete sanitary sewer within Hazeldean Road and an existing 450 mm diameter asbestos cement sanitary sewer within Savage Drive available to service the site. The Hazeldean sewer is tributary to the pumping station located on Maple Grove Road. The Savage Drive sewer is tributary to the Hazeldean Pumping Station.

5.2 Proposed Sanitary Sewer

Table 5, below, summarizes the wastewater design criteria identified by the Ottawa Sewer Guidelines.

Table 4: Sanitary Design Criteria

Design Parameter	Value
Studio Apartment (83 units)	1.4 persons/unit
Residential 1 Bedroom / Bachelor Apartment (250 Units)	1.4 persons/unit
Residential 2 Bedroom Apartment (247 Units)	2.1 persons/unit
Average Daily Demand	280 L/day/person

It is anticipated that the sanitary lateral will be connected to Savage Drive, however coordination will be required with the internal building layout and mechanical design during site plan control.

Table 6, below, summarizes the estimated wastewater flow from the contemplated development. Refer to Appendix D for detailed calculations.

Table 5: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/s)
Total Estimated Average Dry Weather Flow	2.47
Total Estimated Peak Dry Weather Flow	8.07
Total Estimated Peak Wet Weather Flow	8.24

City staff were contacted on July 8th, 2025, to review contemplated wastewater flows from the site and advise if there were any downstream constraints. At the time of this submission, the City has yet to provide a response confirming the flow capacity of the subject sewers.

6.0 STORM SEWER & STORM WATER MANAGEMENT DESIGN

6.1 Existing Storm Sewers

Stormwater runoff from the site is currently tributary to the Ottawa River through Poole Creek and the Carp River. The following subsections outline the storm infrastructure that exists within Hazeldean Road and Savage Drive.

6.1.1 Hazeldean Road

There is an existing 375 mm diameter PVC storm sewer located within Hazeldean Road. The storm sewer slopes to the north and discharges to an existing larger 1050 mm diameter storm sewer within Hazeldean Road.

6.1.2 Savage Drive

There are existing road side ditches within Savage Drive which appear to outlet to the existing 2400mm diameter concrete storm sewer within Hazeldean Road.

6.2 Proposed Storm Sewers

It is anticipated that runoff will be directed to the existing 375 mm diameter storm sewer within Hazeldean Road at a restricted rate. The release rates will be such that the 100year post-development runoff events discharge at the 5 year pre-development rates.

It is anticipated that a combination of surface, subsurface, rooftop, and internal cistern storage will be required to meet the SWM criteria identified by the City of Ottawa. Further details on the storm sewer design to be provided for the Site Plan Control application.

7.0 STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

Stormwater management for the site will be maintained through positive drainage away from the contemplated building and towards the adjacent ROWs. The quantitative and qualitative properties of the storm runoff for both the pre-development 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 as directed by the RVCA and City:

Quality Control

- Quality control to be provided by an OGS unit for proposed development.

Quantity Control

- 100 year post-development to be restricted to 5 year predevelopment flows, based on a calculated runoff coefficient (the lesser of either the calculated pre-development rational method coefficient or 0.50). Time of concentration must be equal to or greater than 10 minutes.

7.2 Runoff Calculations

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

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

Where: C = Runoff coefficient

I = Rainfall intensity in mm/hr (City of Ottawa IDF curves)

A = Drainage area in hectares

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any stormwater management facility sized using this method is anticipated 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 Ottawa Sewer Guidelines, the 2 or 5-year balanced 'C' value must be increased by 25% for a 100-year storm event to a maximum of 1.0.

7.3 Site Drainage

Based on the criteria listed in Section 7.1, the contemplated development will be required to restrict flows for the 100 year post-development quantities to the 5 year pre-development runoff quantities.

It has been assumed that the existing development contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 5, and 100-year events are summarized below in Table 7.

Table 6: Pre-Development Runoff Summary

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.59	0.50	0.50	10	84.90	145.50
Total	0.59				84.90	145.50

The restriction of stormwater runoff from the site will create the need for on-site storage. To meet the stormwater objectives, the contemplated development may contain a combination of flow attenuation including surface and subsurface storage as well as building storage via an internal cistern and rooftops.

The following storage requirement estimate assumes the flow will be restricted to 84.9 L/s/ha up to the 100-year storm event. The estimated post-development peak flows for the 5 and 100-year events and the required storage volumes are summarized below in Table 8, below.

Table 7: Post Development Flow Rate and Storage Requirements

Drainage Area	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m ³)	
	5-year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	26.27	50.01	10.00	15.00	10.0	22.5
B2	25.30	48.17	10.00	15.00	9.3	21.2
B3	15.25	29.03	10.00	15.00	3.1	8.4
B4	60.78	116.11	10.00	15.00	38.6	81.3
B5	4.35	9.32	4.35	9.32	--	--
Total	131.94	252.65	44.35	69.32	60.98	133.44

It is anticipated that approximately 133m³ of storage will be required on site to attenuate flow to the established release rate of 69.32 L/s. Flow and storage calculations can be found within Appendix E. Actual storage volumes will need to be confirmed at the detailed design stage based on a number of factors including site imperviousness and grading constraints.

8.0 SUMMARY

- Development including a four-storey residential building, a 19-storey residential tower, and a 25-storey residential tower are contemplated at 3872, 3880, 3884 Hazeldean Road and 7 Savage Drive;
- The FUS method estimated a maximum fire flow of 15,000 L/min is required for the contemplated development;
- The development is anticipated to have a peak wet weather flow of 8.24 L/s. City to provide a response to confirm the sewer capacities to accommodate the anticipated sanitary flows;
- Based on the feedback phase 1 notes, the proposed development will be required to attenuate post development flows to an equivalent release rate of the 5 year pre-development release rate;
- To meet the stormwater objectives the contemplated development may contain a combination of flow attenuation including surface and subsurface storage as well as building storage via an internal cistern and rooftops. It is anticipated that approximately 133 m³ of onsite storage will be required to attenuate flow to the established release rate.
- Quality controls are to be proposed for the development via an OGS unit in the detailed design phase.

9.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that City of Ottawa approve this Assessment of Adequacy of Public Services in support of the proposed rezoning for 3872, 3880, 3884 Hazeldean Road and 7 Savage Drive.

This report is respectfully being submitted for approval.

Regards,

Egis Canada Ltd.



Mitchell Raper, P.Eng.
Engineering Intern , Land Development
T: 613.315.5098
E: mitch.raper@egis-group.com



Robert D. Freel, P.Eng.
Senior Project Manager, Land Development
T: 613.714.6174
E: Robert.freel@egis-group.com

U:\Infrastructure\2025\CCO-25-3864 Fotenn-5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive-Civil\03 - Servicing\Report

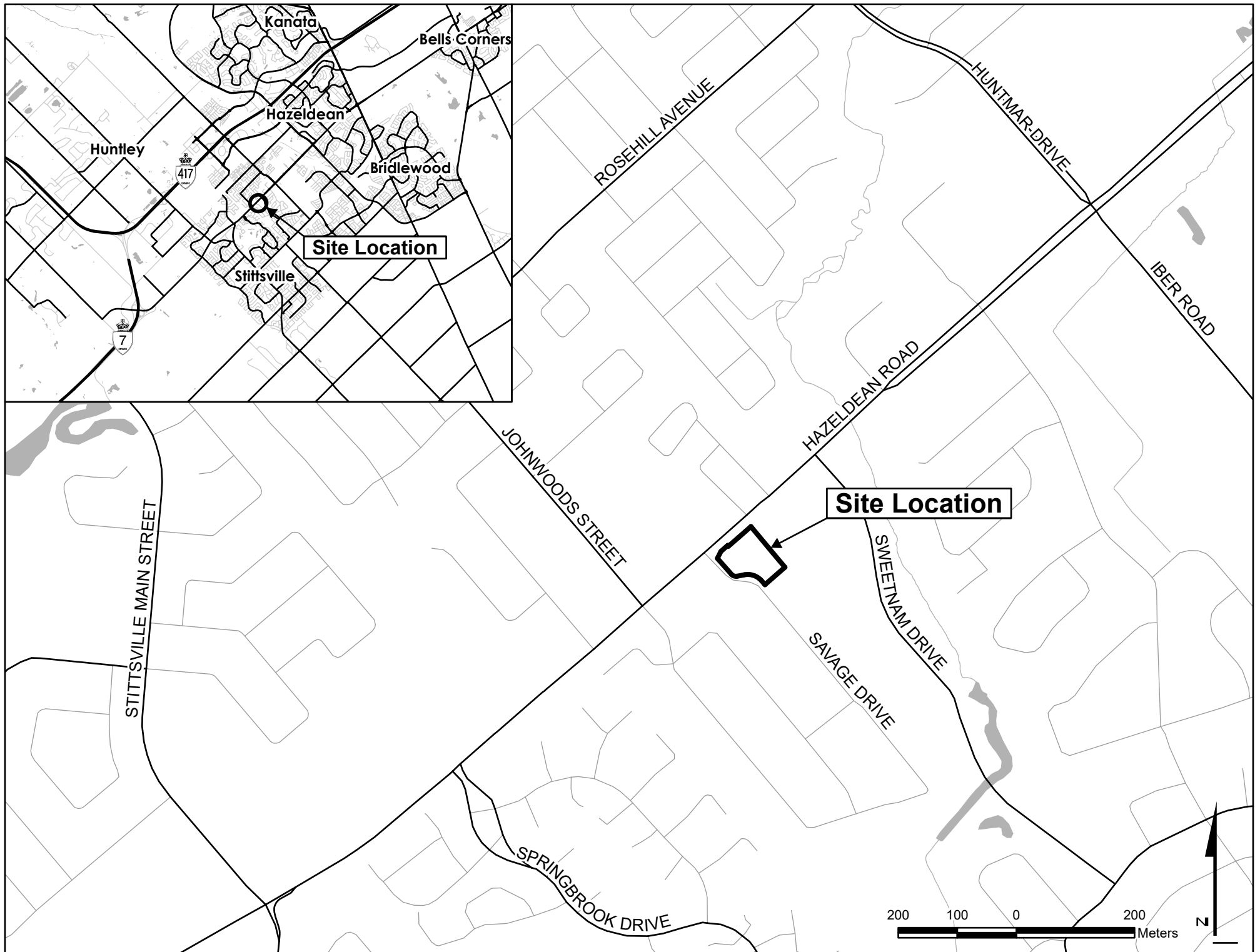
10.0 STATEMENT OF LIMITATIONS

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

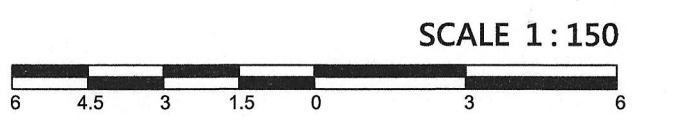
Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. Egis Canada accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this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



APPENDIX B BACKGROUND DOCUMENTS



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

SURVEYOR'S CERTIFICATE

- I CERTIFY THAT:
- THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEY ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
 - THE SURVEY WAS COMPLETED ON THE 18TH DAY OF NOVEMBER, 2024.

DATE: Nov 20, 2024
J.E. ANDERSON
ONTARIO LAND SURVEYOR

LEGEND

- LEGEND
- | SYMBOL | DESCRIPTION |
|--------|-------------------------------------|
| ■ | FOUND SURVEY MONUMENT |
| □ | PLANTED SURVEY MONUMENT |
| ○ | IRON BAR |
| ○ | STANDARD IRON BAR |
| ○ | SHORT STANDARD IRON BAR |
| ○ | PLASTIC BAR |
| ○ | ROUND IRON BAR |
| ○ | WITNESS |
| ○ | ACCEPTED |
| ○ | MEASURED |
| ○ | MONUMENT-URSO SURVEYING LTD. |
| ○ | REGISTERED PLAN 701 |
| ○ | PLAN 4R - 2754 |
| ○ | 1230 PLAN DATED OCTOBER 27, 2007 |
| ○ | PLAN 4R - 2657 |
| ○ | PLAN 4R - 1841 |
| ○ | PLAN 4R - 2657 |
| ○ | 1870 SURVEY DATED FEBRUARY 18, 2005 |
| ○ | BOUNDARY |
| ○ | MEASURED |
| ○ | CHAR LINE FENCE |
| ○ | EDGE OF INTERLOCK |
| ○ | EDGE OF CONCRETE |
| ○ | EDGE OF ASPHALT |
| ○ | TOP OF PIPE |
| ○ | TOP OF GRADE |
| ○ | ETCH CENTERLINE |
| ○ | TOP OF SLOPE |
| ○ | WOODEN RETAINING WALL |
| ○ | TRANSFORMER |
| ○ | CORRUGATED STEEL PIPE |
| ○ | AIR CONDITIONER |
| ○ | CATCH BASIN |
| ○ | GATE |
| ○ | GAS METER |
| ○ | SOIL |
| ○ | WATER VALVE |
| ○ | UTILITY POLE |
| ○ | ANCHOR |
| ○ | DIAMETER |
| ○ | BOUNDARY |
| ○ | CATCH BASIN |
| ○ | DITCH INLET |
| ○ | FIRE HYDRANT |
| ○ | HAND HOLE |
| ○ | LIGHT STANDARD |
| ○ | MAINTENANCE HOLE - UNIDENTIFIED |
| ○ | MAINTENANCE HOLE - SANITARY |
| ○ | MAINTENANCE HOLE - STORMWATER |
| ○ | UNKNOWN UTILITY FOOTING |
| ○ | WELL |
| ○ | OVERHEAD WIRE |
| ○ | DISCREET TREE |
| ○ | CONIFEROUS TREE |
| ○ | EXISTING ELEVATIONS |
| ○ | TOP OF WALL ELEVATIONS |

BEARING NOTES

BEARINGS ARE IN MAGNETIC GRID, DERIVED FROM CAN-NET OBSERVATIONS AND ARE REFERRED TO THE CENTRAL MERIDIAN T-20° WEST LONGITUDE OF N.T.M. ZONE 9 NAD83 (CORS) 2011.

FOR BEARING COMPARISONS A ROTATION OF 0°27'12" COUNTER CLOCKWISE WAS APPLIED TO T-20° AND ADJUSTED TO 0°27'12" COUNTER CLOCKWISE WAS APPLIED TO T-20° TO CONVERT TO GRID BEARINGS.

UTILITY NOTE

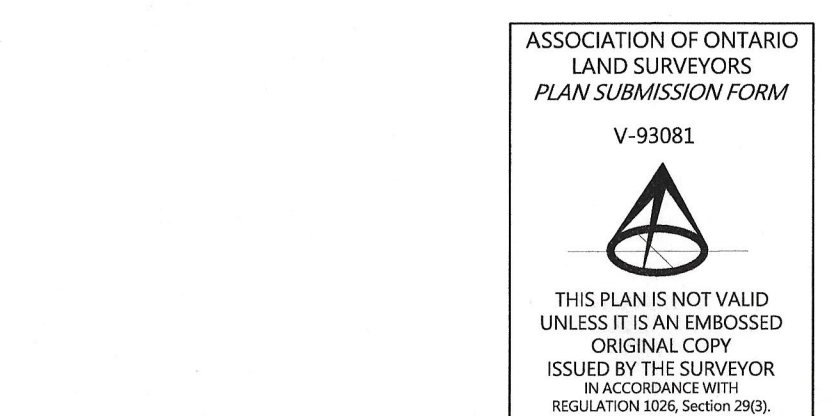
THIS SURVEY DOES NOT SERVE AS A COMPREHENSIVE CONFIRMATION OF ALL UTILITIES PRESENT. IT IS THE USER'S RESPONSIBILITY TO CONTACT THE RELEVANT UTILITY AUTHORITIES FOR VERIFICATION.

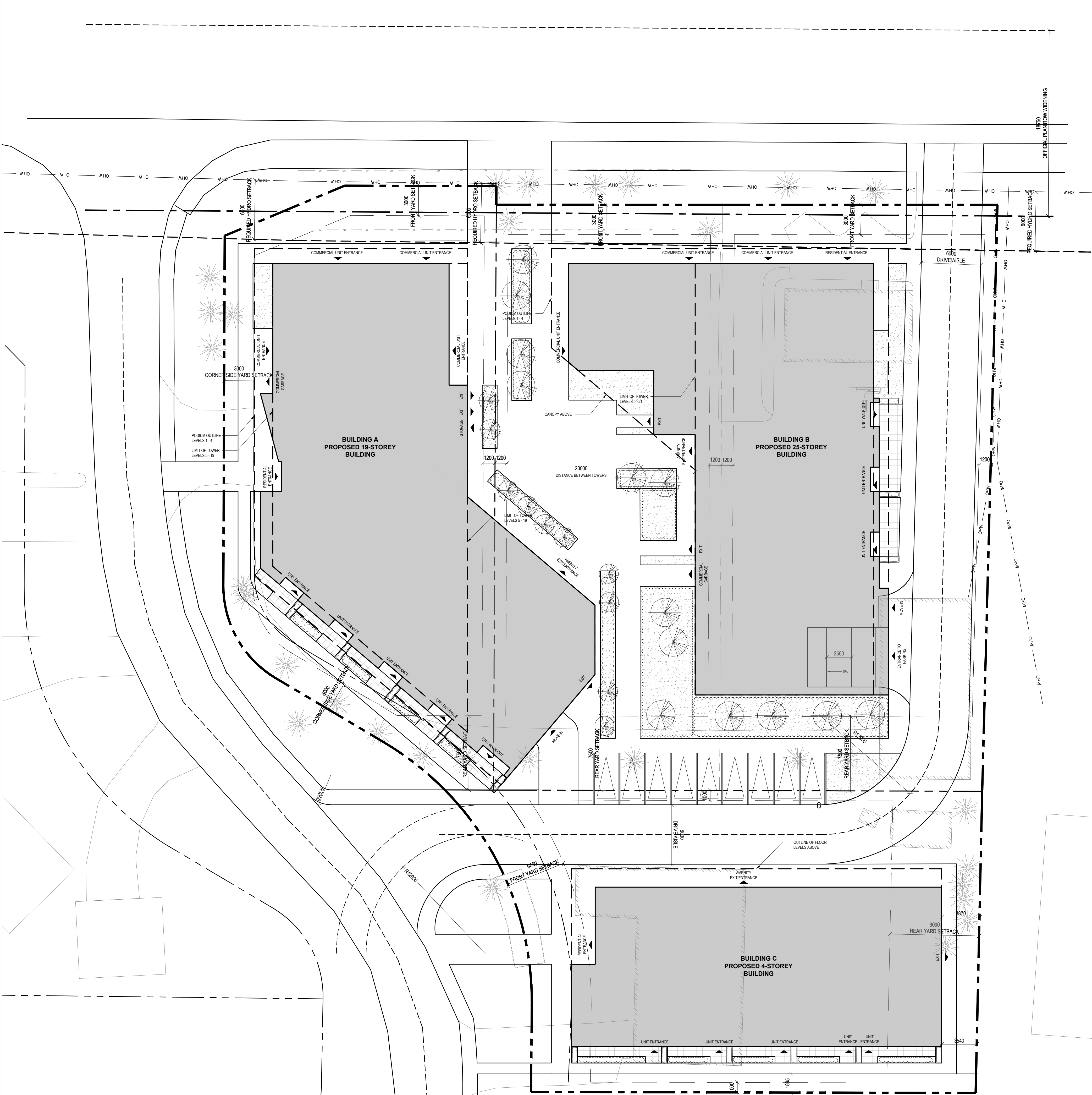
ONLY UTILITIES VISIBLE ON THE SURFACE HAVE BEEN IDENTIFIED. PRIOR TO ANY ACTIVITIES SUCH AS DIGGING, IT IS MANDATORY TO OBTAIN A FIELD LOCATION OF UNDERGROUND UTILITIES FROM THE APPROPRIATE AUTHORITY.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND REFERRED TO THE CANADIAN GEODETIC DATUM 1984 (CGD84) BY DIRECT MEASUREMENT TO A REAL TIME NETWORK.

THE USER OF THIS INFORMATION BEARS THE RESPONSIBILITY TO CONFIRM THAT THE JOB BENCHMARK REMAINS UNALTERED AND UNDISTURBED, AND THAT ITS RELATIVE HEIGHT AND DESCRIPTION ALONG WITH THE DETAILS PRESENTED IN THIS PLAN.





PROPERTY DESCRIPTION

REZONE DEVELOPMENT PROJECT

CITY OF OTTAWA PIN NUMBER

MUNICIPAL ADDRESS

SITE INFORMATION

TOTAL SITE AREA: 5405 m²

0462-0719, 0462-0733, 0462-0481 & 0462-0484

5872, 5880, 5884 HAZELDEAN ROAD & 7 SAVAGE DRIVE

SITE & ZONING	5872, 5880, 5884 HAZELDEAN ROAD	7 SAVAGE DRIVE	
ZONING TABLE	GM14 H(11)	R1D	
CITY OF OTTAWA ZONING BY-LAW No. 2008-250	REQUIRED	REQUIRED	PROPOSED
MINIMUM LOT AREA	no minimum	20m	
MINIMUM LOT WIDTH	no minimum	600m²	
MINIMUM FRONT YARD AND CORNER SIDE YARD SETBACK	3m	FY = 6m CSY = 4.5m	
HYDRO SETBACK	6m	6m	
MINIMUM INTERIOR SIDE YARD SETBACK	1.2m	1m	
MINIMUM REAR YARD SETBACK	7.5m	9m	
MAXIMUM BUILDING HEIGHT	11m	11m (AREA C)	
MAXIMUM LOT COVERAGE		40 %	
MINIMUM WIDTH OF LANDSCAPED AREA	3m, ABUTTING STREET		
VEHICLE PARKING REQUIREMENTS (AREA C, SCHEDULE 1A)	1.2 PER UNIT = 456 SPOTS	1.2 PER UNIT = 456 SPOTS	239 SPOTS BELOW GRADE 9 SURFACE PARKING = 248 TOTAL
BICYCLE PARKING SPACES	0.5 PER UNIT = 228 SPACES		319 SPACES

UNIT COUNT

BUILDING A = 174 UNITS

BUILDING B = 247 UNITS

BUILDING C = 35 UNITS

TOTAL = 456 UNITS

Ingénieur / Engineer
(Mécanique & Électrique / Mechanical & Electrical)

Ingénieur / Engineer
(Structure / Structure)

Architecte / Architect
(paysagiste / Landscaping)

Ingénieur / Engineer
(Civile / Civil)

Client / Client

Architecte / Architect
Collectif architectes / Architects Collective
fig. 1
3500, Saint-Antoine O.
Montréal QC H4C 1A8
T. 514 881-9122
fig. 2
190 Somerset St W #206
Ottawa ON K2P 0A4
T. 613 695-6122
www.figur.ca
Droit d'auteur / Copyright
Ce dessin est sujet au droit d'auteur. Il ne peut être reproduit pour quelques intentions ou usages que ce soit, si ce n'est avec l'autorisation écrite et immédiate de la signature et de l'estampe originale.
This drawing is subject to copyright, it is not to be reproduced for any purpose or by any means, and may only be used if it bears an original stamp and signature.
Scalé / Seal
Note:
L'entrepreneur doit vérifier toutes les dimensions et informations sur le site et avant immédiatement signaler toute erreur ou omission à l'architecte.
Contractor shall verify all information and dimensions on site and immediately report any errors or omissions to the architect.
Projet / Project
2428 - HAZELDEAN ROAD REZONE
5872, 5880, 5884 HAZELDEAN ROAD & 7 SAVAGE DRIVE
Titre / Title
SITE PLAN
Dessiné par / Drawn by
KJ
No. sheet / Project number
2428
Vérifié par / Verified by
RC
No. dessin / Drawing number
Revision / Revision
Échelle / Scale
1:200
Date de création du dessin / Drawing creation date
08/19/2024

A000

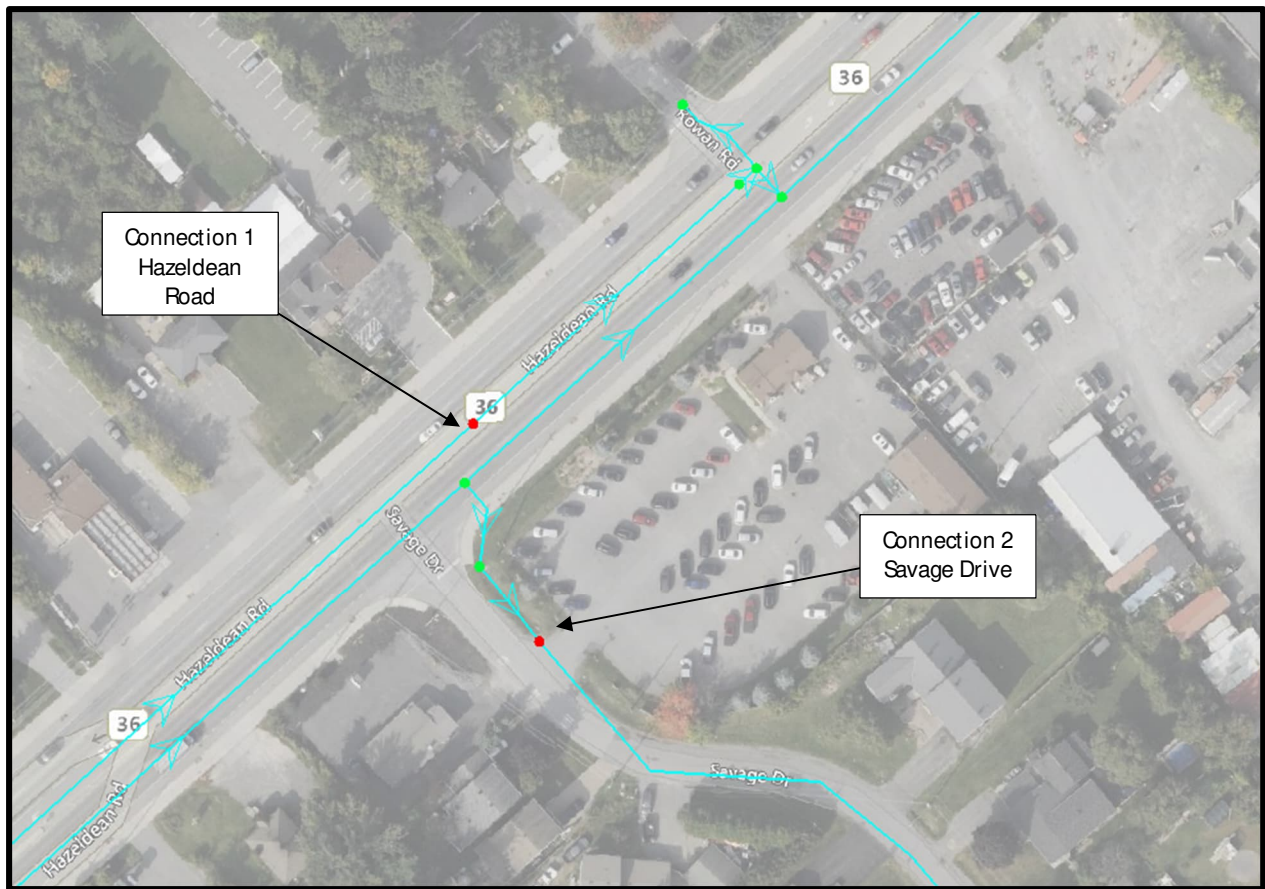
APPENDIX C WATERMAIN CALCULATIONS

Boundary Conditions 5872 Hazeldean Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	146	2.44
Maximum Daily Demand	365	6.09
Peak Hour	812	13.53
Fire Flow Demand #1	13,000	216.67

Location



Results

Connection 1 – Hazeldean Road

Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	161.2	73.0
Peak Hour	156.4	66.2
Max Day plus Fire Flow #1	156.4	66.2

¹ Ground Elevation = 109.8 m

Connection 2 – Savage Drive

Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	161.2	72.4
Maximum HGL	156.4	65.6
Max Day plus Fire Flow #1	150.7	57.4

¹ Ground Elevation = 110.3 m

Notes

1. The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

000-25-3864 - 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive

Project:	5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive
Project No.:	000-25-3864
Designed By:	MR
Checked By:	RF
Date:	July 11, 2025
Site Area:	0.59 gross ha

Residential	NUMBER OF UNITS	UNIT RATE	
Studio Apartment	20 units	1.4	persons/unit
1 Bedroom Apartment	274 units	1.4	persons/unit
2 Bedroom Apartment	162 units	2.1	persons/unit

Total Population 752 persons

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	2.44 L/s
	Commercial/ Industrial/ Institutional	0.00 L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.5 x avg. day	L/c/d
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d
MAXIMUM DAILY DEMAND	Residential	6.09 L/s
	Commercial/ Industrial/ Institutional	0.00 L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	2.2 x max. day	L/c/d
Industrial	1.8 x max. day	L/gross ha/d
Commercial	1.8 x max. day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	13.53 L/s
	Commercial/ Industrial/ Institutional	0.00 L/s

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

AVERAGE DAILY DEMAND	2.44	L/s
MAXIMUM DAILY DEMAND	6.09	L/s
MAXIMUM HOUR DEMAND	13.53	L/s

5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building A

Project:	5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building A
Project No.:	CCO-25-3864
Designed By:	MR
Checked By:	RF
Date:	July 11, 2025

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

Water Supply for Fire-Fighting - Building A

Building is classified as Group : C- Residential (from table 3.2.2.55)
 Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with subsections 3.2.2., including loadbearing walls, columns and arches

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

$$(a) Q = K \times V \times S_{tot}$$

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

S_{tot} = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

$$S_{tot} = 1.0 + [S_{side1} + S_{side2} + S_{side3} + \dots \text{etc.}]$$

K	10	(from Table 1 pg A-31)
V	70,980	(Total building volume in m ³ , provided by Architect.)
S_{tot}	1.0	(From figure 1 pg A-32)
Q =	709,800.00 L	

			From Figure 1 (A-32)
Snorth	40 m	0.0	
Seast	11 m	0.0	
Ssouth	15 m	0.0	
Swest	25 m	0.0	

* approximate distances

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

9,000 L/min
 2378 gpm
 150 L/s

if Q > 270,000 L

5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building B

Project:	5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building B
Project No.:	CCO-25-3864
Designed By:	MR
Checked By:	RF
Date:	July 11, 2025

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

Water Supply for Fire-Fighting - Building B

Building is classified as Group : C- Residential (from table 3.2.2.55)
 Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with subsections 3.2.2., including loadbearing walls, columns and arches

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

$$(a) Q = K \times V \times S_{tot}$$

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

S_{tot} = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

$$S_{tot} = 1.0 + [S_{side1} + S_{side2} + S_{side3} + \dots \text{etc.}]$$

K	10	(from Table 1 pg A-31)
V	87,048	(Total building volume in m ³ , provided by Architect.)
S_{tot}	1.0	(From figure 1 pg A-32)
Q =	870,480.00 L	

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

9,000 L/min
 2378 gpm
 150 L/s

if Q > 270,000 L

			From Figure 1 (A-32)
Snorth	30 m	0.0	
Seast	15 m	0.0	
Ssouth	20 m	0.0	
Swest	11 m	0.0	

* approximate distances

5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building C

Project:	5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building C
Project No.:	CCO-25-3864
Designed By:	MR
Checked By:	RF
Date:	July 11, 2025

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

Water Supply for Fire-Fighting - Building C

Building is classified as Group : C- Residential (from table 3.2.2.55)
 Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

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

$$(a) Q = K \times V \times S_{tot}$$

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

S_{tot} = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

$$S_{tot} = 1.0 + [S_{side1} + S_{side2} + S_{side3} + \dots \text{etc.}]$$

K	10	(from Table 1 pg A-31)
V	6,384	(Total building volume in m ³ .)
S_{tot}	1.4	(From figure 1 pg A-32)
Q =	89,376.00 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	15 m	0.0	
Seast	6 m	0.4	
Ssouth	10 m	0.0	
Swest	25 m	0.0	

* approximate distances

000-25-3864 - 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building A - Fire Underwriters Survey - Apartment Building

Project: 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building A
 Project No.: 000-25-3864
 Designed By: MR
 Checked By: PF
 Date: July 11, 2025

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 vA Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type Non-Combustible Construction

C 0.8

Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area) 15,692.7 m² * Unprotected Vertical Openings

Calculated Fire Flow	22,047.6 L/min
	22,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:
 Limited Combustible -15%

Fire Flow	18,700.0 L/min
-----------	----------------

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered -40%

Reduction	-7,480.0 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	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	14	25	350.0	6%	East
Exposure 2	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	10	4	40.0	4%	South
Exposure 3	Over 30 m	Wood frame	NA	2	NA	0%	West
Exposure 4	Over 30 m	Wood frame	NA	3	NA	0%	North
% Increase*						10%	

Increase*	1,870.0 L/min
-----------	---------------

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

Fire Flow	13,090.0 L/min
Fire Flow Required**	13,000.0 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

000-25-3864 - 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building B - Fire Underwriters Survey - Apartment Building

Project: 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building B
 Project No.: 000-25-3864
 Designed By: MR
 Checked By: PF
 Date: July 11, 2025

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 vA Where: F = Required fire flow in liters per minute
 C = Coefficient related to the type of construction.
 A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

Construction Type Non-Combustible Construction

C 0.8

Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area) 20,015.5 m² * Unprotected Vertical Openings

Calculated Fire Flow 24,899.8 L/min
 25,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:
 Limited Combustible -15%

Fire Flow 21,250.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered -40%

Reduction -8,500.0 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	Wood frame	N/A	1	N/A	0%	North
Exposure 2	20.1 to 30	Wood frame	20	2	40.0	2%	East
Exposure 3	20.1 to 30	Fire Resistive - Non Combustible (Unprotected Openings)	35	4	140.0	2%	South
Exposure 4	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	14.0	19	266.0	6%	West
% Increase*						10%	

Increase* 2,125.0 L/min

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

Fire Flow 14,875.0 L/min
 Fire Flow Required** 15,000.0 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

000-25-3864 - 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building C- Fire Underwriters Survey - Apartment Building

Project: 5872, 5880 & 5884 Hazeldean Road and 7 Savage Drive Building C
 Project No.: 000-25-3864
 Designed By: MR
 Checked By: RF
 Date: July 11, 2025

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 vA Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

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

Construction Type Non-Combustible Construction

C

0.8

Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area) 2,599.3 m²

* Unprotected Vertical Openings

Calculated Fire Flow

8,973.1 L/min

9,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible

-15%

Fire Flow

7,650.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered

-40%

Reduction

-3,060.0 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	20.1 to 30	Fire Resistive - Non Combustible (Unprotected Openings)	20	25	500.0	2%	North
Exposure 2	Over 30 m	Ordinary - Mass Timber (Unprotected)	N/A	1	N/A	0%	East
Exposure 3	20.1 to 30	Fire Resistive - Non Combustible (Unprotected Openings)	25.4	2	50.8	1%	South
Exposure 4	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	16.5	3	49.5	5%	West
						% Increase*	8%

Increase*

612.0 L/min

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

Fire Flow

5,202.0 L/min

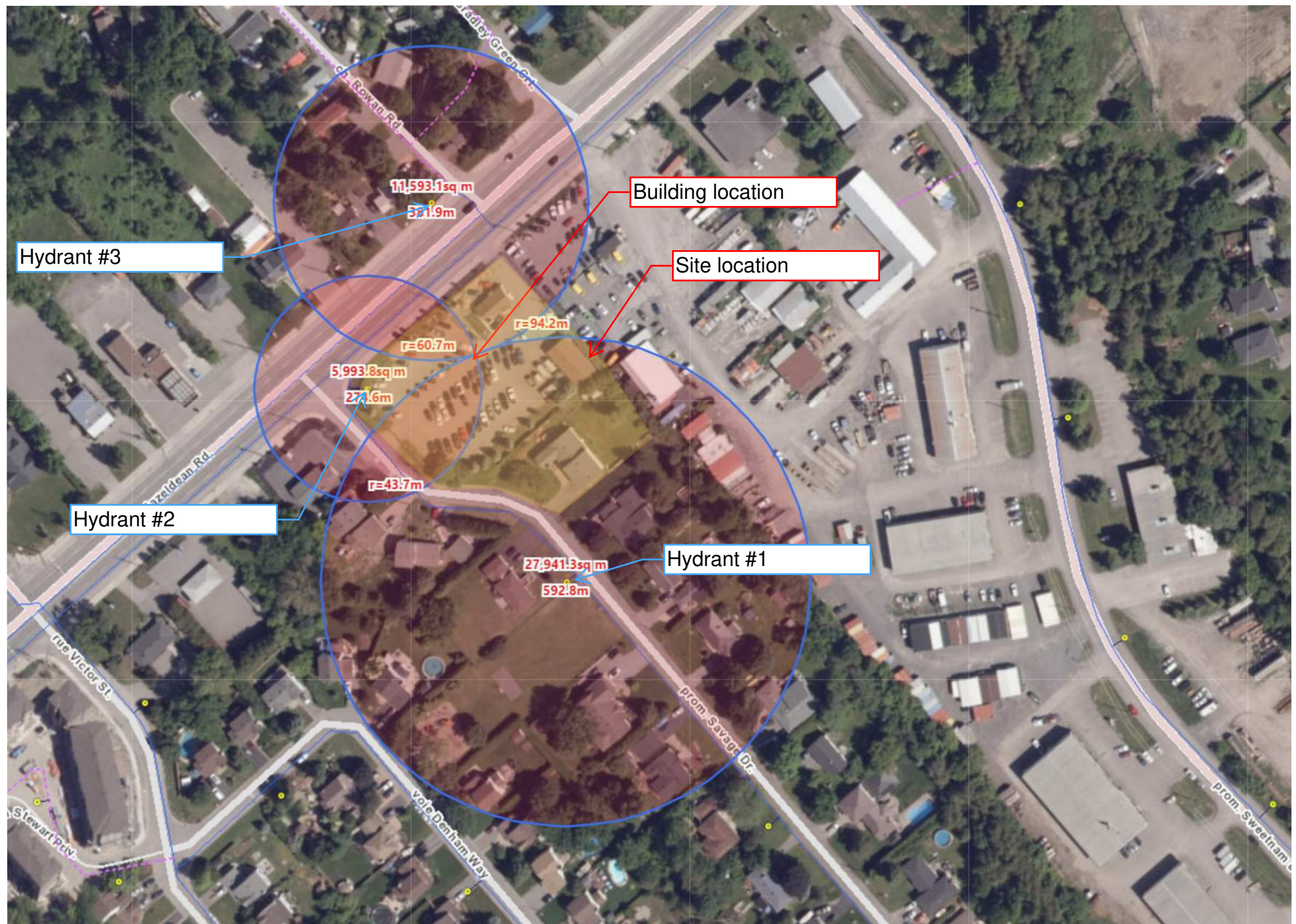
Fire Flow Required**

5,000.0 L/min

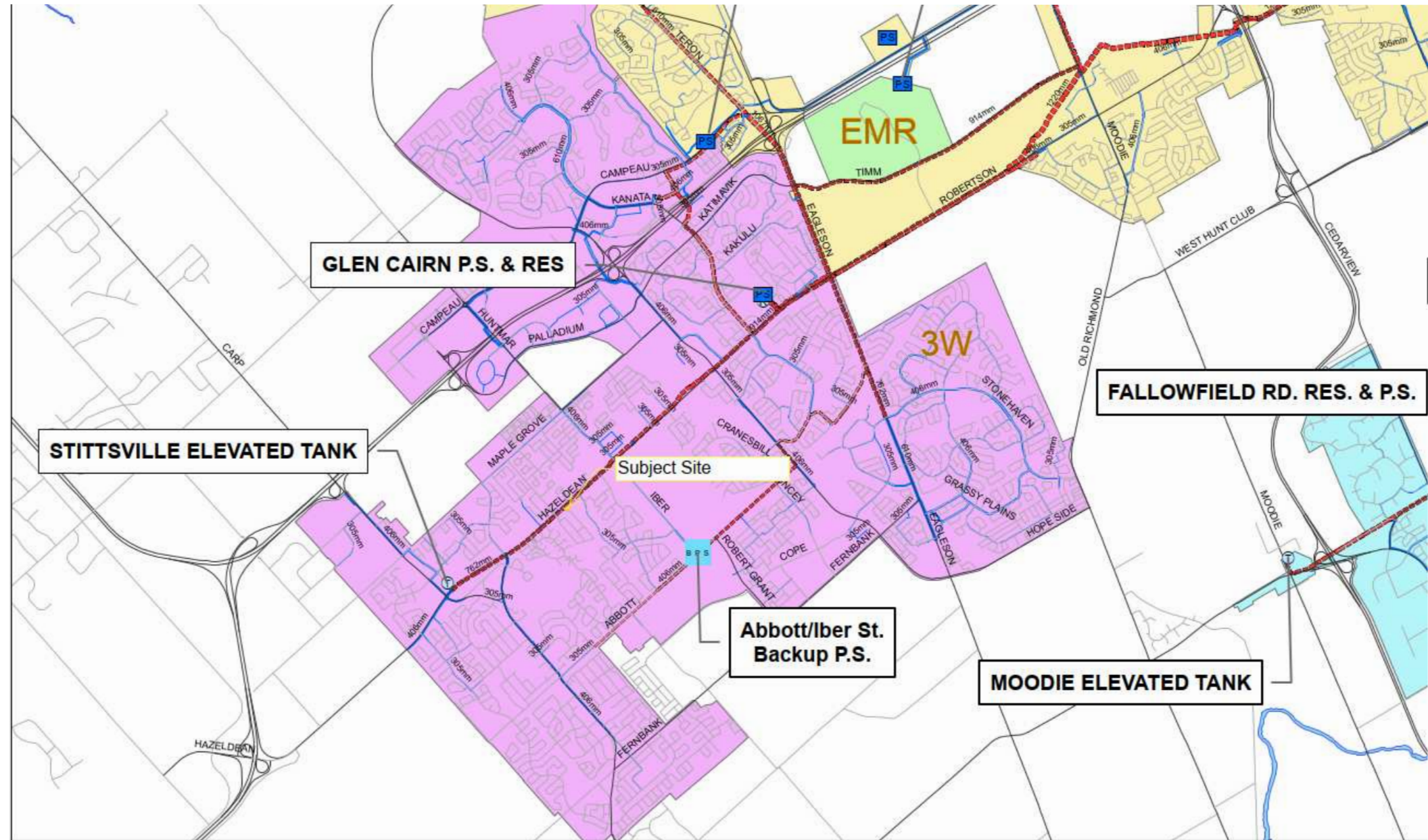
* In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%

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

3872, 3880, 3884 Hazeldean Road 7 Savage Drive - Hydrant Distance Figure



3872, 3880, 3884 Hazeldean Road & 7 Savage Drive - City of Ottawa
Pressure Zone Mapping Site Figure



APPENDIX D SANITARY CALCULATIONS



000-25-3864 - 3872, 3880, 3884 Hazeldean Road & 7 Savage Drive - Sanitary Demands

Project:	3872, 3880, 3884 Hazeldean Road & 7 Savage Drive		
Project No.:	000-25-3864		
Designed By:	FV		
Checked By:	RF		
Date:	Jul-25		
Site Area	0.59	Gross ha	
Studio	20	1.40	Persons per unit
1 Bedroom	274	1.40	Persons per unit
2 Bedroom	162	2.10	Persons per unit
3 Bedroom	0	3.10	Persons per unit
Total Population	752	Persons	
Commercial/ Amenity	0	m ²	

DESIGN PARAMETERS

Institutional/ Commercial Peaking Factor	1.0	
Residential Peaking Factor	3.30	* 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

EXTRANEOUSFLOW ALLOWANCES

Infiltration / Inflow	Flow (L/ s)
Dry	0.03
Wet	0.16
Total	0.19

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/ s)
Residential	280	L/ c/ d	752	2.44
Industrial - Light**	35,000	L/ gross ha/ d		0
Industrial - Heavy**	55,000	L/ gross ha/ d		0
Commercial / Amenity	2,800	L/ (1000m ² / d)	0.00	0.00
Hospital	900	L/ (bed/ day)		0
Schools	70	L/ (Student/ d)		0
Trailer Parks no Hook-Ups	340	L/ (space/ d)		0
Trailer Park with Hook-Ups	800	L/ (space/ d)		0
Campgrounds	225	L/ (campsite/ d)		0
Mobile Home Parks	1,000	L/ (Space/ d)		0
Motels	150	L/ (bed-space/ d)		0
Hotels	225	L/ (bed-space/ d)		0
Office	75	L/ 7.0m ² / d		0
Tourist Commercial	28,000	L/ gross ha/ d		0
Other Commercial	28,000	L/ gross ha/ d		0

AVERAGE RESIDENTIAL FLOW	2.44	L/ s
PEAK RESIDENTIAL FLOW	8.04	L/ s
AVERAGE IQ FLOW	0.00	L/ s
PEAK INSTITUTIONAL/ COMMERCIAL FLOW	0.00	L/ s
PEAK INDUSTRIAL FLOW	0.00	L/ s
TOTAL PEAK IQ FLOW	0.00	L/ s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	2.47	L/ s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	8.07	L/ s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	8.24	L/ s

APPENDIX E STORMWATER MANAGEMENT CALCULATIONS

Tc (min)	Intensity (mm/hr)		
	5-Year	100-Year	
20	70.3	120.0	PRE-DEVELOPMENT
10	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 (5-year)	Average C (100-year)
A1	3,963	0	1,899	0.67	0.76

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.59	0.50	0.50	10	84.90	145.50
Total	0.59				84.90	145.50

* Runoff coefficient limited to 0.5 per preconsult feedback form - phase 1 dated October 8, 2024

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m ²)	Gravel (m ²)	Pervious Area (m ²)	Average C (5-year)	Average C (100-year)	
B1	1,008	0	0	0.90	1.00	Building A
B2	970	0	0	0.90	1.00	Building B
B3	585	0	0	0.90	1.00	Building C
B4	2,269	0	279	0.82	0.92	
B5	0	0	751	0.20	0.25	

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
B1	0.10	0.90	1.00	10	26.27	50.01
B2	0.10	0.90	1.00	10	25.30	48.17
B3	0.06	0.90	1.00	10	15.25	29.03
B4	0.25	0.82	0.92	10	60.78	116.11
B5	0.08	0.20	0.25	10	4.35	9.32
Total	0.59				131.94	252.65

Required Restricted Flow for areas B1 -B4

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.59	0.50	0.50	10	84.90	145.50

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m ³)	
	5-year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	26.27	50.01	10.00	15.00	10.0	22.5
B2	25.30	48.17	10.00	15.00	9.3	21.2
B3	15.25	29.03	10.00	15.00	3.1	8.4
B4	60.78	116.11	10.00	15.00	38.6	81.3
B5	4.35	9.32	4.35	9.32	--	--
Total	131.94	252.65	44.35	69.32	60.98	133.44

Storage Requirements for Area B1

2 of 5

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	26.27	10.00	16.27	9.76
15	83.6	21.07	10.00	11.07	9.97
20	70.3	17.72	10.00	7.72	9.27
25	60.9	15.35	10.00	5.35	8.03
30	53.9	13.59	10.00	3.59	6.46
35	48.5	12.23	10.00	2.23	4.68
40	44.2	11.14	10.00	1.14	2.74
45	40.6	10.23	10.00	0.23	0.63
50	37.7	9.50	10.00	-0.50	-1.49
55	35.1	8.85	10.00	-1.15	-3.80
60	32.9	8.29	10.00	-1.71	-6.14
65	31.0	7.81	10.00	-2.19	-8.52

Maximum Storage Required 5-year = 10 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	50.03	15.00	35.03	21.02
15	142.9	40.03	15.00	25.03	22.52
20	120.0	33.61	15.00	18.61	22.33
25	103.8	29.07	15.00	14.07	21.11
30	91.9	25.74	15.00	10.74	19.33
35	82.6	23.14	15.00	8.14	17.09
40	75.1	21.04	15.00	6.04	14.48
45	69.1	19.35	15.00	4.35	11.76
50	64.0	17.93	15.00	2.93	8.78
55	59.6	16.69	15.00	1.69	5.59
60	55.9	15.66	15.00	0.66	2.37
65	52.6	14.73	15.00	-0.27	-1.04
70	49.8	13.95	15.00	-1.05	-4.41
75	47.3	13.25	15.00	-1.75	-7.88

Maximum Storage Required 100-year = 23 m³

Storage Requirements for Area B1

3 of 5

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	25.30	10.00	15.30	9.18
15	83.6	20.30	10.00	10.30	9.27
20	70.3	17.07	10.00	7.07	8.48
25	60.9	14.79	10.00	4.79	7.18
30	53.9	13.09	10.00	3.09	5.56
35	48.5	11.78	10.00	1.78	3.73
40	44.2	10.73	10.00	0.73	1.76
45	40.6	9.86	10.00	-0.14	-0.39
50	37.7	9.15	10.00	-0.85	-2.54
55	35.1	8.52	10.00	-1.48	-4.88
60	32.9	7.99	10.00	-2.01	-7.24
65	31.0	7.53	10.00	-2.47	-9.65

Maximum Storage Required 5-year = 9 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	48.18	15.00	33.18	19.91
15	142.9	38.55	15.00	23.55	21.19
20	120.0	32.37	15.00	17.37	20.85
25	103.8	28.00	15.00	13.00	19.50
30	91.9	24.79	15.00	9.79	17.62
35	82.6	22.28	15.00	7.28	15.29
40	75.1	20.26	15.00	5.26	12.62
45	69.1	18.64	15.00	3.64	9.83
50	64.0	17.27	15.00	2.27	6.80
55	59.6	16.08	15.00	1.08	3.56
60	55.9	15.08	15.00	0.08	0.29
65	52.6	14.19	15.00	-0.81	-3.16
70	49.8	13.43	15.00	-1.57	-6.58
75	47.3	12.76	15.00	-2.24	-10.08

Maximum Storage Required 100-year = 21 m³

Storage Requirements for Area B1

4 of 5

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	15.25	10.00	5.25	3.15
15	83.6	12.23	10.00	2.23	2.01
20	70.3	10.29	10.00	0.29	0.35
25	60.9	8.91	10.00	-1.09	-1.63
30	53.9	7.89	10.00	-2.11	-3.80
35	48.5	7.10	10.00	-2.90	-6.10
40	44.2	6.47	10.00	-3.53	-8.48
45	40.6	5.94	10.00	-4.06	-10.96
50	37.7	5.52	10.00	-4.48	-13.45
55	35.1	5.14	10.00	-4.86	-16.05
60	32.9	4.81	10.00	-5.19	-18.67
65	31.0	4.54	10.00	-5.46	-21.31

Maximum Storage Required 5-year = 3 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	29.04	15.00	14.04	8.42
15	142.9	23.24	15.00	8.24	7.41
20	120.0	19.51	15.00	4.51	5.41
25	103.8	16.88	15.00	1.88	2.82
30	91.9	14.94	15.00	-0.06	-0.10
35	82.6	13.43	15.00	-1.57	-3.30
40	75.1	12.21	15.00	-2.79	-6.69
45	69.1	11.24	15.00	-3.76	-10.16
50	64.0	10.41	15.00	-4.59	-13.78
55	59.6	9.69	15.00	-5.31	-17.52
60	55.9	9.09	15.00	-5.91	-21.28
65	52.6	8.55	15.00	-6.45	-25.14
70	49.8	8.10	15.00	-6.90	-28.99
75	47.3	7.69	15.00	-7.31	-32.89

Maximum Storage Required 100-year = 8 m³

Storage Requirements for Area B1

5 of 5

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	104.2	60.78	10.00	50.78	30.47
15	83.6	48.76	10.00	38.76	34.89
20	70.3	41.01	10.00	31.01	37.21
25	60.9	35.52	10.00	25.52	38.28
30	53.9	31.44	10.00	21.44	38.59
35	48.5	28.29	10.00	18.29	38.41
40	44.2	25.78	10.00	15.78	37.88
45	40.6	23.68	10.00	13.68	36.94
50	37.7	21.99	10.00	11.99	35.97
55	35.1	20.47	10.00	10.47	34.56
60	32.9	19.19	10.00	9.19	33.09
65	31.0	18.08	10.00	8.08	31.52

Maximum Storage Required 5-year = 39 m³

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m ³)
10	178.6	116.14	15.00	101.14	60.68
15	142.9	92.92	15.00	77.92	70.13
20	120.0	78.03	15.00	63.03	75.64
25	103.8	67.50	15.00	52.50	78.75
30	91.9	59.76	15.00	44.76	80.57
35	82.6	53.71	15.00	38.71	81.30
40	75.1	48.84	15.00	33.84	81.20
45	69.1	44.93	15.00	29.93	80.82
50	64.0	41.62	15.00	26.62	79.85
55	59.6	38.76	15.00	23.76	78.39
60	55.9	36.35	15.00	21.35	76.86
65	52.6	34.20	15.00	19.20	74.90
70	49.8	32.38	15.00	17.38	73.01
75	47.3	30.76	15.00	15.76	70.91

Maximum Storage Required 100-year = 81 m³

APPENDIX H CITY OF OTTAWA DESIGN CHECKLIST

4. Development Servicing Study Checklist

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

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

4.1 General Content

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

<input type="checkbox"/> Identification of existing and proposed infrastructure available in the immediate area.	N/ A
<input type="checkbox"/> Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/ A
<input type="checkbox"/> Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/ A
<input type="checkbox"/> Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/ A
<input type="checkbox"/> Proposed phasing of the development, if applicable.	N/ A
<input type="checkbox"/> Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
<input type="checkbox"/> All preliminary and formal site plan submissions should have the following information: <ul style="list-style-type: none"> 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)
<input type="checkbox"/> Confirm consistency with Master Servicing Study, if available	N/ A
<input type="checkbox"/> Availability of public infrastructure to service proposed development	N/ A
<input type="checkbox"/> Identification of system constraints	N/ A
<input type="checkbox"/> Identify boundary conditions	Appendix C
<input type="checkbox"/> Confirmation of adequate domestic supply and pressure	N/ A
<input type="checkbox"/> Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Appendix C
<input type="checkbox"/> Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/ A
<input type="checkbox"/> Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/ A
<input type="checkbox"/> Address reliability requirements such as appropriate location of shut-off valves	N/ A
<input type="checkbox"/> Check on the necessity of a pressure zone boundary modification.	N/ A
<input type="checkbox"/> Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Appendix C, Section 4.2 Proposed Water Servicing

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

4.3 Development Servicing Report: Wastewater

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

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

4.4 Development Servicing Report: Stormwater Checklist

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

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

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

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

Criteria	Location (if applicable)
<input type="checkbox"/> Clearly stated conclusions and recommendations	Section 8.0 Summary
<input type="checkbox"/> Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	All are stamped
<input type="checkbox"/> All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	All are stamped