ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES 1047 RICHMOND ROAD

Project No.: CCO-22-2242

Prepared for:

Fengate
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July 14, 2023

McINTOSH PERRY

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1.0 PROJECT OVERVIEW

1.1 Purpose

McIntosh Perry (MP) has been retained by Fengate 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 1047 Richmond Road, 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 Rideau Valley Conservation Authority (RVCA), 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 1047 Richmond Road within the Bay Ward in the City of Ottawa. The site covers approximately 1.02 ha and is located at the north east corner of the Richmond Road and New Orchard Avenue North intersection. The site is zoned for Traditional Mainstreet use (TM[2494] H[25]). Additional details are included on the Site Location Plan included in Appendix 'A'.

1.3 Proposed Development and Statistics

The contemplated development consists of three residential buildings ranging from 6 to 40-storeys and park land to be dedicated to the City. The Site Plan proposes 1,152 residential units and 859 m^2 of retail space. Refer to Site Plan prepared by Arcadis and included in Appendix B for further details.

1.4 Existing Conditions and Infrastructure

The site is currently developed as a car dealership with asphalt parking areas. Based on available mapping, the existing building appears to be serviced by the municipal infrastructure within Richmond Road.

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:

- Ambleside Drive
  - 203 mm diameter PVC watermain; and
  - 300 mm diameter concrete storm sewer, tributary to the Ottawa River.
- New Orchard Drive
  - 203/152 mm diameter cast iron watermain;
  - 300 mm diameter concrete sanitary sewer, tributary to the West Nepean Collector; and
  - 675 mm diameter concrete storm Sewer, tributary to the Ottawa River.
- North of 1071 Ambleside Drive
  - 1220 mm diameter concrete feedermain; and
  - 1350 mm diameter concrete sanitary West Nepean Collector sewer.

1.5 Approvals

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

The development will be 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, is not tributary to a combined sewer system, and does not propose industrial usage.

2.0 BACKROUND 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.

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 ISTB-2018-01 City of Ottawa, January 2018. (ISTB-2018-01)
  - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. (ISTB-2018-03)
  - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. (ISTB-2019-01)
  - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (ISTB-2019-02)
- Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (Ottawa Water Guidelines)
  - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (ISD-2010-2)
  - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
  - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (ISTB-2018-02)
  - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. (ISTB-2021-03)
- Stormwater management Design Criteria for the Pinecrest Creek/Westboro Area, City of Ottawa, May 2020. (Pinecrest Creek Study)

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 October 14th, 2021 regarding the contemplated development at 1047 Richmond Road. Specific design parameters to be incorporated within this design include the following.

- RCVA to confirm quality controls requirements.
- Any storm events greater than 5 year, up to 100 year, and including 100-year storm event must be detained on site.
- Post-development to be restricted to the 2-year storm event, based on a calculated time of concentration and 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.
- 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 WATERMAIN

4.1 Existing Watermain

The subject site is located within the 1W pressure zone, as shown by the Water Distribution figure located in Appendix C. The following subsections outline the water infrastructure that exists within Richmond Road and New Orchard Drive.

4.1.1 Richmond Road

There is an existing 203 mm diameter PVC watermain within Richmond Road. Based on City of Ottawa mapping, the existing building is currently serviced by this watermain. In addition, there is an existing fire hydrant fronting the site along Richmond Road.

4.1.2 New Orchard Drive

There is an existing 203 mm diameter PVC watermain within New Orchard Avenue N. Approximately 79 m north of Richmond Road, the municipal system transitions from a 203 mm diameter watermain to a 152 mm diameter watermain. The watermain stops short of the 1220 mm diameter transmission main at the north end of New Orchard Ave N. In addition, there are two existing fire hydrants fronting the site along New Orchard Ave N.

4.2 Proposed Watermain

In accordance with Section 4.3.1 of the Ottawa Water Guidelines, service areas with a basic day demand greater than 50 m^3/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.

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 – Fully Supervised Sprinkler

The results of the calculations yielded a required fire flow of 10,000 L/min (166.7 L/s) for Tower A, 12,000 L/min (200.0 L/s) for Tower B and 7,000 L/min (116.7 L/s) for Building C. 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	1.02 ha
Residential	280 L/day/person
Residential 1 Bedroom & Bachelor Apartment (615 Units)	1.4 person/unit
Residential 2 Bedroom Apartment (519 Units)	2.1 person/unit
Residential 3 Bedroom Apartment (18 Units)	3.1 person/unit
Commercial Space	28,000 L/gross ha/day
Average Day Demand (L/s)	6.58 L/s
Maximum Daily Demand (L/s)	16.38 L/s
Peak Hourly Demand (L/s)	35.98 L/s
Building A - FUS Fire Flow Requirement (L/s)	166.7 L/s (10,000 L/min)
Building B - FUS Fire Flow Requirement (L/s)	200.0 L/s (12,000 L/min)
Building C - FUS Fire Flow Requirement (L/s)	116.7 L/s (7,000 L/min)

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

Table 2: Boundary Condition Results

Scenario	Proposed Demands (L/s)	Connection HGL (m H_2O)* / kPa
Average Day Demand	6.58	51.2 / 502.3
Maximum Daily + Fire Flow Demand	216.38	145.0 L/s available @ 20 PSI
Peak Hourly Demand	35.98	42.2 / 414.0
* Adjusted for an estimated ground elevation of 64.8m above the connection point.		

It is anticipated that the existing municipal water infrastructure will be able to service the development as the normal operating pressure range would be 414 kPa to 502 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi).

Based on boundary conditions provided by the City, the local watermain network is capable of providing 8,700 L/min at the minimum operating pressure of 140 kPa. In accordance with the FUS, the existing watermain network can provide the required fire flow to building C. Buildings A and B however, may require a combination of fire resistive construction methods, fire separations or upgrades to the municipal infrastructure to meet the required fire flow. It is anticipated that one or more of these options will be implemented at the detailed design stage.

The requirement for fire pumps and or booster pumps will be evaluated with the aid of the mechanical consultant at the detailed design stage.

To confirm the adequacy of hydrant coverage 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. As demonstrated by Table 3, below.

Table 3: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min.)
1047 Richmond Road	10,000 L/min – FUS 12,000 L/min – FUS 7,000 L/min – FUS	4 public	1 public	26,600

Based on City guidelines (ISTB-2018-02), it is anticipated that the existing municipal hydrants can provide adequate fire coverage to the contemplated development.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

There is an existing 225 mm diameter sanitary sewer within Richmond Road and an existing 300 mm diameter sanitary sewer within New Orchard Drive available to service the site. Both sanitary sewers are tributary to the same outlet, the West Nepean Collector, at the north end of New Orchard Avenue N.

5.2 Proposed Sanitary Sewer

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

Table 4: Sanitary Design Criteria

Design Parameter	Value
Residential 1 Bedroom / Bachelor Apartment (615 Units)	1.4 persons/unit
Residential 2 Bedroom Apartment (519 Units)	2.1 persons/unit
Residential 3 Bedroom Apartment (18 Units)	3.1 persons/unit
Average Daily Demand	280 L/day/person
Commercial Space	2800 L/(1000m² /day)

It is anticipated that the contemplated development will be serviced by the 300 mm diameter sanitary sewer within New Orchard Drive.

Table 5, 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	6.63
Total Estimated Peak Dry Weather Flow	20.12
Total Estimated Peak Wet Weather Flow	20.41

City staff were contacted on October 15th, 2020 to review contemplated wastewater flows from the site and advise if there were any downstream constraints. City staff confirmed on October 27th, 2020 that there were no concerns with the municipal system based on a contemplated flow of 22.77 L/s. Revised site statistics were received after initial consultation, as demonstrated by Table 5, above.

Correspondence with City Staff is included in Appendix D.

6.0 STORM SEWER & STORMWATER MANAGEMENT DESIGN

6.1 Existing Storm Sewers

Stormwater runoff from the site is currently tributary to the Ottawa River within the Ottawa Central sub-watershed. The following subsections outline the storm infrastructure that exists within New Orchard Avenue N and Richmond Road.

6.1.1 New Orchard Avenue N

There is an existing 675 mm diameter storm sewer located within New Orchard Drive. The storm sewer slopes to the north and discharges directly into the Ottawa river approximately 300 m downstream.

6.1.2 Richmond Road

There is an existing 1050 mm diameter storm sewer located within Richmond Road. The storm sewer slopes to the west and connects to New Orchard Avenue N.

6.2 Proposed Storm Sewers

It is anticipated that runoff will be directed to the existing storm infrastructure at a restricted rate, as discussed in Section 7.1. 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- 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

- Based on coordination with the RVCA, quality controls may not be required for the development if the grading is enhanced, and best management practices are incorporated. The RVCA will confirm this requirement when the Site Plan is reviewed as part of the Site Plan Control application.

Quantity Control

- Any storm events greater than 2 year, up to 100 year, and including 100-year storm event must be detained on site.

- Post-development to be restricted to the 2-year storm event, based on a calculated time of concentration and 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
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 flow to the 2-year storm event. It is estimated that the target release rate during the 100-year event will be 108.60 L/s.

It has been assumed that the existing development contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events are summarized below in Table 6.

Table 6: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Q (L/s)		
		2-Year	5-Year	100-Year
A1	1.02	195.63	265.38	505.33

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 that approximately 10% of the development area will be directed to the outlet without flow attenuation. The estimated post-development peak flows for the 2, 5 and 100-year events and the required storage volumes are summarized below in Table 7, below.

Table 7: Post Development Flow Rate and Storage Requirements

Drainage Area	Unrestricted Flow (L/S)			Restricted Flow (L/S)			Storage Required (m^3)		
	2-year	5-year	100-Year	2-year	5-Year	100-Year	2-year	5-Year	100-Year
B1 (Restricted)	161.48	219.06	454.80	20.92	28.38	58.92	115.80	154.9	318.1
B2 (Unrestricted)	17.10	23.19	49.68	17.10	23.19	49.68			
Total	178.58	242.26	504.48	38.02	51.57	108.60			

It is anticipated that approximately 318 m^3 of storage will be required on site to attenuate flow to the established release rate of 108.60 L/s. Flow and storage calculations can be found within Appendix G. 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 three residential ranging from 6 to 40-storeys and park land to be dedicated to the City is contemplated at 1047 Richmond Road;
- The FUS method estimated a maximum fire flow of 12,000 L/min is required for the contemplated development;
- The development is anticipated to have a peak wet weather flow of 20.41 L/s. Based on coordination with City staff, it is anticipated that the municipal system can accommodate the wastewater flow;
- Based on City of Ottawa guidelines, the development will be required to attenuate post-development 2, 5 and 100-year flows to the pre-development 2-year release rate of 108.60 L/s;
- 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 318 m^3 of onsite storage will be required to attenuate flow to the established release rate. 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;
- Based on coordination with the RVCA, quality controls may not be required for the development if the grading is enhanced, and best management practices are incorporated. The RVCA will confirm this requirement when the Site Plan is reviewed as part of the Site Plan Control application.

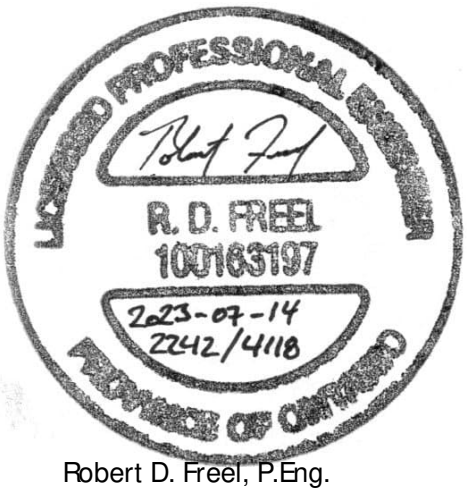
9.0 RECOMMENDATION

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 1047 Richmond Road.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.



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10.0 STATEMENT OF LIMITATIONS

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

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

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

APPENDIX A
KEY PLAN

McINTOSH PERRY

LEGEND

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

REFERENCE

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

CLIENT: FENGATE

PROJECT: 1047 RICHMOND ROAD

TITLE: SITE LOCATION PLAN

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
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PROJECT NO:	CCO-22-2242
Date	Dec., 17, 2021
GIS	SK
Checked By	AG

FIGURE: 1

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APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY

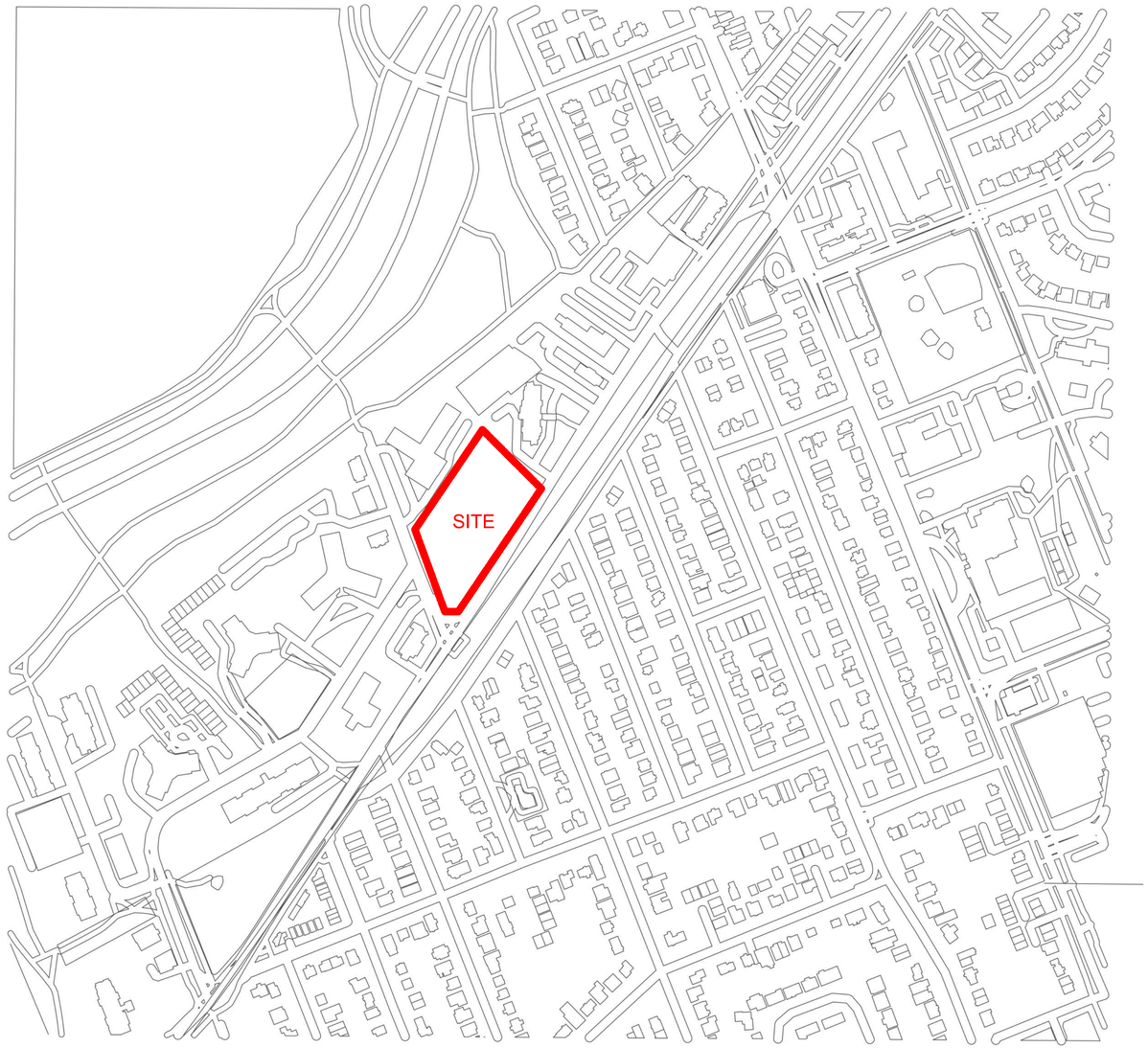
- The Servicing Study Guidelines for Development Applications are available at the following link: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans
- Record drawings and utility plans are available for purchase from the City's Information Centre. Contact the City's Information Centre by email at informationcentre@ottawa.ca or by phone at (613) 580-2424 x44455
- Stormwater quantity control criteria – Control the 100-yr to the 2-yr allowable release rate using on site SWM. The allowable release rate is to be determined using the lesser of c=0.5 or existing. Tc is to be computed but not less than 10 minutes.
- As for the sanitary, the pipe on New Orchard is only 300 mm. Therefore, please provide the sanitary flow estimate from this site to determine if there is capacity available for this existing pipe or if the pipe needs to be upgraded. Note that west Nepean Collector is only 100 m away, so it would not be difficult to upgrade the pipe if required.
- Existing 203 mm dia. watermain is available on New Orchard Ave. N. for service connection.
- Looping may be required depends on the water demand.
- Stormwater quality control – Consult with the Conservation Authority (RVCA) for their requirements. Include the correspondence with RVCA in the stormwater/site servicing report.
- Please note that as per Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14) there shall be no surface ponding on private parking areas during the 2-year storm rainfall event. Depending on the SWM strategy proposed underground or additional underground storage may be required to satisfy this requirement.
- 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.
- Please provide an Existing Conditions/Removals Plan as part of the engineering drawing set. Any existing services are to be removed or abandoned in accordance with City standards.
- As per the City of Ottawa Slope Stability Guidelines for Development Applications an engineering report is required for any retaining walls proposed 1.0 m or greater in height within the subject site that addresses the global stability of the wall and provides structural details. A Retaining Wall Stability Analysis Report and Retaining Wall Structural Details are required to be provided from a Professional Engineer licensed in the Province of Ontario that demonstrates the proposed retaining wall structure has been assessed for global instability as per City standards. Please ensure the analysis and required documentation are provided as part of the submission to address this comment.
- Emergency routes will need to be satisfactory to Fire Services. Please show fire routes on the site plan. For information regarding fire route provisions, please

consult with Kevin Heiss at kevin.heiss@ottawa.ca.

- Clearly show and label the property lines on all sides of the property.
- Clearly show and label all the easements (if any) on the property, on all plans.
- When calculating the post development composite runoff coefficient (C), please provide a drawing showing the individual drainage area and its runoff coefficient.
- When using the modified rational method to calculate the storage requirements for the site, the underground storage should not be included in the overall available storage. The modified rational method assumes that the restricted flow rate is constant throughout the storm which, in this case, underestimates the storage requirement prior to the 1:100-year head elevation being reached. Alternately, if you wish to include the underground storage, you may use an assumed average release rate equal to 50% of the peak allowable rate. Otherwise, disregard the underground storage as available storage or provide modeling to support the design.
- Engineering plans are to be submitted on standard A1 size (594mm x 841mm) sheets.
- Phase 1 ESA and Phase 2 ESA must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
- Provide the following information for water main boundary conditions:
    1. Location map with water service connection location(s).
    2. Average daily demand (l/s).
    3. Maximum daily demand (l/s).
    4. Maximum hourly demand (l/s).
    5. Fire flow demand (provide detailed fire flow calculations based on Fire Underwriters survey (FUS) Water Supply for Public Fire Protection). Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).
    6. 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.
- If you are proposing any exterior light fixtures, all must be included and approved as part of the site plan approval. Therefore, the lights must be clearly identified by make, model and part number. 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 applicant must provide certification from an

acceptable professional engineer. The location of all exterior fixtures, a table showing the fixture types (including make, model, part number), and the mounting heights must be included on a plan.

- As per Ottawa Sewer Design Guideline section 4.4.4.7, a monitoring maintenance hole shall be required just inside the property line for all non-residential and multi residential buildings connections from a private sewer to a public sewer. See the sewer use By-law 2003-514(14) monitoring devices for details.



1047 RICHMOND RD - Ottawa

July 12, 2023

PROJECT STATISTICS

	TOTAL	
SUMMARY	**SQ.M.**	**SQ.FT.**
Site Area	10,188	109,623
Net Site Area (excludes Road Widening)	10,113	108,814
Total GCA (Above grade)	87,135	937,569
Total GFA	69,785	750,890
Total NSA (Residential + Retail)	63,374	681,906
Total Retail Saleable (Ground)	859	9,247
PARK Area (10% of Site area)	1,013	10,900
Total Number of Units in podium	335	
Total Number of Units in towers	817	
Total Number of Units	1,152	

FSI
6.85

PROJECT STATISTICS

	TOTAL	
Tower A (40 Storeys)	**SQ.M.**	**SQ.FT.**
Total Tower GCA	38,713	416,554
Total GFA	30,821	331,638
Total Tower NSA(Residential + Retail)	30,459	327,741
Total Number of Units in Podium	107	
Total Number of Units in Tower	405	
Total Units	512	
Tower B (38 Storeys)	**SQ.M.**	**SQ.FT.**
Total Tower GCA	41,665	448,318
Total GFA	33,277	358,061
Total Tower NSA(Residential + Retail)	32,915	354,165
Total Number of Units in Podium	138	
Total Number of Units in Tower	412	
Total Units	550	
Building C (7 Storeys)	**SQ.M.**	**SQ.FT.**
Total Tower GCA	6,756	72,697
Total GFA	5,687	61,192
Total Tower NSA(Residential + Retail)	5,533	59,536
Total Number of Units in Podium	90	
Total Units	90	

AMENITY AREAS PROVIDED	Tower A (m2)	Required (3sqm/unit)	Tower B (m2)	Required (3sqm/unit)	Building C (m2)	Required (3sqm/unit)	Total (m2)	Required
INDOOR (communal)	785	1536	765	1650	0	270	1,550	3456
OUTDOOR (communal)	1,012		885		267		2,163	
BALCONIES & TERRACES (private)								
TOTAL PROVIDED(6m2 per unit)Balconies can count towards the total	**1,797**	**1,536**	**1,650**	**1,650**	**267**	**270**	**3,713**	**3,456**

UNDERGROUND PARKING GCA	SQ.M.	SQ.FT.
P1	8736	93,999
P2	8736	93,999
P3	8736	93,999
TOTAL	**26208**	**281998**

VEHICULAR PARKING PROVIDED	Required	Proposed
VISITOR (30/per building)	68	68
RESIDENTIAL (Area 2, Not Required)	0	621
TOTAL	**68**	**689**

**16 to be accessible parking spacesdistributed throughout all parking levels P1-P3*

BICYCLE PARKING PROVIDED	Required	Proposed
RESIDENTIAL (0.5/per unit)	576	726
TOTAL	**576**	**726**

UNIT MIX	TOWER A		TOWER B		BUILDING C	
UNIT TYPE	**UNITS**	**BARRIER-FREE**	**UNITS**	**BARRIER-FREE**	**UNITS**	**BARRIER-FREE**
STUDIO	33	5	38	6	18	3
1B	241	43	244	37	41	6
2B	225	34	263	40	31	5
3B	13	2	5	1	0	0
TOTAL	**512**	**84**	**550**	**83**	**90**	**14**
TOTAL NUMBER OF UNITS	**1,152**					

LOADING SPACES	BUILDINGS A, B, C
RESIDENTIAL	3
COMMERCIAL	
TOTAL	**3**

GARBAGE BINS			
TYPE	**TOWER A**	**TOWER B**	**BUILDING C**
GARBAGE (3CY)	28	30	5
RECYCLING (4CY)	5	6	1
GLASS, METAL AND PLASTIC (3CY)	4	4	1
ORGANIC (240L CARTS)	11	12	2
TOTAL	**48**	**52**	**9**

Notes:

GCA is Gross Constructible Area (includes everything inside building envelope).
NSA is Net Saleable Area (Includes the residential units measured to the exterior of the outside wall).
GFA is calculated based on the City of Ottawa Definition copied below.
**GFA is calculated based on the City of Ottawa Definition copied below.*
Gross floor area (GFA) *means the total area of each floor whether located above, at or below grade, measured from the interiors of outside walls and including floor area occupied by interior walls and floor area created by bay windows, but excluding;*
(a) floor area occupied by shared mechanical, service and electrical equipment that serve the building; (By-law 2008-326)
(b) common hallways, corridors, stairwells, elevator shafts and other voids, steps and landings; Part 1 – Administration, Interpretation and Definitions 1 - 24
City of Ottawa Zoning By-law 2008-250 Consolidation
(By-law 2008-326) (By-law 2017-302)
(c) bicycle parking; motor vehicle parking or loading facilities;
(d) common laundry, storage and washroom facilities that serve the building or tenants;
(e) common storage areas that are accessory to the principal use of the building; (By-law 2008-326)
(f) common amenity area and play areas accessory to a principal use on the lot; and (By-law 2008-326)
(g) living quarters for a caretaker of the building. (surface de plancher hors oeuvre brute)

CLIENT

Client Name

ISSUES

NO.	ISSUANCE	STATUS	DATE

SEAL

SUB CONSULTANT

PRIME CONSULTANT

IBI

ibigroup.com

PROJECT

1047 RICHMOND ROAD

Project Address

PROJECT NO:	Project Number
DRAWN BY:	Author
CHKD' BY:	Checker
SCALE:	1:2500
DATE:	07/12/21

SHEET TITLE

CONTEXT AND SITE STATISTICS

SHEET NUMBER

A100

ISSUE

CLIENT

Client Name

ISSUES

NO	ISSUANCE	STATUS	DATE

SUB CONSULTANT

PRIME CONSULTANT

IBI
ibigroup.com

PROJECT

1047 RICHMOND ROAD
Project Address

PROJECT NO:	Project Number
DRAWN BY:	Author
CHKD' BY:	Checker
SCALE:	1 : 300
DATE:	12/09/20

SHEET TITLE

SITE PLAN

SHEET NUMBER

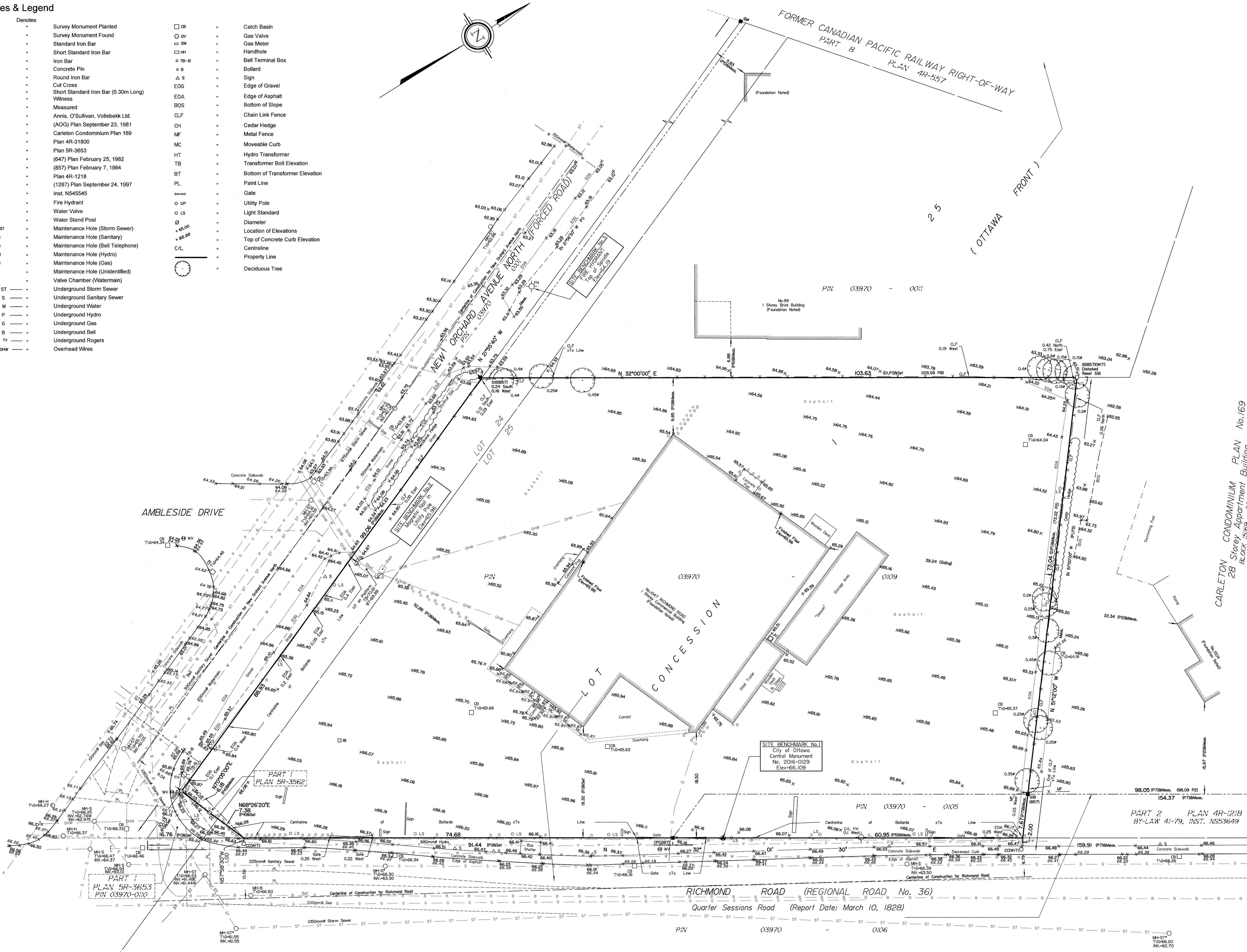
A102

ISSUE

SEAL

Notes & Legend

Symbol	Denotes	Symbol	Denotes
—□—	" Survey Monument Planted	□ CB	" Catch Basin
—■—	" Survey Monument Found	⊗ GV	" Gas Valve
SIB	" Standard Iron Bar	▭ GM	" Gas Meter
SSIB	" Short Standard Iron Bar	▭ HH	" Handhole
IB	" Iron Bar	▫ TB–B	" Bell Terminal Box
CP	" Concrete Pin	○ B	" Bollard
IBø	" Round Iron Bar	△ S	" Sign
CC	" Cut Cross	EOG	" Edge of Gravel
SSIB*	" Short Standard Iron Bar (0.30m Long)	EOA	" Edge of Asphalt
(WIT)	" Witness	BOS	" Bottom of Slope
Meas.	" Measured	CLF	" Chain Link Fence
(AOG)	" Annis, O'Sullivan, Vollebekk Ltd.	CH	" Cedar Hedge
(P1)	" (AOG) Plan September 23, 1981	MF	" Metal Fence
(P2)	" Carleton Condominium Plan 169	MC	" Moveable Curb
(P3)	" Plan 4R-31800	HT	" Hydro Transformer
(P4)	" Plan 5R-3653	TB	" Transformer Bolt Elevation
(P5)	" (647) Plan February 25, 1982	BT	" Bottom of Transformer Elevation
(P6)	" (857) Plan February 7, 1984	PL	" Paint Line
(P7)	" Plan 4R-1218	⊳⊲	" Gate
(P8)	" (1287) Plan September 24, 1997	○ UP	" Utility Pole
(DI)	" Inst. N545545	○ LS	" Light Standard
○ FH	" Fire Hydrant	Ø	" Diameter
⊗ WV	" Water Valve	+ 65.00	" Location of Elevations
∘ SP	" Water Stand Post	+ 65.00	" Top of Concrete Curb Elevation
○ MH–ST	" Maintenance Hole (Storm Sewer)	C/L	" Centreline
○ MH-S	" Maintenance Hole (Sanitary)	———	" Property Line
○ MH-B	" Maintenance Hole (Bell Telephone)	(tree symbol)	" Deciduous Tree
○ MH-H	" Maintenance Hole (Hydro)		
○ MH-G	" Maintenance Hole (Gas)		
○ MH	" Maintenance Hole (Unidentified)		
⊖ VC	" Valve Chamber (Watermain)		
—— ST ——	" Underground Storm Sewer		
—— S ——	" Underground Sanitary Sewer		
—— W ——	" Underground Water		
—— P ——	" Underground Hydro		
—— G ——	" Underground Gas		
—— B ——	" Underground Bell		
—— TV ——	" Underground Rogers		
—— OHW ——	" Overhead Wires		



TOPOGRAPHICAL PLAN OF SURVEY OF

PART OF LOTS 24 AND 25 CONCESSION 1 (OTTAWA FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 300

12 9 6 3 0 6 12 Metres

Metric

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

Surveyor's Certificate

I CERTIFY THAT :

1. This survey and plan are correct and in accordance with the Surveys Act and the Surveyors Act and the regulations made under them.
2. The survey was completed on the 29th day of September, 2021.

Oct. 1, 2021 — Date

E. H. Herweyer
Ontario Land Surveyor

Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.999982.

For bearing comparisons, a rotation of 0°01'00" counter-clockwise was applied to bearings on P1,P4 & P5.
For bearing comparisons, a rotation of 0°19'10" counter-clockwise was applied to bearings on P6.
For bearing comparisons, a rotation of 0°01'30" counter-clockwise was applied to bearings on P2 & P7.

Coordinates are derived from Can-Net 2016 Real Time Network GPS observations referenced to Specified Control Points 01919680005 and 01919750705, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-16989

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29 (3).

ELEVATION NOTES

1. Elevations shown are geodetic derived from City of Ottawa Monument No.2016-0129 with a published elevation of 66.109m and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference E-01-09.
4. Sanitary and storm sewer grades and inverts were derived from Plan 2353 (Sheet 4, 5 & 6 of 6) & Plan I-10-c-1.
5. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.
6. Manholes noted with a " * " were not located in the field due to field conditions and construction work. The location of these manholes is derived per the noted drawings above.

Ontario Land Surveyors
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 21985-21 FengateDvlpmnt PrtLts24 25 Con1 OF T F | DG

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Water Demands - Total

Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RF
Date:	July 14, 2023
Site Area:	1.02 gross ha

Residential	NUMBER OF UNITS		UNIT RATE	
Bachelor Apartment	89	units	1.4	persons/unit
1 Bedroom Apartment	526	units	1.4	persons/unit
2 Bedroom Apartment	519	units	2.1	persons/unit
3 Bedroom Apartment	18	units	3.1	persons/unit
Total Population	2007	persons		
Commercial	2409	m2		
Industrial - Light		m2		
Industrial - Heavy		m2		

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	
Residential	280	L/c/d	
Industrial - Light	35,000	L/gross ha/d	
Industrial - Heavy	55,000	L/gross ha/d	
Shopping Centres	2,500	L/(1000m² /d	
Hospital	900	L/(bed/day)	
Schools	70	L/(Student/d)	
Trailer Park with no Hook-Ups	340	L/(space/d)	
Trailer Park with Hook-Ups	800	L/(space/d)	
Campgrounds	225	L/(campsite/d)	
Mobile Home Parks	1,000	L/(Space/d)	
Motels	150	L/(bed-space/d)	
Hotels	225	L/(bed-space/d)	
Tourist Commercial	28,000	L/gross ha/d	
Other Commercial	28,000	L/gross ha/d	
AVERAGE DAILY DEMAND	Residential	6.50	L/s
	Commerical/ Industrial / Institutional	0.08	L/s

115 Walgreen Road, R.R.3. Carp, ON K0A 1L0 | T. 613-836-2184 | F. 613-836-3742
info@mcintoshperry.com | www.mcintoshperry.com

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	16.26	L/s
	Commerical/ Industrial / Institutional	0.12	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	35.77	L/s
	Commerical/ Industrial / Institutional	0.21	L/s

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

AVERAGE DAILY DEMAND	6.58	L/s
MAXIMUM DAILY DEMAND	16.38	L/s
MAXIMUM HOUR DEMAND	35.98	L/s

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Fire Underwriters Survey - Building A

Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RF
Date:	July 14, 2023

From the Fire Underwriters Survey (2020)

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

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

F = 220 x C x √A Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (Two largest addjoining floor areas plus 50% of all floors immediately above them up to a maximum of right) in the building being considered.

Construction Type: Non-Combustible Construction — 40 Storey Building

C	0.8	Gross Floor Area	37,760.8 m^2	Levels 1-7 = 1739.2 m^2 Per Floor Levels 7-40 = 803.7 m^2 Per Floor
A		Total Effective Floor Area (per the 2020 FUS Page 22)	7,760.5 m^2	* Unprotected Vertical Openings

Calculated Fire Flow	15,504.5 L/min
	16,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible	-15%

Fire Flow	13,600.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered	-50%

Reduction	-6,800.0 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)	31	2	62.0	6%
Exposure 2	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	42	6	252.0	8%
Exposure 3	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	21	38	798.0	8%
Exposure 4	Over 30 m	Fire Resistive - Non Combustible (Unprotected Openings)	10	4	40.0	0%
					%Increase*	22%

Increase*	2,992.0 L/min

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

Fire Flow	9,792.0 L/min
Fire Flow Required**	10,000.0 L/min

* In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%
** In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Fire Underwriters Survey - Building B

Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RF
Date:	July 14, 2023

From the Fire Underwriters Survey (2020)

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

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

F = 220 x C x √A Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (Two largest addjoining floor areas plus 50% of all floors immediately above them up to a maximum of right) in the building being considered.

Construction Type: Non-Combustible Construction — 38 Storey Building

C	0.8	Gross Floor Area	39,820.0 m^2	Levels 1-7 = 2034.0 m^2 Per Floor Levels 7 -38 = 863.0 m^2 Per Floor
A		Total Effective Floor Area (per the 2020 FUS Page 22)	8,999.0 m^2	* Unprotected Vertical Openings

Calculated Fire Flow	16,695.9 L/min
	17,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible	-15%

Fire Flow	14,450.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered	-50%

Reduction	-7,225.0 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)	55	2	110.0	8%
Exposure 2	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	30	28	840.0	8%
Exposure 3	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	20	6	120.0	8%
Exposure 4	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	20	40	800.0	8%
					% Increase*	32%

Increase*	4,624.0 L/min

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

Fire Flow	11,849.0 L/min
Fire Flow Required**	12,000.0 L/min

* In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%
** In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Fire Underwriters Survey - Building C

Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RF
Date:	July 14, 2023

From the Fire Underwriters Survey (2020)

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

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

F = 220 x C x √A Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (Two largest addjoining floor areas plus 50% of all floors immediately above them up to a maximum of right) in the building being considered.

Construction Type: Non-Combustible Construction — 6 Storey Building

C	0.8	Gross Floor Area	6,576.3 m^2	Levels 1 = 889.5 m^2 Per Floor Levels 2-3 = 1209.3 m^2 Per Floor Levels 4-6 = 1089.4 m^2 Per Floor
A		Total Effective Floor Area (per the 2020 FUS Page 22)	4,337.6 m^2	* Unprotected Vertical Openings

Calculated Fire Flow	11,591.4 L/min 12,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible	-15%
Fire Flow	10,200.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Fully Supervised Sprinklered	-50%
Reduction	-5,100.0 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)	43	40	1720.0	8%
Exposure 2	10.1 to 20	Fire Resistive - Non Combustible (Unprotected Openings)	25	38	950.0	8%
Exposure 3	Over 30 m	Fire Resistive - Non Combustible (Unprotected Openings)	15	2	30.0	0%
Exposure 4	Over 30 m	Fire Resistive - Non Combustible (Unprotected Openings)	20	24	480.0	0%
					%Increase*	16%

Increase*	1,632.0 L/min

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

Fire Flow	6,732.0 L/min
Fire Flow Required**	7,000.0 L/min

* In accordance with Part II, Section 4, the Increase for separation distance is not to exceed 75%
** In accordance with Section 4 the Fire flow is not to exceed 45,000 L/min or be less than 2,000 L/min

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Boundary Condition Unit Conversion

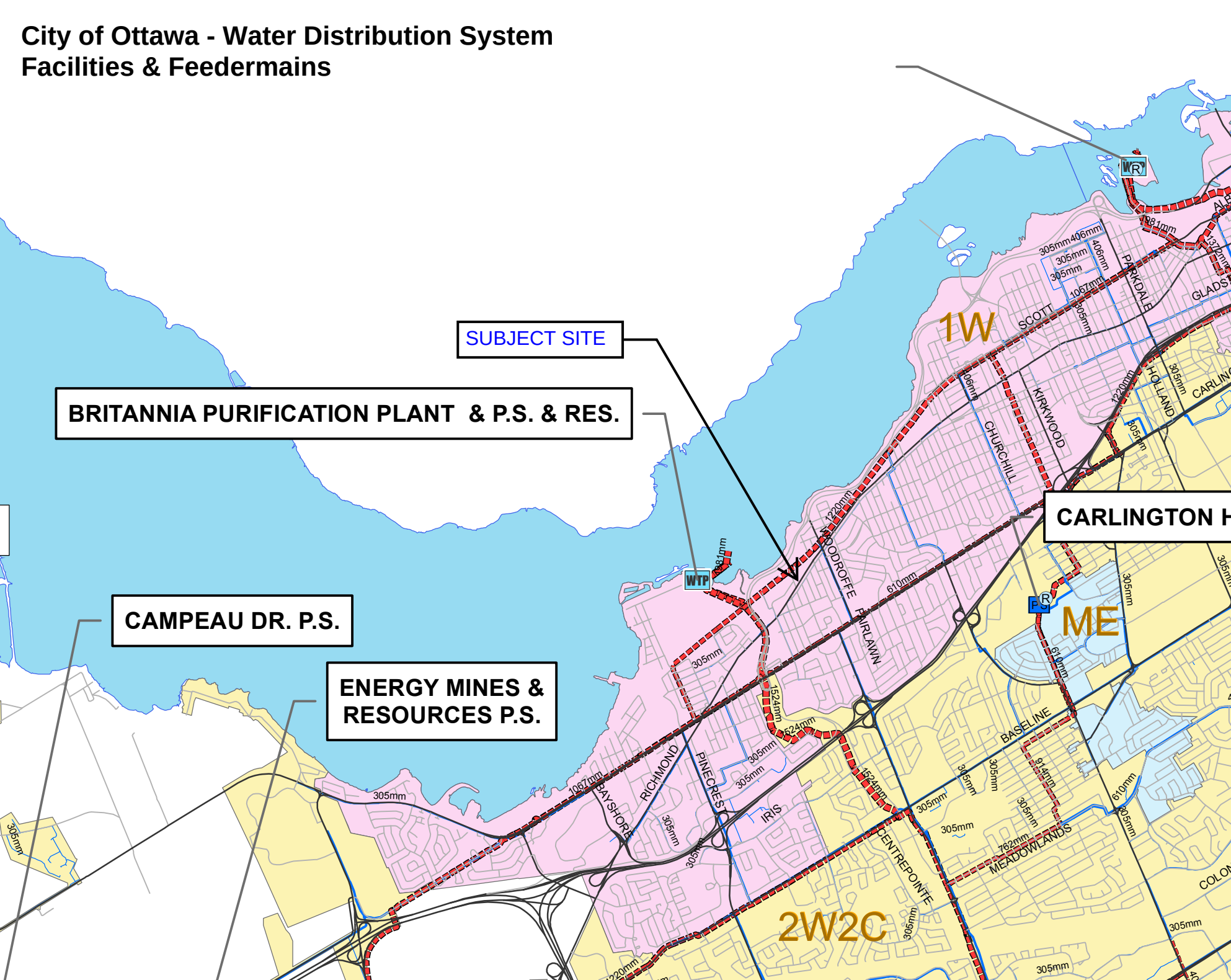
Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RF
Date:	July 14, 2023

Boundary Conditions Unit Conversion

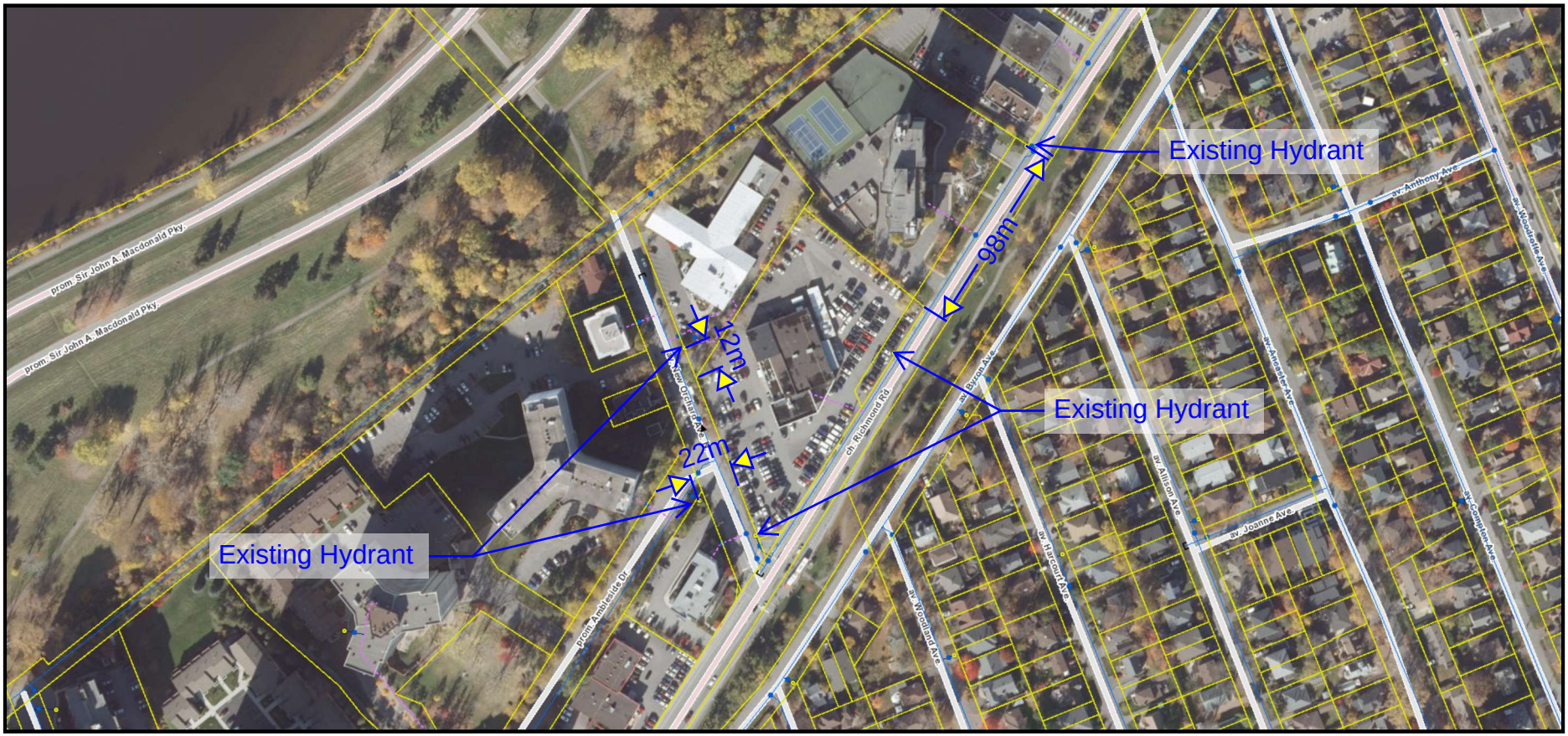
Richmond Rd./New Orchard Ave N.

Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	116.0	64.8	51.2	72.8	502.3
Fire Flow (200 L/s or 12,000 L/min)	Fire flow available @ 20 PSI = 145 L/s or 8,700 L/min				
Peak Hour	107.0	64.8	42.2	60.0	414.0

City of Ottawa - Water Distribution System
Facilities & Feedermains



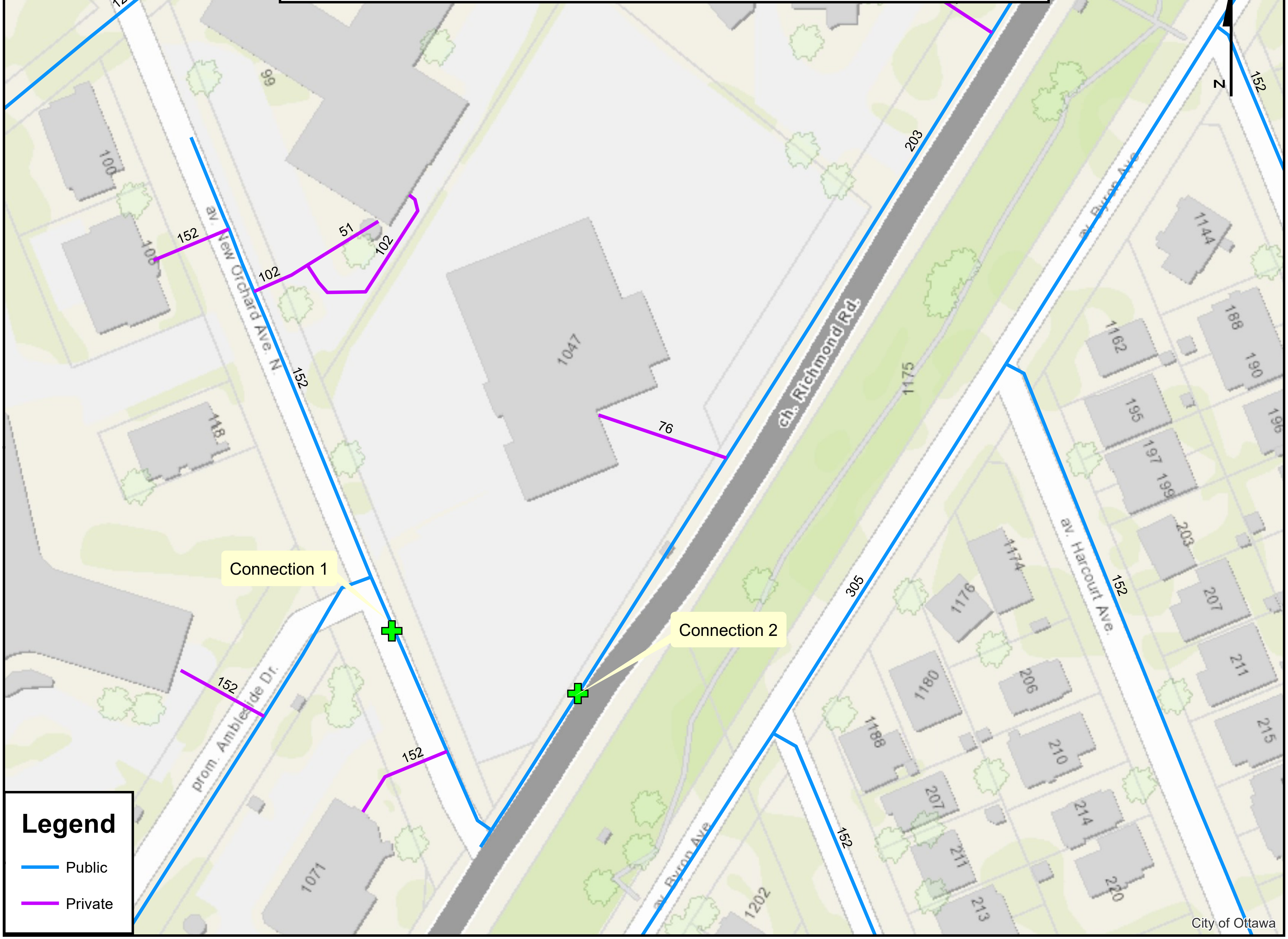
1047 Richmond Road
Hydrant Coverage Figure



https://maps.ottawa.ca/geoOttawa/

2021-10-08

Boundary Conditions for 1047 Richmond Road



Ryan Robineau

From:	Armstrong, Justin <justin.armstrong@ottawa.ca>
Sent:	July 11, 2023 9:20 AM
To:	Ryan Robineau
Cc:	Robbie Pickard; Robert Freel; Surprenant, Eric
Subject:	RE: 1047 Richmond Road Boundary Condition Request
Attachments:	1047 Richmond Road July 2023.pdf

Hi Ryan,

Received the following from the water group this morning. Note for future reference, that their typical turnaround timeline for water boundary condition requests is 2 weeks (10 business days).

Please note 12,000 L/min FF is too high and should be reduced.

The following are boundary conditions, HGL, for hydraulic analysis at 1047 Richmond Road, (zone 1W) assumed to be connected to the 203 mm watermain on Richmond Road and the 203 mm on Old Orchard Avenue (see attached PDF for location).

Min HGL: 107.0 m

Max HGL: 116.0 m

Available fire flow at 20 psi: 145 L/s, assuming ground elevation of 64.8m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Regards,
Justin

Justin Armstrong, P.Eng.
Project Manager
Planning, Real Estate and Economic Development Department – Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 21746, justin.armstrong@ottawa.ca

From: Ryan Robineau <r.robineau@mcintoshperry.com>
Sent: July 10, 2023 4:29 PM
To: Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: Robbie Pickard <r.pickard@mcintoshperry.com>; Robert Freel <r.freel@mcintoshperry.com>; Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Subject: RE: 1047 Richmond Road Boundary Condition Request

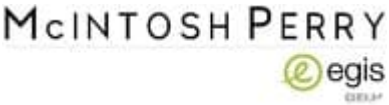
Good afternoon Justin,

I hope your are well.

Just following up to see if the water group has provided an update on the boundary condition request.

Regards,

Ryan Robineau, EIT
Civil Engineering Technologist
T. 613.714.6611
r.robineau@mcintoshperry.com | www.mcintoshperry.com



Turning Possibilities Into Reality

From: Armstrong, Justin <justin.armstrong@ottawa.ca>
Sent: June 28, 2023 2:30 PM
To: Ryan Robineau <r.robineau@mcintoshperry.com>
Cc: Robbie Pickard <r.pickard@mcintoshperry.com>; Robert Freel <r.freel@mcintoshperry.com>; Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Subject: RE: 1047 Richmond Road Boundary Condition Request

Hi Ryan,

I have sent off the request for boundary conditions to the City's water group. I will let you know once I receive the results.

Thanks,
Justin

Justin Armstrong, P.Eng.
Project Manager

Planning, Real Estate and Economic Development Department – Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - West Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 21746, justin.armstrong@ottawa.ca

From: Ryan Robineau <r.robineau@mcintoshperry.com>
Sent: June 26, 2023 10:23 AM
To: Armstrong, Justin <justin.armstrong@ottawa.ca>
Cc: Robbie Pickard <r.pickard@mcintoshperry.com>; Robert Freel <r.freel@mcintoshperry.com>; Surprenant, Eric <Eric.Surprenant@ottawa.ca>
Subject: RE: 1047 Richmond Road Boundary Condition Request

Hello Justin,

Please see the attached revised water calculations for the below boundary condition request.

A breakdown of area per floor has been added to the FUS calculation and a C value of 0.8 has been determined for the buildings per further coordination with the architect.

- The estimated fire flow is 12,000 L/min based on the 2020 FUS
- Average daily demand: 6.61L/s
- Maximum daily demand: 16.44 L/s
- Maximum hourly daily: 36.13L/s

If you require any further clarification please do not hesitate to contact me.

Regards,

Ryan Robineau, EIT
Civil Engineering Technologist
T. 613.714.6611
r.robineau@mcintoshperry.com | www.mcintoshperry.com

McINTOSH PERRY

Turning Possibilities Into Reality

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road - Sanitary Demands

Project:	1047 Richmond Road
Project No.:	CCO-22-2242
Designed By:	RP
Checked By:	RDF
Date:	July 14, 2023

Site Area	1.02	Gross ha	
Bachelor	89	1.40	Persons per unit
1 Bedroom	526	1.40	Persons per unit
2 Bedroom	519	2.10	Persons per unit
3 Bedroom	18	3.10	Persons per unit
Total Population	2007	Persons	
Commercial Area	859	m^2	
Amenity Space	1550	m^3	

DESIGN PARAMETERS

Institutional/Commercial Peaking Facto	1.5	
Residential Peaking Factor	3.07	* 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	0.05
Wet	0.29
Total	0.34

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	2007	6.50
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)	2409	0.08
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

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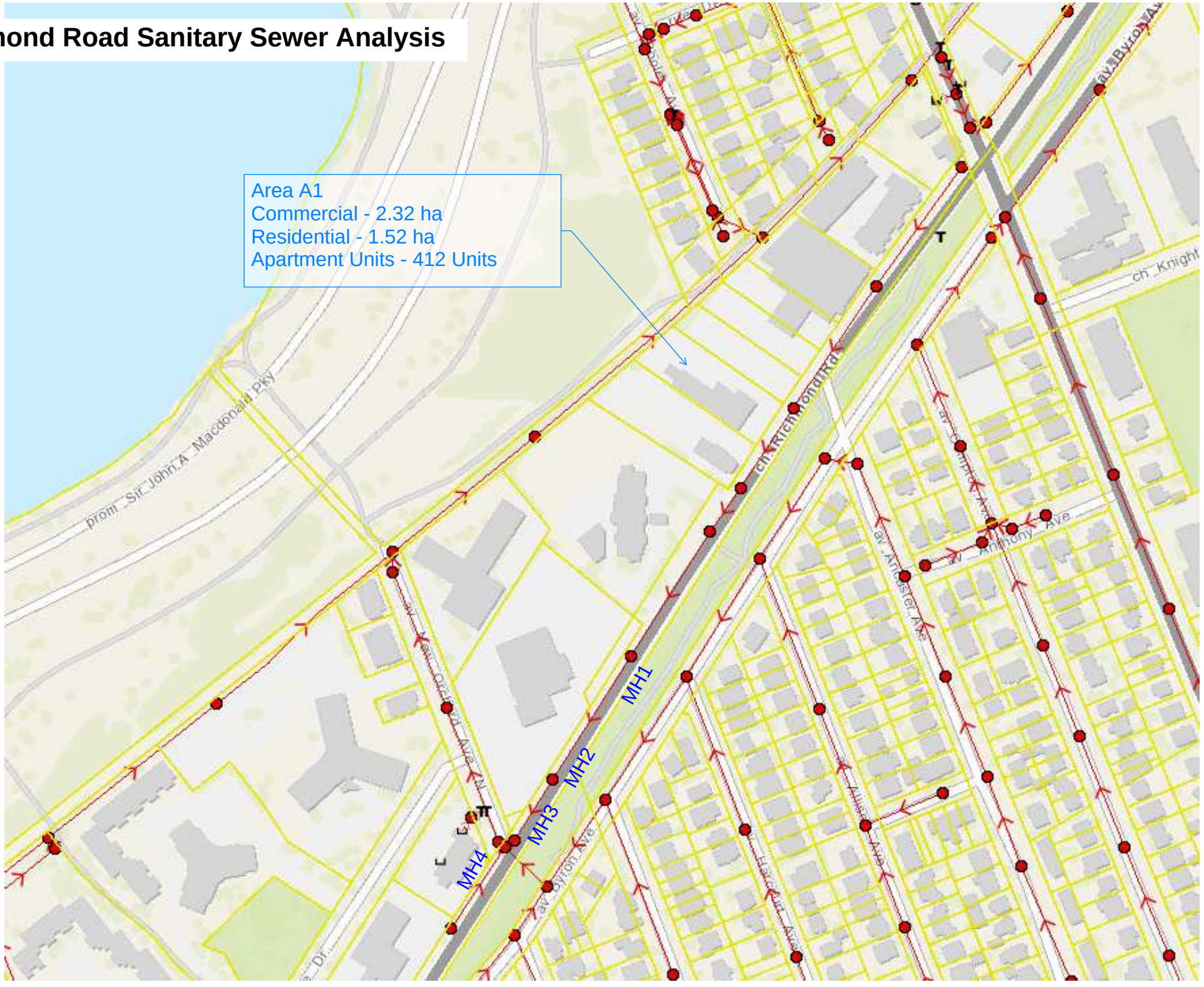
info@mcintoshperry.com | www.mcintoshperry.com

AVERAGE RESIDENTIAL FLOW	6.50	L/s
PEAK RESIDENTIAL FLOW	19.95	L/s
AVERAGE ICI FLOW	0.08	L/s
PEAK INSTITUTIONAL/ COMMERCIAL FLOW	0.12	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.12	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	6.63	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	20.12	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	20.41	L/s

Richmond Road Sanitary Sewer Analysis



2021-10-08

SANITARY SEWER DESIGN SHEET

PROJECT: 1047 RICHMOND ROAD
LOCATION:
CLIENT: FENGATE

McINTOSH PERRY

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY	
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								L/s	(%)
													IND	CUM	IND	CUM	IND	CUM											
Richmond Road	A-1	MH1	MH2				412	1.52	947.6	947.6	3.25	9.99		0.00	2.32	2.32		0.00	1.13	3.84	3.84	1.27	12.38	26.91	91.44	225	0.33	0.656	14.53	53.99
Richmond Road		MH2	MH3						0.0	947.6	3.25	9.99		0.00		2.32		0.00	1.13	0.00	3.84	1.27	12.38	30.72	44.20	225	0.43	0.748	18.34	59.69
Richmond Road		MH3	MH4						0.0	947.6	3.25	9.99		0.00		2.32		0.00	1.13	0.00	3.84	1.27	12.38	44.19	9.66	225	0.89	1.077	31.81	71.98

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
TH/SD	2.7	p/p/u	INST	28,000	L/Ha/day	1.5
APT	2.3	p/p/u	COM	28,000	L/Ha/day	1.5
Other	60	p/p/Ha	IND	35,000	L/Ha/day	MOE Chart

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

Designed: AJG
Checked: AJG
Project No.: CCO-22-2242

No.	Revision	Date
1.	Due Diligence Brief	2021-10-08

Sheet No: 1 of 1

Alison Gosling

Subject: RE: 1047 Richmond Road -

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: October 27, 2021 10:48 AM
To: 'Anthony Girolami' <anthony.girolami@fengate.com>; Alison Gosling <a.gosling@mcintoshperry.com>
Cc: Robert Freel <r.freel@mcintoshperry.com>
Subject: RE: 1047 Richmond Road -

Hello All

Following is the response I received from our Asset Management Branch regarding the existing sanitary sewer capacity:

"I have no concerns with the proposed sanitary flows."

Thanks,

Santhosh

From: Kuruvilla, Santhosh
Sent: October 19, 2021 1:06 PM
To: 'Anthony Girolami' <anthony.girolami@fengate.com>; 'Alison Gosling' <a.gosling@mcintoshperry.com>
Cc: Robert Freel <r.freel@mcintoshperry.com>
Subject: RE: 22-2242 Richmond Road - Sanitary HGL Analysis

Thanks Anthony. Yes, I did attend the pre-application consultation meeting for **1047 Richmond Rd.**

I will forward the sanitary flow information provided below to our Asset Management to assess if the existing sanitary sewer has adequate capacity to receive this flow or not and get back to you.

Thanks,

Santhosh

From: Anthony Girolami <anthony.girolami@fengate.com>
Sent: October 19, 2021 12:47 PM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>; 'Alison Gosling' <a.gosling@mcintoshperry.com>
Cc: Robert Freel <r.freel@mcintoshperry.com>
Subject: RE: 22-2242 Richmond Road - Sanitary HGL Analysis

Hi Santhosh,

The project is located at 1047 Richmond Road and our pre-con was held last Thursday, October 14th at 1:30. Laurel McCreight was the Planner on the file.

Thank you,

Anthony Girolami
Development Manager, Real Estate

FENGATE Asset Management
C: 289-230-1014
anthony.girolami@fengate.com | fengate.com

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: October 19, 2021 10:11 AM
To: 'Alison Gosling' <a.gosling@mcintoshperry.com>
Cc: Robert Freel <r.freel@mcintoshperry.com>; Anthony Girolami <anthony.girolami@fengate.com>
Subject: RE: 22-2242 Richmond Road - Sanitary HGL Analysis

Good morning Alison,

Hope you are doing well.

I don't remember attending a pre-application consultation meeting for 2242 Richmond Road. Could you please provide me the correct address of this site and who (planner and the project manager) attended the pre-application consultation meeting from the City side?

Thanks,

Santhosh

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: October 15, 2021 4:04 PM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Cc: Robert Freel <r.freel@mcintoshperry.com>; Anthony Girolami <anthony.girolami@fengate.com>
Subject: 22-2242 Richmond Road - Sanitary HGL Analysis

Good afternoon Santhosh,

Hope this message finds you well.

We wanted to touch base with you regarding the 300 mm diameter sanitary sewer within New Orchard Avenue North. Due to the proximity to trunk infrastructure, we would like to request an HGL and capacity analysis from Asset Management. The contemplated sanitary flows are summarized below.

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	7.47	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	22.49	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	22.77	L/s

Figure 1: 300mm diameter Sanitary Sewer – New Orchard Ave N

Please let us know if you have any questions.

Thank you,

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

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CCO-22-2242 - 1047 Richmond Road

Job Name

Tc (min)	Intensity (mm/hr)				C-Values	
	2-Year	5-Year	100-Year			
10	76.8	104.2	178.6	PRE-DEVELOPMENT	Impervious	0.90
10	76.8	104.2	178.6	POST-DEVELOPMENT	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	9,743	0	0	0.90	1.00

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 2/5-Year	C 100-Year	Tc (min)	Q (L/s)		
					2-Year	5-Year	100-Year
A1	1.02	0.90	1.00	10	195.63	265.38	505.33
Total	1.02				195.63	265.38	505.33

Post-Development Runoff Coefficient

Drainage Area	Impervious Area (m^2)	Gravel (m^2)	Pervious Area (m^2)	Average C (2/5-year)	Average C (100-year)	
B1	7,677	0	1,485	0.83	1.00	Restricted (Assumed to be 90% of the total area)
B2	853	0	165	0.79	0.98	Unrestricted (Assumed to be 10% of the total area)

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 2/5-Year	C 100-Year	Tc (min)	Q (L/s)			
					2-Year	5-Year	100-Year	
B1	0.92	0.83	1.00	10	161.48	219.06	454.80	Restricted
B2	0.10	0.79	0.98	10	17.10	23.19	49.68	Unrestricted
Total	1.02				178.58	242.26	504.48	

Required Restricted Flow

Drainage Area	Area (ha)	C 2/5-Year	Tc (min)	Q (L/s)
				2-Year
A1	1.02	0.50	10	108.60

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/S)			Restricted Flow (L/S)			Storage Required (m3)		
	2-year	5-year	100-Year	2-Year	5-Year	100-Year	2-Year	5-Year	100-Year
B1	161.48	219.06	454.80	20.92	28.38	58.92	115.80	154.9	318.1
B2	17.10	23.19	49.68	17.10	23.19	49.68			
Total	178.58	242.26	504.48	38.02	51.57	108.60			

CCO-22-2242 - 1047 Richmond Road

Storage Requirements for Area B1

2-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	76.8	161.47	20.92	140.55	84.33
15	61.8	129.93	20.92	109.01	98.11
20	52.0	109.33	20.92	88.41	106.09
25	45.2	95.03	20.92	74.11	111.17
30	40.0	84.10	20.92	63.18	113.72
35	36.1	75.90	20.92	54.98	115.46
40	32.9	69.17	20.92	48.25	115.80
45	30.2	63.50	20.92	42.57	114.95
50	28.0	58.87	20.92	37.95	113.85

Maximum Storage Required 5-year =	116	m^3

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	219.08	28.38	190.70	114.42
15	83.6	175.77	28.38	147.39	132.65
20	70.3	147.80	28.38	119.42	143.31
25	60.9	128.04	28.38	99.66	149.49
30	53.9	113.32	28.38	84.94	152.90
35	48.5	101.97	28.38	73.59	154.54
40	44.2	92.93	28.38	64.55	154.92
45	40.6	85.36	28.38	56.98	153.85
50	37.7	79.26	28.38	50.88	152.65

Maximum Storage Required 5-year =	155	m^3

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B1	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	454.90	58.92	395.98	237.59
15	142.9	363.97	58.92	305.05	274.55
20	120.0	305.64	58.92	246.72	296.07
25	103.8	264.38	58.92	205.46	308.19
30	91.9	234.07	58.92	175.15	315.28
35	82.6	210.39	58.92	151.47	318.08
40	75.1	191.28	58.92	132.36	317.67
45	69.1	176.00	58.92	117.08	316.12
50	64.0	163.01	58.92	104.09	312.27
55	59.6	151.80	58.92	92.88	306.52

Maximum Storage Required 100-year =	318	m^3

Time of Concentration Pre-Development

Drainage Area ID	Sheet Flow Distance (m)	Slope of Land (%)	Tc (min) (5-Year)	Tc (min) (100-Year)
A1	48	1.97	4	2

Therefore, a Tc of 10 can be used

Tc= (3.26(1.1-c)L^0.5/ S^0.33)

c = Balanced Runoff Coefficient

L = Length of drainage area

S = Average slope of watershed

APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

McINTOSH PERRY

City of Ottawa

4. Development Servicing Study Checklist

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

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

4.1 General Content

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

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	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.	Section 2.0 Background Studies, Standards and References
☐ All preliminary and formal site plan submissions should have the following information: ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names	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

☐ 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
☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☐ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Appendix C
☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

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

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

4.4 Development Servicing Report: Stormwater Checklist

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

☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☐ Calculate pre-and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 7.0 Proposed Stormwater Management Appendix G
☐ Any proposed diversion of drainage catchment areas from one outlet to another.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐ Identification of potential impacts to receiving watercourses	N/A
☐ Identification of municipal drains and related approval requirements.	N/A
☐ Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 6.0 Stormwater Sewer Design & Section 7.0 Proposed Stormwater Management
☐ 100-year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐ 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.	N/A
☐ 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 8.0 Summary Section 9.0 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