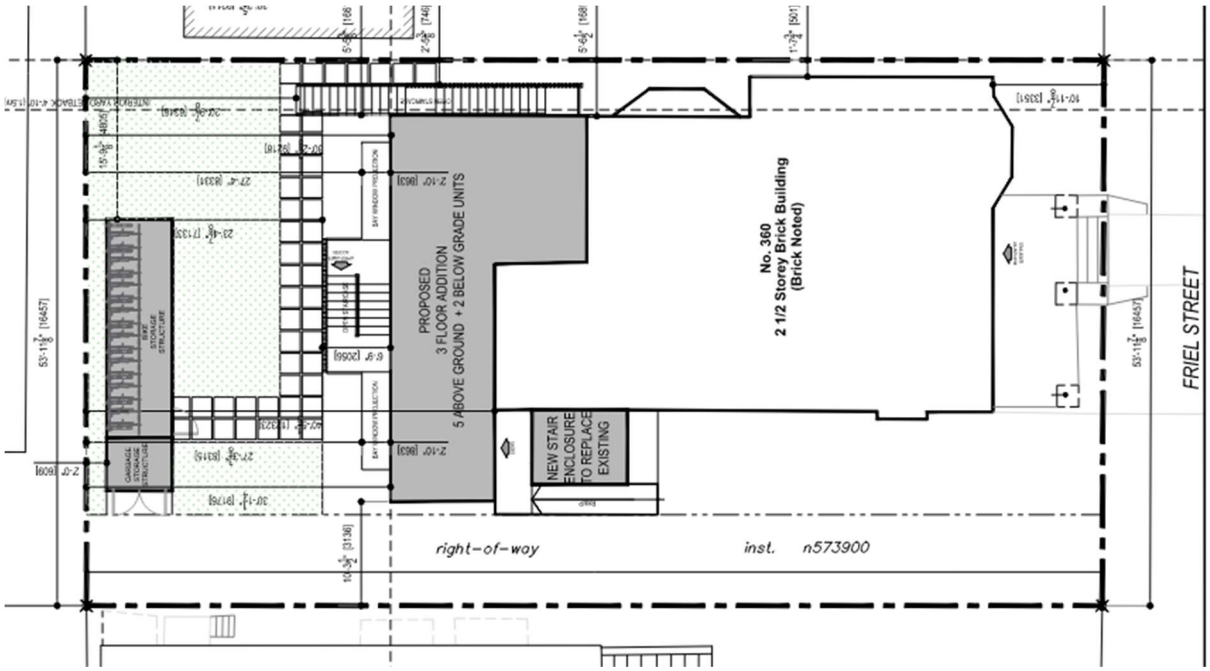
SERVICING & STORMWATER MANAGEMENT REPORT
360 FRIEL STREET



Project No.: CCO-22-1646

City File No.: D07-12-XX-XXXX

Prepared for:

Smart Living Properties
226 Argyle Avenue
Ottawa, ON K2P 1B9

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
Carp, ON K0A 1L0

2021-09-16

McINTOSH PERRY

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1.0 PROJECT OVERVIEW

1.1 Purpose

McIntosh Perry (MP) has been retained by Smart Living Properties to prepare this Servicing and Stormwater Management Report in support of the Zoning By-law Amendment (Minor) and Site Plan Control (SPC) application process for the proposed development at 360 Friel Street, within the City of Ottawa.

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

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

- CCO-22-1646, C101 – Site Grading, Drainage and Sediment & Erosion Control Plan
- CCO-22-1646, C102 – Site Servicing Plan
- CCO-22-1646, PRE – Pre-Development Drainage Area Plan (***Appendix E***)
- CCO-22-1646, POST – Post-Development Drainage Area Plan (***Appendix F***)

1.2 Site Description

Figure 1: Site Map

The subject property, herein referred to as the site, is located at 360 Friel Street within the Rideau-Vanier Ward in the City of Ottawa. The site covers approximately ***0.05 ha*** and is located north west of the Laurier Avenue East and Friel Street intersection, as shown by ***Figure 1,*** above. The site is zoned for Residential Use (R4UD). Additional details are included on the Site Location Plan included in ***Appendix A***.

1.3 Proposed Development and Statistics

The proposed development incorporates a building addition to the existing residential building. 7 additional residential units to the existing 9 units are proposed, with street access from Friel Street. The development is proposed within ***0.033 ha*** of the site. Refer to ***Site Plan*** prepared by Muzaiko Architecture and included in ***Appendix B*** for further details.

1.4 Existing Conditions and Infrastructure

The property is located within the City of Ottawa's Central Sub-Watershed, tributary to the Rideau River. A residential building exists within the site and is proposed to be retained, along with the shared driveway with 362 Friel Street. The existing building is currently serviced via the City's infrastructure within Friel Street. The rear gravel parking area is proposed to be removed as part of the development.

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:

- **Friel Street**
  - 305 mm diameter ductile iron watermain;
  - 450 mm diameter PVC sanitary sewer, tributary to the King Edward Avenue Trunk; and
  - 675 mm diameter concrete storm sewer, tributary to the Rideau River approximately 750 m downstream.

1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control approval and zoning by-law amendment processes. 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 since the development is contained within one property parcel, the development does not propose industrial usage, and since the site is not serviced by a combined sewer. As a result, the stormwater management system meets the exemption requirements under O.Reg 525/90.

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 proposed development.

A topographic survey (20095-19) of the site was completed by Annis, O'Sullivan, Vollebekk Ltd. dated March 9th, 2020.

The Site Plan, A0.1 was prepared by Muzaiko Architecture dated May 12th, 2021 (***Site Plan***).

2.2 Applicable Guidelines and Standards

City of Ottawa:

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

Ministry of Environment, Conservation and Parks:

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

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was conducted on June 18th, 2021 regarding the proposed development at 360 Friel Street. Specific design parameters to be incorporated within this design are noted by the City of Ottawa pre-consultation found in ***Appendix B*** and are noted below.

- Confirm that the municipal infrastructure can provide sufficient fire flow to the site in order to support the increased demand.
- Control 5 through 100-year post-development flows to the 5-year storm event with a combined C value to a maximum of 0.50.
- Quality control are not required for this site as the development proposes to improve the quality of water leaving the site. Correspondence with the RVCA 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***. There is an existing 305 mm diameter watermain, that runs the entire length of the property along Friel Street. There are five public hydrants within 150 m of the site, as discussed in *Section 4.2*.

4.2 Proposed Watermain

It is proposed to service the proposed building addition through the existing building. A mechanical consultant will need to review and confirm whether upgrades to the existing building are required to accommodate the addition.

Table 1, below, summarizes the water supply design criteria obtained from the ***Ottawa Water Guidelines*** and utilized for the water analysis.

Table 1: Water Supply Design Criteria

Site Area	0.05 ha
Residential	280 L/day/person
Residential Apartment - Average	1.8 person/unit
Max Day Peaking Factor	9.5 x avg. day
Peak Hour Peaking Factor	14.3 x avg. day

The water analysis results have been summarized in ***Table 2***, below. The fire flow demand accounted for both the existing above-ground floor area and the proposed area.

Table 2: Summary of Estimated Water Demand

Design Parameter	Total Flow (L/s) Existing	Total Flow (L/s) Proposed	Total Flow (L/s) Total
Average Daily Demand	0.06	0.04	0.09
Max Day Demand	0.52	0.39	0.89
Max Day + Fire Flow Demand (183 L/s)	-	-	184.22
Peak Hour Demand	0.79	0.58	1.33

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

The following parameters were coordinated with the architect:

- Type of construction – Wood Frame Construction;
- Occupancy type – Combustible;
- Sprinkler Protection – Not Sprinklered.

The results of the calculations yielded a required fire flow of ***183.3 L/s*** (11,000 L/min). The detailed calculations for the FUS can be found in ***Appendix C***.

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 3***, below.

Table 3: Boundary Conditions Results

Scenario	Proposed Demands (L/S)	Connection 1 HGL (m H_2O)*/kPa
Average Day Demand	0.09	45.6 / 447.0
Maximum Daily + Fire Flow Demand	184.22	38.1 / 373.5
Peak Hourly Demand	1.33	36.3 / 355.8
**Adjusted for an estimated ground elevation of 58.75m above the connection point for connection.*		

The normal operating pressure range is anticipated to be 356 kPa to 447 kPa and will not be less than 275 kPa (40 psi) or exceed 689 kPa (100 psi). The proposed watermains 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 fire hydrants within 150 m of the proposed building were accounted for per ***ISTB 2018-03*** *Appendix I*. As demonstrated by ***Table 4***, below.

Table 4: Fire Protection Confirmation

Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m	Fire Hydrant(s) within 150m	Combined Fire Flow (L/min)
11,000 L/min (183 L/s)	1 public	4 public	20,100 (335 L/s)

Based on City guidelines the existing hydrants located in the vicinity can provide adequate fire protection to the site.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

The subject site lies within the King Edward Collector sewer collection area. There is an existing 450 mm diameter sanitary sewer located within Friel Street tributary to the King Edward Collector sewer approximately 1.8 km downstream.

5.2 Proposed Sanitary Sewer

It is proposed to service the proposed building addition through the existing building. A mechanical consultant will need to review and confirm whether upgrades to the existing building are required to accommodate the addition.

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

Table 5: Sanitary Design Criteria

Design Parameter	Value
Residential Apartment - Average	1.8 persons/unit
Average Daily Demand	280 L/day/person
Extraneous Flow Allowance	0.33 L/s/ha

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

Table 6: Summary of Estimated Sanitary Flow

Design Parameter	Total Flow (L/s)
Total Estimated Average Dry Weather Flow	0.10
Total Estimated Peak Dry Weather Flow	0.35
Total Estimated Peak Wet Weather Flow	0.36

Based on pre-consultation with the City, capacity concerns were not identified for the Friel Street sanitary sewer. Due to the complexity of the downstream network the City will need to advise of any downstream constraints.

6.0 STORM SEWER & STORMWATER MANAGEMENT DESIGN

6.1 Existing Storm Sewers

Stormwater runoff from the site is currently tributary to the Rideau River within the Ottawa Central sub-watershed. There is an existing 675 mm diameter storm sewer within Friel Street, tributary to the Rideau River approximately 750 m downstream.

6.2 Proposed Storm Sewers

A new 250 mm diameter storm service will be extended from the existing 675 mm diameter storm sewer within Friel Street to provide flow attenuation for the building addition and at-grade common area within the site.

Foundation drainage is proposed to be connected to the existing building drainage systems. The internal servicing layout is to be reviewed by the mechanical engineer.

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

Runoff from the at-grade common areas within the site will be collected by two catch basins within the subject site. Each catch basin will contain an inlet control device (ICD) and will utilize surface storage to meet the City requirements for the site, in accordance with the pre-consultation notes included in ***Appendix B***.

See CCO-22-1646 - *POST* include in ***Appendix F*** of this report for more details. The Stormwater Management design for the subject property will be outlined in *Section 7.0* of this report.

7.0 STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

The following design criteria will need to be employed to develop the stormwater management design for the site, as directed by the City:

Quality Control

- Quality control are not required for this site as the development proposes to improve the quality of water leaving the site. Correspondence with the RVCA can be found in ***Appendix B***.

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 5-year storm event, based on a calculated time of concentration greater than 10 minutes and a rational method coefficient of 0.50. Refer to *Section 7.2* for further details.

7.2 Quality Control

7.2.1 *Runoff Calculations*

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

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

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

It is recognized that the Rational Method tends to overestimate runoff rates. As a result, the conservative calculation of runoff ensures that any SWM facility sized using this method is expected to function as intended.

The following coefficients were used to develop an average C for each area:

Roofs/Concrete/Asphalt	0.90
Undeveloped and Grass	0.20

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

The time of concentration (Tc) used for pre-development shall be calculated and no less than 10 minutes and post-development flows shall be calculated and no less than 10 minutes.

Based on the criteria listed in *Section 7.2.1*, the development will be required to restrict flow to the 5-year storm event. It is estimated that the target release rate during the 100-year event will be ***4.74 L/s*** based on the construction limit of ***0.033 ha***.

7.3 Pre-Development Drainage

A pre-development drainage area plan has been prepared for the site. As noted by drawing CCO-22-1646 – *PRE,* included in ***Appendix E*** of this report, there are two drainage patterns observed. Runoff within Area A1 runs east overland towards Friel Street. Runoff within Area A2 runs west overland towards the neighbouring property (300 Wilbrod Street).

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 7***. See CCO-22-1646 - *PRE* in ***Appendix E*** and ***Appendix G*** for calculations.

Table 7: Pre-Development Runoff Summary

Drainage Area	Area (ha)	Q (L/s)	
		5-Year	100-Year
A1 & A2	0.033	6.21	12.29

7.4 Post-Development Drainage

To meet the stormwater objectives the development will contain a combination of flow attenuation with rooftop controls and surface storage.

Based on the criteria listed in *Section 7.2.1*, the development will be required to restrict flow to the 5-year storm event. It is estimated that the target release rate during the 100-year event will be ***4.74 L/s*** based on the construction limit of ***0.033 ha***. See ***Appendix G*** for calculations.

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-22-1646 - *POST* in ***Appendix F*** of this report for more details. A summary of the Post-Development Runoff Calculations can be found below.

Table 8: Post-Development Runoff Summary

Drainage Area	Area (ha)	5-year Peak Flow (L/s)	100-year Peak Flow (L/s)	100-year Storage Required (m^3)	100-year Storage Available (m^3)
B1	0.026	3.74	3.80	3.48	3.50
B2	0.005	0.60	0.72	1.11	1.11
B3	0.002	0.11	0.22	-	-
Total	**0.033**	**4.45**	**4.74**	**4.59**	**4.61**

Runoff for area B1 will be restricted before discharging to the existing storm system within Friel Street. The flow will be controlled within catch basin CB1, installed with a Tempest LMF40 ICD. CB1 will provide up to ***3.27 m^3*** of surface storage. The flow will also be controlled within catch basin CB2, installed with a Tempest LMF40 ICD. CB2 will provide up to ***0.23 m^3*** of surface storage. Drainage from Area B1 will be controlled to a maximum release rate of ***3.80 L/s***.

Runoff for area B2 will be stored on the roof of the proposed building addition and restricted using two Watts Accutrol roof drains (or equivalent product) to a maximum release rate of ***0.72 L/s*** and will provide up to ***1.11 m^3*** of storage.

The flow from Area B3 will continue to flow overland towards existing outlets A1 and A2. The development will result in a reduction of stormwater towards these outlets and therefore is not anticipated to have a significant impact.

The remaining site area will be undisturbed.

8.0 EROSION AND SEDIMENT CONTROL

8.1 Temporary Measures

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

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

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

8.2 Permanent Measures

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to

the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

9.0 SUMMARY

- The proposed development incorporates a building addition to the existing building within 360 Friel Street. The ***Site Plan*** proposes an additional 7 units to the existing 9 units, with street access from Friel Street. The development is proposed within ***0.033 ha*** of the site.
- The FUS method estimated fire flow indicated that ***11,000 L/min*** is required for the proposed development;
- The development is estimated to have a combined peak wet weather flow of ***0.36 L/s***. Based on pre-consultation with the City, capacity within the receiving system is not a concern;
- Based on City of Ottawa guidelines, the development will be required to attenuate post-development 5 and 100-year flows to the 5-year release rate of ***4.74 L/s***. This flow rate is based on the limit of work area of ***0.033 ha***;
- To meet the stormwater objectives the development will contain a combination of flow attenuation with rooftop controls and subsurface storage. ***4.59 m^3*** of onsite storage will be required to attenuate flow to the established release rate; and
- Based on coordination with the RVCA, quality controls are not required for this site as the development proposes to improve the quality of water leaving the site.

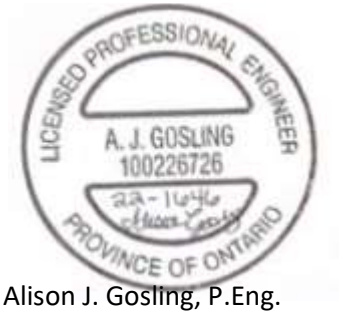
10.0 RECOMMENDATION

Based on the information presented in this report, we recommend that City of Ottawa approve this Servicing and Stormwater Management report in support of the proposed development at 360 Friel Street.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.



Alison J. Gosling, P.Eng.
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11.0 STATEMENT OF LIMITATIONS

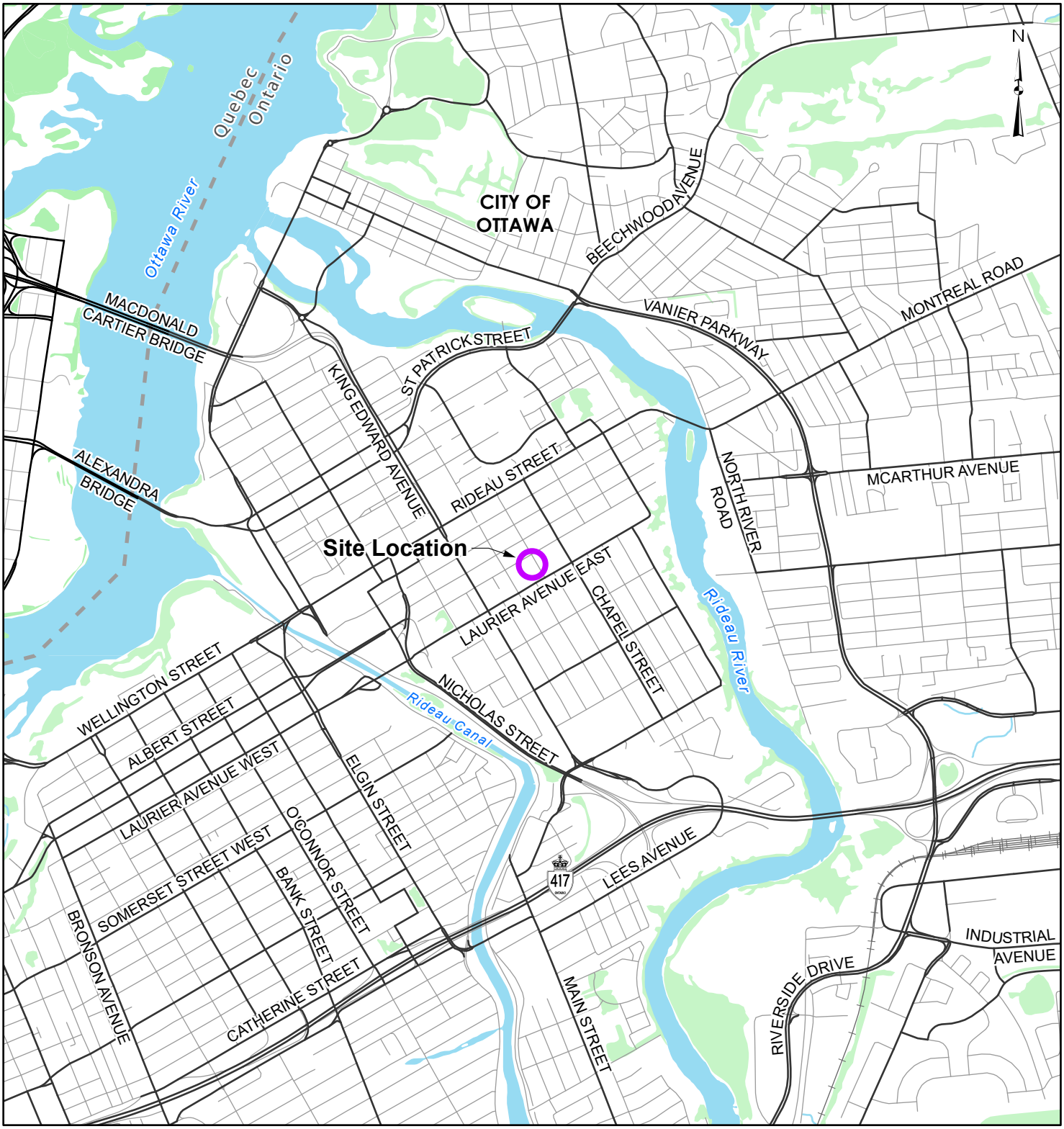
This report was produced for the exclusive use of Osgoode Properties. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry 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
- Railroad
- Watercourse
- Waterbody
- Wooded Area

600 300 0 600

Scale 1:25,000 Metres

REFERENCE

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

CLIENT: SMART LIVING PROPERTIES

PROJECT: 360 FRIEL STREET, OTTAWA, ON

TITLE: SITE LOCATION PLAN

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
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www.mcintoshperry.com

PROJECT NO: CCO-22-1646	
Date	Aug., 23, 2021
GIS	EU
Checked By	AG

FIGURE: 1

APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY

Pre-Application Consultation Meeting Notes

Property Address: 360 Friel Street
PC2021-0205
Friday, June 18, 2021
9am - 10am via Microsoft Teams

Attendees:

City of Ottawa
Seana Turkington, File Lead
Holly Newitt, Student Planner
Christopher Moise, Urban Design
John Wu, Engineer
Patrick McMahon, Transportation
Greg MacPherson, Heritage (regrets)
Mark Richardson, Forestry (regrets)

Applicant Team
Ghada Zaki, Fotenn
Jeremy Silburt, SmartLiving
Paulo Alves, Architect

Community Association
John Verbaas, Action Sandy Hill

Meeting Notes:

Opening & attendee introduction

- Introduction of meeting attendees
- Confirmation NDA has been signed

Overview of proposal

Ghada Zaki

- Subject site currently 2.5 storey apartment building with parking at the rear.
- The structure on site is listed on the Heritage Register.
- Designated General Urban Area in OP
    - Sandy Hill Secondary Plan = residential area, low profile (not directly regulating height)
    - Sandy Hill Cultural Heritage Character Area
- Currently zoned R4UD(480).
- Proposed development - maintain existing residential and construct a 3 storey rear addition with 8 one-bedroom units. Relief is being requested from the Zoning By-law for the following:
    - No parking spaces proposed;
    - Reduction in 2-bedroom unit requirement;
    - Reduction in rear yard setback.
- Proposed addition contrasts with original house. The exterior materials for the addition are still to be confirmed. Two open staircases are proposed will provide access to upper units.
- Units in existing building will remain as they are.

Technical Comments:

Planning- Provided by Seana Turkington

- Bike parking needs to be secure (as per Section 111(10) of the Zoning By-law) and must meet all the applicable requirements of Section 111. Bike parking should be protected from the elements. Please consider placing bike parking interior to the building.

- Bike parking details shall be shown on the required Site Plan as per the Guide to Preparing Studies and Plans. Dimensions of bicycle parking racks shall be included on the Site Plan.
- If one or more accessory structures are built for garbage or bike storage, please note that the requirements of Section 55 of the Zoning By-law will apply.
- Staff would be supportive of a 1:1 biking ratio and no parking.
- The infill provisions updated last October are now in full force and effect. Please ensure the proposal meets the infill provisions.
- Landscaping requirements should be met, if not exceeded. Please plant some trees at the rear to provide shade to tenants during the summer months. Trees will also add to the existing urban canopy. Please consider planting species native to the Ottawa area. For further information, please visit: https://ottawa.ca/en/living-ottawa/environment-conservation-and-climate/wildlife-and-plants/plants
- Staff have concerns about the relief requested for the reduction to the 2-bedroom requirement stipulated under the R4 provisions. Please consider reducing the number of units to meet this 2-bedroom requirement. Reducing the unit size will also result in increased unit space for tenants.
- The New OP is scheduled to go to Council in September. Any application submission should have regard for the New OP policies. Please note that depending on application submission timing, the policy regime may change.

Urban Design- Provided by Christopher Moise

- We have the following comments/questions for the design proposed;
    - We appreciate the challenge related to managing an existing building however we note that various set-back reduction requests need to be balanced with what can be provided;
    - Two-bedroom units: We suggest that providing two bedroom units will decrease the number of units provided possibly to below the threshold requiring any accessibility measures. We recommend that the addition of 2 more two-bedroom units (in lieu of 4 one-bedroom units in the addition should be considered;
    - Providing both primary and secondary accesses for the addition external to the building envelope is problematic, though due to the existing building condition and narrow site appears unavoidable. We recommend care be taken in how those stairs are being screened to provide high visual aesthetic and protection from over-look to neighbouring properties;
    - Protected bike parking: We recommend that vehicular parking be considered when there is ample space to accommodate all other requirements of the rear yard. In this case the rear yard set-back is being reduced, that reduction is being encroached upon by a required access stair external to the building envelope, and the rear yard has yet to be design to accommodate the requirements of amenity space for all units, protected bike parking for all units, protected garbage enclosure for all units. Therefore, we do not believe this rear yard space should be further reduced to accommodate any vehicular parking;
    - Protected garbage enclosure: We recommend space be allocated within the building for garbage storage. If no space can be found it should be allocated in a discrete and protected enclosure in the rear yard such that it does not impede the other requirements of that space, for amenity, trees, and bikes;
    - Heritage: Although there is a requirement for the addition to be subservient to the existing building, we would support a minor difference in building height if it can be demonstrated to not be visible from the street AND can be demonstrated to improve the access to natural light in the basement units;
    - Accessibility: We recommend that accessibility requirements be further reviewed and addressed in the design. We note that the total number of units may trigger these thresholds;
    - Material choice: We recommend that the choice of material for the addition be sensitive to the surrounding context and the existing building;
    - Rear yard amenity: We recommend that the rear yard should be dedicated to unit amenity requirements, bike/garbage utility and vegetation/trees, not to vehicular parking.
- A Design Brief is a required submittal for all Site Plan/Re-zoning applications. Please see the Design Brief Terms of Reference provided.

Heritage- Provided by Greg MacPherson

- The subject property is located within the Sandy Hill Cultural Heritage Character Area and is identified as a Grade 3 property in the Sandy Hill Cultural Heritage Character Area Guidelines. Heritage staff are satisfied that the proposed addition is located to the rear of the property and is distinguishable in style from the existing building. As set out in guideline 5.2.11, new additions should be subordinate to the original building. As such, heritage staff recommend that the height of the addition be reduced to match or be lower than that of the existing building.
- Heritage staff recommend that the choice of material for the addition be sensitive to the surrounding context and the existing building. Materials should be distinguishable from those of the existing building.
- Please speak to the heritage structure and compatibility of the proposed addition with the existing structure in the required planning rationale.

Transportation- Provided by Patrick McMahon

- Ensure that a TIA Screening form is included with the application.
    - No TIA will be required as part of this application, however the TDM-supportive Development Design and Infrastructure Checklist should be completed.
- On site plan:
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
    - Show lane/aisle widths.
    - Include the vehicle and bicycle parking provisions and locations. Sheltered bicycle parking is encouraged as much as possible, especially while accompanying a reduction in vehicle parking.
    - Note that for a two-way access leading to less than 20 spaces, a minimum width of 3.6m is required.
- As the site proposed is residential, AODA legislation applies for all areas accessible to the public (i.e. outdoor pathways, parking, etc.).

Engineering- Provided by John Wu

- There are all infrastructures fronting the property. The applicants need to make sure that the fire flow on street is capable for the required increase of the fire flow demand.
- The sanitary and storm looks like no capacity issues. The proposed development must have the storm water management on site. The required storm water management is using c 0.5, 5 year's storm to control up to 100 year's storm on site.
- If rezoning, the servicing study, storm water management report, geotech, and phase one ESA report will be required.
- For site plan, it will require the above plus servicing plan and grading plan.

Forestry- Provided by Mark Richardson

Tree Conservation Report requirements:

- A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City- an approved TCR is a requirement of Site Plan approval.
- As of January 1 2021, any removal of privately-owned trees 10cm or larger in diameter, or publicly (City) owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
- The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR:
    - If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    - Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
- The TCR must list all trees on site by species, diameter and health condition.
- Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line).

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

LP tree planting requirements:
For additional information on the following please contact tracy.smith@Ottawa.ca

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

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

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

Action Sandy Hill Community Association

John Verbaas, Action Sandy Hill

- Would like to see more 2-bedroom units to appeal to a broader mix of potential tenants.
- Would like to see quality bike parking.
- Would be in favor of greater amenity space instead of visitor parking.
- Please consider how the garbage is currently handled and how additional quantities be dealt with.
- Consider removing existing asphalt in favor of more greenspace. For example, it may be worth exploring the reduction/repurposing of the existing right of way.
- Additional greenspace would improve the overall streetscape
- Concerned with the screening on the rear stairs. Consider alternatives.

Next steps:

- The applicant is encouraged to discuss the proposal with the local Councillor and the Community Association.

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.
A indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information and guidance on preparing required studies and plans refer to:

http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans

S/A	Number of copies	ENGINEERING		S/A	Number of copies
S	**3**	1. **Site Servicing Plan**	2. **Assessment of Adequacy of Public Services / Site Servicing Study**	**S**	**3**
S	**3**	3. **Grade Control and Drainage Plan**	4. **Geotechnical Study**	**S**	**3**
	2	5. Composite Utility Plan	6. Groundwater Impact Study (if over 10,000 L/day)		4
	5	7. Servicing Options Report	8. Wellhead Protection Study		6
S	**9**	9. **Transportation Impact Assessment (Screening Form)**	10. **Erosion and Sediment Control Plan**	**S**	**3**
S	**3**	11. **Stormwater Management Report**	12. Full Hydro geological and Terrain Analysis		3
	3	13. Hydraulic Water main Analysis (is over 10,000 L/day)	14. Noise Study (environmental and stationary)		3
	35/50/55	15. Roadway Modification Design Plan	16.		

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	50	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage		2
	30	19. Draft Plan of Condominium	20. **Planning Rationale**	**S**	**3**
S	**4**	21. **Site Plan**	22. Minimum Distance Separation (MDS) Calculations (can include in Planning Rationale)		2
	20	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		5
S	**4**	25. **Floor Plans**	26. Cultural Heritage Impact Statement		3
S	**4**	27. **Landscape Plan**	28. Archaeological Resource Assessment Requirements: Dependent on results of screening form		2
S	**2**	29. **Survey Plan**	30. Shadow Analysis		3
S	**4**	31. **Architectural Building Elevation Drawings (dimensioned)**	32. **Design Brief (includes the Design Review Panel Submission Requirements)**	**S**	**3**
	6	33. Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	**3**	34. **Phase 1 Environmental Site Assessment**	35. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		6
S	**3**	36. **Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)**	37. Assessment of Landform Features		7
	4	38. Record of Site Condition	39. Mineral Resource Impact Assessment		3
S	**3**	40. **Tree Conservation Report**	41. Environmental Impact Statement / Impact Assessment of Endangered Species		2
S	**1**	42. **PDF copy of all plans and reports**	43. Lighting Study		

Meeting Date: June 18, 2021

Application Type(s): *Zoning By-law Amendment (Minor) and Site Plan Control (to be confirmed)*

File Lead: Seana Turkington

Infrastructure Approvals Project Manager: John Wu

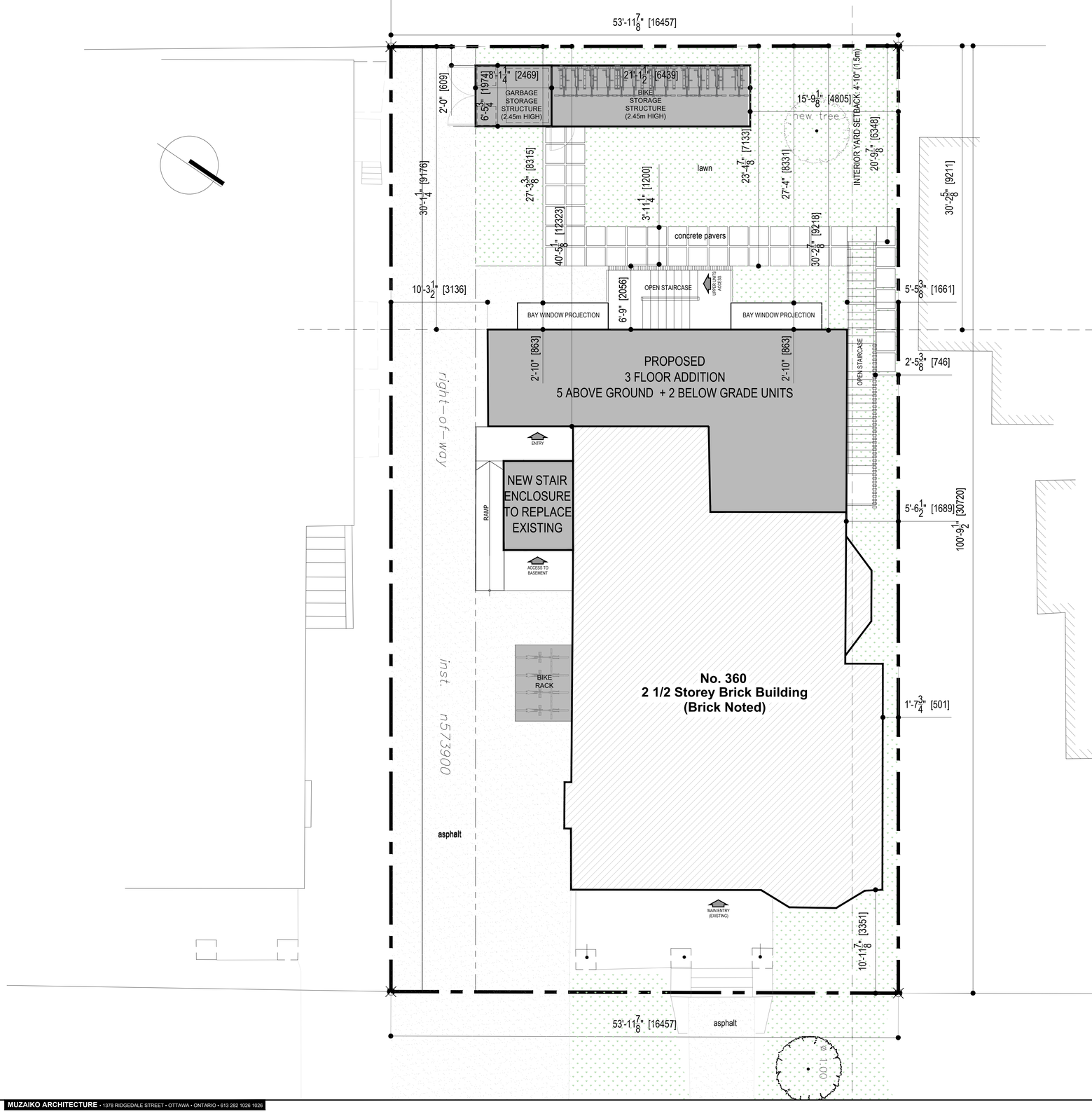
Site Address (Municipal Address): 360 Friel Street

*Preliminary Assessment: 1☐ 2☐ 3☐ 4☐ 5☐

*One (1) indicates that considerable major revisions are required before a planning application is submitted, while five (5) suggests that proposal appears to meet the City's key land use policies and guidelines. **This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.**

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, the Planning and Growth Management Department will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the Planning and Growth Management Department.

Muzaiko



DEVELOPED FROM

PART OF LOTS 23 AND 24
South Wilbrod Street
REGISTERED PLAN 6
CITY OF OTTAWA

Annis, O'Sullivan, Vollebekk Ltd. 2020

-5 0 10 20 ft

GRAPHIC SCALE FOR REFERENCE ONLY
ALL MEASUREMENTS ARE IMPERIAL WITH CORRESPONDING METRIC IN BRACKETS

ZONING: R4UD [480] - Proposed Use: Low-rise Apartment, 9 or more units

ZONING MECHANISM			REQUIRED	PROVIDED	COMMENTS
A) MINIMUM LOT AREA			450m²	504.8m²	exceeds by 54.8m² or 12%
B) MINIMUM LOT WIDTH			15m	16.5m	exceeds by 1.45m or 9.6%
C) MINIMUM LOT DEPTH			n/a	30.7m	
D) MINIMUM FRONT YARD SETBACK			4.5m	3.4m	existing building setback
E) MINIMUM INTERIOR SIDE YARD SETBACK	EXISTING PORTION		1.5m	0.5m	varies from 1.68 to 0.5m
	NEW ADDITION		1.5m	1.66m	
	OPEN STAIRCASE		1.0m	0.746m	relief required
F) MINIMUM REAR YARD AREA (see by-law provision amendments outlined below)	As per section 144 by-law no. 2020 - 289	AREA	151.4m²	151.4m²	based on 25% of lot area
G) MINIMUM REAR YARD SETBACK (see by-law provision amendments outlined below)	As per section 144 by-law no. 2020 - 289	DEPTH	9.2m	9.2m	based on 30% of lot depth
H) MAXIMUM BUILDING HEIGHT			14.5m	10.2m	exceeds by 4.3m or 30%
I) AMENITY AREA			n/a	n/a	
J) VEHICLE PARKING			0	1	
K) BICYCLE STORAGE	0.5 PER UNIT		8	16	12 interior + 4 exterior

Section 144 – Alternative Yard Setbacks for Low-rise Residential Uses in the Greenbelt for the minimum required rear yard setback. The rear yard must comprise at least 25 percent of the lot area; and the minimum rear yard setback is pursuant to Table 144A

PROPOSED SITE DEVELOPMENT INFO				COMMENTS
LOT AREA		504.8m²		
BUILDING HEIGHT		10.2m		
PARKING SPACES		2		
NUMBER OF STOREYS		3		
NUMBER OF UNITS		EXISTING	NEW	10 existing + 7 new
- BACHELOR UNITS		4	6	
- ONE-BEDROOM UNITS		2	0	
- TWO-BEDROOM UNITS		3	1	one barrier-free unit
LOT COVERAGE		44.6%		building footprint 225.2m²
SOFT LANDSCAPING COVERAGE	FRONT	34m²		
	REAR	61m²		
HARD LANDSCAPING		125m²		

GARBAGE MANAGEMENT REQUIREMENT		
	REQUIRED	PROVIDED
GARBAGE	0.231 cubic yards per unit: 16x0.231=3.696	1- 4 cubic yard garbage container
RECYCLING	for every 6 units provide 1 360L blue cart and 1 360L black cart	3-360L Blue carts and 3-360L Black carts
ORGANICS	container for each unit and 1 communal 240L green container per 50 units	container for each unit and 1 communal 240L green

Property owner will be responsible for the removal and storage of snow for all walkways, exterior stairs, and driveway throughout the winter

BUILDING AREA (gross areas)	EXISITNG	ADDITION	TOTAL
BASEMENT	136.0m²	56.1m²	192.1m²
GROUND FLOOR	136.1m²	56.1m²	192.2m²
SECOND FLOOR	130.6m²	56.1m²	186.7m²
THIRD FLOOR	108.8m²	56.1m²	164.9m²
TOTAL AREAS	511.3m²	224.4m²	735.9m²

01 SITEPLAN - Option B

-4 -2 0 2 4 10 ft

project north true north

G
F
E
D
C
B
A
issue description date

360 Friel Street
Proposed Addition

drawing title

SITEPLAN

drawn by	P.A.
scale	3/16"=1'-0"
date	2021.05.12
project number	-
drawing number	A0.1 _rev -

Alison Gosling

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: September 1, 2021 10:28 AM
To: Alison Gosling; Jamie Batchelor
Subject: RE: 22-1646 360 Friel Street - Quality Control Request

Hi Alison,

The RVCA has no additional on-site water quality protection requirements for the expansion proposed. Best management practices are provided where possible.

Thank you,

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

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: Tuesday, August 31, 2021 3:59 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>; Eric Lalande <eric.lalande@rvca.ca>
Subject: 22-1646 360 Friel Street - Quality Control Request

Good afternoon Jamie and Eric,

We wanted to touch base with you regarding the development at 360 Friel Street.

The property currently contains a residential building with surface parking along the side yard (south) and rear yard (west). The owner of 360 Friel Street is proposing to add a building addition to the existing building. As demonstrated by the attached site plan, the rear parking area will be converted to a building addition, bike storage shelter, and landscaped area. The driveway along the south side of the property is proposed to remain since it is shared with the neighbouring property owner.

Drainage from the subject site is collected by the 675mm storm sewer within Friel Street and travels approximately 750m downstream to the Rideau River. (see image below)

Quality controls are not anticipated for the development since the quality of water leaving the site will be improved from existing conditions. Can you please review and confirm?

Please let me know if you have any questions.

Thank you,

Alison Gosling, P.Eng.

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

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APPENDIX C
WATERMAIN CALCULATIONS

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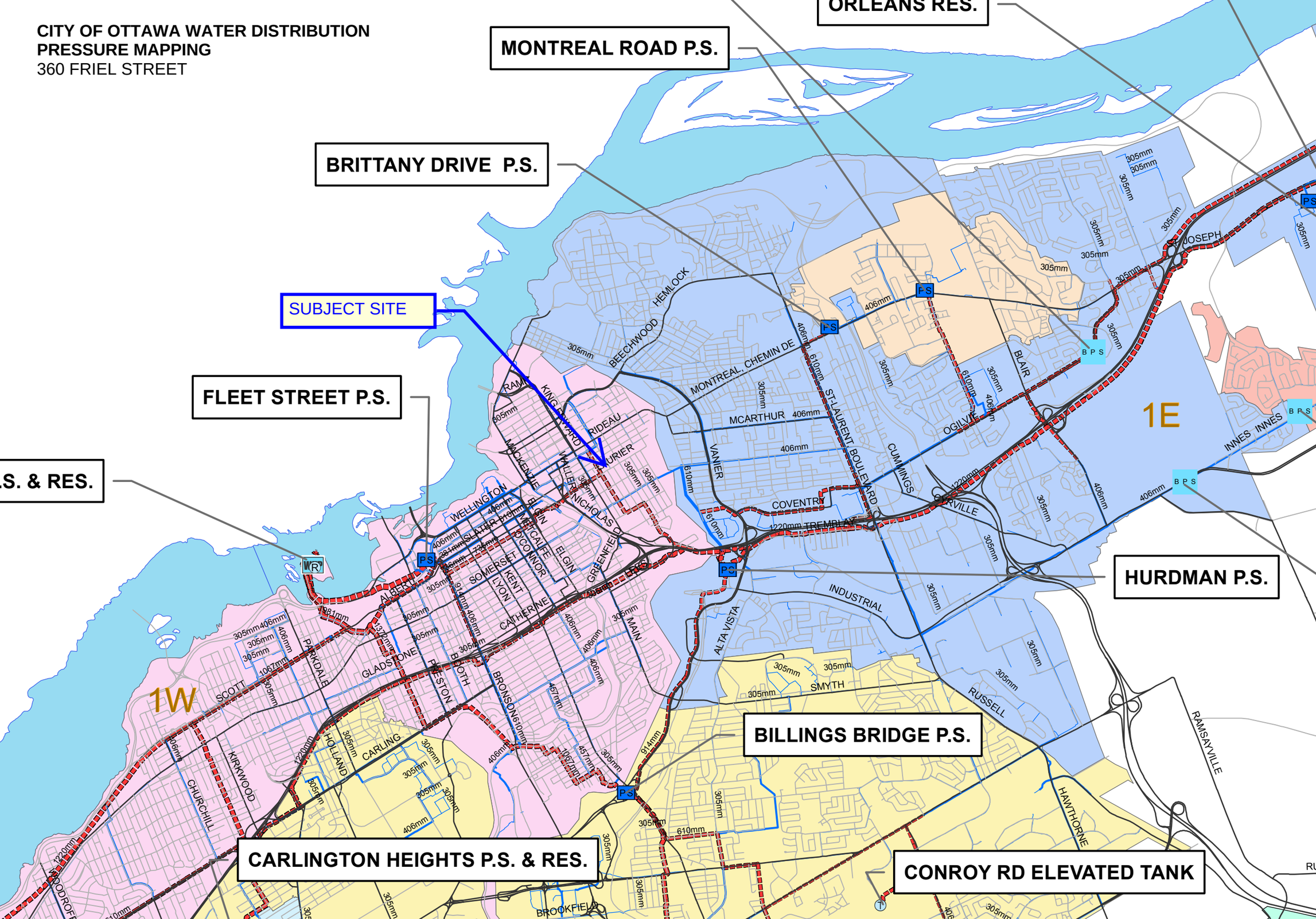
CITY OF OTTAWA WATER DISTRIBUTION
PRESSURE MAPPING
360 FRIEL STREET



McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - Existing Water Demands

Project:	360 Friel Street	
Project No.:	CCO-22-1646	
Designed By:	AJG	
Checked By:	AJG	
Date:	September 8, 2021	
Site Area:	0.05	gross ha
Units:	9	Units
Unit Rate:	1.8	Persons/unit
Persons:	17	People

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
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motel	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	**0.06**	**L/s**

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*9.5 x avg. day*	*L/c/d*
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d

MAXIMUM DAILY DEMAND	**0.52**	**L/s**

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*14.3 x avg. day*	*L/c/d*
Industrial	1.8 x max. day	L/gross ha/d
Commercial	1.8 x max. day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	**0.79**	**L/s**

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

McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - Proposed Water Demands

Project:	360 Friel Street	
Project No.:	CCO-22-1646	
Designed By:	AJG	
Checked By:	AJG	
Date:	September 8, 2021	
Site Area:	0.05	gross ha
Units:	7	Units
Unit Rate:	1.8	Persons/unit
Persons:	13	People

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
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motel	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	**0.04**	**L/s**

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*9.5 x avg. day*	*L/c/d*
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d

MAXIMUM DAILY DEMAND	**0.39**	**L/s**

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*14.3 x avg. day*	*L/c/d*
Industrial	1.8 x max. day	L/gross ha/d
Commercial	1.8 x max. day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	**0.58**	**L/s**

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

McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - Combined Water Demands

Project:	360 Friel Street		
Project No.:	CCO-22-1646		
Designed By:	AJG		
Checked By:	AJG		
Date:	September 8, 2021		
Site Area:	0.05	gross ha	
Units:	16	Units	** 9 Existing Units, 7 Proposed Units*
Unit Rate:	1.8	Persons/unit	
Persons:	29	People	

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
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motel	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	**0.09**	**L/s**

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*9.5 x avg. day*	*L/c/d*
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d

MAXIMUM DAILY DEMAND	**0.89**	**L/s**

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	*14.3 x avg. day*	*L/c/d*
Industrial	1.8 x max. day	L/gross ha/d
Commercial	1.8 x max. day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	**1.33**	**L/s**

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

McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - OBC Fire Calculations

Project:	360 Friel Street
Project No.:	CCO-22-1646
Designed By:	AJG
Checked By:	AJG
Date:	September 8, 2021

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

***Water Supply for Fire-Fighting* - Residential**

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

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

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres

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

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

K	**23**	(from Table 1 pg A-31) (Worst case occupancy {E / F2} 'K' value used)
V	**1,326**	(Total building volume in m^3.)
Stot	**2.0**	(From figure 1 pg A-32)
Q =	**60,996.09 L**	

			From Figure 1 (A-32)
Snorth	0.50	m	0.5
Seast	3.35	m	0.5
Ssouth	3.14	m	0.5
Swest	9.18	m	0.1

*approximate distances

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

2700 L/min (if Q <108,000 L)
713 gpm

McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - Fire Underwriters Survey

Project:	360 Friel Street
Project No.:	CCO-22-1646
Designed By:	AJG
Checked By:	AJG
Date:	September 8, 2021

From the Fire Underwriters Survey (1999)

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

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

F = 220 x C x √A Where:

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

Construction Type Wood Frame

C 1.5 **A** **543.8** m^2

Caluclated Fire Flow	**7,695.4 L/min**
	8,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

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

Combustible 0%

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

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Non-Sprinklered 0%

Reduction	**0.0 L/min**

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons.of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1 (N)	0 to 3	Ordinary (Semi-Protected Openings)	7.5	3	22.5	16%
Exposure 2 (E)	20.1 to 30	Ordinary (Semi-Protected Openings)	13	3	0.0	4%
Exposure 3 (S)	3.1 to 10	Ordinary (Semi-Protected Openings)	28	3	84.0	14%
Exposure 4 (W)	10.1 to 20	Ordinary (Semi-Protected Openings)	13	4	52.0	8%
					% Increase*	**42%**

Increase*	**3,360.0 L/min**

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

Fire Flow	**11,360.0 L/min**
Fire Flow Required**	**11,000.0 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-22-1646 - 360 Friel Street - Boundary Condition Unit Conversion

Project:	360 Friel Street
Project No.:	CCO-22-1646
Designed By:	AJG
Checked By:	AJG
Date:	September 8, 2021

Boundary Conditions Unit Conversion

FRIEL STREET

Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	115.4	69.83	45.6	64.8	447.0
Fire Flow (183.3 L/s or 11,000 L/min)	107.9	69.83	38.1	54.2	373.5
Peak Hour	106.1	69.83	36.3	51.6	355.8

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info@mcintoshperry.com | www.mcintoshperry.com

Alison Gosling

From: Wu, John <John.Wu@ottawa.ca>
Sent: September 2, 2021 1:56 PM
To: Alison Gosling
Subject: RE: 22-1646 360 Friel - Boundary Condition Request
Attachments: 360 Friel Street September 2021.pdf

Here is the result:

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 360 Friel Street (zone 1W) assumed connected to the 305 mm watermain on Friel Street (see attached PDF for location).

Minimum HGL: 106.1 m

Maximum HGL: 115.4 m

Max Day + FF (183.3 L/s): 107.9 m

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

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

John

From: Alison Gosling <a.gosling@mcintoshperry.com>
Sent: August 26, 2021 10:59 AM
To: Wu, John <John.Wu@ottawa.ca>
Subject: 22-1646 360 Friel - Boundary Condition Request

Good morning John,

We would like to request boundary conditions for 360 Friel Street. The proposed development is a 3-storey 7-unit residential building addition to the existing 3-storey 9-unit residential building.

- The estimated fire flow is 11,000 L/min, based on the FUS calculations (attached).

- The estimated fire flow is 9,000 L/min, based on the OBC calculations (attached).
- Average daily demand: 0.04 L/s OR 0.09 L/s with the existing building demand.
- Maximum daily demand: 0.39 L/s OR 0.89 L/s with the existing building demand.
- Maximum hourly daily demand: 0.58 L/s OR 1.33 L/s with the existing building demand.

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

If there are any questions, please feel free to contact me.

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
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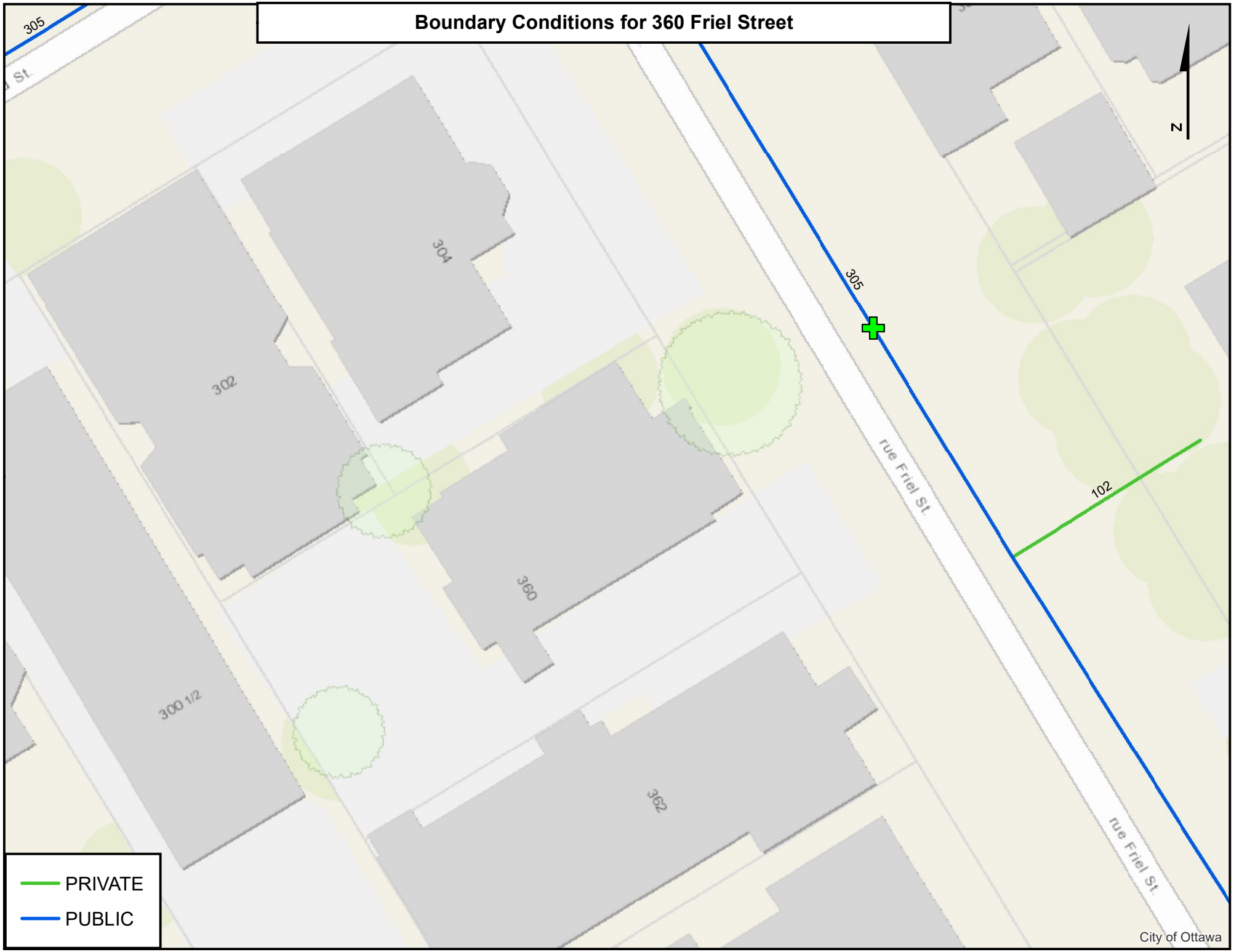
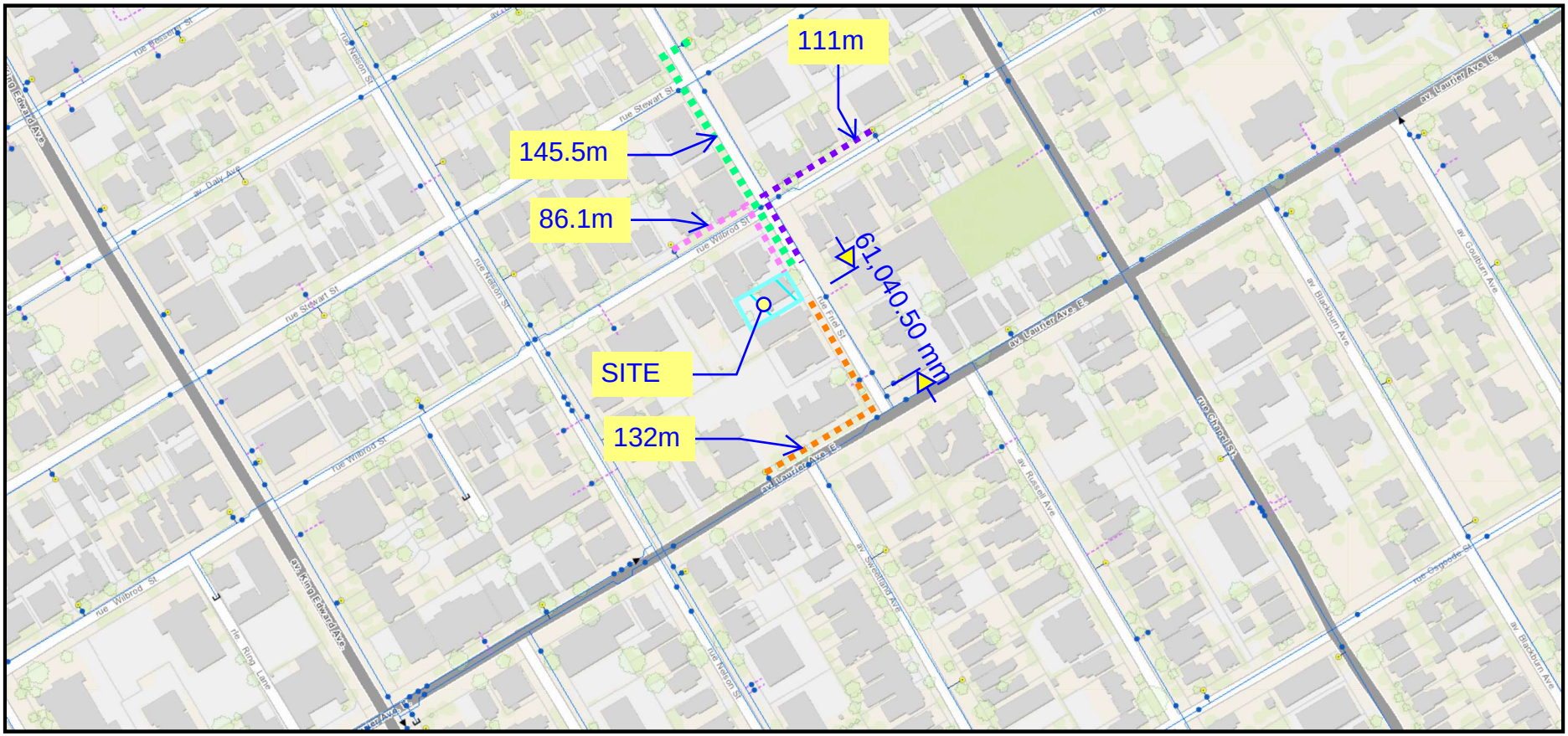

Boundary Conditions for 360 Friel Street
305
St.
304
302
360
300 1/2
362
305
rue Friel St.
102
rue Friel St.
N
PRIVATE
PUBLIC
City of Ottawa

360 Friel Street
Hydrant Coverage Figure



Number of Hydrants	Distance
1	<75m
4	75m-150m

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

2021-08-31

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-22-1646 - 360 Friel Street - Sanitary Demands

Project:	360 Friel Street
Project No.:	CCO-22-1646
Designed By:	AJG
Checked By:	AJG
Date:	September 1, 2021

Site Area	**0.05**	**Gross ha**		
Average Apartment	**9**	**1.80**	**Persons per unit**	**** Existing Building***
Average Apartment	**7**	**1.80**	**Persons per unit**	**** Proposed Addition***

Total Population	29	Persons
Commercial Area	0.00	m^2
Amenity Space	0.00	m^2

DESIGN PARAMETERS

Institutional/Commercial Peaking Facto	1.5	
Residential Peaking Factor	3.69	** 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	0.002
Wet	0.014
Total	**0.016**

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	***280***	***L/c/d***	***29***	***0.09***
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

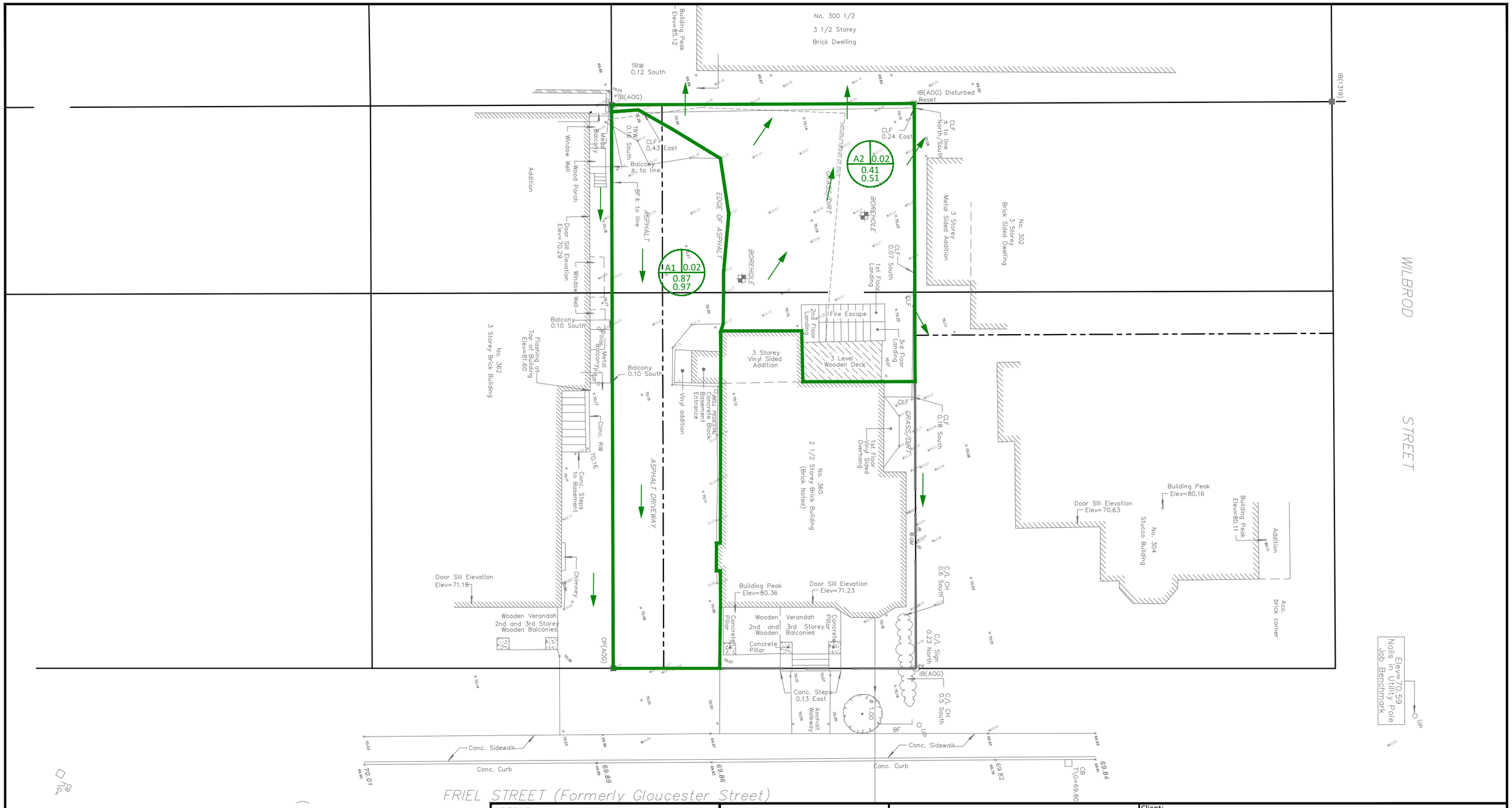
AVERAGE RESIDENTIAL FLOW	0.09	L/s
PEAK RESIDENTIAL FLOW	0.35	L/s
AVERAGE ICI FLOW	0.00	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.00	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.00	L/s

TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.10	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	0.35	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	0.36	L/s

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



SCALE 1 : 200

0 10 20 Metres

LEGEND

AREA I.D. — DRAINAGE AREA (ha)

A1 | 0.50
0.20
0.25

DRAINAGE COEFFICIENT
5-YEAR
100-YEAR

EXISTING DRAINAGE DIRECTION

N

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Client: SMART LIVING PROPERTIES
226 ARGYLE AVE. OTTAWA, ON K2P 1B9

Project: 360 FRIEL STREET
OTTAWA, ON

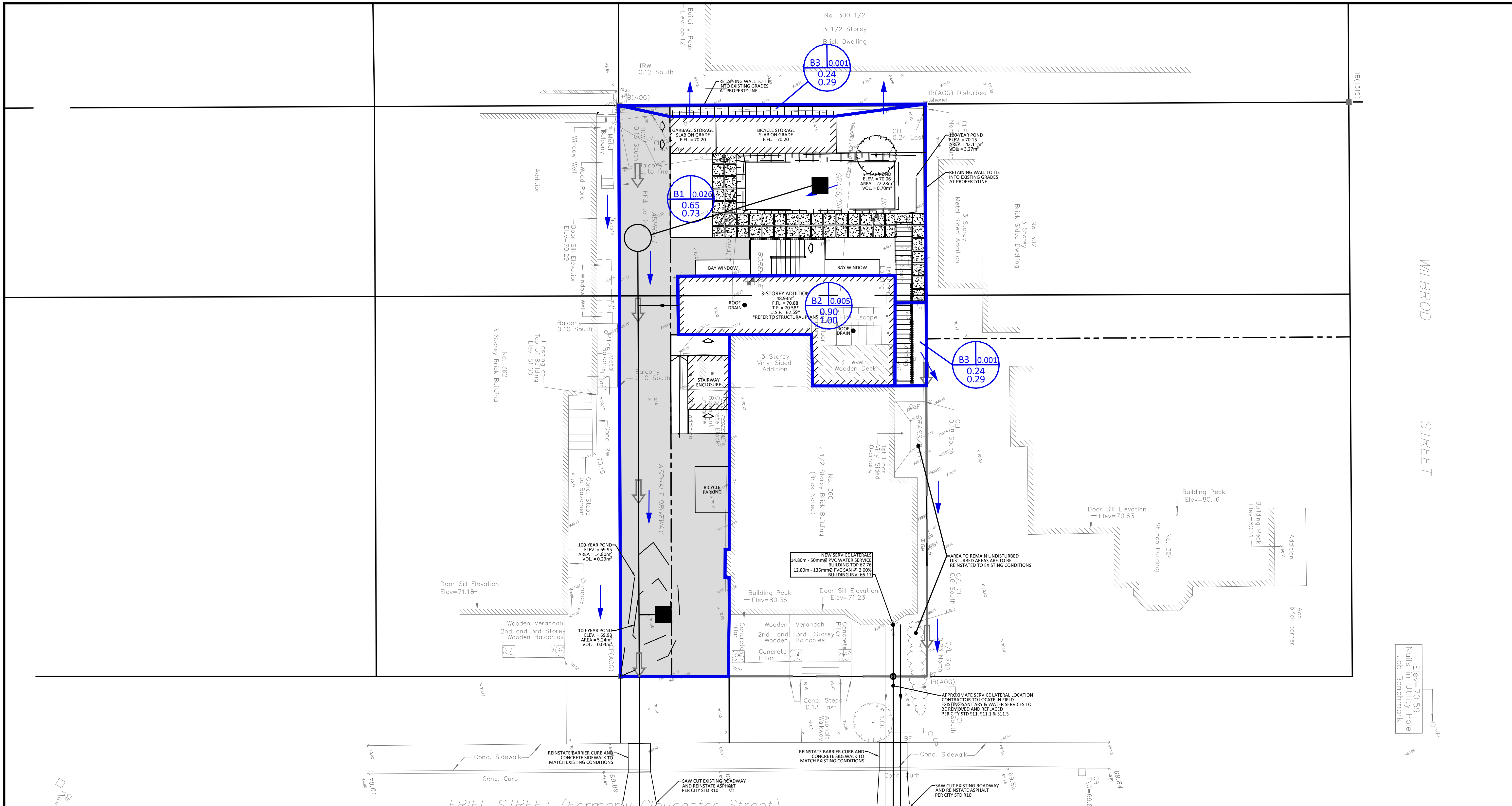
Drawing Title: PRE-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:			Drawing Number:
P.G.K.	A.J.G.			PRE
Scale: 1:200	Project Number: CCO-22-1646	1	ISSUED FOR SITE PLAN CONTROL	SEP. 16, 2021
		No.	Revisions	Date

FILENAME: U:\Ottawa\01 Project - Proposals\2022 Jobs\CCO\CCO-22-1646 Smart Living_Apartment_360 Friel Street\12 - Drawings\CCO-22-1646 - PRESENTATION.dwg
LAST SAVED: Thursday, September 16, 2021 11:47 AM BY: p.kamtsis
LAST PLOTTED: Thursday, September 16, 2021 12:08 PM BY: p.kamtsis

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



SCALE 1 : 200

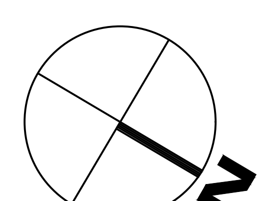
0 10 20 Metres

LEGEND

AREA I.D. — A1 0.50 — DRAINAGE AREA (ha)

0.20 / 0.25 — DRAINAGE COEFFICIENT 5-YEAR 100-YEAR

PROPOSED DRAINAGE DIRECTION



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Client: SMART LIVING PROPERTIES
226 ARGYLE AVE. OTTAWA, ON K2P 1B9

Project: 360 FRIEL STREET
OTTAWA, ON

Drawing Title: POST-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:
P.G.K.	A.J.G.
Scale: 1:200	Project Number: CCO-22-1646

No.	Revisions	Date
1	ISSUED FOR SITE PLAN CONTROL	SEP. 16, 2021

Drawing Number: POST

FILENAME: U:\Ottawa\01 Project - Proposals\2022 Jobs\CCO\CCO-22-1646 Smart Living_Apartment_360 Friel Street\12 - Drawings\CCO-22-1646 - PRESENTATION.dwg
LAST SAVED: Thursday, September 16, 2021 LAST SAVED BY: p.kirkimtzis
LAST PLOTTED: Thursday, September 16, 2021 CTB FILE USED: ----

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

CCO-22-1646 - Smart Living Apartment - 360 Friel Street

Tc (min)	Intensity (mm/hr)		
	5-Year	100-Year	
10	104.2	178.6	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	163.35	7.36	3.67	0.87	0.97
A2	0.00	79.43	73.17	0.41	0.51

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.017	0.87	0.97	10	4.41	8.43
A2	0.015	0.41	0.51	10	1.80	3.87
Total	**0.033**				**6.21**	**12.29**

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	167.85	0.00	94.95	0.65	0.73
B2	48.93	0.00	0.00	0.90	1.00
B3	0.84	0.00	14.51	0.24	0.29

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
B1	0.026	0.65	0.73	10	4.93	9.51
B2	0.005	0.90	1.00	10	1.28	2.43
B3	0.002	0.24	0.29	10	0.11	0.22
Total	**0.033**				**6.31**	**12.16**

Required Restricted Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	Q (L/s)
				5-Year
A1	0.033	0.50	10	4.74

*City of Ottawa allowable 100-year flow to be controlled to 5-year event at Tc = 10min and max. C = 0.50

Post-Development Restricted Runoff Calculations

Drainage Area	Unrestricted Flow (L/S)		Restricted Flow (L/S)		Storage Required (m^3)		Storage Provided (m^3)	
	5-year	100-Year	5-Year	100-Year	5-Year	100-Year	5-Year	100-Year
B1	4.93	9.51	3.74	3.80	0.71	3.48	0.74	3.50
B2	1.28	2.43	0.60	0.72	0.41	1.11	0.84	1.11
B3	0.11	0.22	0.11	0.22	-	-	-	-
Total	**6.31**	**12.16**	**4.45**	**4.74**	**1.12**	**4.59**	**1.58**	**4.61**

CCO-22-1646 - Smart Living Apartment - 360 Friel Street

Storage Requirements for Area B1

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	4.93	3.74	1.19	0.71
11	99.2	4.69	3.74	0.95	0.63
12	94.7	4.48	3.74	0.74	0.53
13	90.6	4.28	3.74	0.54	0.42
14	86.9	4.11	3.74	0.37	0.31
15	83.6	3.95	3.74	0.21	0.19
16	80.5	3.81	3.74	0.07	0.06

Maximum Storage Required 5-year =	0.71 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	9.51	3.80	5.71	3.43
11	169.9	9.05	3.80	5.25	3.46
12	162.1	8.63	3.80	4.83	3.48
13	155.1	8.26	3.80	4.46	3.48
14	148.7	7.92	3.80	4.12	3.46
15	142.9	7.61	3.80	3.81	3.43
16	137.5	7.32	3.80	3.52	3.38

Maximum Storage Required 100-year =	3.48 m^3

5-Year Storm Event Surface Ponding Storage Summary

Location	Area (m^2)	Depth (m)	Head (m)	Volume (m^3)
CB1	22.28	0.06	1.66	0.70
CB2	5.24	0.02	1.62	0.04

Storage Available (m^3) =	0.74
Storage Required (m^3) =	0.71

100-Year Storm Event Surface Ponding Storage Summary

Location	Area (m^2)	Depth (m)	Head (m)	Volume (m^3)
CB1	43.11	0.15	1.75	3.27
CB2	14.80	0.04	1.64	0.23

Storage Available (m^3) =	3.50
Storage Required (m^3) =	3.48

CCO-22-1646 - Smart Living Apartment - 360 Friel Street

For Orifice Flow, C= 0.60
For Weir Flow, C= 1.84

	Orifice 1	Orifice 2
invert elevation	68.30	68.21
center of crest elevation	68.40	68.31
orifice width / weir length	26 mm	26 mm
weir height	X	X
orifice area (m^2)	0.001	0.001

Elevation Discharge Table - Storm Routing

Elevation	Orifice 1		Orifice 2		Orifice 1	Orifice 2	
	H [m]	Q [m^3/s]	H [m]	Q [m^3/s]	Q [L/s]	Q [L/s]	
69.80	1.40	0.002	1.49	0.00	1.73	1.78	
69.81	1.41	0.002	1.50	0.00	1.74	1.79	
69.82	1.42	0.002	1.51	0.00	1.74	1.80	
69.83	1.43	0.002	1.52	0.00	1.75	1.80	
69.84	1.44	0.002	1.53	0.00	1.75	1.81	
69.85	1.45	0.002	1.54	0.00	1.76	1.81	
69.86	1.46	0.002	1.55	0.00	1.77	1.82	
69.87	1.47	0.002	1.56	0.00	1.77	1.83	
69.88	1.48	0.002	1.57	0.00	1.78	1.83	
69.89	1.49	0.002	1.58	0.00	1.78	1.84	
69.90	1.50	0.002	1.59	0.00	1.79	1.84	
69.91	1.51	0.002	1.60	0.00	1.80	1.85	
69.92	1.52	0.002	1.61	0.00	1.80	1.85	
69.93	1.53	0.002	1.62	0.00	1.81	**1.86**	**CB2 - 5 year**
69.94	1.54	0.002	1.63	0.00	1.81	1.87	
69.95	1.55	0.002	1.64	0.00	1.82	**1.87**	**CB2 - 100 year**
69.96	1.56	0.002	1.65	0.00	1.83	1.88	
69.97	1.57	0.002	1.66	0.00	1.83	1.88	
69.98	1.58	0.002	1.67	0.00	1.84	1.89	
69.99	1.59	0.002	1.68	0.00	1.84	1.89	
70.00	1.60	0.002	1.69	0.00	1.85	1.90	
70.01	1.61	0.002	1.70	0.00	1.85	1.91	
70.02	1.62	0.002	1.71	0.00	1.86	1.91	
70.03	1.63	0.002	1.72	0.00	1.87	1.92	
70.04	1.64	0.002	1.73	0.00	1.87	1.92	
70.05	1.65	0.002	1.74	0.00	1.88	1.93	
70.06	1.66	0.002	1.75	0.00	**1.88**	1.93	**CB1 - 5 year**
70.07	1.67	0.002	1.76	0.00	1.89	1.94	
70.08	1.68	0.002	1.77	0.00	1.89	1.94	
70.09	1.69	0.002	1.78	0.00	1.90	1.95	
70.10	1.70	0.002	1.79	0.00	1.91	1.96	
70.11	1.71	0.002	1.80	0.00	1.91	1.96	
70.12	1.72	0.002	1.81	0.00	1.92	1.97	
70.13	1.73	0.002	1.82	0.00	1.92	1.97	
70.14	1.74	0.002	1.83	0.00	1.93	1.98	
70.15	1.75	0.002	1.84	0.00	**1.93**	1.98	**CB1 - 100 year**
70.16	1.76	0.002	1.85	0.00	1.94	1.99	

Notes:
1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.
2. Orifice Equation: $Q = cA(2gh)^{1/2}$
3. Weir Equation: $Q = CLH^{3/2}$
4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.
5. H for orifice equations is depth of water above the centroide of the orifice.
6. H for weir equations is depth of water above the weir crest.

Storage Requirements for Area B2

5-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	1.28	0.60	0.68	0.41
11	99.2	1.21	0.60	0.61	0.41
12	94.7	1.16	0.60	0.56	0.40
13	90.6	1.11	0.60	0.51	0.40
14	86.9	1.06	0.60	0.46	0.39
15	83.6	1.02	0.60	0.42	0.38
16	80.5	0.99	0.60	0.39	0.37

Maximum Storage Required 5-year =	0.41 m^3

100-Year Storm Event

Tc (min)	I (mm/hr)	Runoff (L/s) B2	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
14	148.7	2.02	0.72	1.30	1.09
15	142.9	1.94	0.72	1.22	1.10
16	137.5	1.87	0.72	1.15	1.10
17	132.6	1.80	0.72	1.08	1.11
18	128.1	1.74	0.72	1.02	1.10
19	123.9	1.69	0.72	0.97	1.10
20	120.0	1.63	0.72	0.91	1.09

Maximum Storage Required 100-year =	1.11 m^3

5-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Drain 1	16.89	0.025	0.42
Drain 2	16.89	0.025	0.42

Storage Available (m^3) =	0.84
Storage Required (m^3) =	0.41

100-Year Storm Event Storage Summary

Roof Storage			
Location	Area*	Depth	Volume (m^3)
Drain 1	16.89	0.030	0.51
Drain 2	19.82	0.030	0.59

Storage Available (m^3) =	1.11
Storage Required (m^3) =	1.11

*Area is 75% of the total roof area

Roof Drain Flow B2

Roof Drains Summary		
Type of Control Device	Watts Drianage - Accutrol Weir	
Number of Roof Drians	2	
	5-Year	100-Year
Rooftop Storage (m^3)	0.84	1.11
Storage Depth (mm)	0.025	0.030
Flow (Per Roof Drain) (L/s)	0.30	0.36
Total Flow (L/s)	0.60	0.72

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

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

CALCULATING ROOF FLOW EXAMPLES

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

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

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

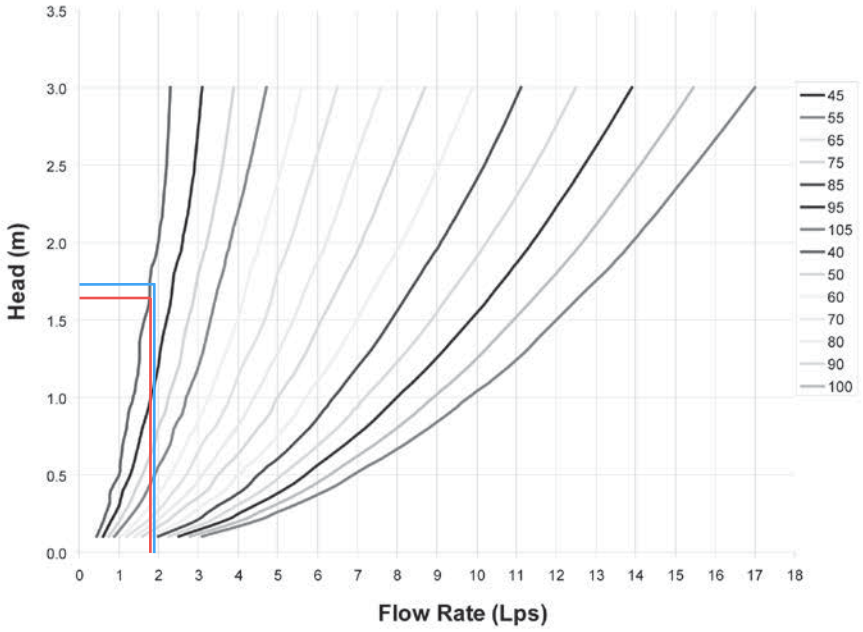
4 roof drains during a 100 year storm
elevation of water = 50mm
Flow leaving 4 roof drains = (4 x 0.60 L/s) = 2.40 L/s

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

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

CB1 Orifice Sizing

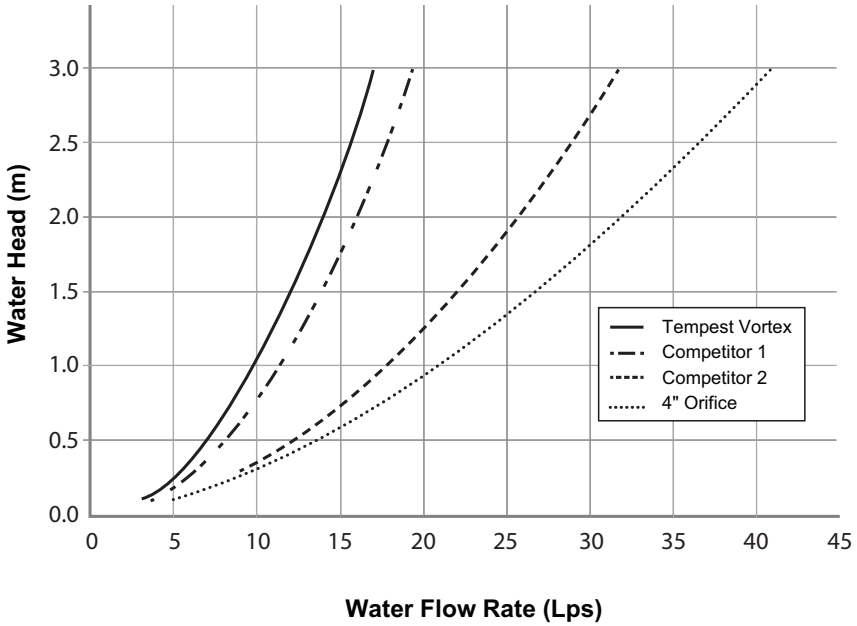
Chart 1: LMF 14 Preset Flow Curves



5-Year Storm Event

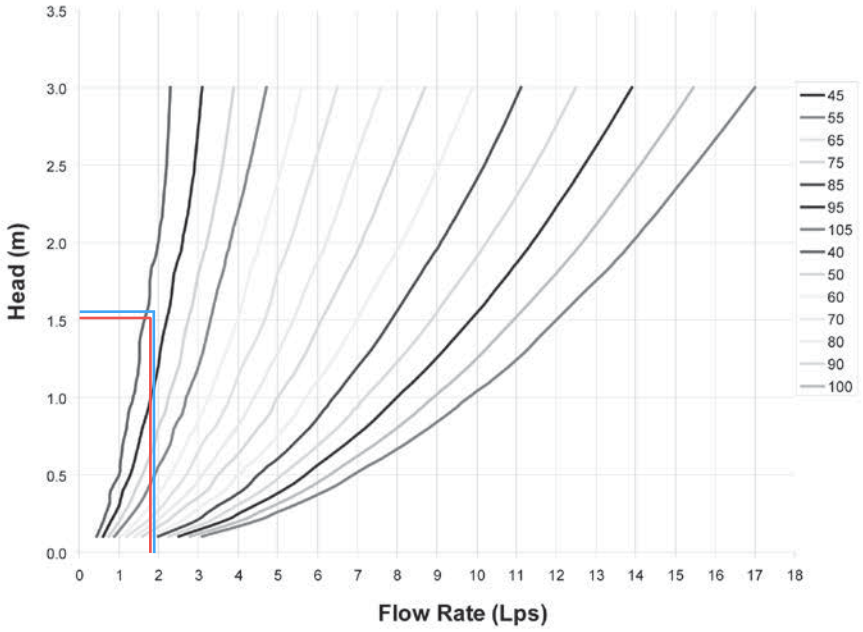
100-Year Storm Event

Chart 2: LMF Flow vs. ICD Alternatives



CB2 Orifice Sizing

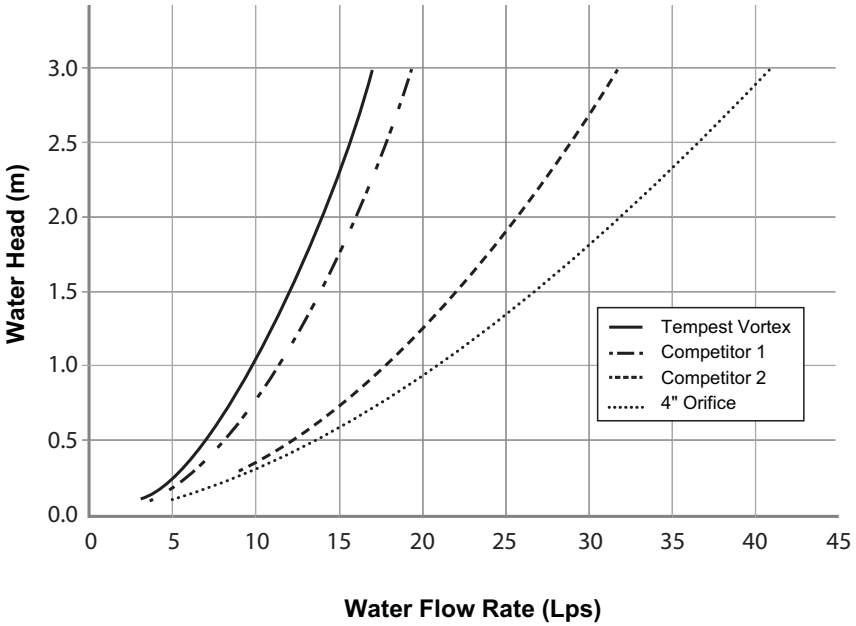
Chart 1: LMF 14 Preset Flow Curves



5-Year Storm Event

100-Year Storm Event

Chart 2: LMF Flow vs. ICD Alternatives



APPENDIX H
CITY OF OTTAWA DESIGN CHECKLIST

McINTOSH PERRY

City of Ottawa

4. Development Servicing Study Checklist

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

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

4.1 General Content

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

☐ Identification of existing and proposed infrastructure available in the immediate area.	N/A
☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Site Grading Plan (C101)
☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Site Grading Plan (C101)
☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐ Proposed phasing of the development, if applicable.	N/A
☐ Reference to geotechnical studies and recommendations concerning servicing.	Section 2.0 Background Studies, Standards and References
☐ All preliminary and formal site plan submissions should have the following information: ○ Metric scale ○ North arrow (including construction North) ○ Key plan ○ Name and contact information of applicant and property owner ○ Property limits including bearings and dimensions ○ Existing and proposed structures and parking areas ○ Easements, road widening and rights-of-way ○ Adjacent street names	Site Grading Plan (C101)

4.2 Development Servicing Report: Water

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

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

4.3 Development Servicing Report: Wastewater

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

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

4.4 Development Servicing Report: Stormwater Checklist

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

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

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

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

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