SERVICING & STORMWATER MANAGEMENT REPORT
1 FINCH PRIVATE

Project No.: CCO-23-1408

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

Prepared for:

CSV Architects
190 O'Connor Street
Ottawa, Ontario
K2P 2R3

Prepared by:

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May 12th, 2023

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1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by CSV Architects to prepare this Servicing and Stormwater Management Report in support of the Site Plan Control process for the proposed development located at 1 Finch Private 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 and available services will adequately service the proposed development.

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

- CCO-23-1408, C101 – Removals, Erosion & Sediment Control Plan
- CCO-23-1408, C101 – Lot Grading, Drainage & Servicing Plan
- CCO-23-1408, PRE – Pre-Development Drainage Plan (Appendix E)
- CCO-23-1408, POST – Post-Development Drainage Plan (Appendix F)

1.2 Site Description

Figure 1: Site Map

The subject property, herein referred to as the site, is located at 1 Finch Private the River Ward. The site covers approximately 0.25 ha and is located at the corner of Finch Private and Pinson Private. The site is zoned for Residential Fifth Density (R5B H(18)). See Site Location Plan in Appendix 'A' for more details.

1.3 Proposed Development and Statistics

The proposed development consists of the addition of a 6-storey 45-unit apartment building, Development is proposed within 0.17 ha of the site. Refer to Site Plan prepared by CSV Architects and included in Appendix B for further details.

1.4 Existing Conditions and Infrastructures

The site is currently developed containing a 6-unit townhouse block. The townhouse block will 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 rights-of-way(s):

- Pinson Private
  - 150 mm diameter watermain, a
  - 200 mm diameter sanitary sewer, and a
  - 300 mm diameter concrete storm sewer, tributary to Sawmill Creek approximately 1.7km downstream.

1.5 Approvals

The proposed development is subject to the City of Ottawa site plan control approval process. Site plan control requires the City to review, 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 since the proposed storm sewer system services one parcel of land and industrial use is not proposed.

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 proposed site were reviewed in order to identify infrastructure available to service the proposed development.

A topographic survey (V22200) of the site was completed by Farley, Smith & Denis Surveying LTD. and dated December 4th, 2020.

The Site Plan (A100) was prepared by CSV Architects (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-2018-04 City of Ottawa, March 2018. (ISTB-2018-04)
  - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. (ISTB-2019-02)
- Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. (Ottawa Water Guidelines)
  - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. (ISD-2010-2)
  - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. (ISDTB-2014-02)
  - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. (ISTB-2018-02)
  - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. (ISTB-2021-03)

Ministry of Environment, Conservation and Parks:

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

Other:

- Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. (FUS Guidelines)

3.0 PRE-CONSULTATION SUMMARY

A pre-consultation meeting was held with City staff on February 9th, 2023 regarding the proposed site servicing. Specific design parameters to be incorporated within this design include the following:

- Pre-development and post-development flows shall be calculated using a time of concentration (Tc) no less than 10 minutes.
- The building shall provide roof storage to capture up to and including the 100-year event to the pre-existing 5-year storm release rate. The storm water in soft landscaped areas may be uncontrolled and shall be retained on site.

4.0 WATERMAIN

4.1 Existing Watermain

The site is located within the 2W2C pressure zone, as per the Water Distribution System mapping included in Appendix C. There are three privately owned fire hydrants available to service the proposed development, located along Finch Private and Pinson Private.

4.2 Proposed Watermain

It is proposed to service the new building with a 150 mm diameter water service connected to the proposed upgraded 200mm diameter water main within Pinson Private.

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	0.17 ha
Residential	280 L/day/person
Residential Apartment – 1 Bedroom	1.4 person/unit
Residential Apartment – 2 Bedroom	2.1 person/unit
Residential Apartment – 3 Bedroom	3.1 person/unit
Max Day Peaking Factor - Residential	6.5 x avg. day
Peak Hour Peaking Factor - Residential	9.8 x avg. day

The OBC and Fire Underwriters Survey 2020 (FUS) methods were utilized to estimate the required fire flow for the proposed building. Fire flow requirements were calculated per City of Ottawa Technical Bulletin ISTB-2018-02. The following parameters were coordinated with the architect:

FUS:

- Type of construction – Non-Combustible Construction
- Occupancy Type – Limited Combustible
- Sprinkler Protection – Standard Sprinkler System

OBC:

- Type of construction – Non-Combustible Construction
- Occupancy Type: Group C
- Water Supply Coefficient (K): 10

The results of the FUS calculations yielded a maximum required fire flow of 10,000 L/min (166.67 L/s), and the results of the OBC calculations yielded a maximum required fire flow of 9,000 L/min (150.0 L/s). The detailed calculations for the FUS and OBC can be found in Appendix C.

Boundary conditions have been provided by the City of Ottawa for the current conditions and are available in Appendix 'C'. A water model was completed using Bentley's WaterCAD based on the boundary conditions. The results determined that the existing 150mm watermain cannot adequately service the proposed development and provide sufficient fire flow. As seen in Table 2, below, the maximum available fire flow at Junction 5 is 70.14 L/s @ 20psi, while the required fire flow is 166.67 L/s. Given the FUS fire demand of the existing townhouse blocks is estimated to be 7,000 – 8,000 L/min, it is assumed that the existing development is underserviced with regards to fire flow. The results of the water model are available in Appendix 'C' of this report.

Table 2: Available Fire Flow at 20psi (Existing Conditions)

Junction	Required Fire flow (L/s)	Available Fire Flow @ 20psi (L/s)
J-5 (BLDG)	166.67	70.14

To improve the available fire flow, a second water model was completed which proposes extending a new 200 mm diameter watermain from the 305mm watermain within Uplands Drive. The new 200 mm diameter watermain will be extended along Finch Private and connect to the existing 150mm diameter watermain to form a loop. Refer to drawing C103 and the water model figure included in Appendix 'C'. The results of the water model indicated that fire flows can be met with the new 200mm watermain connection to the existing 150 mm diameter watermain. The proposed building will require a service connection to the upgraded 200 mm diameter watermain, therefore a section of the existing 150 mm diameter watermain will need to be upsized as well. The results of the model are shown in Table 3, below.

Table 3: Available Fire Flow at 20psi (Proposed Loop)

Junction	Required Fire flow (L/s)	Available Fire Flow @ 20psi (L/s)
J-5 (BLDG)	166.67	181.02

To confirm the adequacy of fire flow to protect the proposed development, existing hydrants within 150 m of the proposed building were analysed per City of Ottawa ISTB 2018-02 Appendix I Table 1. The results are summarized below.

Table 4: Fire Protection Confirmation

Building	Fire Flow Demand (L/min.)	Fire Hydrant(s) within 75m (5,700 L/min)	Fire Hydrant(s) within 150m (3,800 L/min)
1 Finch Private	9,000 (OBC) 10,000 (FUS)	1 Private	2 Private

Based on City guidelines (ISTB-2018-02), the existing hydrants provide adequate protection for the proposed development. A hydrant coverage figure can be found in Appendix C.

5.0 SANITARY DESIGN

5.1 Existing Sanitary Sewer

There is an existing 200 mm diameter sanitary sewer located within Pinson Private available to service the proposed development.

5.2 Proposed Sanitary Sewer

A new 150 mm diameter gravity sanitary service will be extended from the 200 mm diameter sanitary main within Pinson Private to service the proposed building, complete with a monitoring maintenance hole located just inside the property line.

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

Table 5: Sanitary Design Criteria

Design Parameter	Value
Site Area	0.17ha
Residential	280 L/person/day
1 Bedroom Apartment	1.4 persons/unit
2 Bedroom Apartment	2.7 persons/unit
3 Bedroom Apartment	3.1 persons/unit
Residential Peaking Factor	3.59
Extraneous Flow Allowance	0.33 L/s/ha
Estimated Population	109 persons

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	0.36
Total Estimated Peak Dry Weather Flow	1.28
Total Estimated Peak Wet Weather Flow	1.32

As noted above, the development is proposed to be serviced via a proposed 150 mm sanitary service connection to the 200 mm sanitary sewer within Pinson Private.

The full flowing capacity of a 150 mm diameter service at 1.0% slope is estimated to be 15.89 L/s. Per Table 6, a peak wet weather flow of 1.32 L/s will be conveyed within the 150 mm diameter service, therefore the proposed system is sufficiently sized for the development.

The full flowing capacity of the existing 200 mm diameter sanitary sewer at 0.96% slope is estimated to be 33.53 L/s. Per Table 6, the proposed development will only occupy 3.9% of the sewer capacity, therefore capacity issues are not anticipated. Due to the complexity of the downstream network the City will need to advise of any downstream constraints.

6.0 STORM SEWER DESIGN

6.1 Existing Storm Sewers

Stormwater runoff from the existing site flows overland towards Pinson Private and towards an existing swale east of the site. Runoff is conveyed via an existing private 300 mm diameter storm sewer to the existing 750mm storm sewer within Uplands Drive, where it travels approximately 1.7km before discharging to Sawmill Creek.

6.2 Proposed Storm Sewers

The proposed development will be serviced through a new 300 mm storm service connection to the existing 300 mm diameter storm sewer within Pinson Private.

Foundation drainage is proposed to be conveyed via the proposed 300 mm storm service, complete with a backwater valve.

Runoff collected on the roof of the proposed building will be stored and controlled internally using 7 roof drains. The roof drains will be used to limit the flow from the roof to the specified allowable release rate. Roof drainage will be directed to the proposed 300 mm diameter storm service, downstream of the backflow preventer. For calculation purposes a Watts Accutrol roof drain in the open position was used to estimate a reasonable roof flow. Other products may be specified at detailed building design provided release rates and storage volumes are respected.

See CCO-23-1408 - 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 PROPOSED STORMWATER MANAGEMENT

7.1 Design Criteria and Methodology

As per Section 6.2, stormwater management for the proposed development will be provided by rooftop storage. The controlled stormwater flow will be directed to the existing 300 mm diameter storm sewer within Pinson Private. Stormwater management will account for the proposed development area of 0.17 ha, and drainage considerations for the remainder of the site will be incorporated into the grading design.

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

Quality Control

- Quality controls are not anticipated to be required as the majority of runoff will be roof flow, which is considered clean.

Quantity Control

- Any storm events greater than the 5-year, up to 100-year, and including 100-year storm event must be detained on the roof.
- Post-development roof flow to be restricted to the 5-year storm event, based on a calculated time of concentration of at least 10 minutes and a combined maximum rational method coefficient of 0.50. Refer to Section 7.2 for further details.

7.2 Runoff Calculations

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

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

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

7.3 Pre-Development Drainage

It has been assumed that the development area contains no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 5-, and 100-year events are summarized below in Table 7. See CCO-23-1408 - PRE in Appendix E and Appendix G for calculations.

Table 7: Pre-Development Runoff Summary

Drainage Area	Area (ha)	C 5 & 100-Year	Q (L/s)	
			5-Year	100-Year
A1	0.17	0.43 / 0.49	21.41	42.40
Total	0.17	-	21.41	42.40

7.4 Post-Development Drainage

To meet the stormwater objectives, the development will contain flow attenuation via rooftop storage. Table 8, below, summarizes the required restricted flow for the roof.

Table 8: Required Restricted Roof Flow

Drainage Area	Area (ha)	C (5-Year)	Q (L/s) 5-Year
A1	0.08	0.43	10.19

Based on the criteria listed in Section 7.1, 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 10.19 L/s. See Appendix G for calculations.

The proposed site drainage limits are demonstrated on the Post-Development Drainage Area Plan. See CCO-23-1408 - POST in Appendix F of this report for more details. A summary of the post-development runoff calculations can be found below.

Table 9: 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)
B1A	0.07	4.54	6.81	19.79	20.92
B1B	0.01	0.76	1.20	3.77	4.09
Roof Total	0.08	5.30	8.01	23.57	25.01
B2	0.09	10.37	20.65	-	-
Site Total	0.17	15.67	28.66	23.57	25.01

Runoff from areas B1A and B1B will be controlled and stored on the roof of the proposed building (B1) using 6 and 1 roof drains, respectively. The 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 in the open position was used to estimate a reasonable roof flow. Other products may be specified at detailed building design provided release rates and storage volumes are respected.

Runoff from area B2 is comprised of surface runoff from the walkways and landscaped areas and will be unrestricted and maintain existing drainage patterns.

As seen in Table 10, below, roof runoff will be restricted to a maximum release rate of 8.01 L/s, allowing for a proposed 25.01 m^3 of roof storage.

Table 10: Roof Drainage Summary

Drainage Area	Area (ha)	# of Roof Drains	Storage Depth (mm)		Total Flow Rate (L/s)	
			5-Year	100-Year	5-Year	100-Year
B1A	0.07	6	60	90	4.54	6.81
B1B	0.01	1	60	95	0.76	1.20
Total	0.08	7	-	-	5.30	8.01

7.5 Quality Control

As noted in Section 7.1, quality controls are not anticipated to be required for the development as the majority of runoff will be comprised of roof flow, which is considered clean.

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 are 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

- A new 6-storey 823 m^2 apartment building is proposed to be constructed at 1 Finch Private. The site covers 0.25 ha, and development is proposed within 0.17 ha of the site.
- It is proposed to service the new building through a new 150 mm diameter water service and 150 mm diameter sanitary service. A new 300 mm diameter storm service is proposed to convey foundation and roof drainage.
- It is proposed to service the development area via roof storage. The storm system will connect to the existing 300 mm diameter storm sewer within Pinson Private, which discharges to the existing 750 mm diameter storm sewer within Uplands Drive.
- Storage for the 5- through 100-year storm events will be provided on the roof.

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 1 Finch Private.

This report is respectfully being submitted for approval.

Regards,

McIntosh Perry Consulting Engineers Ltd.

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11.0 STATEMENT OF LIMITATIONS

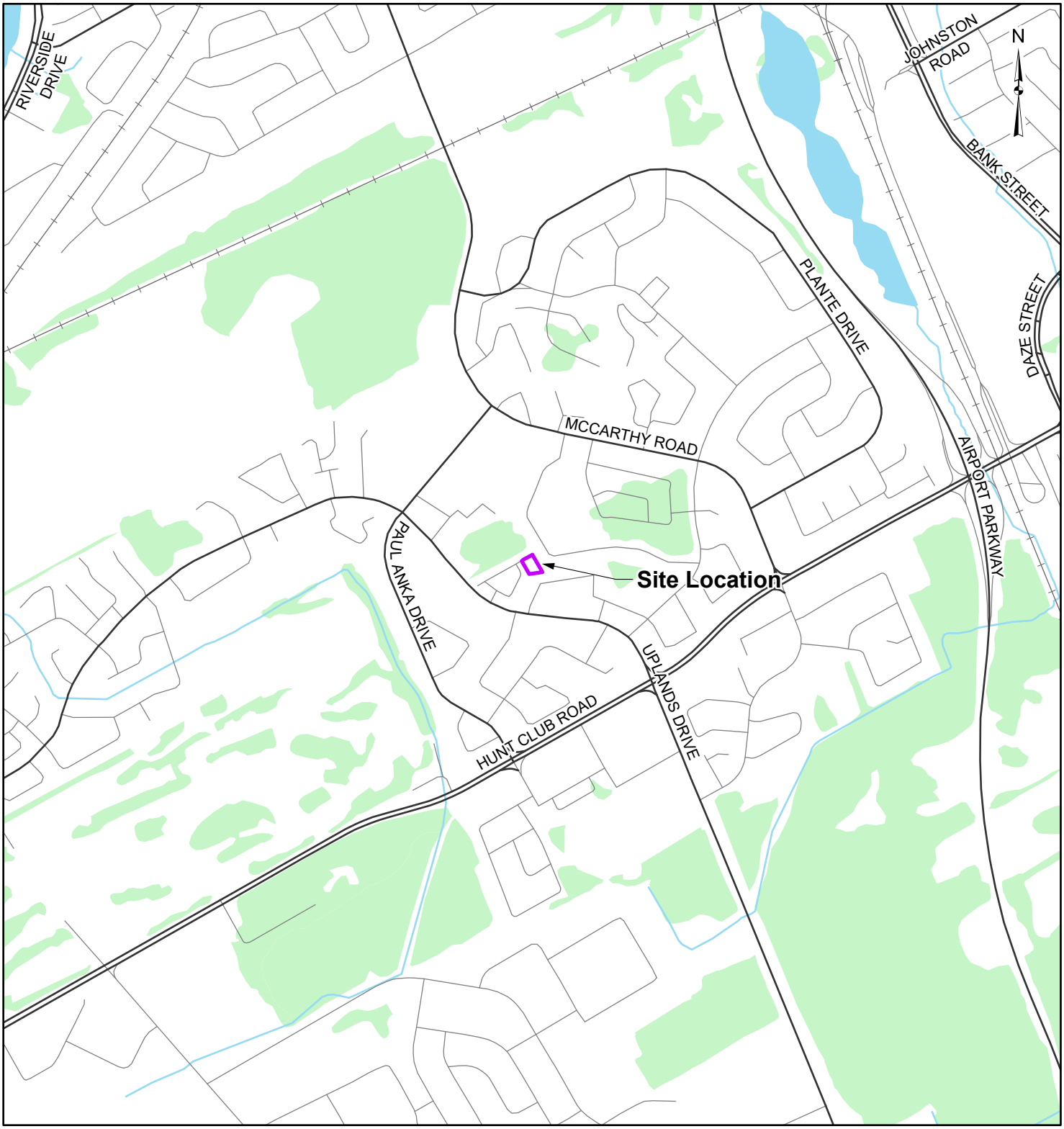
This report was produced for the exclusive use of CSV Architects. The purpose of the report is to assess the existing stormwater management system and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the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



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Scale 1:15,000 Metres

LEGEND

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

REFERENCE

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

CLIENT: CSV ARCHITECTS

PROJECT: OCH RESIDENTIAL DEVELOPMENT

TITLE: SITE LOCATION

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

PROJECT NO: CCO-23-1408		FIGURE:
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APPENDIX B
BACKGROUND DOCUMENTS

McINTOSH PERRY

MEMO

Date:

To / Destinataire	Craig Hamilton, Planner	
From / Expéditeur	Bruce Bramah, Project Manager, Infrastructure Approvals	
Subject / Objet	**Pre-Application Consultation** **1 Finch Private**, *The proposed is a 45 unit, 6 storey affordable/market rental residential building that would be a part of the existing PUD. It is within the R5B H(18). The building will be accessed by the existing lanes. New parking will be provided along central green space for residents and visitors.*	File No. PC2023-0021

Please note the following information regarding the engineering design submission for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications

2. Servicing and site works shall be in accordance with the following documents:

   - ⇨ Ottawa Sewer Design Guidelines (October 2012)
   - ⇨ Ottawa Design Guidelines – Water Distribution (2010)
   - ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
   - ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
   - ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
   - ⇨ City of Ottawa Park and Pathway Development Manual (2012)

- ⇨ City of Ottawa Accessibility Design Standards (2012)
- ⇨ Ottawa Standard Tender Documents (latest version)
- ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

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

   i. The 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.

   ii. The pre-development runoff coefficient or a maximum equivalent 'C' of 0.5, whichever is less (§ 8.3.7.3).

   iii. A calculated time of concentration (Cannot be less than 10 minutes).

   iv. The building shall provide roof storage to capture up to and including the 100-year event to the pre-existing 5 year storm release rate. The storm water in soft landscaped areas may be uncontrolled and shall be retained on site.

   v. On site quality control will be required (80% TSS removal).

   vi. No surface ponding within parking areas during the 2-year event.

   vii. The site outlets to the Sawmill Creek and there may be area specific SWM Criteria that may apply. Check for any related SWM &/or Sub-watershed studies that may have been completed.

   viii. If existing services are to be used, a CCTV scan and recommendation memo by a qualified professional to will be required to verify the condition and identify any structural deficiencies.

5. Deep Services (Storm, Sanitary & Water Supply)

   i. *Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.*

   ii. *Connections to trunk sewers and easement sewers are typically not permitted.*

   iii. *Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).*

   iv. *Review provision of a high-level sewer.*

   v. *Provide information on the type of connection permitted*

   Sewer connections to be made above the springline of the sewermain as per:

   a. Std Dwg S11.1 for flexible main sewers – *connections made using approved tee or wye fittings.*

   b. Std Dwg S11 (For rigid main sewers) – *lateral must be less that 50% the diameter of the sewermain,*

   c. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,*

   d. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

   e. *No submerged outlet connections.*

6. Water Boundary condition requests must include the location of the service and the expected loads (net increase) required by the proposed development. The

hydraulic modelling submission shall include all existing demands on the private system. Please provide the following information for water boundary conditions:

i. Location of service

ii. Type of development and the amount of fire flow required (as per FUS, 1999).

iii. Average daily demand: ___ l/s.

iv. Maximum daily demand: ___l/s.

v. Maximum hourly daily demand: ___ l/s.

7. Developments with an average day demand over 50m3/day or 50units require two connections to the public watermain with an isolation valve in between to prevent any vulnerable service areas.

8. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

9. ECA Requirements:

   Note that an MOECC Environmental Compliance Approval (Private Sewage Works) may be required for the proposed development if the stormwater management plan for the site results in flows (major or minor) that cross any shared property line. ECA requirements can be further assessed once a formal application is received.

Should you have any questions or require additional information, please contact me directly at (613) 580-2424, ext. 29686 or by email at Bruce.Bramah@ottawa.ca.

– SITE PLAN APPLICATION – Municipal servicing

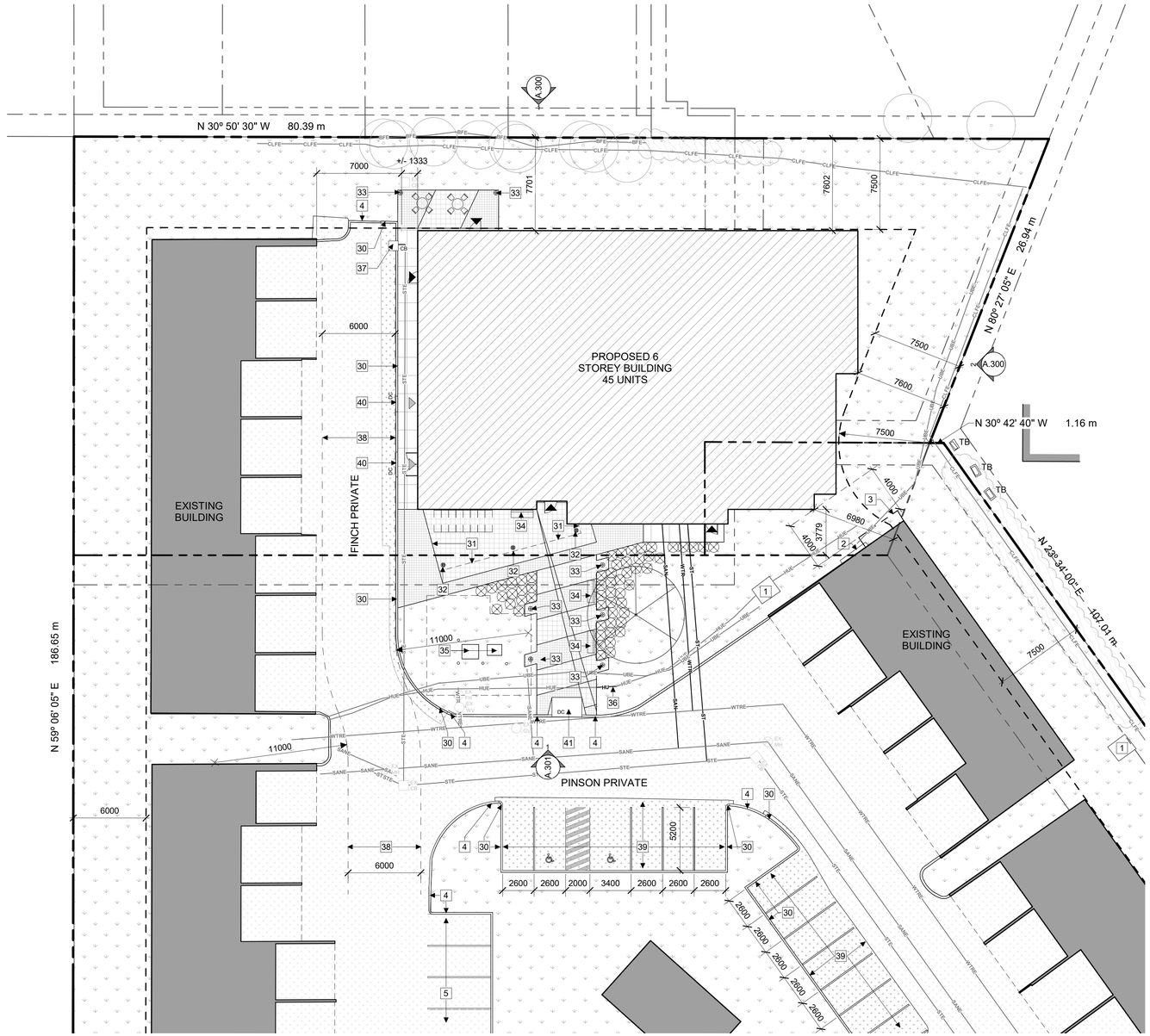
Legend:

The letter **S** indicates that the study or plan is required with application submission.
The letter **M** indicates that the study or plan may be required with application submission.

For information 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		1. Site Servicing Plan	2. Assessment of Adequacy of Public Services / Site Servicing Study / Brief	**S**	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study / Slope Stability Study	**S**	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	**S**	
S		11. Storm water Management Report / Brief	12. Hydro-geological and Terrain Analysis		
M		13. Water main Analysis	14. Noise / Vibration Study		
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		



1 PROPOSED SITE PLAN
A100 | 1 : 200

LEGAL DESCRIPTION	SITE AREA	16 946m² (TBC)
	BUILDING AREA	825m²
REFERENCE SURVEY	GROSS FLOOR AREA	4926m²
	BUILDING HEIGHT	18m / 6 STOREYS
MUNICIPAL ADDRESS	ZONE	R5B (H18)
	SCHEDULE 1	AREA C
	SCHEDULE 2	N / A

ZONING PROVISION	REQUIRED	PROVIDED
MIN. LOT WIDTH	N/A	34.5m
MIN. LOT AREA	1400m²	2541m²
MIN. FRONT YARD SETBACK	3.0m	N/A
MIN. CORNER YARD SETBACK	N/A	N/A
MIN. REAR YARD SETBACK	7.5m	7.6m
MIN. INTERIOR YARD SETBACK	7.5m	7.6m
MAX. HEIGHT	18m	18m
AMENITY AREA	270m² + TBD	79.3m² Interior 191m² Exterior 1302m²
LANDSCAPED AREA	762.3m²	
MINIMUM SETBACK OF WALL OF RESIDENTIAL BUILDING TO PRIVATE WAY	1.8m	1.8m
MINIMUM SEPARATION AREA BETWEEN BUILDINGS IN A PLANNED UNIT DEVELOPMENT	3.0m	4.0m

PARKING QUEING + LOADING	REQUIRED	PROVIDED
RESIDENTIAL SPACES	54	54
VISITOR SPACES	9	9
ACCESSIBLE PARKING		2
BICYCLE PARKING	45	77

GARBAGE COLLECTION:
- GARBAGE 11yard: 3x4 Yd. bins
- GMP 0.81 yds
- FIBER 2.8 yds
- COMPOST 1x240L Cart

NEW SITE PLAN GENERAL NOTES:

A. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPILED FROM EXISTING PLANS AND SURVEYS
B. DO NOT SCALE THIS DRAWING
C. REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WORK. NO RESPONSIBILITY IS BORN BY THE CONSULTANT FOR UNKNOWN SUBSURFACE CONDITIONS
D. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND/OR OMISSIONS TO THE CONSULTANT
E. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE CONSULTANT
F. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS ETC. TO APPROVAL OF CONSULTANT PRIOR TO ANY JOB EXCAVATION
G. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED - CONTRACTOR TO VERIFY PRIOR TO EXCAVATION
H. INDIVIDUAL UTILITY COMPANY MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING
I. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE NOTED
J. PROVIDE TEMPORARY HOARDING AND FACING AROUND CONSTRUCTION SITE FOR PERIOD OF WORK
K. PROTECT EXISTING TREES FROM DAMAGE FOR PERIOD OF WORK

NEW SITE PLAN KEYNOTES:

1 EXISTING HYDRO KIOSK
2 EXISTING HYDRO METERS AT WOODEN BOX
3 EXISTING BUILDING ABOVE
4 EXISTING CURB TO REMAIN
5 EXISTING PARKING

30 NEW CURB
31 NEW CANOPY OVERHANG ABOVE (DASHED)
32 NEW COLUMN
33 NEW BOLLARD LIGHT PER LANDSCAPING
34 BENCH
35 NEW TRANSFORMER AND SWITCH PER ELECTRICAL
36 ADJUSTS UNDERGROUND HYDRO LINES PER ELECTRICAL AFTER HYDRO KIOSK REMOVAL PER ELECTRICAL
37 NEW CATCH BASING. ADJUST STORM WATER LINE AS REQUIRED
38 FIRE ROUTE
39 NEW PARKING
40 NEW DROPPED CURB AND SIDEWALK RAMP
41 NEW DROPPED CURB AND ACCESSIBLE SIDEWALK RAMP
42 NEW BIKE PACKING SPACES

NEW SITE PLAN LEGEND:

EXISTING BUILDING
PROPOSED BUILDING
NEW ASPHALT PAVING
EXISTING ASPHALT PAVING EXISTING
NEW GRASS
NEW CONCRETE SIDEWALK
NEW CONCRETE PAD
NEW PAVER TYPE 1
NEW PAVER TYPE 2
EXISTING CEDAR HEDGE

EMERGENCY EXIT
SERVICE DOORS
BUILDING MAIN ENTRANCE
PROPERTY LINE
PARCEL MAIN BOUNDARY LINE
PARCEL STANDARD BOUNDARY LINE
SET BACK LINE
NEW FENCE PER LANDSCAPE
EXISTING CHAIN LINK FENCE
EXISTING BOARD FENCE
EXISTING WATER
NEW WATER
EXISTING SANITARY
NEW SANITARY
EXISTING STORM
NEW STORM
EXISTING ELECTRICAL SERVICE (BELOW GRADE)
NEW ELECTRICAL SERVICE (BELOW GRADE)
EXISTING BELL SERVICE (BELOW GRADE)
EXISTING GAS
NEW GAS
CATCH BASIN
CATCH BASIN EXISTING
LIGHT STANDARD
LIGHT STANDARD EXISTING
FIRE HYDRANT
FIRE HYDRANT EXISTING
MANHOLE
MANHOLE EXISTING
UTILITY POLE
UTILITY POLE EXISTING
WATER VALVE CHAMBER EXISTING
WATER VALVE EXISTING
GAS VALVE EXISTING
SIAMESE CONNECTION
DROPPED CURB
NEW TREE PER LANDSCAPING
NEW SHRUB PER LANDSCAPING
EXISTING TREE

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STAMP

REV	DATE	ISSUE
1	2023/05/11	ISSUED FOR COORDINATION

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CLIENT
OTTAWA COMMUNITY HOUSING
OTTAWA
ONTARIO, CANADA

PROJECT
OCH SHEARWATER APARTMENTS
1 FINCH PRIVATE, OTTAWA, ON

TITLE
PROPOSED SITE PLAN

PROJECT NO: 2022-1430
DRAWN: AL / LCB / IK
APPROVED: JS
SCALE: 1 : 200
DATE PRINTED: 5/12/2023 9:46:48 AM

REV 1
DRAWING NO. A100

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-23-1408 - 1 Finch Private - Water Demands

Project:	1 Finch Private
Project No.:	CCO-23-1408
Designed By:	FV
Checked By:	AM
Date:	May 10, 2023
Site Area:	0.17 gross ha

Residential	NUMBER OF UNITS		UNIT RATE	
1 Bedroom Apartment	11	units	1.4	persons/unit
2 Bedroom Apartment	12	units	2.1	persons/unit
3 Bedroom Apartment	22	units	3.1	persons/unit
Total Population	109	persons		

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS
Residential	280	L/c/d
Industrial - Light	35,000	L/gross ha/d
Industrial - Heavy	55,000	L/gross ha/d
Shopping Centres	2,500	L/(1000m² /d
Hospital	900	L/(bed/day)
Schools	70	L/(Student/d)
Trailer Park with no Hook-Ups	340	L/(space/d)
Trailer Park with Hook-Ups	800	L/(space/d)
Campgrounds	225	L/(campsite/d)
Mobile Home Parks	1,000	L/(Space/d)
Motels	150	L/(bed-space/d)
Hotels	225	L/(bed-space/d)
Tourist Commercial	28,000	L/gross ha/d
Other Commercial	28,000	L/gross ha/d
AVERAGE DAILY DEMAND	Residential	0.35 L/s
	Commercial/ Industrial / Institutional	0.00 L/s

MAXIMUM DAILY DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	6.5	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	2.30	L/s
	Commercial/ Industrial / Institutional	0.00	L/s

MAXIMUM HOUR DEMAND

DEMAND TYPE	AMOUNT		UNITS
Residential	9.8	x avg. day	L/c/d
Industrial	1.8	x max. day	L/gross ha/d
Commercial	1.8	x max. day	L/gross ha/d
Institutional	1.8	x max. day	L/gross ha/d
MAXIMUM HOUR DEMAND	Residential	3.46	L/s
	Commercial/ Industrial / Institutional	0.00	L/s

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

AVERAGE DAILY DEMAND	0.35	L/s
MAXIMUM DAILY DEMAND	2.30	L/s
MAXIMUM HOUR DEMAND	3.46	L/s

McINTOSH PERRY

CCO-23-1408 - 1 Finch Private - OBC Fire Calculations

Project:	1 Finch Private
Project No.:	CCO-23-1408
Designed By:	FV
Checked By:	AM
Date:	May 10, 2023

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

Water Supply for Fire-Fighting - Apartment Building

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

Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with subsections 3.2.2., including loadbearing walls, columns and arches

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

(a) Q = K 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	10	(from Table 1 pg A-31) (Worst case occupancy {E/ F2} 'K' value used)
V	14,978	(Total building volume in m³.)
Stot	2.0	(From figure 1 pg A-32)
Q =	299,559.60 L	

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

9000 L/min if Q > 270,000 L

2378 gpm

From Figure 1 (A-32)

Snorth	28.36	m	0.0
Seast	7.67	m	0.2
Ssouth	5.32	m	0.5
Swest	2.58	m	0.5

* approximate distances

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McINTOSH PERRY

CCO-23-1408 - 1 Finch Private - Fire Underwriters Survey

Project:	1 Finch Private
Project No.:	CCO-23-1408
Designed By:	FV
Checked By:	AM
Date:	May 10, 2023

From the Fire Underwriters Survey (2020)

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

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

F = 220 x C x √A Where:

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

Construction Type Non-Combustible Construction

C 0.8 A 4,682.3 m^2

Total Floor Area (per the 2020 FUS Page 20 - Total Effective Area) 3,121.7 m^2

Calculated Fire Flow	9,833.5 L/min
	10,000.0 L/min

B. REDUCTION FOR OCCUPANCY TYPE (No Rounding)

From Page 24 of the Fire Underwriters Survey:

Limited Combustible	-15%	
Fire Flow		8,500.0 L/min

C. REDUCTION FOR SPRINKLER TYPE (No Rounding)

Standard Water Supply Sprinklered	-40%	
Reduction		-3,400.0 L/min

D. INCREASE FOR EXPOSURE (No Rounding)

	Separation Distance (m)	Cons. of Exposed Wall	Length Exposed Adjacent Wall (m)	Height (Stories)	Length-Height Factor	
Exposure 1	10.1 to 20	Wood frame	39.2	3	117.6	15%
Exposure 2	10.1 to 20	Wood frame	22.67	2	45.3	12%
Exposure 3	10.1 to 20	Wood frame	31	3	93.0	14%
Exposure 4	3.1 to 10	Wood frame	10.81	3	32.4	16%
					% Increase*	57%

Increase*	4,845.0 L/min

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

Fire Flow	9,945.0 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

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McINTOSH PERRY

CCO-23-1408 - 1 Finch Private - Boundary Condition Unit Conversion

Project:	1 Finch Private
Project No.:	CCO-23-1408
Designed By:	FV
Checked By:	AM
Date:	May 10, 2023

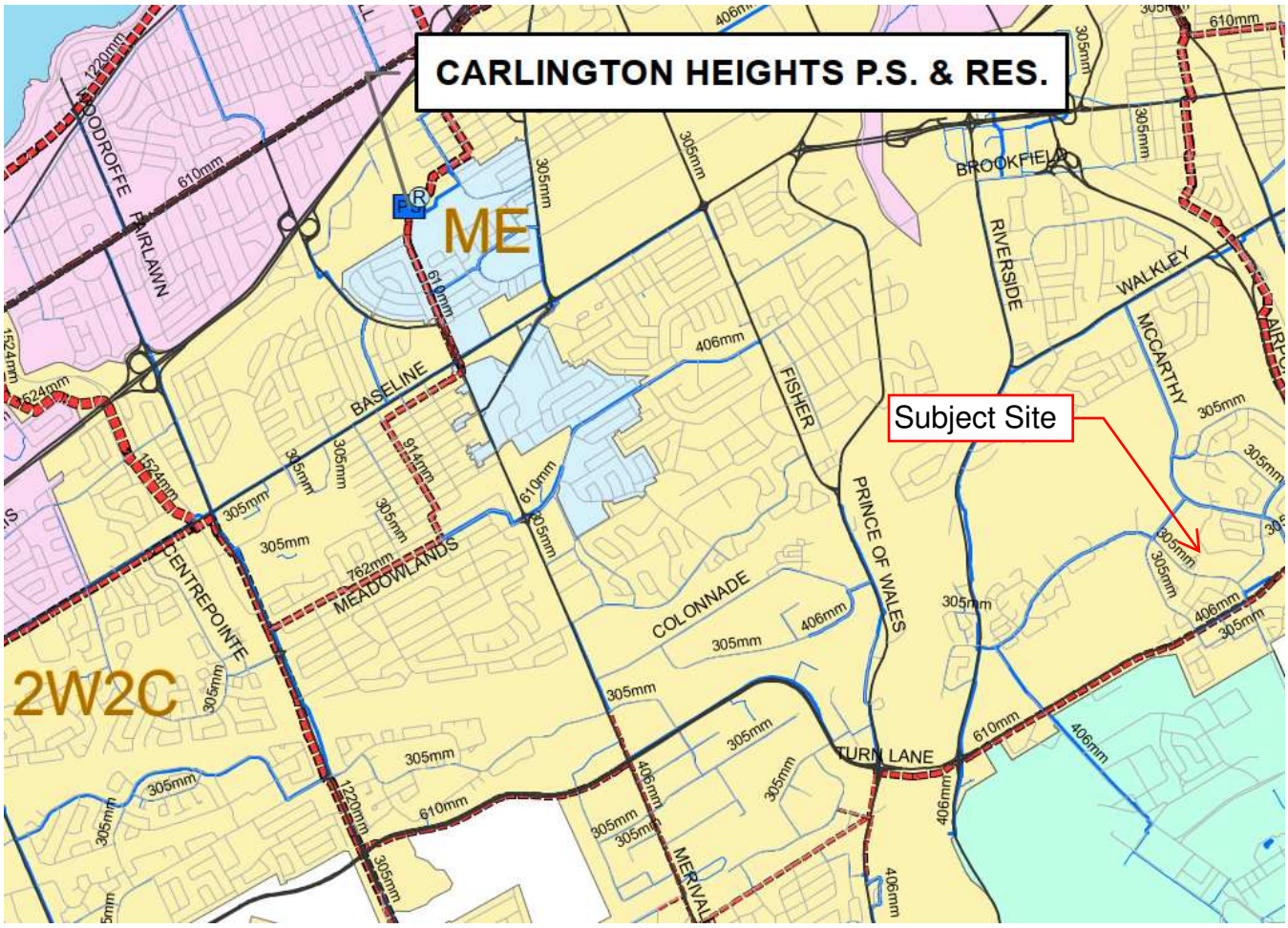
Boundary Conditions Unit Conversion

Uplands Drive

Scenario	Height (m)	Elevation (m)	m H_2O	PSI	kPa
Avg. DD	131.9	95.9	36.0	51.2	352.8
OBC Fire Flow (150 L/s or 9,000 L/min)	126.2	95.9	30.3	43.1	296.9
FUS Fire Flow (166.67 L/s or 10,000 L/min)	125.8	95.9	29.9	42.5	292.9
Peak Hour	124.0	95.9	28.1	39.9	275.3

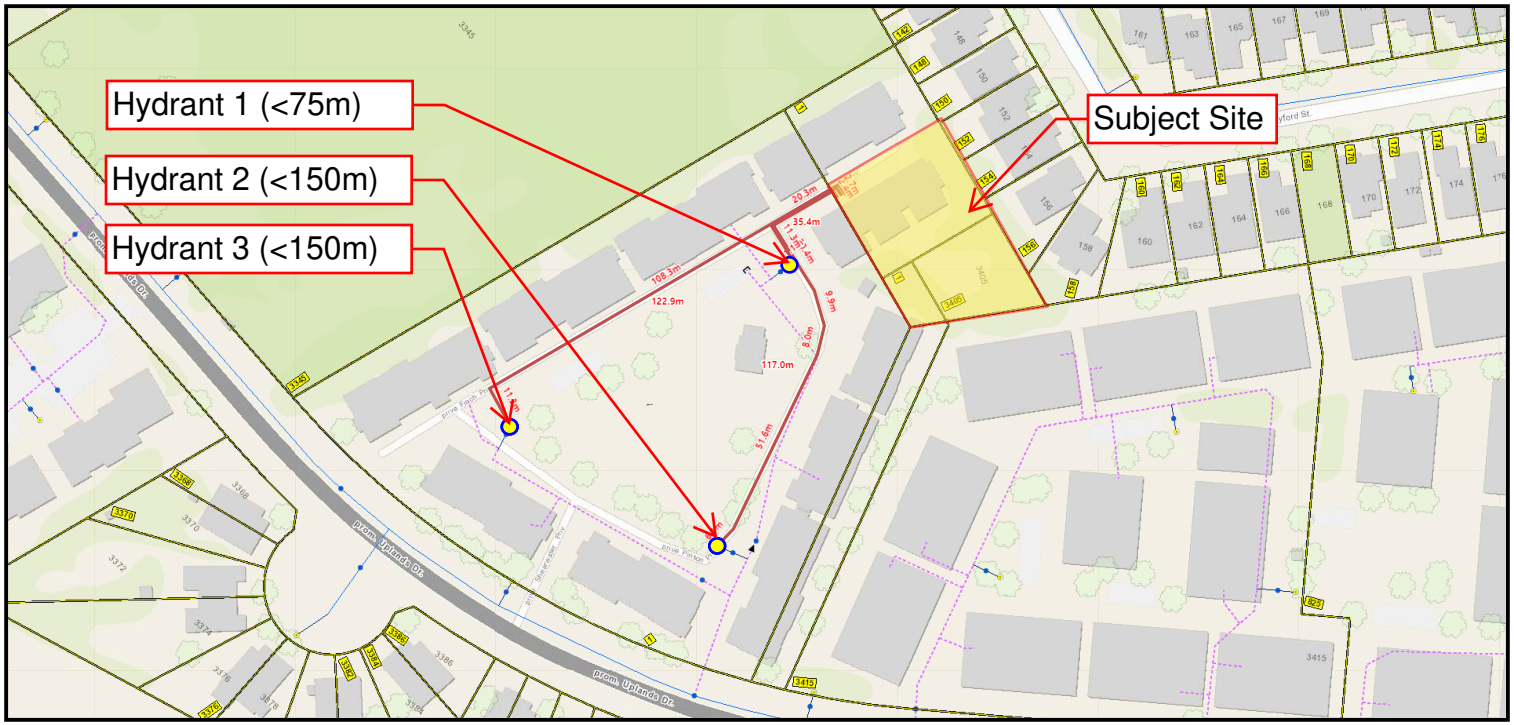
1 Finch Private

Pressure Zone Figure



1 Finch Private

Hydrant Coverage Figure



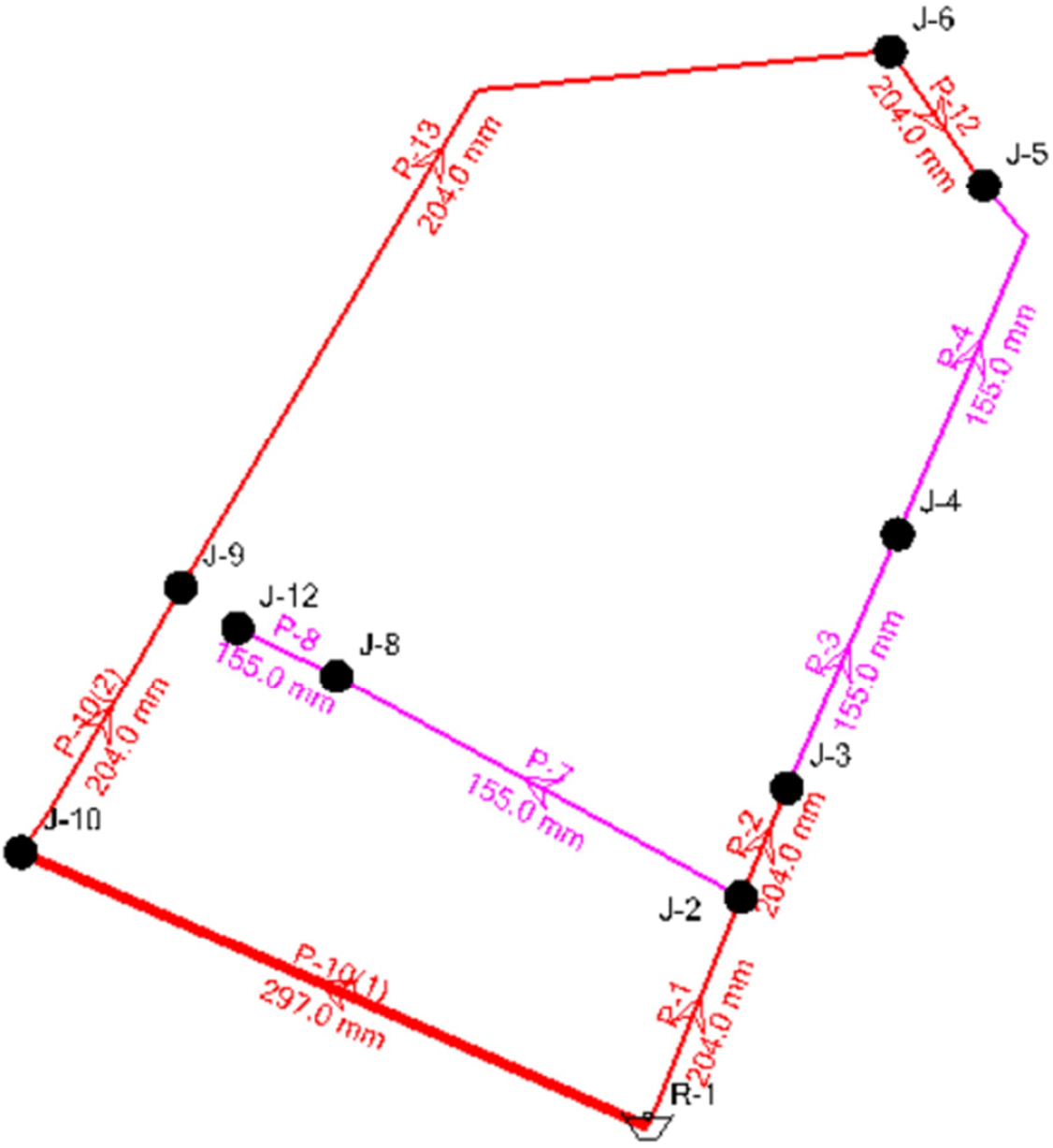


FIGURE: WATERCAD MODEL WITH NEW 200mm DIAMETER LOOP

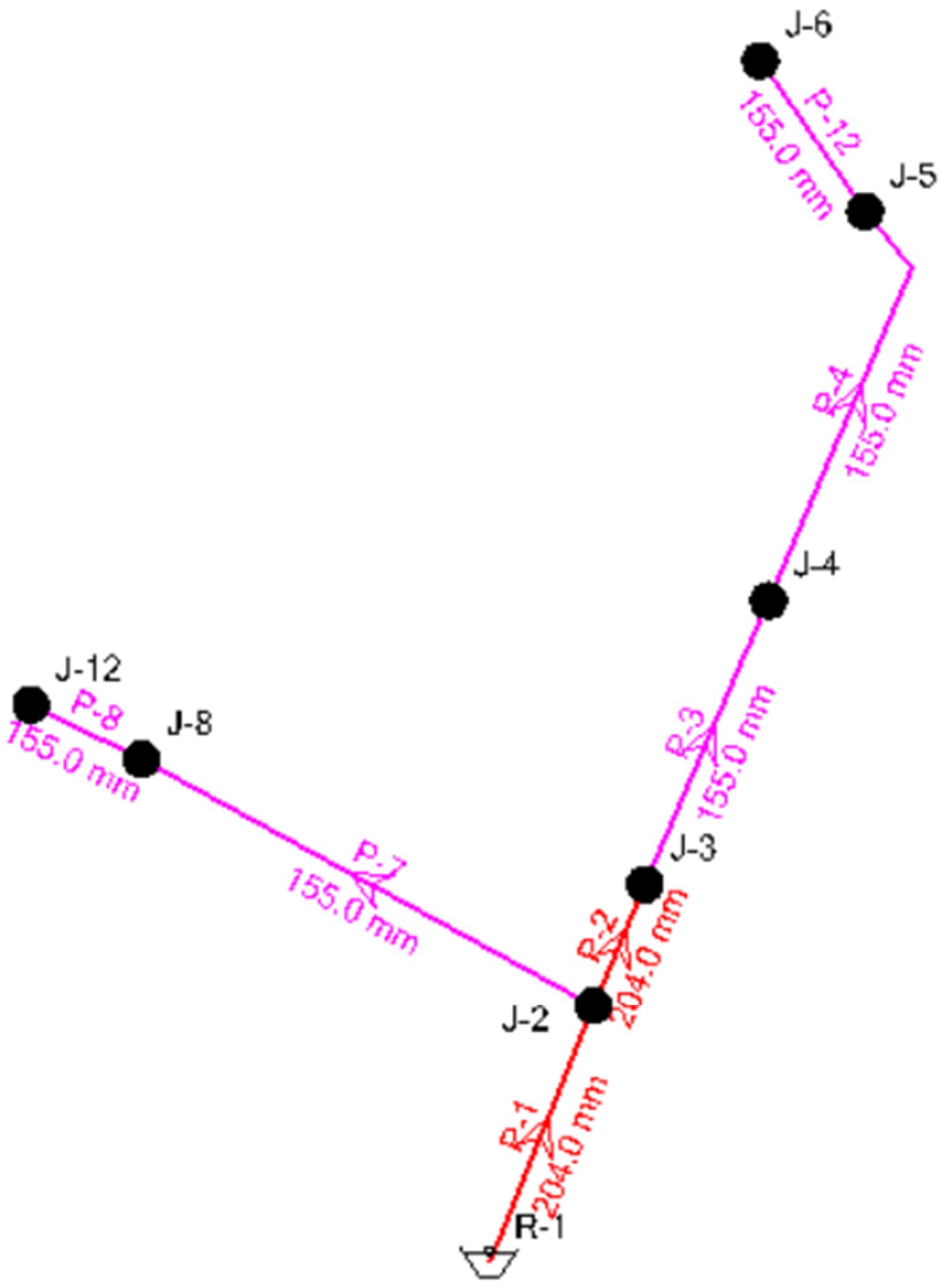


FIGURE: WATERCAD MODEL EXISTING CONDITIONS

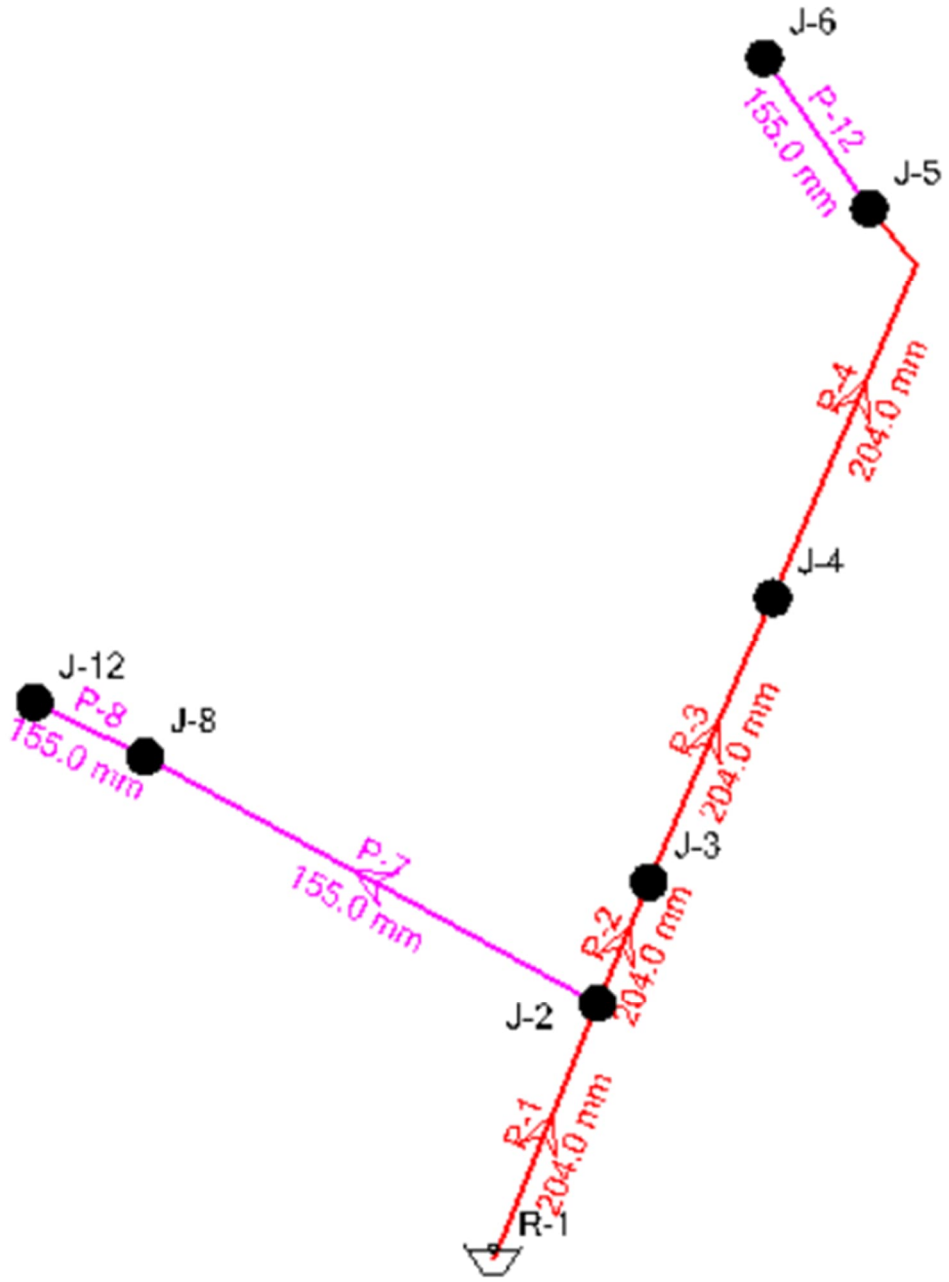


FIGURE: WATERCAD MODEL UPSIZED WATERMAIN (SINGLE FEED)

Shearwater Development - 3405 Uplands Drive
Average Day Demands (Existing Conditions)
Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
31	J-2	98.73	0.000	131.90	47
33	J-3	98.90	0.000	131.90	47
35	J-4	99.70	0.220	131.90	46
37	J-5	99.80	0.320	131.90	46
72	J-6	100.00	0.180	131.90	45
43	J-8	99.00	0.150	131.90	47
45	J-9	99.20	(N/A)	(N/A)	(N/A)
68	J-10	99.64	(N/A)	(N/A)	(N/A)
77	J-12	99.20	0.180	131.90	187

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
36	P-3	31	J-3	J-4	155.0	PVC	100.0	0.720	0.04
38	P-4	43	J-4	J-5	155.0	PVC	100.0	0.500	0.03
44	P-7	51	J-2	J-8	155.0	PVC	100.0	0.330	0.02
78	P-8	12	J-8	J-12	155.0	PVC	100.0	0.180	0.01
34	P-2	13	J-2	J-3	204.0	PVC	110.0	0.720	0.02
48	P-1	28	R-1	J-2	204.0	PVC	110.0	1.050	0.03
70	P-10(2)	34	J-10	J-9	204.0	PVC	110.0	(N/A)	(N/A)
73	P-12	18	J-5	J-6	155.0	PVC	100.0	0.180	0.01
74	P-13	110	J-6	J-9	204.0	PVC	110.0	(N/A)	(N/A)
69	P-10(1)	76	R-1	J-10	375.0	PVC	120.0	(N/A)	(N/A)

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Hydraulic Grade (m)
47	R-1	131.90	131.90

Shearwater Development - 3405 Uplands Drive
Peak Hour Demands (Existing Conditions)
Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
31	J-2	98.73	0.000	123.99	36
33	J-3	98.90	0.000	123.99	36
35	J-4	99.70	1.200	123.97	34
37	J-5	99.80	1.790	123.96	34
72	J-6	100.00	0.960	123.95	34
43	J-8	99.00	0.840	123.98	35
45	J-9	99.20	(N/A)	(N/A)	(N/A)
68	J-10	99.64	(N/A)	(N/A)	(N/A)
77	J-12	99.20	0.960	123.98	176

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
36	P-3	31	J-3	J-4	155.0	PVC	100.0	3.950	0.21
38	P-4	43	J-4	J-5	155.0	PVC	100.0	2.750	0.15
44	P-7	51	J-2	J-8	155.0	PVC	100.0	1.800	0.10
78	P-8	12	J-8	J-12	155.0	PVC	100.0	0.960	0.05
34	P-2	13	J-2	J-3	204.0	PVC	110.0	3.950	0.12
48	P-1	28	R-1	J-2	204.0	PVC	110.0	5.750	0.18
70	P-10(2)	34	J-10	J-9	204.0	PVC	110.0	(N/A)	(N/A)
73	P-12	18	J-5	J-6	155.0	PVC	100.0	0.960	0.05
74	P-13	110	J-6	J-9	204.0	PVC	110.0	(N/A)	(N/A)
69	P-10(1)	76	R-1	J-10	375.0	PVC	120.0	(N/A)	(N/A)

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Hydraulic Grade (m)
47	R-1	124.00	124.00

Shearwater Development - 3405 Uplands Drive
Peak Hour Demands (New 200mm Loop)
Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
31	J-2	98.73	0.000	124.00	36
33	J-3	98.90	0.000	124.00	36
35	J-4	99.70	1.200	123.99	34
37	J-5	99.80	1.790	123.99	34
72	J-6	100.00	0.960	123.99	34
43	J-8	99.00	0.840	123.99	35
45	J-9	99.20	0.960	124.00	35
68	J-10	99.64	0.000	124.00	35
77	J-12	99.20	0.960	123.99	176

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
36	P-3	31	J-3	J-4	155.0	PVC	100.0	1.775	0.09
38	P-4	43	J-4	J-5	155.0	PVC	100.0	0.575	0.03
44	P-7	51	J-2	J-8	155.0	PVC	100.0	1.800	0.10
78	P-8	12	J-8	J-12	155.0	PVC	100.0	0.960	0.05
34	P-2	13	J-2	J-3	204.0	PVC	110.0	1.775	0.05
48	P-1	28	R-1	J-2	204.0	PVC	110.0	3.575	0.11
70	P-10(2)	34	J-10	J-9	204.0	PVC	110.0	3.135	0.10
73	P-12	18	J-5	J-6	204.0	PVC	110.0	-1.215	0.04
74	P-13	110	J-6	J-9	204.0	PVC	110.0	-2.175	0.07
69	P-10(1)	76	R-1	J-10	375.0	PVC	120.0	3.135	0.03

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Hydraulic Grade (m)
47	R-1	124.00	124.00

Shearwater Development - 3405 Uplands Drive

Maximum Day + Fire Flow (Existing Conditions)

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
31	J-2	98.73	0.000	125.80	38
33	J-3	98.90	0.000	125.80	38
35	J-4	99.70	0.550	125.79	37
37	J-5	99.80	0.810	125.79	37
72	J-6	100.00	0.440	125.79	37
43	J-8	99.00	0.380	125.80	38
45	J-9	99.20	(N/A)	(N/A)	(N/A)
68	J-10	99.64	(N/A)	(N/A)	(N/A)
77	J-12	99.20	0.440	125.80	38

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
36	P-3	31	J-3	J-4	155.0	PVC	100.0	1.800	0.10
38	P-4	43	J-4	J-5	155.0	PVC	100.0	1.250	0.07
44	P-7	51	J-2	J-8	155.0	PVC	100.0	0.820	0.04
78	P-8	12	J-8	J-12	155.0	PVC	100.0	0.440	0.02
34	P-2	13	J-2	J-3	204.0	PVC	110.0	1.800	0.06
48	P-1	28	R-1	J-2	204.0	PVC	110.0	2.620	0.08
70	P-10(2)	34	J-10	J-9	204.0	PVC	110.0	(N/A)	(N/A)
73	P-12	18	J-5	J-6	155.0	PVC	100.0	0.440	0.02
74	P-13	110	J-6	J-9	204.0	PVC	110.0	(N/A)	(N/A)
69	P-10(1)	76	R-1	J-10	297.0	PVC	120.0	(N/A)	(N/A)

Fire Flow Results Table - Time: 0.00 hours

Label	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (m/s)	Satisfies Fire Flow Constraints ?
J-2	226.176	28	J-6	P-1	7.00	True
J-3	226.176	23	J-6	P-1	7.00	True
J-4	104.902	20	J-6	P-3	5.65	False
J-5	70.142	20	J-6	P-3	3.81	False
J-8	89.904	20	J-12	P-7	4.81	False
J-9	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-6	63.093	20	J-5	P-3	3.44	False
J-12	80.985	20	J-8	P-7	4.34	False

Shearwater Development - 3405 Uplands Drive
Maximum Day + Fire Flow (Existing Conditions)
Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Hydraulic Grade (m)
47	R-1	125.80	125.80

Shearwater Development - 3405 Uplands Drive
Maximum Day + Fire Flow (New 200mm Loop

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
31	J-2	98.73	0.000	125.80	38
33	J-3	98.90	0.000	125.80	38
35	J-4	99.70	0.550	125.80	37
37	J-5	99.80	0.810	125.80	37
72	J-6	100.00	0.440	125.80	37
43	J-8	99.00	0.380	125.80	38
45	J-9	99.20	0.440	125.80	38
68	J-10	99.64	0.000	125.80	37
77	J-12	99.20	0.440	125.80	38

Pipe Table - Time: 0.00 hours

ID	Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)
36	P-3	31	J-3	J-4	155.0	PVC	100.0	0.827	0.04
38	P-4	43	J-4	J-5	155.0	PVC	100.0	0.277	0.01
44	P-7	51	J-2	J-8	155.0	PVC	100.0	0.820	0.04
78	P-8	12	J-8	J-12	155.0	PVC	100.0	0.440	0.02
34	P-2	13	J-2	J-3	204.0	PVC	110.0	0.827	0.03
48	P-1	28	R-1	J-2	204.0	PVC	110.0	1.647	0.05
70	P-10(2)	34	J-10	J-9	204.0	PVC	110.0	1.413	0.04
73	P-12	18	J-5	J-6	204.0	PVC	110.0	-0.533	0.02
74	P-13	110	J-6	J-9	204.0	PVC	110.0	-0.973	0.03
69	P-10(1)	76	R-1	J-10	297.0	PVC	120.0	1.413	0.02

Fire Flow Results Table - Time: 0.00 hours

Label	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (psi)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (m/s)	Satisfies Fire Flow Constraints ?
J-2	250.000	30	J-12	P-1	6.40	True
J-3	250.000	26	J-4	P-1	6.14	True
J-4	180.543	20	J-5	P-3	5.74	True
J-5	181.015	20	J-6	P-3	3.85	True
J-8	91.579	20	J-12	P-7	4.90	False
J-9	250.000	25	J-6	P-10(2)	6.06	True
J-10	250.000	33	J-6	P-10(1)	3.25	True
J-6	184.286	20	J-5	P-3	3.72	True
J-12	82.236	20	J-8	P-7	4.40	False

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Hydraulic Grade (m)
47	R-1	125.80	125.80

APPENDIX D
SANITARY CALCULATIONS

McINTOSH PERRY

McINTOSH PERRY

CCO-23-1408 - 1 Finch Private - Sanitary Demands

Project:	1 Finch Private
Project No.:	CCO-23-1408
Designed By:	FV
Checked By:	NV
Date:	May-23

Site Area	0.17	Gross ha	
1 Bedroom	11	1.40	Persons per unit
2 Bedroom	12	2.10	Persons per unit
3 Bedroom	22	3.10	Persons per unit
Total Population	109	Persons	
Amenity Space		m^2	

DESIGN PARAMETERS

Institutional/Commercial Peaking Factc	1.5	
Residential Peaking Factor	3.59	* 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	0.01
Wet	0.05
Total	0.06

AVERAGE DAILY DEMAND

DEMAND TYPE	AMOUNT	UNITS	POPULATION / AREA	Flow (L/s)
Residential	280	L/c/d	109	0.35
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

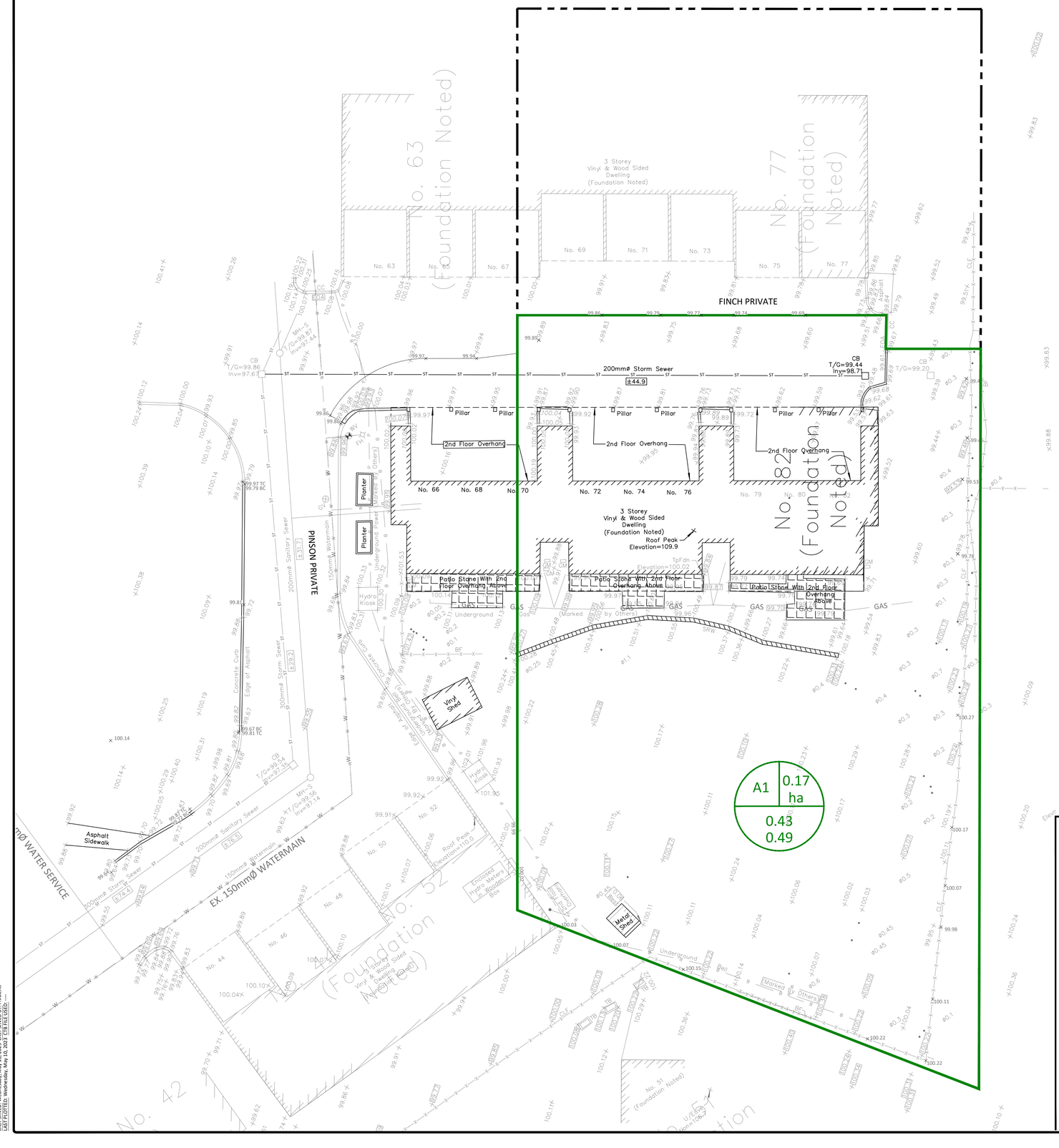
AVERAGE RESIDENTIAL FLOW	0.35	L/s
PEAK RESIDENTIAL FLOW	1.27	L/s
AVERAGE ICI FLOW	0.00	L/s
PEAK INSTITUTIONAL/COMMERCIAL FLOW	0.00	L/s
PEAK INDUSTRIAL FLOW	0.00	L/s
TOTAL PEAK ICI FLOW	0.00	L/s

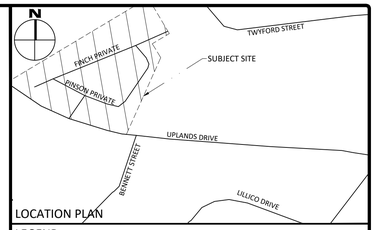
TOTAL SANITARY DEMAND

TOTAL ESTIMATED AVERAGE DRY WEATHER FLOW	0.36	L/s
TOTAL ESTIMATED PEAK DRY WEATHER FLOW	1.28	L/s
TOTAL ESTIMATED PEAK WET WEATHER FLOW	1.32	L/s

APPENDIX E
PRE-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY





LOCATION PLAN

LEGEND

FOR REVIEW ONLY
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4. THE CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT.
5. THE CONTRACTOR IS TO DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME ALL RESPONSIBILITY FOR EXISTING UTILITIES WHETHER OR NOT SHOWN ON THESE DRAWINGS. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
6. RESTORE ALL TRENCHES AND SURFACES OF PUBLIC ROAD ALLOWANCES TO CONDITION EQUAL OR BETTER THAN ORIGINAL CONDITION AND TO THE SATISFACTION OF THE CITY AUTHORITIES.
7. EXCAVATE AND DISPOSE OF ALL EXCESS EXCAVATED MATERIAL, SUCH AS ASPHALT, CURBING AND DEBRIS, OFF SITE AS DIRECTED BY THE ENGINEER AND THE CITY.
8. TOPSOIL TO BE STRIPPED AND STOCKPILED FOR REHABILITATION. CLEAN FILL TO BE PLACED IN FILL AREAS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
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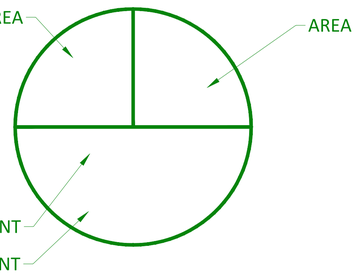
19. THIS PLAN MUST BE READ IN CONJUNCTION WITH THE GEOTECHNICAL INVESTIGATION COMPLETED BY PATERSON GROUP, DATED OCTOBER 19, 2020

LEGEND:



No.	Revisions	Date
1		

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

SCALE 1 : 150

0 5 10 15 Metres

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115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Stamp:

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

Project:
RESIDENTIAL DEVELOPMENT
1 FINCH PRIVATE

Drawing Title:
PRE-DEVELOPMENT DRAINAGE AREA PLAN

Scale:	1:150	Project Number:	CCO-23-1408
Drawn By:	FV		
Checked By:	AM	Drawing Number:	PRE
Designed By:	NV		

D07-12-XX-XXXX

#XXXXX

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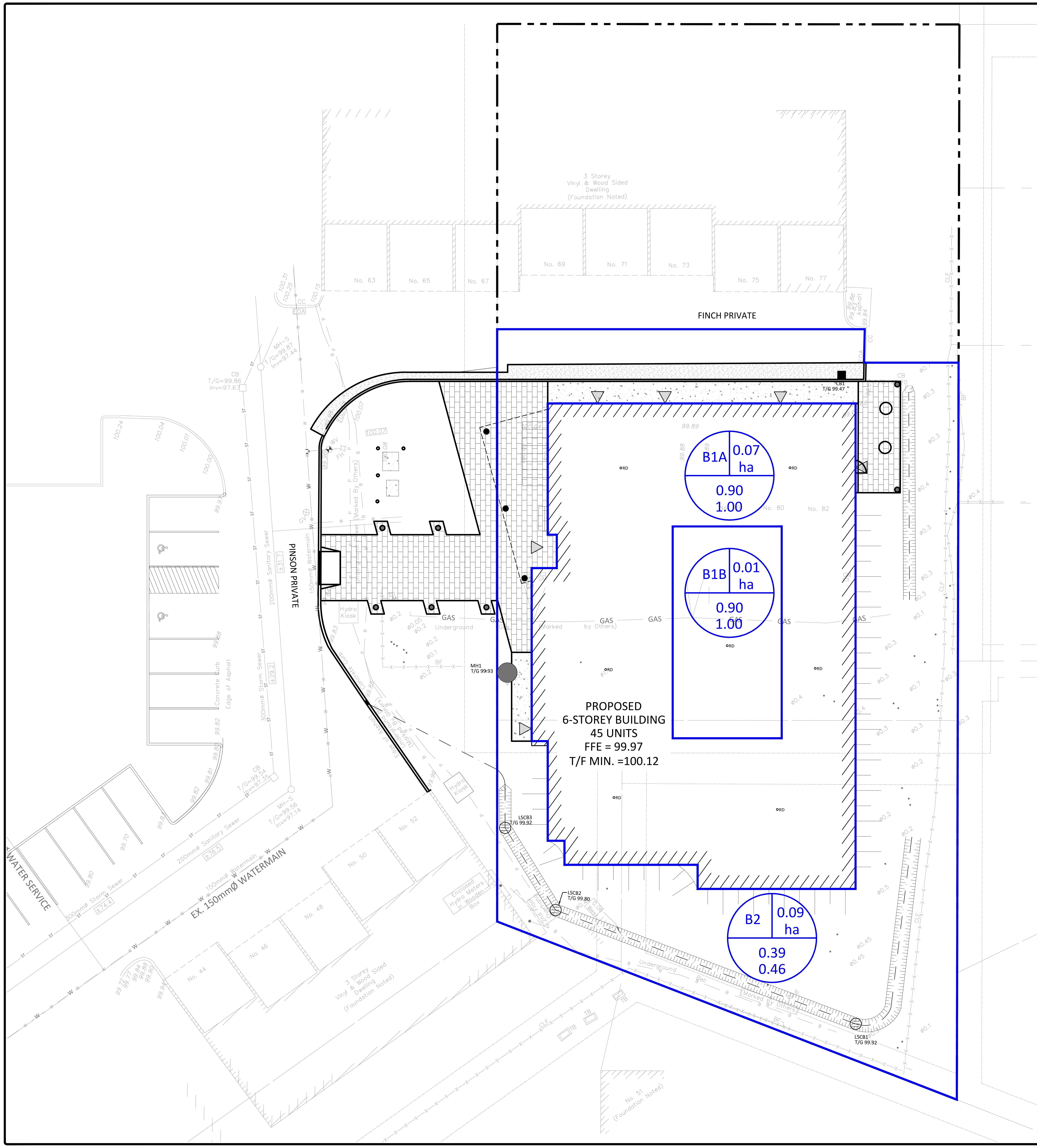
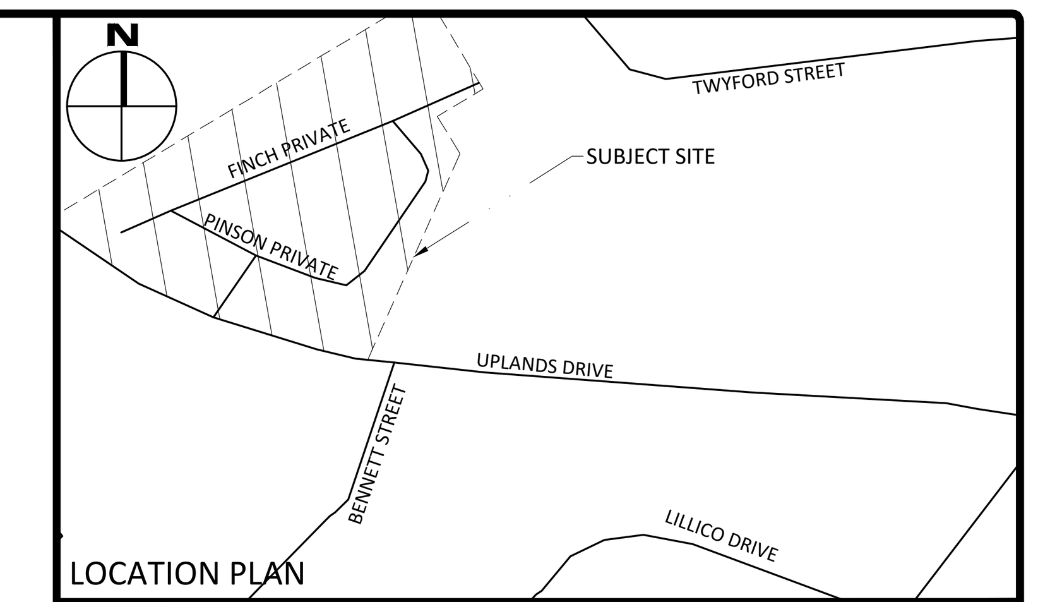
LAST SAVED: Wednesday, May 10, 2023 LAST SAVED BY: F.Valenti
LAST PLOTTED: Wednesday, May 24, 2023 STB FILE USED:

APPENDIX F
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY





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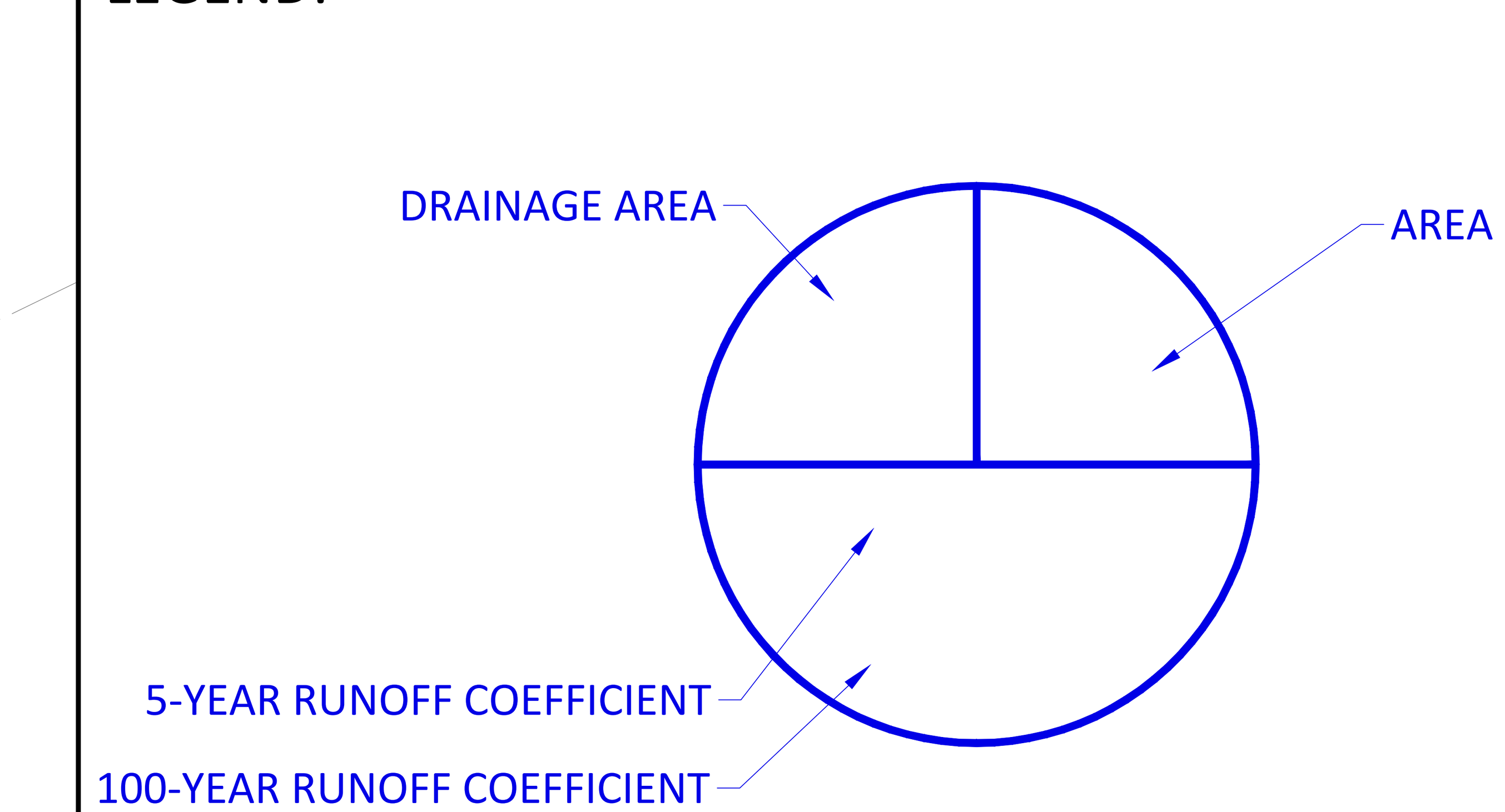
LEGEND:



No.	Revisions	Date
1		

Check and verify all dimensions before proceeding with the work

Do not scale drawings

SCALE 1 : 150 (0, 5, 10, 15 Metres)

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www.mcintoshperry.com

Stamp:

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

Project:
RESIDENTIAL DEVELOPMENT
1 FINCH PRIVATE

Drawing Title:
POST-DEVELOPMENT DRAINAGE AREA PLAN

Scale: 1:150	Project Number: CCO-23-1408
Drawn By: FV	
Checked By: AM	Drawing Number: POST
Designed By: NV	

D07-12-XX-XXXX

#XXXXX

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LAST SAVED: Wednesday, May 10, 2023 LAST SAVED BY: F.Valenti
LAST PLOTTED: Friday, May 12, 2023 CTB FILE USED: ----

APPENDIX G
STORMWATER MANAGEMENT CALCULATIONS

McINTOSH PERRY

Tc (min)	Intensity (mm/hr)	
	5-Year	100-Year
20	70.3	120.0
10	104.2	178.6

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	560	0	1,176	0.43	0.49

Pre-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)	
					5-Year	100-Year
A1	0.17	0.43	0.49	10	21.41	42.40
Total	0.17				21.41	42.40

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)	
B1A	697	0	0	0.90	1.00	Proposed Bldg Roof
B1B	129	0	0	0.90	1.00	Proposed Mech. Roof
B2	251	0	658	0.39	0.46	Unrestricted

Post-Development Runoff Calculations

Drainage Area	Area (ha)	C 5-Year	C 100-Year	Tc (min)	Q (L/s)		
					5-Year	100-Year	
B1A	0.07	0.90	1.00	10	18.18	34.61	Proposed Bldg Roof
B1B	0.01	0.90	1.00	10	3.36	6.40	Proposed Mech. Roof
B2	0.09	0.39	0.46	10	10.37	20.65	Unrestricted
Total	0.17				31.91	61.67	

Required Restricted Roof Flow

Drainage Area	Area (ha)	C 5-Year	Tc (min)	Q (L/s) 5-Year	
A1	0.08	0.43	10	10.19	Required restricted flow for areas B1A-B1B

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
B1A	18.18	34.61	4.54	6.81	9.27	19.79	10.46	20.92
B1B	3.36	6.40	0.76	1.20	1.81	3.77	1.94	4.09
Total (Roof)	21.54	41.02	5.30	8.01	11.08	23.57	12.40	25.01
B2	10.37	20.65	10.37	20.65				
Total (Site)	31.91	61.67	15.67	28.66	11.08	23.57	12.40	25.01

5-Year Storm Event

Tc (min)	I (mm/hr)	B1A Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	18.18	4.54	13.64	8.18
20	70.3	12.27	4.54	7.72	9.27
30	53.9	9.40	4.54	4.86	8.75
40	44.2	7.71	4.54	3.17	7.61
50	37.7	6.58	4.54	2.04	6.11
60	32.9	5.74	4.54	1.20	4.31
70	29.4	5.13	4.54	0.59	2.47
80	26.6	4.64	4.54	0.10	0.47

Maximum Storage Required 5-Year (m^3) =	9.27

100-Year Storm Event

Tc (min)	I (mm/hr)	B1A Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	34.61	6.81	27.80	16.68
20	120.0	23.25	6.81	16.44	19.73
30	91.9	17.81	6.81	11.00	19.79
40	75.1	14.57	6.81	7.75	18.61
50	64.0	12.40	6.81	5.58	16.75
60	55.9	10.84	6.81	4.02	14.48
70	49.8	9.65	6.81	2.84	11.92
80	45.0	8.72	6.81	1.91	9.16

Maximum Storage Required 100-Year (m^3) =	19.79

Storage Parameters	
Roof Area (m^2)	697.32
Usable Roof Area (%)	75%
Usable Roof Area (m^2)	522.99

5-Year Storage Summary	
Max. Storage Available (m^3)	10.46
Storage Required (m^3)	9.27
Max. Ponding Depth (m)	0.06

100-Year Storage Summary	
Max. Storage Available (m^3)	20.92
100-Year Storage Required (m^3)	19.79
Max. Ponding Depth (m)	0.090

CCO-23-1408 - 1 Finch Private - Roof Storage - B1A

Roof Drain Flow (B1A)

Roof Drains Summary		
Type of Control Device	Watts Drainage - Accutrol Weir	
Number of Roof Drains	6	
Roof Drain Position	Open	
	5-Year	100-Year
Rooftop Storage Available (m^3)	10.46	20.92
Rooftop Storage Required (m^3)	9.27	19.79
Storage Depth (m)	0.060	0.090
Flow (Per Roof Drain) (L/s)	0.76	1.14
Total Flow (L/s)	4.54	6.81

Flow Rate Vs. Build-Up (Individual Drain)	
Depth (mm)	Flow (L/s)
0	0.00
5	0.06
10	0.13
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69
60	0.76
65	0.82
70	0.88
75	0.95
80	1.01
85	1.07
90	1.14
95	1.20
100	1.26
105	1.32
110	1.39
115	1.45
120	1.51
125	1.58
130	1.64
135	1.70
140	1.77
145	1.83
150	1.89

	Roof Drain Flow		
	Individual Flow (l/s)	Storage Depth (mm)	Cumulative Flow (l/s)
	0.00	0	0.00
	0.06	5	0.38
	0.13	10	0.76
	0.19	15	1.14
	0.25	20	1.51
	0.32	25	1.89
	0.38	30	2.27
	0.44	35	2.65
	0.50	40	3.03
	0.57	45	3.41
	0.63	50	3.79
	0.69	55	4.16
5-Year	0.76	60	4.54
	0.82	65	4.92
	0.88	70	5.30
	0.95	75	5.68
	1.01	80	6.06
	1.07	85	6.44
100-Year	1.14	90	6.81
	1.20	95	7.19
	1.26	100	7.57
	1.32	105	7.95
	1.39	110	8.33
	1.45	115	8.71
	1.51	120	9.08
	1.58	125	9.46
	1.64	130	9.84
	1.70	135	10.22
	1.77	140	10.60
	1.83	145	10.98
	1.89	150	11.36

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

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

5-Year Storm Event

Tc (min)	I (mm/hr)	B1B Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	104.2	3.36	0.76	2.61	1.56
20	70.3	2.27	0.76	1.51	1.81
30	53.9	1.74	0.76	0.98	1.77
40	44.2	1.43	0.76	0.67	1.61
50	37.7	1.22	0.76	0.46	1.38
60	32.9	1.06	0.76	0.30	1.10
70	29.4	0.95	0.76	0.19	0.81
80	26.6	0.86	0.76	0.10	0.49

Maximum Storage Required 5-Year (m^3) =	1.81

100-Year Storm Event

Tc (min)	I (mm/hr)	B1B Runoff (L/s)	Allowable Outflow (L/s)	Runoff to be Stored (L/s)	Storage Required (m^3)
10	178.6	6.40	1.20	5.21	3.12
20	120.0	4.30	1.20	3.10	3.72
30	91.9	3.30	1.20	2.10	3.77
40	75.1	2.70	1.20	1.50	3.59
50	64.0	2.29	1.20	1.10	3.29
60	55.9	2.00	1.20	0.81	2.90
70	49.8	1.79	1.20	0.59	2.47
80	45.0	1.61	1.20	0.42	1.99

Maximum Storage Required 100-Year (m^3) =	3.77

Storage Parameters	
Roof Area (m^2)	129.02
Usable Roof Area (%)	75%
Usable Roof Area (m^2)	96.77

5-Year Storage Summary	
Max. Storage Available (m^3)	1.94
Storage Required (m^3)	1.81
Max. Ponding Depth (m)	0.06

100-Year Storage Summary	
Max. Storage Available (m^3)	4.09
100-Year Storage Required (m^3)	3.77
Max. Ponding Depth (m)	0.095

CCO-23-1408 - 1 Finch Private - Roof Storage - B1B

Roof Drain Flow (B1B)

Roof Drains Summary		
Type of Control Device	Watts Drainage - Accutrol Weir	
Number of Roof Drains	1	
Roof Drain Position	Open	
	5-Year	100-Year
Rooftop Storage Available (m^3)	1.94	4.09
Rooftop Storage Required (m^3)	1.81	3.77
Storage Depth (m)	0.060	0.095
Flow (Per Roof Drain) (L/s)	0.76	1.20
Total Flow (L/s)	0.76	1.20

Flow Rate Vs. Build-Up (Individual Drain)	
Depth (mm)	Flow (L/s)
0	0.00
5	0.06
10	0.13
15	0.19
20	0.25
25	0.32
30	0.38
35	0.44
40	0.50
45	0.57
50	0.63
55	0.69
60	0.76
65	0.82
70	0.88
75	0.95
80	1.01
85	1.07
90	1.14
95	1.20
100	1.26
105	1.32
110	1.39
115	1.45
120	1.51
125	1.58
130	1.64
135	1.70
140	1.77
145	1.83
150	1.89

	Roof Drain Flow		
	Individual Flow (l/s)	Storage Depth (mm)	Cumulative Flow (l/s)
	0.00	0	0.00
	0.06	5	0.06
	0.13	10	0.13
	0.19	15	0.19
	0.25	20	0.25
	0.32	25	0.32
	0.38	30	0.38
	0.44	35	0.44
	0.50	40	0.50
	0.57	45	0.57
	0.63	50	0.63
	0.69	55	0.69
5-Year	0.76	60	0.76
	0.82	65	0.82
	0.88	70	0.88
	0.95	75	0.95
	1.01	80	1.01
	1.07	85	1.07
	1.14	90	1.14
100-Year	1.20	95	1.20
	1.26	100	1.26
	1.32	105	1.32
	1.39	110	1.39
	1.45	115	1.45
	1.51	120	1.51
	1.58	125	1.58
	1.64	130	1.64
	1.70	135	1.70
	1.77	140	1.77
	1.83	145	1.83
	1.89	150	1.89

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

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

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: o Metric scale o North arrow (including construction North) o Key plan o Name and contact information of applicant and property owner o Property limits including bearings and dimensions o Existing and proposed structures and parking areas o Easements, road widening and rights-of-way o Adjacent street names	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