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PROPOSED 6-STOREY RESIDENTIAL DEVELOPMENT 441 Echo Drive

Development Servicing Study and
Stormwater Management Report

**PROPOSED 6-STOREY RESIDENTIAL DEVELOPMENT
441 ECHO DRIVE**

**DEVELOPMENT SERVICING STUDY
AND STORMWATER MANAGEMENT REPORT**

Prepared by:

NOVATECH

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April 30, 2026

Ref: R-2026-010
Novatech File No. 126003

April 30, 2026

JB Holdings Inc.
107 Pretoria Avenue
Ottawa, Ontario
K1S 1W8

Attention: Anthony Bassi

**Re: Development Servicing Study and Stormwater Management Report
Proposed 6-Storey, Residential Development
441 Echo Drive, Ottawa, ON
Novatech File No.: 126003**

Enclosed is a copy of the 'Development Servicing Study and Stormwater Management Report' for the proposed 6-storey residential development located at 441 Echo Drive in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is being submitted in support of Official Plan Amendment (OPA), Zoning By-Law Amendment (ZBLA), and Site Plan Control (SPC) applications.

Please contact the undersigned, should you have any questions or require additional information.

NOVATECH



François Thauvette, P. Eng.
Senior Project Manager

cc: Brett Hughes (City of Ottawa)
Tamara Nahal (Fotenn)
Ryan Koolwine (Project1 Studio)

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1.0 INTRODUCTION

Novatech has been retained by JB Holdings Inc. to complete the site servicing, grading, and stormwater management design related to the proposed re-development of the 441 Echo Drive property. This report is being submitted in support of concurrent Official Plan Amendment (OPA), Zoning By-Law Amendment (ZBLA), and Site Plan Control (SPC) applications.

1.1 Location and Site Description

The 0.139-hectare site to be re-developed is located on the east side of Echo Drive, south of Herridge Street, and is currently occupied by a residential building and associated surface parking. The subject site is bordered by other residential properties to the north, south and east. The legal description of the site is designated as Lots 11 and 12 and Part of Lots 3, & 4, Block 'K', Registered Plan 102, City of Ottawa.

Figure 1: Aerial View of the Subject Site



Image Source: geoOttawa (City of Ottawa)

1.2 Pre-Consultation Information

An initial pre-consultation meeting was held with the City of Ottawa on November 5, 2025, at which time the client was advised of the general submission requirements. Based on a review of **O.Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) will not be required for the proposed

development. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

1.3 Proposed Development

The proposed development will consist of a new 6-storey residential building, outdoor amenity space, as well as underground parking. The development will include a single site entrance off Echo Drive.

1.4 Reference Material

The following design guidelines have been used to establish the servicing and stormwater management requirements for the proposed development:

- Ottawa Sewer Design Guidelines (2025)
- Ottawa Water Distribution Design Guidelines (2025)
- Ministry of the Environment Design Guidelines for Sewage Works (2008)
- Ministry of the Environment Stormwater Management Planning and Design Manual (2003)
- Ministry of the Environment Design Guidelines for Drinking Water Systems (2008)
- Fire Underwriters Survey (FUS) Water Supply for Public Fire protection (2020)

The following reports and studies were reviewed and/or prepared as part of the design process:

1. The “Geotechnical Site Investigation” (Project No.: 2512064), prepared by GeoTerra, dated April 28, 2026.

2.0 SITE SERVICING

The objective of this report is to demonstrate that proper sewage outlets (sanitary and storm) as well as a suitable domestic water supply and appropriate fire protection are available for the proposed development. The servicing criteria, the expected sewage flows, and water demands are to conform to the requirements of the City of Ottawa municipal design guidelines for sewer and water distribution systems. Refer to the enclosed **General Plan of Services** (126003-GP), and to the subsequent sections for the report for further details.

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is deemed complete and ready for review by City of Ottawa infrastructure Approvals. A completed checklist is enclosed in **Appendix B** of the report.

2.1 Sanitary Servicing

The existing building to be demolished is currently being serviced by the 250mm dia. PVC municipal sanitary sewer in Echo Drive. The local sanitary sewer flows south along Echo Drive and discharges into the 1050mm dia. sanitary collector sewer in Clegg Street.

Under post-development conditions, the proposed development will be serviced by the local sanitary sewer in Echo Drive. The City of Ottawa Sewer design criteria were used to calculate the total theoretical peak sanitary flow from the proposed development. The following design criteria were taken from Section 4 of the City of Ottawa Sewer Design Guidelines:

- Residential Units (1-Bedroom or Studio): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Residential Units (3-Bedroom): 3.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day
- Residential Peaking Factor = 3.60 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha

Table 1 identifies the theoretical sanitary flows for the proposed development based on the above design criteria and information provided by the architect.

Table 1: Theoretical Post-Development Sanitary Flows

Proposed Development	Unit Count (1/2/3-Bd)	Design Population / Area	Average Flow (L/s) *	Peaking Factor	Sanitary Peak Flow (L/s) *
Residential Units	30/20/2	91	0.29	3.60	1.06
Infiltration Allowance	-	0.139 ha	-	-	0.05
Total	52	-	0.29	-	1.11

*Represents rounded values

The proposed 200mm dia. PVC sanitary service lateral at a minimum slope of 1.0% has a minimum full flow capacity of 34.2 L/s and will have enough capacity to convey the theoretical sanitary flows from the proposed development. The sanitary service will also be equipped with a backflow prevention device to protect the building from any potential sewer back-ups. Refer to **Appendix C** for detailed sanitary sewage calculations. Sanitary site flows will travel approximately 107m within the local municipal sanitary sewer in Echo Drive before being discharged into the 1050mm dia. sanitary collector sewer in Clegg Street.

2.2 Water Supply for Domestic Use and Firefighting

The subject site is located within the City of Ottawa 1W pressure zone. The existing building to be demolished is currently being serviced by the 406mm dia. PVC municipal watermain in Echo Drive. Under post-development conditions, the proposed development will continue to be serviced by the municipal watermain in Echo Drive. As per City of Ottawa Water Distribution Guidelines, the proposed development will require a single water service lateral as the anticipated daily water demands are expected to be less than 50m³/day (~0.58 L/s), which is the trigger for redundant servicing requirements. The proposed building will be sprinklered and the water meter will be located within the water entry room, with the remote meter and siamese connection on the exterior face of the building.

2.2.1 Water Demands and Watermain Analysis

The theoretical water demand and fire flow calculations are based on criteria in the City of Ottawa Water Distribution Design Guidelines. The fire flow requirements were calculated per the Fire Underwriters Survey (FUS), based on information provided by the architect. The following design criteria were taken from the City of Ottawa Water Distribution Design Guidelines:

- Residential Units (1-Bedroom or Studio): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Residential Units (3-Bedroom): 3.1 people per unit
- Average Daily Residential Water Demand: 280 L/person/day
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand (City Water Table 4.2)

Table 2 identifies the theoretical domestic water demands and fire flow requirements for the development based on the above design criteria. Refer to **Appendix D** for detailed calculations.

Table 2: Theoretical Water Demand and FUS Fire Flows for Proposed Development

Proposed Development	Unit Count (1/2/3-Bd)	Design Population	Avg. Day Demand (L/s)	Max. Day Demand (L/s)*	Peak Hour Demand (L/s)*	FUS Fire Flow (L/s)
Residential Units	30/20/2	91	0.29	0.74	1.62	150

*Represents rounded values

The following design criteria were taken from Section 4.2.2 – ‘Watermain Pressure and Demand Objectives’ of the City of Ottawa Design Guidelines for Water Distribution:

- Normal operating pressures are to range between 345 kPa (50 psi) and 483 kPa (70 psi) under Max Day demands
- Minimum system pressures are to be 276 kPa (40 psi) under Peak Hour demands
- Minimum system pressures are to be 140 kPa (20 psi) under Max Day + Fire Flow demands

Preliminary domestic water demands, and fire flow requirements were provided to the City of Ottawa to generate the municipal watermain network boundary conditions. **Table 2.1** summarizes preliminary hydraulic analysis results based on municipal watermain boundary conditions provided by the City as indicated in the correspondence from the City of Ottawa.

Table 2.1: Hydraulic Boundary Conditions Provided by the City

Municipal Watermain Boundary Condition	Boundary Condition Head of Water (m)	Normal Operating Pressure Range (psi)	Anticipated WM Pressure (psi)*
Connection to ex. 400mm dia. watermain in Echo Dr.			
Minimum HGL (Peak Hour Demand)	106.1 m	40 psi (min.)	~ 62 psi
Maximum HGL (Max Day Demand)	114.7 m	50-70 psi	~ 74 psi
HGL Max Day + Fire Flow (150 L/s)	109.7 m	20 psi (min.)	~ 67 psi

*Based on approximate roadway elevation of 64.82m at connection to existing watermain in Echo Drive. Design pressure = (HGL – watermain elevation) x 1.42197 PSI/m

**A multi-hydrant approach to firefighting will be necessary.

Based on preliminary calculations and correspondence received from the City of Ottawa, it is anticipated that the pressure within the municipal watermain network will generally be within the normal operating pressure range during the Peak Hour, Max HGL, and Max Day + Fire Flow Conditions. Booster pump(s) may be required to provide adequate water pressure to the upper floors. Mechanical details will need to be determined by the mechanical consultant as part of the detailed design of the building.

As discussed with the City of Ottawa, a multi-hydrant approach to firefighting will be required to supply the fire flow calculated above. Based on a review of the geoOttawa website, there are several municipal hydrants available within 150m of the subject site. Based on the City of Ottawa Water Distribution Design Guidelines, Class AA (blue bonnet) hydrants within 75m of the building should provide a capacity 95 L/s each (at a pressure of 20 PSI) while hydrants between 75m and 150m should provide at least 63 L/s (at a pressure of 20 PSI). **Table 2.2** summarizes the theoretical combined fire flow available from the nearby municipal fire hydrants and compares it to the fire flow demands based on the FUS calculations.

Table 2.2: Theoretical Fire Protection Summary Table

Building	(FUS) Fire Flow Demand (L/s)	Fire Hydrant(s) within 75m (~ 95 L/s each)	Fire Hydrant(s) within 150m (~ 63 L/s each)	Theoretical Combined Available Fire Flow (L/s)
6-Storey Residential Building	150	1	2	>150

The combined maximum flow from these hydrants will exceed the Fire Flow requirement (150 L/s) of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Water Distribution Design Guidelines. Refer to **Appendix D** for detailed calculations, correspondence from the City of Ottawa, a letter from the architect supporting the FUS fire flow calculations, a fire hydrant sketch showing the existing fire hydrant locations and the dimensions confirming the appropriate site coverage.

2.3 Storm Drainage and Stormwater Management

Under pre-development conditions, stormwater runoff from the subject site and contributing off-site areas are generally directed toward the municipal storm sewer in Echo Drive, while a small portion of the site directs drainage to the municipal storm sewer in McGillivray Street. These storm sewers ultimately outlet into the Rideau River, just east of Springhurst Avenue, approximately 1.3 km downstream of the subject site.

Under post-development conditions, storm flows from the edges of the site (~0.052 ha.) and contributing off-site areas (which cannot be diverted) will sheet drain to the adjacent Echo Drive and McGillivray Street right-of-ways. Storm flows from the building roof and rear yard patios (~0.087 ha.) will be controlled prior to being directed to the 300mm dia. PVC municipal storm sewer in Echo Drive via a new 250mm dia. PVC storm service lateral. On-site stormwater management (quantity control) will be implemented to meet the requirements of the City of Ottawa.

2.3.1 Stormwater Management Criteria and Objectives

The stormwater management (SWM) quantity control criteria have been provided during a pre-consultation meeting with the City of Ottawa, and the objectives are as follows:

- Provide a dual drainage system (i.e., minor, and major system flows).
- Control post-development storm flows, up to and including the 100-year design event, to the maximum allowable release rate calculated using the Rational Method, with a runoff coefficient equivalent to existing conditions, but in no case greater than $C=0.5$, a time of concentration no less than 10 minutes and a 5-year rainfall intensity from City of Ottawa IDF curves).
- Maintain existing drainage patterns and major overland flow paths as much as possible.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RCVA) and is tributary to the Rideau River. Based on correspondence provided by the City of Ottawa, on-site stormwater quality control measures will not be required due to the nature of the development and the fact that all on-site parking will be provided within the underground parking levels. Refer to **Appendix A** for correspondence from the City of Ottawa.

2.3.2 Pre-Development Conditions and Allowable Release Rate

Although unknown, it is assumed that site flows are currently not being controlled prior to being released into the municipal storm sewer system. As specified by the City of Ottawa, the maximum allowable release rate from the subject site is to be calculated using the Rational Method, with a runoff coefficient equivalent to existing conditions, but in no case greater than $C=0.5$, a time of concentration of 10 minutes and a 5-year rainfall intensity from City of Ottawa IDF curves. The maximum allowable release rate for the proposed development is calculated as follows:

$$\begin{aligned}
 T_c &= 10 \text{ min} & C &= 0.50 \\
 I_{5yr} &= 104.2 \text{ mm/hr} & A &= 0.139 \text{ ha} \\
 Q_{allow} &= 2.78 \text{ CIA} \\
 &= 2.78 \times 0.50 \times 104.2 \times 0.139 \\
 &= 20.2 \text{ L/s}
 \end{aligned}$$

Refer to the **Stormwater Management Plan** (126003-SWM) and to **Appendix E** for detailed SWM calculations.

2.3.3 Post-Development Conditions

The post-development conditions will include both uncontrolled direct runoff and controlled site flows, as well as off-site flows draining onto the subject site (which cannot be diverted). The uncontrolled direct runoff includes areas along the edges of the site, which will sheet drain uncontrolled towards the adjacent streets. There is no practical way to capture this drainage without also capturing off-site flows, which would result in oversized pipes/plumbing and increased SWM storage requirements. Flows from the building roof and rear yard patios (above the underground parking structure) will be sent to an internal SWM storage tank and controlled prior to being discharged (pumped) into the 300mm dia. PVC municipal storm sewer in Echo Drive.

2.3.3.1 Areas OS-1 & OS-2: Off Site Tributary Areas (Northeast & Southeast)

Due to existing elevations, storm drainage from existing adjacent residential properties will drain through the subject site towards the roadway catchbasins in Echo Drive and McGillivray Street.

Uncontrolled post-development flows from these sub-catchment areas were calculated using the Rational Method to be approximately 9.8 L/s and 6.4 L/s respectively during the 5-year design event; and 19.2 L/s and 12.6 L/s respectively during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.2 Area A-1a: Direct Runoff to Echo Drive

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 7.4 L/s during the 5-year design event and 14.5 L/s during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.3 Area A-1b: Direct Runoff to McGillivray Street

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 0.1 L/s during the 5-year design event and 0.2 L/s during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.4 Area A-2: Controlled Site Flow

Stormwater runoff from this sub-catchment area will be captured by uncontrolled roof drains and rear yard patio deck drains and will be directed to an internal SWM storage tank. Stormwater collected within the storage tank will be pumped up to a new 250mm dia. storm service lateral and released into the existing 300mm dia. storm sewer in Echo Drive. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 5.3 L/s (~84 USGPM). A “stand-by” pump will be provided for emergency and/or maintenance purposes. An emergency power supply will also be provided. The intent is for the internal storage SWM storage tank to be equipped with an overflow pipe to by-pass any flows exceeding the 100-Year + 20% stress test. The internal plumbing is to be pressure rated piping specified by the mechanical engineer. The pump will act as the backflow prevention device to protect the building from any potential sewer back-ups. Internal SWM storage tank and overflow details will need to be confirmed by the mechanical engineer. **Table 3** summarizes the controlled post-development design flows and approximate storage volumes during the 5-year and 100-year design events as well as the 100-Year + 20% stress test.

Table 3: Internal Stormwater Storage Tank and Pumped Flow

Design Event	Post-Development Conditions		
	Pumped Design Flow (L/s)	Volume Required (m ³)	Volume Provided (m ³)
5-Year	5.3 L/s	12.1 m ³	> 41 m ³
100-Year		31.1 m ³	
100-Year + 20%		40.1 m ³	

As indicated in **Table 3** above, the internal stormwater storage tank will provide sufficient storage for the 100-year + 20% stress test, exceeding the storage requirements specified by the City of Ottawa. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.5 Summary of Total Flow to Municipal Stormwater Sewer

Table 3.1 provides a summary of the total post-development flows from the site and compares them to the respective uncontrolled pre-development flows and to the allowable release rate specified by the City of Ottawa.

Table 3.1: Site Flows Summary and Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions				
	Uncontrolled Flow (L/s)	Allowable Release Rate (L/s)	A-1a Direct Runoff (L/s)	A-1b Direct Runoff (L/s)	A2 Controlled Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
5-Yr	31.7	20.2	7.4	0.1	5.3	12.8	18.9 or 60%
100-Yr	60.7		14.5	0.2		20.0	40.7 or 67%

*Reduced flow compared to pre-development uncontrolled conditions.

As indicated in the table above, the post-development flows from the site will not exceed the allowable release rate specified by the City of Ottawa. Furthermore, this represents significant reductions in total site flow rate when compared to the uncontrolled pre-development conditions. Most of the flows are being directed towards the municipal storm sewer in Echo Drive, however a small portion (A-1b) is being directed to the municipal storm sewer in McGillivray Street.

2.3.4 Stormwater Quality Control

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA) and is tributary to the Ottawa River. Conservation Authorities typically consider runoff from landscaped areas and roof tops as clear for the purpose of protecting water quality for aquatic habitat. As all on-site site parking will be provided within the underground parking structure, on-site stormwater quality control measures will not be required. Refer to **Appendix A** for correspondence from the City of Ottawa.

3.0 SITE GRADING

The existing site generally slopes to the west, with the grade sloping from approximately 66.00m to 65.00m along the north and south property lines. The site is located at an existing low point (sag) in Echo Drive and based on a review of elevations indicated on 1:1000 mapping for the surrounding area, the spill elevation for this section of Echo Drive is approximately 64.20m. As a result, the proposed finished floor elevation (FFE) will be set at 65.78m, exceeding the minimum 0.3m clearance from the spill elevation in the street. The existing grades around the perimeter of the site will generally be maintained. Refer to the enclosed **Grading and Erosion & Sediment Control Plan** (126003-GR) for details.

4.0 GEOTECHNICAL INVESTIGATIONS

The Geotechnical Site Investigation Report¹ was prepared by GeoTerra for the proposed development. Refer to the Geotechnical Report¹ for subsurface conditions, construction recommendations and geotechnical inspection requirements.

5.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the storm drainage system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with Best Management Practices for Erosion and Sediment Control. Details are provided on the **Grading and Erosion & Sediment Control Plan** (126003-GR). This includes the following measures:

- Filter bags / catch basin inserts (sediment sacks) will be placed under the grates of nearby catch basins and manholes, and they will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- Mud mats will be installed at the site entrance(s).
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.
- Any stockpiled material will be properly managed to prevent those materials from entering the sewer system and/or the downstream ditch or watercourse.

The temporary erosion and sediment control measures will be implemented prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

6.0 CONCLUSION

This report has been prepared in support of concurrent OPA, ZBLA, and SPC applications for the proposed development. The conclusions are as follows:

- The proposed development will be serviced by the municipal infrastructure in Echo Drive.
 - Sanitary flows from the building will continue to be directed to the existing 250mm dia. municipal sanitary sewer in Echo Drive.
 - The proposed development will continue to be serviced by the municipal watermain network via a new water service lateral connected to the existing 406mm dia. watermain in Echo Drive. Adequate water supply and system pressures will exist throughout the watermain network under the specified 'Max Day + Fire Flow' and 'Peak Hour' conditions.
 - Storm flows from the main portion of the site, including the building roof and rear yard patios (above the underground parking structure) will be sent to an internal SWM tank, then pumped to the existing 300mm dia. municipal storm sewer in Echo Drive. Runoff from the remainder of the site will sheet drain uncontrolled towards the adjacent streets, similar to existing conditions.
- The proposed building will be sprinklered. The municipal watermain network, including the nearby municipal fire hydrants, will provide the necessary water for firefighting purposes.
- The bulk of the post-development flow from the subject site will be directed to the municipal storm sewer system in Echo Drive, accounting for 12.7 L/s of the total 12.8 L/s site flow during the 5-year design event and 19.8 L/s of the total 20.0 L/s during the 100-year event. The remaining site flows will be directed to the storm sewer in McGillivray Street. The total

site flows will be less than the allowable release rate for the site (20.2 L/s) specified by the City of Ottawa.

- Regular inspection and maintenance of the building services, roof drains, internal SWM tank, and pumps are recommended to ensure that the storm drainage system is clean and operational.
- Erosion and sediment controls are to be provided during construction.

It is recommended that the proposed site servicing and stormwater management design be approved for implementation.

NOVATECH

Prepared by:



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CAD Designer - Land Development

Reviewed by:



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APPENDIX A
Project Correspondence

November 14, 2025

Tamara Nahal
Fotenn Planning + Design
Via email: nahal@fotenn.com

**Subject: Pre-Consultation: Meeting Feedback Form
Proposed Official Plan Amendment, Zoning By-law Amendment, Site
Plan Control Application – 441 Echo Drive**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on November 5, 2025.

Pre-Consultation Preliminary Assessment

Next Steps

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

Supporting Information and Material Requirements

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

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

Consultation with Technical Agencies

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

Planning

Comments:

1. Subject Site:

- a. The subject block is bounded by Echo Drive to the west, Herridge Street to the north, McGillivray Street to the east, and Clegg Street to the south.
- b. The subject site is known municipally as 441 Echo Drive and is in the Old Ottawa East neighbourhood. The site is a through-lot with 40.25 m frontage on Echo Drive and 3.5 metres of frontage on McGillivray Street with a depth of approximately 61 metres. The site is an irregular shape with approximately 1,394.32 square metres in area.
- c. The site is occupied by a low-rise four-storey apartment building and surface parking.
- d. The site is on the western edge of the Old Ottawa East neighbourhood, in an area generally characterized by low-rise residential buildings. Abutting the site to the north, east and south are existing low-rise residential buildings. To the west, the property abuts the Echo Drive Right-of-Way, beyond which is NCC-owned Colonel By Drive, the UNESCO designated Rideau Canal, and a pedestrian and cycling bridge that crosses the Rideau Canal called the Flora Footbridge.

2. Proposal:

- a. This is a Phase 1 Pre-consultation for an Official Plan Amendment, Zoning By-law Amendment, and a Site Plan Control application to permit a 6 ½ residential apartment building containing 59 dwelling units. The proposal also includes an underground parking garage, accessed from Echo Drive, containing 25 vehicular parking spaces and 62 bicycle parking spaces.

3. The following Planning Act applications will be required to pursue this proposal:

- a. Official Plan Amendment
- b. Zoning By-law Amendment - Major

- c. Site Plan Control - Complex
4. Official Plan Amendment application:
- a. It is understood from the pre-consultation meeting that the applicant's intent would be to amend Volume 2C of the Official Plan to add site-specific policies for lands known as 441 Echo Drive to permit the proposed six-storey height and massing.
 - b. An Official Plan Amendment application would be required to:
 - i. Provide relief from Section 6.6.1(1)(d) to allow for additional building height. The subject property is within the Rideau Canal Special District and is not subject to any Secondary Plan (see interpretation within "Policies" bullet below). As per Official Plan Section 6.6.1(1)(d), the permitted building height is limited to the existing zoning in place at the time of adoption of the Official Plan. The proposal is to permit a six-storey residential building, which is not permitted in the zoning in place on the property when the Official Plan was adopted.
 - ii. Provide relief from Section 6.6.2.2(4)(a) to allow for a development that does not respect the existing patterns of building footprints, height massing, scale, setback and landscape character as well as not preserve the mature trees / existing landscape patterns.
 - 1. Please note, this relief is required based on the proposal in front of staff at this meeting. Should the proposal evolve, relief from this section may or may not be required.
 - iii. Address all the criteria listed in Section 12.3(1) of the Official Plan to address area-specific policies.
5. Zoning By-law Amendment application:
- a. It is understood from the pre-consultation meeting that the applicant's intent would be to rezone the property from R4UD (Residential Fourth Density, Subzone UD) to R5 (Residential Fifth Density), or N5B H(20.5) in the new Zoning By-law.
 - b. A Zoning By-law Amendment would be required to upzone the site to permit a mid-rise building typology.
6. Site Plan Control application:
- a. A Site Plan Control application is required as the new residential building proposes 59 dwelling units and 25 vehicular parking spaces, which would trigger SPC in the SPC By-law.

7. As per the *Next Steps* section, prior to applying for any of the above applications a submission and attendance at an Urban Design Review Panel (UDRP) meeting is required. This project site is located within the Rideau Canal Special District Design Priority Area and meets the thresholds for UDRP review and is therefore subject to the UDRP. A UDRP report is required to form a complete application.
8. Policies:
 - a. Inner Urban Transect
 - b. Designated Rideau Canal Special District #3
 - c. Colonel By Drive and the Flora Footbridge directly west of the site are designated as “major pathways”
 - d. The site is within a “Design Priority Area”
 - e. Colonel By Drive, which runs parallel to Echo Drive to the west, is designated “Scenic Capital Entry Route”
 - f. Staff acknowledge that while the majority of the property is **not** within the Old Ottawa East Secondary Plan, the eastern half (or ‘tail end’) of the property, that fronts onto McGillvray is shown as within the boundaries of the Old Ottawa East Secondary Plan. Given the irregular lot fabric and as the proposal is not impacting this segment of the lot (except perhaps to add soft-landscaping), this Secondary Plan is not considered applicable to review of the proposal.
 - g. See Official Plan Sections related to Special Districts (6.6), and specifically the Rideau Canal Special District (6.6.2.2).
 - h. Review and address Official Plan Area-Specific Policies (Section 12.3). Specifically, each one of the policies in Section 12.3(1) must be addressed In the Planning Rationale in order for an area-specific policy to be considered.
9. Staff support redevelopment of this site to remove surface parking and introduce increased residential housing. Certain aspects of the design are also supported, such as the continuity of built form along the streetscape and the multiple at-grade access to units at-grade and the internalizing of parking.
10. Staff have concerns with the massing, mature tree removal, and amenity space.

Massing

11. Staff acknowledge that this site is unique in that it is larger in area and already contains a building taller than its neighbours. However, staff have concerns with the existing massing and the associated prominence of the building (given its

special location adjacent to a UNESCO site) and its impact on abutting neighbours which are identified as a low-rise context facing the canal.

12. Consider ways to adjust the massing to reduce its impact.
13. Incorporate setbacks to sensitively address the abutting low-rise residential dwellings.
14. Consider how the building can better relate to the streetscape and consider how the building will be viewed, within the existing surrounding context, from surrounding areas.
15. Consider lighter cladding/materiality.

Mature tree removal

16. Staff expect tree retention along Echo Drive. This would require the underground parking garage to shift eastward to an extent that would not impact the critical root zones. This would also require the removal of the window wells within the front yard. Please note that the existing Hydro lines along Echo Drive create limitations for replacement trees. Please see policy support here:
 - a. OP Section 6.6.2.2(4)iii): “Carefully consider the visual relationship between the site and the Canal, including...the preservation of mature trees by ensuring the continuity of the existing landscape patterns”
 - b. OP Section 4.6.2(4)b): “Development abutting Scenic Routes...shall contribute to conserving or creating a desirable context by such means as...preserving and restoring landscaping, including but not limited to distinctive trees and vegetation along the right of way”.
 - c. Tree Protection By-law 2020-340
17. Please demonstrate an effort to retain the existing mature shared trees in the rear / southern interior yard. These rear yard trees have a large canopy. They are likely shared ownership with the neighbouring property.

Amenity space

18. It appears that the majority of the amenity area is outdoors (balconies, rooftop). Consider allocating more space for indoor amenity which can be utilized year-round, in line with Section 4.6.6(4) in the Official Plan.
19. The soft landscaped area at the rear is only accessible from McGillivray Street, and does not appear to be easily accessible to the tenants of the building. This area would not count towards amenity area on site.

Other considerations

20. An HIA will be required and details on mitigation measures to conserve the cultural heritage landscape and heritage values of the Rideau Canal as a World Heritage Site and National Historic site is required (see OP Section 6.6.2.2(3)(a))
21. When considering lighting for the proposal please refer to: [Capital Illumination Plan | National Capital Commission](#) (see OP Section 6.6.2.2(3)(b))
22. As the proposal and design progress, please demonstrate design excellence and attend the UDRP. This property is within a Design Priority Area Tier 1 – International as it is within the Rideau Canal Special District (see OP Section 4.6.1, Table 5, and Schedule C7-A – Design Priority Areas - Urban)
23. Please consider providing a ratio of 1:1 bicycle parking to dwelling units and providing safe, secure and easily accessible bike parking. Colonel By Drive and the Flora Footbridge are both designated “major pathways” and, as such, the proposal should consider active transportation considerations (See OP Schedule C3 – Active Transportation Network).
24. Colonel By Drive is a Scenic Capital Entry Route and the proposal and rationale should address how the development will be viewed from Colonel By and how the development contributes to conserving and creating a desirable context (See OP Section 4.6.2(4), and OP Schedule C13).
25. Consider how to increase connectivity throughout the site, such that tenants could access landscaping in the rear and the through-lot connection.

Feel free to contact Margot Linker, Planner II, for follow-up questions.

Heritage

Comments:

26. 441 Echo Drive is not designated under the Ontario Heritage Act, so a heritage application will not be required as part of this proposal.
27. This property is across from the Rideau Canal which is a UNESCO World Heritage Site, a national historic site of Canada and a Canadian Heritage River and is also within the Rideau Canal Special District within the City’s Official Plan. A Heritage Impact Assessment (HIA) is required.
28. The HIA must adhere to the Heritage Impact Assessment Terms of Reference (TOR). Through the HIA please demonstrate how the application adheres to Section 6.6.2.2 The Rideau Canal Special District Policies 3) and 4) a). The HIA should speak specifically to potential impacts of the proposed project on the Canal in terms of visual relationship, height, massing, scale and landscape character.

29. The City of Ottawa, National Capital Commission and Parks Canada are currently working on a Cultural Landscape Study of the urban section of the Rideau Canal. This Study is in draft form, but we encourage you to consider the following draft guidelines:
- a. Encourage property owners to retain and plant trees to strengthen the urban canopy and the park- like feel of even the small public spaces along the Driveway, and
 - b. Minimize signage (especially lighted signs) and other visual clutter obscuring heritage viewscapes.

Feel free to contact Taylor Quibell, Heritage Planner, for follow-up questions.

Urban Design

Submission requirements:

30. Urban Design Brief is required. Please see attached updated Terms of Reference to guide the preparation. The Urban Design Brief should be organized by generally following the structure outlined in the Terms of Reference.
31. Drawings and studies are required as shown on the SPIL. Please follow the terms of references ([Planning application submission information and materials | City of Ottawa](#)) to prepare these drawings and studies. These include:
- a. Site Plan
 - b. Landscape Plan
 - c. Building Elevations
 - d. Wind Study
 - e. Shadow Study
 - f. View Study (views of the proposed building and its impacts on the Rideau Canal)
32. UDRP Review:
- a. The site is within a Design Priority Area. Given the complexity of the development, the prominent location of site in proximity to Rideau Canal UNESCO Heritage site, the project can benefit from UDRP review.
 - b. Please contact udrp@ottawa.ca for scheduling details. Early consultation with the UDRP is highly recommended. If UDRP review occurs at pre-consultation stage, a URRP report is required to ensure process transparency ([Urban Design Review Panel Report](#)).

Comments on Design:

33. Urban design appreciates the unique lot conditions and the context, the opportunity to improve conditions of the public realm along Echo Drive through activation and ground floor uses, and the elegance of the architecture.
34. Overall, the development can benefit from further contextualization as required by the Official Plan particularly those related the Rideau Canal Special District 6.6.2.2. More specifically, from urban design perspective:
 - a. Development will respect the existing patterns of building footprints, height, massing, scale, setback and landscape character within the associated streetscape.
 - b. Provide carefully consider the visual relationship between the site and the canal, including the adjacent or nearby federal parkways.
 - c. Preserve mature trees by ensuring the continuity of the existing landscape patterns, orientation of buildings and preserving views to and from the canal.
35. Site orientation
 - a. Ensure that the trees on the site are protected.
 - b. Provide landscaping in the rear yard and interior side yard to the extent possible.
 - c. Study rear yard conditions and the relationship between the proposed development and the abutting properties along McGillivray. The proposed building may be too close to the rear property lines of the abutting properties. Additional setbacks should be considered.
 - d. Explore pedestrian connections throughout the site.
36. Built form
 - a. Height and massing of the overall building should ensure sensitive integration with the abutting low-rise context and should respect the character and views of Rideau Canal and streetscape.
 - b. The ground plane should be set to respond to the pattern shown on adjacent buildings. The current proposal appears to be a little bit too high for its context.
 - c. The height and rhythm of the base should be responsive to the existing buildings along Echo Drive. The massing of the abutting buildings should be further studied and accurately represented in future renderings. It

appears that the current three storey base may be too high. A datum line at the second storey may be more sensitive to the context.

- d. The base may be broken up vertically to mimic the architectural rhythm of Echo Drive.
- e. The glazing to wall ratio appears to be quite high. Given the context, increased solidity particularly at the base may be appropriate.

Feel free to contact Sahara Shrestha, Planner II, Urban Design, for follow-up questions.

Forestry

Comments:

37. A Tree Conservation Report (TCR) and Landscape Plan (LP) will be required, showing existing, protected trees within and bordering the site, and detailing tree removals, impacts, & protection measures. The Landscape Plan must provide details on proposed plantings, including the soil volumes created to support tree planting and retention. Please refer to the detailed guidelines below.

38. There are six privately-owned, protected trees on & adjacent to the subject site, including two in the Echo Dr frontage, one on the adjacent property at 435 Echo Dr., and three on the boundary with 447 Echo Dr. See below for a rough depiction of their locations. As of 05/11/2025, all trees were healthy, though the trees listed as 2 & 3 have structural defects. Trees listed as 1, 4, 5, & 6 should be prioritized for retention.



39. Currently, the proposed development does not account for the existing trees on & adjacent to the site. Of particular concern is the extent of the proposed underground parking, which would require the removal of the existing trees in the Echo Dr frontage and would prevent or severely limit the ability to provide replacement plantings in that location. Additionally, the boundary and adjacent trees in the rear yard would be significantly impacted and would most likely require removal. The design of the building and site should be revised to ensure that the development maintains the existing, healthy trees on & adjacent to the site.
40. The Official Plan clearly states the need to prioritize retention and protection of existing trees, as well as the enhancement of the Urban Forest, in the policies of Section 4.8.2. In particular, Policy 3 requires that: *Growth, development and intensification shall maintain the urban forest canopy and its ecosystem services, in accordance with Subsection 4.8.2, Policy 6) and the following:*
- a) Preserve and provide space for mature, healthy trees on private and public property, including the provision of adequate volumes of high-quality soil as recommended by a Landscape Architect;
 - b) On urban properties subject to site plan control or community planning permits, development shall create tree planting areas within the site and in the adjacent boulevard, as applicable, that meet the soil volume requirements in any applicable City standards or best management practices or in accordance with the recommendation of a Landscape Architect
 - c) Planning and development decisions, including Committee of Adjustment decisions, shall have regard for short-term, long-term and cumulative impacts on the urban forest at the neighbourhood and urban-wide scale;
 - d) When considering impacts on individual trees, planning and development decisions, including Committee of Adjustment decisions, shall give priority to the retention and protection of large, healthy trees over replacement plantings and compensation; and
 - e) Planning and development review processes shall support the goals and effective implementation of the Tree Protection By-law, including early consideration of trees in application and business processes.
41. Furthermore, the policies of the Rideau Canal Special District (OP Section 6.6.2.2. 4) require that development respect and maintain the streetscape, including the preservation of mature trees, as outlined in policy 4) iii:
- a) Carefully consider the visual relationship between the site and the Canal, including the adjacent or nearby federal parkways and the preservation of mature trees by ensuring the continuity of the existing landscape patterns, orientation of buildings and preserving views to and from the Canal;

42. To align with the policies of the Special District, please revise the extent of the proposed building and underground parking garage to retain and protect the soil volume that supports the two trees in the Echo Dr. frontage (listed as trees 5 & 6 in the above sketch).
43. Please also revise the extent of the underground garage and explore the inclusion of step-backs above the existing third-storey, to ensure existing boundary & adjacent trees (listed as trees 1 & 4 in the above sketch) can be retained through demolition and construction. The Tree Conservation Report must provide realistic and detailed tree protection measures to support tree retention. In particular, this should include limiting excavation within the Critical Root Zone of tree 4 to the current extent of the building, and the protection of existing softscape that supports this tree.
44. The following Tree Conservation Report (TCR) guidelines have been adapted from the Schedule E of the Tree Protection By-law – for more information on these requirements please contact julian.alvarez-barkham@ottawa.ca.
 - a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City.
 - i. An approved TCR is a requirement of Site Plan approval.
 - b. Any removal of privately-owned trees 10cm or larger in diameter within the urban area, or 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.
 - c. The TCR must contain 2 separate plans:
 - i. Plan/Map 1 - show existing conditions with tree cover information.
 - ii. Plan/Map 2 - show proposed development with tree cover information.
 - d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition.
 - i. For ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table.
 - e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
 - f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.
 - i. Compensation may be required for the removal of city owned trees.

- g. The removal of trees on a property line will require the permission of both property owners.
 - h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available on the Tree Protection Specification or by searching Ottawa.ca.
 - i. The location of tree protection fencing must be shown on the plan.
 - ii. Show the critical root zone of the retained trees.
2. As per the Official Plan Section 4.8.2, the retention of healthy trees must be prioritized wherever possible. Please seek opportunities for retention of trees that will contribute to the design and function of the site.
45. The following Landscape Plan (LP) guidelines have been adapted from Schedule E of the Tree Protection By-law – for more information on these requirements please contact julian.alvarez-barkham@ottawa.ca.
- a. Please ensure any retained trees are shown on the LP.
 - b. Minimum Setbacks
 - i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
 - ii. Maintain 2.5m from curb.
 - iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
 - iv. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.
 - v. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
 - b. Tree specifications
 - i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
 - ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
 - c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.
 - d. No root barriers, dead-man anchor systems, or planters are permitted.
 - e. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

- f. Hard surface planting
 - i. If there are hard surface plantings, a planting detail must be provided.
 - ii. Curb style planter design is highly recommended.
 - iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- c. Trees are to be planted at grade.
- d. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

Tree Type/Size	Single Tree Soil Volume (m ³)	Multiple Tree Soil Volume (m ³ /tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

- i. It is strongly suggested that the proposed species list include a column listing the available soil volume.
- e. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- f. The City requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- g. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. **Please provide a projection of the future canopy cover for the site to 40 years.**

Feel free to contact Julian Alvarez-Barkham, Forester, for follow-up questions.

Engineering

Comments:

46. General Comments:

- a. It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an Existing Conditions Plan.
- b. Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A legal survey plan shall be provided and all easements shall be shown on the engineering plans.
- c. A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.) will not have an impact on any adjacent buildings and infrastructure.
- d. All underground and above ground building footprints and permanent walls need to be shown on the plans to confirm that any permanent structure does not extend either above or below into the existing property lines and sight triangles.
- e. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).
- f. Added to the general information for servicing and grading plans is a note that an O.L.S. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an O.L.S. for development projects is emphasized.
- g. Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Specific information has been incorporated into both the Guide to Preparing Studies and Plans for a site plan. Planning application submission information and materials. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.
- h. The Stormwater Management Criteria, for the subject site, is to be based on the following:

- a. Application of the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
 - b. For separated sewer systems built up until 2016, the design of the storm sewers were based on a 5-year storm; storm systems after such time are, generally, based on a 2-year level-of-service.
 - c. In separated areas, the pre-development runoff shall be the lower of the existing coefficient or a maximum equivalent 'C' of 0.5, whichever is less (Section 8.3.7.3).
 - d. A calculated time of concentration (cannot be less than 10 minutes).
 - e. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site.
 - f. Storm sewer outlets should not be submerged.
 - g. Quantity Control criteria - 100-year post-development to 5-year pre-development and $C=0.5$.
 - h. Quality Control criteria - Site is next to Rideau River and storm water discharges into this body of water near the site. If any ground parking is utilized, an Oil and Grit Separator (OGS) MH must be incorporated in Storm sewer/lateral design. If only minor uncontrolled flows and roof drainage, then no quality controls are necessary.
47. Services (Storm, Sanitary and/or Water Supply)
- a. Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.
 - b. Connections to trunk sewers and easement sewers are typically not permitted.
 - c. Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).
 - d. Review provision of a high-level sewer.
 - e. Sewer connections to be made above the springline of the sewermain as per:
 - i. Std Dwg S11.1 for flexible main sewers – connections made using approved tee or wye fittings.

- ii. Std Dwg S11 (For rigid main sewers) – lateral must be less than 50% the diameter of the sewermain,
- iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,
- iv. Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – Connect obvert to obvert with the outlet pipe unless pipes are a similar size.

48. Water

- a. Water Data Card (future requirement)
- b. 400mm dia. PVC WTR main is available within the Echo Drive ROW
- c. Existing water services are to be blanked at the watermain.
- d. Water Supply Redundancy: As per ISTB-2021-03, Industrial, commercial, institutional service areas with a basic day demand greater than 50 m³/day (0.57 L/s) and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m³/day (0.57 L/s) shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.
- e. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:
 - a. Location of service
 - b. Type of development
 - c. The amount of fire flow required (per OBC or FUS).
 - d. Average daily demand: ___ l/s.
 - e. Maximum daily demand: ___ l/s.
 - f. Maximum hourly daily demand: ___ l/s.

49. Sanitary

- a. 250 mm dia. PVC SAN sewer (c. 1995) is available within the Echo Drive ROW.
- b. For the Sanitary sewer capacity, please provide the proposed Sanitary sewer discharge and we confirm if Sanitary sewer main has the capacity.
- c. Include correspondence from the Architect within the Appendix of the report confirming the number of units and a unit type breakdown to support the calculated building populations.
- d. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.
- e. A Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) Monitoring Devices. If there is no space to accommodate a monitoring maintenance hole, a test port giving access to the city personnel shall be provided.
- f. A backwater valve is required on the Sanitary service for protection.

50. Storm

- a. 300 mm dia. PVC STM sewer (c. 1995) is available within the Echo Drive ROW.
- b. Please provide a stormwater management report (SWM) based on the Stormwater Management Criteria applicable for the site.
- c. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.
- d. Underground Storage: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

- e. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.
- f. In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.
- g. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 2- and 100-year event storage requirements.
- h. In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.
- i. Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.
- j. Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.
- k. Please provide a Pre-Development Drainage Area Plan to define the pre-development drainage areas/patterns. Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution.
- l. If rooftop control and storage is proposed as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a Roof Drain Plan as part of the submission.
- m. Street catch basins are not to be located at any proposed entrances.

51. Grading / Drainage

- a. Please demonstrate how retained trees and soils are to be incorporated in design from grading, soil retention and drainage perspective.
- b. Please also speak to rear laneway in regards to drainage/SWM and how this ties into project.
- c. Note, site is fronting a low point (sag) in roadway. See Sewer Design Guidelines and ISTB Bulletins (as ammended), regarding lowest opening, considering UG parking / garage ramps and entrance ways/floor plate, in terms of possibility of flooding issues. Consider this in design.

52. Fire-fighting flow rate(s)

- a. Refer to ISTB-2021-03 and ISTB-2024-05
- b. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal.
- c. Type of development and the amount of fire flow required (L/min). Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).
- d. Hydrant capacity shall be assessed to demonstrate the RFF can be achieved. Please identify which hydrants are being considered to meet the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

53. Geotechnical (including, where applicable, detailed sensitive marine clay investigation, retaining walls, shoring, rock excavation, dewatering, etc.)

- a. A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- b. Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.
- c. Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications. Geotechnical

Investigation and Reporting (ottawa.ca). See the Studies Plans and Identification List for more information.

- d. Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.
- e. If Sensitive marine clay soils are present in this area that are susceptible to soil shrinkage that can lead to foundation and building damages. All six (6) conditions listed in the Tree Planting in Sensitive Marine Clay Soils-2017 Guidelines are required to be satisfied. Note that if the plasticity index of the soil is determined to be less than 40% a minimum separation between a street tree and the proposed building foundations of 4.5m will need to be achieved. A memorandum addressing the Tree in Clay Soil Guidelines prepared by a geotechnical engineer is required to be provided to the City.
- f. <https://ottawa.ca/en/city-hall/planning-and-development/community-plans-and-design-guidelines/design-and-planning/completed-guidelines/tree-planting-sensitive-marine-clay-soils-2017-guidelines>.
- g. Echo Dr. has mature trees to be maintained and Retaining Walls will likely be required. Any Retaining Wall in excess of 1m in height will need to be designed by structural engineer and shall resist global stability. Geotechnical Consultant to speak to this also. Plans shall show top and bottom of wall elevations and materiality for any Engineering Retaining Walls.

Feel free to contact Brett Hughes, Infrastructure Project Manager (IPM & SME), at brett.hughes@ottawa.ca for follow-up questions.

Noise

Noise requirements:

54. A Traffic and Stationary Noise (roof top units, parking lots, drive thru retail, etc.) studies are required.

Feel free to contact Brett Hughes, Infrastructure Project Manager (IPM & SME), at brett.hughes@ottawa.ca for follow-up questions.

Transportation

Comments:

55. Right-of-way protection.

- a. See [Schedule C16 of the Official Plan](#).
- b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

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

57. Echo Drive is classified as a Local Road. There is no additional protected ROW limits identified in the OP. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

58. The Site Plan should identify street names, road, and sidewalk features.

59. Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.

60. The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended <https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447> or as approved through the Site Plan control process. If ramp exceeds 6% grade, a subsurface melting element will be required.

61. The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed access.

62. The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb, and boulevard to City standards.

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

64. The purchaser, tenant or sub-lessee acknowledges the unit being rented/sold is not provided with any on-site parking and should a tenant/purchaser have a

vehicle for which they wish to have parking that alternative and lawful arrangements will need to be made to accommodate their parking need at an alternative location. The Purchaser/Tenant also acknowledges that the availability and regulations governing on-street parking vary; that access to on-street parking, including through residential on-street parking permits issued by the City cannot be guaranteed now or in the future; and that a purchaser, tenant or sub-lessee intending to rely on on-street parking for their vehicle or vehicles does so at their own risk.

65. The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.

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

Environment

Comments:

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

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

Parkland

Comments:

69. Cash-in-lieu of Parkland (CILP) will be required, at the rate specified in the Parkland Dedication By-law No.2022-280, as amended.
- a. CILP rate for residential uses > 18 units/net ha = one hectare per 1,000 net residential units but shall not exceed a maximum of 10% of the gross land area where the land is less than or equal to five hectares.

- b. In accordance with the Housing Acceleration Action Plan Directives approved by Council on October 8th, 2027, CILP payment, plus applicable appraisal fee(s), will be due at issuance of the first occupancy permit for the subject development.
- c. Please note, if the proposed unit count, land use changes or development application mix of uses changes, then the parkland dedication and conveyance requirement will be re-evaluated accordingly.

Feel free to contact Mike Russett, Parks Planner, for follow-up questions.

National Capital Commission

Comments:

1. Susan Millar (susan.millar@pc.gc.ca) is the planner for Parks Canada responsible for the Rideau Canal. We suggest looping her in on any development applications in proximity to the canal for their input.
2. From the draft cultural landscape study that has been the work of the NCC and the City, the area-specific guidelines for this sector include to:
 - a. *Encourage property owners to retain and plant trees to strengthen the urban canopy and the park- like feel of even the small public spaces along the Driveway, and*
 - b. *Minimize signage (especially lighted signs) and other visual clutter obscuring heritage viewscapes.*
 - c. From this, we suggest the following to assist the building in blending into the canal's landscape:
 - i. Limiting architectural lighting and any building uplighting;
 - ii. Limiting any signage to the ground floor, and limiting to non-illuminated signage;
 - iii. Exploring additional tree planting opportunities (challenging perhaps given the underground parking) – I can inquire of my colleagues responsible for our lands between the site and the canal if there might be opportunities for nearby off-site plantings on our lands.
3. Renderings of views of the proposed development from further north and south on the canal (e.g. from the canal along Patterson Creek and from Princess Patricia Way) would assist in understanding its visual impact to the canal. If you are able to request these of the proponent, we would appreciate it.

Feel free to contact Ted Horton, National Capital Commission, for follow-up questions.

Parks Canada

Comments:

4. Parks Canada will be included on future circulations of the proposed development. Parks Canada supports the comments provided by City Heritage staff and will review the HIA with a particular interest in compatibility with the local landscape character and the visual impact on the Rideau Canal NHS & WHS.

Feel free to contact Susan Millar, Parks Canada, for follow-up questions.

Community issues

Old Ottawa East Community Association

Comments:

5. We oppose an increase in building height to 6+ storeys. A building of that height would be very out of scale with all of the other buildings on Echo - both south and north of Clegg. The city is proposing a maximum of 4 storeys in the new Zoning Bylaws for the area in which the proposed development is located, and we do not feel a change is warranted for this property. While a higher building will provide more units for the neighbourhood, it would be totally out of scale with all of the surrounding buildings and could set a precedent for the future.
6. We encourage more transitions / step backs on all sides as this would make the building less imposing to its neighbours.
7. We support the retention of as many of the existing trees as possible and support the planting of as many new trees as is practical.

Other

8. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.
 - a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.
 - b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

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

Submission Requirements and Fees

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



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

Yours Truly,
Ann O'Connor, Planner III

Encl. Studies and Plans Identification List
Urban Design Brief Terms of Reference
Supplementary Development Information
List of Technical Agencies
HPDS Overview for Applicants
HPDS Example Checklists
ADS Site Plan Checklist

c.c. Margot Linker, Planner II
Spencer Mulvaney, Planner I
Shawn Wessel, Infrastructure Project Manager
Brett Hughes, Infrastructure Project Manager
Wally Dubyk, Transportation Project Manager
Randolph Wang, Urban Design Planner III
Sahara Shrestha, Urban Design Planner II
Taylor Quibell, Heritage Planner II
Mike Russett, Parks Planner III
Julian Alvaraz-Barkham, Planning Forester
Matthew Hayley, Environmental Planner III
Amy MacPherson, Environmental Planner II

Susan Millar, Parks Canada
Ted Horton, NCC

Phyllis Odenback, Old Ottawa East Community Association -
podenbac.curling@gmail.com

John Dance, Old Ottawa East Community Association -
john.dance.ottawa@gmail.com

Joseph Sleiman, Old Ottawa East Community Association - me@jmsleiman.com

Kynan Dsa

From: Bailey Haskins <Haskins@project1studio.ca>
Sent: Tuesday, April 28, 2026 3:49 PM
To: Kynan Dsa; Francois Thauvette
Cc: Ryan Koolwine
Subject: 441 Echo Civil Coordination

Hi guys,

Here are the current parking floor elevations:

TOF = +/-55.67m
P1 = 62.517m
P2 = 58.86m
P3 = 55.97m
USF = +/-55.37m

Also here is the updated unit type breakdown:

UNIT COUNT								
NAME	LVL 01	LVL 02	LVL 03	LVL 04	LVL 05	LVL 06	TOTAL COUNT	PERCENTAGE
1-BED	2	5	5	5	5	0	22	42%
1-BED + DEN	3	1	1	1	1	1	8	15%
2-BED	2	4	4	4	4	1	19	37%
2-BED + DEN	0	0	0	0	0	1	1	2%
3-BED	0	0	0	0	0	2	2	4%
TOTAL	7	10	10	10	10	5	52	100%

Best,

Bailey Haskins

project1studio

260 St. Patrick Street - Suite 300 | project1studio.ca | 613 884-3939 x8 then x2

APPENDIX B
Development Servicing Study Checklist

Servicing study guidelines for development applications

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

- Executive Summary (for larger reports only).
- Date and revision number of the report.
- Location map and plan showing municipal address, boundary, and layout of proposed development.
- Plan showing the site and location of all existing services.
- 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.
- Summary of Pre-consultation Meetings with City and other approval agencies.
- Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.
- Statement of objectives and servicing criteria.
- Identification of existing and proposed infrastructure available in the immediate area.
- 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).
- 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.
- 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.
- Proposed phasing of the development, if applicable.

- Reference to geotechnical studies and recommendations concerning servicing.

- 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

4.2 Development Servicing Report: Water

- Confirm consistency with Master Servicing Study, if available
- Availability of public infrastructure to service proposed development
- Identification of system constraints
- Identify boundary conditions
- Confirmation of adequate domestic supply and pressure
- 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.
- 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.
- Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- Address reliability requirements such as appropriate location of shut-off valves
- Check on the necessity of a pressure zone boundary modification.
- 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

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

4.3 Development Servicing Report: Wastewater

- 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).
- Confirm consistency with Master Servicing Study and/or justifications for deviations.
- 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.
- Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- 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)
- Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.
- Description of proposed sewer network including sewers, pumping stations, and forcemains.
- 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).
- Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- Analysis of available capacity in existing public infrastructure.
- A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- 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.
- Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- Set-back from private sewage disposal systems.
- Watercourse and hazard lands setbacks.
- Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- 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.
- Any proposed diversion of drainage catchment areas from one outlet to another.
- Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- 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.
- Identification of potential impacts to receiving watercourses
- Identification of municipal drains and related approval requirements.
- Descriptions of how the conveyance and storage capacity will be achieved for the development.
- 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- Inclusion of hydraulic analysis including hydraulic grade line elevations.
- Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- 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.
- Identification of fill constraints related to floodplain and geotechnical investigation.

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:

- 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.
- Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- Changes to Municipal Drains.
- Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

- Clearly stated conclusions and 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 draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

APPENDIX C

Sanitary Sewage Calculations, E-mail Correspondence from the City of Ottawa

441 Echo Drive - 6-Storey Residential Building
POST-DEVELOPMENT SANITARY FLOWS

Residential Flows	Post-Development
Number of 1-Bedroom Units & Den	30
Persons per 1-Bedroom Units	1.4
Number of 2-Bedroom Units	20
Persons per 2-Bedroom Unit	2.1
Number of 3-Bedroom Units	2
Persons per 3-Bedroom Units	3.1
Total Number of Units	52
Design Population	91
Average Daily Flow per Resident (280 L/c/day)	0.29 L/s
Peaking Factor (Harmon Formula)	3.60
Peak Residential Flow	1.06 L/s
Extraneous Flow	
Site Area	0.139 ha
Infiltration Allowance	0.33 L/s/ha
Peak Extraneous Flow	0.05 L/s
Total Peak Sanitary Flow	1.11 L/s

Brendan Nichols

From: Hughes, Brett <brett.hughes@ottawa.ca>
Sent: Thursday, February 5, 2026 9:14 AM
To: Francois Thauvette
Cc: Brendan Nichols
Subject: RE: 441 Echo Drive - Anticipated Peak Sanitary Flows (126003)
Attachments: 126003-SAN_Flows_Adequacy.pdf

Francois,
Asset Management has responded confirming they have no concerns with the proposed peak sanitary flows.

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

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

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: January 28, 2026 4:27 PM
To: Hughes, Brett <brett.hughes@ottawa.ca>
Cc: Brendan Nichols <b.nichols@novatech-eng.com>
Subject: FW: 441 Echo Drive - Anticipated Peak Sanitary Flows (126003)

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ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Brett,

As requested in the pre-consultation meeting notes for this project, we are sending you the anticipate peak sanitary flows for the proposed 6-storey residential development located at 441 Echo Drive. Please review the e-mail below, attached calculations and let us know if there are any capacity concerns.

Regards,

François Thauvette, P. Eng., Sr. Project Manager | Land Development & Public-Sector Engineering
NOVATECH

Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | T: 613.254.9643 Ext: 219 | C: 613.276.0310
The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Brendan Nichols <b.nichols@novatech-eng.com>
Sent: Wednesday, January 28, 2026 3:37 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 441 Echo Drive - Anticipated Peak Sanitary Flows (126003)

Hi François,

Please see below the draft email pertaining to the anticipated peak sanitary flows and its calculations.

We are sending this e-mail with the anticipated peak sanitary flows to obtain feedback on the capacity of the nearby sanitary sewer in support of our ZBLA, OPA & SPA applications. The proposed re-development of 441 Echo Drive will seek to demolish the existing building, followed by the construction of a 6-storey residential building. Parking will be provided within an underground parking structure.

The intent is to provide a sanitary service lateral connected to the 250mm dia. municipal PVC sanitary sewer that runs adjacent to the proposed property in Echo Drive. Based on the preliminary unit count, the anticipated peak sanitary flow for the proposed development would be approximately **~1.1 L/s**. Refer to the attached **Sanitary Flows calculation sheet** for details.

Thank you,

Brendan Nichols, CAD Technologist

NOVATECH

Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6
Tel: 613.254.9643

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APPENDIX D

**Water Demands and FUS Calculations,
Watermain Boundary Conditions, E-mail
Correspondence from the City of Ottawa, Correspondence
from Architect to support FUS Calculations**

441 Echo Drive - 6-Storey Residential Building POST-DEVELOPMENT WATER DEMANDS

DOMESTIC WATER DEMAND

Residential Water Demands	Post-Development
Number of 1-Bedroom Units & Den	30
Persons per 1-Bedroom Units & Den	1.4
Number of 2-Bedroom Units	20
Persons per 2-Bedroom Unit	2.1
Number of 3-Bedroom Units	2
Persons per 3-Bedroom Unit	3.1
Total Number of Units	52
Design Population	91
Average Daily Flow per resident	280 L/c/day
Average Day Demand	0.29 L/s
Maximum Day Demand (2.5 x avg. day)	0.74 L/s
Peak Hour Demand (2.2 x max. day)	1.62 L/s
TOTALS	
Average Day Demand	0.29 L/s
Maximum Day Demand	0.74 L/s
Peak Hour Demand	1.62 L/s

BOUNDARY CONDITIONS (CONNECTION TO EX. 406mm dia. WM IN ECHO DR.)

Minimum HGL (Peak Hour) =	106.1	m
Maximum HGL =	114.7	m
Max Day + Fire Flow =	109.7	m

PRESSURE TESTS

To convert Head(m) to PSI: multiply by 1.42

Average Ground Elevation at Connection	64.82 m
Low Pressure Test = (Min. HGL - Watermain Elevation.) x 1.42197 PSI/m (should be > 40 PSI)	62 PSI
High Pressure Test = (Max. HGL - Watermain Elevation.) x 1.42197 PSI/m (should be 50-70 PSI)	74 PSI
Max Day + Fire Flow Test = (Max Day + Fire Flow - Watermain Elevation.) x 1.42197 PSI/m (should be > 20 PSI)	67 PSI

FUS - Fire Flow Calculations



Engineers, Planners & Landscape Architects

Novatech Project #: 126003
 Project Name: 441 Echo Drive, Ottawa, ON
 Date: 1/28/2026
 Input By: Brendan Nichols
 Reviewed By:

Legend: Input by User
 No Input Required
 Reference: Fire Underwriter's Survey Guideline (2020)
 Formula Method

Building Description: Six-Storey Residential Building
 Type II - Non-combustible construction

Step		Choose		Value Used	Total Fire Flow (L/min)	
Base Fire Flow						
1	Construction Material		Multiplier			
	Coefficient related to type of construction C	Type V - Wood frame		1.5		0.8
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
Type I - Fire resistive construction (2 hrs)			0.6			
2	Floor Area				9,000	
	A	Building Footprint (m ²)	722			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr) if C<1.0				
		Area of structure considered (m ²)		2,888		
F	Base fire flow without reductions					
	$F = 220 C (A)^{0.5}$					
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge	7,650	
	(1)	Non-combustible		-25%		-15%
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
Rapid burning			25%			
4	Sprinkler Reduction		FUS Table 4	Reduction	-3,060	
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%		-30%
		Standard Water Supply	Yes	-10%		-10%
		Fully Supervised System	No	-10%		
		Cumulative Sub-Total				-40%
	Area of Sprinklered Coverage (m²)	4,332	100%			
Cumulative Total			-40%			
5	Exposure Surcharge		FUS Table 6	Surcharge	4,437	
	(3)	North Side	0 - 3 m			21%
		East Side	3.1 - 10 m			16%
		South Side	0 - 3 m			21%
		West Side	>30m			0%
Cumulative Total			58%			
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min		L/min	9,000	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	150
				or	USGPM	2,378
7	Storage Volume	Required Duration of Fire Flow (hours)	FUS Table 1	Hours	2	
		Required Volume of Fire Flow (m ³)		m ³	1080	

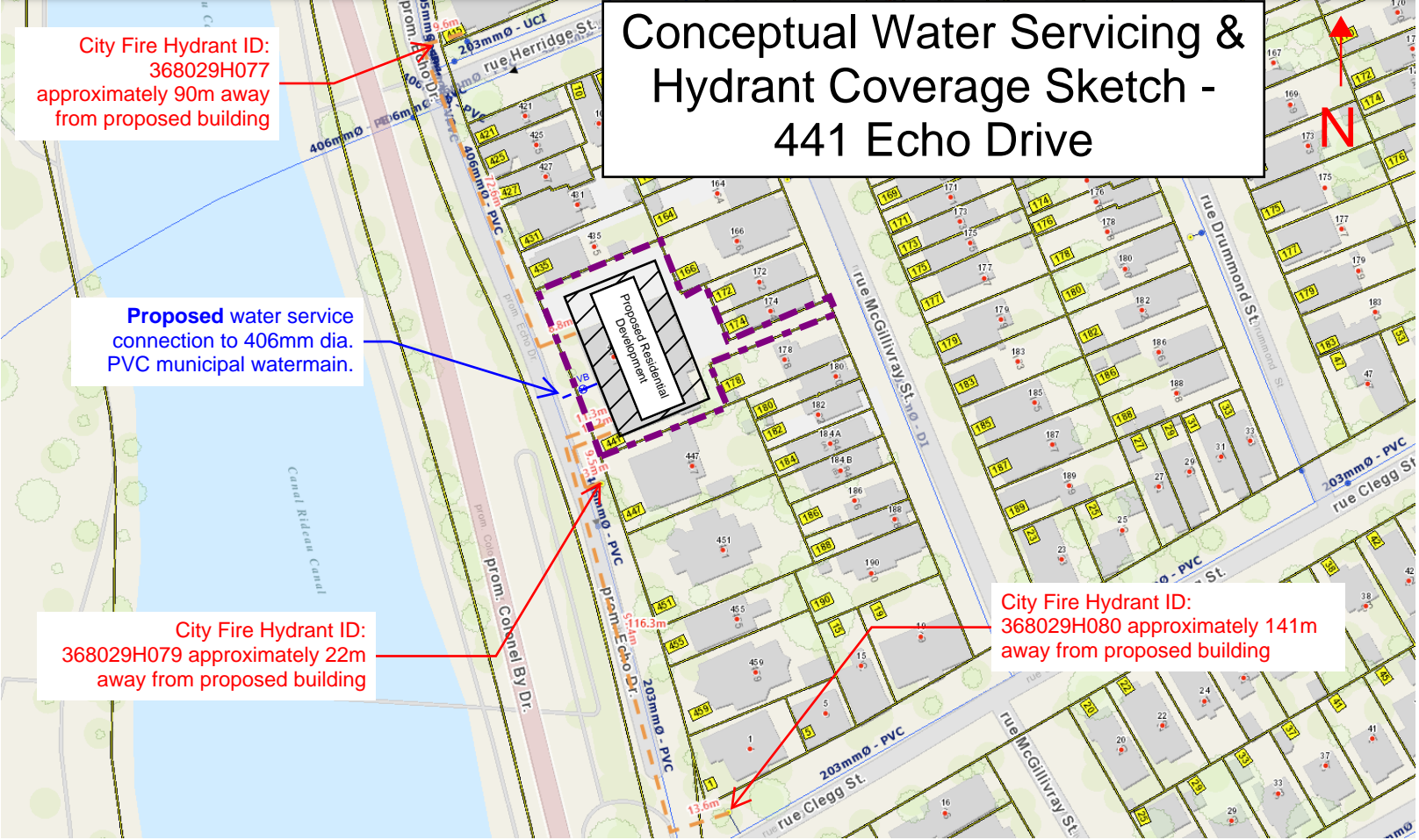
Conceptual Water Servicing & Hydrant Coverage Sketch - 441 Echo Drive

City Fire Hydrant ID:
368029H077
approximately 90m away
from proposed building

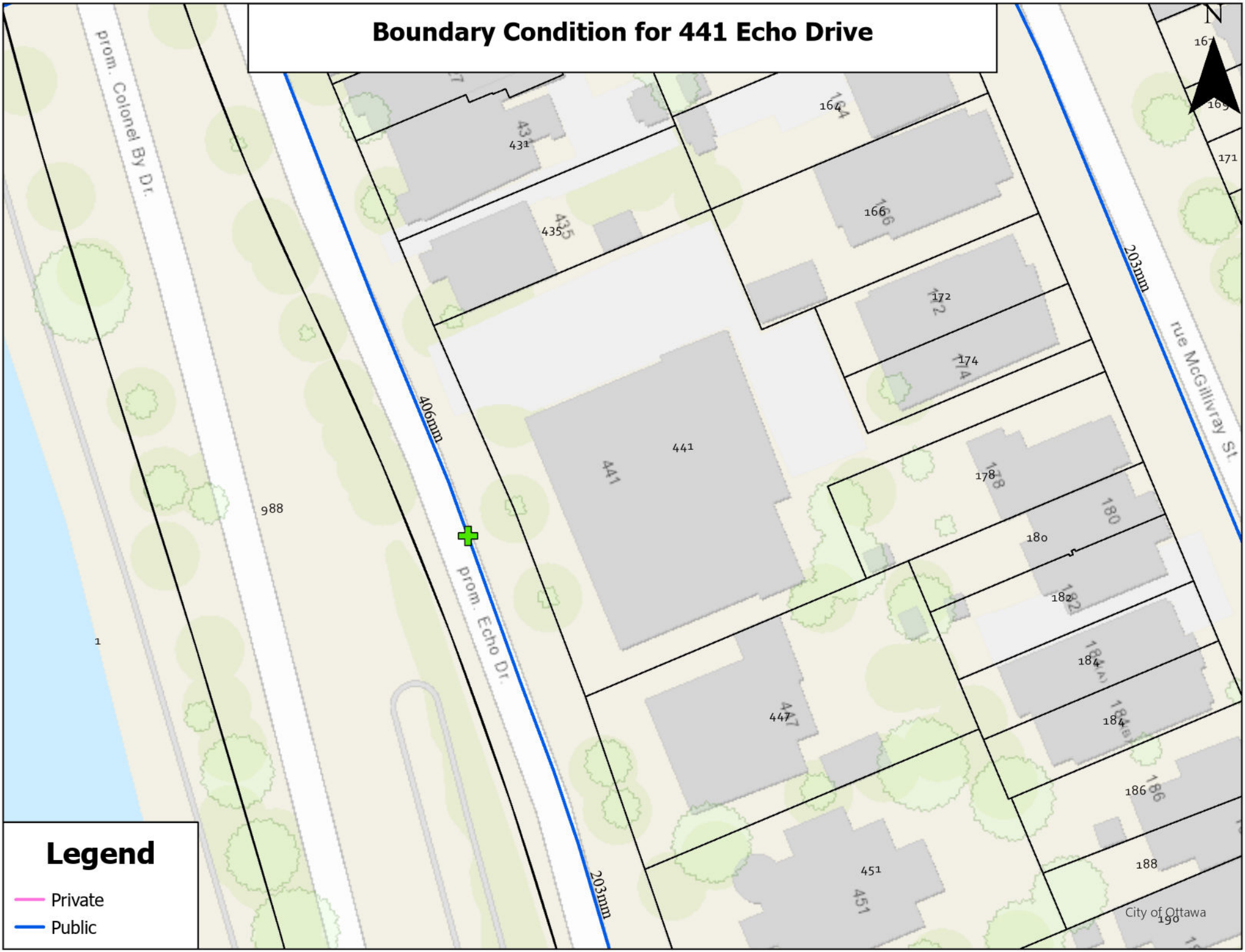
Proposed water service
connection to 406mm dia.
PVC municipal watermain.

City Fire Hydrant ID:
368029H079 approximately 22m
away from proposed building

City Fire Hydrant ID:
368029H080 approximately 141m
away from proposed building



Boundary Condition for 441 Echo Drive



Legend

- Private
- Public

Kynan Dsa

From: Hughes, Brett <brett.hughes@ottawa.ca>
Sent: Monday, March 16, 2026 1:16 PM
To: Francois Thauvette
Cc: Brendan Nichols; Kynan Dsa; Wu, John
Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

Francois,

The issue with the current guideline is that “residential facilities” is not properly defined. Water Resources has confirmed their interpretation of an individual residential facility to be a licensed, often small-scale, home-like environment that provides 24-hour, long-term care and supervision to individuals who cannot live independently. They consider housing, featuring homes, apartments, and dwellings where people live to fall under the definition of residential area. Water Resources Planning and Engineering Branch have confirmed that 50+units require 2 connections.

Regards,

Brett Hughes

Project Manager, Infrastructure Approvals

Development Review Central

PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS)

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City of Ottawa | Ville d'Ottawa

☎ 613.580.2424 ext./poste 76665

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From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: March 13, 2026 10:20 AM
To: Hughes, Brett <brett.hughes@ottawa.ca>
Cc: Brendan Nichols <b.nichols@novatech-eng.com>; Kynan Dsa <k.dsa@novatech-eng.com>
Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

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Hi Brett,

Thank you for chasing down the WM boundary conditions for us. We do however require clarification as to why the e-mail below from the Water Department assumes the proposed water service to be “**dually connected** to the 406mm watermain on Echo Drive”. The 2025 Ottawa Water Distribution Guidelines state that “**Individual residential facilities** with a basic day demand greater than 50 m³/day shall be connected with a minimum of two water services, separated by an isolation valve...” (see excerpt below for details).

Industrial, commercial, institutional service areas with a basic day demand greater than 50 m³/day and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m³/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid the creation of a vulnerable service area.

As indicated in the water demand calculation sheet we had sent to the City, the proposed residential building is anticipated to have a 0.29 L/s average day demand, which is **less than** the ~0.58 L/s (50,000 L/day) threshold for a redundant water service requirement. We had also specified that only one water service lateral was being proposed in our boundary conditions request. Please ask the Water Department why the term “dually connected” was used in their water boundary conditions e-mail.

Regards,

François Thauvette, P. Eng., Sr. Project Manager | Land Development & Public-Sector Engineering
NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | T: 613.254.9643 Ext: 219 | C: 613.276.0310

The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Hughes, Brett <brett.hughes@ottawa.ca>

Sent: Friday, March 13, 2026 9:34 AM

To: Francois Thauvette <f.thauvette@novatech-eng.com>

Cc: Brendan Nichols <b.nichols@novatech-eng.com>

Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

Francois,

The following are boundary conditions, HGL, for hydraulic analysis at 441 Echo Drive (zone 1W) assumed to be **dually connected** to the 406mm watermain on Echo Drive (see attached PDF for location).

Minimum HGL = 106.1 m

Maximum HGL = 114.7 m

Max Day + Fire Flow (150 L/s) = 109.7 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. Fire Flow analysis is a reflection of available flow in the watermain; there may

be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Regards,

Brett Hughes

Project Manager, Infrastructure Approvals
Development Review Central
PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS)
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City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext./poste 76665

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From: Hughes, Brett
Sent: March 11, 2026 12:49 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Cc: Brendan Nichols <b.nichols@novatech-eng.com>
Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

Francois,

Thanks for following up, I have asked Water Services for an update and that this request receive priority. Hoping to have something back to you shortly.

Regards,

Brett Hughes

Project Manager, Infrastructure Approvals
Development Review Central
PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS)
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City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext./poste 76665

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: March 10, 2026 11:32 AM
To: Hughes, Brett <brett.hughes@ottawa.ca>
Cc: Brendan Nichols <b.nichols@novatech-eng.com>
Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

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Hi Brett,

Would you be able to reach out to the Water Department to see if they can provide us with the Municipal Watermain Boundary Conditions for this project? We put in the request almost 6 weeks ago.

Thanks,

François Thauvette, P. Eng., Sr. Project Manager | Land Development & Public-Sector Engineering

NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | T: 613.254.9643 Ext: 219 | C: 613.276.0310

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From: Hughes, Brett <brett.hughes@ottawa.ca>

Sent: Tuesday, February 3, 2026 3:17 PM

To: Francois Thauvette <f.thauvette@novatech-eng.com>

Cc: Brendan Nichols <b.nichols@novatech-eng.com>

Subject: RE: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

Francois,

Apologies in advance for any delays, I am just getting back today from a week of vacation. I have forwarded the anticipated sanitary calculations to Asset Management and I have also sent in the boundary condition request this afternoon. Please stand by.

Regards,

Brett Hughes

Project Manager, Infrastructure Approvals

Development Review Central

PLANNING, DEVELOPMENT & BUILDING SERVICES (PDBS)

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From: Francois Thauvette <f.thauvette@novatech-eng.com>

Sent: January 28, 2026 4:40 PM

To: Hughes, Brett <brett.hughes@ottawa.ca>

Cc: Brendan Nichols <b.nichols@novatech-eng.com>

Subject: FW: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

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Hi Brett,

As requested in the pre-consultation meeting notes for this project, we are sending you this e-mail to request municipal watermain boundary conditions for the proposed 6-storey residential development located at 441 Echo Drive. Refer to the e-mail below and attached calculations for details.

Regards,

François Thauvette, P. Eng., Sr. Project Manager | Land Development & Public-Sector Engineering

NOVATECH

Engineers, Planners & Landscape Architects

From: Brendan Nichols <b.nichols@novatech-eng.com>
Sent: Wednesday, January 28, 2026 3:36 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 441 Echo Drive - Request for Municipal WM Boundary Conditions (126003)

Hi François,

Please see below the draft email to request the WM boundary conditions from the City of Ottawa.

The proposed re-development of 441 Echo Drive will seek to demolish the existing building, followed by the construction of a 6-storey residential building. Parking will be provided within an underground parking structure.

The purpose of this email is to request watermain boundary conditions for the existing 406mm dia. PVC watermain in Echo Drive. We do not anticipate requiring a redundant water service connection as the average daily demand for the proposed development is not anticipated to exceed 50,000 L/day. The anticipated water demands of the proposed development are as follows:

- Average Day Demand = **0.29 L/s**
- Maximum Day Demand = **0.73 L/s**
- Peak Hour Demand = **1.60 L/s**
- Maximum Fire Flow Demand = **150 L/s**

Refer to the attached **Water Demand** and **FUS Fire Flow** calculation sheets for details.

A multi-hydrant approach to firefighting is required. As indicated on the geoOttawa website, there is (1) blue bonnet municipal hydrants within a 75m radius of the subject site, as well as two (2) available additional blue bonnet municipal hydrants within 150m radius of the subject site. See attached file **WM Boundary Conditions Request Sketch** for details.

Thank you,

Brendan Nichols, CAD Technologist

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Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6
Tel: 613.254.9643

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MEMORANDUM

Project:	441 Echo Drive	Sent by:	E-mail
Date:	30 April 2026	Pages:	1

To:	Ann O'Connor	City of Ottawa – Planner III
	Margot Linker	City of Ottawa – Planner II
	Spencer Mulvaney	City of Ottawa – Planner I
	Shawn Wessel	City of Ottawa – Infrastructure

Copies:	Tamara Nahal	Fotenn
	Francois Thauvette	Novatech
	Kynan Dsa	Novatech
	Anthony Bassi	JB Holdings

REGARDING: FUS Design Parameters

The proposed development at 441 Echo Drive is a 6-Storey Mid-Rise Apartment building with a 3-Level underground parking structure. The building will be of non-combustible construction with a poured concrete structure. This memorandum is confirmation that the building will be designed to ensure that the parameters used to determine the FUS fire flow calculations for the project are maintained.

The following parameters were used to establish the required fire flow per FUS (2020) for the project:

- Type II non-combustible construction material (0.8 construction coefficient)
- Limited combustibility occupancy class (i.e., residential building with U/G parking)
- Fully sprinklered building, sprinkler system designed per NFPA 13
- 2-hour fire rating for all structural elements

Sincerely,



Ryan Koolwine | Principal
M. Arch, OAA

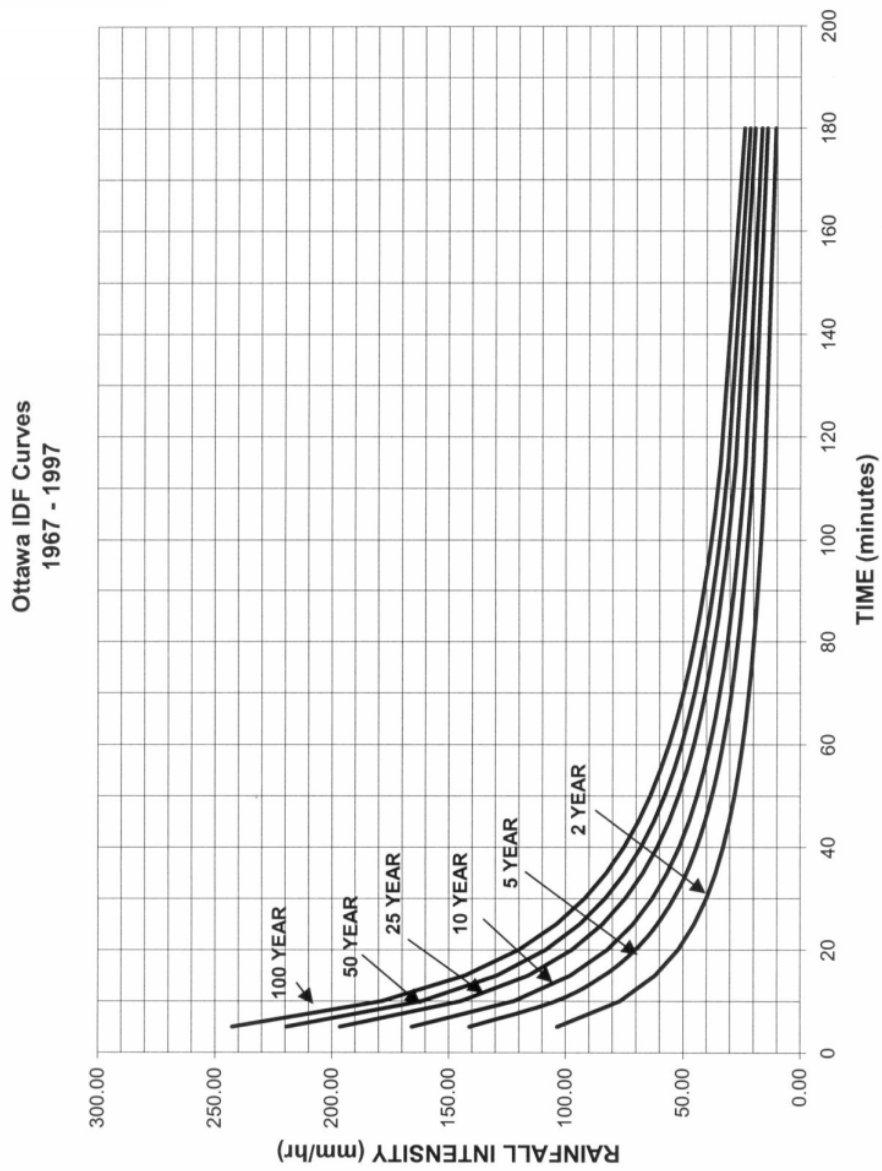


APPENDIX E
IDF Curves and SWM Calculations

Ottawa Sewer Design Guidelines

APPENDIX 5-A

OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



Proposed Residential Building 441 Echo Drive

Pre - Development Site Flows											
Description	Area (ha)	A _{Impervious} (ha) C=0.9	A _{stone/plaster} (ha) C=0.6	A _{pervious} (ha) C=0.2	Weighted C _{WS}	Weighted C _{w100}	2-Year Flow (L/s)	5-Year Flow (L/s)	100-Year Flow (L/s)	Allowable C _w =0.5 Max	Allowable Flow
											5-year (L/s)
Off-Site Tributary Area OS-1 (Northeast)	0.063	0.030	0.000	0.033	0.54	0.61	7.2	9.8	19.2	0.50	20.2
Off-Site Tributary Area OS-2 (Southeast)	0.048	0.018	0.000	0.030	0.46	0.53	4.7	6.4	12.6	0.50	
Site to be Developed	0.139	0.116	0.000	0.023	0.78	0.88	23.4	31.7	60.7	0.50	

T_c = 10mins

Post - Development Site Flows																
Area	Description	Area (ha)	A _{imp} (ha) C=0.9	A _{stone/plaster} (ha) C=0.6	A _{perv} (ha) C=0.2	C _S	C ₁₀₀	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Storage Required (m ³)		
								2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year
OS-1	Off-Site Tributary Area OS-1 (Northeast)	0.063	0.030	0.000	0.033	0.54	0.61	7.2	9.8	19.2	-	-	-	-	-	-
OS-2	Off-Site Tributary Area OS-2 (Southeast)	0.048	0.018	0.000	0.030	0.46	0.53	4.7	6.4	12.6	-	-	-	-	-	-
A-1a	Direct Runoff to Echo Drive	0.050	0.020	0.004	0.026	0.51	0.59	5.4	7.4	14.5	-	-	-	-	-	-
A-1b	Direct Runoff to McGillivray Street	0.002	0.000	0.000	0.002	0.20	0.25	0.1	0.1	0.2	-	-	-	-	-	-
A-2	Controlled Site Flow (Pumped)	0.087	0.087	0.000	0.000	0.90	1.00	-	-	-	5.3	5.3	5.3	7.4	12.1	31.1
Total Site Flows :								10.8	12.8	20.1						
T _c = 10mins								Overcontrolled=	9.4	7.4	0.1					

Excl. OS flow 0.139

*The river stone on filter cloth that comprises the landscape maintenance buffer is considered to have a c-value of 0.6. Refer to the Landscape Plan for further details.

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:2 YEAR EVENT AREA OS-1 Off-Site Tributary Area OS-1 (Northeast)				
OTTAWA IDF CURVE				
Area =	0.063	ha	Qallow =	7.2 L/s
C =	0.54		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	9.76	2.52	0.76
10	76.81	7.24	0.00	0.00
15	61.77	5.82	-1.42	-1.28
20	52.03	4.90	-2.34	-2.80
25	45.17	4.26	-2.98	-4.47
30	40.04	3.77	-3.47	-6.24
35	36.06	3.40	-3.84	-8.07
40	32.86	3.10	-4.14	-9.94
45	30.24	2.85	-4.39	-11.85
50	28.04	2.64	-4.60	-13.79
55	26.17	2.47	-4.77	-15.75
60	24.56	2.32	-4.93	-17.73
65	23.15	2.18	-5.06	-19.73
70	21.91	2.07	-5.17	-21.73
75	20.81	1.96	-5.28	-23.75
80	19.83	1.87	-5.37	-25.78
85	18.94	1.79	-5.45	-27.82
90	18.14	1.71	-5.53	-29.86

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:5 YEAR EVENT AREA OS-1 Off-Site Tributary Area OS-1 (Northeast)				
OTTAWA IDF CURVE				
Area =	0.063	ha	Qallow =	9.8 L/s
C =	0.54		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	13.31	6.07	1.82
10	104.19	9.82	2.58	1.55
15	83.56	7.88	0.64	0.57
20	70.25	6.62	-0.62	-0.74
25	60.90	5.74	-1.50	-2.25
30	53.93	5.08	-2.16	-3.88
35	48.52	4.57	-2.67	-5.60
40	44.18	4.17	-3.08	-7.38
45	40.63	3.83	-3.41	-9.21
50	37.65	3.55	-3.69	-11.07
55	35.12	3.31	-3.93	-12.97
60	32.94	3.11	-4.13	-14.89
65	31.04	2.93	-4.31	-16.82
70	29.37	2.77	-4.47	-18.78
75	27.89	2.63	-4.61	-20.75
80	26.56	2.50	-4.74	-22.73
85	25.37	2.39	-4.85	-24.73
90	24.29	2.29	-4.95	-26.73

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YEAR EVENT AREA OS-1 Off-Site Tributary Area OS-1 (Northeast)				
OTTAWA IDF CURVE				
Area =	0.063	ha	Qallow =	19.2 L/s
C =	0.61		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	26.04	6.88	2.06
10	178.56	19.16	0.00	0.00
15	142.89	15.33	-3.83	-3.44
20	119.95	12.87	-6.29	-7.55
25	103.85	11.14	-8.02	-12.02
30	91.87	9.86	-9.30	-16.74
35	82.58	8.86	-10.30	-21.62
40	75.15	8.06	-11.09	-26.63
45	69.05	7.41	-11.75	-31.72
50	63.95	6.86	-12.29	-36.88
55	59.62	6.40	-12.76	-42.11
60	55.89	6.00	-13.16	-47.37
65	52.65	5.65	-13.51	-52.68
70	49.79	5.34	-13.81	-58.02
75	47.26	5.07	-14.09	-63.39
80	44.99	4.83	-14.33	-68.78
85	42.95	4.61	-14.55	-74.19
90	41.11	4.41	-14.75	-79.63

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YR + 20% IDF Increase AREA OS-1 Off-Site Tributary Area OS-1 (Northeast)				
OTTAWA IDF CURVE				
Area =	0.063	ha	Qallow =	23.0 L/s
C =	0.61		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	291.24	31.24	12.09	3.63
10	214.27	22.99	3.83	2.30
15	171.47	18.40	-0.76	-0.68
20	143.94	15.44	-3.71	-4.46
25	124.62	13.37	-5.79	-8.68
30	110.24	11.83	-7.33	-13.19
35	99.09	10.63	-8.52	-17.90
40	90.17	9.67	-9.48	-22.76
45	82.86	8.89	-10.27	-27.72
50	76.74	8.23	-10.92	-32.77
55	71.55	7.68	-11.48	-37.88
60	67.07	7.20	-11.96	-43.06
65	63.18	6.78	-12.38	-48.28
70	59.75	6.41	-12.75	-53.53
75	56.71	6.08	-13.07	-58.83
80	53.99	5.79	-13.36	-64.15
85	51.54	5.53	-13.63	-69.49
90	49.33	5.29	-13.86	-74.86

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:2 YEAR EVENT AREA OS-2 Off-Site Tributary Area OS-2 (Southeast)				
OTTAWA IDF CURVE				
Area =	0.048	ha	Qallow =	4.7 L/s
C =	0.46		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	6.37	1.65	0.49
10	76.81	4.72	0.00	0.00
15	61.77	3.80	-0.92	-0.83
20	52.03	3.20	-1.52	-1.83
25	45.17	2.78	-1.95	-2.92
30	40.04	2.46	-2.26	-4.07
35	36.06	2.22	-2.51	-5.26
40	32.86	2.02	-2.70	-6.49
45	30.24	1.86	-2.86	-7.73
50	28.04	1.72	-3.00	-9.00
55	26.17	1.61	-3.11	-10.28
60	24.56	1.51	-3.21	-11.57
65	23.15	1.42	-3.30	-12.87
70	21.91	1.35	-3.38	-14.18
75	20.81	1.28	-3.44	-15.49
80	19.83	1.22	-3.50	-16.82
85	18.94	1.17	-3.56	-18.15
90	18.14	1.12	-3.61	-19.48

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:5 YEAR EVENT AREA OS-2 Off-Site Tributary Area OS-2 (Southeast)				
OTTAWA IDF CURVE				
Area =	0.048	ha	Qallow =	6.4 L/s
C =	0.46		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	8.68	3.96	1.19
10	104.19	6.41	1.68	1.01
15	83.56	5.14	0.42	0.37
20	70.25	4.32	-0.40	-0.48
25	60.90	3.74	-0.98	-1.47
30	53.93	3.32	-1.41	-2.53
35	48.52	2.98	-1.74	-3.65
40	44.18	2.72	-2.01	-4.81
45	40.63	2.50	-2.22	-6.01
50	37.65	2.32	-2.41	-7.22
55	35.12	2.16	-2.56	-8.46
60	32.94	2.03	-2.70	-9.71
65	31.04	1.91	-2.81	-10.98
70	29.37	1.81	-2.92	-12.25
75	27.89	1.72	-3.01	-13.54
80	26.56	1.63	-3.09	-14.83
85	25.37	1.56	-3.16	-16.13
90	24.29	1.49	-3.23	-17.44

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YEAR EVENT AREA OS-2 Off-Site Tributary Area OS-2 (Southeast)				
OTTAWA IDF CURVE				
Area =	0.048	ha	Qallow =	12.6 L/s
C =	0.53		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	17.14	4.53	1.36
10	178.56	12.61	0.00	0.00
15	142.89	10.09	-2.52	-2.27
20	119.95	8.47	-4.14	-4.97
25	103.85	7.33	-5.28	-7.91
30	91.87	6.49	-6.12	-11.02
35	82.58	5.83	-6.78	-14.23
40	75.15	5.31	-7.30	-17.53
45	69.05	4.88	-7.73	-20.88
50	63.95	4.52	-8.09	-24.28
55	59.62	4.21	-8.40	-27.72
60	55.89	3.95	-8.66	-31.18
65	52.65	3.72	-8.89	-34.68
70	49.79	3.52	-9.09	-38.19
75	47.26	3.34	-9.27	-41.72
80	44.99	3.18	-9.43	-45.27
85	42.95	3.03	-9.58	-48.84
90	41.11	2.90	-9.71	-52.41

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YR + 20% IDF Increase AREA OS-2 Off-Site Tributary Area OS-2 (Southeast)				
OTTAWA IDF CURVE				
Area =	0.048	ha	Qallow =	15.1 L/s
C =	0.53		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	291.24	20.57	7.96	2.39
10	214.27	15.13	2.52	1.51
15	171.47	12.11	-0.50	-0.45
20	143.94	10.16	-2.44	-2.93
25	124.62	8.80	-3.81	-5.71
30	110.24	7.78	-4.82	-8.68
35	99.09	7.00	-5.61	-11.78
40	90.17	6.37	-6.24	-14.98
45	82.86	5.85	-6.76	-18.25
50	76.74	5.42	-7.19	-21.57
55	71.55	5.05	-7.56	-24.94
60	67.07	4.74	-7.87	-28.34
65	63.18	4.46	-8.15	-31.78
70	59.75	4.22	-8.39	-35.24
75	56.71	4.00	-8.60	-38.72
80	53.99	3.81	-8.80	-42.22
85	51.54	3.64	-8.97	-45.74
90	49.33	3.48	-9.13	-49.28

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-1a Direct Runoff to Echo Drive				
OTTAWA IDF CURVE				
Area =	0.050	ha	Qallow =	5.4 L/s
C =	0.51		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	7.31	1.89	0.57
10	76.81	5.42	0.00	0.00
15	61.77	4.36	-1.06	-0.96
20	52.03	3.67	-1.75	-2.10
25	45.17	3.19	-2.23	-3.35
30	40.04	2.83	-2.60	-4.67
35	36.06	2.55	-2.88	-6.04
40	32.86	2.32	-3.10	-7.45
45	30.24	2.14	-3.29	-8.88
50	28.04	1.98	-3.44	-10.33
55	26.17	1.85	-3.58	-11.80
60	24.56	1.73	-3.69	-13.28
65	23.15	1.63	-3.79	-14.78
70	21.91	1.55	-3.88	-16.28
75	20.81	1.47	-3.95	-17.79
80	19.83	1.40	-4.02	-19.31
85	18.94	1.34	-4.09	-20.84
90	18.14	1.28	-4.14	-22.37

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-1a Direct Runoff to Echo Drive				
OTTAWA IDF CURVE				
Area =	0.050	ha	Qallow =	7.4 L/s
C =	0.51		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	9.97	4.55	1.36
10	104.19	7.36	1.93	1.16
15	83.56	5.90	0.48	0.43
20	70.25	4.96	-0.46	-0.56
25	60.90	4.30	-1.12	-1.69
30	53.93	3.81	-1.62	-2.91
35	48.52	3.43	-2.00	-4.19
40	44.18	3.12	-2.30	-5.53
45	40.63	2.87	-2.55	-6.90
50	37.65	2.66	-2.76	-8.29
55	35.12	2.48	-2.94	-9.71
60	32.94	2.33	-3.10	-11.15
65	31.04	2.19	-3.23	-12.60
70	29.37	2.07	-3.35	-14.07
75	27.89	1.97	-3.45	-15.54
80	26.56	1.88	-3.55	-17.03
85	25.37	1.79	-3.63	-18.52
90	24.29	1.72	-3.71	-20.03

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-1a Direct Runoff to Echo Drive				
OTTAWA IDF CURVE				
Area =	0.050	ha	Qallow =	14.5 L/s
C =	0.59		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	19.74	5.22	1.56
10	178.56	14.52	0.00	0.00
15	142.89	11.62	-2.90	-2.61
20	119.95	9.75	-4.77	-5.72
25	103.85	8.44	-6.08	-9.11
30	91.87	7.47	-7.05	-12.69
35	82.58	6.72	-7.81	-16.39
40	75.15	6.11	-8.41	-20.18
45	69.05	5.62	-8.91	-24.04
50	63.95	5.20	-9.32	-27.96
55	59.62	4.85	-9.67	-31.92
60	55.89	4.55	-9.97	-35.91
65	52.65	4.28	-10.24	-39.93
70	49.79	4.05	-10.47	-43.98
75	47.26	3.84	-10.68	-48.05
80	44.99	3.66	-10.86	-52.14
85	42.95	3.49	-11.03	-56.24
90	41.11	3.34	-11.18	-60.36

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YR + 20% IDF Increase AREA A-1a Direct Runoff to Echo Drive				
OTTAWA IDF CURVE				
Area =	0.050	ha	Qallow =	17.4 L/s
C =	0.59		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	291.24	23.68	9.16	2.75
10	214.27	17.42	2.90	1.74
15	171.47	13.94	-0.58	-0.52
20	143.94	11.71	-2.82	-3.38
25	124.62	10.13	-4.39	-6.58
30	110.24	8.96	-5.56	-10.00
35	99.09	8.06	-6.46	-13.57
40	90.17	7.33	-7.19	-17.25
45	82.86	6.74	-7.78	-21.01
50	76.74	6.24	-8.28	-24.84
55	71.55	5.82	-8.70	-28.72
60	67.07	5.45	-9.07	-32.64
65	63.18	5.14	-9.38	-36.59
70	59.75	4.86	-9.66	-40.58
75	56.71	4.61	-9.91	-44.59
80	53.99	4.39	-10.13	-48.62
85	51.54	4.19	-10.33	-52.68
90	49.33	4.01	-10.51	-56.75

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-1b Direct Runoff to McGillivray Street				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.1 L/s
C =	0.20		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	0.12	0.03	0.01
10	76.81	0.09	0.00	0.00
15	61.77	0.07	-0.02	-0.02
20	52.03	0.06	-0.03	-0.03
25	45.17	0.05	-0.04	-0.05
30	40.04	0.04	-0.04	-0.07
35	36.06	0.04	-0.05	-0.10
40	32.86	0.04	-0.05	-0.12
45	30.24	0.03	-0.05	-0.14
50	28.04	0.03	-0.05	-0.16
55	26.17	0.03	-0.06	-0.19
60	24.56	0.03	-0.06	-0.21
65	23.15	0.03	-0.06	-0.23
70	21.91	0.02	-0.06	-0.26
75	20.81	0.02	-0.06	-0.28
80	19.83	0.02	-0.06	-0.30
85	18.94	0.02	-0.06	-0.33
90	18.14	0.02	-0.07	-0.35

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-1b Direct Runoff to McGillivray Street				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.1 L/s
C =	0.20		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	0.16	0.07	0.02
10	104.19	0.12	0.03	0.02
15	83.56	0.09	0.01	0.01
20	70.25	0.08	-0.01	-0.01
25	60.90	0.07	-0.02	-0.03
30	53.93	0.06	-0.03	-0.05
35	48.52	0.05	-0.03	-0.07
40	44.18	0.05	-0.04	-0.09
45	40.63	0.05	-0.04	-0.11
50	37.65	0.04	-0.04	-0.13
55	35.12	0.04	-0.05	-0.15
60	32.94	0.04	-0.05	-0.18
65	31.04	0.03	-0.05	-0.20
70	29.37	0.03	-0.05	-0.22
75	27.89	0.03	-0.05	-0.24
80	26.56	0.03	-0.06	-0.27
85	25.37	0.03	-0.06	-0.29
90	24.29	0.03	-0.06	-0.32

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-1b Direct Runoff to McGillivray Street				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.2 L/s
C =	0.25		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	0.34	0.09	0.03
10	178.56	0.25	0.00	0.00
15	142.89	0.20	-0.05	-0.04
20	119.95	0.17	-0.08	-0.10
25	103.85	0.14	-0.10	-0.16
30	91.87	0.13	-0.12	-0.22
35	82.58	0.11	-0.13	-0.28
40	75.15	0.10	-0.14	-0.34
45	69.05	0.10	-0.15	-0.41
50	63.95	0.09	-0.16	-0.48
55	59.62	0.08	-0.17	-0.55
60	55.89	0.08	-0.17	-0.61
65	52.65	0.07	-0.18	-0.68
70	49.79	0.07	-0.18	-0.75
75	47.26	0.07	-0.18	-0.82
80	44.99	0.06	-0.19	-0.89
85	42.95	0.06	-0.19	-0.96
90	41.11	0.06	-0.19	-1.03

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YR + 20% IDF Increase AREA A-1b Direct Runoff to McGillivray Street				
OTTAWA IDF CURVE				
Area =	0.002	ha	Qallow =	0.3 L/s
C =	0.25		Vol(max) =	0.0 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	291.24	0.40	0.16	0.05
10	214.27	0.30	0.05	0.03
15	171.47	0.24	-0.01	-0.01
20	143.94	0.20	-0.05	-0.06
25	124.62	0.17	-0.07	-0.11
30	110.24	0.15	-0.09	-0.17
35	99.09	0.14	-0.11	-0.23
40	90.17	0.13	-0.12	-0.29
45	82.86	0.12	-0.13	-0.36
50	76.74	0.11	-0.14	-0.42
55	71.55	0.10	-0.15	-0.49
60	67.07	0.09	-0.15	-0.56
65	63.18	0.09	-0.16	-0.63
70	59.75	0.08	-0.17	-0.69
75	56.71	0.08	-0.17	-0.76
80	53.99	0.08	-0.17	-0.83
85	51.54	0.07	-0.18	-0.90
90	49.33	0.07	-0.18	-0.97

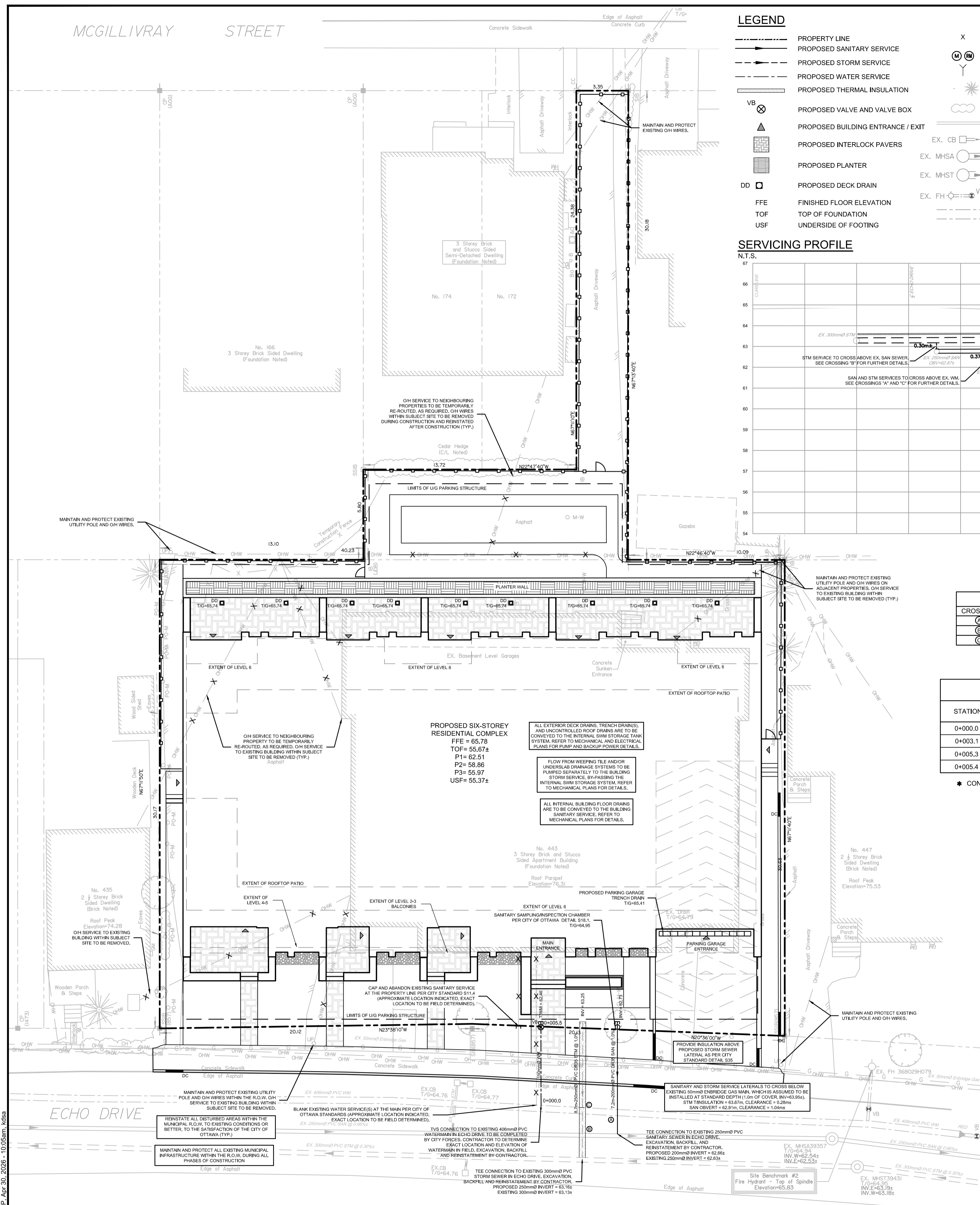
Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-2 Controlled Site Flow (Pumped)				
OTTAWA IDF CURVE				
Area =	0.087	ha	Qallow =	5.3 L/s
C =	0.90		Vol(max) =	7.4 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	103.57	22.66	17.36	5.21
10	76.81	16.80	11.50	6.90
15	61.77	13.51	8.21	7.39
20	52.03	11.38	6.08	7.30
25	45.17	9.88	4.58	6.87
30	40.04	8.76	3.46	6.23
35	36.06	7.89	2.59	5.44
40	32.86	7.19	1.89	4.53
45	30.24	6.62	1.32	3.55
50	28.04	6.13	0.83	2.50
55	26.17	5.72	0.42	1.40
60	24.56	5.37	0.07	0.26
65	23.15	5.06	-0.24	-0.92
70	21.91	4.79	-0.51	-2.13
75	20.81	4.55	-0.75	-3.36
80	19.83	4.34	-0.96	-4.62
85	18.94	4.14	-1.16	-5.89
90	18.14	3.97	-1.33	-7.19

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-2 Controlled Site Flow (Pumped)				
OTTAWA IDF CURVE				
Area =	0.087	ha	Qallow =	5.3 L/s
C =	0.90		Vol(max) =	12.1 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	141.18	30.88	25.58	7.68
10	104.19	22.79	17.49	10.50
15	83.56	18.28	12.98	11.68
20	70.25	15.37	10.07	12.08
25	60.90	13.32	8.02	12.03
30	53.93	11.80	6.50	11.69
35	48.52	10.61	5.31	11.16
40	44.18	9.67	4.37	10.48
45	40.63	8.89	3.59	9.69
50	37.65	8.24	2.94	8.81
55	35.12	7.68	2.38	7.87
60	32.94	7.21	1.91	6.86
65	31.04	6.79	1.49	5.81
70	29.37	6.43	1.13	4.73
75	27.89	6.10	0.80	3.60
80	26.56	5.81	0.51	2.45
85	25.37	5.55	0.25	1.27
90	24.29	5.31	0.01	0.07

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-2 Controlled Site Flow (Pumped)				
OTTAWA IDF CURVE				
Area =	0.087	ha	Qallow =	5.3 L/s
C =	1.00		Vol(max) =	31.1 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	242.70	58.99	53.69	16.11
10	178.56	43.40	38.10	22.86
15	142.89	34.73	29.43	26.49
20	119.95	29.16	23.86	28.63
25	103.85	25.24	19.94	29.91
30	91.87	22.33	17.03	30.65
35	82.58	20.07	14.77	31.02
40	75.15	18.26	12.96	31.12
45	69.05	16.78	11.48	31.01
50	63.95	15.54	10.24	30.73
55	59.62	14.49	9.19	30.33
60	55.89	13.59	8.29	29.83
65	52.65	12.80	7.50	29.24
70	49.79	12.10	6.80	28.57
75	47.26	11.49	6.19	27.84
80	44.99	10.94	5.64	27.05
85	42.95	10.44	5.14	26.22
90	41.11	9.99	4.69	25.34

Proposed Mixed-Use Development Novatech Project No. 126003 REQUIRED STORAGE - 1:100 YR + 20% IDF Increase AREA A-2 Controlled Site Flow (Pumped)				
OTTAWA IDF CURVE				
Area =	0.087	ha	Qallow =	5.3 L/s
C =	1.00		Vol(max) =	40.1 m ³
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m ³)
5	291.24	70.79	65.49	19.65
10	214.27	52.08	46.78	28.07
15	171.47	41.68	36.38	32.74
20	143.94	34.99	29.69	35.62
25	124.62	30.29	24.99	37.48
30	110.24	26.80	21.50	38.69
35	99.09	24.09	18.79	39.45
40	90.17	21.92	16.62	39.88
45	82.86	20.14	14.84	40.07
50	76.74	18.65	13.35	40.06
55	71.55	17.39	12.09	39.90
60	67.07	16.30	11.00	39.61
65	63.18	15.36	10.06	39.22
70	59.75	14.52	9.22	38.73
75	56.71	13.78	8.48	38.17
80	53.99	13.12	7.82	37.55
85	51.54	12.53	7.23	36.87
90	49.33	11.99	6.69	36.13

APPENDIX F
Engineering Drawings

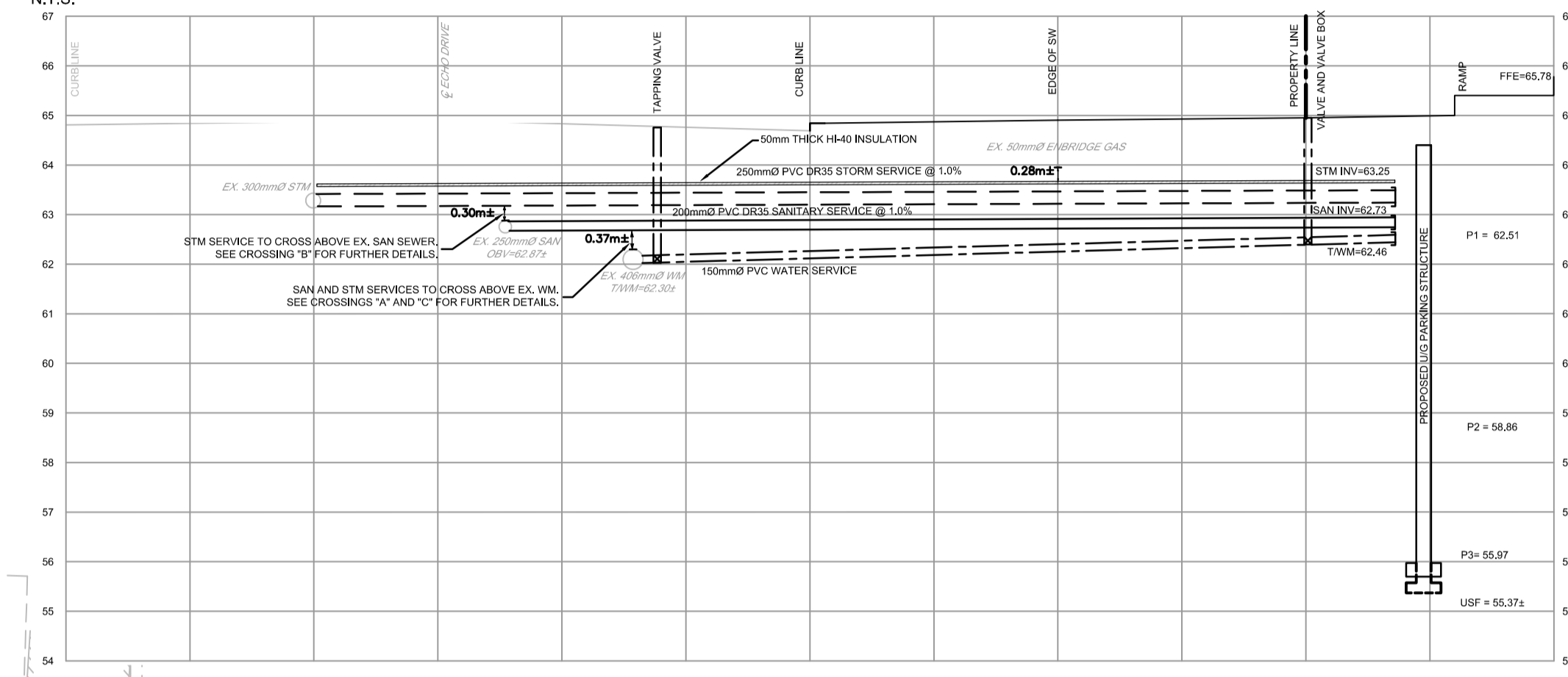


LEGEND

- PROPERTY LINE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SERVICE
- PROPOSED WATER SERVICE
- PROPOSED THERMAL INSULATION
- ⊗ PROPOSED VALVE AND VALVE BOX
- ▴ PROPOSED BUILDING ENTRANCE / EXIT
- ▣ PROPOSED INTERLOCK PAVERS
- ▤ PROPOSED PLANTER
- ▢ PROPOSED DECK DRAIN
- FFE FINISHED FLOOR ELEVATION
- TOF TOP OF FOUNDATION
- USF UNDERSIDE OF FOOTING

- X REMOVALS
- ⊕ PROPOSED WATER METER & REMOTE METER
- PROPOSED FIRE DEPARTMENT CONNECTION
- EXISTING TREES / VEGETATION
- EXISTING HEDGE
- EX. CONCRETE CURB
- EX. CB — EXISTING CATCHBASIN & LEAD
- EX. M-HSA — EXISTING SANITARY MANHOLE & SEWER
- EX. M-HST — EXISTING STORM MANHOLE & SEWER
- EX. FH — EXISTING HYDRANT, VALVE & LEAD
- EXISTING WATERMAIN

SERVICING PROFILE



CRITICAL SEWER PIPE CROSSING TABLE

CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE	SURFACE ELEVATION
1	400mmØ WM T/WM=62.30	200mmØ SAN INV=62.67	± 0.37m	64.83 m
2	250mmØ SAN OBV=62.87	250mmØ S'IM INV=63.17	± 0.30m	64.85 m
3	400mmØ WM T/WM=62.30	250mmØ S'IM INV=63.19	± 0.89m	64.83 m

150mmØ WATER SERVICE TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+000.0	64.82±	62.18±	150mmØ TVS CONNECTION TO EX. 406mmØ PVC WM
0+003.1	64.98	62.34	CROSS BELOW EX. 50mmØ ENBRIDGE GAS (~1.59m CLEARANCE)
0+005.3	65.08	62.45	150mmØ VALVE & VALVE BOX
0+005.4	65.09	62.46	CAP JUST OUTSIDE FOUNDATION WALL

* CONNECTION TO EXISTING 406mmØ PVC WATERMAIN. EXACT ELEVATIONS TO BE FIELD DETERMINED.

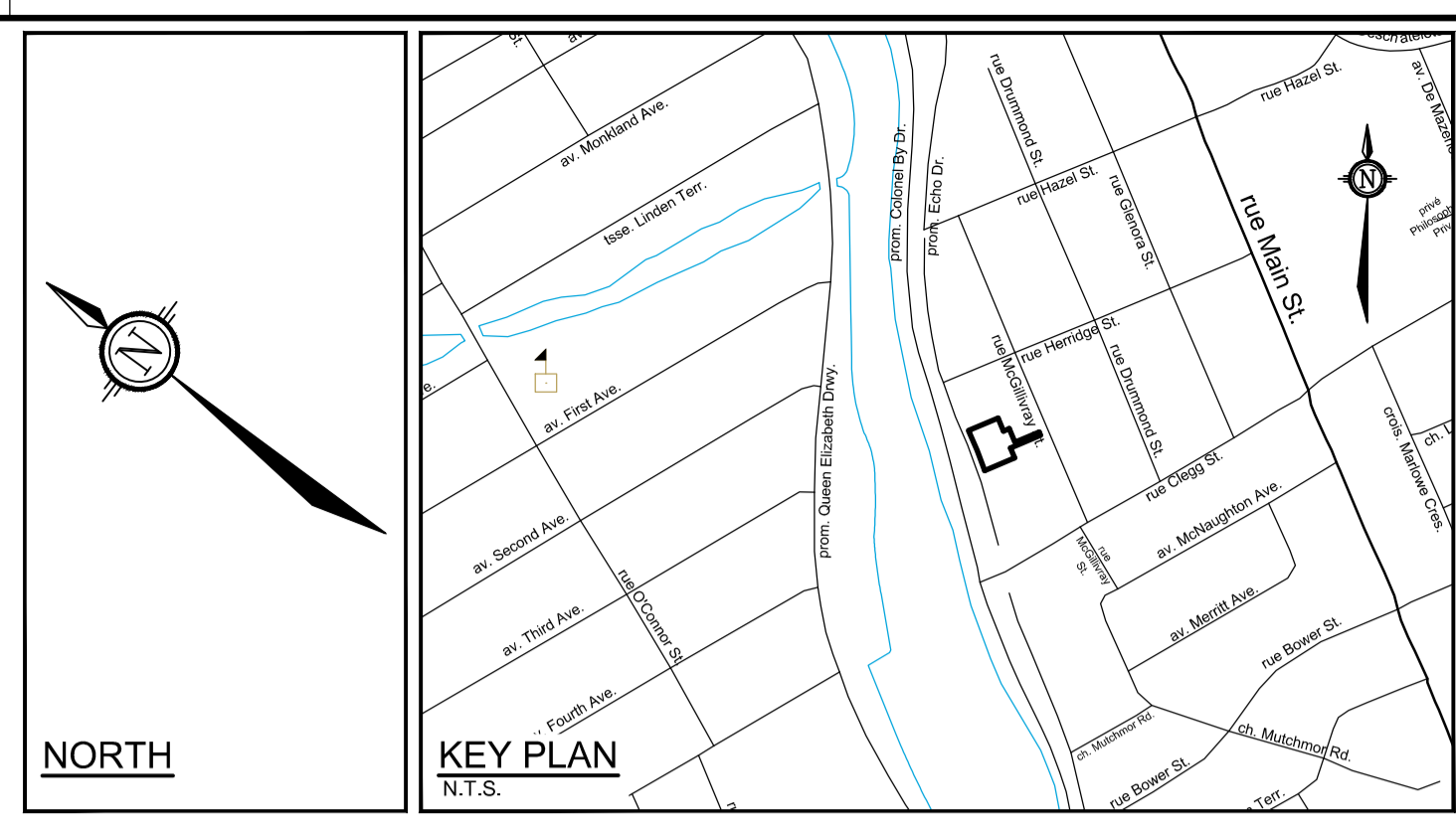
INTERNAL SWM STORAGE SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES REQUIRED	PROVIDED
1.2 YR		7.4 m³	
1.5 YR	PUMPED FLOW	12.1 m³	>41 m³
1:100 YR	RATE = 5.3 L/s	31.1 m³	
1:100+20%YR		40.1 m³	

- NOTES:**
- ALL DRAINAGE FROM AREA A-2 (PROPOSED ROOF DRAINS AND DECK DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
 - REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.
 - REFER TO MECHANICAL PLANS FOR INTERNAL STORM PLUMBING, PUMP INFORMATION, EMERGENCY OVERFLOW PIPING, AND OTHER DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

BENCHMARK NOTES:

- ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, (MTM ZONE 9, NAD-83 ORIGINAL).
- IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
- BENCHMARK WAS PROVIDED ON TOPOGRAPHIC PLAN OF SURVEY OF LOTS 11 AND 12 AND PART OF LOTS 3 AND 4, BLOCK 'K', REGISTERED PLAN 102, CITY OF OTTAWA, SURVEYED BY ANNIS, O'SULLIVAN, VOLLEBEK LTD, SIGNED AND DATED DECEMBER 10, 2025.



GENERAL NOTES:

- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
- OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
- BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR \$5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
- COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
- RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
- ALL ELEVATIONS ARE GEODETIC.
- REFER TO GEOTECHNICAL SITE INVESTIGATION (PROJECT NO. 2512064, DATED APRIL 28, 2026), PREPARED BY GEOTERRA, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
- REFER TO ARCHITECTS AND LANDSCAPE ARCHITECTS DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
- REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2026-010) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
- SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
- PROVIDE LINE / PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

SEWER NOTES:

- SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND 'AS AMENDED'.
- SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
STORM / CBMH MANHOLE FRAME AND COVER	401.010 - TYPE "B"	OPSD
WATERTIGHT MH FRAME AND COVER	401.030	OPSD
SEWER TRENCH	S8	CITY OF OTTAWA
EXISTING UTILITY CROSSING	S10	CITY OF OTTAWA
WASTEWATER SAMPLING/INSPECTION CHAMBER	S18.1	CITY OF OTTAWA
INSULATION FOR SHALLOW SEWERS	S35	CITY OF OTTAWA
- STORM SEWER: PVC DR 35
SANITARY SEWER: PVC DR 35
- ALL STORM AND SANITARY SERVICE LATERALS SHALL BE EQUIPPED WITH BACKFLOW PREVENTION DEVICES AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
- INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.8m COVER WITH HI-40 INSULATION PER CITY OF OTTAWA STANDARD DETAIL S35. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
- SERVICES ARE TO BE CONSTRUCTED TO 1.0m OF THE FOUNDATION WALL OR JUST OUTSIDE AND CAPPED AT A MINIMUM SLOPE OF 1.0%, UNLESS OTHERWISE INDICATED.
- PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
- FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
- THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.18, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
- ALL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMP UNLESS OTHERWISE INDICATED. ALL CATCHBASINS ARE TO HAVE 600mm SUMPS.
- ALL CATCHBASINS, MANHOLES AND/OR CATCHBASIN MANHOLES THAT ARE TO HAVE AN ICD INSTALLED WITHIN THEM ARE TO HAVE 600mm SUMPS.
- ALL WEAVING TILE SYSTEMS ARE TO BE PUMPED SEPARATELY TO THE BUILDING SERVICE AS INDICATED ON THE GENERAL PLAN OF SERVICES DRAWING. REFER TO MECHANICAL PLANS FOR DETAILS.
- CONTRACTOR TO TELETYPE (CTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.
- CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/E ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

WATERMAIN NOTES:

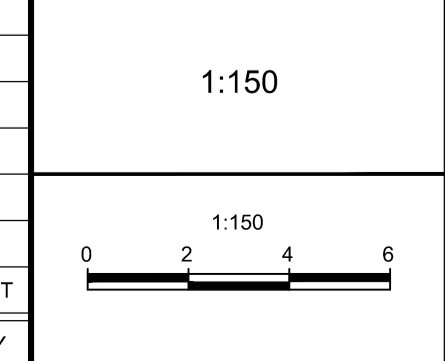
- SUPPLY AND CONSTRUCT ALL WATERMANS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND 'AS AMENDED'. EXCAVATION, INSTALLATION, TESTING, BACKFILL AND REINSTATEMENT FOR ALL WATERMANS BY THE CONTRACTOR. CONNECTIONS, SHUT-OFFS AT THE MAIN, FLUSHING, AND DISINFECTION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY FORCES.
- SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN	PVC DR 18	
 - WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE, UNLESS OTHERWISE INDICATED.
 - PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, UNLESS OTHERWISE INDICATED.
 - WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF THE FOUNDATION WALL OR JUST OUTSIDE AND CAPPED.
 - DUE TO SITE-SPECIFIC CONDITIONS, THE USE OF POLYETHYLENE ENCASEMENT AND OTHER CORROSION PROTECTION MEASURES SHOULD BE EVALUATED (IN ACCORDANCE WITH AWWA C105 AND THE PIPE SUPPLIER'S RECOMMENDATIONS) FOR DUCTILE IRON AND SIMILAR FERROUS FITTINGS, AS DESCRIBED IN THE GEOTECHNICAL REPORT.

NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

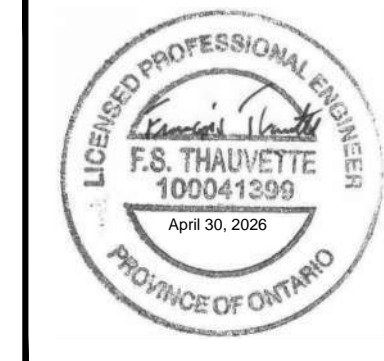
OWNER INFORMATION:
 JB HOLDINGS INC.
 107 PRETORIA AVE.
 OTTAWA, ON, K1S 1W8
 PHONE: (613) 793 6322
 anthony@jbpa.ca

SCALE



FOR REVIEW ONLY

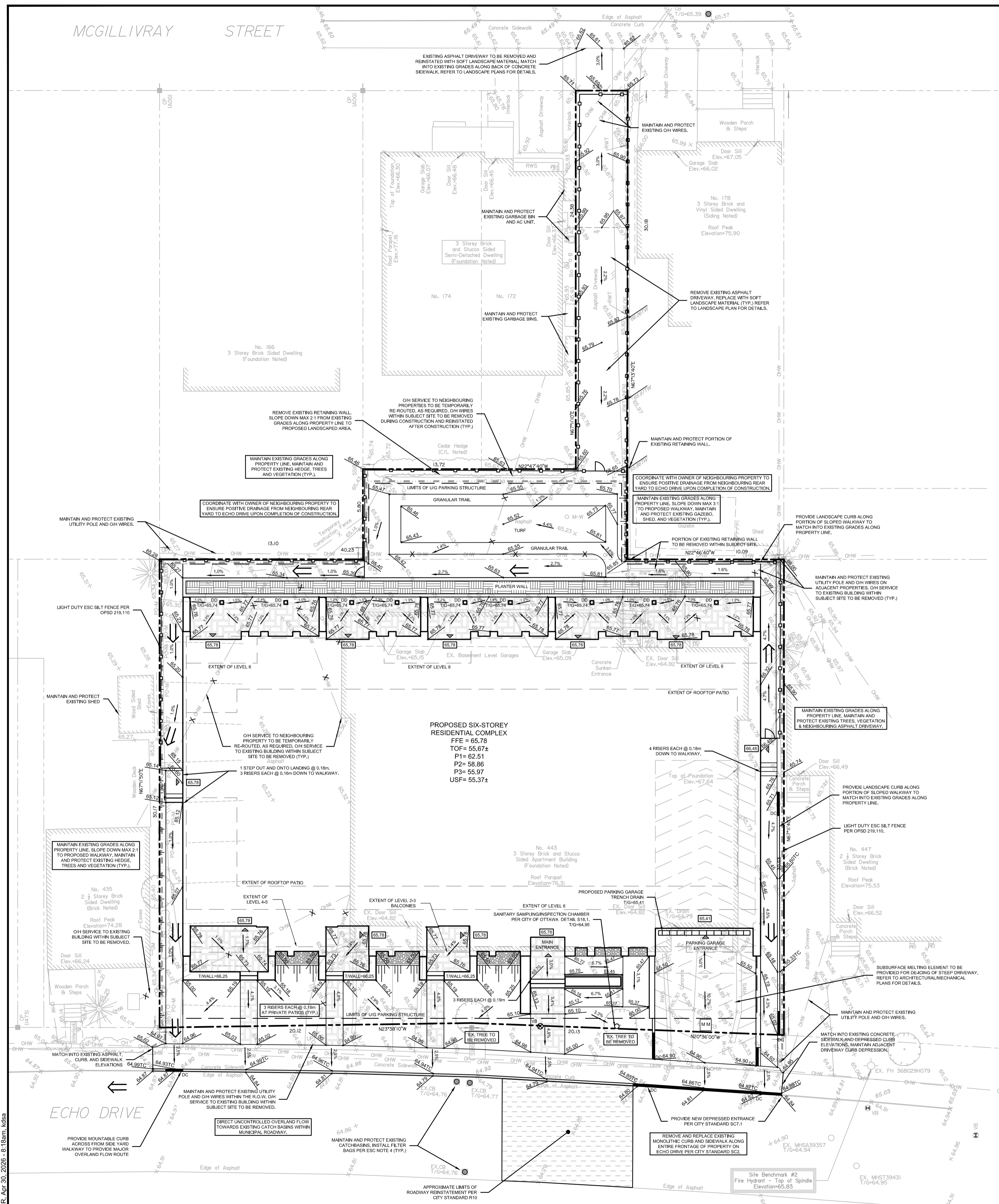
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CHECKED	FST
APPROVED	FST



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 Facsimile: (613) 254-5867
 Website: www.novatech-eng.com

LOCATION		DRAWING NAME	
CITY OF OTTAWA 441 ECHO DRIVE		GENERAL PLAN OF SERVICES	
PROJECT No.	126003	REV	REV # 1
DRAWING No.		126003-GP	

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GENERAL NOTES:

- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
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- PROVIDE LINE / PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

GRADING NOTES:

- ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
- EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
- ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
- THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
- MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
- MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
- ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
- ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1). MOUNTABLE CURBS ARE TO BE PER CITY OF OTTAWA STANDARD (SC1.3).
- ALL RETAINING WALLS OF AT LEAST 0.6m IN HEIGHT SHALL HAVE FENCING/RAILING ALONG TOP SURFACE OF WALL PER OBC ARTICLE 9.8.8.1.
- REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
- CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES:

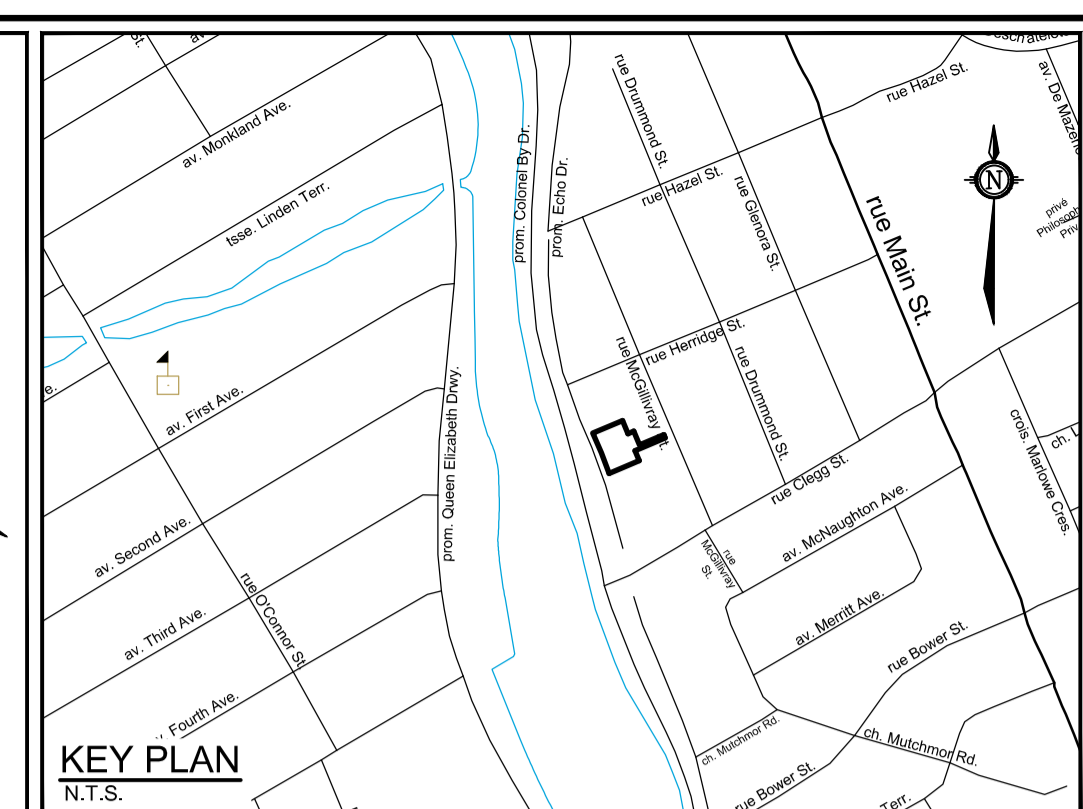
- THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
- EROSION AND SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED DURING CONSTRUCTION IN ACCORDANCE WITH THE 'GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES' (GOVERNMENT OF ONTARIO, MAY 1987). THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY AGENCY REQUIREMENTS.
- TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER CLOTH WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
- TO LIMIT EROSION: MINIMIZE THE AMOUNT OF EXPOSED SOILS AT ANY GIVEN TIME, RE-VEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE AND PROTECT EXPOSED SLOPES WITH NATURAL OR SYNTHETIC MULCHES.
- FOR MATERIAL STOCKPILING: MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME, APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.
- THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
- THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- ROADWAYS ARE TO BE SWEEP AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
- THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS. MONITOR DUST LEVELS DURING SITE PREPARATION/EXCAVATION, AND CONSTRUCTION ACTIVITIES, AND WHEN DUST LEVELS BECOME VISUALLY APPARENT SPRAY WATER TO MINIMIZE THE RELEASE OF DUST FROM GRAVEL, PAVED AREAS AND EXPOSED SOILS. USE CHEMICAL DUST SUPPRESSANTS ONLY WHERE NECESSARY ON PROBLEM AREAS.

BENCHMARK NOTES:

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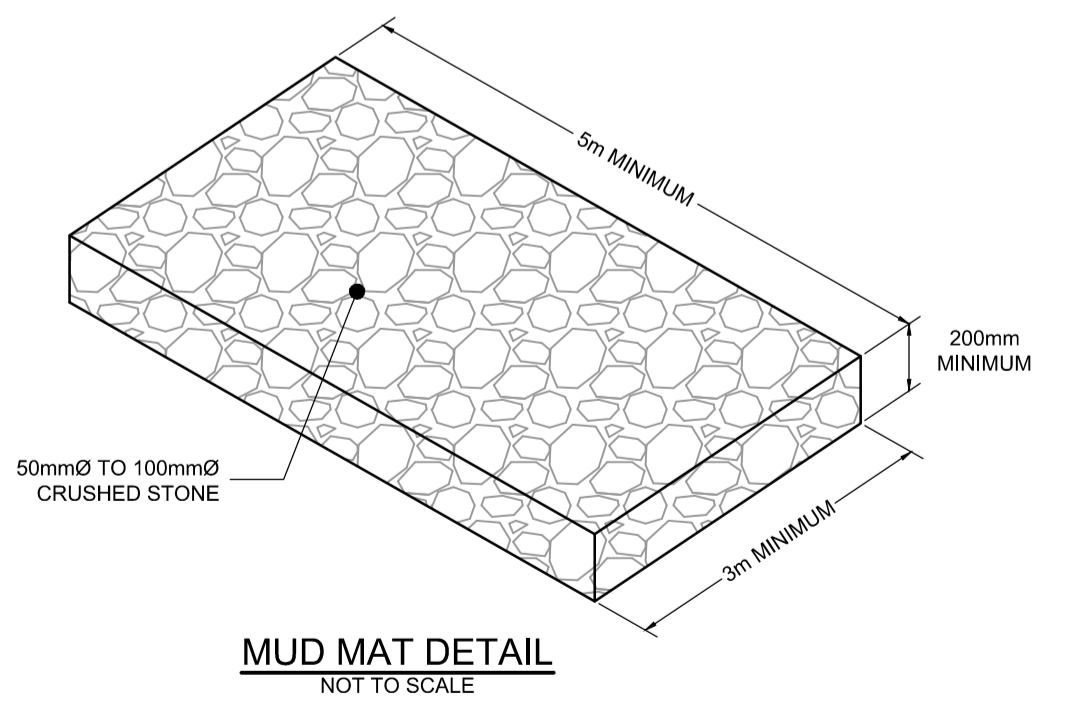
Erosion and Sediment Control Responsibilities:

ESC Measure	Symbol	Specification	Installation Responsibility	Inspection/Maintenance Responsibility	Inspection Frequency	Approval to Remove	Removal Responsibility	Inspection/Maintenance Frequency
Silt Fence	---	OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Fiber Fabric	---	Erosion and Sediment Control (ESC) Note #3	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Mud Mat	M M	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
Dust Control	---	Location as Required by Erosion and Sediment Control Note	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
Stabilized Material Stockpiling	---	Location as Required by Erosion and Sediment Control Note	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
Sediment Basin	---	Location as Required by Erosion and Sediment Control Note	Developer's Contractor	Developer's Contractor	After Each Rainstorm	Developer's Contractor	Developer's Contractor	N/A



LEGEND

- PROPERTY LINE
- PROPOSED ELEVATION
- EXISTING ELEVATION
- PROPOSED TOP OF CURB ELEVATION
- SLOPE AND DIRECTION
- MAXIMUM 3:1 SIDESLOPE (UNLESS OTHERWISE INDICATED)
- DIRECTION OF MAJOR OVERLAND FLOW ROUTE
- PROPOSED HIGH POINT
- PROPOSED ENTRANCE/EXIT ELEVATION
- PROPOSED BUILDING ENTRANCE / EXIT
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- FULL ASPHALT OVERLAY PER CITY STANDARD R10
- PROPOSED INTERLOCK PAVERS
- PROPOSED PLANTER
- PROPOSED RIVERWASH STONE
- PROPOSED LANDSCAPE FENCE
- PROPOSED SILT FENCING (OPSD 219.110)
- PROPOSED FILTER BAG
- FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION
- UNDERSIDE OF FOOTING
- REMOVALS
- EXISTING ELEVATION
- EXISTING RETAINING WALL ELEVATION
- EXISTING TREES / VEGETATION
- EXISTING HEDGE
- EXISTING CONCRETE CURB
- EXISTING CATCHBASIN
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING HYDRANT & VALVE
- EXISTING OVERHEAD WIRES
- EXISTING UTILITY POLE



NOTE:
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OWNER INFORMATION:
JB HOLDINGS INC.
107 PRETORIA AVE.
OTTAWA, ON, K1S 1W8
PHONE: (613) 793 6322
anthony@jbpa.ca

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN CONTROL APPROVAL	APR 30/26	FST

DESIGN	BN/KD
CHECKED	FST
DRAWN	BN/KD
CHECKED	FST
APPROVED	FST



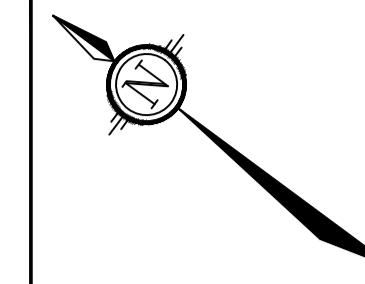
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone: (613) 254-9643
Facsimile: (613) 254-5867
Website: www.novatech-eng.com

LOCATION CITY OF OTTAWA 441 ECHO DRIVE	PROJECT No. 126003
DRAWING NAME GRADING AND EROSION & SEDIMENT CONTROL PLAN	REV # 1
DRAWING No. 126003-GR	

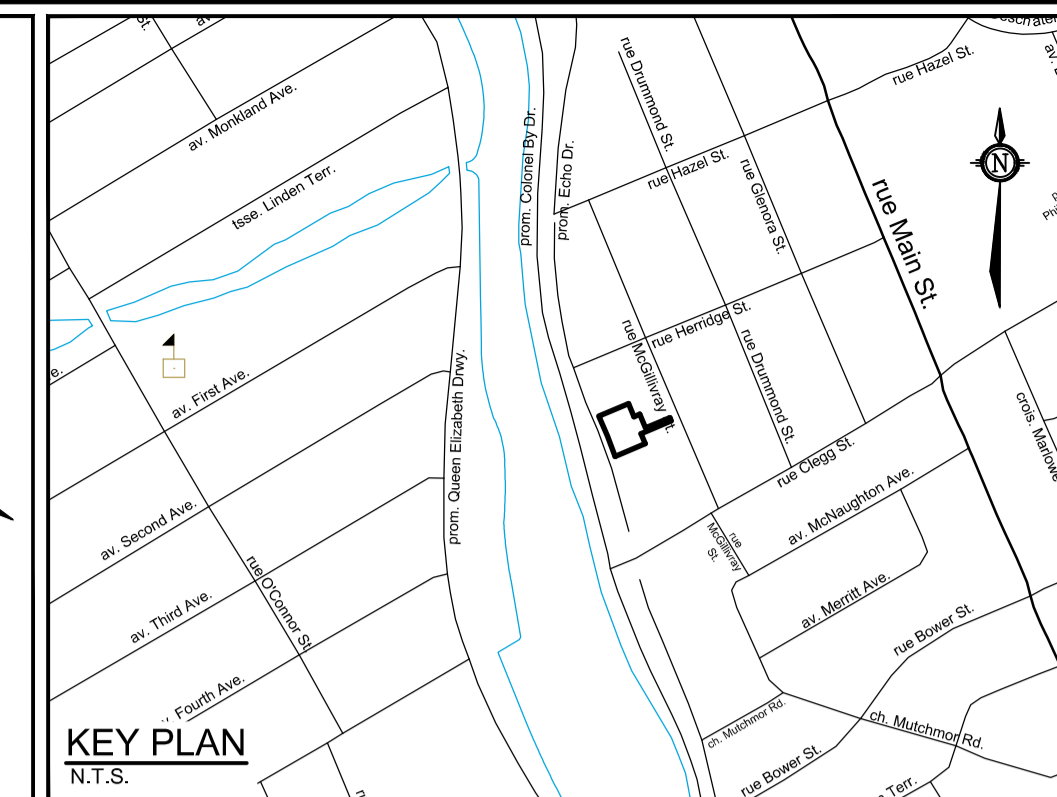
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LEGEND

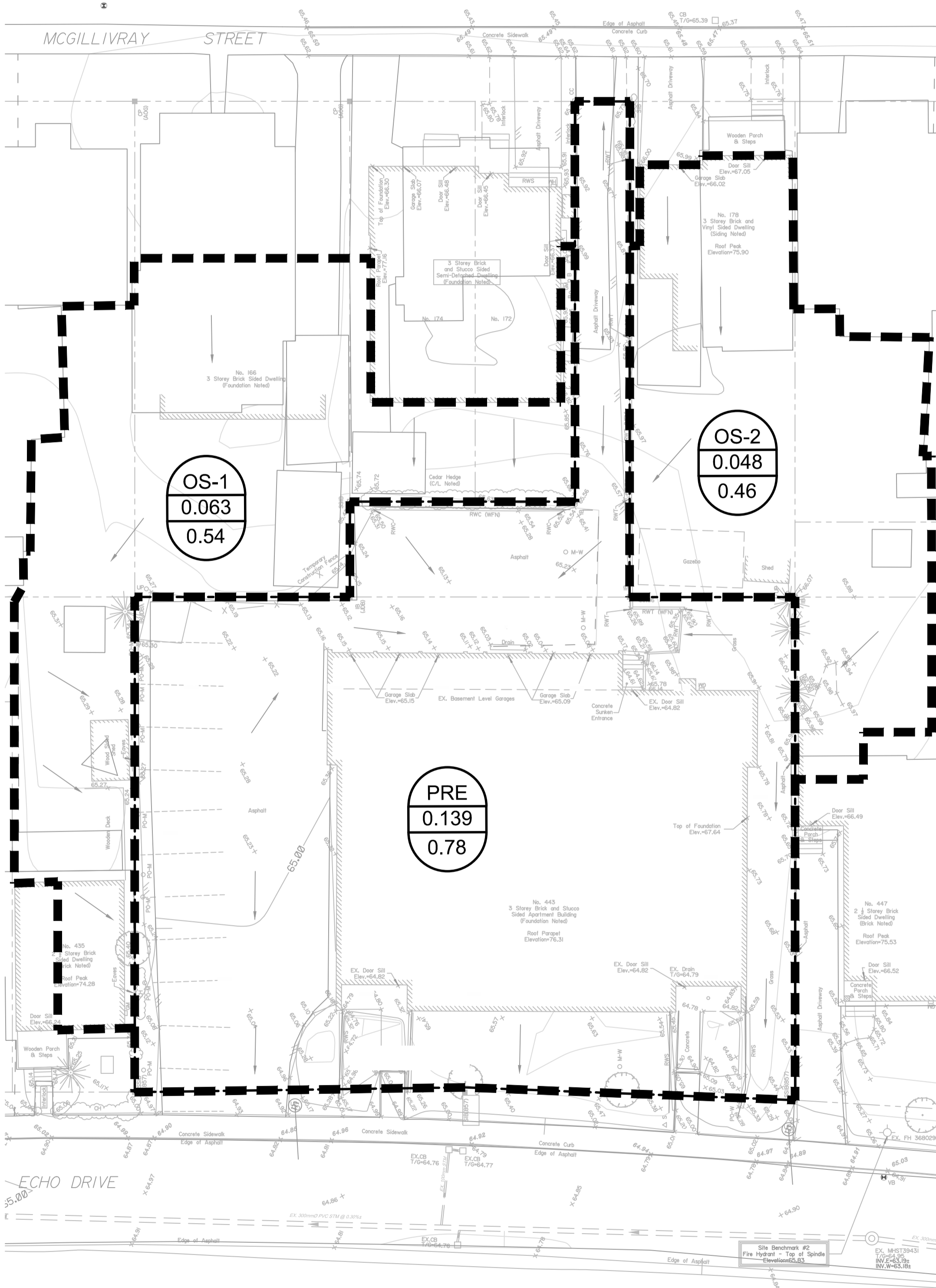
	PROPOSED BARRIER CURB		PROPOSED DRAINAGE DIRECTION		PROPOSED PLANTER		EXISTING DRAINAGE DIRECTION ARROWS
	PROPOSED DEPRESSED CURB		DIRECTION OF MAJOR OVERLAND FLOW ROUTE		PROPOSED RIVERWASH STONE		EXISTING CONCRETE CURB
	DRAINAGE AREA LIMITS		PROPOSED STORM SERVICE		PROPOSED INTERLOCK PAVERS		EXISTING CATCHBASIN & LEAD
	DECK DRAIN		MAXIMUM 3:1 SLOPE (UNLESS OTHERWISE INDICATED)		EXISTING STORM MANHOLE & SEWER		
	PRE-DEVELOPMENT AREA ID		POST-DEVELOPMENT AREA ID				
	PRE-DEVELOPMENT DRAINAGE AREA (ha)		POST-DEVELOPMENT DRAINAGE AREA (ha)				
	1.5 YEAR WEIGHTED RUNOFF COEFFICIENT		1.5 YEAR WEIGHTED RUNOFF COEFFICIENT				



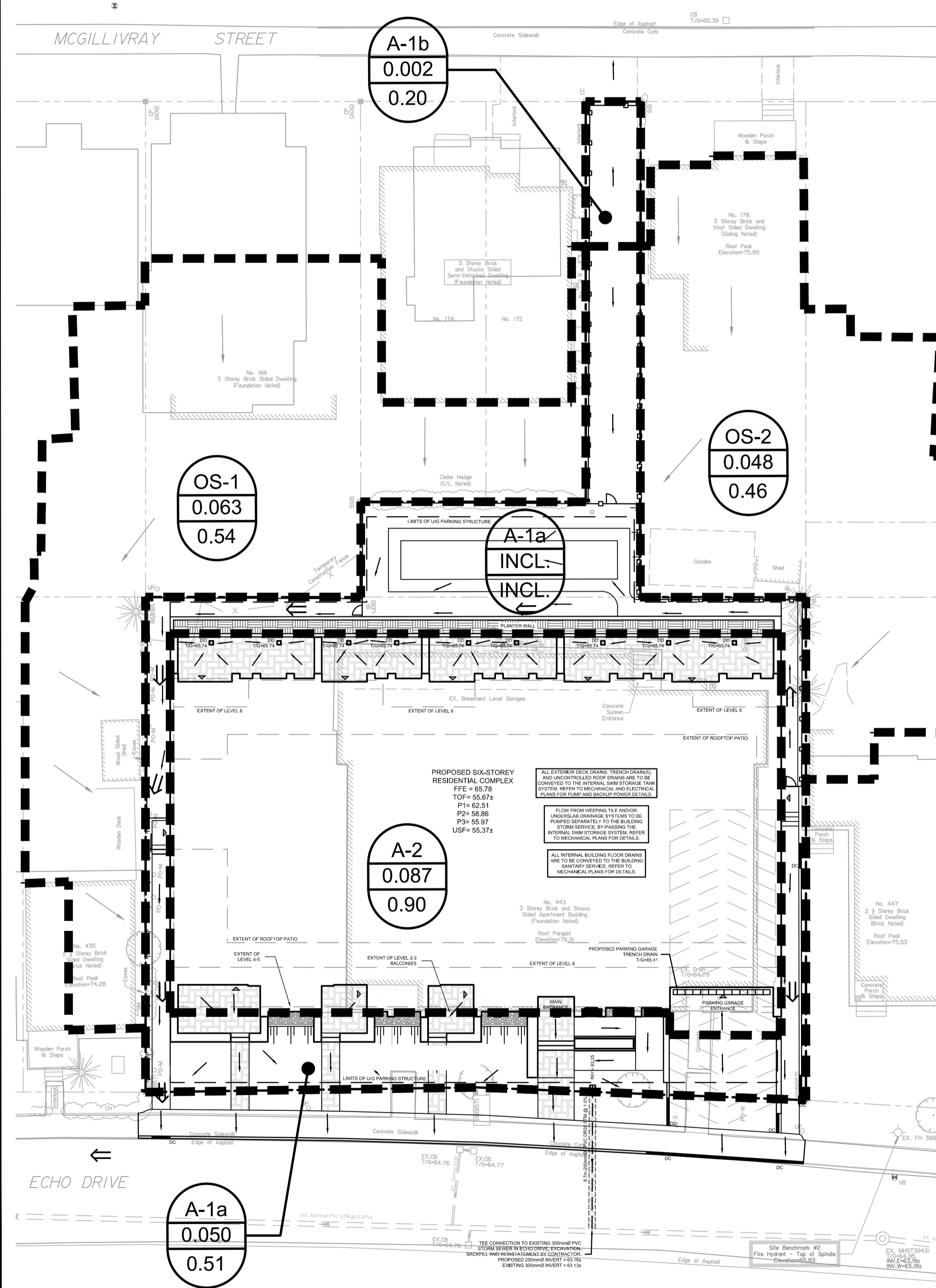
KEY PLAN
N.T.S.



PRE-DEVELOPMENT CONDITIONS



POST-DEVELOPMENT CONDITIONS



GENERAL NOTES:

- COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
- DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
- OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
- BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR \$5,000,000.00, INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
- COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BY-LAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
- RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
- REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
- ALL ELEVATIONS ARE GEODETIC.
- REFER TO GEOTECHNICAL SITE INVESTIGATION (PROJECT NO. 2512064, DATED APRIL 28, 2026), PREPARED BY GEOTERRA, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
- REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
- REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT (R-2026-010) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
- SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
- PROVIDE LINE / PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

BENCHMARK NOTES:

- ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, (MTM ZONE 9, NAD-83 ORIGINAL).
- IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT ITS RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
- BENCHMARK WAS PROVIDED ON TOPOGRAPHIC PLAN OF SURVEY OF LOTS 11 AND 12 AND PART OF LOTS 3 AND 4, BLOCK 'K', REGISTERED PLAN 102, CITY OF OTTAWA, SURVEYED BY ANNIS, O'SULLIVAN, VOLLEBEK LTD, SIGNED AND DATED DECEMBER 10, 2025.

INTERNAL SWM STORAGE SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1.2 YR	PUMPED FLOW RATE = 5.3 L/s	7.4 m ³	>41 m ³
1.5 YR		12.1 m ³	
1:100 YR		31.1 m ³	
1:100+20% ¹		40.1 m ³	

- NOTES:**
- ALL DRAINAGE FROM AREA A-2 (PROPOSED ROOF DRAINS AND DECK DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
 - REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
 - REFER TO MECHANICAL PLANS FOR INTERNAL STORM PUMPING, PUMP INFORMATION, EMERGENCY OVERFLOW PIPING, AND OTHER DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

OWNER INFORMATION:
JB HOLDINGS INC.
107 PRETORIA AVE.
OTTAWA, ON, K1S 1W8
PHONE: (613) 793 6322
anthony@jbpa.ca

No.	REVISION	DATE	BY
1.	ISSUED FOR SITE PLAN CONTROL APPROVAL	APR 30/26	FST

SCALE

1:200

DESIGN	BN/KD
CHECKED	FST
DRAWN	BN/KD
CHECKED	FST
APPROVED	FST

FOR REVIEW ONLY



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Engineers, Planners & Landscape Architects
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Ottawa, Ontario, Canada K2M 1P6
Telephone: (613) 254-9643
Facsimile: (613) 254-5867
Website: www.novatech-eng.com

LOCATION
CITY OF OTTAWA
441 ECHO DRIVE

DRAWING NAME
STORMWATER
MANAGEMENT PLAN

PROJECT No.
126003

REV #
REV #1

DRAWING No.
126003-SWM