



Engineers, Planners & Landscape Architects

**Engineering**

- Land / Site Development
- Municipal Infrastructure
- Environmental / Water Resources
- Traffic / Transportation
- Structural
- Recreational

**Planning**

- Land / Site Development
- Planning Application Management
- Municipal Planning Documents & Studies
- Expert Witness (OMB)
- Wireless Industry

**Landscape Architecture**

- Urban Design & Streetscapes
- Open Space, Parks & Recreation Planning
- Community & Residential Developments
- Commercial & Institutional Sites
- Environmental Restoration



# Proposed Mixed-Use Development 472 Byron Place

## Development Servicing Study and Stormwater Management Report



**PROPOSED MIXED-USE DEVELOPMENT  
472 BYRON PLACE**

**DEVELOPMENT SERVICING STUDY AND  
STORMWATER MANAGEMENT REPORT**

Prepared by:

**NOVATECH**

Suite 200, 240 Michael Cowpland Drive  
Kanata, Ontario  
K2M 1P6

April 5, 2019

**Revised May 6, 2020**

Ref: R-2019-013

Novatech File No. 118024



May 6, 2020

2592532 Ontario Inc.  
165 Pretoria Avenue  
Ottawa, ON  
K1S 1X1

**Attention: Mr. Simon Si**

Dear Sir:

**Re: Development Servicing Study and Stormwater Management Report  
Proposed Mixed-Use Development  
472 Byron Place, Ottawa, ON  
Novatech File No.: 118024  
City File No.: D07-12-19-0059**

---

Enclosed is a copy of the revised 'Development Servicing Study and Stormwater Management Report' for the proposed mixed-use development located at 472 Byron Place, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of a site plan control application.

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

Yours truly,

**NOVATECH**



François Thauvette, P. Eng.  
Senior Project Manager

cc: John Wu (City of Ottawa)  
Richard Chmiel (Chmiel Architects Inc.)  
Greg Snaith (Smith + Andersen)



## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Purpose .....	1
1.2	Site Description and Location .....	1
1.3	Pre-Consultation Information .....	2
1.4	Proposed Development.....	2
1.5	Reference Material.....	2
<b>2.0</b>	<b>SITE SERVICING.....</b>	<b>2</b>
2.1	Sanitary Sewage .....	2
2.2	Water .....	3
2.2.1	Domestic Water Demands and Watermain Analysis .....	4
2.2.2	Water Supply for Fire-Fighting.....	5
2.3	Storm Drainage and Stormwater Management.....	6
2.3.1	Stormwater Management Criteria and Objectives .....	6
2.3.2	Pre-Development Conditions and Allowable Release Rate .....	6
2.3.3	Post-Development Conditions .....	6
2.3.3.1	Area A-0: Uncontrolled Runoff.....	7
2.3.3.2	Area R-1: Controlled Flow from Building Roof .....	7
2.3.3.3	Stormwater Flow Summary .....	7
2.3.4	Stormwater Quality Control.....	8
<b>3.0</b>	<b>SITE GRADING .....</b>	<b>8</b>
<b>4.0</b>	<b>GEOTECHNICAL INVESTIGATIONS .....</b>	<b>8</b>
<b>5.0</b>	<b>EROSION AND SEDIMENT CONTROL .....</b>	<b>8</b>
<b>6.0</b>	<b>CONCLUSION .....</b>	<b>9</b>



## **LIST OF FIGURES**

Figure 1 Aerial Plan

## **LIST OF APPENDICES**

Appendix A: Correspondence

Appendix B: Development Servicing Study Checklist

Appendix C: Water Demands, FUS Calculations, City of Ottawa Boundary Conditions and Hydraulic Modelling Results

Appendix D: IDF Curves and SWM Calculations

## **LIST OF PLANS**

General Plan of Services (118024-GP)

Grading and Erosion & Sediment Control Plan (118024-GR)

Stormwater Management Plan (118024-SWM)



## 1.0 INTRODUCTION

The new mixed-use building is being proposed by 2592532 Ontario Inc. and Novatech has been retained to complete the site servicing and stormwater management design for this project.

### 1.1 Purpose

This report addresses the approach to site servicing and stormwater management and is being submitted in support of a site plan control application.

### 1.2 Site Description and Location

The subject site is approximately 0.191 hectares in size and currently consists of three residential lots and a used car lot. The properties (formerly 433, 435 Churchill Avenue North and 468, 472 Byron Place) will be merged to accommodate the proposed mixed-use development. The subject site is located at 472 Byron Place, between Churchill Avenue North and Highcroft Avenue. Residential lots abut the property to the south. The legal description of the subject site is designated as Lots 1, 2, 3 and 4, Registered Plan 269, City of Ottawa.

**Figure 1 – Aerial Plan** provides an aerial view of the site.





### 1.3 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on November 7, 2017, at which time the client was advised of the general submission requirements. A follow-up meeting was then held with the City of Ottawa on January 24, 2018 to confirm the submission requirements. The Rideau Valley Conservation Authority (RVCA) was also consulted regarding the proposed development. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

### 1.4 Proposed Development

The proposed development will consist of a 6-storey residential building with commercial space on the ground floor. All existing buildings occupying the subject site will be demolished. The proposed 6-storey building will be serviced by extending new services to the municipal sanitary and storm sewers in Highcroft Avenue and to the municipal watermain in Byron Place. Access to the underground parking levels will be provided off Highcroft Avenue.

### 1.5 Reference Material

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

- <sup>1</sup> Adequacy of Public Sanitary Services Memorandum (R-2019-012), prepared by Novatech on March 13, 2019.
- <sup>2</sup> The Geotechnical Investigation Report (Ref. No. PG4712-1), prepared by Paterson Group on February 25, 2019.

## 2.0 SITE SERVICING

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. The servicing criteria, the expected sewage flows and the 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 subsequent sections of 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 Sewage

The proposed development will be serviced by a new 200mm dia. sanitary sewer connected to the existing 250mm dia. sanitary sewer in Highcroft Avenue.

The City of Ottawa design criteria were used to calculate the theoretical sanitary flows for the proposed development. The following design criteria were taken from Section 4 – 'Sanitary Sewer Systems' and Appendix 4-A - 'Daily Sewage Flow for Various Types of Establishments' of the City of Ottawa Sewer Design Guidelines:



### Residential and Commercial Uses

- Residential Units (Studio or 1 Bedroom): 1.4 people per unit
- Residential Units (2 Bedroom): 2.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day
- Residential Peaking Factor = 3.6 (Harmon Equation)
- Average Commercial Sewage Flow: 5.0 L/m<sup>2</sup>/day
- Commercial Peaking Factor = 1.5
- Infiltration Allowance: 0.33 L/s/ha x 0.191 ha site = 0.06 L/s

**Table 1** identifies the theoretical sanitary flows for the proposed development based on the above design criteria.

**Table 1: Theoretical Post-Development Sanitary Flows**

Type of Use	Unit Count/ Floor Area	Design Population	Average Flow (L/s)	Peaking Factor	Peak Flow (L/s)	Total Flow (L/s)
1 Bedroom / Studio	50	70	0.23	3.6	0.82	0.82
2 Bedroom	22	47	0.15	3.6	0.55	0.55
Commercial Space	333 m <sup>2</sup>	-	0.02	1.5	0.03	0.03
Infiltration Allowance	-	-	-	-	-	0.06
<b>Total</b>	-	<b>117</b>	<b>0.40</b>	-	-	<b>1.46</b>

A 200mm dia. sanitary gravity sewer at a minimum slope of 1.0% has a full flow conveyance capacity of 34.2 L/s and will have enough capacity to convey the theoretical sanitary flows for the proposed development.

As indicated in the Adequacy of Public Sanitary Services Memorandum<sup>1</sup>, the existing municipal sanitary sewer system from the subject site to the outlet at the West Nepean Trunk Collector appears to have enough capacity to service the proposed mixed-use development.

## **2.2 Water**

The proposed development will be serviced by a new 150mm dia. water service connected to the existing 150mm dia. watermain in Byron Place. The water service has been sized to provide the required domestic water demand and fire flow. A shut-off valve will be provided on the proposed water service. The water meter will be located within the water entry room, with a remote meter on the exterior face of the building.



## 2.2.1 Domestic Water Demands and Watermain Analysis

The City of Ottawa design criteria were used to calculate the theoretical water demands for the proposed development. The following design criteria were taken from Section 4 – ‘Water Distribution Systems’ of the Ottawa Design Guidelines – Water Distribution:

- Residential Units (Studio or 1 Bedroom): 1.4 people per unit
- Residential Units (2 Bedroom): 2.1 people per unit
- Average Daily Residential Water Demand: 350 L/person/day (City Water Table 4.2)
- 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)
- Average Commercial Water Demand: 5.0 L/m<sup>2</sup>/day
- Maximum Day Demand Peaking Factor = 1.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 1.8 x Max. Day Demand (City Water Table 4.2)

**Table 2** identifies the theoretical domestic water demands for the development based on the above design criteria.

**Table 2: Theoretical Water Demand for Proposed Development**

Type of Use	Unit Count / Floor Area	Design Population	Average Day Demand (L/s)	Max. Day Demand (L/s)	Peak Hour Demand (L/s)
1 Bedroom / Studio	50	70	0.28	0.71	1.56
2 Bedroom	22	47	0.19	0.48	1.05
Commercial Space	333 m <sup>2</sup>	-	0.02	0.03	0.05
<b>Total for Site</b>	-	<b>117</b>	<b>0.49</b>	<b>1.22</b>	<b>2.66</b>

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. These values were used to generate the municipal watermain network boundary conditions. **Table 2.1** summarizes the watermain boundary conditions and the results of the hydraulic analysis related to the domestic demands. It is anticipated that a booster pump will likely be required to increase pressure to the commercial units and upper floors of the building.



**Table 2.2 : Hydraulic Boundary Condition Provided by the City**

Municipal Watermain Boundary Condition	Boundary Condition	Domestic Demand (L/s)	Normal Operating Pressure Range (psi)	Design Pressure (psi)*
Minimum HGL (Peak Hour Demand)	105.7m	2.66	40 psi (min.)	44.4
Maximum HGL (Max Day Demand)	114.5m	1.22	50-70 psi	56.9

\*Based on a municipal watermain elevation of approx. 74.50m. Design pressure = (HGL – watermain elevation) x 1.42197 PSI/m.

As indicated above, the existing municipal watermain should provide adequate system pressures, within the normal operating pressure ranges specified by the City of Ottawa. A booster pump may be required to provide adequate pressure to the upper levels of the building.

### 2.2.2 Water Supply for Fire-Fighting

The proposed building will be fully sprinklered and supplied with a fire department (siamese) connection. The siamese connection will be located on the north side of the building, within 45m of the relocated municipal fire hydrant along Byron Place.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed building. Based on information provided by the architect, a 6-storey, sprinklered building, constructed using non-combustible materials was used in the calculations.

**Table 2.2** summarizes the fire flow requirements for the proposed building, based on FUS calculations.

**Table 2.2: Fire Flow Requirements for the Proposed Development**

Type of Uses	Fire Flow Demand USGPM (L/s)
Proposed Mixed-Use Building	3,435 USGPM (217 L/s)

The fire flow requirements include both sprinkler system and hose allowances in accordance with the OBC and NFPA 13. The sprinkler systems will be designed by the fire protection (sprinkler) contractor as this process involves detailed hydraulic calculations based on building layout, pipe runs, head losses, fire pump requirements, etc. Fire flow requirements calculated using the FUS method tend to generate higher values when compared to flows being calculated using the OBC and NFPA. Refer to **Appendix C** for a copy of the preliminary FUS fire flow calculations.

As discussed with the City of Ottawa during the design process, there is one (1) Class A (blue bonnet) municipal fire hydrant along Byron Place and two (2) additional Class AA (blue bonnet) fire hydrants along Churchill Avenue, within the vicinity of the proposed development. Based on the correspondence from the City of Ottawa, the three hydrants will provide a combined maximum fire flow of approximately 225 L/s at 20 psi, which is adequate for the Maximum Day + Fire Flow requirement of 218 L/s. This multi-hydrant approach to fire-fighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02. Refer to **Appendix C** for detailed calculations and for correspondence from the City of Ottawa.

As indicated above, the existing municipal watermain network should have adequate water supply for the proposed development and will provide adequate system pressures for both 'Max



Day + Fire Flow' and 'Peak Hour' conditions, within the normal operating pressure ranges.

## 2.3 Storm Drainage and Stormwater Management

The proposed storm outlet for the site is the existing 600mm dia. storm sewer in Highcroft Avenue. The proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report.

### 2.3.1 Stormwater Management Criteria and Objectives

The stormwater management criteria and objectives for the site are as follows:

- Provide a dual drainage system (i.e. minor and major system flows);
- Control the 100-year post-development flow from the site to an allowable release rate corresponding to the 5-year peak flow with an applied runoff coefficient of 0.5, as specified by the City of Ottawa. Post-development peak flows exceeding the allowable release rate are to be controlled on-site prior to being released into the municipal storm sewer system.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

### 2.3.2 Pre-Development Conditions and Allowable Release Rate

The uncontrolled pre-development flows from the 0.191 ha site were calculated using the Rational Method to be 36.8 L/s during the 1:5-year design event and 71.0 L/s during the 1:100-year design event. Refer to **Appendix D** for detailed calculations. There are currently no water quantity or water quality control measures being provided on site.

As specified by the City of Ottawa, the maximum allowable release rate from the site is to be calculated using the Rational Method, based on a 10-minute rainfall intensity, using a 5-year return period (City of Ottawa IDF Curves) and a runoff coefficient of 0.50.

$$\begin{aligned}
 T_c &= 10 \text{ min} & C &= 0.50 \\
 I_{5yr} &= 104.2 \text{ mm/hr} & A &= 0.191 \text{ ha} \\
 Q_{allow} &= 2.78 \text{ CIA} \\
 &= 2.78 (0.50) (104.2) (0.191) \\
 &= 27.7 \text{ L/s}
 \end{aligned}$$

### 2.3.3 Post-Development Conditions

The proposed site will be serviced by connecting to the existing 600mm dia. storm sewer in Highcroft Avenue. To mitigate the stormwater related impacts due to the increase in imperviousness of the site, stormwater runoff will be attenuated using an internal stormwater storage tank with an ICD in the outlet pipe from the tank to control flows from the building roof.

Although most the runoff from the site will be controlled; due to the existing grades and proposed grading design, runoff from the rear and side yards will sheet drain directly to the municipal Right-of-ways.



### 2.3.3.1 Area A-0: Uncontrolled Runoff

The runoff from this sub-catchment area will flow overland towards the roadway catch basins in Churchill Avenue, Byron Place and Highcroft Avenue. The uncontrolled post-development flows from this sub-catchment area were calculated using the Rational Method to be approximately 6.6 L/s during the 1:5-year design event and 12.9 L/s during the 1:100-year design event. Refer to **Appendix D** for detailed calculations.

### 2.3.3.2 Area R-1: Controlled Flow from Building Roof

Stormwater runoff from this sub-catchment area will be captured by the main roof drains and lower terrace roof drains and directed to an internal stormwater storage tank located on the P1 parking level. Stormwater collected within the storage tank will be controlled by an inlet control device (ICD) prior to being released in to the storm sewer in Highcroft Avenue. CBMH 1 will provide access to the internal tank (i.e. sump, ICD and outlet pipe) from the exterior of the building and will act as the emergency overflow from the tank. The top of grate elevation of CBMH 1 will be set 0.4m below the (residential) finished floor elevation of the building (77.25m).

**Table 3** summarizes the post-development design flows and storage volumes for both the 1:5-year and 1:100-year design events.

**Table 3: Internal Stormwater Storage Tank and Pumped Flow**

Design Event	Post-Development Conditions			
	ICD Type	Design Flow (L/s)	Volume Required (m³)	Volume Provided (m³)
1:5 Year	Hydrovex 125 VHV-2	11.8 L/s	17.0 m³	> 45 m³
1:100 Year		14.1 L/s	42.5 m³	

As indicated in the table above, the internal stormwater storage tank will provide adequate storage for both the 1:5-year and 1:100-year design events. Refer to **Appendix D** for detailed calculations.

### 2.3.3.3 Stormwater Flow Summary

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

**Table 3.1: Stormwater Flows Comparison Table**

Design Event	Pre-Development Conditions		Post-Development Conditions			
	Uncontrolled Flow (L/s)	Allowable Release Rate (L/s)	A-0 Flow (L/s)	R-1 Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
5-Yr	36.8	27.7	6.6	11.8	18.4	18.4 or 50%
100-Yr	71.0	27.7	12.9	14.1	27.0	44.0 or 62%

\* Reduced flow compared to uncontrolled pre-development conditions.

As indicated in the table above, the 100-year post-development flows from the site will be slightly less than the allowable release rate specified by the City of Ottawa. Furthermore, this



represents significant reductions in total site flow rate when compared to the respective pre-development conditions.

### **2.3.4 Stormwater Quality Control**

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on correspondence with the RVCA, on-site stormwater quality control measures will not be required for the proposed development. Refer to **Appendix A** for a copy of the correspondence received from the RVCA.

## **3.0 SITE GRADING**

The elevation of the existing site varies from approximately 78.0m along the back of sidewalk along Churchill Avenue down to approximately 76.7m near the northeast property corner. The existing site generally slopes in a north-easterly direction. The finished floor elevation (FFE) of the proposed commercial units along Churchill Avenue will be set at an elevation of 78.05m to match into the existing sidewalk elevations, while the FFE of the residential portion of the building will be set at an elevation of 77.25m to better match into the adjacent property grades. The grades along the property lines will be maintained, where possible. Refer to the enclosed Grading and Erosion & Sediment Control Plans for details.

## **4.0 GEOTECHNICAL INVESTIGATIONS**

A Geotechnical Investigation Report has been prepared by Paterson Group for the proposed project. Refer to the Geotechnical Report<sup>2</sup> 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 sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags will be placed under the grates of nearby catchbasins, manholes and 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 entrances.
- 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.

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 a site plan control application for the proposed mixed-use development located at 472 Byron Place.

The conclusions are as follows:

- The proposed building will be serviced by the municipal watermain in Byron Place and by the sanitary and storm sewers in Highcroft Avenue.
- The building will be sprinklered and supplied with a fire department siamese connection. The siamese connection will be located within 45m of a municipal fire hydrant.
- The site flows from sub-catchment area A-0 will be uncontrolled. The flows from sub-catchment area R-1 will be directed to an internal SWM tank and controlled prior to being discharged into the municipal storm sewer system.
- The total post-development site flow will be approximately 18.4 L/s during the 5-year design event and 27.0 L/s during the 100-year event, both of which are less than the allowable release rate of 27.7 L/s, specified by the City of Ottawa. Post-development flows will be reduced by approximately 18.4 L/s (or 50%) during the 5-year event and by as much as 44.0 L/s (or 62%) during the 100-year design event when compared to current conditions.
- Regular inspection and maintenance of the building services, roof drains, internal SWM tank is recommended to ensure that the storm drainage system is clean and operational.
- Temporary erosion and sediment control measures are to be provided during construction.

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

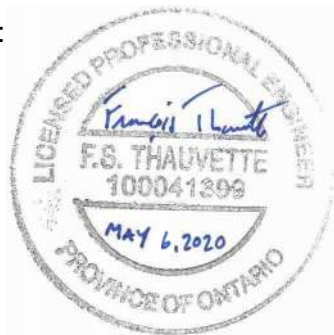
## NOVATECH

Prepared by:



Stephen Matthews, B.A. (Env.)  
Senior Design Technologist

Reviewed by:



François Thauvette, P. Eng.  
Senior Project Manager



## **APPENDIX A**

### **Correspondence**



## Francois Thauvette

---

**From:** Nitsche, Kersten <Kersten.Nitsche@ottawa.ca>  
**Sent:** Tuesday, January 30, 2018 1:06 PM  
**To:** Danna SeeHar; Murray Chown; Danna SeeHar; 'Craig Gillier'; Richard Chmiel; Simon Si  
**Cc:** Dubyk, Wally; Wu, John; Jennifer Luong; Karen Johnson  
**Subject:** 433 Churchill - Second Pre-Consultation - Follow-up  
**Attachments:** Community Organization List.pdf; 433 Churchill - List of Plans and Studies.pdf; 433 Churchill Ave - 2nd Preconsult Minutes.pdf

Good afternoon,

Please find attached the minutes from the follow-up meeting of Wednesday, January 24, regarding the proposed development at 433 Churchill Avenue et al. Please review the minutes and let me know if any comments have been missed or misrepresented.

With regard to the proposed development, please also note the following:

### **Policies/Designations for the Site:**

- Official Plan (OP) – General Urban Area
- Zoning: The site is current zoned as “LC [772]” – Local Commercial, Exception 772 and “R3R” – Residential Third Density, Subzone R.
- An informal review by the UDRP will be a useful tool to help guide the design in preparation of the application submission.
- Note that a design brief is required with the application submission, even if the applicant chooses not to have an informal review by the UDRP.
- Applicant team needs to review Section 37 guidelines and provide detailed GFA information with application submission to determine if it applies.

### **Site Servicing and Transportation:**

- As John was unable to attend last week’s meeting due to illness, please feel free to contact him directly with any questions. Additionally, please consider the following:
  - The major servicing issue for the proposed development is sanitary sewer capacity: a sanitary sewer capacity analysis up to the last connection to the West Nepean Trunk Collector Sewer is required.
  - The small collector sewer along Tweedsmuir Avenue is only 375, and has a large collection area. You need to show that there is no issue when the proposed development is connected to this system.
  - As for storm water management, the development can store the peak on site to meet our goals which is c 0.5 5 year’s storm to restrict up to 100 years’ storm.
  - The development will need two watermain connections.
  - You need to show that the existing 6 inch watermain on Byron is no issue for the proposed development, otherwise, it will need to be upsized.
- All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend into existing property lines, sight triangles and/or future road widening requirements.



- The concrete sidewalk is to meet City standards and be 2.0 metres in width and be continuous along property frontage and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1).
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
- The proposed modifications to the traffic calming measures on Highcroft Avenue will require a Roadway Modification Approval (RMA). Please review the TIA guidelines, as the RMA and functional drawings are required for the TIA Report at the time of the application submission.
- I have contacted Traffic Operations and Right-of-Way Operations with respect to the proposed modifications within the Byron Place ROW. I have not yet heard back, but will let you know what their comments are once they are received.

#### **Development Application Required:**

- Major Zoning By-law amendment:  
[http://app06.ottawa.ca/online\\_services/forms/ds/zoning\\_amendment\\_en.pdf](http://app06.ottawa.ca/online_services/forms/ds/zoning_amendment_en.pdf)
- Site Plan Application (New- Manager Approval, Public Consultation):  
[http://app06.ottawa.ca/online\\_services/forms/ds/site\\_plan\\_control\\_en.pdf](http://app06.ottawa.ca/online_services/forms/ds/site_plan_control_en.pdf)
- The list of required studies and plans is attached to this email. This list assumes that the applications will be submitted together and circulated concurrently. If you would like separate lists, please let me know.
- Please refer to the City's [guide](#) to preparing studies and plans.

#### **Cash-in-lieu of Parkland:**

- The Property Owner shall pay cash-in-lieu of parkland in accordance with the Parkland Dedication By-law of the City of Ottawa, as well as the fee for appraisal services. The monies are to be paid at the time of execution of the Site Plan Agreement.
- Information about the Parkland Dedication process is available here: <http://ottawa.ca/en/parkland-dedication-law-no-2009-95>

#### **Additional Information:**

- Please note that these pre-consultation comments are valid for one year. If you submit a development application after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change.
- Prior to making a complete submission, I encourage you to discuss the proposal with the Councillor (Councillor Leiper) and local community associations. I've attached a list of community organizations registered with the City for your use.

I trust you will find the information provided above helpful. Please do not hesitate to contact me if you have questions or require clarification.

Regards,  
Kersten

#### **Kersten Nitsche, MCIP, RPP**

Planner II | Urbaniste II

Development Review | Examen des projets d'aménagement

Planning, Infrastructure and Economic Development Department | Services de planifications, de l'infrastructure et du développement économique

City of Ottawa | Ville d'Ottawa



110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

☎ 613.580.2424 ext./poste 16616

[ottawa.ca/planning](http://ottawa.ca/planning) / [ottawa.ca/urbanisme](http://ottawa.ca/urbanisme)

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'



## **MINUTES**

Second Pre-Application Consultation Meeting

Address: 433 to 439 Churchill Avenue

Date: January 24, 2018

Time: 2 – 3 pm

Location: Room 4102 E, 110 Laurier Avenue W.

City Contact: Kersten Nitsche

**City of Ottawa Staff Present:** Kersten Nitsche (Planner), Christopher Moise (Urban Designer)

**Invitees Present:** Richard Chmiel (Chmiel Architects Incorporated), Craig Gillier (Chmiel Architects Incorporated), Murray Chown (Novatech), Danna See-Har (Novatech), Simon Si (Owner), Jason Cheng (Owner), Karen Johnson (Westboro Community Association).

### **1.0 Introductions**

### **2.0 Overview of Proposal**

- Option 1 (6 storeys/4 storeys) chosen as the preferred option
- Stepback on fifth storey proposed along Churchill Avenue frontage
- Projecting balconies proposed along Churchill Avenue and Highcroft Avenue frontages
- Public park proposed to enhance current public art area at corner of Churchill and Byron Place
- Expanded parking area proposed within Byron Place right-of-way. Convenient for proposed retail uses and proposed park. Is also a benefit to the community.
- Jennifer explained proposed roadway modifications to accommodate the development proposal (relocation of traffic calming and rationale for underground parking garage location on Highcroft)

### **3.0 Comments from City**

#### **Transportation Comments (Kersten Nitsche on behalf of Wally of Dubyk)**

- Proposed roadway modifications will require an RMA (roadway modification approval). The public notification process is through either the Site Plan Control process or done separately via notification on the City's website.
- Concerned about effective privatization of parking spaces on Byron Place. Applicant team indicated that they could be metered. Kersten to follow-up with parking operations.
- Mature trees in Byron Place will not be permitted to be removed for parking.
- Highcroft Avenue does appear to be the best choice for an underground parking garage entrance as Churchill is a cycle route with cycle track and Byron Place presents challenges for turning radii.



### **Planning and Urban Design Comments (Kersten Nitsche)**

- Not supportive of rezoning the entire development area to LC as commercial should remain on Churchill and not encroach into the residential neighbourhood at this location.
- Encourage the developer to stay within the Zoning By-law requirements for parking and not exceed them as the site is within walking distance of a traditional mainstreet, and almost within the 600m radii of two transit stations.
- Would support a reduction in required parking, but will have to evaluate any requests within the existing and planned context.
- Providing parking in excess of the zoning by-law requirements will not be permitted if it results in negative impacts on other aspects of the development (e.g., landscaping, tree removal, etc.).
- Have concerns about the garbage pick-up proposed within a long narrow lane and in close proximity to the adjacent residential neighbourhood and dwelling.
- Also consider the yard setbacks from the perspective that redevelopment of the Byron Place lots could be oriented to Highcroft Avenue with a side-yard condition.
- Better transition into the residential neighbourhood has to be provided. For example, explore how the street-level units can better transition by providing real front doors that act as the main entrance to the unit – not just patio doors.
- As currently proposed, Planning doesn't support the proposed development but looks forward to further discussion and review based on the comments and direction provided.

### **Urban Design Comments (Christopher Moise)**

- The development needs to be compatible, with respect to massing and design and character, to the existing residential neighbourhood.
- Analysis of the environment needs to be undertaken as the proposal is significantly deviating from the existing context.
- Need to have views in perspective from various points to fully understand the potential impact.
- Need to have a footprint analysis of the surrounding neighbourhood to understand the existing context and how the proposed development contributes/deviates to this context.
- Location of amenity space and back-lane apartments needs to be given more thought.
- This is an important site within the neighbourhood and the design, transition and compatibility needs to reflect this.
- Recommend informal review by UDRP as a tool to help guide the design of the development.

### **4.0 Comments from Community Association Representative (Karen Johnson)**

- Residential neighbourhood will have concern with impact of underground parking garage on Highcroft Avenue and the impact that has on traffic and neighbourhood character.



- Want to see the trees along the north side of Byron Place retained. Contribute to the landscaped and treed boulevard that has been created by the linear park along Byron Avenue.
- Residents prefer that more on-street parking spaces be provided as visitors to the neighbourhood don't use underground parking – they use on-street parking. So adding more designated on-street parking areas is good.
- Like what has been done for the units on Byron further east – wrought-iron fences, doors facing the street.
- The proposed park area will contribute to the linear park along Byron Avenue.
- Community will ask about a marketing study for commercial uses.
- Concerned about the location of garbage pick-up.
- Concerned about walkability and how it is impacted by this development – how will it feel when you walk by the development?
- Minimize reflective surfaces, especially along the ground-level façade.
- Please provide information about affordability – the community wants to maintain diversity of residents. How is the penthouse going to be balanced with other units?

## **5.0 Restatement of Previous Comments**

- Applicant team needs to review Section 37 guidelines and provide detailed GFA information with application submission to determine if it applies.
- This proposal is also within an area subject to demolition control-may want to consider submitting demolition control applications separately.
- Sanitary sewer capacity is of concern.
- Should you submit a formal application, a servicing study examining both upstream and downstream flows will be required.
- A noise study will also be required.
- Consider the edge condition along Churchill Avenue and how this proposal would impact that.
- Need broader context. What is the relationship between the proposed development and the residential area at the rear of the subject sites? How will the building transition and respect the residential area?
- The application must merit the increase in height and density in this area given that it is not with the target intensification zone.

## **6.0 Next Steps**

- File lead to provide follow-up email
- List of required plans and studies to be provided
- Informal review by UDRP recommended before application submission



## APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.

**A** indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

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

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

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

S/A	Number of copies	PLANNING / DESIGN / SURVEY		S/A	Number of copies
	50	17. Draft Plan of Subdivision	18. Plan Showing Layout of Parking Garage	S	3
	30	19. Draft Plan of Condominium	20. Planning Rationale	S	3
S	15	21. Site Plan	22. Minimum Distance Separation (MDS)		3
	20	23. Concept Plan Showing Proposed Land Uses and Landscaping	24. Agrology and Soil Capability Study		5
	3	25. Concept Plan Showing Ultimate Use of Land	26. Cultural Heritage Impact Statement		3
S	15	27. Landscape Plan	28. Archaeological Resource Assessment Requirements: <b>S</b> (site plan) <b>A</b> (subdivision, condo)		3
S	2	29. Survey Plan	30. Shadow Analysis	S	3
S	3	31. Architectural Building Elevation Drawings (dimensioned)	32. Design Brief (includes the Design Review Panel Submission Requirements)	S	Available online
S	3	33. Wind Analysis			

S/A	Number of copies	ENVIRONMENTAL		S/A	Number of copies
S	3	34. Phase 1 Environmental Site Assessment	35. Impact Assessment of Adjacent Waste Disposal/Former Landfill Site		6
S	3	36. Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37. Assessment of Landform Features		7
S	3	38. Record of Site Condition	39. Mineral Resource Impact Assessment		4
S	3	40. Tree Conservation Report	41. Environmental Impact Statement / Impact Assessment of Endangered Species – CHIMNEY SWIFT	S	3
	4	42. Mine Hazard Study / Abandoned Pit or Quarry Study	43. Integrated Environmental Review (Draft, as part of Planning Rationale)		3

File Lead (Assigned Planner): Kersten Nitsche

Infrastructure Approvals Project Manager: John Wu

Site Address (Municipal Address): 433/435 Churchill and 468/472 Byron Place

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

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

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



## Francois Thauvette

---

**From:** Eric Lalande <eric.lalande@rvca.ca>  
**Sent:** Friday, January 4, 2019 10:44 AM  
**To:** Francois Thauvette  
**Subject:** RE: Request for Stormwater Quality Control Criteria - Mixed-Use Development (Churchill & Byron)

Hello Francois,

The RVCA will not require quality control protection for the above noted project, best management practices are encouraged to be integrated where possible into the design.

Thank you,

**Eric Lalande, MCIP, RPP**  
Planner, Rideau Valley Conservation Authority  
613-692-3571 x1137

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>  
**Sent:** Friday, January 04, 2019 9:46 AM  
**To:** Eric Lalande <eric.lalande@rvca.ca>  
**Subject:** RE: Request for Stormwater Quality Control Criteria - Mixed-Use Development (Churchill & Byron)

Hi Eric,

Attached is a PDF copy of the current site plan.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering  
**NOVATECH** Engineers, Planners & Landscape Architects  
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Eric Lalande <[eric.lalande@rvca.ca](mailto:eric.lalande@rvca.ca)>  
**Sent:** Friday, January 4, 2019 9:18 AM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Request for Stormwater Quality Control Criteria - Mixed-Use Development (Churchill & Byron)

Hi Francois,

Do you have a Site Plan I could take review? Based on the description provided it seems likely that no quality controls will be required, however, I would like to take a look before formalizing comments.

Thank you,

**Eric Lalande, MCIP, RPP**  
Planner, Rideau Valley Conservation Authority  
613-692-3571 x1137



---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>

**Sent:** Friday, December 21, 2018 2:06 PM

**To:** Eric Lalande <[eric.lalande@rvca.ca](mailto:eric.lalande@rvca.ca)>

**Subject:** Request for Stormwater Quality Control Criteria - Mixed-Use Development (Churchill & Byron)

Hi Eric,

We are working on a proposed 6-storey mixed-use residential development with commercial space on the ground level and underground parking. The building footprint will almost cover the entire site. The subject site is located near the corner of Churchill Avenue and Byron Avenue (existing civic addresses: 433, 435 Churchill & 468, 472 Byron Place). Please confirm the stormwater quality control criteria for this project.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

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



## **APPENDIX B**

### **Development Servicing Study Checklist**



## 4. Development Servicing Study Checklist

---

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

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

### 4.1 General Content

- N/A ☐ 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.
- N/A ☐ 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.
- N/A ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).



- ☒ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- N/A ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- N/A ☐ Proposed phasing of the development, if applicable.
- ☒ 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

- N/A ☐ Confirm consistency with Master Servicing Study, if available
- N/A ☐ Availability of public infrastructure to service proposed development
- ☒ Identification of system constraints
- N/A ☐ 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.
- N/A ☐ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
- N/A ☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
- ☒ Address reliability requirements such as appropriate location of shut-off valves
- N/A ☐ 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.
- N/A ☐ 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).
- N/A ☐ 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.
- N/A ☐ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- N/A ☐ 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)
- N/A ☐ 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.



- N/A ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- N/A ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- N/A ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- N/A ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☒ 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.
- N/A ☐ 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).
- N/A ☐ 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.
- N/A ☐ 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.
- N/A ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.
- N/A ☐ Identification of potential impacts to receiving watercourses
- N/A ☐ Identification of municipal drains and related approval requirements.
- ☒ 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.
- N/A ☐ 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.
- N/A ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- N/A ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

## 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:



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

## 4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- TBD ☐ 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**

### **Water Demands, FUS Calculations, City of Ottawa Boundary Conditions and Hydraulic Modelling Results**



# Multi-Hydrant Analysis for 433-468 Bryon

HYD2

HYD1 (note hydrant shown  
in GIS is at the wrong location)

Service connection

HYD3

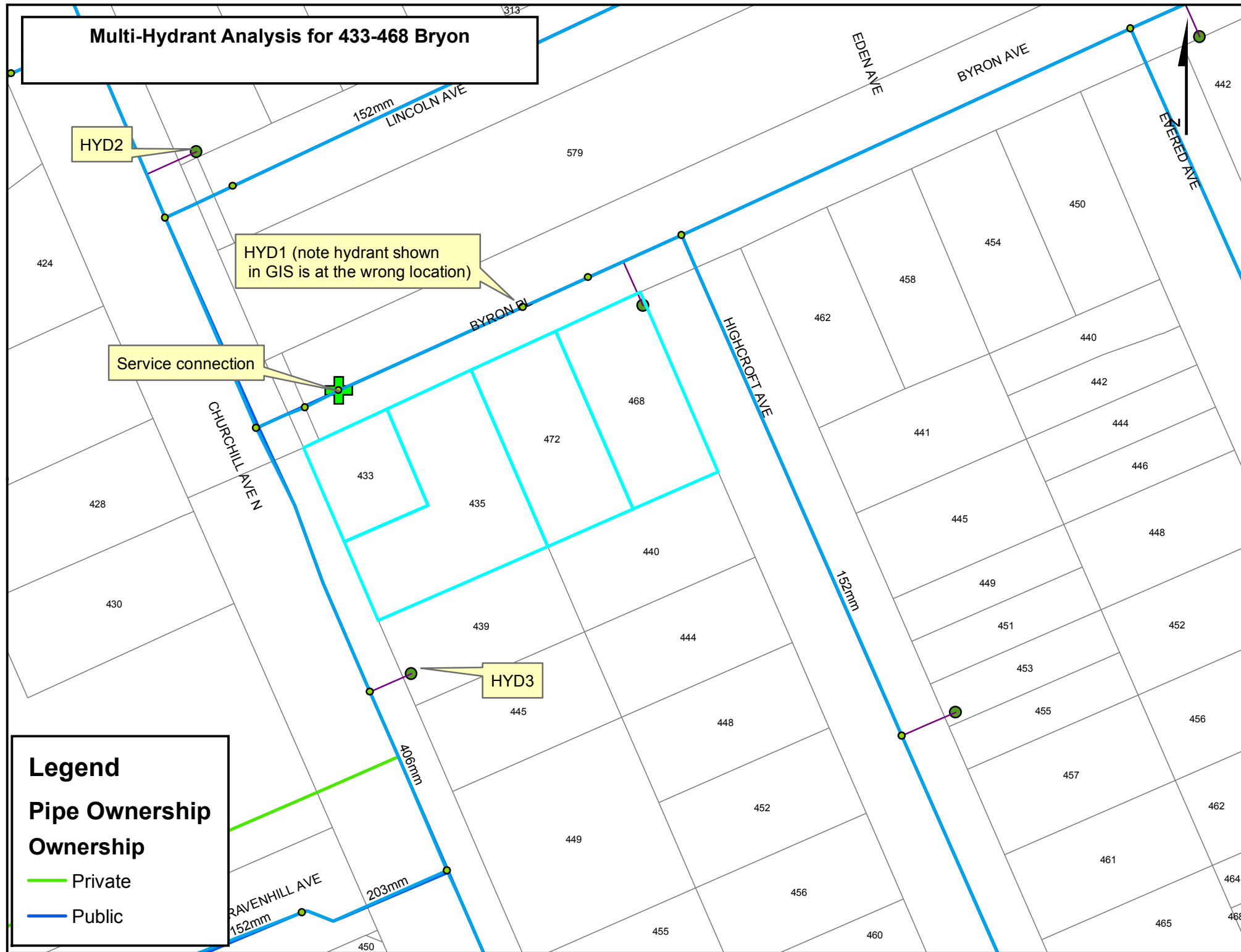
## Legend

### Pipe Ownership

Ownership

Private

Public





## Francois Thauvette

---

**From:** Wu, John <John.Wu@ottawa.ca>  
**Sent:** Friday, March 15, 2019 9:48 AM  
**To:** Francois Thauvette  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant  
**Attachments:** 433-468 Bryon Multi Hydrant March 2019\_rev.pdf

### Here it is:

The following are boundary conditions, HGL, for hydraulic analysis at 433-468 Bryron Place (zone 1W) assumed to be connected to the 152mm on Byron approximately 15m east of Churchill. As requested by the consultant, a multi-hydrant was performed at the following locations (see attached PDF for location):

- HYD1 (152mm on Byron Place)
- HYD2 (406mm on Churchill)
- HYD3 (406mm on Churchill)

Minimum HGL = 105.7m

Maximum HGL = 114.5m

Multi Hydrant Analysis assuming all three hydrants running simultaneously:

	Maximum Flow	Assumptions
HYD1	65 L/s	
HYD2	95 L/s	Assumed within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
HYD3	95 L/s	Assumed within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
total	255 L/s	

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

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

John



---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 12, 2019 11:15 AM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Hi John,

Hydrant 4 (in front of 421 Churchill) has a blue bonnet, is fed off the 400mm dia. watermain in Churchill and will be approximately 53m from the proposed building. We anticipate that it will have the same fire flow as Hydrant 3 (capped at 95 L/s per Technical Bulletin ISTB-2018-02).

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering  
**NOVATECH** Engineers, Planners & Landscape Architects  
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Tuesday, March 12, 2019 11:09 AM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Is that within 150m or 100 metres, if it is out 150 meters to the main entrance, we can not consider it.

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 11, 2019 4:14 PM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Hi John,

Thank you for the formal information from the water-modeling group. It appears that we only need an additional 10 L/s to meet the 200 L/s fire flow requirement. As indicated in my previous e-mail, please include a 4<sup>th</sup> hydrant in the fire-fighting analysis. The hydrant (which has a blue bonnet) is located in front of 421 Churchill Avenue and is fed off the 400mm dia. watermain in Churchill. It is likely that hydrant #2 may not even be required if hydrant 4 is used instead. See attached sketch for details.

Please provide updated information for our use.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering  
**NOVATECH** Engineers, Planners & Landscape Architects  
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Monday, March 11, 2019 1:06 PM



**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>

**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

This is formal:

The following are boundary conditions, HGL, for hydraulic analysis at 433-468 Bryron Place (zone 1W) assumed to be connected to the 152mm on Byron approximately 15m east of Churchill. As requested by the consultant, a multi-hydrant was performed at the following locations (see attached PDF for location):

- HYD1 (152mm on Byron Place)
- HYD2 (152mm on Highcroft)
- HYD3 (406mm on Churchill)

Minimum HGL = 105.7m

Maximum HGL = 114.5m

Multi Hydrant Analysis assuming all three hydrants running simultaneously:

	Maximum Flow	Assumptions
HYD1	70 L/s	
HYD2	25 L/s	
HYD3	95 L/s	Assumed within 75m of property and capped at 95 L/s as per technical bulletin ISTB-2018-02
total	190 L/s	

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

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

John

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>

**Sent:** March 11, 2019 11:07 AM

**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>

**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Hi John,



Please ask the water-modelling group to review their numbers.

Their previous e-mail had the hydrant in front of 472 Byron Place (which has a blue bonnet) able to provide 160 L/s by itself, which means the other two hydrant combined would only be providing an additional 30 L/s for a total of 190 L/s. This does not appear to be correct, considering the hydrant in front of 439 Churchill Avenue (which also has a blue bonnet) is fed off the 400mm dia. watermain in Churchill Avenue. We realize that the flow available from the hydrant in front of 453 Highcroft Avenue (which has an orange bonnet) will be limited. Please note that if required, there is another hydrant (with a blue bonnet) in front of 421 Churchill Avenue, which is fed off the 400mm dia. watermain in Churchill.

Please provide updated watermain boundary condition calculations along with a sketch.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

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

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>

**Sent:** Monday, March 11, 2019 10:48 AM

**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>

**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

The total available flow would be 190 L/s.

I just got it from modelling group.

John

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>

**Sent:** March 7, 2019 3:45 PM

**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>

**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Hi John,

Thank you for the updated information. Can you provide the revised sketch that goes with this analysis?

If we use the following three (3) hydrants, we can provide the necessary fire-flow (200 L/s) without having to up-size the 150mm dia. watermain in Byron Place:

- Relocated hydrant in front of 472 Byron Place
- Existing hydrant in front of 439 Churchill Ave.
- Existing hydrant in front of 453 Highcroft Ave.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering

**NOVATECH** Engineers, Planners & Landscape Architects



**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Thursday, March 7, 2019 3:10 PM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Here is the new result:

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

The following are boundary conditions, HGL, for hydraulic analysis at 433-468 Bryron Place (zone 1W) assumed to be connected to the 152mm on Byron approximately 15m east of Churchill (see attached PDF for location). As per as-built, approximately 9m of 203mm PVC was assumed on Byron east of Churchill.

Minimum HGL = 105.7m

Maximum HGL = 114.5m

Available Flow @ 20psi = 160 L/s assuming a ground elevation of 77.0m

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.*

*So you need to change the 152 water main till the new fire hydrant. I can guarantee it works.*

John

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 7, 2019 1:11 PM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Cc:** Steve Matthews <[S.Matthews@novatech-eng.com](mailto:S.Matthews@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Byron Place hydrant

Ok, we will move it to the north side of the street, but will not shift it west.

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Thursday, March 7, 2019 1:09 PM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Request for WM boundary conditions



I don't think we will allow you to shift the hydrant on Byron Place, small relocation is possible.

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 7, 2019 12:55 PM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Subject:** RE: Byron/Churchill Apartments - Request for WM boundary conditions

Hi John,

Please see attached plans (15350p&p24 and 16858p&p29) for existing watermain information. Please confirm that the City model includes the correct watermain sizes (i.e. 200mm dia. and 150mm dia.) and hydrant locations (in front of 472, not 468) along Byron Place, as this information is not shown or is incorrectly shown on the modelling sketch.

Please also note that the existing fire hydrant along Byron Place (in front of 472) will need to be relocated to the north side of the street to accommodate the proposed development. Since we have to relocate the existing hydrant, would it be possible to shift it further west? If so, how far could it be shifted?

Please ask the water-modelling group to run the model again with the following modifications:

- The proposed building service will be off the Byron Place watermain, approximately 14.5m east of the 400mm dia. watermain in Churchill.
- Confirm the maximum flow available at the relocated hydrant along Byron Place.
- Confirm the maximum flow available at the existing hydrant in front of 439 Churchill Ave, as we intend to use both hydrants for fire-fighting purposes.

Please call should you have any questions or require further clarification.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering  
**NOVATECH** Engineers, Planners & Landscape Architects  
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Thursday, March 7, 2019 10:00 AM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Request for WM boundary conditions

Here is it:

The following are boundary conditions, HGL, for hydraulic analysis at 468 Bryron Place (zone 1W) assumed to be connected to the 152mm on Byron (see attached PDF for location).

Minimum HGL = 105.7m

Maximum HGL = 114.5m

Available Flow @ 20psi = 75 L/s assuming a ground elevation of 76.5m

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



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

John

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 5, 2019 11:55 AM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Cc:** Steve Matthews <[S.Matthews@novatech-eng.com](mailto:S.Matthews@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Request for WM boundary conditions

Hi John,

The water service will likely be near the NW building corner, with a connection to the existing 150mm dia. watermain in Byron Place. Our understanding is that we cannot connect to the existing 400mm dia. watermain in Churchill, as it is considered a 'backbone' watermain.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering  
**NOVATECH** Engineers, Planners & Landscape Architects  
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867  
The information contained in this email message is confidential and is for exclusive use of the addressee.

---

**From:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Sent:** Tuesday, March 5, 2019 11:43 AM  
**To:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Subject:** RE: Byron/Churchill Apartments - Request for WM boundary conditions

Where are you connected? it only need one connection.

---

**From:** Francois Thauvette <[f.thauvette@novatech-eng.com](mailto:f.thauvette@novatech-eng.com)>  
**Sent:** March 5, 2019 11:35 AM  
**To:** Wu, John <[John.Wu@ottawa.ca](mailto:John.Wu@ottawa.ca)>  
**Cc:** Steve Matthews <[S.Matthews@novatech-eng.com](mailto:S.Matthews@novatech-eng.com)>  
**Subject:** Byron/Churchill Apartments - Request for WM boundary conditions

Hi John,

We are working on a proposed 6-storey residential development with commercial space on the ground floor, see attached geoOttawa map showing the proposed site location. We are sending you this e-mail to request watermain boundary conditions for a proposed water service connection to the 150mm dia. WM along Byron Place. The anticipated water demands for the proposed development are as follows:

- Average Day Demand = 0.53 L/s
- Max. Day Demand = 1.30 L/s



- Peak Hour Demand = 2.84 L/s
- Max Daily + Fire Flow = 201 L/s (FUS fire flow of 200 L/s)\*

\*Based on a non-combustible, 6-storey building with an unsupervised sprinkler system, per the architectural design. See attached FUS calculation sheet for details.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering

**NOVATECH** Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

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

,

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

,

,

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

,

,

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

,

,

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.



'  
'  
  
This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'  
'  
  
This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'  
'  
  
This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'  
'  
  
This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.



## FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners &amp; Landscape Architects

Novatech Project #: 118024

Project Name: Byron / Churchill

Date: 3/4/2019

Input By: S.Matthews

Reviewed By: F.Thauvette

Legend

Input by User

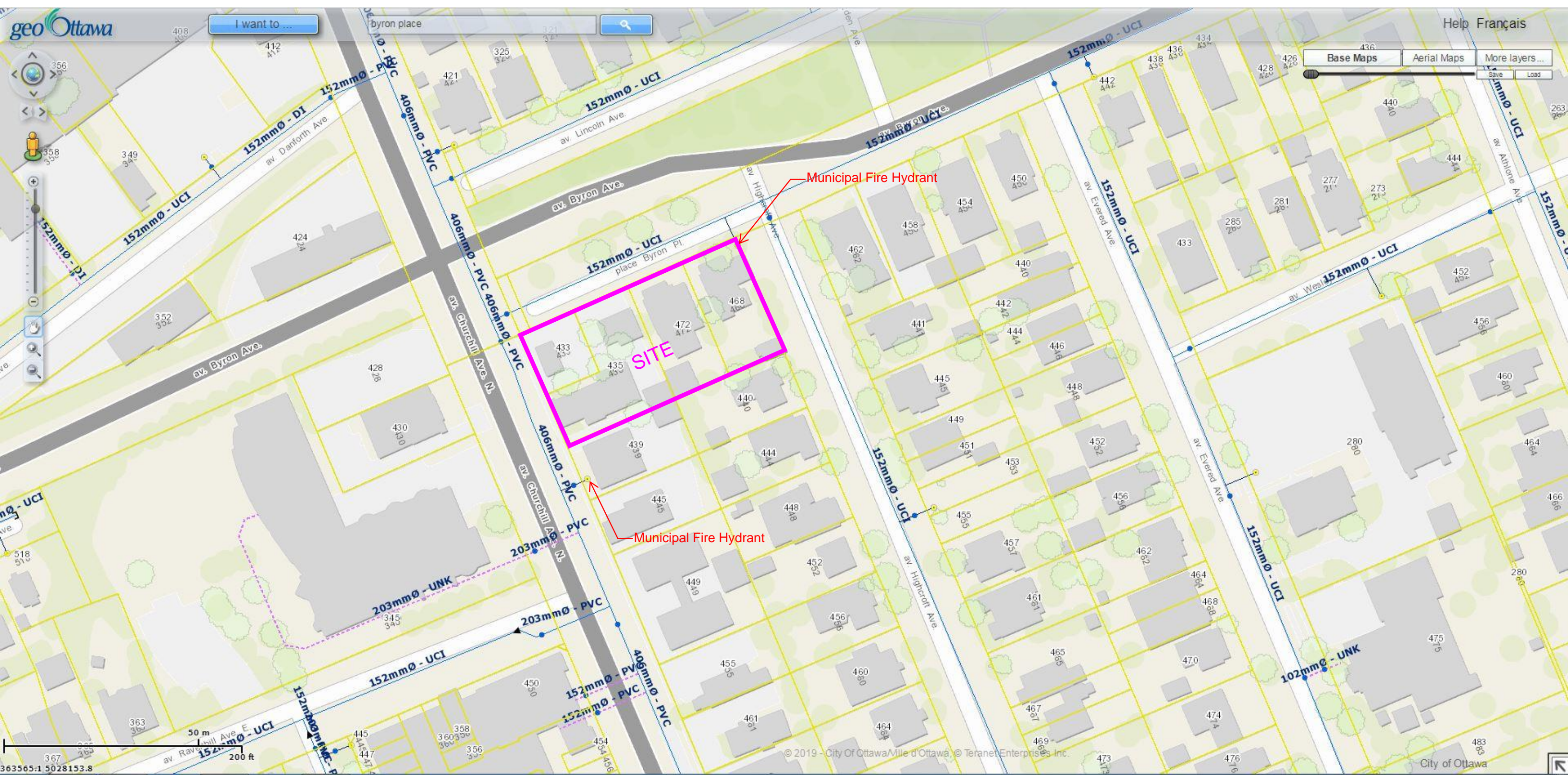
No Information or Input Required

Building Description: 6-Storey Mixed Use Building

Non-combustible construction

Step			Input		Value Used	Total Fire Flow (L/min)
<b>Base Fire Flow</b>						
1	<b>Construction Material</b>			<b>Multiplier</b>		0.8
	<b>Coefficient related to type of construction</b> <b>C</b>	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	<b>Floor Area</b>					14,000
	<b>A</b>	Building Footprint (m <sup>2</sup> )	1060			
		Number of Floors/Storeys	6			
		Area of structure considered (m <sup>2</sup> )	6,360			
	<b>F</b>	<b>Base fire flow without reductions</b>				
<b>F = 220 C (A)<sup>0.5</sup></b>						
<b>Reductions or Surcharges</b>						
3	<b>Occupancy hazard reduction or surcharge</b>			<b>Reduction/Surcharge</b>		11,900
	<b>(1)</b>	Non-combustible		-25%	-15%	
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	<b>Sprinkler Reduction</b>			<b>Reduction</b>		-4,760
	<b>(2)</b>	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
		<b>Cumulative Total</b>			<b>-40%</b>	
5	<b>Exposure Surcharge (cumulative %)</b>			<b>Surcharge</b>		5,355
	<b>(3)</b>	North Side	> 45.1m		0%	
		East Side	20.1 - 30 m		10%	
		South Side	0 - 3 m		25%	
		West Side	20.1 - 30 m		10%	
		<b>Cumulative Total</b>			<b>45%</b>	
<b>Results</b>						
6	<b>(1) + (2) + (3)</b>	<b>Total Required Fire Flow, rounded to nearest 1000L/min</b>			<b>L/min</b>	<b>12,000</b>
		(2,000 L/min < Fire Flow < 45,000 L/min)			<b>L/s</b>	<b>200</b>
					<b>USGPM</b>	<b>3,170</b>
7	<b>Storage Volume</b>	Required Duration of Fire Flow (hours)			Hours	2.5
		Required Volume of Fire Flow (m <sup>3</sup> )			m <sup>3</sup>	1800







## **APPENDIX D**

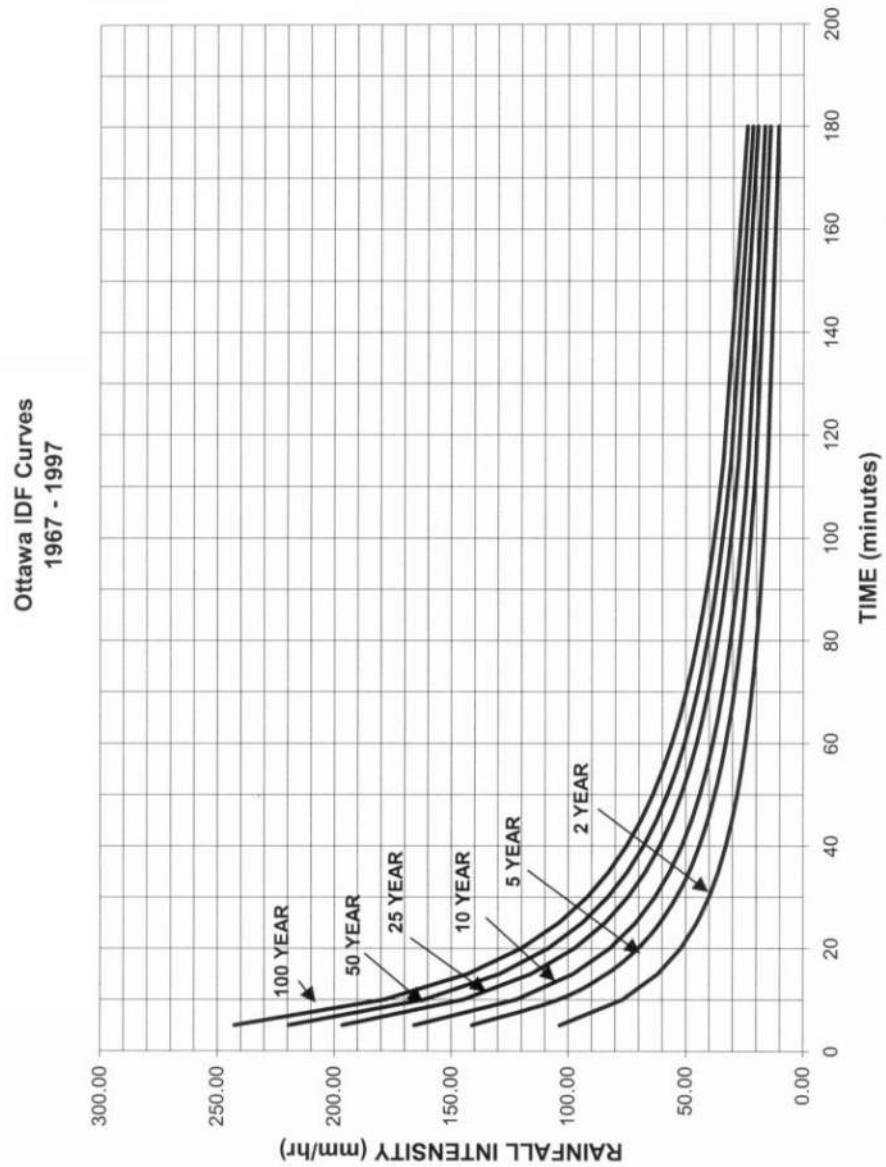
### **IDF Curves and SWM Calculations**



## Ottawa Sewer Design Guidelines

## APPENDIX 5-A

## OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE





## Proposed Mixed-Use Building 472 Byron Place

Pre - Development Stormwater Flows											
Description	Area (ha)	$A_{impervious} (ha)$ $C=0.9$	$A_{gravel} (ha)$ $C=0.7$	$A_{pervious} (ha)$ $C=0.2$	Weighted $C_{w5}$	Weighted $C_{w100}$	1:5 Year Flow (L/s)	1:100 Year Flow (L/s)	Allowable $C_{value}$	Total Allowable Flow	
										5 year (L/s)	100 year (L/s)
Total Site Area	0.191	0.127	0.000	0.064	0.67	0.75	36.8	71.0	0.5	27.7	27.7

Post - Development : Theoretical Uncontrolled Site								
Area	Description	Area (ha)	$A_{imp} (ha)$ $C=0.9$	$A_{perv} (ha)$ $C=0.2$	$C_5$	$C_{100}$	Uncontrolled Flow (L/s)	
							5 year	100 year
A-0	Direct Runoff	0.044	0.020	0.024	0.52	0.59	6.6	12.9
R-1	Controlled Internal SWM Tank	0.147	0.147	0.000	0.90	1.00	38.3	73.0

Summed Area Check: 0.191

$T_c = 10mins$      $T_c = 10mins$

Exceeds allowable flow, therefore must be controlled  
(see table below for controlled flows from area R-1)

Post - Development : Total Flows for Controlled Site + Uncontrolled Runoff						
Area	Description	Flow (L/s)		Storage Required (m <sup>3</sup> )		Provided (m <sup>3</sup> )
		5 year	100 year	5 year	100 year	
A-0	Direct Runoff	6.6	12.9	-	-	-
R-1	Controlled Internal SWM Tank	11.8	14.1	17.0	42.5	54.9
Totals :		18.4	27.0	17.0	42.5	>45.0

Over Controlled: 9.3    0.7

based on Tank Footprint Area of 64.6m<sup>2</sup>  
100-Year+20% storage requirement = 51.9m<sup>3</sup>



<b>Proposed Residential / Commercial Building</b>				
<b>Novatech Project No. 118024</b>				
<b>REQUIRED STORAGE - 1:5 YEAR EVENT</b>				
<b>AREA A-0 Direct Runoff to Municipal R.O.W.</b>				
OTTAWA IDF CURVE				
Area =	0.044	ha	Qallow =	6.6 L/s
C =	0.52		Vol(max) =	0.0 m <sup>3</sup>
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m <sup>3</sup> )
5	141.18	8.95	2.34	0.70
10	104.19	6.60	0.00	0.00
15	83.56	5.30	-1.31	-1.18
20	70.25	4.45	-2.15	-2.58
25	60.90	3.86	-2.74	-4.12
30	53.93	3.42	-3.19	-5.73
35	48.52	3.08	-3.53	-7.41
40	44.18	2.80	-3.80	-9.13
45	40.63	2.58	-4.03	-10.88
50	37.65	2.39	-4.22	-12.65
55	35.12	2.23	-4.38	-14.45
60	32.94	2.09	-4.52	-16.26
65	31.04	1.97	-4.64	-18.08
70	29.37	1.86	-4.74	-19.92
75	27.89	1.77	-4.84	-21.76
80	26.56	1.68	-4.92	-23.62
85	25.37	1.61	-5.00	-25.48
90	24.29	1.54	-5.06	-27.35

<b>Proposed Residential / Commercial Building</b>				
<b>Novatech Project No. 118024</b>				
<b>REQUIRED STORAGE - 1:100 YEAR EVENT</b>				
<b>AREA A-0 Direct Runoff to Municipal R.O.W.</b>				
OTTAWA IDF CURVE				
Area =	0.044	ha	Qallow =	12.9 L/s
C =	0.59		Vol(max) =	0.0 m <sup>3</sup>
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m <sup>3</sup> )
5	242.70	17.54	4.64	1.39
10	178.56	12.91	0.00	0.00
15	142.89	10.33	-2.58	-2.32
20	119.95	8.67	-4.24	-5.08
25	103.85	7.51	-5.40	-8.10
30	91.87	6.64	-6.27	-11.28
35	82.58	5.97	-6.94	-14.57
40	75.15	5.43	-7.47	-17.94
45	69.05	4.99	-7.92	-21.37
50	63.95	4.62	-8.28	-24.85
55	59.62	4.31	-8.60	-28.37
60	55.89	4.04	-8.87	-31.92
65	52.65	3.81	-9.10	-35.49
70	49.79	3.60	-9.31	-39.09
75	47.26	3.42	-9.49	-42.71
80	44.99	3.25	-9.65	-46.34
85	42.95	3.10	-9.80	-49.99
90	41.11	2.97	-9.93	-53.65



Proposed Residential / Commercial Building				
Novatech Project No. 118024				
REQUIRED STORAGE - 1:5 YEAR EVENT				
AREA R-1 Controlled Flow-Internal SWM Tank				
OTTAWA IDF CURVE				
Area =	0.147	ha	Qallow =	11.8 L/s
C =	0.90		Vol(max) =	17.0 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	51.92	40.12	12.04
10	104.19	38.32	26.52	15.91
15	83.56	30.73	18.93	17.04
20	70.25	25.84	14.04	16.85
25	60.90	22.40	10.60	15.90
30	53.93	19.83	8.03	14.46
35	48.52	17.84	6.04	12.69
40	44.18	16.25	4.45	10.68
45	40.63	14.94	3.14	8.49
50	37.65	13.85	2.05	6.15
55	35.12	12.92	1.12	3.69
60	32.94	12.12	0.32	1.14
65	31.04	11.42	-0.38	-1.49
70	29.37	10.80	-1.00	-4.19
75	27.89	10.26	-1.54	-6.94
90	24.29	8.93	-2.87	-15.48
105	21.58	7.94	-3.86	-24.33
120	19.47	7.16	-4.64	-33.41
135	17.76	6.53	-5.27	-42.66
150	16.36	6.02	-5.78	-52.04

Proposed Residential / Commercial Building				
Novatech Project No. 118024				
REQUIRED STORAGE - 1:100 YEAR EVENT				
AREA R-1 Controlled Flow-Internal SWM Tank				
OTTAWA IDF CURVE				
Area =	0.147	ha	Qallow =	14.1 L/s
C =	1.00		Vol(max) =	42.5 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	99.18	85.08	25.53
10	178.56	72.97	58.87	35.32
15	142.89	58.40	44.30	39.87
20	119.95	49.02	34.92	41.90
25	103.85	42.44	28.34	42.51
30	91.87	37.54	23.44	42.20
35	82.58	33.75	19.65	41.26
40	75.15	30.71	16.61	39.86
45	69.05	28.22	14.12	38.12
50	63.95	26.14	12.04	36.11
55	59.62	24.37	10.27	33.88
60	55.89	22.84	8.74	31.47
65	52.65	21.51	7.41	28.92
70	49.79	20.35	6.25	26.24
75	47.26	19.31	5.21	23.45
90	41.11	16.80	2.70	14.58
105	36.50	14.92	0.82	5.13
120	32.89	13.44	-0.66	-4.73
135	30.00	12.26	-1.84	-14.92
150	27.61	11.28	-2.82	-25.35

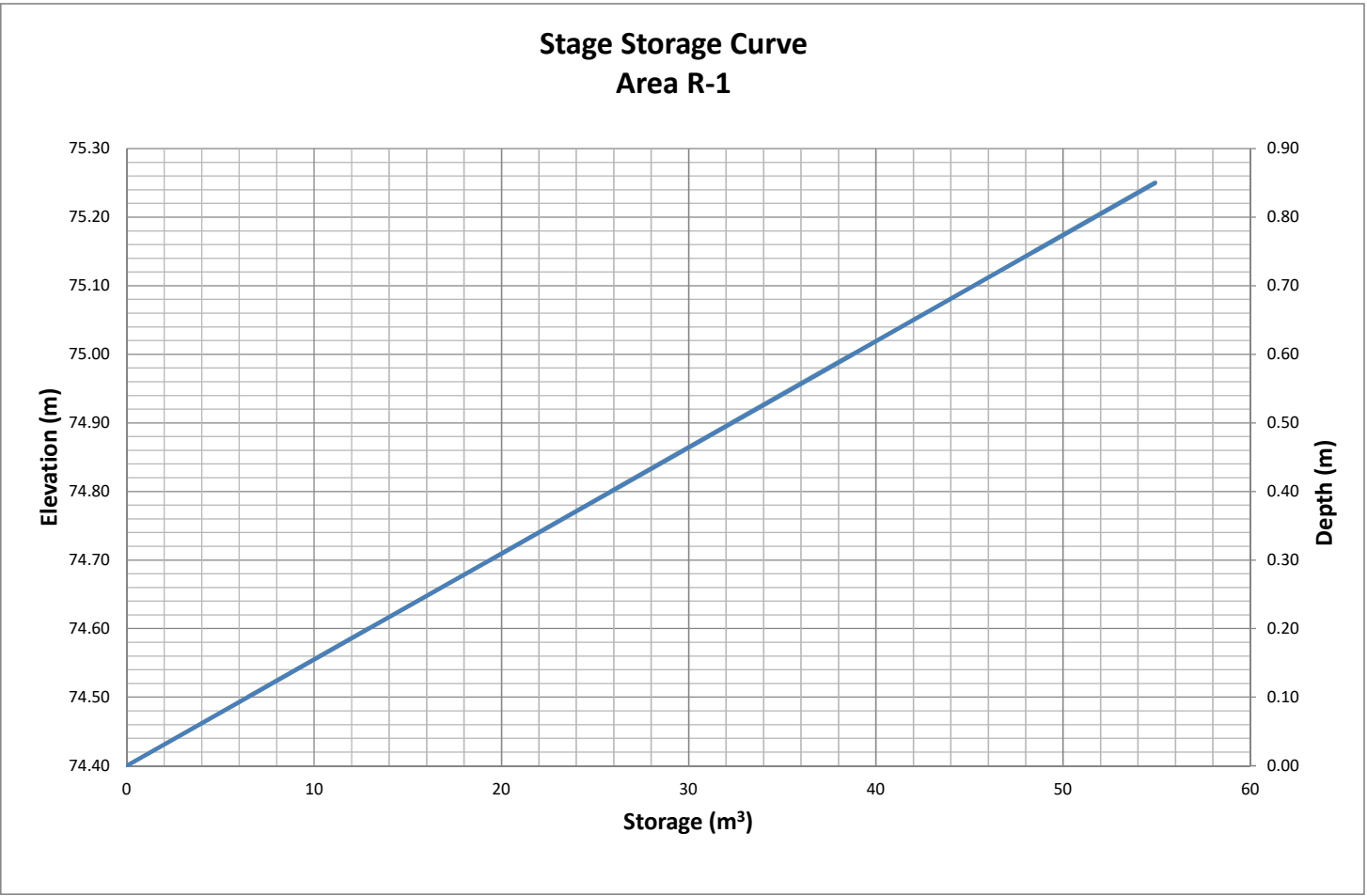
Area R-1: Storage Table		Internal Storage Tank	Total Storage	
Elevation (m)	Internal Tank Depth (m)	Area of Tank (m²)	Tank Volume (m³)	Total Volume (m³)
73.70	-	-	-	0
74.40	0.00	64.6	0.0	0.0
74.50	0.10	64.6	6.5	6.5
74.60	0.20	64.6	12.9	12.9
74.70	0.30	64.6	19.4	19.4
74.80	0.40	64.6	25.8	25.8
74.90	0.50	64.6	32.3	32.3
75.00	0.60	64.6	38.8	38.8
75.15	0.75	64.6	48.4	48.4
75.25	0.85	64.6	54.9	54.9

HydroVex 125 VHV-2 ICD	
1:100 Yr	
Flow (L/s) = 14.1	
Head (m) = 1.36	
Elevation (m) = 75.06	
Outlet Pipe Dia.(mm) = 204	
Volume (m3) = 42.5	
1:5 Yr	
Flow (L/s) = 11.8	
Head (m) = 0.97	
Elevation (m) = 74.67	
Outlet Pipe Dia.(mm) = 204	
Volume (m3) = 17.0	

Maximum Ponding Depth (cm)	
1:100 Yr	-
1:5 Yr	-

Orifice Size - 1:100 yr Flow Check		
Q=0.62xAx(2gh)^0.5		
	1:100 yr	Flow Check
Q (m³/s) =	0.0141	0.0141
g (m/s²) =	9.81	9.81
h (m) =	1.36	1.36
A (m²) =	0.004402592	0.00442
D (m) =	0.074870252	0.07500
D (mm) =	75	75.0

1:5 yr Flow Check		
	1:5 yr	
Q (m³/s) =	0.0119	
g (m/s²) =	9.81	
h (m) =	0.97	
A (m²) =	0.00442	
D (m) =	0.075	
D (mm) =	75	

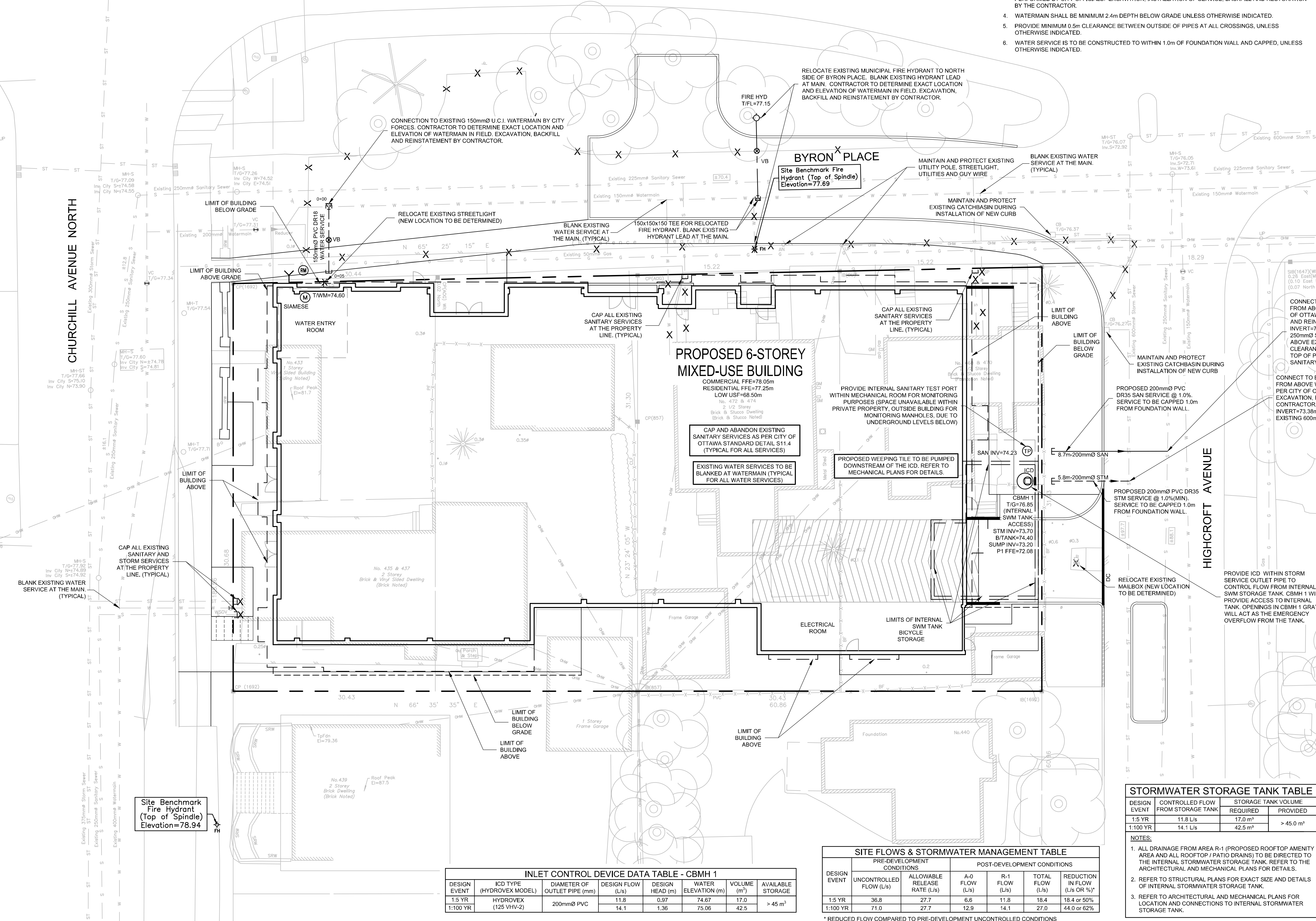


Proposed Residential / Commercial Building				
Novatech Project No. 118024				
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase				
AREA R-1 Controlled Flow-Internal SWM Tank				
OTTAWA IDF CURVE				
Area =	0.147	ha	Qallow =	16.3 L/s
C =	1.00		Vol(max) =	51.9 m3
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	119.02	102.72	30.82
10	214.27	87.56	71.26	42.76
15	171.47	70.07	53.77	48.40
20	143.94	58.82	42.52	51.03
25	124.62	50.93	34.63	51.94
30	110.24	45.05	28.75	51.75
35	99.09	40.50	24.20	50.81
40	90.17	36.85	20.55	49.32
45	82.86	33.86	17.56	47.42
50	76.74	31.36	15.06	45.19
55	71.55	29.24	12.94	42.70
60	67.07	27.41	11.11	40.00
65	63.18	25.82	9.52	37.12
70	59.75	24.42	8.12	34.09
75	56.71	23.17	6.87	30.93
90	49.33	20.16	3.86	20.85
105	43.80	17.90	1.60	10.07
120	39.47	16.13	-0.17	-1.21
135	36.00	14.71	-1.59	-12.88
150	33.13	13.54	-2.76	-24.84



150mmØ WATER SERVICE TABLE			
STATION	SURFACE ELEVATION	TWM ELEVATION	COMMENTS
0+00	77.25	74.50±	CONNECTION TO EX. 150mmØ WATERMAIN
0+02.5	77.30	74.55	150mmØ VALVE AND VALVE BOX
0+04.3	77.33	74.60	CROSS BELOW EX. 50mmØ GAS (±1.7m CLEARANCE)
0+05.0	77.35	74.60	CAP 1.0m FROM BUILDING FACE

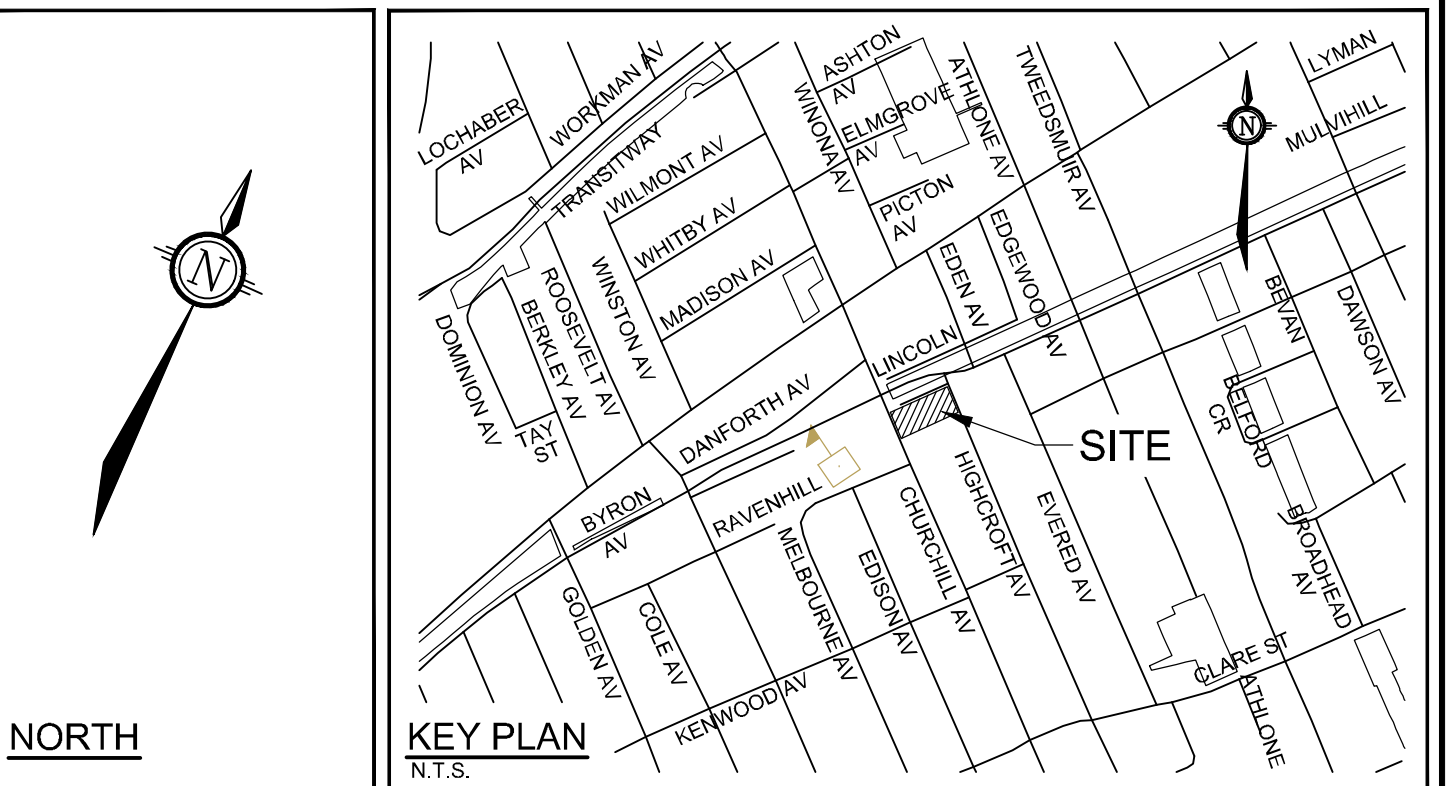
- 150mmØ CONNECTION TO EXISTING 200mmØ DUCTILE IRON WATERMAIN. EXACT ELEVATION TO BE FIELD DETERMINED.
- PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W23 AND DETAIL W22 WHERE COVER IS LESS THAN 2.4m AND/OR ADJACENT TO OPEN STRUCTURES.



WATERMAIN NOTES:

- SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
- SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
HYDRANT INSTALLATION	W19	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION BY OPEN STRUCTURES	W23	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWERS	W25	CITY OF OTTAWA
WATERMAIN MATERIAL	PVC DR 18 (100mm AND LARGER)	
- EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMANS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.
- 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 FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.



- LEGEND
- PROPERTY LINE
  - PROPOSED SANITARY SERVICE
  - PROPOSED STORM SERVICE
  - CONTROLLED FLOW ROOF DRAIN
  - PROPOSED DECK DRAIN
  - THERMAL INSULATION FOR SHALLOW SEWERS
  - PROPOSED TRENCH DRAIN
  - PROPOSED BARRIER CURB
  - PROPOSED DEPRESSION CURB
  - PROPOSED WATER SERVICE AND DIAMETER
  - PROPOSED VALVE & VALVE BOX
  - PROPOSED CAP
  - PROPOSED SIAMISE CONNECTION
  - PROPOSED WATER METER & REMOTE METER
  - PROPOSED BUILDING ENTRANCE
  - REMOVALS
  - PROPOSED HYDRO TRANSFORMER
  - EXISTING OVERHEAD WIRES
  - EXISTING CONCRETE CURB
  - EXISTING SANITARY MANHOLE & SEWER
  - EXISTING CATCHBASIN MANHOLE
  - EXISTING STORM MANHOLE & SEWER
  - EXISTING CATCHBASIN C/W CATCHBASIN LEAD
  - EXISTING HYDRANT & VALVE
  - EXISTING TREES / VEGETATION
  - EXISTING UTILITY POLE C/W GUY WIRES
  - EXISTING FENCE
  - EXISTING WATERMAIN
  - EXISTING HYDRANT C/W VALVE & LEAD

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.
- 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 MUNICIPAL AUTHORITIES.
- 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 INVESTIGATION (PG4712-1), DATED FEBRUARY 25, 2019, PREPARED BY PATERSON GROUP 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 SURFACED AREAS AND DIMENSIONS.
- REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2019-013) PREPARED BY NOVATECH.
- SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

SEWER NOTES:

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

ITEM	SPEC. No.	REFERENCE
STORM SERVICE	PVC DR 35	
SANITARY SERVICE	PVC DR 35	
SEWER TRENCH	BEDDING (GRANULAR 'A') COVER (GRANULAR 'B' OR GRANULAR 'B' TYPE I WITH MAXIMUM PARTICLE SIZE=25mm)	
- THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH BACKFLOW PREVENTERS WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
- PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
- INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.5m COVER WITH UP TO 125mm THICK HI-40 RIGID INSULATION.
- CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL APPLICABLE SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND TIG ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
- 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 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SEWERS 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.

STORMWATER STORAGE TANK TABLE			
DESIGN EVENT	CONTROLLED FLOW FROM STORAGE TANK	STORAGE TANK VOLUME REQUIRED	STORAGE TANK VOLUME PROVIDED
1:5 YR	11.8 L/s	17.0 m³	> 45.0 m³
1:100 YR	14.1 L/s	42.5 m³	

- NOTES:
- ALL DRAINAGE FROM AREA R-1 (PROPOSED ROOFTOP AMENITY AREA AND ALL ROOFTOP/PATIO DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE TANK. REFER TO THE ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
  - REFER TO STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE TANK.
  - REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR LOCATION AND CONNECTIONS TO INTERNAL STORMWATER STORAGE TANK.

INLET CONTROL DEVICE DATA TABLE - CBMH 1						
DESIGN EVENT	ICD TYPE (HYDROVEX MODEL)	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m³)
1:5 YR	HYDROVEX (125 VHV-2)	200mmØ PVC	11.8	0.97	74.67	17.0
1:100 YR			14.1	1.36	75.06	42.5

SITE FLOWS & STORMWATER MANAGEMENT TABLE						
DESIGN EVENT	PRE-DEVELOPMENT CONDITIONS			POST-DEVELOPMENT CONDITIONS		
	UNCONTROLLED FLOW (L/s)	ALLOWABLE RELEASE RATE (L/s)	A-0 FLOW (L/s)	R-1 FLOW (L/s)	TOTAL FLOW (L/s)	REDUCTION IN FLOW (L/s OR %)
1:5 YR	36.8	27.7	6.8	11.8	18.4	18.4 or 50%
1:100 YR	71.0	27.7	12.9	14.1	27.0	44.0 or 62%

\* REDUCED FLOW COMPARED TO PRE-DEVELOPMENT UNCONTROLLED CONDITIONS

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  
2592532 ONTARIO INC.  
165 PRETORIA AVENUE,  
OTTAWA, ONTARIO, K1S 1X1  
CONTACT: SIMON S  
PHONE: (613) 255-3422  
SIMONS@ROYALPAGE.CA

REVISION			
No.	REVISION	DATE	BY
2	RE-ISSUED FOR SITE PLAN APPROVAL	MAY 6/20	FST
1	ISSUED FOR SITE PLAN	APR 5/19	FST

FOR REVIEW ONLY



**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 472 BYRON PLACE - BYRON PLACE APARTMENTS	
DRAWING NAME GENERAL PLAN OF SERVICES	
PROJECT No. 118024	REV #2
DRAWING No. 118024-GP	

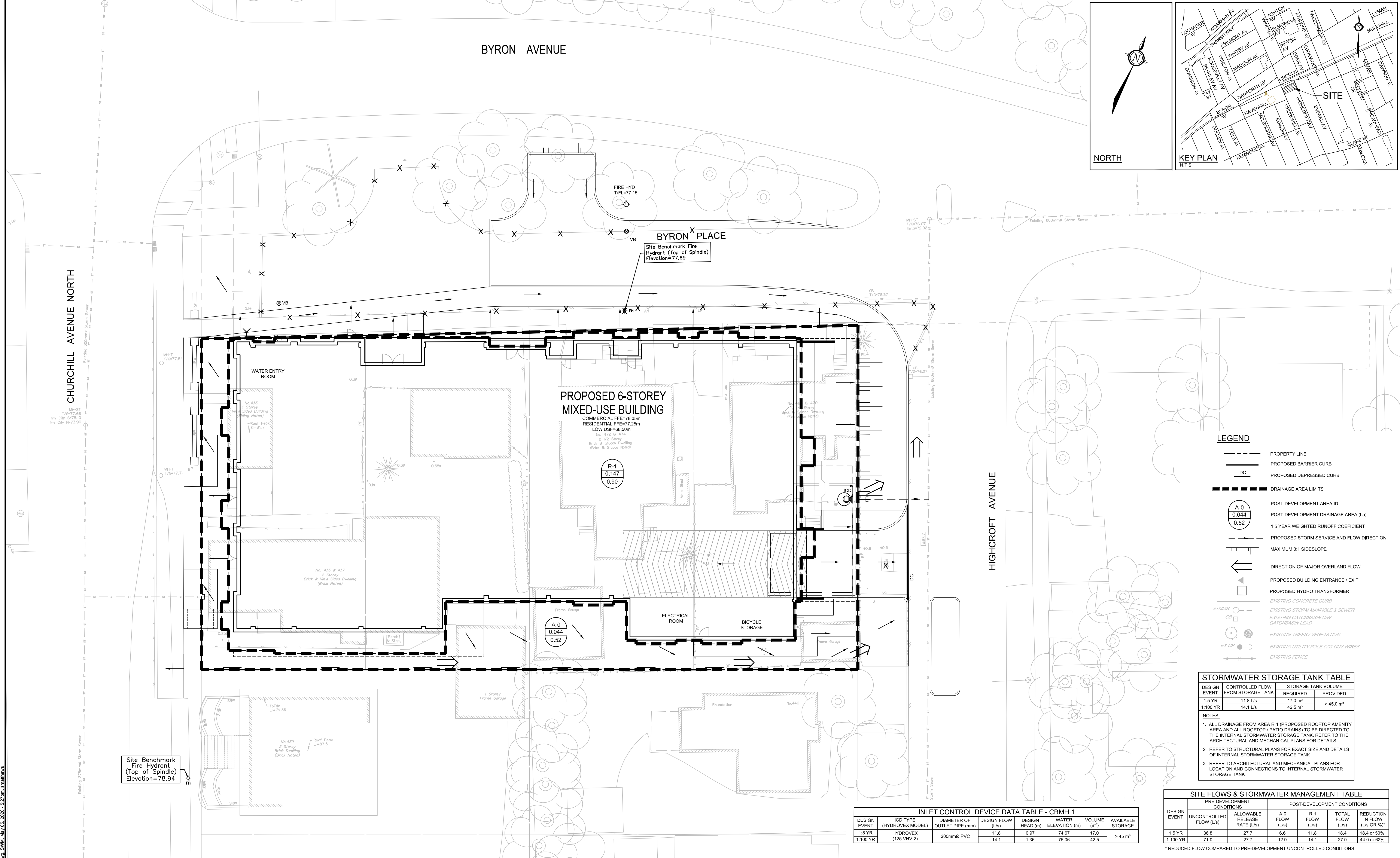
D07-12-19-0059

U:\2018\118024\GP\Design\118024-GP.dwg GP May 05, 2020 - 5:26pm mathhans









- LEGEND**
- PROPERTY LINE
  - PROPOSED BARRIER CURB
  - PROPOSED DEPRESSED CURB
  - DC
  - DRAINAGE AREA LIMITS
  - POST-DEVELOPMENT AREA ID
  - POST-DEVELOPMENT DRAINAGE AREA (ha)
  - 1:5 YEAR WEIGHTED RUNOFF COEFFICIENT
  - PROPOSED STORM SERVICE AND FLOW DIRECTION
  - MAXIMUM 3:1 SIDESLOPE
  - DIRECTION OF MAJOR OVERLAND FLOW
  - PROPOSED BUILDING ENTRANCE / EXIT
  - PROPOSED HYDRO TRANSFORMER
  - EXISTING CONCRETE CURB
  - STMMH
  - EXISTING STORM MANHOLE & SEWER
  - EXISTING CATCHBASIN C/W CATCHBASIN LEAD
  - EXISTING TREES / VEGETATION
  - EXISTING UTILITY POLE C/W GUY WIRES
  - EXISTING FENCE

STORMWATER STORAGE TANK TABLE				
DESIGN EVENT	CONTROLLED FLOW FROM STORAGE TANK	STORAGE TANK VOLUME		
		REQUIRED	PROVIDED	
1:5 YR	11.8 L/s	17.0 m³		
1:100 YR	14.1 L/s	42.5 m³		> 45.0 m³

NOTES:

- ALL DRAINAGE FROM AREA R-1 (PROPOSED ROOFTOP AMENITY AREA AND ALL ROOFTOP / PATIO DRAINS) TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE TANK. REFER TO THE ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
- REFER TO STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE TANK.
- REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR LOCATION AND CONNECTIONS TO INTERNAL STORMWATER STORAGE TANK.

SITE FLOWS & STORMWATER MANAGEMENT TABLE						
DESIGN EVENT	PRE-DEVELOPMENT CONDITIONS		POST-DEVELOPMENT CONDITIONS			
	UNCONTROLLED FLOW (L/s)	ALLOWABLE RELEASE RATE (L/s)	A-0 FLOW (L/s)	R-1 FLOW (L/s)	TOTAL FLOW (L/s)	REDUCTION IN FLOW (L/s OR %)
1:5 YR	36.8	27.7	6.6	11.8	18.4	18.4 or 50%
1:100 YR	71.0	27.7	12.9	14.1	27.0	44.0 or 62%

\* REDUCED FLOW COMPARED TO PRE-DEVELOPMENT UNCONTROLLED CONDITIONS

INLET CONTROL DEVICE DATA TABLE - CBMH 1						
DESIGN EVENT	ICD TYPE (HYDROVEX MODEL)	DIAMETER OF OUTLET PIPE (mm)	DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m³)
1:5 YR	HYDROVEX (125 VHV-2)	200mmØ PVC	11.8	0.97	74.67	17.0
1:100 YR			14.1	1.36	75.06	42.5

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**  
2592532 ONTARIO INC.  
165 PRETORIA AVENUE,  
OTTAWA, ONTARIO, K1S 1X1  
CONTACT: SIMON SI  
PHONE: (613) 255-3422  
SIMONSI@ROYALPAGE.CA

**SCALE**  
1:150

0 2 4 6

DESIGN  
FST / SM

CHECKED  
FST

DRAWN  
SM

CHECKED  
FST / SM

APPROVED  
FST

**FOR REVIEW ONLY**

**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  
472 BYRON PLACE - BYRON PLACE APARTMENTS

DRAWING NAME  
STORMWATER MANAGEMENT PLAN

PROJECT No.  
118024

REV  
REV # 2

DRAWING No.  
118024-SWM

14/2018/118024/CAD/Design/118024-SWM.dwg, SWM, May 05, 2020 - 5:27pm, emathews

D07-12-19-0059

#17934