NOVATECH

Engineers, Planners & Landscape Architects

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

**Planning**
- Land/Site Development
- Planning Application Management
- Municipal Planning
- Urban Design
- Expert Witness (LPAT)
- Wireless Industry

**Landscape Architecture**
- Streetscapes & Public Amenities
- Open Space, Parks & Recreation
- Community & Residential
- Commercial & Institutional
- Environmental Restoration

39 Years

# PROPOSED RESIDENTIAL DEVELOPMENT
## 12, 14, 16, 18, 20 & 24 HAWTHORNE AVENUE

Assessment of Adequacy of
Public Services Report

# PROPOSED RESIDENTIAL DEVELOPMENT
# 12, 14, 16, 18, 20 and 24 HAWTHORNE AVENUE

# ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES REPORT

Prepared by:

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

September 20, 2022

Ref: R-2022-147
Novatech File No. 122152

NOVATECH
Engineers, Planners & Landscape Architects

September 20, 2022

JBPA Developments Inc.
107 Pretoria Avenue
Ottawa, Ontario. K1S 1W8

**Attention: Mr. Kevin Fagan**

**Re: Assessment of Adequacy of Public Services Report**
**Proposed Residential Development**
**12-24 Hawthorne Avenue, Ottawa, ON**
**Novatech File No.: 122152**

Enclosed is a copy of the 'Assessment of Adequacy of Public Services Report' for the proposed residential development located at 12, 14, 16, 18, 20 and 24 Hawthorne Avenue, in the City of Ottawa. The purpose of this report is to demonstrate that the proposed residential development can be serviced by the municipal infrastructure fronting the subject site. This report is being submitted in support of a Zoning By-Law Amendment 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: Reza Bakhit (City of Ottawa)
Rob Verch (RLA)



Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

# TABLE OF CONTENTS



## LIST OF FIGURES



## LIST OF APPENDICES

# 1.0 INTRODUCTION

Novatech has been retained by JBPA Developments Inc. to assess the adequacy of the existing public services related to the proposed re-development of the 12, 14, 16, 18, 20 and 24 Hawthorne Avenue properties which will be merged. The purpose of this report is to demonstrate that the proposed development can be serviced by the municipal infrastructure surrounding the subject site. This report is being submitted in support of a Zoning By-Law Amendment application.

## 1.1 Site Location and Description

The subject site is comprised of the properties located at 12, 14, 16, 18, 20 and 24 Hawthorne Avenue, in the City of Ottawa. The properties cover a combined area of approximately 0.145 hectares. The 12-18 Hawthorne Avenue site is currently occupied by residential buildings (four dwellings) while the residential buildings on the 20 and 24 Hawthorne Avenue sites have been recently demolished. The legal description of the subject site as indicated on the Topographical Plan of Survey prepared by Annis, O'Sullivan, Vollbekk Ltd. is designated as Lots 2, 3, 4, 5 and Part of Lot 6 on Registered Plan 220, City of Ottawa.

**Figure 1: Aerial View of the Subject Site**


Image Source: geoOttawa (City of Ottawa)

## 1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on March 24, 2022, at which time the client was advised of the general submission requirements. The Rideau Valley Conservation Authority (RVCA) was also consulted regarding the proposed development. Based on a review of **O. Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) will not be required for the proposed development, as all properties will be merged. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

## 1.3 Proposed Development

The proposed development will include a 6-storey residential building with 2 levels of underground parking. The proposed building will be serviced by extending new laterals to the municipal sanitary sewer, storm sewer and watermain in Hawthorne Avenue.

## 2.0 SITE SERVICING

The objective of this report is to demonstrate that proper sewage outlets (sanitary and storm) and suitable domestic water supply with appropriate fire protection are available for the proposed development. The servicing criteria, the expected sewage flows and water demands are to conform to the requirements of the City of Ottawa municipal design guidelines for sewer and water distribution systems. Stormwater runoff from the site will continue to be directed to the nearby Rideau River, via the local municipal storm sewer in Hawthorne Avenue and trunk sewers in Main Street and Springhurst Avenue. On-site stormwater management will be implemented to meet the requirements of the City of Ottawa and the RVCA.

## 2.1 Sanitary Servicing

The properties are currently being serviced by the existing 225mm dia. concrete sanitary sewer in Hawthorne Avenue. As part of the City of Ottawa Roadway Reconstruction project, the existing pipe will be replaced with a new 250mm dia. PVC sanitary sewer. Construction of the new infrastructure will likely commence in the spring of 2023. Under post-development conditions, the proposed development will be serviced by this new municipal sanitary sewer in Hawthorne Avenue. Based on criteria in the City of Ottawa Sewer Design Guidelines and subsequent Technical Bulletins, the theoretical peak sanitary flow from the proposed development will be approximately 1.4 L/s, including infiltration. The table below summarizes the preliminary sanitary sewage flows.

| **Residential Use** | **Unit Count/ Site Area** | **Design Population** | **Average Flow (L/s)** | **Peaking Factor** | **Peak Flow* (L/s)** |
|---|---|---|---|---|---|
| 1-Bedroom / Studio | 42 | 59 | 0.19 | 3.76 | 0.72 |
| 2-Bedroom | 25 | 53 | 0.17 | | 0.64 |
| Infiltration Allowance | 0.145 ha | - | 0.05 | - | 0.05 |
| **Total for Site** | **67** | **112** | 0.41 | - | 1.41 |

*Represents rounded values

A 200mm dia. PVC sanitary service lateral at a minimum slope of 1.0% has a full flow conveyance capacity of approximately 34.2 L/s and should have enough capacity to convey the theoretical sanitary flows from the proposed development.

The proposed 250mm dia. PVC sanitary sewer in Hawthorne Avenue will have an approximate depth of 3.2m in front of the subject site and should therefore accommodate a gravity outlet from the building. It is anticipated that any flow from underground parking level floor drains and elevator sump pit would be pumped.

Based on correspondence received from the City of Ottawa the municipal sanitary sewer in Hawthorne Avenue will have adequate capacity to accommodate the proposed development. Refer to **Appendix B** for detailed sanitary sewage calculations and e-mail correspondence from the City of Ottawa. The sanitary sewage calculations and servicing design will be refined as part of the Site Plan Control application to the City of Ottawa.

Refer to **Figure 2** showing the municipal sanitary sewer infrastructure and conceptual servicing layout.

**Figure 2: Conceptual Sanitary Servicing Layout**

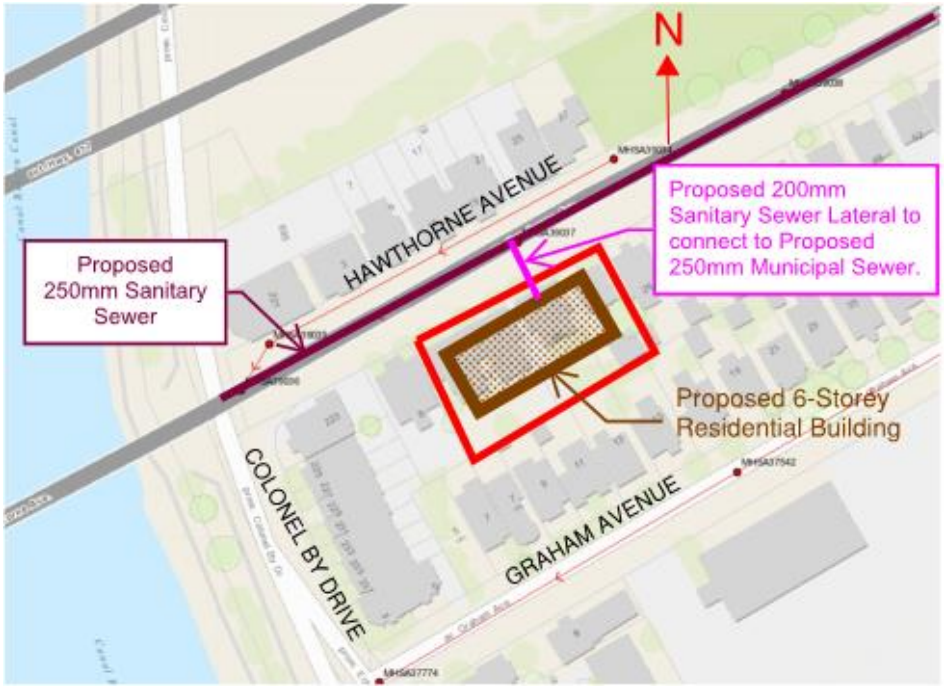



Image Source: geoOttawa (City of Ottawa)

## 2.2 Water Supply for Domestic Use and Firefighting

The properties are currently being serviced by the existing 100mm dia. UCI watermain in Hawthorne Avenue. As part of the City of Ottawa Roadway Reconstruction project, the existing pipe will be replaced with a new 200mm dia. PVC watermain. Construction of the new infrastructure will likely commence in the spring of 2023. Under post-development conditions, the proposed development will be serviced by the new municipal watermain in Hawthorne Avenue. Based on the calculations below, the anticipated average daily water demand will be less than 50m$^3$/day (0.58 L/s), therefore, the proposed building will only require a single service lateral. The building will be sprinklered and will include an internal water meter, with a remote meter and siamese connection on the exterior face of the building. A 1220mm dia. (backbone) watermain is also located within Hawthorne Avenue, however the proposed development will not be allowed to connect into this large diameter feeder main. The subject site is located within the City of Ottawa 1W watermain pressure zone.

Preliminary water demand and fire flow calculations have been prepared for the proposed development based on criteria in the City of Ottawa Design Guidelines for Water Distribution

Systems and subsequent Technical Bulletins. Given the size of the building, the fire flows have been calculated using the Fire Underwriters Survey (FUS) method, based on general building assumptions, including building footprint, construction materials and a fully sprinklered building. Refer to the table below for a summary of the water demands and fire flows and to **Appendix C** for detailed calculations.

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

| Residential Use | Unit Count / Floor Area | Design Population | Avg. Day Demand (L/s) | Max. Day Demand (L/s) | Peak Hour Demand (L/s) | Fire Flow (L/s) |
|---|---|---|---|---|---|---|
| 1-Bdrm/Studio | 42 | 59 | 0.19 | 0.48 | 1.05 | 217 |
| 2-Bdrm | 25 | 53 | 0.17 | 0.43 | 0.94 | |
| **Total for Site** | **67** | **112** | **0.36*** | **0.91*** | **1.99*** | |

*Represents rounded values

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

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

The anticipated domestic water and fire flow demand calculations have been provided to the City of Ottawa to obtain municipal watermain boundary conditions used to complete a watermain network analysis (typically included in this type of report). Based on e-mail correspondence from the City of Ottawa, the modeling team cannot provide formal boundary conditions for future watermain conditions. Given the context of the Hawthorne construction the future conditions can change. However, the modelling team ran a simulation with the proposed 200mm dia. watermain in Hawthorne Avenue and with the hydrants shown on the design drawings, the municipal watermain should achieve the required fire flow demand of 217 L/s for the proposed development.

The following table summarizes the anticipated watermain pressures, however the City will only provide formal boundary conditions once the new watermain is in service, at which time a proper network analysis will be competed. Given the height of the proposed building, it is also anticipated that booster pumps will be required to provide adequate water pressure to the upper floors.

**Table 2.1: Hydraulic Boundary Conditions Provided by the City**

| Municipal Watermain Boundary Condition | Boundary Condition Head of Water (m) | Normal Operating Pressure Range (psi) | Anticipated WM Pressure (psi)* |
|---|---|---|---|
| **Connection at proposed 200mm dia. WM in Hawthorne Avenue** | | | |
| Minimum HGL (Peak Hour Demand) | TBD | 40 psi (min.) | >40 psi |
| Maximum HGL (Max Day Demand) | TBD | 50-70 psi | >50 psi |
| HGL (Max Day + Fire Flow (217 L/s) | TBD | 20 psi (min.) | >20 psi |

A multi-hydrant approach to firefighting will be required to supply the fire flow calculated above. Based on a review of the Hawthorne Road Reconstruction plans and the geoOttawa website, there will be two (2) new Class AA (blue bonnet) municipal fire hydrants on the south side of Hawthorne Avenue, and there are two (2) existing hydrants within 150m of the site along Colonel By Drive and Graham Avenue. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m of the building should provide a maximum capacity 95 L/s each (at a pressure of 20 PSI) while hydrants between 75m and 150m should provide a maximum of 63 L/s (at a pressure of 20 PSI). The combined maximum flow from these hydrants will exceed the Max Day + Fire Flow requirement of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02.

Refer to **Figure 3** showing the municipal watermain infrastructure and conceptual servicing layout.

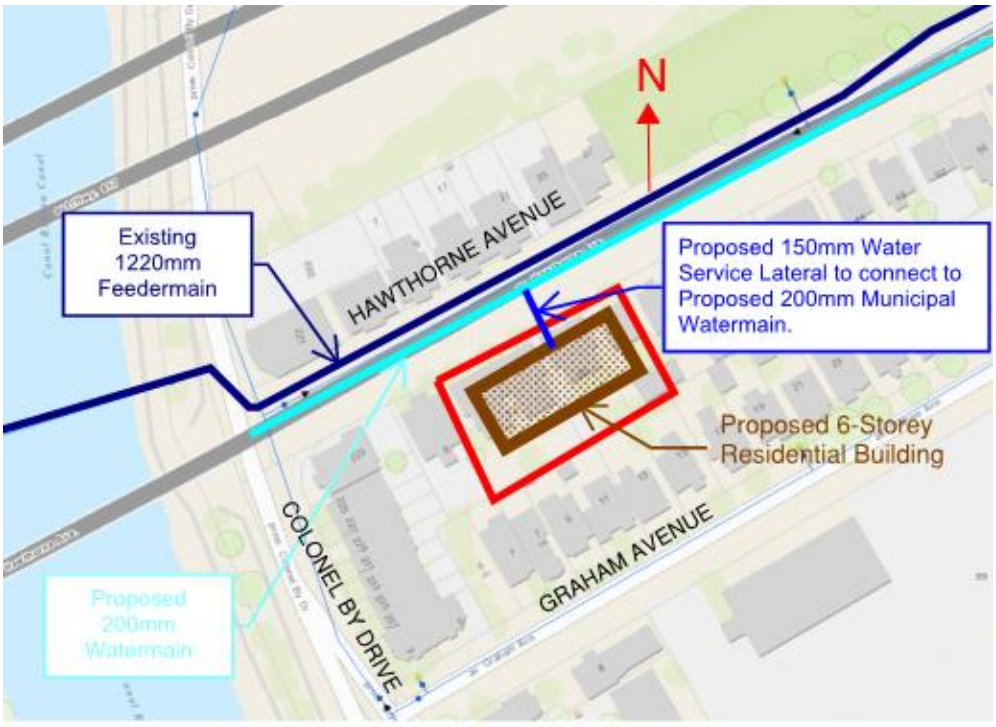



Image Source: geoOttawa (City of Ottawa)

Refer to **Appendix C** for preliminary domestic water demand, FUS fire flow calculations and correspondence with the City of Ottawa. A complete watermain network analysis will be provided as part of the Site Plan Control application to the City of Ottawa, once the watermain boundary conditions are provided.

## 2.3 Storm Drainage and Stormwater Management

The properties are currently being serviced by the existing 300mm dia. concrete storm sewer in Hawthorne Avenue. As part of the City of Ottawa Roadway Reconstruction project, the existing pipe will be replaced with a new 450mm/525mm dia. concrete storm sewer. Construction of the new infrastructure will likely commence in the spring of 2023. Under post-development conditions, storm flows from the site will continue to be directed to the nearby Rideau River, via the local municipal storm sewer in Hawthorne Avenue and trunk sewers in Main Street and Springhurst Avenue. Refer to **Figure 4** showing the municipal storm sewer infrastructure and conceptual servicing layout.

**Figure 4: Conceptual Storm Servicing Layout**

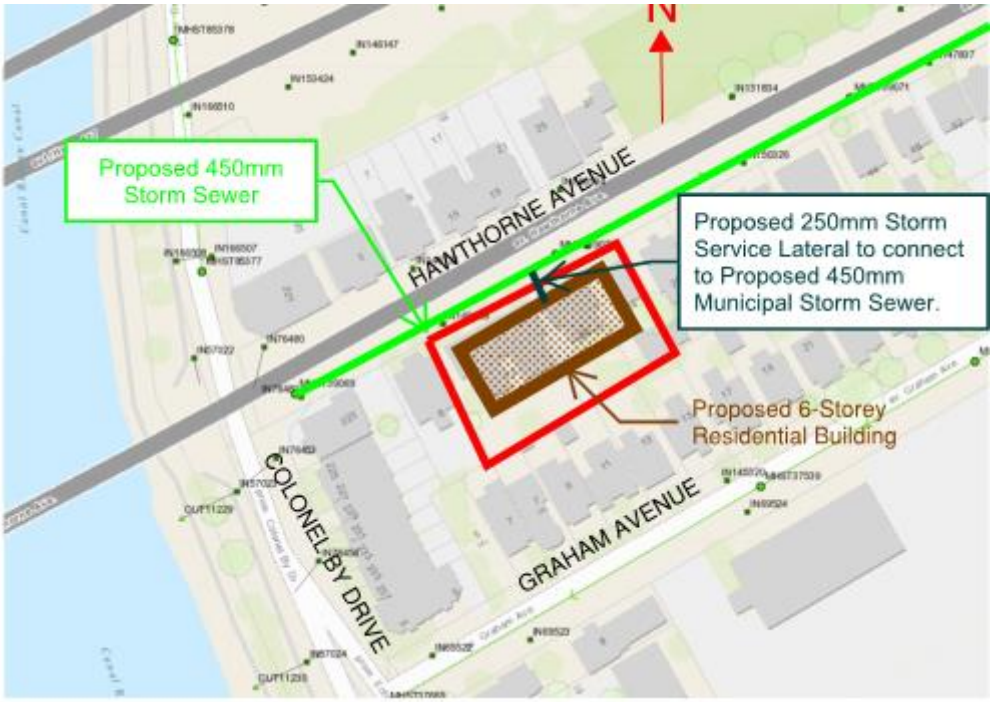



Image Source: geoOttawa (City of Ottawa)

The proposed 450mm dia. PVC storm sewer in Hawthorne Avenue will have an approximate depth of 2.0m in front of the subject site and should therefore accommodate a gravity outlet from the building.

On-site stormwater management (SWM) including quantity control measures will be required given the proximity of the site to the Rideau River. The SWM criteria have been provided during pre-consultation meetings with the City of Ottawa and the Rideau Valley Conservation Authority (RVCA). Based on correspondence from the City of Ottawa the allowable release rate from the site will be calculated using the Rational Method, with a maximum allowable runoff coefficient equivalent to existing conditions, but in no case greater than C=0.5, a time of concentration no less than 10 minutes and a 2-year rainfall intensity from City of Ottawa IDF curves. Based on a

2-year maximum runoff coefficient ($C_w$=0.50) and a time of concentration of 10 mins., the allowable release rate for the site was calculated using the Rational Method to be approximately 15.5 L/s. The portion of the total allowable release rate will have to be allotted to the various catchment areas on site, depending on the relative size and imperviousness as well as the potential storage available within the sub-catchment areas. For the purpose of this report (and preliminary calculations), the total site area (0.145 ha) was divided into the following sub-catchment areas with an estimated allotted allowable release rate:

- A-1: Uncontrolled direct runoff (~0.018 ha) – Allotted 100-year release rate = 8.5 L/s
- A-2: Controlled Flow from Building A (~0.127 h) – Allotted 100-year release rate = 7.0 L/s

Refer to **Figure 5** showing the conceptual stormwater management plan and approach to on-site stormwater management.

**Figure 5: Conceptual Stormwater Management Plan**


Image Source: geoOttawa (City of Ottawa)

The following table compares the post-development flows from the proposed development to both the uncontrolled pre-development flows and to the allowable release rate specified by the City of Ottawa, for the 2-year, 5-year and the 100-year design events. Refer to **Appendix D** for preliminary SWM calculations and to **Appendix A** for a copy of the correspondence from the City of Ottawa.

**Preliminary Stormwater Flow Comparison Table**

| Design Event | Drainage Areas A-1 to A-2 | | | | |
|---|---|---|---|---|---|
| | Pre-Development Conditions | | Post-Development Conditions | | |
| | Uncontrolled Flow (L/s) | Allowable Release Rate (L/s) | A-1 Flow (L/s) | A-2 Flow (L/s) | Total Flow (L/s)* |
| 5-Yr | 31.9 | 15.5 | 2.3 | 3.8 | 6.1 |
| 100-Yr | 61.2 | | 4.5 | | 8.4 |

*Reduced flow compared to pre-development uncontrolled conditions

It is anticipated that the use of control flow roof drains and/or an internal SWM storage tank with pumps will be required to control flows from catchment area A-2. The following table summarizes the approximate storage volume requirements, based on the controlled release rates.

**Preliminary Stormwater Storage Requirements Table**

| Design Event | Post-Development Storage Volume Requirements | |
|---|---|---|
| | A-1 - Direct Runoff from Front and Side Yards ($m^3$) | A-2 - Building Roof and Rear Yard Amenity Area ($m^3$) |
| 2-Yr | - | ~16 |
| 5-Yr | - | ~25 |
| 100-Yr | - | ~58 |

Represents preliminary calculations only.

Refer to **Appendix D** for preliminary SWM calculations. Controlled flows from are A-2 could be increased to the maximum allowable site flow less the direct runoff from area A-1, which would result in reduced on-site storage requirements. A complete stormwater management (SWM) analysis will be included as part of the Site Plan Control submission to the City of Ottawa.

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA) and is tributary to the Rideau River. Based on the Concept Plan, with all the parking will be provided within the underground parking levels of the building, on-site quality control, measures will not be required. Rainwater runoff from rooftop drainage and landscaped areas are considered clean for the purpose of protecting water quality for aquatic habitat. Refer to **Appendix A** for correspondence from the RVCA.

## 3.0 CONCLUSION

Based on our preliminary analysis of the information available, the upgraded municipal infrastructure (sanitary and storm sewers) should have adequate capacity to service the proposed development. On-site stormwater management will be implemented to meet the requirements of the City of Ottawa and the Rideau Valley Conservation Authority (RVCA). Furthermore, the upgraded municipal watermain network should provide adequate water supply for domestic use and firefighting purposes to the subject site.

A complete servicing, grading and SWM design will be included as part of the Site Plan Control submission to the City of Ottawa.

**NOVATECH**

Prepared by:

Chris Visser
Project Coordinator

Reviewed by:

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
Sept 20, 2022
PROVINCE OF ONTARIO

François Thauvette, P. Eng.
Senior Project Manager

# APPENDIX A

## Correspondence

# Pre-Application Consultation Meeting Notes

**12-20 Hawthorne Avenue, Ottawa**
**Meeting Date: Thursday, March 24, 2022**
**MS Teams**

---

**Attendees:**

*City of Ottawa:*
Jessica Button, File Lead
Adrian van Wyk, Heritage Planner and Urban Designer
Reza Bakhit, Infrastructure Project Manager
Wally Dubyk, Transportation Project Manager
Parthvi Patel, Student Planner

*Applicant Team:*
Haris Khan, Fotenn, Planner
Brian Casagrande, Fotenn
Dylan Desjardins, TCU, Director of Real Estate
Roberto Campos, Figurr Architects
Melissa Du Plessis, Figurr Architects

*Old Ottawa East Community Association:*
Paul Goodkey
John Dance

---

**Subject: Proposal for a Site Plan Control and Zoning By-law Amendment application to support a six-storey residential building at 12-20 Hawthorne Avenue**

**Proposal Details:**

- Currently, 12-18 Hawthorne contains two-storey townhouses, and 20 Hawthorne is vacant, due to a recent demolition.
- The proposal seeks to combine both properties to develop a new six-storey residential building with a total of 66 units and an underground garage.
- The proposed development is seeking variance to increase building height from 14.5 meters to 20 meters.

**Technical Comments – City Staff**

Planning Comments – Jessica Button

- Application required
    - Zoning By-law Amendment, Site Plan Control – Complex (Manager Approval, Public Consultation)
- The property is designated “Traditional Mainstreet” in Schedule A of Old Ottawa East Secondary Plan.

  - No buildings will be allowed higher than six storeys and 20 metres
  - To reduce the impact on adjacent low-rise residential areas, within the Traditional Mainstreet designation, the City will require building setbacks from both the front and rear property lines and above the fourth floor of all new buildings.
  - In order to provide wider and more attractive sidewalks and to encourage pedestrian traffic along Main Street and Hawthorne Street the City will require new buildings to be set back from the street
  - Develop the south side of this corridor in accordance with the TM zoning. With lot depths ranging from 26 to 30 metres the stepped building envelope massing is important to achieve compatibility with the low-rise residential on Graham Street to the south.
- See the Old Ottawa East Secondary Plan for additional policy direction.
- The following City policies or guidelines are applicable to the site:
  - Tree Protection By-law
  - Urban Design Guidelines for Development along Traditional Mainstreets

The site includes the following zones:

- The site is zoned TM12[1839] H14.5
- A zoning by-law amendment is required to support height above 14.5m and nonresidential at grade uses as per 1839
- Consider including non-residential uses required in this zone.
- Addition transition is required to support this height. Heritage protection may assist in these goals.
- A tree protection plan will be required and should consider the protection of trees in the rear yard to assist in the transition to the Graham Street properties. This plan should consider the extent of excavation required for underground parking.
- If a parking reduction is proposed, bike parking is recommended at 1:1.
- A landscape plan should include tree plantings at the front and back of the development and will need to consider the extent of underground parking.
- Review and ensure compliance with Section 137 – Amenity Area
- Review and ensure compliance with Section 143 – Waste Management

Transportation Comments - Wally Dubyk

- How many parking spaces are being proposed?
- Road, Sewer, Water along Hawthorne Avenue is targeted to start this season.
- The Screening Form has indicated that the TIA Triggers have been met. Please proceed with the TIA Step 2 – Scoping report.
- During the Analysis, ensure that both TDM checklists are filled out and appropriate measures are taken to achieve the target modal shares. In the future, please contact Tim Wei (tim.wei@ottawa.ca) to obtain a local snapshot of the Long-Range Transportation model to help inform background growth rates.
- Hawthorne Avenue is designated as an Arterial road within the City's Official Plan with a ROW protection limit of 20.0 metres. The ROW protection limit and the offset distance (10.0 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.

- ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.
- 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 either above or below into the sight triangles and/or future road widening protection limits.
- Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.
- The consultant should review the sight distance to the access and any obstructions that may hinder the view of the driver.
- The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed access.
- The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process.
- The proponent is to provide an access grade that does not exceed 2% within the private property for a minimum distance of 6.0 metres from the **ROW limits**. This is a critical safe distance to allow a driver to stop at the top of the ramp and have a good sight angle of pedestrians.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb, and boulevard to City standards.
- The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.
- Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.
- A construction Traffic Management Plan is to be provided for approval by the Senior Engineer, Traffic Management, Transportation Services Dept.

Heritage Comments - Adrian van Wyk

- This property is listed on the City's Municipal Heritage Register. Heritage staff strongly recommend that the existing building be retained and incorporated into the proposed development. Policy 8 of the Old Ottawa East Secondary Plan provides:
    - "8) There are several properties within the secondary planning area that are currently protected from demolition and incompatible redevelopment because they are designated under the Ontario Heritage Act. In addition to that protection, development within the secondary planning area will also:
        - a) Recognize, support, and commemorate the presence of the existing institutions as part of the community in the redevelopment of these lands; and

    - b) Respect the built and cultural heritage value of heritage buildings in the design of all new development."
- In addition to preserving the heritage value of this building, retention may also aid the development in terms of compatibility with the surrounding establish neighbourhood, provide an effective transition in height and scale from Hawthorne Avenue and preserve the existing two-storey streetwall condition.
- Any proposal to demolish a listed heritage resource will need to comply with the notice requirements under Section 27(5) of the Ontario Heritage Act. Please see our website for more information.

Urban Design Comments – Adrian van Wyk

- An Urban Design Brief will be required as part of a complete application. Please see the attached Terms of Reference for requirements.
- Transition to neighbouring buildings and the street should be demonstrated through the use of angular planes.
- The applicant should demonstrate how the proposal fits within the future intended built form of the area by modelling surrounding potential redevelopment.
- This property is located in a Design Priority Area. The proposal will be subject to formal review by the Urban Design Review Panel. The applicant is encouraged to submit an application for informal review prior to the submission of Planning approval applications. Please see our website for more information.
- The proposal should address the Urban Design Guidelines for Development along Traditional Mainstreets.
- The applicant is encouraged to return for a second pre-consultation meeting once the proposal has been further developed.
- The existing street trees should be retained if possible.
- This property is located within 1km of two existing LRT stations (i.e., UOttawa and Lees Stations). The applicant is encouraged to explore the feasibility of a reduced parking rate for this proposal.
- Bicycle parking should be provided at a ratio of one space per unit.
- The applicant is *strongly encouraged to incorporate sustainable design features into the proposal.*

Engineer Comments – Reza Bakhit

*General:*

- It is the sole responsibility of the consultant to investigate the location of existing underground utilities in the proposed servicing area and submit a request for locates to avoid conflict(s). The location of existing utilities and services shall be documented on an **Existing Conditions Plan**.
- Any easements on the subject site shall be identified and respected by any development proposal and shall adhere to the conditions identified in the easement agreement. A **legal survey plan** shall be provided and all easements shall be shown on the engineering plans..

- An application to consolidate the parcels ( 12-20 Hawthorne) of land will be required otherwise the proposed stormwater works will be servicing more than one parcel of land and thus does not meet the exemption set out in O.Reg. 525/98. This would mean an **ECA would be required** regardless of who owns the parcels..
- A deep excavation and dewatering operations have the potential to cause damages to the neighboring adjacent buildings/ City infrastructure. Document that construction activities (excavation, dewatering, vibrations associated with construction, etc.) will not have an impact on any adjacent buildings and infrastructure.
- A **Record of Site Condition (RSC) in accordance with O.Reg.** 153/04 will be required to be filed and acknowledged by the Ministry prior to issuance of a building permit due to a change to a more sensitive property use.
- Existing buildings require a CCTV inspection and report to ensure existing services to be re-used are in good working order and meet current minimum size requirements. Located services to be placed on site servicing plans.

  **Important Note: Water , Sanitary, and storm mains within the ROW on Hawthorne Ave will be upgraded during 2022. Therefore , the applicant's engineering team is responsible to coordinate with the City to obtain the latest engineering information or permits needed to design the service laterals for this site.**

- Reference documents for information purposes :
  - Ottawa Sewer Design Guidelines (October 2012)
  - Technical Bulletin PIEDTB-2016-01
  - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
  - Ottawa Design Guidelines - Water Distribution (2010)
  - Technical Bulletin ISTB-2021-03
  - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
  - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
  - City of Ottawa Environmental Noise Control Guidelines (January 2016)
  - City of Ottawa Accessibility Design Standards (2012) (City recommends development be in accordance with these standards on private property)
  - Ottawa Standard Tender Documents (latest version)
  - Ontario Provincial Standards for Roads & Public Works (2013)
  - Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-424 x.44455).

Please note that this is the applicant responsibility to refer to the latest applicable guidelines while preparing reports and studies.


*Disclaimer:*

*The City of Ottawa does not guarantee the accuracy or completeness of the data and information contained on the above image(s) and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the image(s) provided. This image is for schematic purposes only.*

*Stormwater Management Criteria and Information:*

- **Water Quantity Control:** In the absence of area specific SWM criteria please control post-development runoff from the subject site, up to and including the **100-year storm event**, to **a 2-year pre-development level.** The pre-development runoff coefficient will need to be determined **as per existing conditions** but in no case more than 0.5. [**If 0.5 applies it needs to be clearly demonstrated in the report that the pre-development runoff coefficient is greater than 0.5**]. The time of concentration ($T_c$) used to determine the pre-development condition should be calculated. *Tc should not be less than 10 min. since IDF curves become unrealistic at less than 10 min; $T_c$ of 10 minutes shall be used for all post-development calculations*].
- Any storm events greater than the established **2-year allowable** release rate, up to and including the **100-year storm event**, shall be detained on-site. The SWM measures required to avoid impact on downstream sewer system will be subject to review.
- **Considering the size of the site, it would be acceptable to control the roof portion only ( 100-year storm event, to a 2-year pre-development level) and leave the remainder of the site uncontrol as long as the uncontrolled portion is directed towards the right of way. This approach should be discussed in the SWM report. Also, the grading plan should clearly demonstrate that the runoff from the uncontrolled portion of the site will be directed towards the ROW.**

- Please note that foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. **It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.**
- **Water Quality Control:** Please consult with the local conservation authority (RVCA) regarding water quality criteria prior to submission of a Site Plan Control Proposal application to establish any water quality control restrictions, criteria and measures for the site. Correspondence and clearance shall be provided in the Appendix of the report.
- Please note that as per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 2-year storm rainfall event**.
- **If Underground Storage proposed:** Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.
  When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. **We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a submersible pump in the design to ensure a constant release rate.**

  In the event that there is a disagreement from the designer regarding the required storage, The City will require that the designer demonstrate their rationale utilizing dynamic modelling, that will then be reviewed by City modellers in the Water Resources Group.

  Please provide information on UG storage pipe. Provide required cover over pipe and details, chart of storage values, capacity etc. How will this pipe be cleaned of sediment and debris?
  Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc.

  Provide a cross section of underground chamber system showing invert and obvert/top, major and minor HWLs, top of ground, system volume provided during major and minor events. UG storage to provide actual 2- and 100-year event storage requirements.

  In regard to all proposed UG storage, ground water levels (and in particular HGW levels) will need to be reviewed to ensure that the proposed system does not become surcharged and thereby ineffective.

Modeling can be provided to ensure capacity for both storm and sanitary sewers for the proposed development by City's Water Distribution Dept. – Modeling Group, through PM and upon request.

- Please note that the minimum orifice dia. for a plug style **ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s** in order to reduce the likelihood of plugging.
- Post-development site grading shall match existing property line grades in order to minimize disruption to the adjacent residential properties. A **topographical plan of survey** shall be provided as part of the submission and a note provided on the plans.
- Please provide a **Pre-Development Drainage Area Plan** to define the pre-development drainage areas/patterns. **Existing drainage patterns shall be maintained and discussed as part of the proposed SWM solution**.
- **If rooftop control and storage is proposed** as part of the SWM solutions sufficient details (Cl. 8.3.8.4) shall be discussed and document in the report and on the plans. Roof drains are to be connected downstream of any incorporated ICDs within the SWM system and not to the foundation drain system. Provide a **Roof Drain Plan** as part of the submission.
- If **Window wells** are proposed, they are to be indirectly connected to the footing drains. A detail of window well with indirect connection is required, as is a note at window well location speaking to indirect connection.
- There must be at least **15cm of vertical clearance** between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area. The exception in this case would be at reverse sloped loading dock locations. At these locations, a minimum of 15cm of vertical clearance must be provided below loading dock openings. Ensure to provide discussion in report and ensure grading plan matches if applicable.

*Storm Sewer:*

**The existing 300mm dia. CONC storm sewer within the ROW is being replaced /upgrade in 2022. The applicant's engineering team is responsible to coordinate with the City to obtain the latest engineering information needed to design the service laterals for this site.**

*Sanitary Sewer ~~Maclaren St:~~*

**The existing 225 mm dia. CONC Sanitary sewer within the ROW is to replaced/upgrade in 2022. The applicant's engineering team is responsible to coordinate with the City to obtain the latest engineering information needed to design the service laterals for this site.**

- Please provide the new Sanitary sewer discharge and we confirm if sanitary sewer main has the capacity. An analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater system is required to be provided. Needs to be demonstrated that there is adequate capacity to support any increase in wastewater flow.
- Please apply the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01.*

- Sanitary sewer monitoring maintenance hole is required to be installed at the property line (on the private side of the property) as per City of Ottawa Sewer-Use By-Law 2003-514 (14) *Monitoring Devices*.
- A backwater valve is required on the sanitary service for protection.

*Water:*

**The existing 102mm watermain within the ROW is being replaced/upgrade in 2022. The applicant's engineering team is responsible to coordinate with the City to obtain the latest engineering information needed to design the service laterals for this site.**

- Existing residential service to be blanked at the main.
- **Water Supply Redundancy:** Residential buildings with a basic day demand greater than 50m$^3$/day (0.57 L/s) are required to be connected to a minimum of two water services separated by an isolation valve to avoid a vulnerable service area as per the *Ottawa Design Guidelines - Water Distribution, WDG001, July 2010 Clause 4.3.1 Configuration.*
- Please **review Technical Bulletin ISTB-2018-0**, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A **hydrant coverage figure** shall be provided and **demonstrate there is adequate fire protection for the proposal**. Two or more public hydrants are anticipated to be required to handle fire flow.
- Boundary conditions are required to confirm that the require fire flows can be achieved as well as availability of the domestic water pressure on the City street in front of the development. Use Table 3-3 of the MOE Design Guidelines for Drinking-Water System to determine Maximum Day and Maximum Hour peaking factors for 0 to 500 persons and use Table 4.2 of the Ottawa Design Guidelines, Water Distribution for 501 to 3,000 persons. Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
    - Type of Development and Units
    - Site Address
    - A plan showing the proposed water service connection location.
    - **Average Daily Demand** (L/s)
    - **Maximum Daily Demand** (L/s)
    - **Peak Hour Demand** (L/s)
    - **Fire Flow** (L/min)

[*Fire flow demand requirements shall be based on **Fire Underwriters Survey (FUS)** Water Supply for Public Fire Protection 1999*]

*[Fire flow demand requirements shall be based on ISTB-2021-03]*

*Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used.*

*Exposure separation distances shall be defined on a figure to support the FUS calculation and required fore flow (RFF).*

- **Hydrant capacity shall be assessed to demonstrate the RFF can be achieved**. Please identify which hydrants are being considered to meet

the RFF on a fire hydrant coverage plan as part of the boundary conditions request.

*Snow Storage:*

- Any portion of the subject property which is intended to be used for permanent or temporary snow storage shall be as shown on the approved site plan and grading plan. Snow storage shall not interfere with approved grading and drainage patters or servicing. Snow storage areas shall be setback from the property lines, foundations, fencing or landscaping a minimum of 1.5m. Snow storage areas shall not occupy driveways, aisles, required parking spaces or any portion of a road allowance. If snow is to be removed from the site please indicate this on the plan(s).

*Gas pressure regulating station*

A gas pressure regulating station may be required depending on HVAC needs (typically for 12+ units). Be sure to include this on the Grading, Site Servicing, SWM and Landscape plans. This is to ensure that there are no barriers for overland flow routes (SWM) or conflicts with any proposed grading or landscape features with installed structures and has nothing to do with supply and demand of any product.

*Regarding Quantity Estimates:*

Please note that external Garbage and/or bicycle storage structures are to be added to QE under Landscaping as it is subject to securities.In addition, sump pumps for Sanitary and Storm laterals and/or cisterns are to be added to QE under Hard items as it is subject to securities, even though it is internal and is spoken to under SWM and Site Servicing Report and Plan.

*Required Engineering Plans and Studies:*

PLANS:

- Existing Conditions and Removals Plan
- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan
- Roof Drainage Plan ( If rooftop storage proposed)
- Topographical survey

REPORTS:

- Site Servicing and Stormwater Management Report ( is required per section 4.7.1, policy 6 and section 4.7.1, policy 23 of the OP)
- Geotechnical Study/Investigation (including sensitive marine clays and unstable slopes) is required per section 10.1.4 of OP)
- Noise Control Study required as per section 10.2.1

- Phase I ESA 4) A Phase 1 and, where required, a Phase 2 ESA are required per section 10.1.6 OP
- Phase II ESA (Depending on recommendations of Phase I ESA)
- RSC ( Record of the site Conditions)
- ECA ( If the SWM system services two parcels)
- Site lighting certificate

Please refer to the **City of Ottawa Guide to Preparing Studies and Plans [Engineering]:**

Specific information has been incorporated into both the Guide to Preparing Studies and Plans for a site plan. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Added to the general information for servicing and grading plans is a note that an **O.L.S**. should be engaged when reporting on or relating information to property boundaries or existing conditions. The importance of engaging an **O.L.S**. for development projects is emphasized.

*Phase One Environmental Site Assessment:*

- A Phase I ESA is required to be completed in accordance with Ontario Regulation 153/04 in support of this development proposal to determine the potential for site contamination. Depending on the Phase I recommendations a Phase II ESA may be required.
- The Phase I ESA shall provide all the required Environmental Source Information as required by O. Reg. 153/04. ERIS records are available to public at a reasonable cost and need to be included in the ESA report to comply with O.Reg. 153/04 and the Official Plan. The City will not be in a position to approve the Phase I ESA without the inclusion of the ERIS reports.
- Official Plan Section 4.8.4:

https://ottawa.ca/en/city-hall/planning-and-development/official-plan-and-master-plans/official-plan/volume-1-official-plan/section-4-review-development-applications#4-8-protection-health-and-safety

*RSC ( Record of the site Conditions)*

- A RSC is required when changing the land use (zoning) of a property to a more sensitive land use.

Submitting a record of site condition | Ontario.ca

*Geotechnical Investigation:*

- A Geotechnical Study/Investigation shall be prepared in support of this development proposal.
- Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and

investigated to ensure there will be no short term and long term damages associated with lowering the groundwater in this area.
- Geotechnical Study shall be consistent with the **Geotechnical Investigation and Reporting Guidelines for Development Applications**.

https://documents.ottawa.ca/sites/documents/files/geotech_report_en.pdf

*Slope Stability Assessment Reports ( If applicable)*

- A report addressing the stability of slopes, prepared by a qualified geotechnical engineer licensed in the Province of Ontario, should be provided wherever a site has slopes (existing or proposed) steeper than 5 horizontal to 1 vertical (i.e., 11 degree inclination from horizontal) and/or more than 2 metres in height.
- A report is also required for sites having retaining walls greater than 1 metre high, that addresses the global stability of the proposed retaining walls. https://documents.ottawa.ca/en/document/slope-stability-guidelines-development-applications

*Noise Study:*

- A **Transportation Noise Assessment** is required as the subject development is located within 100m proximity of an Arterial Road
- A **Stationary Noise Assessment** is required in order to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits specified in the City Environmental Noise Control Guidelines.

https://documents.ottawa.ca/sites/default/files/documents/enviro_noise_guide_en.pdf

*Exterior Site Lighting:*

- Any proposed light fixtures (both pole-mounted and wall mounted) must be part of the approved Site Plan. All external light fixtures must meet the criteria for Full Cut-off Classification as recognized by the Illuminating Engineering Society of North America (IESNA or IES), and must result in minimal light spillage onto adjacent properties (as a guideline, 0.5 fc is normally the maximum allowable spillage). In order to satisfy these criteria, the please provide the City with a **Certification (Statement) Letter** from an acceptable professional engineer stating that the design is compliant.

*Fourth ($4^{th}$) Review Charge:*

Please be advised that additional charges for each review, after the $3^{rd}$ review, will be applicable to each file. There will be no exceptions.

*Construction approach* – Please contact the Right-of-Ways Permit Office TMconstruction@ottawa.ca early in the Site Plan process to determine the ability to construct site and copy **File Lead** on this request.

Please note that these comments are considered preliminary based on the information available to date and therefore maybe amended as additional details become available and presented to the city. It is the responsibility of the applicant to verify the above information. The applicant may contact me for follow-up questions related to engineering/infrastructure prior to submission of an application if necessary.

Infrastructure and Water Comments – Patrick Sammon

- We are preparing to tender the capital project shortly, and plan on performing a utility circulation in parallel to the tendering process. Note Hawthorne from Colonel By Drive to Main Street is within our project limits, with construction potentially starting as early as late June of this year.
- Although we feel we have the sewer and watermain set, release of the planned works drawings may be better deferred until we achieve the Utility Circulation or Tendering milestone drawing set.
- It is unclear what the timing of the development work is, but coordination for servicing should be done with our proposed mainline sewer / watermains and confirmed with the as-built information once available.
- As part of our work, burial of overhead hydro and communications lines will be conducted on this section of Hawthorne, which is likely already known.
- Please advise of the public awareness of this potential development as I am sure it will generate interest in the Old Ottawa East Community. I would like to know if this is known yet by the Councillor and the community, and how sensitive the information is at this stage.
- Below is the project link.
    - Greenfield Avenue, Main Street, Hawthorne Avenue et al. reconstruction project | City of Ottawa

Community Comments – Paul Goodkey, John Dance

- The community is opposed to the six-storey proposal.
    - Note: The four-storey height limit of 14.5 m on the south side of Hawthorne was the staff recommendation and Council's decision, per the zoning By-law 2015-59. That zoning by-law amendment followed from considerable public consultation with the OOECA, from early 2014 thru to enactment in 2015. Prior to 2015, the height limit was 20 m on both sides of Main and Hawthorne. That 20m height limit remains to be the case for the north side of Hawthorne and all of Main north of Clegg.
- Amenities for the neighbourhood are important – Exception 1839 talks about non-residential uses on the ground floor, we would like to see this on the entirety of the ground-floor, which is not addressed in this proposal.
    - Note that the zoning says, "When not a residential use listed in 198(12) and when located in the TM12 zone, residential uses are permitted to a maximum of

50% of the ground floor area of a building that faces Hawthorne Avenue and the non-residential uses on the ground floor must face Hawthorne Avenue."

- The front yard setback is important – the two-meter minimum and three-meter maximum would allow for wider sidewalks on private property, which is important to consider alongside the road widening allowance that will take place, with the two-meter on private property to be measured outside of the right-of-way widening.
- We are concerned about the treescape and street trees, we would like to see rear yard trees as well if possible.
- We believe that there are too many units being proposed – the Old Ottawa East Secondary Plan is looking for 150 dwelling units to be added along the entirety of Hawthorne, this site alone would cover 1/3$^{rd}$ of the target, which is too much.

## Francois Thauvette

**From:** Eric Lalande <eric.lalande@rvca.ca>
**Sent:** Tuesday, August 23, 2022 10:30 AM
**To:** Francois Thauvette
**Cc:** Chris Visser
**Subject:** RE: 12-24 Hathorne Ave - Residential Development - RVCA Pre-Consultation

Hi Francois,

Based on the plan, and description, the RVCA has no on-site requirements for water quality protection. It is encouraged to implement best management practices into the design where possible.

Thank you,

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

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Monday, August 22, 2022 2:45 PM
**To:** Eric Lalande <eric.lalande@rvca.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** 12-24 Hathorne Ave - Residential Development - RVCA Pre-Consultation

Hi Eric,

We are working on a proposed residential development in the City of Ottawa (12-24 Hawthorne Ave). All existing properties will be merged. The site will include a 6-storey residential building with outdoor amenity space and 2 levels of UG parking (i.e., there will be no surface parking). See attached 3D rendering for details. Based on similar developments, we assume that on-site quality control measures will not be required. Please review and confirm if this assumption is correct.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

# APPENDIX B

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

# 12-24 Hawthorne Avenue - Proposed 6-Storey Residential Building
# SANITARY SEWAGE ANALYSIS

| **Residential** | **Post-Development** | |
|---|---|---|
| Number of 1-Bedroom Apartments | 42 | |
| Number of Persons per 1-Bdrm Apartment | 1.4 | |
| Number of 2-Bedroom Apartments (including Penthouse Loft Units) | 25 | |
| Number of Persons per 2-Bdrm Apartment | 2.1 | |
| Design Population | 112 | |
| Average Daily Flow per resident | 280 | L/c/day |
| Peak Factor (Harmon Formula) | 3.76 | |
| Peak Residential Flow | 1.37 | L/s |
| | | |
| **Extraneous Flow** | | |
| Site Area | 0.145 | ha |
| Infiltration Allowance | 0.33 | L/s/ha |
| **Peak Extraneous Flows** | 0.05 | L/s |
| | | |
| **Total Peak Sanitary Flow** | **1.41** | **L/s** |

## Francois Thauvette

**From:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Sent:** Monday, September 19, 2022 2:28 PM
**To:** Francois Thauvette
**Cc:** Chris Visser
**Subject:** RE: 12-24 Hawthorne - Redevelopment (San Flows)

Hi Francois,

No concern with the SAN flow from this site.

Thanks,

**Reza Bakhit, P.Eng, C.E.T**
Project Manager
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - Centeral Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca
**Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.**

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Monday, September 19, 2022 1:15 PM
**To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** RE: 12-24 Hawthorne - Redevelopment (San Flows)



Hi Reza,

Any luck obtaining feedback from your colleagues on this one?

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

**From:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Sent:** Wednesday, September 14, 2022 11:47 AM
**To:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** RE: 12-24 Hawthorne - Redevelopment (San Flows)

Hi Francois,

I will follow up too.

Thanks for the reminder,

Reza
**Reza Bakhit, P.Eng, C.E.T**
Project Manager
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - Centeral Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca
**Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.**

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Wednesday, September 14, 2022 9:31 AM
**To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** RE: 12-24 Hawthorne - Redevelopment (San Flows)



Hi Reza,

Just following-up on the e-mail below. Would the City's modelling group be able to confirm if the future sanitary sewer (to be upgraded) will have adequate capacity to accommodate the proposed development and/or if there are any known constraints within the municipal sanitary sewer system in this area? We would like to include this correspondence in our Assessment of Adequacy of Public Services Report.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

**From:** Francois Thauvette
**Sent:** Tuesday, August 30, 2022 4:26 PM
**To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** 12-24 Hawthorne - Redevelopment (San Flows)

Hi Reza,

The client has decided they no longer want to apply concurrently for a Zoning By-Law Amendment and Site Plan Control. As a result, we will be preparing an Assessment of Adequacy of Public Services Report in support of the ZBLA application, followed by a detailed design (plans and reports) in support of the SPC application.

Below is a conceptual sanitary servicing sketch. Also attached are the theoretical sanitary sewer flow calculations for the proposed 6-storey residential development (peak flow = 1.4 L/s).


In the light of the proposed infrastructure upgrades in Hawthorne Ave (i.e., existing 225mm dia. sanitary sewer is being replaced by a new 250mm dia. PVC sewer), please have the City modelling department confirm if the upgraded sanitary sewer will have adequate capacity to accommodate the proposed development and/or if there are any known constraints with the municipal infrastructure in this area.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867


'

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.

'

# APPENDIX C

## Preliminary Water Demands, FUS Calculations, and E-mail Correspondence from the City of Ottawa

# 12-24 Hawthorne: 6 Storey Residential Building
# WATER ANALYSIS

## DOMESTIC WATER DEMANDS

| Residential Use | Post-Development | |
|---|---|---|
| Number of Studio / 1-Bedroom Units | 42 | |
| Persons per Studio / 1-Bedroom Unit | 1.4 | |
| Number of 2-Bedroom Units | 25 | |
| Persons per 2-Bedroom Unit | 2.1 | |
| Total Number of Units | 67 | |
| Total Design Population | 111 | |
| **Average Day Demand (280 L/c/day)** | **0.36** | L/s/day |
| **Maximum Day Demand (2.5 x avg. day)** | **0.90** | **L/s** |
| **Peak Hour Demand (2.2 x max. day)** | **1.98** | **L/s** |
| | | |
| **Commercial/Amenity Use** | | |
| Commercial Space | 0 | $m^2$ |
| **Average Day Demand (28,000 L/ha/day)** | **0.00** | **L/s** |
| **Maximum Day Demand (1.5 x avg. day)** | **0.00** | **L/s** |
| **Peak Hour Demand (1.8 x max. day)** | **0.00** | **L/s** |
| | | |
| **Total Average Day Demand** | **0.36** | **L/s** |
| **Total Maximum Day Demand** | **0.90** | **L/s** |
| **Total Peak Hour Demand** | **1.98** | **L/s** |

# FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

**Novatech Project #:** 122152
**Project Name:** 12-24 Hawthorne Avenue
**Date:** 9/13/2022
**Input By:** F. Thauvette
**Reviewed By:** F. Thauvette

Legend: Input by User; No Information or Input Required

**Building Description:** 6-Storey Residential Building
**Type II - Non-combustible construction**

| Step | | | Choose | | Value Used | Total Fire Flow (L/min) |
|---|---|---|---|---|---|---|
| **Base Fire Flow** | | | | | | |
| 1 | **Construction Material** | | | **Multiplier** | | |
| | **Coefficient related to type of construction** **C** | Type V - Wood frame | | 1.5 | 0.8 | |
| | | Type IV - Mass Timber | | Varies | | |
| | | Type III - Ordinary construction | | 1 | | |
| | | Type II - Non-combustible construction | Yes | 0.8 | | |
| | | Type I - Fire resistive construction (2 hrs) | | 0.6 | | |
| 2 | **Floor Area** | | | | | |
| | **A** | Building Footprint ($m^2$) | 917 | | | |
| | | Number of Floors/Storeys | 6 | | | |
| | | Protected Openings (1 hr) | No | | | |
| | | Area of structure considered ($m^2$) | | | **3,668** | |
| | **F** | **Base fire flow without reductions** | | | | **11,000** |
| | | **F** = 220 **C** (**A**)$^{0.5}$ | | | | |
| **Reductions or Surcharges** | | | | | | |
| 3 | **Occupancy hazard reduction or surcharge** | | | **Reduction/Surcharge** | | |
| | **(1)** | Non-combustible | | -25% | -15% | **9,350** |
| | | Limited combustible | Yes | -15% | | |
| | | Combustible | | 0% | | |
| | | Free burning | | 15% | | |
| | | Rapid burning | | 25% | | |
| 4 | **Sprinkler Reduction ( 100% sprinkler coverage of building used)** | | | **Reduction** | | |
| | **(2)** | Adequately Designed System (NFPA 13) | Yes | -30% | -30% | **-3,740** |
| | | Standard Water Supply | Yes | -10% | -10% | |
| | | Fully Supervised System | | -10% | | |
| | | | | **Cumulative Total** | **-40%** | |
| 5 | **Exposure Surcharge (cumulative %, Maximum Exposure Adjustment Charge Used)** | | | | **Surcharge** | |
| | **(3)** | North Side | 20.1 - 30 m | | 10% | **7,013** |
| | | East Side | 0 - 3 m | | 25% | |
| | | South Side | 3.1 - 10 m | | 20% | |
| | | West Side | 0 - 3 m | | 25% | |
| | | | | **Cumulative Total** | **75%** | |
| **Results** | | | | | | |
| 6 | **(1) + (2) + (3)** | **Total Required Fire Flow, rounded to nearest 1000L/min** | | | **L/min** | **13,000** |
| | | (2,000 L/min < Fire Flow < 45,000 L/min) | | or | L/s | **217** |
| | | | | or | USGPM | 3,435 |
| 7 | **Storage Volume** | Required Duration of Fire Flow (hours) | | | Hours | 2.5 |
| | | Required Volume of Fire Flow ($m^3$) | | | $m^3$ | 1950 |

## Francois Thauvette

**From:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Sent:** Monday, September 12, 2022 10:25 AM
**To:** Francois Thauvette
**Cc:** Chris Visser
**Subject:** RE: 12-24 Hawthorne Ave - Request for WM Boundary Conditions

Hi Francois,

Unfortunately, the modeling team cannot provide a formal BC from future conditions. Given the context of the Hawthorne construction the future conditions can change. However, they did run a simulation with the proposed 203 mm watermain on Hawthorne Ave and with the hydrants drawn on the concept plan, it will likely achieve the required fire flow demand of 217 L/s for this development.

We can provide a formal BC response when the new watermain is in service.

Regards,

**Reza Bakhit, P.Eng, C.E.T**
Project Manager
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique
Development Review - Centeral Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 19346, reza.bakhit@ottawa.ca
**Please note: Given the current pandemic, I will be working from home until further notice; reaching me by email is the easiest. I will be checking my voicemail, just not as frequently as I normally would be.**

---

**From:** Francois Thauvette <f.thauvette@novatech-eng.com>
**Sent:** Friday, September 09, 2022 11:02 AM
**To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** RE: 12-24 Hawthorne Ave - Request for WM Boundary Conditions



Hi Reza,

Could you provide us with an update on the watermain boundary conditions request? It was sent in 2.5 week ago.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867


---

**From:** Francois Thauvette
**Sent:** Tuesday, August 23, 2022 9:31 AM
**To:** Bakhit, Reza <reza.bakhit@ottawa.ca>
**Cc:** Chris Visser <c.visser@novatech-eng.com>
**Subject:** 12-24 Hawthorne Ave - Request for WM Boundary Conditions

Hi Reza,

We are sending this e-mail to request municipal watermain boundary conditions for the above-noted development. This request is for a proposed 6-storey, residential development located at 12-24 Hawthorne Avenue, in Ottawa. The existing properties will be merged to accommodate the proposed development. Attached is a sketch showing the subject site and nearby watermain infrastructure and hydrants based on both existing conditions as well as the proposed Hawthorne Reconstruction watermain upgrades (incl. a new 200mm dia. PVC WM and hydrants).

The anticipated water demands for the proposed residential development are as follows:

- Average Day Demand = 0.36L/s
- Maximum Day Demand = 0.9 L/s
- Peak Hour Demand = 2.0 L/s
- FUS Fire Flow Demand = 217 L/s

See attached calculation sheets and Hawthorne Reconstruction plans for details.

It is anticipated that a multi-hydrant approach to firefighting will be required. Based on a review of geoOttawa and the proposed Hawthorne Reconstruction drawings, there will 1 new blue bonnet hydrant within 75m of the subject and 3 other blue bonnet hydrants within 150m of the site. Please review and confirm the hydrants (existing + proposed) will provide the necessary fire flow.

Regards,

**François Thauvette**, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
**NOVATECH** Engineers, Planners & Landscape Architects
Please note that I am working from home. Email or MS Teams are the best ways to contact me.
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.

'

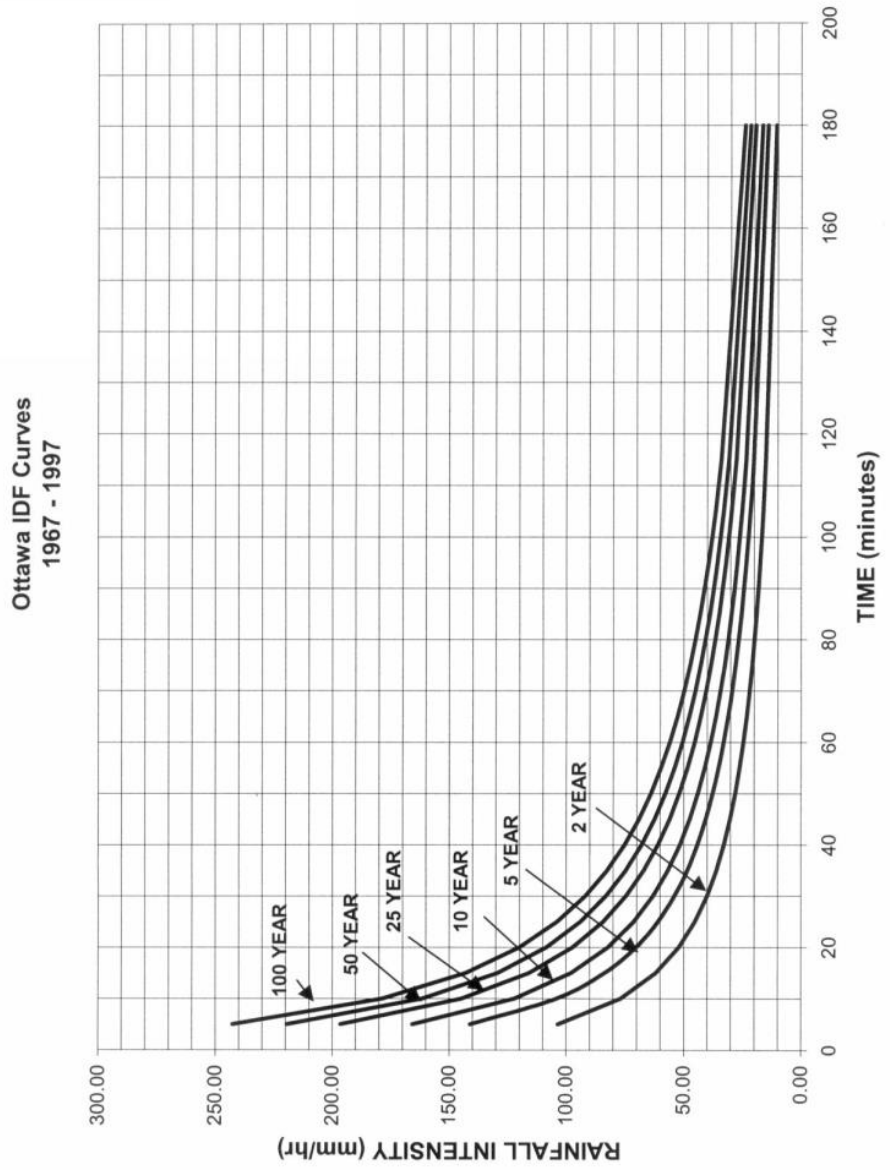


'

# APPENDIX D

## IDF Curves and Preliminary SWM Calculations

APPENDIX 5-A OTTAWA INTENSITY DURATION FREQUENCY (IDF) CURVE



PROJECT NUMBER: 122152
PROJECT NAME: 12-24 Hawthorne Avenue
LOCATION: Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 9/14/2022

# Proposed 6-Storey Residential Building
# 12-24 Hawthorne Avenue

| Pre - Development Site Flows | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Description | Area (ha) | $A_{impervious}$ (ha) C=0.9 | $A_{gravel}$ (ha) C=0.6 | $A_{pervious}$ (ha) C=0.2 | Weighted $C_{w5}$ | Weighted $C_{w100}$ | 1:5 Year Flow (L/s) | 1:100 Year Flow (L/s) | Allowable $C_{value}$ | Allowable Flow 2 year (L/s) |
| Subject Site | 0.145 | 0.116 | 0.000 | 0.029 | 0.76 | 0.85 | 31.9 | 61.2 | 0.5 | 15.5 |

$T_c$ = 10mins

| Post - Development : Site Flows if the areas were left Uncontrolled | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 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 | Uncontrolled Flow (L/s) 100 year |
| A-1 | Direct Runoff from Site | 0.018 | 0.006 | 0.012 | 0.44 | 0.51 | 2.3 | 4.5 |
| A-2 | Controlled Internal SWM Tank | 0.127 | 0.127 | 0.000 | 0.90 | 1.00 | 33.1 | 63.1 |
| | Summed Area Check: | 0.145 | | | | | $T_c$ = 10mins | $T_c$ = 10mins |

| Post - Development : Total Flows for Controlled Site + Uncontrolled Direct Runoff | | | | | | |
|---|---|---|---|---|---|---|
| Area | Description | Peak Design Flow (L/s) 5 year | Peak Design Flow (L/s) 100 year | Storage Required ($m^3$) 5 year | Storage Required ($m^3$) 100 year | Provided ($m^3$) |
| A-1 | Direct Runoff from Site | 2.3 | 4.5 | - | - | - |
| A-2 | Controlled Internal SWM Tank | 3.8 | 3.8 | 24.7 | 58.1 | > 74 |
| | **Totals :** | **6.1** | **8.4** | **24.7** | **58.1** | **> 74** |
| | Over Controlled: | 9.4 | 7.1 | | | |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:5 YEAR EVENT**
**AREA A-1 Direct Runoff from Site**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.018 | ha | Qallow = | 2.3 | L/s |
| C = | 0.44 | | Vol(max) = | 0.0 | $m^3$ |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol ($m^3$) |
|---|---|---|---|---|
| 5 | 141.18 | 3.12 | 0.82 | 0.24 |
| 10 | 104.19 | 2.30 | 0.00 | 0.00 |
| 15 | 83.56 | 1.84 | -0.46 | -0.41 |
| 20 | 70.25 | 1.55 | -0.75 | -0.90 |
| 25 | 60.90 | 1.34 | -0.96 | -1.43 |
| 30 | 53.93 | 1.19 | -1.11 | -2.00 |
| 35 | 48.52 | 1.07 | -1.23 | -2.58 |
| 40 | 44.18 | 0.98 | -1.32 | -3.18 |
| 45 | 40.63 | 0.90 | -1.40 | -3.79 |
| 50 | 37.65 | 0.83 | -1.47 | -4.41 |
| 55 | 35.12 | 0.78 | -1.52 | -5.03 |
| 60 | 32.94 | 0.73 | -1.57 | -5.66 |
| 65 | 31.04 | 0.69 | -1.61 | -6.30 |
| 70 | 29.37 | 0.65 | -1.65 | -6.94 |
| 75 | 27.89 | 0.62 | -1.68 | -7.58 |
| 80 | 26.56 | 0.59 | -1.71 | -8.23 |
| 85 | 25.37 | 0.56 | -1.74 | -8.87 |
| 90 | 24.29 | 0.54 | -1.76 | -9.52 |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:100 YEAR EVENT**
**AREA A-1 Direct Runoff from Site**

OTTAWA IDF CURVE

| | | | | | |
|---|---|---|---|---|---|
| Area = | 0.018 | ha | Qallow = | 4.5 | L/s |
| C = | 0.51 | | Vol(max) = | 0.0 | $m^3$ |

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol ($m^3$) |
|---|---|---|---|---|
| 5 | 242.70 | 6.17 | 1.63 | 0.49 |
| 10 | 178.56 | 4.54 | 0.00 | 0.00 |
| 15 | 142.89 | 3.63 | -0.91 | -0.82 |
| 20 | 119.95 | 3.05 | -1.49 | -1.79 |
| 25 | 103.85 | 2.64 | -1.90 | -2.85 |
| 30 | 91.87 | 2.34 | -2.21 | -3.97 |
| 35 | 82.58 | 2.10 | -2.44 | -5.13 |
| 40 | 75.15 | 1.91 | -2.63 | -6.31 |
| 45 | 69.05 | 1.76 | -2.79 | -7.52 |
| 50 | 63.95 | 1.63 | -2.92 | -8.75 |
| 55 | 59.62 | 1.52 | -3.03 | -9.98 |
| 60 | 55.89 | 1.42 | -3.12 | -11.23 |
| 65 | 52.65 | 1.34 | -3.20 | -12.49 |
| 70 | 49.79 | 1.27 | -3.28 | -13.76 |
| 75 | 47.26 | 1.20 | -3.34 | -15.03 |
| 80 | 44.99 | 1.14 | -3.40 | -16.31 |
| 85 | 42.95 | 1.09 | -3.45 | -17.59 |
| 90 | 41.11 | 1.05 | -3.50 | -18.88 |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:2 YEAR EVENT**
**AREA A-2 Controlled Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.127 ha Qallow = 3.78 L/s
C = 0.90 Vol(max) = 16.1 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 103.57 | 32.91 | 29.13 | 8.74 |
| 10 | 76.81 | 24.41 | 20.63 | 12.38 |
| 15 | 61.77 | 19.63 | 15.85 | 14.26 |
| 20 | 52.03 | 16.53 | 12.75 | 15.30 |
| 25 | 45.17 | 14.35 | 10.57 | 15.86 |
| 30 | 40.04 | 12.72 | 8.94 | 16.10 |
| 35 | 36.06 | 11.46 | 7.68 | 16.12 |
| 40 | 32.86 | 10.44 | 6.66 | 15.99 |
| 45 | 30.24 | 9.61 | 5.83 | 15.74 |
| 50 | 28.04 | 8.91 | 5.13 | 15.39 |
| 55 | 26.17 | 8.32 | 4.54 | 14.97 |
| 60 | 24.56 | 7.80 | 4.02 | 14.48 |
| 65 | 23.15 | 7.36 | 3.58 | 13.95 |
| 75 | 20.81 | 6.61 | 2.83 | 12.75 |
| 90 | 18.14 | 5.76 | 1.98 | 10.72 |
| 120 | 14.56 | 4.63 | 0.85 | 6.10 |
| 150 | 12.25 | 3.89 | 0.11 | 1.02 |
| 180 | 10.63 | 3.38 | -0.40 | -4.36 |
| 210 | 9.42 | 2.99 | -0.79 | -9.93 |
| 240 | 8.47 | 2.69 | -1.09 | -15.65 |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:5 YEAR EVENT**
**AREA A-2 Controlled Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.127 ha Qallow = 3.78 L/s
C = 0.90 Vol(max) = 24.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 141.18 | 44.86 | 41.08 | 12.32 |
| 10 | 104.19 | 33.11 | 29.33 | 17.60 |
| 15 | 83.56 | 26.55 | 22.77 | 20.49 |
| 20 | 70.25 | 22.32 | 18.54 | 22.25 |
| 25 | 60.90 | 19.35 | 15.57 | 23.35 |
| 30 | 53.93 | 17.14 | 13.36 | 24.04 |
| 35 | 48.52 | 15.42 | 11.64 | 24.44 |
| 40 | 44.18 | 14.04 | 10.26 | 24.62 |
| 45 | 40.63 | 12.91 | 9.13 | 24.65 |
| 50 | 37.65 | 11.96 | 8.18 | 24.55 |
| 55 | 35.12 | 11.16 | 7.38 | 24.36 |
| 60 | 32.94 | 10.47 | 6.69 | 24.08 |
| 65 | 31.04 | 9.86 | 6.08 | 23.73 |
| 75 | 27.89 | 8.86 | 5.08 | 22.87 |
| 90 | 24.29 | 7.72 | 3.94 | 21.26 |
| 120 | 19.47 | 6.19 | 2.41 | 17.32 |
| 150 | 16.36 | 5.20 | 1.42 | 12.77 |
| 180 | 14.18 | 4.51 | 0.73 | 7.84 |
| 210 | 12.56 | 3.99 | 0.21 | 2.64 |
| 240 | 11.29 | 3.59 | -0.19 | -2.75 |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:100 YEAR EVENT**
**AREA A-2 Controlled Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.127 ha Qallow = 3.78 L/s
C = 1.00 Vol(max) = 58.1 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 242.70 | 85.69 | 81.91 | 24.57 |
| 10 | 178.56 | 63.04 | 59.26 | 35.56 |
| 15 | 142.89 | 50.45 | 46.67 | 42.00 |
| 20 | 119.95 | 42.35 | 38.57 | 46.28 |
| 25 | 103.85 | 36.66 | 32.88 | 49.33 |
| 30 | 91.87 | 32.43 | 28.65 | 51.58 |
| 35 | 82.58 | 29.16 | 25.38 | 53.29 |
| 40 | 75.15 | 26.53 | 22.75 | 54.60 |
| 45 | 69.05 | 24.38 | 20.60 | 55.62 |
| 50 | 63.95 | 22.58 | 18.80 | 56.40 |
| 55 | 59.62 | 21.05 | 17.27 | 56.99 |
| 60 | 55.89 | 19.73 | 15.95 | 57.43 |
| 65 | 52.65 | 18.59 | 14.81 | 57.75 |
| 75 | 47.26 | 16.68 | 12.90 | 58.07 |
| 90 | 41.11 | 14.51 | 10.73 | 57.97 |
| 120 | 32.89 | 11.61 | 7.83 | 56.40 |
| 150 | 27.61 | 9.75 | 5.97 | 53.71 |
| 180 | 23.90 | 8.44 | 4.66 | 50.32 |
| 210 | 21.14 | 7.47 | 3.69 | 46.43 |
| 240 | 19.01 | 6.71 | 2.93 | 42.19 |

**Proposed 6-Storey Residential Building**
**Novatech Project No. 119210**
**REQUIRED STORAGE - 1:100 YR + 20% IDF Increase**
**AREA A-2 Controlled Internal SWM Tank**

OTTAWA IDF CURVE

Area = 0.127 ha Qallow = 3.78 L/s
C = 1.00 Vol(max) = 73.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|---|---|---|---|---|
| 5 | 291.24 | 102.83 | 99.05 | 29.71 |
| 10 | 214.27 | 75.65 | 71.87 | 43.12 |
| 15 | 171.47 | 60.54 | 56.76 | 51.08 |
| 20 | 143.94 | 50.82 | 47.04 | 56.45 |
| 25 | 124.62 | 44.00 | 40.22 | 60.33 |
| 30 | 110.24 | 38.92 | 35.14 | 63.26 |
| 35 | 99.09 | 34.99 | 31.21 | 65.53 |
| 40 | 90.17 | 31.84 | 28.06 | 67.34 |
| 45 | 82.86 | 29.25 | 25.47 | 68.78 |
| 50 | 76.74 | 27.10 | 23.32 | 69.95 |
| 55 | 71.55 | 25.26 | 21.48 | 70.89 |
| 60 | 67.07 | 23.68 | 19.90 | 71.64 |
| 65 | 63.18 | 22.30 | 18.52 | 72.25 |
| 75 | 56.71 | 20.02 | 16.24 | 73.08 |
| 90 | 49.33 | 17.42 | 13.64 | 73.64 |
| 120 | 39.47 | 13.94 | 10.16 | 73.13 |
| 150 | 33.13 | 11.70 | 7.92 | 71.26 |
| 180 | 28.68 | 10.13 | 6.35 | 68.55 |
| 210 | 25.37 | 8.96 | 5.18 | 65.25 |
| 240 | 22.81 | 8.05 | 4.27 | 61.52 |