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PROPOSED RESIDENTIAL DEVELOPMENT
10 EMPRESS AVENUE NORTH

Development Servicing and Stormwater Management Report

PROPOSED RESIDENTIAL DEVELOPMENT
10 EMPRESS AVENUE NORTH

DEVELOPMENT SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared by:

NOVATECH
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August 9, 2024

Ref: R-2023-111
Novatech File No. 121234

NOVATECH
Engineers, Planners & Landscape Architects

August 9, 2024

City of Ottawa
Planning, Real Estate and Economic Development Department
Development Review – Central Branch
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

Attention: Mr. John Wu

Dear Sir:

Re: Development Servicing and Stormwater Management Report
Proposed 4-Storey Residential Development
10 Empress Avenue North, Ottawa, ON
Novatech File No: 121234

Enclosed is a copy of the 'Development Servicing and Stormwater Management Report' for the proposed 4-storey residential development located at 10 Empress Avenue North, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of the site plan control application.

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

Yours truly,

NOVATECH

Miroslav Savic, P. Eng.
Senior Project Manager

cc: Dean Philip Michaud (Henry Investment)
Julien Hébert (Project1 Studio)

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1.0 INTRODUCTION

The new 4-storey residential development is being proposed by Dalhousie Non-profit Housing Cooperative 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 the site plan control application.

1.2 Site Description and Location

The subject site is approximately 0.12 hectares in size occupied by two residential duplexes with gravel parking on Perkins Street and pedestrian entrances on Empress Avenue North. The site is located between Empress Avenue North and Perkins Street and is bordered by residential dwellings to the north and south. The survey description of the subject site is designated as Lot 5 and Part of Lot 6, Registered Plan 7, 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 June 14, 2024, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for the pre-consultation meeting notes.

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 since the on-site stormwater management facilities will service a single lot that is not an industrial site and the storm flows from this site will discharge into a municipal storm sewer that is not a combined sewer.

1.4 Proposed Development

The proposed development will consist of a new 4-storey residential building with an underground parking garage. Driveway access to the parking garage will be provided off Perkins Street. Barrier-free access to the proposed building will be provided off Empress Avenue North at the building's main entrance.

The proposed development will be serviced by connecting service laterals to the existing watermain and sanitary sewer in Perkins Street and storm sewer in Empress Avenue North.

1.5 Design Guidelines and Reference Material

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

- Ottawa Sewer Design Guidelines (2012) and Technical Bulletins
- Ottawa Design Guidelines for Water Distribution (2010) & Technical Bulletins
- Ministry of the Environment Design Guidelines for Sewage Works (2008)
- Ministry of the Environment Stormwater Management Planning and Design Manual (2003)
- Ministry of the Environment Design Guidelines for Drinking Water Systems (2008)
- Fire Underwriters Survey (FUS) Water Supply for Public Fire protection

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

- Geotechnical Investigation Proposed Residential Development,10-20 Empress Avenue, prepared by Pinchin (February 22, 2024).

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 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

There is a 250 mm diameter sanitary sewer within Empress Avenue North and a 250mm diameter sanitary sewer within Perkins Street. As per the City record drawings, the existing residential duplexes are currently connected to the 250mm dia. sanitary sewer in Empress Avenue North.

Based on a review of the existing sanitary sewer depth and pipe crossing constraints with the existing municipal infrastructure, the new building is proposed is to be connected to the existing 250mm dia. PVC sewer in Perkins Street. A 150mm service lateral will be provided.

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 Units (1-Bedroom): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Residential Units (3-Bedroom): 3.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day (ISTB-2018-01)
- Residential Peaking Factor calculated by the Harmon Equation
- Infiltration Allowance: 0.33 L/s/ha x 0.122 ha site = 0.04 L/s (ISTB-2018-01)

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

Table 1: Theoretical Sanitary Flows

Proposed Development	Unit Count	Design Population	Peak Residential Flow (L/s)	Infiltration Allowance (L/s)	Peak Sewage Flow (L/s)
4-Storey Appt Building	41	82	0.85	0.04	0.89

The total calculated peak sanitary flow from the proposed building, including infiltration, is approximately 0.89 L/s. Refer to **Appendix C** for detailed calculations.

The above sanitary flow calculations have been provided to the City of Ottawa for the purpose of downstream analysis of the existing municipal sanitary sewer system. The City asset management has advised that there are no capacity concerns with the proposed sanitary discharge to the existing municipal sanitary sewer system. Refer to **Appendix C** for e-mail correspondence with the City of Ottawa.

2.2 Water

There is a 150 mm diameter PVC watermain within Empress Avenue North and a 200mm diameter PVC watermain within Perkins Street. As per the City record drawings, the existing residential duplexes are currently connected to the 150mm diameter Empress Avenue North watermain.

The proposed development is proposed to be serviced by connecting to the existing 200mm dia. municipal watermain in Perkins Street. The water service has been sized to provide the required domestic water demand and fire flow.

2.2.1 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 (1-Bedroom or Studio): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Residential Units (3-Bedroom): 3.1 people per unit
- Average Daily Residential Water Demand: 280 L/person/day (ISTB-2021-03)
- Maximum Day Demand Peaking Factor = 7.5 x Avg. Day Demand (MOE Table 3-3)
- Peak Hour Demand Peaking Factor = 11.3 x Avg. Day Demand (MOE Table 3-3)

The fire flow is calculated using the Fire Underwriters Survey (FUS) method, based on the building information provided by the architect.

Refer to **Table 2.1** below for a summary of the domestic water demands and fire flows and to **Appendix E** for detailed calculations.

Table 2.1: **Theoretical Domestic Water and Fire Flow Demands**

Proposed Development	Unit Count	Design Population	Avg. Day Demand (L/s)	Max. Day Demand (L/s)	Peak Hour Demand (L/s)	FUS Fire Flow Demand (L/s)
4-Storey Appt Building	41	82	0.27	1.99	3.00	267

The above water demands have been submitted to the City for the purpose of obtaining the watermain boundary conditions. The boundary conditions provided the City are enclosed in **Appendix E**.

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:

- Maximum system pressure is not to exceed 552 kPa (80 psi).
- Minimum system pressures are to be >276 kPa (40 psi) under Peak Hour demand.
- Minimum system pressures are to be >140 kPa (20 psi) under Max Day + Fire Flow demands.

The following table summarizes preliminary hydraulic analysis results based on municipal watermain boundary conditions.

Table 2.2: Hydraulic Analysis Summary

Municipal Watermain Boundary Condition	Boundary Condition	Water Demand (L/s)	Min/Max Operating Pressure (psi)	Design Pressure (psi)*
Minimum HGL (Peak Hour Demand)	107.7 m	3.0	40 psi (min.)	64.0
Maximum HGL (Avg Day Demand)	115.6 m	0.27	80 psi (max.)	75.2
Max Day + Fire Flow HGL	79.6 m	267 + 1.99	20 psi (min.)	24.0

As indicated above, the existing municipal watermain should provide adequate system pressures to the proposed development. A booster pump may be required to increase pressure to the upper floors 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 provided near the main entrance to the building within 45m unobstructed path from the existing municipal hydrant located in Empress Avenue North.

A multi-hydrant approach to firefighting will be required to supply adequate FUS fire flow to the proposed development. There are currently four (4) Class AA (blue bonnet) hydrants within 150m of the proposed site. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m have a maximum capacity of 95 L/s while hydrants between 75m and 150m have a maximum capacity of 63 L/s (at a pressure of 20 PSI). Refer to the hydrant sketch in **Appendix D** showing the approximate distances from the existing hydrant to the proposed building.

Table 2.2 summarizes the theoretical combined fire flow available from the nearby municipal fire hydrants and compares it to the fire flow demands based on the FUS calculations.

Table 2.2: **Theoretical Fire Protection Summary Table**

Proposed Development	FUS Fire Flow Demand (L/s)	Fire Hydrant(s) within 75m (~ 95 L/s each)	Fire Hydrant(s) within 150m (~ 63 L/s each)	Theoretical Combined Available Fire Flow (L/s)
4-Storey Appt Building	**267**	3	1	**~348**

The theoretical combined maximum flow from these hydrants exceeds the FUS fire flow requirements for the proposed development.

The City has performed a multi-hydrant analysis with four existing hydrants within 150 m of the property. Refer to the watermain boundary conditions enclosed in **Appendix E**. The total aggregate flow assuming the four existing hydrants running simultaneously provides the required FUS fire flow for the site.

2.3 Storm Drainage and Stormwater Management

The proposed residential apartment building will be serviced by connecting to the existing 525mm dia. storm sewer in Empress Avenue North. A new 200mm dia. storm lateral will be extended to the proposed building near the south-east corner of the site.

2.3.1 Stormwater Management Criteria and Objectives

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

- Maximize the use of on-site storage on the building roof to provide quantity control for the proposed development.
- Provide best measures to control the post-development flows from the site to a target 5-year release rate specified by the City of Ottawa. Control post-development flows from the site being developed up to and including the 100-year design event.
- Minimize the impact on the existing municipal sewer in Empress Avenue North and Perkins Street by reducing the post-development storm flows from the site, when compared to current conditions.
- 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 site is approximately 0.121 ha in size and is comprised of two residential duplexes facing Empress Avenue North, landscaped backyards, and gravel parking area adjacent to Perkins Street. The existing residential duplexes are currently connected to the 525mm diameter storm sewer in Empress Avenue North. The existing backyards and gravel parking areas primarily sheet drain towards Perkins Street. Refer to Pre-Development Drainage Area Plan enclosed in **Appendix E**.

The uncontrolled pre-development flows from the site to be developed were calculated using the Rational Method to be 20.1 L/s during the 1:5-year design event and 39.7 L/s during the 1:100-year design event. Refer to **Appendix E** for detailed calculations. There are currently no water quality control measures being provided on site.

As specified by the City of Ottawa, the target allowable release rate from the site was calculated using the Rational Method, to be approximately 17.6 L/s, based on a 10-min. rainfall intensity, using a 5-year return period (City of Ottawa IDF Curves) and a runoff coefficient of 0.50. Refer to **Appendix E** for detailed calculations.

2.3.3 Post-Development Conditions

The proposed site will be serviced by connecting the 200mm dia. building service to the existing 525mm dia. concrete storm sewer in Empress Avenue North. Stormwater runoff from the proposed building roof will be attenuated using control flow roof drains. Stormwater runoff from the podium amenity areas will be collected by the proposed deck drains and connected to the new building service. Stormwater runoff from the ramp to U/G garage will be collected by the proposed trench drain and connected to the new building service via a mechanical plumbing system. Refer to **121234-SWM** plan for drainage areas and details.

2.3.3.1 Area D1: Direct Runoff to Perkins

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be 2.2 L/s during the 5-year design event and 4.3 L/s during the 100-year design event.

2.3.3.2 Area D2: Direct Runoff to Empress

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be 1.4 L/s during the 5-year design event and 2.9 L/s during the 100-year design event.

2.3.3.3 Area A1: Uncontrolled Site Flows

Stormwater runoff from this sub-catchment area will be captured by the proposed deck drains and the trench drain and will be directed to the new building service via a mechanical plumbing system. The uncontrolled post-development flow from this area was calculated using the Rational Method to be 2.3 L/s during the 5-year design event and 4.5 L/s during the 100-year design event

2.3.3.4 Area A2: Uncontrolled Site Flows

The stormwater from the window wells will be directed to the weeping tile system and will be pumped to the new building service. The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be 0.8 L/s during the 5-year design event and 1.5 L/s during the 100-year design event.

2.3.3.5 Area R1 to R7: Controlled Flow Roof Drains

The post-development flow from the building roof will be attenuated by eight (7) Watts Adjustable flow control roof drains prior to being directed to the proposed storm service connected to Empress.

Table 2.3 summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, the maximum anticipated ponding depths, storage volumes required, and storage volumes provided for both the 5-year and the 100-year design events.

Table 2.3: Design Flow and Roof Drain Table

Roof Drain ID	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)		Approximate Ponding Depth Above Drains (cm)		Storage Volume Required (m^3)		Max. Storage Available (m^3)
			5-Yr	100-Yr	5-Yr	100-Yr	5-Yr	100-Yr	
RD 1	1	RD-100-A-ADJ (1/4 Exposed)	0.79	0.95	10	14	1.8	4.3	4.8
RD 2	1	RD-100-A-ADJ (1/4 Exposed)	0.79	0.87	10	13	1.0	2.6	3.7
RD 3	1	RD-100-A-ADJ (Closed)	0.32	0.32	11	15	1.1	2.8	2.9
RD 4	1	RD-100-A-ADJ (1/4 Exposed)	0.79	0.95	11	14	2.7	6.2	7.0

RD 5	1	RD-100-A-ADJ (1/2 Exposed)	0.95	1.26	11	15	3.1	7.0	7.1
RD 6	1	RD-100-A-ADJ (1/4 Exposed)	0.87	1.10	9	13	0.4	1.2	1.8
RD 7	1	RD-100-A-ADJ (Closed)	0.32	0.32	11	14	1.6	3.9	4.4
Total Roof	**7**	**-**	**4.8**	**5.6**	**-**	**-**	**11.8**	**28.1**	**31.7**

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for roof drain information. As indicated in the table above, the building roof will provide sufficient storage for both the 5-year and 100-year design events.

2.3.4 Stormwater Flow Summary

Table 2.4 provides a summary of the total post-development flows from the site and compares them to the uncontrolled pre-development flows and target release rate specified by the City.

Table 2.4: Stormwater Flow Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions				
	Uncontrolled Flow (L/s)	Target Allowable Flow (L/s)	D1&D2 Flow (L/s)	A1&A2 Flow (L/s)	R1 to R7 Flow (L/s)	Total Flow (L/s)	Reduction in Flow (L/s or %)*
5-Yr	20.1	17.6	3.6	3.4	4.8	11.6	8.5 or 42%
100-Yr	39.7		7.2	6.0	5.6	18.8	30.7 or 68%

*Reduced flow compared to uncontrolled pre-development conditions.

During the 5-year post-development design event, flow from the subject site will be less than the target allowable flow of 17.6 L/s, specified by the City of Ottawa. During the 100-year design event, the total site flow will slightly exceed the desired release rate by approximately 1.2 L/s.

As indicated in the table above, the total post-development flows from the site represent a significant reduction in flows when compared to pre-development conditions.

2.4 Stormwater Quality Control

An OGS unit for on-site stormwater quality control will not be required for this development. The parking will be provided underground, and the rooftops and the landscaped areas are considered clean for the purposes of water quality and aquatic habitat protection.

3.0 SITE GRADING

The existing site is relatively flat and it is located in a sag, the lowest point in the adjacent roads. As per discussions with the City of Ottawa, the access ramp to u/g garage is graded with 10% slope up from the street to assure the top of ramp is a minimum 150mm higher that spill point elevation on Perkins Street (top of ramp elevation = 63.04m, spill point elevation on Perkins = 62.89m). The proposed elevation in front of the main entrance off Empress Avenue North is a minimum 150mm higher than the spill point elevation on Empress (elevation at the main entrance = 62.90m, spill point elevation on Empress = 62.75m). Similarly, the top of retaining

wall elevation by the window wells is 150mm higher than spill point elevation in Empress, to assure major storm from the street will not overflow into the building or the window wells.

3.1 Emergency Overland Flow Route

In the case of a major rainfall event exceeding the design storms provided for, the stormwater located within the subject site will overflow towards Empress Avenue North and Perkins Street.

4.0 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 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.
- A mud mat will be installed at the construction entrance for the site.
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.

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.

5.0 CONCLUSION

This report has been prepared in support of the site plan control application for the proposed residential development located at 10 Empress Avenue North in the City of Ottawa.

The conclusions are as follows:

Watermain

- The proposed development will be serviced by connecting to the 200mm diameter watermain in Perkins Street.
- The water supply for fire protection will be provided from the existing municipal hydrants in Empress Avenue North and Perkins Street.
- The building will be sprinklered and supplied with a fire department siamese connection. The siamese connection will be located within 45m of the existing municipal fire hydrant in Empress Avenue North.
- The existing municipal watermain system will provide adequate water supply and system pressures to the proposed development.

Sanitary Servicing

- The proposed development will be serviced by connecting to the 200mm diameter sanitary sewer in Perkins Street.
- There is adequate capacity within the proposed sanitary service and existing sanitary infrastructure to service the proposed development.

Stormwater Management

- The proposed development will be serviced by connecting to the 525mm diameter storm sewer in Empress Avenue North.
- The proposed development will control the flows from the site to the 5-year target release rate calculated using a runoff coefficient of 0.50 and a time of concentration of 10 minutes.
- During the 5-year post-development design event, flow from the subject site will be less than the target allowable flow of 17.6 L/s. During the 100-year design event, the total site flow will slightly exceed the desired release rate by approximately 1.2 L/s.
- The total post-development flows from the site represent a significant reduction in flows when compared to pre-development conditions.

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

NOVATECH

Prepared by:

Miroslav Savic, P. Eng.
Senior Project Manager
Land Development Engineering

Reviewed by:

J. Lee Sheets, C.E.T.
Director
Land Development & Public Sector Infrastructure

APPENDIX A

Pre-consultation Meeting Notes

File No.: PC2024-0210

June 14, 2024

Simran Soor
Novatech
Via email: s.soor@novatech-eng.com

Subject: **Pre-Consultation: Meeting Feedback**
Proposed Site Plan Application – 10 Empress Ave North

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on June 11, 2024.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☐	**5** ☒

One (1) indicates that considerable major revisions are required while five (5) suggests that the 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.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

    a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

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

Planning

Comments:

1. Please add any relevant zoning provisions in table format to the Site Plan drawing and ensure it has all measurements and details required in the City's ToR.

2. For this Plan, please utilize only the exterior massing of the building and remove the floor plan information. Replacing this layer with a label identifying the proposed use and GFA would be appreciated.

Urban Design

Submission Requirements

3. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation of the submission.

    a. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.

4. Additional drawings and studies are required as shown on the ASPIL. Please follow the terms of reference (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies. These include:

    a. Landscape Plan.

    b. Elevations.

Comments on Preliminary Design

5. We resolved design related items during the re-zoning phase and have no additional comments at this time.

Engineering

Outstanding comments from previous ZBLA application:

1. Phase One Environmental Site Assessment, prepared by Pinchin, File Number 329062, dated April 1, 2024

    a. Please note that as a condition of the future Site Plan Control approval, prior to a building permit issuance, a verification sampling report needs to be submitted for review and approval, summarizing the verification sampling activities and findings. This report shall confirm the remaining soil and groundwater (if required) onsite meet the applicable provincial standards.

    b. It is our understanding that the demolition of the existing dwelling will take place prior to site plan control approval. We strongly recommend that the verification sampling report which confirms the remaining soil and groundwater onsite meet the applicable provincial standards, is submitted for our review and approval prior to site plan control approval.

2. Geotechnical Investigation, prepared by Pinchin, File Number 329062.001, dated February 22, 2024

    a. As identified in Section 5.6, the soils on the subject property have the potential to be liquifiable. Please confirm through additional testing if this is the case and provide mitigation measures as deemed necessary.

3. Traffic Noise Impact Study, prepared by State of the Art Acoustik, dated April 8, 2024

    a. A typical cross-section of the proposed acoustic barrier and its details must be included in the report.

    b. Show the location of the acoustic barrier on the grading plan and provide top of barrier elevations.

4. Assessment of Adequacy of Public Services Report, Ref: R-2023-150, File No. 121234, prepared by Novatech, dated April 9, 2024

    a. Section 2.2.2, please confirm if a new fire hydrant is proposed as part of this development or if the Siamese connection will be located within 45m from the existing hydrant on Perkins Street.

    b. Section 2.1, Consideration should be taken to downsizing the sanitary lateral to 150mm diameter seeing as this size is more than sufficient to convey the proposed peak flowComments:

SPC Phase 1 Preconsultation comments based on the site plan provided:

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

    a. Water Quality Control: provide enhanced levels of protection of 80% for total suspended solids removal for any surface parking.

    b. 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 5-year pre-development level.

        i. 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].

        ii. The time of concentration (Tc) 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; Tc of 10 minutes shall be used for all post-development calculations.

iii. Any storm events greater than the established 5-year allowable release rate, up to and including the 100-year storm event, shall be detained on-site. For events greater than 100 years, spillage must be directed to a public ROW and not to neighboring private property.

c. 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.

d. Ponding Notes:
   i. 100-year spill elevation must be 300mm lower than any building opening or ramp.
   ii. Demonstrate that the stress test spill elevation (100-year +20% event) does not spill onto any permanent structures.
   iii. The maximum permissible ponding depth for the 100-year storm event is 350mm. No spilling to adjacent sites.

e. Document how any foundation drainage system will be integrated into the servicing design and show the positive outlet on the plan. Foundation drainage is to be independently connected to sewer main unless being pumped with appropriate back up power, sufficient sized pump and back flow prevention. It is recommended that the foundation drainage system be drained by a sump pump connection to the storm sewer to minimize risk of basement flooding as it will provide the best protection from the uncontrolled sewer system compared to relying on the backwater valve.

f. 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.

g. If rooftop control and storage is proposed as part of the SWM solutions, sufficient details (Cl. 8.3.8.4) shall be discussed and documented 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.

h. Underground Storage: Please note that the Modified Rational Method for storage computation in the Sewer Design Guidelines was originally intended to be used for above ground storage (i.e. parking lot) where the change in head over the orifice varied from 1.5 m to 1.2 m (assuming a 1.2 m deep CB and a max ponding depth of 0.3 m). This change in head

was small and hence the release rate fluctuated little, therefore there was no need to use an average release rate.

i. 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 modelers in the Water Resources Group. Regarding 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.

ii. Provide information on type of underground storage system including product name and model, number of chambers, chamber configuration, confirm invert of chamber system, top of chamber system, required cover over system and details, interior bottom slope (for self-cleansing), chart of storage values, length, width and height, capacity, entry ports (maintenance) etc. UG storage to provide actual 5- and 100-year event storage requirements.

2. General Servicing

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

b. Where servicing involves three or more service trenches, either a full road width or full lane width 40 mm asphalt overlay will be required, as per amended Road Activity By-Law 2003-445 and City Standard Detail Drawing R10. The extent of the overlay must be shown on the grading plan or a road reinstatement plan.

c. CCTV sewer inspection of city infrastructure is required to record pre and post construction conditions and ensure there is no damage to City Assets.

d. Sewer connections to be made above the springline of the sewer main as per:

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

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

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

iv. No submerged outlet connections.

3. Storm Sewer

    a. A 525mm dia. CONC storm sewer (2015) is available within Empress Ave N.

    b. A 375mm dia. PVC storm sewer (2015) is available within Perkins St.

4. Sanitary Sewer

    a. A 250 mm dia. PVC sanitary sewer (2015) is available within Empress Ave N.

    b. A 250 mm dia. PVC sanitary sewer (2015) is available within Perkins St.

    c. Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

    d. A backwater valve is required on the sanitary service for protection.

5. Water:

    a. A 152 mm dia. PVC watermain (2016) is available within Empress Ave N.

    b. A 203mm dia. PVC watermain (2016) is available within Perkins St

    c. Existing residential services are to be blanked at the main.

    d. Water Supply Redundancy: As per ISTB-2021-03, Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/day and residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area. Individual residential facilities with a basic day demand greater than 50 m3/day shall be connected with a minimum of two water services, each their own meter and separated by an isolation valve, to avoid the creation of a vulnerable service area.

    e. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the

expected loads required by the proposed development, including calculations. Please provide the following information:

i. Plan showing the proposed location of service(s).

ii. Type of development and the amount of fire flow required (L/min). Note: The OBC method can be used if the fire demand for the private property is less than 9,000 L/min. If the OBC fire demand reaches 9000 L/min, then the FUS method is to be used. Fire flow demand requirements are to be based on ISTB-2021-03. Exposure separation distances shall be defined on a figure to support the FUS calculation and required fire flow (RFF).

iii. Average daily demand: __L/s.

iv. Maximum daily demand: __L/s.

v. Maximum hourly daily demand: __L/s.

vi. Note: 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.

f. Please review Technical Bulletin ISTB-2018-02, maximum fire flow hydrant capacity is provided in Section 3 Table 1 of Appendix I. A hydrant coverage figure shall be provided and demonstrate there is adequate fire protection for the proposal. Two or more public hydrants are anticipated to be required to handle fire flow.

g. A Water Data Card will have to be submitted to size the water meter.

6. Grading and Erosion

a. 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.

b. Erosion and sediment control plan must be provided.

c. Street catch basins are not to be located at any proposed entrances.

d. Depressed driveways are discouraged and are not allowed in sag locations. For other locations, the builder must ensure that the maximum depth of flow on the street during the 100-year and stress test events will not spill onto the depressed driveway.

7. Environmental

a. 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.

b. 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.

c. Official Plan: Section 10. Protection of Health and Safety (ottawa.ca)

8. Geotechnical

a. A Geotechnical Study/Investigation shall be prepared in support of this development proposal.

b. Reducing the groundwater level in this area can lead to potential damages to surrounding structures due to excessive differential settlements of the ground. The impact of groundwater lowering on adjacent properties needs to be discussed and investigated to ensure there will be no short term and long-term damages associated with lowering the groundwater in this area.

c. Geotechnical Study shall be consistent with the Geotechnical Investigation and Reporting Guidelines for Development Applications. Geotechnical Investigation and Reporting (ottawa.ca)

9. Pre-Construction Survey

a. Pre-Construction (Piling/Hoe Ramming or close proximity to City Assets) and/or Pre-Blasting (if applicable) Survey required for any buildings/dwellings in proximity of 75m of site and circulation of notice of vibration/noise to residents within 150 m of site. Conditions for Pre-Construction/ Pre-Blast Survey & Use of Explosives will be applied to agreements. Refer to City's Standard S.P. No. F-1201 entitled Use of Explosives, as amended.

10. Regarding Quantity Estimates

a. 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.

Please refer to the City of Ottawa Guide to Preparing Studies and Plans [Engineering]: Planning application submission information and materials. The guide outlines the requirement for a statement to be provided on the plan about where the property boundaries have been derived from.

Feel free to contact Vincent Duquette, Infrastructure Project Manager, for follow-up questions.

Noise

Comments:

1. Noise Study Requirements

    a. A Transportation Noise Assessment is required as the subject development is located within 100m proximity of Albert Street.

Feel free to contact Vincent Duquette, Infrastructure Project Manager, for follow-up questions.

Transportation

Comments:

6. Right-of-way protection.

    a. See Schedule C16 of the Official Plan.

    b. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

7. The proposed development is within 400 metres of the Lebreton Station.

8. The development site proposes 41 units and 16 parking spaces. This development would not generate sufficient traffic to warrant a TIA report. The consultant is to address how they plan to enable and encourage travel by sustainable modes (i.e., to make walking, cycling, transit, carpooling and telework more convenient, accessible, safe, and comfortable).

9. The consultant has submitted the City of Ottawa's *TDM Measures Checklist*.

10. Ensure that potential tenants who are not assigned a parking space are aware that on street parking is not a viable option for tenants.

11. The consultant has acknowledged the Transportation comments submitted under PC2023-0370, no change to PC2024-0022 & no change to PC2024-0210.

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

Environment

Comments:

12. The closest significant natural feature is the escarpment which is located approximately 18 m east of the site (indicated on Schedule C11A). Development and site alteration within 30 m of a natural feature triggers an Environmental Impact Statement (EIS) however since there is not development proposed that will impact that natural feature and the site is separated from the feature by a travelled public road, we will waive the EIS requirement.

13. Bird-Safe Design Guidelines are triggered in situations where the proposal is over 4 stories in height, so they don't apply. However, we encourage the applicant team to consider the guidelines when designing the building to avoid design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf

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

Forestry

Comments:

14. Tree preservation and Tree Removal - A Tree Conservation Report (TCR) is required. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact mark.richardson@ottawa.ca

    a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
        i. An approved TCR is a requirement of Site Plan approval.
    b. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
    c. The TCR must contain 2 separate plans:
        i. Plan/Map 1 - show existing conditions with tree cover information

ii. Plan/Map 2 - show proposed development with tree cover information.

d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter and health condition

i. For ease of review, the Planning Forester suggests that all trees be numbered and referenced in an inventory table.

e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

i. Compensation may be required for the removal of city owned trees.

g. The removal of trees on a property line will require the permission of both property owners.

h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

i. The location of tree protection fencing must be shown on the plan

ii. Show the critical root zone of the retained trees

i. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

15. Landscape Plan tree planting requirements – please ensure the LP addresses the following

a. Please identify all retained trees on the LP

b. Minimum Setbacks

i. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

ii. Maintain 2.5m from curb

iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

b. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.

c. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

d. Tree specifications
    i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
e. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.
f. No root barriers, dead-man anchor systems, or planters are permitted.
g. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
h. Hard surface planting
    i. If there are hard surface plantings, a planting detail must be provided
    ii. Curb style planter is highly recommended
    iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
    iv. Trees are to be planted at grade
i. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

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

j. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines
k. The City requests that consideration be given to planting native species where ever there is a high probability of survival to maturity.

l. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.

Feel free to contact Mark Richardson, Planning Forester, for follow-up questions.

Parkland

No Comments

Community issues

Comments: Dalhousie Community Association

16. Thank you for the briefing on the site plan provided today by Katie Turk. We regret that the DCA did not have a representative available for the pre-app meeting on June 11, 2024.

Facade articulation:

17. The changes proposed on the Perkins Street façade are very positive, and help restore Perkins as a residential street. These include the street access for two of the residential units, and what appears to be a scaling back of the east wall and a change in material from wood to brick masonry.
18. On the other hand, the change in the site plan arising from the requirement to place Hydro infrastructure on Perkins is regrettable, and undermines the effort to restore the street. Some of this change can be ameliorated through soft landscaping. We look forward to seeing the formal landscaping plan.
19. The removal of the stairway from the amenity space to Perkins Street should be reconsidered.

Trees and Green Space:

20. The loss of some of the trees planned for Perkins as a result of the Hydro installation is very unfortunate. Can trees be added on Empress (where currently five new trees are illustrated in the elevation drawing)?
21. To repeat our comment from December: A tree conservation report is required, but is it realistic to expect any of the existing trees to be saved? Again, the landscape plan will have particular importance for this property.

Consultation:

22. During the DCA's regular board meeting in May, members asked for a public meeting to inform the community about this development. Questions were asked about the impact of this development on the number of subsidized housing units available in the Dalhousie area.

Other

23. The High Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design. The HPDS was passed by Council on April 13, 2022.

    a. At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

    b. Please refer to the HPDS information attached and ottawa.ca/HPDS for more information.

Submission Requirements and Fees

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

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

Yours Truly,
Katie Turk, MCIP, RPP

c.c. Vincent Duquette, IPM
Christopher Moise, Urban Design
Mark Richardson, Forester
Mathew Hayley, Environmental
Wally Dubyk, TPM
Marika Atfield, Parks Planner

APPENDIX B

Development Servicing Study Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

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

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

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☒ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

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

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

4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- ☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☒ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☐ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☐ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- ☒ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☐ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

APPENDIX C

Sanitary Flow Calculations

10 EMPRESS AVENUE NORTH
SANITARY FLOW

4-STOREY APARTMENT BUILDING

Number of 1 Bedroom/Studio Units	17	
Persons per 1-bdr Unit	1.4	
Number of 2 Bedroom Units	17	
Persons per 2-bdr Unit	2.1	
Number of 3 Bedroom Units	7	
Persons per 3-bdr Unit	3.1	
Total Population	82	
Average Daily Flow	280	L/c/day
Average Daily Volume	22,960	L/day
Peak Factor (Harmon Formula)	3.20	
Peak Sanitary Flow	**0.85**	**L/s**
Site Area	0.12	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.04**	**L/s**
Total Peak Sanitary Flow	**0.89**	**L/s**

Miro Savic

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, October 30, 2023 8:46 AM
To: Miro Savic
Cc: Lee Sheets; Wu, John; Matthew Hrehoriak; Murray Chown
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi Miro,

Asset Management confirmed there is no capacity concerns with the proposed sanitary discharge on both Empress Ave. N and Perkins St.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 27, 2023 9:58 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>; Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi Vincent,

Please copy Matt Hrehoriak (cc'd on this email) on the response from the Asset Management as I will be away from the office next two weeks.

Thanks you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Wednesday, October 25, 2023 12:12 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi Miro,

I am confirming that you have provided the information required and that the request to confirm sanitary capacity for this project has been sent to our Asset Management group.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 25, 2023 10:49 AM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Duquette, Vincent <Vincent.Duquette@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi John,

Just following up on this. Can you please confirm whether you have the information required for the sanitary downstream analysis.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Miro Savic
Sent: Tuesday, October 24, 2023 9:21 AM
To: 'Wu, John' <John.Wu@ottawa.ca>

Cc: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi John,

The daily volume is 22,960 L/day (82persons x 280 L/person/day). The peak sanitary flow is 3.41 L/s. See the attached spreadsheet.

Can you please clarify what do you mean by the peak sanitary volume? This is the first time I was asked to provide this.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Wu, John <John.Wu@ottawa.ca>
Sent: Tuesday, October 24, 2023 8:22 AM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Subject: RE: 10 Empress - Sanitary Sewer Downstream Analysis

Hi, Miro:
You need provide the peak sanitary volume, and daily volume for that.

Thanks.

John

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 23, 2023 4:05 PM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: 10 Empress - Sanitary Sewer Downstream Analysis

Hello John,

I'm writing to request downstream analysis of the municipal sanitary sewer system for the proposed development at 10 Empress Ave N. I have attached the sanitary flow calculations for the City use in the analysis.

Two connections to the municipal sanitary sewer system are being considered (see snipped from the pre-consultation meeting with the City below):

- Connection to 250mm diameter sanitary Sewer in 10 Empress Ave N
- Connection to 250mm diameter sanitary sewer in Perkins St

Sanitary Sewer:

- A 250 mm dia. PVC sanitary sewer (2015) is available within Empress Ave N.
- A 250 mm dia. PVC sanitary sewer (2015) is available within Perkins St.
- 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.

Please confirm whether the City has any concerns with the downstream capacity of the sanitary sewer system for the proposed development.

Please give me a call should you have any questions or require additional information.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

APPENDIX D

Water Demands, FUS Calculations, Boundary Conditions

10 EMPRESS AVENUE NORTH
WATER ANALYSIS

WATER DEMAND

Number of 1 Bedroom Units	17	
Persons per 1 Bedroom Unit	1.4	
Number of 2 Bedroom Units	17	
Persons per 2 Bedroom Unit	2.1	
Number of 3 Bedroom Units	7	
Persons per 3 Bedroom Unit	3.1	
Total Population	82	
Average Day Demand	280	L/c/day
Average Day Demand	0.27	L/s
Maximum Day Demand (7.5 x avg. day per MOE Table 3-3)	1.99	L/s
Peak Hour Demand (11.3 x avg. day per MOE Table 3-3)	3.00	L/s

BOUNDAY CONDITIONS

Maximum HGL =	115.6	m
Minimum HGL =	107.7	m
Max Day + Fire Flow (267 L/s) HGL =	79.6	m

PRESSURE TESTS

AVERAGE GROUND ELEVATION (PERKINS STREET) 62.7 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI

HIGH PRESSURE = **75.2** PSI

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI

LOW PRESSURE = **64.0** PSI

MAX DAY + FIRE FLOW TEST = MAX DAY + FIRE - AVG GROUND ELEV x 1.42197 PSI/m > 20 PSI

MAX DAY + FIRE PRESSURE = **24.0** PSI

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121234
Project Name: 10 Empress Ave N
Date: October 23, 2023
Input By: C. Visser
Reviewed By: M. Savic

Legend: Input by User; No Information or Input Required

Building Description: 4-Storey Residential Building
Type V - Wood frame

Step			Input		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **D**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	805			
		Number of Floors/Storeys	4			
		Area of structure considered (m^2)			**3,220**	
	F	**Base fire flow without reductions**				**19,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**16,150**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-6,460**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	3,220	100%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	0 - 3 m		22%	**6,299**
		East Side	>30m		0%	
		South Side	3.1 - 10 m		15%	
		West Side	20.1 - 30 m		2%	
				Cumulative Total	**39%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**16,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**267**
				or	USGPM	4,227

Miro Savic

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Wednesday, December 6, 2023 1:26 PM
To: Miro Savic
Cc: Wu, John; Lee Sheets; Murray Chown
Subject: RE: 10 Empress - Boundary Conditions Request
Attachments: 10 Empress Avenue North Multi Hydrant November 2023.pdf

Hi Miro,

We requested a multi-hydrant analysis from our water resource group for this site. The available fire flow to site did not change, however it was confirmed that the four hydrants operating simultaneously provides sufficient fire flow. See below updated results.

The following are boundary conditions, HGL, for hydraulic analysis at 10 Empress Avenue North (zone 1W) assumed to be connected to the 152mm watermain on Empress Avenue North (Option1) OR the 203mm watermain on Perkins Street (Option2) (see attached PDF for location).

Both Options:
Minimum HGL= 107.7 m
Maximum HGL= 115.6 m

Fire Flow:
Option 1: Empress Connection
Available Fire Flow at 20 psi: 146.2 L/s, assuming ground elevation of 62.5 m.

Option 2: Perkins Connection
Max Day + Fire flow (267 L/s): 79.6 m

A multi-hydrant analysis was performed with four existing hydrants within 150 m of the property. **The total aggregate flow assuming the four identified hydrants running simultaneously provides the required fire flow for the site**.

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.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca


Multi-Hydrant Analysis for 10 Empress Avenue North
366030H451
Empress Connection
366030H452
Perkins Connection
366030H461
366030H458
rue Albert St.
rue Slater St.
rue Booth St.
av. Lorne Ave.
av. Empress Ave. N
av. Primrose Ave. E
Primrose Ave.
av. Empress Ave.
1220
406
152
203
51
25
102
305
Legend
Public
Private
City of Ottawa

From: Duquette, Vincent
Sent: November 24, 2023 1:33 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Wu, John <John.Wu@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miro,

Thank you for your patience. See below results for the boundary condition requests.

The following are boundary conditions, HGL, for hydraulic analysis at 10 Empress Avenue North (zone 1W) assumed to be connected to the 152mm watermain on Empress Avenue North (Option1) OR the 203mm watermain on Perkins Street (Option2) (see attached PDF for location).

Both Options:
Minimum HGL= 107.7 m
Maximum HGL= 115.6 m

Fire Flow:
Option 1: Empress Connection
Available Fire Flow at 20 psi: 146.2 L/s, assuming ground elevation of 62.5 m. The proposed connection on Empress Avenue North does not meet 267 L/s Fire demand.

Option 2: Perkins Connection
Max Day + Fire flow (267 L/s): 79.6 m

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

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: November 24, 2023 10:22 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Wu, John <John.Wu@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Any update from the water resources?

Thanks,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Miro Savic
Sent: Tuesday, November 21, 2023 3:17 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Wu, John <John.Wu@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Thank you for the email. The FUS calcs provided are accurate for the proposed 4-storey wood frame construction and fully sprinkler building.

There are 4 municipal hydrants within the range of the site and 2 of them are connected to the 406mm watermain in Albert Street. Based on Table 1 in Technical Bulletin ISTB-2010-02, there should be sufficient fire flow available to service the site.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, November 21, 2023 2:25 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Wu, John <John.Wu@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miro,

Our water resource group has concerns regarding the high fireflow requested for this applications. Can you confirm the 267L/s requested is accurate for the proposed building?

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Duquette, Vincent
Sent: November 17, 2023 9:50 AM
To: 'Miro Savic' <m.savic@novatech-eng.com>; Lee Sheets <l.sheets@novatech-eng.com>
Cc: Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miro,

Unfortunately we haven't received the boundary conditions.
When I receive them I will ensure to forward them to you as soon as I get them.

Best,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: November 17, 2023 9:43 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>; Lee Sheets <l.sheets@novatech-eng.com>
Cc: Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Have you heard back from the water resources?

Thanks,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Wednesday, November 8, 2023 9:45 AM
To: Lee Sheets <l.sheets@novatech-eng.com>; Miro Savic <m.savic@novatech-eng.com>
Cc: Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Lee,

I haven't heard back from our water resource group. Please note that typical turn around time for boundary conditions requests is 3-4 weeks. I will keep you posted on their response.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Lee Sheets <l.sheets@novatech-eng.com>
Sent: November 08, 2023 9:08 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>; Miro Savic <m.savic@novatech-eng.com>
Cc: Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent, any update on the request?
Lee

J. Lee Sheets, C.E.T., Director | Land Development & Public Sector Infrastructure
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 209 | Cell: 613.262.3121 | Fax: 613.254.5867

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, October 30, 2023 8:56 AM
To: Miro Savic <m.savic@novatech-eng.com>

Cc: Lee Sheets <l.sheets@novatech-eng.com>; Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

HI Miro,

Boundary conditions have been requested. Should you wish to meet and discuss about the peaking factors, we can do so upon your return in two weeks.
Enjoy the time off.

Best,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central Branch
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110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 27, 2023 10:29 AM
To: Wu, John <John.Wu@ottawa.ca>; Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Matthew Hrehoriak <m.hrehoriak@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hello Vincent,

Please copy Matt Hrehoriak (cc'd on this email) on the boundary conditions as I will be away from the office next two weeks.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Miro Savic
Sent: Wednesday, October 25, 2023 3:21 PM
To: Wu, John <John.Wu@ottawa.ca>; Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>
Subject: FW: 10 Empress - Boundary Conditions Request

Vicent, John,

Can we please meet to discuss this. This is the first time in my 18+ years working in Ottawa that I have been asked to use MOE Table 3-3 for a small infill development like this.

Thanks,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Miro Savic
Sent: Wednesday, October 25, 2023 3:16 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

See the attached revised spreadsheet.. I used dwelling unit column instead of population column in my interpolations earlier.
Please order the boundary conditions.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Wednesday, October 25, 2023 12:21 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miro,

Can you clarify how the Max Day factor (4.1) and Peak Hour factor (6.1) were obtained from Table 3-3?
Based on the proposed units (41) or population (82), it seems the factors should be interpolated higher from Table 3-3.

Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People

DWELLING UNITS SERVICED	EQUIVALENT POPULATION	NIGHT MINIMUM HOUR FACTOR	MAXIMUM DAY FACTOR	PEAK HOUR FACTOR
10	30	0.1	9.5	14.3
50	150	0.1	4.9	7.4
100	300	0.2	3.6	5.4
150	450	0.3	3.0	4.5
167	500	0.4	2.9	4.3

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
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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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 25, 2023 10:52 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Just following up on this. Can you please confirm that you have the information you need to order the water boundary conditions.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Miro Savic
Sent: Tuesday, October 24, 2023 4:34 PM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Your quick response is much appreciated.

I respectfully disagree with your understanding of the water design guidelines - we are not building a subdivision or a water system - we are building a single water service that is connected to a large water system.

However, I do not want to hold the boundary conditions request for the project. Please use the attached water demand calculations based on the MOE Table 3-3 to order the boundary conditions.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Tuesday, October 24, 2023 4:03 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miroslav,

The peaking factors from Table 4.2 are intended for subdivisions or water systems where the anticipated population is ranging from 500 to 3000. Our WDG indicate below that Table 3-3 should be used for small systems with a population of 0 to 500. In this case the water service connection you are requesting boundary conditions for is considered “small” because the water service itself will only serve an anticipated population of 82.

Demand Type	Amount	Units
Commercial and Institutional		
- Shopping Centres	2500	L/(1000m^2/d)
- Hospitals	900	L/(bed/day)
- Schools	70	L/(Student/d)
- Trailer Parks no Hook-Ups	340	L/(space/d)
- Trailer Parks with Hook-Ups	800	L/(space/d)
- Campgrounds	225	L/(campsite/d)
- Mobile Home Parks	1000	L/(Space/d)
- Motels	150	L/(bed-space/d)
- Hotels	225	L/(bed-space/d)
- Tourist Commercial	28,000	L/gross ha/d
- Other Commercial	28,000	L/gross ha/d
Maximum Daily Demand		
Residential	2.5 x avg. day	L/c/d
Industrial	1.5 x avg. day	L/gross ha/d
Commercial	1.5 x avg. day	L/gross ha/d
Institutional	1.5 x avg. day	L/gross ha/d
Maximum Hour Demand		
Residential	2.2 x max. day	L/c/d
Industrial	1.8 x max.day	L/gross ha/d
Commercial	1.8 x max.day	L/gross ha/d
Institutional	1.8 x max. day	L/gross ha/d

10-02

Table Notes:

- Use Table 3-3 of the MOE Design Guidelines for Drinking-Water Systems to determine Maximum day and Maximum hour peaking factors for 0 to 500 persons
- For applications not covered by Table 4.2 consult the MOE Guidelines for direction.

Different consumption rates may be warranted for modeling of existing areas. Consult with the Water Resources Unit, Asset Management Branch for demand estimates for specific projects in existing areas.

4.2.9 Areas Zoned Residential

Undeveloped residential areas within the development area shall consider average daily consumption rates of 35 m³/ha/day for hydraulic design purposes.

I hope this clears things up.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 24, 2023 10:50 AM
To: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>; Wu, John <John.Wu@ottawa.ca>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Vincent,

Thank you for getting back to me quickly.

I don't agree that we should be using MOE Table 3-3 to calculate peaking factors for a single site development. The MOE Table 3-3 is meant to be used for small drinking water **systems** serving less than 500 people, while the proposed site service is connected to a "large" municipal water system serving more than 500 people.

I'm free on Teams if you would like to schedule a meeting to discuss.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265

From: Duquette, Vincent <Vincent.Duquette@ottawa.ca>
Sent: Monday, October 23, 2023 4:07 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.Chown@novatech-eng.com>
Subject: RE: 10 Empress - Boundary Conditions Request

Hi Miroslav,

For smaller populations such as this one, the peaking factors interpolated from the Table 3-3 from the MOE guidelines should be used instead. Please revise the demand calculations accordingly so that I can request boundary conditions from our water modelling group.

Best Regards,

Vincent Duquette, E.I.T
Project Manager, Infrastructure Approvals
Planning, Real Estate and Economic Development Department – Direction général de la planification, des biens immobilier et du développement économique
Development Review – Central 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 14048, vincent.duquette@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: October 23, 2023 2:13 PM
To: Wu, John <John.Wu@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>; Murray Chown <m.chown@novatech-eng.com>
Subject: 10 Empress - Boundary Conditions Request

Hello John,

I'm writing to request water boundary conditions for the proposed residential development located at 10 Empress Avenue N. Please provide the boundary conditions for two potential water service connections:

- Connection 1 to 150mm diameter watermain in Empress Ave N
- Connection 2 to 200mm diameter watermain in Perkins Street

Refer the attached sketch showing approximate water service connection locations.

The FUS fire flow and domestic water demands for the proposed building are calculated as follows:

- FUS Fire Flow = 267 L/s (16,000 L/min)
- Average Day Demand: 0.27 L/s
- Maximum Day Demand: 0.66 L/s
- Peak Hour Demand: 1.46 L.s

There are four existing blue bonnet municipal hydrants within the 150m range from the site. The attached sketch shows Hydrant ID numbers as well as the approximate distances to the proposed building. As per Table 1 in Technical Bulletin ISTB-2010-02, the existing hydrants should provide sufficient fire flow for the proposed building:

- Fire flow from three hydrants located less than 75m from the building: 3 x 5,700 L/min = 17,100 L/min
- Fire flow from one hydrant located between 75 and 150m from the building: 1 x 3,800 L/min
- Total fire flow from the four hydrants: 20,900 L/min

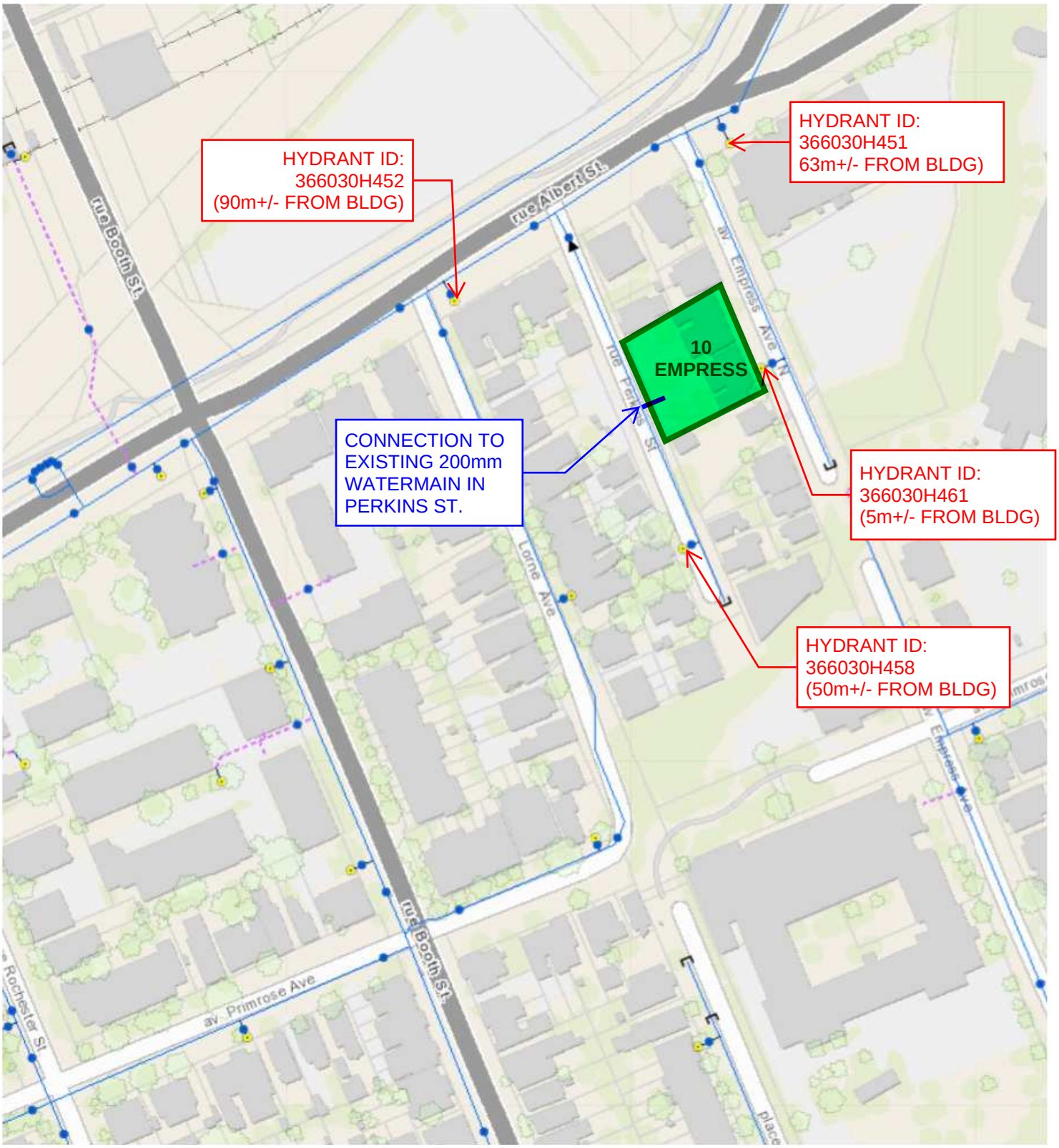
Please let me know if you have any questions or require more information to provide the boundary conditions for the project.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

'

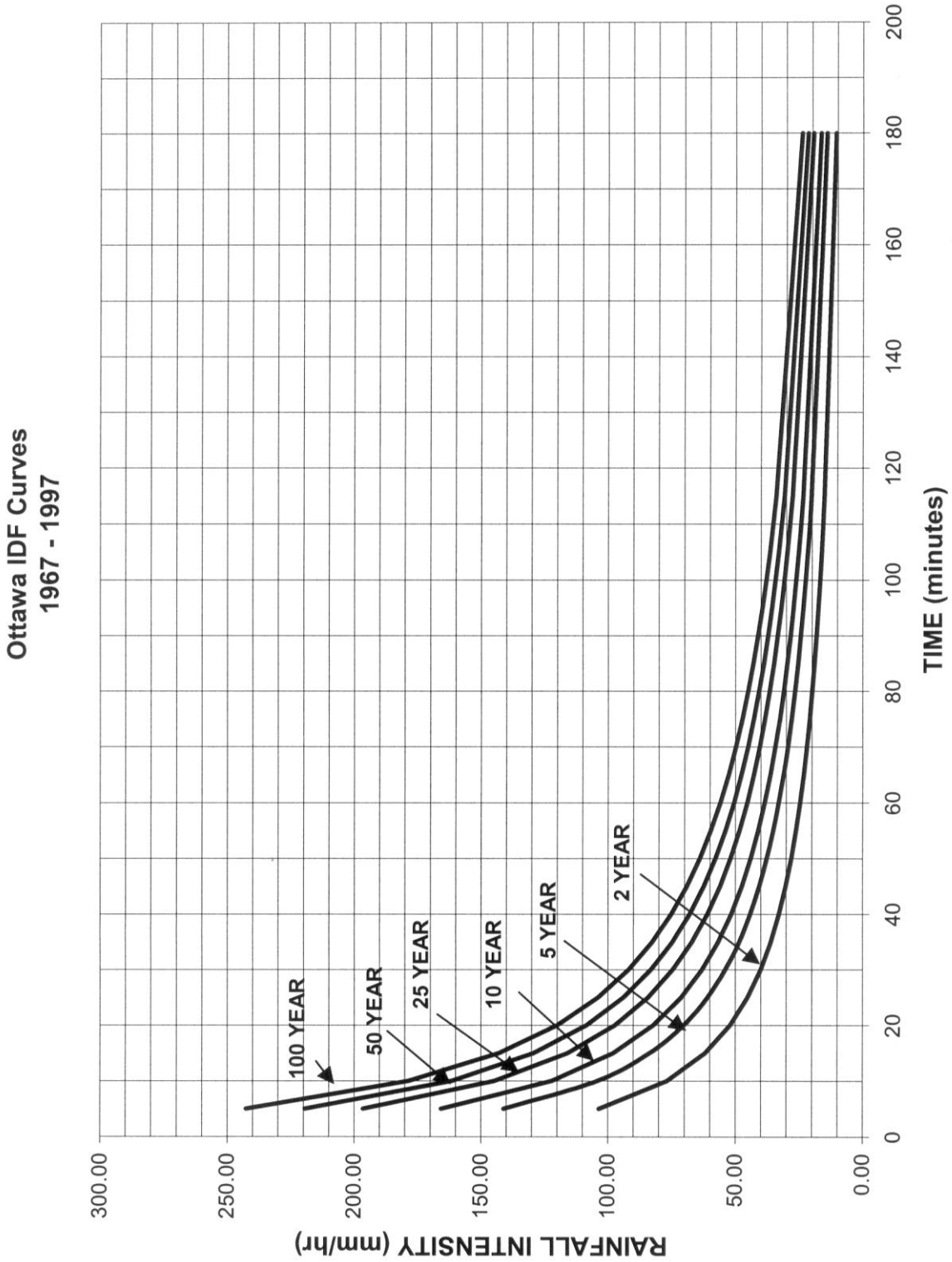
FIRE HYDRANTS SKETCH



APPENDIX E

IDF Curves and SWM Calculations

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



PROJECT NUMBER: 121234
PROJECT NAME: 10 Empress Avenue North
LOCATION: Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 6/7/2024

Proposed 4-Storey Residential Development
10 Empress Avenue North

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}	5-Year Flow (L/s)	100-Year Flow (L/s)	Allowable C_{value}	Allowable Flow 5-year (L/s)
Area EX1 to Empress	0.055	0.042	0.000	0.013	0.74	0.83	11.8	22.7	-	-
Area EX2 to Perkins	0.066	0.011	0.021	0.033	0.43	0.52	8.3	17.1	-	-
Site Total	0.121	0.053	0.021	0.046	0.57	0.66	20.1	39.7	0.5	17.6

T_c = 10mins

Post - Development : Sub-Catchment Areas and Weighted Runoff Coefficients						
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_{w5}	C_{w100}
D1	Direct Runoff to Perkins	0.017	0.006	0.011	0.45	0.51
D2	Direct Runoff to Empress	0.011	0.004	0.007	0.45	0.52
A1	Uncontrolled Flow to Empress	0.009	0.009	0.000	0.90	1.00
A2	Uncontrolled Flow to Empress	0.003	0.003	0.000	0.90	1.00
R1	Controlled Flow Roof Drain 1	0.013	0.013	0.000	0.90	1.00
R2	Controlled Flow Roof Drain 2	0.009	0.009	0.000	0.90	1.00
R3	Controlled Flow Roof Drain 3	0.007	0.007	0.000	0.90	1.00
R4	Controlled Flow Roof Drain 4	0.017	0.019	0.000	0.90	1.00
R5	Controlled Flow Roof Drain 5	0.020	0.018	0.000	0.90	1.00
R6	Controlled Flow Roof Drain 6	0.006	0.006	0.000	0.90	1.00
R7	Controlled Flow Roof Drain 7	0.009	0.009	0.000	0.90	1.00
	Summed Area Check:	0.121				

Post - Development Flows						
Area	Description	Peak Design Flow (L/s)		Storage Required (m^3)		Provided (m^3)
		5-year	100-year	5-year	100-year	
D1	Direct Runoff to Perkins	2.2	4.3	-	-	-
D2	Direct Runoff to Empress	1.4	2.9	-	-	-
A1	Uncontrolled Flow to Empress	2.3	4.5	-	-	-
A2	Uncontrolled Flow to Empress	0.8	1.5	-	-	-
R1	Controlled Flow Roof Drain 1	0.79	0.95	1.8	4.3	4.8
R2	Controlled Flow Roof Drain 2	0.79	0.87	1.0	2.6	3.7
R3	Controlled Flow Roof Drain 3	0.32	0.32	1.1	2.8	3.0
R4	Controlled Flow Roof Drain 4	0.79	0.95	2.7	6.2	7.0
R5	Controlled Flow Roof Drain 5	0.95	1.26	3.1	7.0	7.1
R6	Controlled Flow Roof Drain 6	0.87	0.95	0.4	1.3	1.8
R7	Controlled Flow Roof Drain 7	0.32	0.32	1.6	3.9	4.4
	Totals :	**11.6**	**18.8**	**11.8**	**28.1**	**31.7**
	Over Controlled:	6.0	-1.2			

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R1 **Controlled Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.013	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	1.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	4.59	3.80	1.14
10	104.19	3.39	2.60	1.56
15	83.56	2.72	1.93	1.74
20	70.25	2.28	1.49	1.79
25	60.90	1.98	1.19	1.79
30	53.93	1.75	0.96	1.74
35	48.52	1.58	0.79	1.65
40	44.18	1.44	0.65	1.55
45	40.63	1.32	0.53	1.44
50	37.65	1.22	0.43	1.30
55	35.12	1.14	0.35	1.16
60	32.94	1.07	0.28	1.01
65	31.04	1.01	0.22	0.86
70	29.37	0.96	0.17	0.69
75	27.89	0.91	0.12	0.53
90	24.29	0.79	0.00	0.00
105	21.58	0.70	-0.09	-0.55
120	19.47	0.63	-0.16	-1.13

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R1 **Controlled Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.013	ha	Qallow =	0.95	L/s
C =	1.00		Vol(max) =	4.3	m3

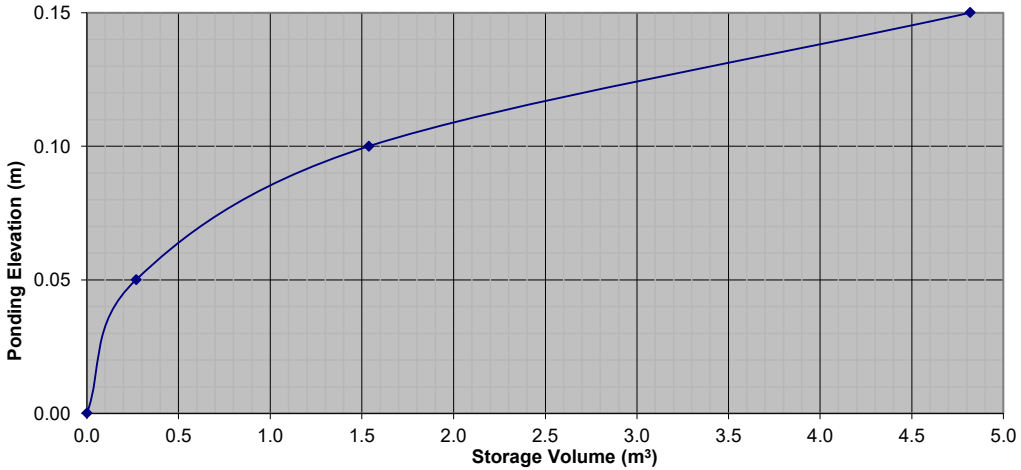
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	8.77	7.82	2.35
10	178.56	6.45	5.50	3.30
15	142.89	5.16	4.21	3.79
20	119.95	4.34	3.39	4.06
25	103.85	3.75	2.80	4.20
30	91.87	3.32	2.37	4.27
35	82.58	2.98	2.03	4.27
40	75.15	2.72	1.77	4.24
45	69.05	2.50	1.55	4.17
50	63.95	2.31	1.36	4.08
55	59.62	2.15	1.20	3.98
60	55.89	2.02	1.07	3.85
65	52.65	1.90	0.95	3.72
70	49.79	1.80	0.85	3.57
75	47.26	1.71	0.76	3.41
90	41.11	1.49	0.54	2.89
105	36.50	1.32	0.37	2.32
120	32.89	1.19	0.24	1.72

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Provided**
1:5 Year	0.79	0.79	10	1.8	4.8
1:100 Year	0.95	0.95	14	4.3	4.8

Roof Drain Storage Table for Area R1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.7	0.3
0.10	40.1	1.5
0.15	91.1	4.8

Stage Storage Curve: Area R1
Controlled Roof Drain #1



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R2 **Controlled Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.18	2.39	0.72
10	104.19	2.35	1.56	0.93
15	83.56	1.88	1.09	0.98
20	70.25	1.58	0.79	0.95
25	60.90	1.37	0.58	0.87
30	53.93	1.21	0.42	0.76
35	48.52	1.09	0.30	0.64
40	44.18	0.99	0.20	0.49
45	40.63	0.91	0.12	0.34
50	37.65	0.85	0.06	0.17
55	35.12	0.79	0.00	0.00
60	32.94	0.74	-0.05	-0.17
65	31.04	0.70	-0.09	-0.35
70	29.37	0.66	-0.13	-0.54
75	27.89	0.63	-0.16	-0.73
90	24.29	0.55	-0.24	-1.31
105	21.58	0.49	-0.30	-1.92
120	19.47	0.44	-0.35	-2.53

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R2 **Controlled Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	2.6	m3

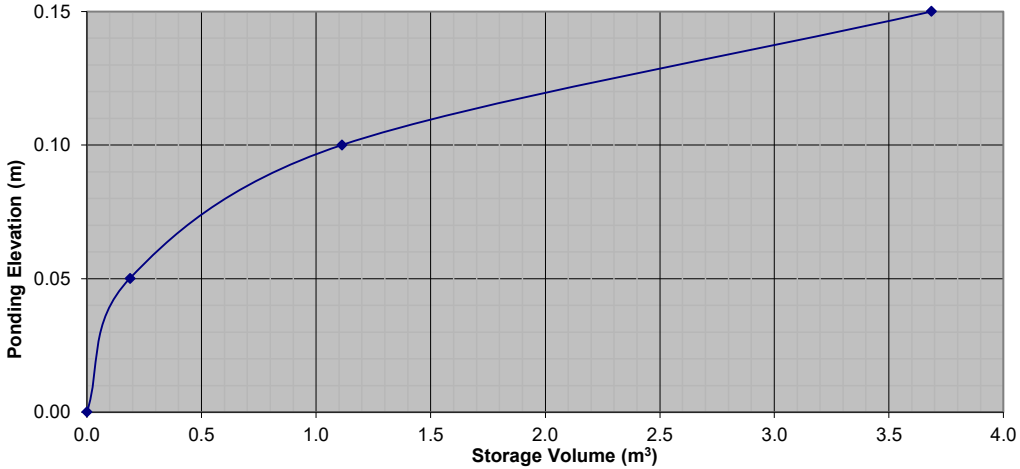
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	6.07	5.20	1.56
10	178.56	4.47	3.60	2.16
15	142.89	3.58	2.71	2.43
20	119.95	3.00	2.13	2.56
25	103.85	2.60	1.73	2.59
30	91.87	2.30	1.43	2.57
35	82.58	2.07	1.20	2.51
40	75.15	1.88	1.01	2.42
45	69.05	1.73	0.86	2.32
50	63.95	1.60	0.73	2.19
55	59.62	1.49	0.62	2.05
60	55.89	1.40	0.53	1.90
65	52.65	1.32	0.45	1.74
70	49.79	1.25	0.38	1.58
75	47.26	1.18	0.31	1.41
90	41.11	1.03	0.16	0.86
105	36.50	0.91	0.04	0.27
120	32.89	0.82	-0.05	-0.34

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Provided**
1:5 Year	0.79	0.79	10	1.0	3.7
1:100 Year	0.87	0.87	13	2.6	3.7

Roof Drain Storage Table for Area R2

Elevation	Area RD 2	Total Volume
m	m^2	m^3
0.00	0	0
0.05	7.5	0.2
0.10	29.5	1.1
0.15	73.4	3.7

Stage Storage Curve: Area R2
Controlled Roof Drain #2



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R3 **Controlled Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.007	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	2.47	2.15	0.65
10	104.19	1.82	1.50	0.90
15	83.56	1.46	1.14	1.03
20	70.25	1.23	0.91	1.09
25	60.90	1.07	0.75	1.12
30	53.93	0.94	0.62	1.12
35	48.52	0.85	0.53	1.11
40	44.18	0.77	0.45	1.09
45	40.63	0.71	0.39	1.06
50	37.65	0.66	0.34	1.02
55	35.12	0.62	0.30	0.97
60	32.94	0.58	0.26	0.93
65	31.04	0.54	0.22	0.87
70	29.37	0.51	0.19	0.82
75	27.89	0.49	0.17	0.76
90	24.29	0.43	0.11	0.57
105	21.58	0.38	0.06	0.37
120	19.47	0.34	0.02	0.15

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R3 **Controlled Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.007	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	2.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	4.72	4.40	1.32
10	178.56	3.47	3.15	1.89
15	142.89	2.78	2.46	2.21
20	119.95	2.33	2.01	2.42
25	103.85	2.02	1.70	2.55
30	91.87	1.79	1.47	2.64
35	82.58	1.61	1.29	2.70
40	75.15	1.46	1.14	2.74
45	69.05	1.34	1.02	2.76
50	63.95	1.24	0.92	2.77
55	59.62	1.16	0.84	2.77
60	55.89	1.09	0.77	2.76
65	52.65	1.02	0.70	2.75
70	49.79	0.97	0.65	2.73
75	47.26	0.92	0.60	2.70
90	41.11	0.80	0.48	2.59
105	36.50	0.71	0.39	2.46
120	32.89	0.64	0.32	2.30

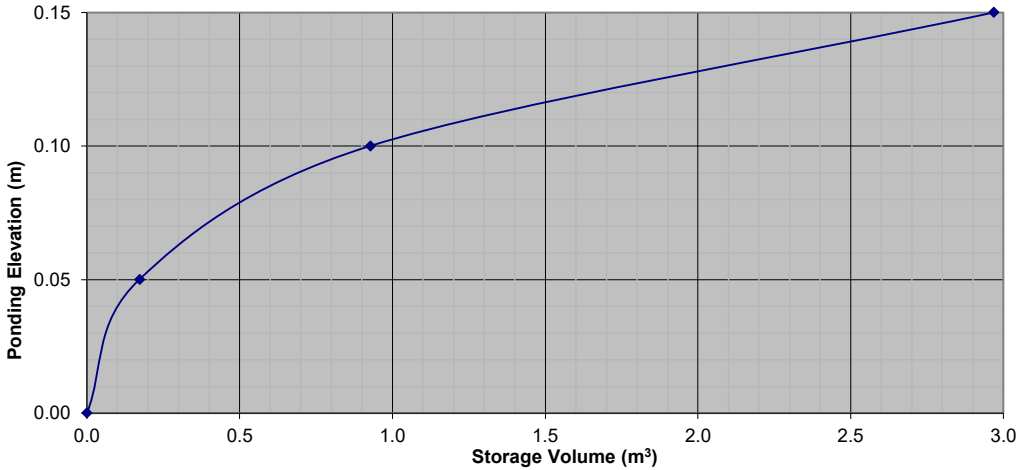
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	11	1.1	3.0
1:100 Year	0.32	0.32	15	2.8	3.0

Roof Drain Storage Table for Area R3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	6.9	0.2
0.10	23.3	0.9
0.15	58.3	3.0

Stage Storage Curve: Area R3
Controlled Roof Drain #3



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R4 **Controlled Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.017	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.00	5.21	1.56
10	104.19	4.43	3.64	2.19
15	83.56	3.55	2.76	2.49
20	70.25	2.99	2.20	2.64
25	60.90	2.59	1.80	2.70
30	53.93	2.29	1.50	2.71
35	48.52	2.06	1.27	2.67
40	44.18	1.88	1.09	2.61
45	40.63	1.73	0.94	2.53
50	37.65	1.60	0.81	2.43
55	35.12	1.49	0.70	2.32
60	32.94	1.40	0.61	2.20
65	31.04	1.32	0.53	2.07
70	29.37	1.25	0.46	1.93
75	27.89	1.19	0.40	1.78
90	24.29	1.03	0.24	1.31
105	21.58	0.92	0.13	0.81
120	19.47	0.83	0.04	0.27

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R4 **Controlled Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.017	ha	Qallow =	0.95	L/s
C =	1.00		Vol(max) =	6.2	m3

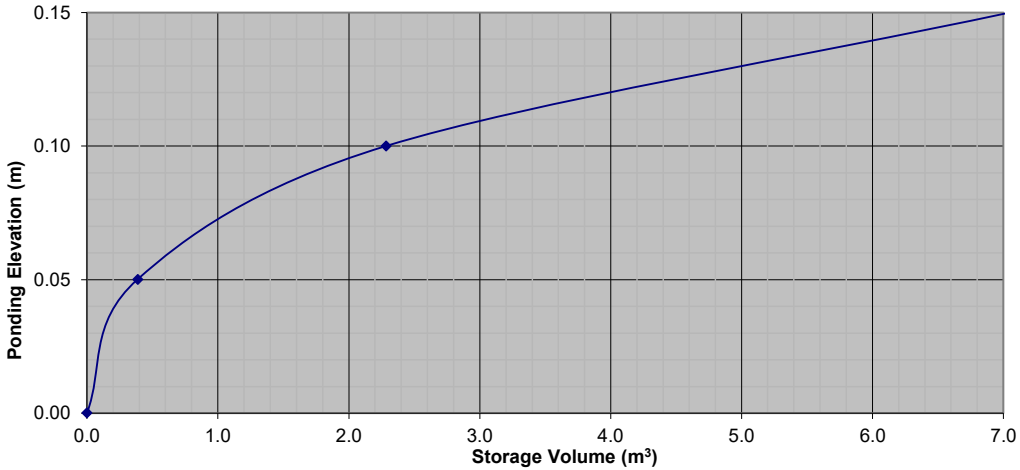
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.47	10.52	3.16
10	178.56	8.44	7.49	4.49
15	142.89	6.75	5.80	5.22
20	119.95	5.67	4.72	5.66
25	103.85	4.91	3.96	5.94
30	91.87	4.34	3.39	6.11
35	82.58	3.90	2.95	6.20
40	75.15	3.55	2.60	6.24
45	69.05	3.26	2.31	6.25
50	63.95	3.02	2.07	6.22
55	59.62	2.82	1.87	6.16
60	55.89	2.64	1.69	6.09
65	52.65	2.49	1.54	6.00
70	49.79	2.35	1.40	5.89
75	47.26	2.23	1.28	5.77
90	41.11	1.94	0.99	5.36
105	36.50	1.72	0.77	4.88
120	32.89	1.55	0.60	4.35

Watts Accutrol Flow Control Roof Drains:		RD-100-A-ADJ set to 1/4 Exposed			
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Provided**
1:5 Year	0.79	0.79	11	2.7	7.0
1:100 Year	0.95	0.95	14	6.2	7.0

Roof Drain Storage Table for Area R4

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	15.5	0.4
0.10	60.4	2.3
0.15	130.1	7.0

Stage Storage Curve: Area R4
Controlled Roof Drain #4



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R5 **Controlled Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.95	L/s
C =	0.90		Vol(max) =	3.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.11	1.83
10	104.19	5.21	4.26	2.56
15	83.56	4.18	3.23	2.91
20	70.25	3.52	2.57	3.08
25	60.90	3.05	2.10	3.15
30	53.93	2.70	1.75	3.15
35	48.52	2.43	1.48	3.10
40	44.18	2.21	1.26	3.03
45	40.63	2.03	1.08	2.92
50	37.65	1.88	0.93	2.80
55	35.12	1.76	0.81	2.66
60	32.94	1.65	0.70	2.51
65	31.04	1.55	0.60	2.35
70	29.37	1.47	0.52	2.18
75	27.89	1.40	0.45	2.00
90	24.29	1.22	0.27	1.43
105	21.58	1.08	0.13	0.82
120	19.47	0.97	0.02	0.17

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R5 **Controlled Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	1.26	L/s
C =	1.00		Vol(max) =	7.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	12.23	3.67
10	178.56	9.93	8.67	5.20
15	142.89	7.94	6.68	6.02
20	119.95	6.67	5.41	6.49
25	103.85	5.77	4.51	6.77
30	91.87	5.11	3.85	6.93
35	82.58	4.59	3.33	7.00
40	75.15	4.18	2.92	7.00
45	69.05	3.84	2.58	6.96
50	63.95	3.56	2.30	6.89
55	59.62	3.32	2.06	6.78
60	55.89	3.11	1.85	6.65
65	52.65	2.93	1.67	6.50
70	49.79	2.77	1.51	6.33
75	47.26	2.63	1.37	6.15
90	41.11	2.29	1.03	5.54
105	36.50	2.03	0.77	4.85
120	32.89	1.83	0.57	4.10

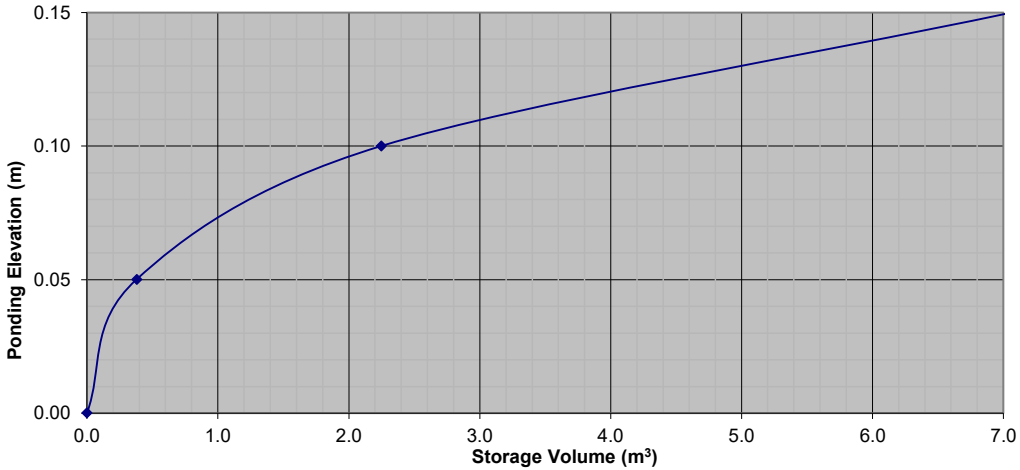
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 1/2 Exposed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.95	0.95	11	3.1	7.1
1:100 Year	1.26	1.26	15	7.0	7.1

Roof Drain Storage Table for Area R5

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	15.2	0.4
0.10	59.5	2.2
0.15	133.1	7.1

Stage Storage Curve: Area R5
Controlled Roof Drain #5



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R6 **Controlled Roof Drain #6**

OTTAWA IDF CURVE

Area = 0.006 ha Qallow = 0.87 L/s
C = 0.90 Vol(max) = 0.4 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	2.12	1.25	0.37
10	104.19	1.56	0.69	0.42
15	83.56	1.25	0.38	0.35
20	70.25	1.05	0.18	0.22
25	60.90	0.91	0.04	0.07
30	53.93	0.81	-0.06	-0.11
35	48.52	0.73	-0.14	-0.30
40	44.18	0.66	-0.21	-0.50
45	40.63	0.61	-0.26	-0.70
50	37.65	0.57	-0.30	-0.91
55	35.12	0.53	-0.34	-1.13
60	32.94	0.49	-0.38	-1.35
65	31.04	0.47	-0.40	-1.58
70	29.37	0.44	-0.43	-1.80
75	27.89	0.42	-0.45	-2.03
90	24.29	0.36	-0.51	-2.73
105	21.58	0.32	-0.55	-3.44
120	19.47	0.29	-0.58	-4.16

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R6 **Controlled Roof Drain #6**

OTTAWA IDF CURVE

Area = 0.006 ha Qallow = 0.95 L/s
C = 1.00 Vol(max) = 1.3 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	4.05	3.10	0.93
10	178.56	2.98	2.03	1.22
15	142.89	2.38	1.43	1.29
20	119.95	2.00	1.05	1.26
25	103.85	1.73	0.78	1.17
30	91.87	1.53	0.58	1.05
35	82.58	1.38	0.43	0.90
40	75.15	1.25	0.30	0.73
45	69.05	1.15	0.20	0.54
50	63.95	1.07	0.12	0.35
55	59.62	0.99	0.04	0.15
60	55.89	0.93	-0.02	-0.06
65	52.65	0.88	-0.07	-0.28
70	49.79	0.83	-0.12	-0.50
75	47.26	0.79	-0.16	-0.73
90	41.11	0.69	-0.26	-1.43
105	36.50	0.61	-0.34	-2.15
120	32.89	0.55	-0.40	-2.89

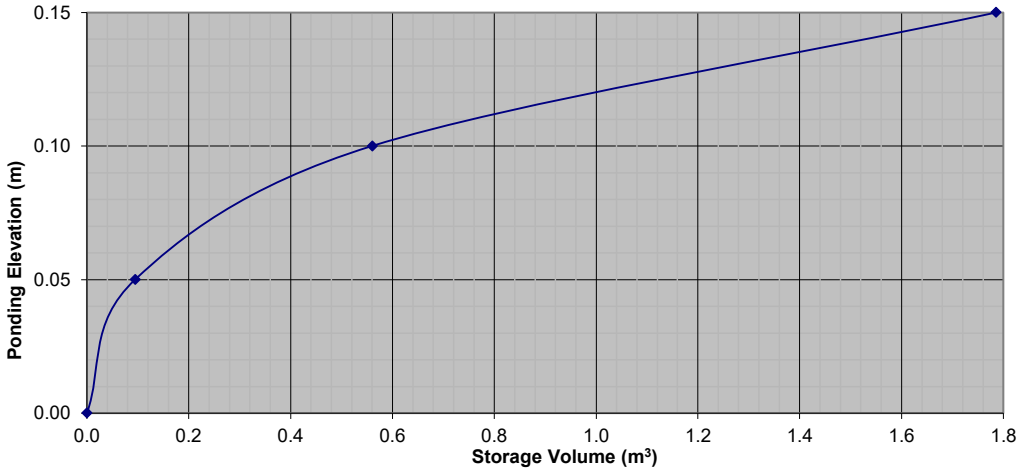
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 1/2 Exposed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.87	0.87	9	0.4	1.8
1:100 Year	0.95	0.95	13	1.3	1.8

Roof Drain Storage Table for Area R6

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	3.8	0.1
0.10	14.8	0.6
0.15	34.2	1.8

Stage Storage Curve: Area R6
Controlled Roof Drain #6



Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R7 **Controlled Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.18	2.86	0.86
10	104.19	2.35	2.03	1.22
15	83.56	1.88	1.56	1.41
20	70.25	1.58	1.26	1.51
25	60.90	1.37	1.05	1.58
30	53.93	1.21	0.89	1.61
35	48.52	1.09	0.77	1.62
40	44.18	0.99	0.67	1.62
45	40.63	0.91	0.59	1.61
50	37.65	0.85	0.53	1.58
55	35.12	0.79	0.47	1.55
60	32.94	0.74	0.42	1.52
65	31.04	0.70	0.38	1.48
70	29.37	0.66	0.34	1.43
75	27.89	0.63	0.31	1.39
90	24.29	0.55	0.23	1.23
105	21.58	0.49	0.17	1.05
120	19.47	0.44	0.12	0.85

Proposed 4-Storey Residential Development
Novatech Project No. 121234
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R7 **Controlled Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	6.07	5.75	1.73
10	178.56	4.47	4.15	2.49
15	142.89	3.58	3.26	2.93
20	119.95	3.00	2.68	3.22
25	103.85	2.60	2.28	3.42
30	91.87	2.30	1.98	3.56
35	82.58	2.07	1.75	3.67
40	75.15	1.88	1.56	3.74
45	69.05	1.73	1.41	3.80
50	63.95	1.60	1.28	3.84
55	59.62	1.49	1.17	3.87
60	55.89	1.40	1.08	3.88
65	52.65	1.32	1.00	3.89
70	49.79	1.25	0.93	3.89
75	47.26	1.18	0.86	3.88
90	41.11	1.03	0.71	3.83
105	36.50	0.91	0.59	3.74
120	32.89	0.82	0.50	3.62

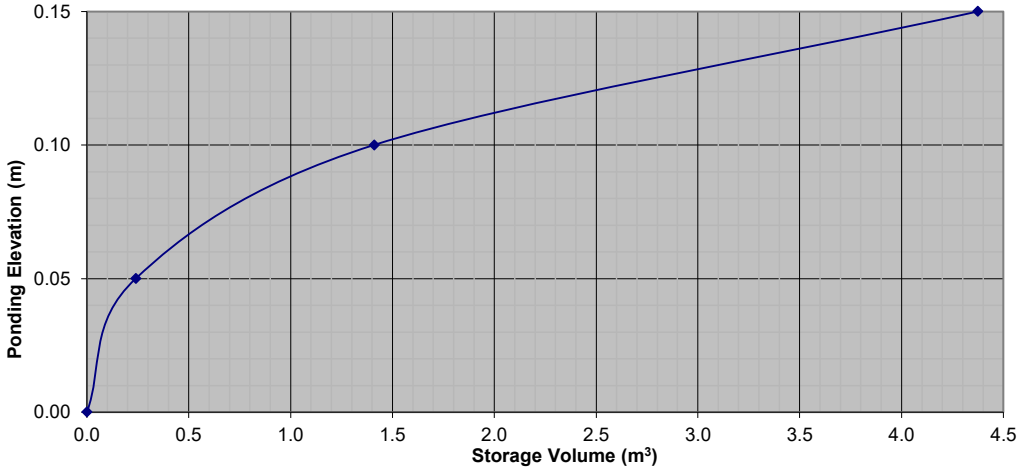
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.32	0.32	11	1.6	4.4
1:100 Year	0.32	0.32	14	3.9	4.4

Roof Drain Storage Table for Area R7

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	9.6	0.2
0.10	37.2	1.4
0.15	81.3	4.4

Stage Storage Curve: Area R7
Controlled Roof Drain #7



LEGEND

DRAINAGE AREA LIMITS

EX1
0.11
0.71

PRE-DEVELOPMENT AREA ID

PRE-DEVELOPMENT DRAINAGE AREA (ha)

1:5 YEAR WEIGHTED RUNOFF COEFICIENT

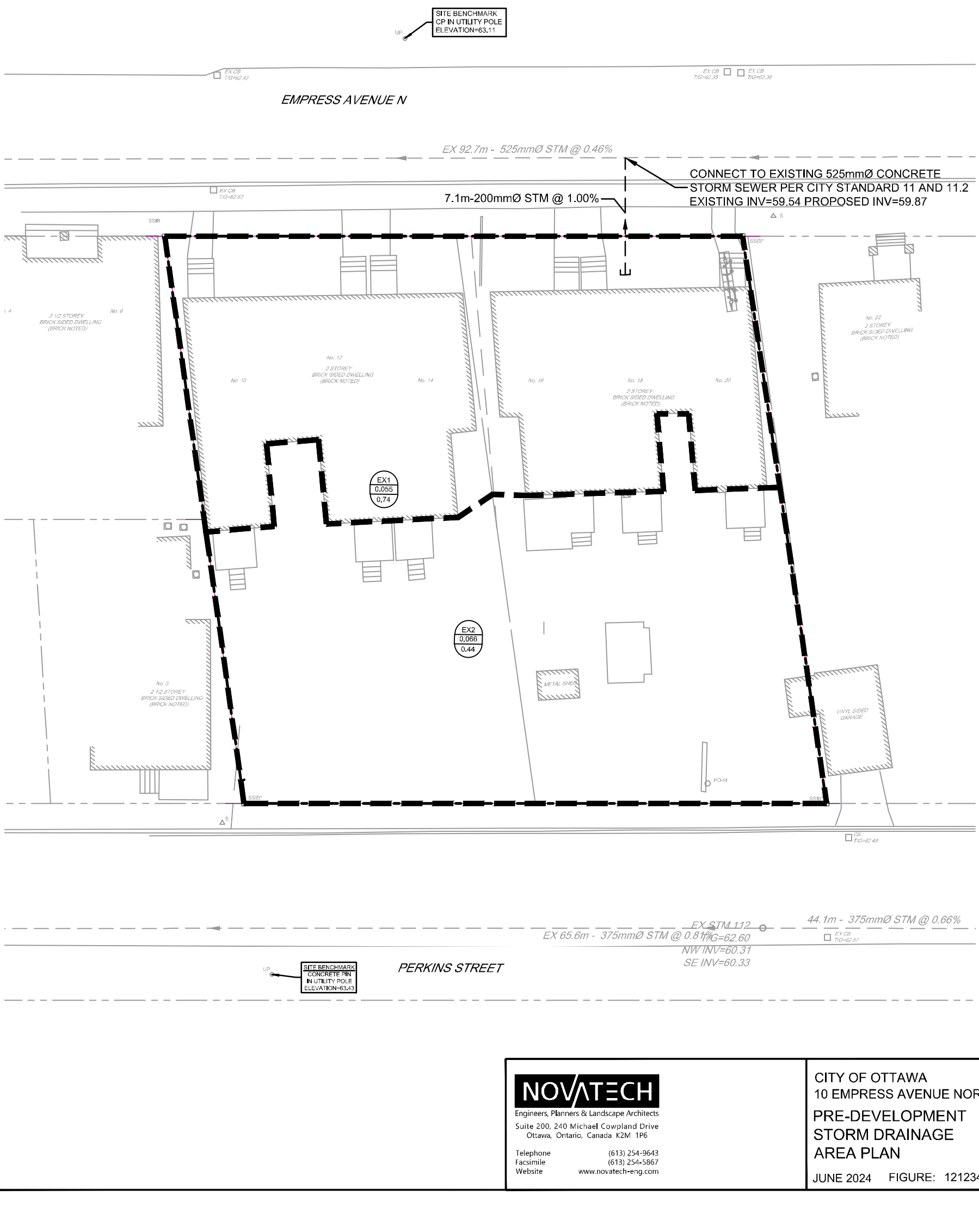
EXISTING CONCRETE CURB

HYD *EXISTING HYDRANT*

CBMH *EXISTING CATCHBASIN*

CB *EXISTING CATCHBASIN MH*

EX UP *EXISTING UTILITY POLE C/W GUY WIRES*



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

CITY OF OTTAWA
10 EMPRESS AVENUE NORTH

PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

JUNE 2024 FIGURE: 121234-PRE

APPENDIX F

Control Flow Rood Drain Information

WATTS®	Adjustable Accutrol Weir Tag: _____	Adjustable Flow Control for Roof Drains

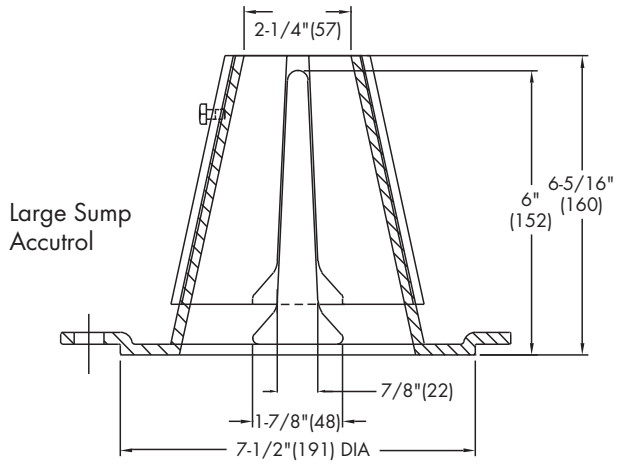
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

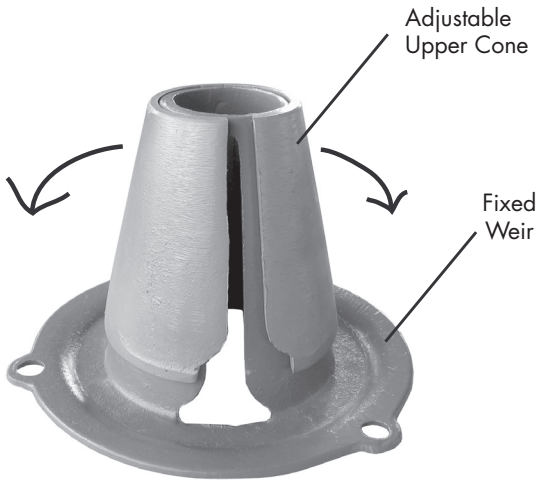
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

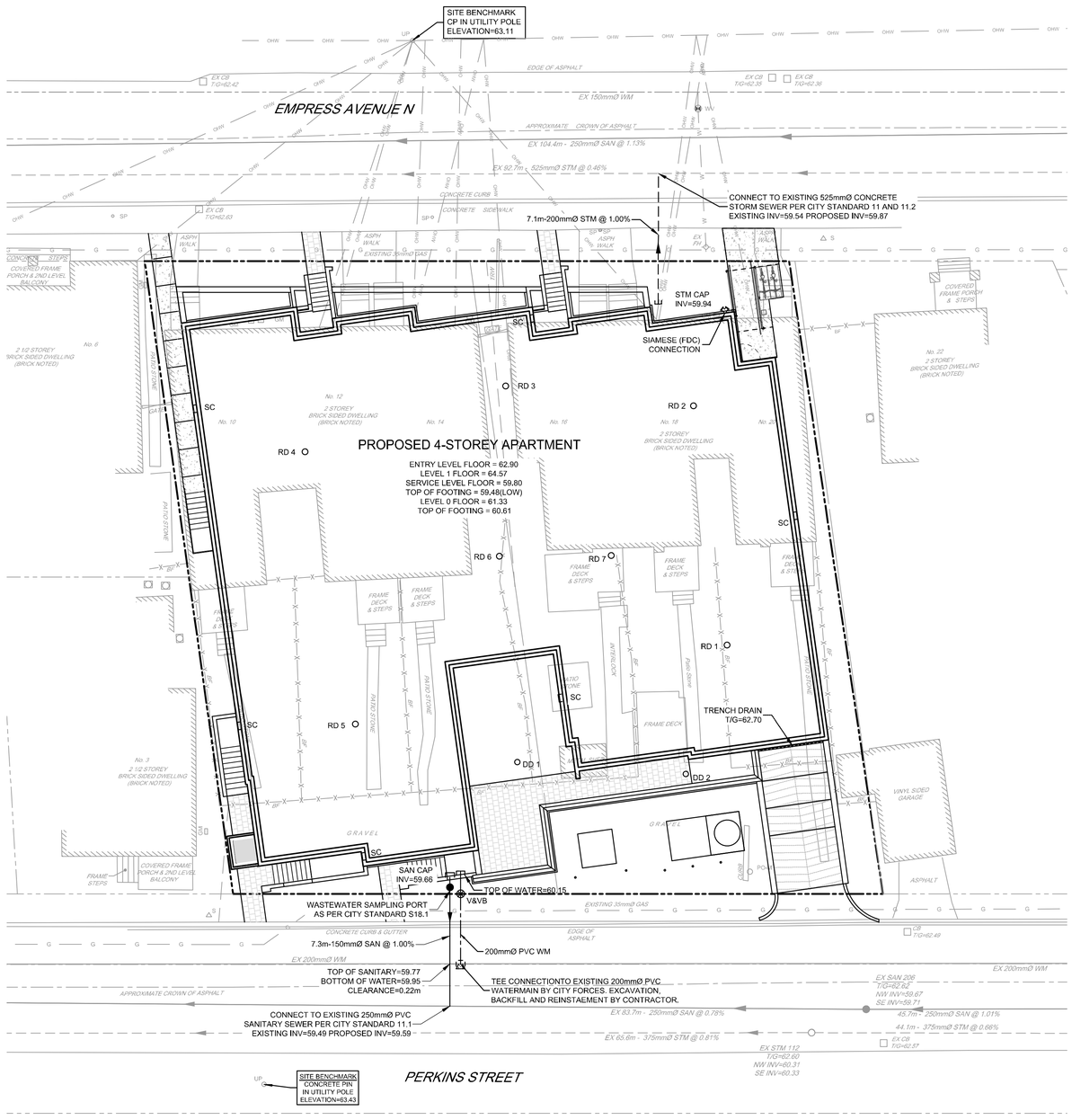
Engineer _____ Representative _____

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

WATTS®
A Watts Water Technologies Company

APPENDIX G

Drawings



GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. 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.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. 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.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. 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.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT (FILE No. 329062.001), DATED FEBRUARY 22, 2024, PREPARED BY PINCHIN LTD., 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.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2023-111) PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD, & AWWA GUIDELINES - ALL CURRENT VERSIONS AND AS AMENDED.
13. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
STORM MANHOLE (1200mmØ)	701.010	OPSD
STORM / CBMH MANHOLE FRAME AND COVER	401.010 - TYPE "B"	OPSD
SEWER TRENCH	S6	CITY OF OTTAWA
STORM SERVICE	PVC DR 35	
SANITARY SERVICE	PVC DR 35	

3. THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
4. THE STORM SERVICE LATERAL SHALL BE EQUIPPED WITH A BACKFLOW PREVENTER WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14. REFER TO MECHANICAL PLANS FOR DETAILS.
5. 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.
6. 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 T/G ELEVATIONS, STRUCTURE LOCATIONS AND ANY ALIGNMENT CHANGES, ETC.
7. 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 SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

WATERMAIN NOTES:

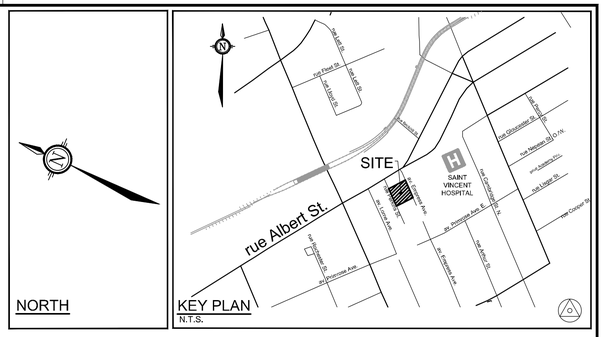
1. SUPPLY AND CONSTRUCT ALL WATERMAIN AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND 'AS AMENDED'.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN MATERIAL	PVC DR 18	

3. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS 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.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
5. PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, UNLESS OTHERWISE INDICATED.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

PROPOSED 200mmØ WATER SERVICE TABLE

STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+000	62.67	60.15±	CONNECT TO EXISTING
0+003.8	62.80	60.15	VALVE AND VALVE BOX
0+005.1	62.80	60.15	CAP 1.0m FROM BUILDING WALL



LEGEND:

- PROPERTY LINE
- RD — PROPOSED CONTROLLED FLOW ROOF DRAIN
- M RM — PROPOSED WATER METER AND REMOTE METER
- DD — PROPOSED DECK DRAIN (SEE MECHANICAL FOR DETAILS)
- PROPOSED BUILDING ENTRANCE
- PROPOSED WATER SERVICE
- PROPOSED STORM SERVICE
- PROPOSED SANITARY SERVICE
- VB — PROPOSED VALVE AND VALVE BOX
- WATERMAIN CAP
- OHW — EXISTING OVERHEAD WIRES
- EXISTING CONCRETE CURB
- SANMH — EXISTING SANITARY MANHOLE & SEWER
- CBMH — EXISTING CATCHBASIN MANHOLE
- STMMH — EXISTING STORM MANHOLE & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- HYD — V&VB — EXISTING HYDRANT & VALVE
- EXISTING TREES / VEGETATION
- EX UP — EXISTING UTILITY POLE
- EXISTING FENCE
- 300mmØ WM — EXISTING WATERMAIN
- HYD — EXISTING HYDRANT C/W VALVE & LEAD

ROOF DRAIN TABLE: AREA R1 to R7 (FOR DRAINS RD1 to RD7)

AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
R1	RD 1 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/S	10 cm	0.95 L/S	14 cm
R2	RD 2 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/S	10 cm	0.87 L/s	13 cm
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SCALE
1:150
1:150
0 2 4 6

DESIGN LSC /MS
CHECKED MS
DRAWN LSC
CHECKED MS
APPROVED MS

FOR REVIEW ONLY

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
10 EMPRESS AVE

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 121234
REV REV #4
DRAWING No. 121234-GP

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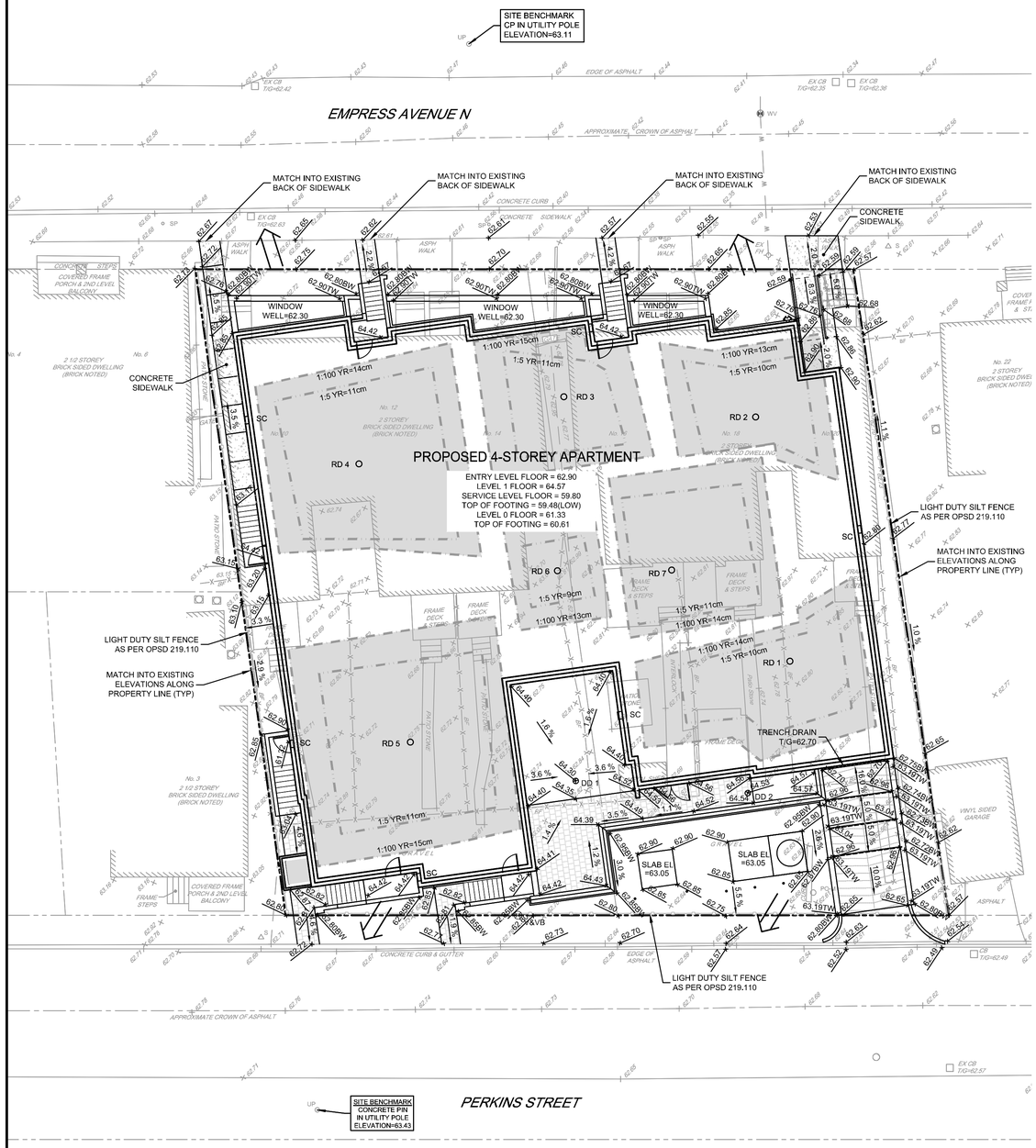

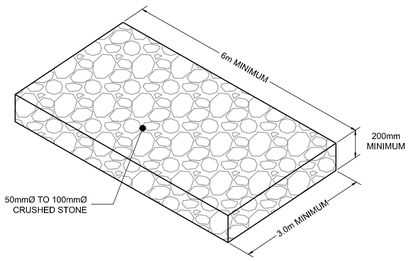

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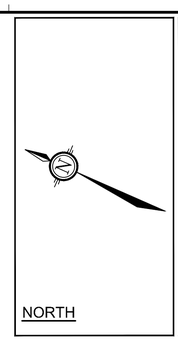

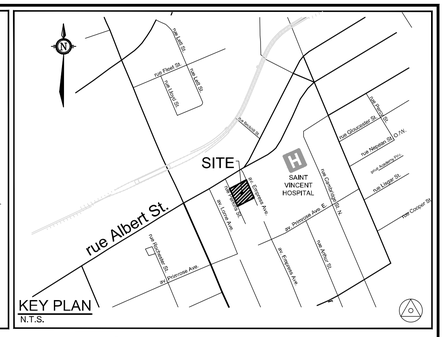

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. 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.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. 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.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. 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.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT (FILE No. 329062.001), DATED FEBRUARY 22, 2024, PREPARED BY PINCHIN LTD., 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.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2023-111) PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD, & AWWA GUIDELINES - ALL CURRENT VERSIONS AND AS AMENDED.
13. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. CURBS SHALL BE 150mm BARRIER CURB AS PER CITY OF OTTAWA STANDARD SC1.1 ON EMPRESS AVENUE AND MOUNTABLE CURB AS PER CITY OF OTTAWA STANDARD SC1.3 ON PERKINS STREET.
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES :

1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
2. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
4. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
5. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
6. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
7. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

Erosion and Sediment Control Responsibilities:

				During Construction			After Construction Prior to Final Acceptance		After Final Acceptance
	ESC Measure	Symbol	Specification	Installation Responsibility	Inspection/Maintenance Responsibility	Inspection Frequency	Approval to Remove	Removal Responsibility	Inspection/Maintenance Responsibility
Temporary Measures	Silt Fence		OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Filter Fabric	Location as Indicated in ESC Note #3	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Mud Mat		Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Dust Control	Location as Required Around Site	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Stabilized Material Stockpiling	Location as Required by Contractor	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Sediment Basin (for flows being pumped out of excavations)	Location as Required by Contractor	- - -	Developer's Contractor	Developer's Contractor	After Every Rainstorm	Developer's Contractor	Developer's Contractor	N/A

LEGEND

━ ━ ━	PROPERTY LINE
59.85	PROPOSED ELEVATION
+ 59.83	*EXISTING ELEVATION*
59.71TW	PROPOSED TOP OF WALL ELEVATION
57.23BW	PROPOSED BOTTOM OF WALL ELEVATION
← 2.0%	GRADE AND DIRECTION
⇐	DIRECTION OF MAJOR SYSTEM OVERLAND FLOW
○ RD	PROPOSED CONTROLLED FLOW ROOF DRAIN
○ DD	PROPOSED DECK DRAIN (SEE MECHANICAL FOR DETAILS)
☐ SC	PROPOSED ROOFTOP SCUPPER LOCATION
X	REMOVAL AND/OR ABANDONMENT
V&VB ⊗	PROPOSED VALVE AND VALVE BOX
1:5 YR 1:100 YR	APPROXIMATE PONDING LIMITS
───	*EXISTING EDGE OF PAVEMENT*
V&VB ⊗	*EXISTING VALVE & VALVE BOX*
HYD	*EXISTING HYDRANT*
COMB MH ●	*EXISTING COMBINED MH*
CB ☐	*EXISTING CATCHBASIN*
EX UP ○	*EXISTING UTILITY POLE*
─x─x─x─	*EXISTING FENCE*

ROOF DRAIN TABLE: AREA R1 to R7 (FOR DRAINS RD1 to RD7)

AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
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SCALE
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1:150
0 2 4 6

DESIGN MS / LSC
CHECKED MS
DRAWN LSC
CHECKED MS
APPROVED MS

FOR REVIEW ONLY

M. SAVIC
100102651
08/09/24

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
10 EMPRESS AVE

DRAWING NAME
GRADING, EROSION AND
SEDIMENT CONTROL PLAN

PROJECT No. 121234
REV REV # 4
DRAWING No. 121234-GR

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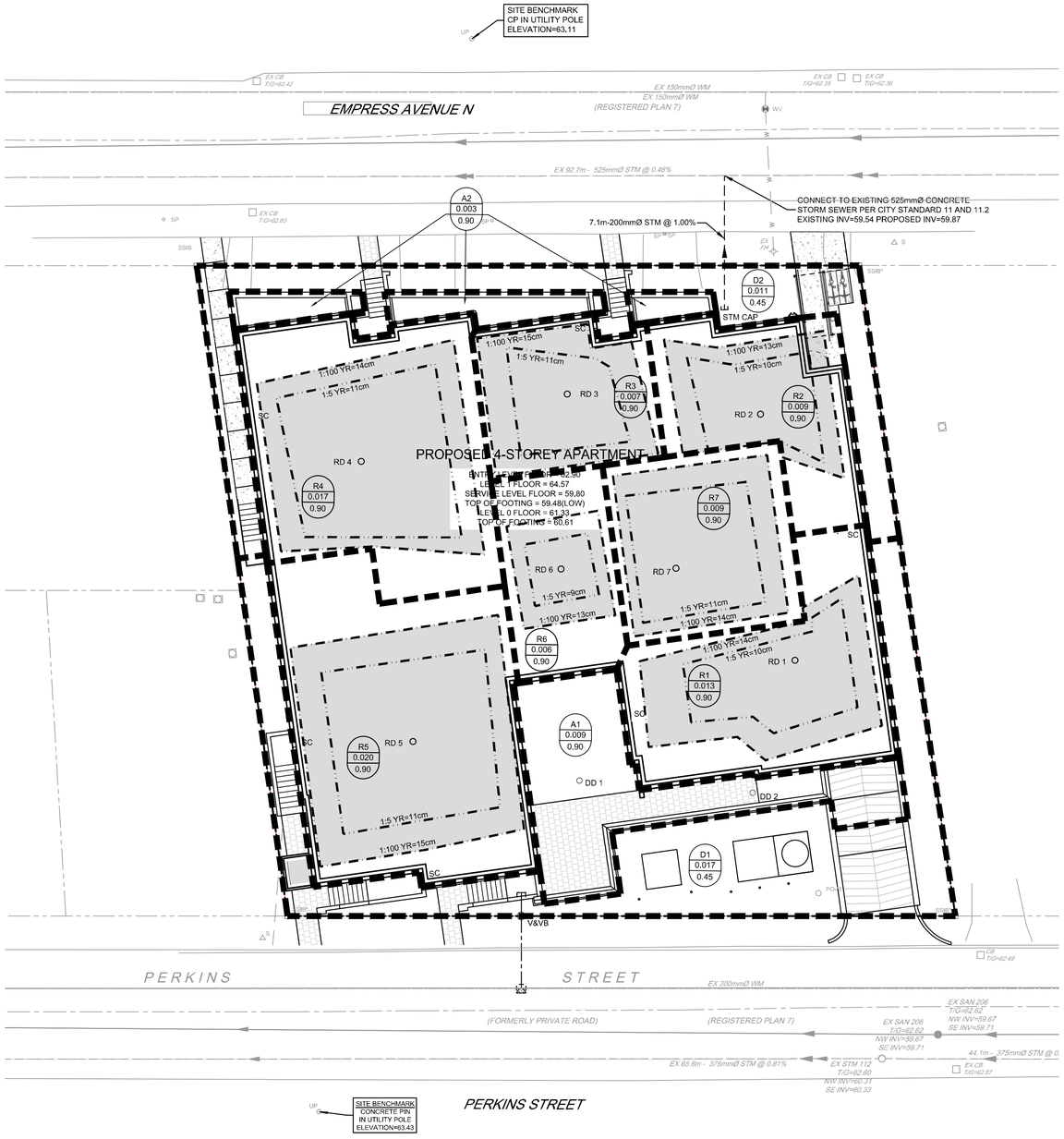

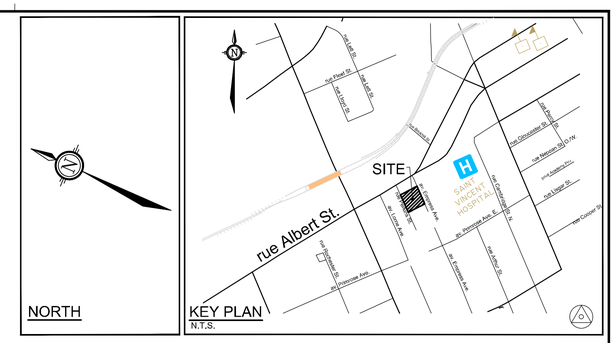

LEGEND

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- PROPOSED STORM SEWER AND FLOW DIRECTION
- DRAINAGE AREA LIMITS
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED BUILDING ENTRANCE / EXIT
- 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- STM MH — EXISTING STORM MH & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- A-3 / 0.023 / 0.71 — POST-DEVELOPMENT AREA ID / POST-DEVELOPMENT DRAINAGE AREA (ha) / 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- RD — PROPOSED CONTROLLED FLOW ROOF DRAIN
- SC — PROPOSED ROOFTOP SCUPPER LOCATION

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SCALE: 1:150 (1:150, 0 2 4 6)

DESIGN: CV
CHECKED: MS
DRAWN: CV / KH
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APPROVED: MS

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LICENSED PROFESSIONAL ENGINEER — M. SAVIC — 100102651 — 08/09/24 — PROVINCE OF ONTARIO

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10 EMPRESS AVE

DRAWING NAME
POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

PROJECT No. 121234
REV REV # 1
DRAWING No. 121234-SWM

PLAN A1.DWG - 841mmx594mm

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