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PROPOSED RESIDENTIAL DEVELOPMENT
3459 & 3479 St. Joseph

Development Servicing Study and Stormwater Management Report

PROPOSED RESIDENTIAL DEVELOPMENT
3459 & 3479 ST. JOSEPH BOULEVARD

DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT

Prepared by:

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July 19, 2024
Revised December 23, 2024
Revised May 09, 2025

Ref: R-2023-086
Novatech File No. 113020

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Engineers, Planners & Landscape Architects

May 09, 2025

8417709 Canada Inc.
430 Boulevard de l'Hôpital, Suite 310
Gatineau, Québec
J8V 1T7

Attention: Mr. Paul-André Charbonneau

Re: Development Servicing Study and Stormwater Management Report
Proposed Residential Development
3459 & 3479 St. Joseph Boulevard, Ottawa, ON
Novatech File No.: 113020

Enclosed is a copy of the revised 'Development Servicing Study and Stormwater Management Report' for the proposed residential development located at 3459 & 3479 St. Joseph Boulevard, in the City of Ottawa. This report addresses the approach to site servicing. grading, and stormwater management, and is being submitted in support of a Site Plan Control application.

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

NOVATECH

François Thauvette, P. Eng.
Senior Project Manager

cc: Kelsey Charie (City of Ottawa)
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1.0 INTRODUCTION

Novatech has been retained by 8417709 Canada Inc. to complete the site servicing, grading and stormwater management design proposed residential development of the 3459 & 3479 St. Joseph Boulevard properties. This report is being submitted in support of a Site Plan Control application.

1.1 Location and Site Description

The subject site is located at 3459 & 3479 St. Joseph Boulevard, in the City of Ottawa, and covers a total area of approximately 1.78 hectares. A small single-family house with a driveway and detached garage currently occupies the 3459 St. Joseph Boulevard parcel. The remainder of the subject site (3479 St. Joseph Boulevard) is undeveloped. The subject site is located on the north side of St. Joseph Boulevard and is bordered by Highway 174 to the north, an existing eastbound Hwy 174 on-ramp to the west and the Terra-Nova Estates (mobile home park) property to the east. The legal description of the site is designated as Part of Lot 33, Concession 1 (Old Survey), Part 2 on Plan 50R-7267, Except Part 11 on Plan 50R-7367, Geographic Township of Cumberland, City of Ottawa and Part of Lot 33, Concession 1 (Old Survey), Geographic Township of Cumberland, City of Ottawa.

Figure 1: Aerial View of the Subject Site

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on June 30th, 2020, at which time the client was advised of the general submission requirements. Subsequent meetings and discussions were held with the City's Planning and Engineering Departments to obtain further clarification on

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

1.3 Proposed Development

The two properties (3459 & 3479 St. Joseph Boulevard) are to be merged into a single property. The proposed development will consist of a total of four (4) multi-storey residential buildings with surface and underground parking as well as outdoor amenity space. The existing topography will have an impact on development, as the grade drops approximately 4.0m from St. Joseph Boulevard at the south end of the property down to the existing roadside ditch flowing east along the Highway 174 on-ramp at the north end of the property.

A Roadway Modification Approval (RMA) will be required as part of the proposed re-development for a section of the Hwy 174 on-ramp to provide a second access to the site.

1.4 Design Guidelines and Reference Material

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

- Ottawa Sewer Design Guidelines (2012) and Technical Bulletins (2010-present)
- Ottawa Design Guidelines for Water Distribution (2010) & Tech. Bulletins (2010-present)
- 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
- Ontario Provincial Standards

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

[1] The Assessment of Adequacy of Public Services Report – Proposed Residential Development 3459 & 3479 St. Joseph Boulevard (Ref. No. R-2020-145), prepared by Novatech, revised July 11, 2022.

[2] The Geotechnical Investigation Report (Ref. No. PG5091-1), prepared by Paterson Group Inc. on November 6, 2019.

[3] CHS Lands Municipal Servicing Study, prepared by Stantec Consulting Ltd., Final Revision December 2007.

2.0 SITE SERVICING

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. The servicing criteria, the expected sewage flows, and the water demands are to conform to the requirements of the City of Ottawa municipal design guidelines for sewer and water distribution systems. Refer to the General Plan of Services (113020-GP1 & 113020-GP2) and 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 in the report to confirm that each applicable

item is deemed complete and ready for review by City of Ottawa Infrastructure Approvals. Enclosed in **Appendix B** of the report is a completed checklist.

2.1 Sanitary Servicing

Based on discussions with the Mechanical Engineer, it was determined that the best way to service the proposed 4-building development would be with two (2) separate outlets to the municipal sanitary sewer system. It will simply be too difficult from a mechanical plumbing perspective to service the entire site (all 4 buildings) with a single sanitary outlet as schematically depicted in the Assessment of Adequacy of Public Services Report[1]. This general approach was discussed and approved by the City of Ottawa. As a result, the proposed development will be serviced as follows:

Buildings A and B

Buildings A and B will be serviced by extending a new 250mm dia. sanitary sewer along the existing roadway (Hwy 174 on-ramp) and along the west side of building B from the existing 750mm dia. sanitary trunk sewer, located on the west side of the R.O.W. The proposed sewer will be relatively shallow due to the elevation of the trunk sewer (assuming an obvert-to-obvert connection).

Buildings C and D

Building C and D will be serviced by extending a new 250mm dia. sanitary service directly from the 450mm dia. municipal sanitary sewer in St. Joseph Boulevard.

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 the City of Ottawa Sewer Design Guidelines and subsequent Technical Bulletins:

Residential and Commercial Uses

- Residential Units (1-Bedroom or Studio): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day (ISTB-2018-01)
- Residential Peaking Factor = 3.53-3.59 (Harmon Equation)
- Infiltration Allowance: 0.33 L/s/ha (ISTB-2018-01)

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

Table 1: Theoretical Post-Development Sanitary Flows

Buildings	Total Unit Count	Design Population	Peaking Factor	Average Flow (L/s)	Peak Extraneous Flows (L/s)	Total Peak Sewage Flow (L/s)
Building A	103	178	3.53	2.0	0.2	2.2
Building B	60	105	3.59	1.2	0.1	1.3
Sub-Total	**163**	**283**	**-**	**3.2**	**0.3**	**3.5**
Building C	60	105	3.59	1.2	0.1	1.3
Building D	103	178	3.53	2.0	0.2	2.2
Sub-Total	**163**	**283**	**-**	**3.2**	**0.3**	**3.5**
Total	**326**	**566**		**6.4***	**0.6***	**7.0***

* Represents Rounded Values

A 250mm dia. PVC sanitary sewer/service at a minimum slope ranging between 0.3% - 1.0% has a full flow conveyance capacity of approximately 34 L/s - 62 L/s and will have enough capacity to convey the theoretical sanitary flows from the proposed development. Refer to **Appendix C** for detailed sanitary sewage calculations.

2.2 Water Supply for Domestic Use and Firefighting

The subject site is located within the City of Ottawa 1E watermain pressure zone. Under post-development conditions, the proposed development will be serviced by the municipal watermain in St. Joseph Boulevard. The intent is to provide a looped private watermain by providing two (2) feeds to the site off the 400mm dia. municipal watermain network. Two (2) water supplies are required for larger developments, when the daily water demands are greater than 50m^3/day (0.58 L/s). All buildings and private on-site hydrants will be fed internally from the looped private watermain network. Detailed design of the internal mechanical plumbing will need to be refined as part of the detailed design stage and Building Permit application. The on-site buildings will be sprinklered and the water meters will be located within the respective water entry rooms of the buildings, with the remote meters and siamese connections on the exterior face of the buildings.

2.2.1 Water Demands and Watermain Analysis

The theoretical water demand and fire flow calculations are based on criteria in the City of Ottawa Design Guidelines. The fire flow requirements were calculated per the Fire Underwriters Survey (FUS) as indicated in City of Ottawa Technical Bulletin ISTB-2021-03, based on information provided by the architect. The following design criteria were taken from City of Ottawa Sewer Design Guidelines and subsequent Technical Bulletins:

- Residential Units (1-Bedroom or Studio): 1.4 people per unit
- Residential Units (2-Bedroom): 2.1 people per unit
- Average Daily Residential Water Demand: 280 L/person/day (ISTB-2021-03)
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand (City Water Table 4.2)
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand (City Water Table 4.2)

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

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

Proposed Residential Development	Unit Count	Design Population	Avg. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	FUS Fire Flow (L/s)
Building A	103	178	0.6	1.4	3.2	133
Building B	60	105	0.3	0.9	1.9	100
Building C	60	105	0.3	0.9	1.9	100
Building 'D'	103	178	0.6	1.4	3.2	133
Total	**326**	**566**	**1.8**	**4.6***	**10.2***	**133 Max**

*Represents rounded values.

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

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

The following table summarizes preliminary hydraulic analysis results based on municipal watermain boundary conditions provided by the City of Ottawa.

Municipal Watermain Boundary Condition	Boundary Condition Head of Water (m)	Normal Operating Pressure Range (psi)	Anticipated Pressure at Municipal WM (psi)*
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 1) West			
Min. HGL (Peak Hour Demand)	109.1 m	40 psi (min.)	~ 67.6 psi
Max. HGL (Max Day Demand)	113.9 m	50-70 psi	~ 74.5 psi
HGL Max Day + Fire Demand	104.3 m	20 psi (min.)	~ 60.8 psi
HGL Max Day + Fire Demand	103.1 m	20 psi (min.)	~ 59.1 psi
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 2) East			
Min. HGL (Peak Hour Demand)	109.1 m	40 psi (min.)	~ 68.5 psi
Max. HGL (Max Day Demand)	113.9 m	50-70 psi	~ 75.4 psi
HGL Max Day + Fire Demand	104.2 m	20 psi (min.)	~ 61.5 psi
HGL Max Day + Fire Demand	103.0 m	20 psi (min.)	~ 59.8 psi

*Based on an approximate elevation of 61.5m at WM connection 1 and 60.9m at WM connection 2.

As previously discussed with the City, a multi-hydrant approach to firefighting will be required to supply adequate fire flow to the proposed development, including both municipal and private on-site hydrants. Based on a review of the geoOttawa website, there appear to be two (2) Class AA (blue bonnet) municipal fire hydrants within 75m of the on-site buildings. The hydrants within 75m are located west of the site on the NW corner of the St. Joseph/Hwy 174 on-ramp (ID382038H163) and the SE corner of the site (ID382038H164). The proposed design will also include private on-site hydrants to provide adequate fire flow to the proposed development. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, Class AA (blue bonnet) hydrants within 75m of the building should provide a minimum capacity 95 L/s each (at a pressure of 20 PSI). The combined maximum flow from these municipal and private hydrants will exceed the Max. Day + Fire Flow requirement (206 L/s) of the proposed development. This approach is in accordance with City Technical Bulletin ISTB-2018-02.

Table 2.2 summarizes the 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: **Fire Protection Summary Table**

Building	FUS Fire Flow Demand (L/s)	Fire Hydrant(s) within 75m (~ 95 L/s each)	Fire Hydrant(s) within 150m (~ 63 L/s each)	Theoretical Combined Available Fire Flow (L/s)
Building A	133	2	2	**>133**
Building B	100	2	2	**>100**
Building C	100	1	5	**>100**
Building D	133	3	3	**>133**

The combined maximum flow from the nearby hydrants will exceed the Max Day + Fire Flow requirement of the proposed development. This multi-hydrant approach to firefighting is in accordance with the City of Ottawa Technical Bulletin ISTB-2018-02.

The hydraulic model EPANET was used to further analyze the performance of the proposed watermain configuration for the following three (3) theoretical conditions, based on a single water supply from two (2) separate sources:

- Peak Hour Demand
- Maximum HGL
- Maximum Day + Fire Flow Demand

Connection #1 - A new 200mm dia. private watermain entering the underground parking level fed from the new 200mm dia. watermain extension along the Hwy 174 on-ramp, fed off the 400mm dia. watermain in St Joseph Boulevard.

Connection #2 - A new 200mm dia. private watermain entering the underground parking level fed directly off the 400mm dia. watermain in St Joseph Boulevard.

A schematic representation of the hydraulic network depicts the node and pipe numbers used in the models. The models are based on hydraulic boundary conditions provided by the City of Ottawa. **Tables 2.3, 2.4,** and **2.5** summarize the hydraulic model results.

Table 2.3: Peak Hour Demand

Operating Condition	Minimum System Pressure	Maximum System Pressure
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 1) - West		
A Peak Hour Demand of approximately 11 L/s at J8 (Building)	Minimum system pressure of 475.6 kPa (69.0 psi) is available at Node J1 (public hydrant)	Maximum system pressure 509.9 kPa (73.9 psi) is available at Nodes J2-J6 (public watermain)
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 2) - East		
A Peak Hour Demand of approximately 11 L/s at J3 (Building)	Minimum system pressure of 471.3 kPa (68.3 psi) is available at Node J1 (private Hydrant)	Maximum system pressure 504.0 kPa (73.1 psi) is available at Node J3 (Building)

Table 2.4: Maximum HGL

Operating Condition	Minimum System Pressure	Maximum System Pressure
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 1) - West		
An Average Day Demand of approximately 2 L/s at J8 (Building)	Minimum system pressure of 523.8 kPa (75.9 psi) is available at Node J1 (public hydrant)	Maximum system pressure 558.1 kPa (80.9 psi) is available at Nodes J2-J6 (public watermain)
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 2) - East		
An Average Day Demand of approximately 2 L/s at J3 (Building)	Minimum system pressure of 518.9 kPa (75.2 psi) is available at Node J1 (private Hydrant)	Maximum system pressure 552.3 kPa (80.1 psi) is available at Node J3 (Building)

Table 2.5: Maximum Day + Fire Flow Demand

Operating Condition	Minimum System Pressure	Maximum System Pressure
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 1) - West		
Max Day + Fire Flow Demand of approximately 138 L/s at J8 (Building)	Minimum system pressure of 235.3 kPa (34.1 psi) is available at Node J8 (building)	Maximum system pressure 421.4 kPa (61.1 psi) is available at Node J9 (public watermain)
200mm dia. Connection to 400mm dia. WM in St. Joseph Boulevard (Connection 2) - East		
Max Day + Fire Flow Demand of approximately 138 L/s at J3 (Building)	Minimum system pressure of 333.5 kPa (48.3 psi) is available at Node J3 (building)	Maximum system pressure 398.0 kPa (57.7 psi) is available at Node J2 (on-site watermain)

The hydraulic analysis indicates that the municipal watermain and private on-site watermain will provide adequate water and system pressures during 'Peak Hour', 'Max HGL' and 'Max Day + Fire Flow' conditions. Pressure reducing valves will be required as system pressures are expected to exceed 80 psi during certain conditions. As previously stated, the detailed design of the internal mechanical plumbing system feeding the on-site buildings and private hydrants will be further refined as part of the detailed design stage and Building Permit application. The looped private watermain network will provide adequate water supply and redundancy to the subject site. Booster pumps may be required to provide adequate water pressure to the upper floors of the residential units. Refer to **Appendix D** for detailed calculations, Municipal watermain boundary conditions, correspondence from the City of Ottawa, a fire hydrant sketch showing the existing fire hydrant locations, schematic representations of the hydraulic network model and modelling results.

2.3 Storm Drainage and Stormwater Management

Due to the topography of the site, the pre-development stormwater runoff, including off-site flows, currently sheet drains uncontrolled in a north-easterly direction, flowing directly into the existing outlet ditch running along the south side of Highway 174. Stormwater flows ultimately outlet to the Ottawa River, via Taylor Creek to the east of the site.

Based on discussions with the Mechanical Engineer, it was determined that the best way to service the proposed 4-building development would be with two (2) separate storm outlets. It will simply be too difficult from a mechanical plumbing perspective to service the entire site (all 4 buildings) with a single storm outlet to the existing ditch as schematically depicted in the Assessment of Adequacy of Public Services Report[1]. This general approach was discussed and approved by the City of Ottawa. As a result, the proposed development will be serviced as follows:

Stormwater runoff from most of the site (i.e., Drainage Areas 'A'), including controlled and uncontrolled flow, will be directed to the existing drainage ditch running along Hwy 174; while stormwater runoff from the remainder of the site (i.e., Drainage Areas 'B') will be directed to the municipal storm sewer in St. Joseph Boulevard. Only runoff from Drainage Area 'A-5' will need stormwater quality treatment.

2.3.1 Stormwater Management Criteria and Objectives

The stormwater management (SWM) criteria have been provided during pre-consultation meetings with the City of Ottawa. The SWM criteria and objectives are as follows:

- Direct most of the site flows towards the existing drainage ditch along Hwy 174, similar to existing drainage patterns.
- Provide a dual drainage system (i.e., minor, and major system flows).
- Control post-development storm flows, up to and including the 100-year design event, to the maximum allowable release rate, using a runoff coefficient equivalent to existing conditions, but in no case greater than C=0.5, a time of concentration of 20 minutes and a 5-year rainfall intensity from City of Ottawa IDF curves.
- Ensure that no surface ponding will occur on the paved surfaces (parking stalls and drive aisles) during the 2-year storm event.
- Provide on-site water quality control equivalent to an 'Enhanced' Level of Protection (i.e., minimum 80% TSS removal) prior to releasing flows from the on-site paved parking lots and drive aisles (i.e., Drainage Area A-5) towards the existing drainage ditch along Hwy 174.

- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion a Sediment Control.

Refer to **Appendix A** for correspondence from the City of Ottawa and RVCA.

2.3.2 Pre-Development Conditions and Allowable Release Rate

Under pre-development conditions, stormwater runoff from the subject site and from the abutting properties to the east and west currently sheet drains uncontrolled through the subject site towards the roadside ditch along the Hwy 174. Pre-Development off-site flows from the neighbouring properties (identified as areas OS-1 and OS-2) will need to be maintained. In other words, these flows cannot be impeded by the proposed development. The uncontrolled pre-development flows from the 1.781 ha site have been calculated using the Rational Method to be approximately 86.9 L/s during the 2-year design event, 118.3 L/s during the 5-year design event and 249.5 L/s during the 100-year design event, based on a T_c of 10 minutes.

As specified by the City of Ottawa, the maximum allowable release rate from the subject site is to be calculated using the Rational Method, with a runoff coefficient equivalent to existing conditions, but in no case greater than C=0.5, a time of concentration of 20 minutes and a 5-year rainfall intensity from City of Ottawa IDF curves. The maximum allowable release rate was calculated as follows, excluding any contributing off-site flows:

The allowable release rate for the 1.781 ha site was calculated as follows:

T_c = 20 min C =0.23
I_{5yr} = 70.25 mm/hr A = 1.781 ha

Q_{allow} = 2.78 CIA
= 2.78 x 0.23 x 70.25 x 1.781
= 79.9 L/s

Refer to **Appendix E** for detailed calculations and to the Pre-Development Storm Drainage & Post-Development Stormwater Management Plan (113020-SWM) for details.

2.3.3 Post-Development Conditions

As described above, stormwater runoff from the site will be directed to two (2) separate outlets, including uncontrolled direct runoff, controlled flow from building roofs (i.e., using control flow roof drains) and controlled site runoff (i.e., drainage from the parking garage deck drains being directed to internal SWM storage tanks and pumped to the respective outlets).

Flow directed to the existing drainage ditch running along Hwy 174

This will include uncontrolled direct runoff from the drainage areas A-1, A-2A and A-2B, which mainly consist of landscaped areas where it is not easy to capture runoff, as well as controlled roof flows from sub-catchment areas A-3 and A-4, and controlled site flows from area A-5.

2.3.3.1 Area A-1 – Uncontrolled Site Runoff along North and East Property Lines

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 5.3 L/s during the 2-year design event, 7.2 L/s during the 5-year design event and 15.5 L/s during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.2 Area A-2A – Uncontrolled Site Runoff along North-West Property Line

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 4.2 L/s during the 2-year design event, 5.7 L/s during the 5-year design event and 12.0 L/s during the 100-year design event. Refer to Appendix E for detailed SWM calculations.

2.3.3.3 Area A-2B + OS-1B – Uncontrolled Site Runoff along SW Property Line

The uncontrolled post-development flow from these combined sub-catchment areas was calculated using the Rational Method to be approximately 5.5 L/s during the 2-year design event, 7.4 L/s during the 5-year design event and 15.0 L/s during the 100-year design event. Refer to Appendix E for detailed SWM calculations.

2.3.3.4 Area A-3 – Building A - Controlled Flow from Roof

The post-development flow from this sub-catchment area will be attenuated using Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service. **Table 2.1** summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, weir setting, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for the 2-year, 5-year and 100-year design events.

Table 2.1: Building A - Controlled Flow Roof Drains

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
RD-A1	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.14	3.1	4.5	10.2	13.1
RD-A2	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.14	3.3	4.8	10.9	13.4
RD-A3	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.4	3.6	8.2	12.3
RD-A4	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.4	3.6	8.2	12.3
RD-A5	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.15	3.3	4.8	10.9	11.3
RD-A6	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.15	3.3	4.8	10.9	11.3
RD-A7	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.14	1.0	1.5	3.6	4.0
RD-A8	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.14	1.0	1.5	3.6	4.0
RD-A9	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.12	2.3	3.5	8.0	14.6

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
RD-A10	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.12	2.3	3.5	8.0	14.6
RD-A11	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.3	3.5	8.0	12.2
RD-A12	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.3	3.5	8.0	12.2
Total Roof (0.190 ha)*	**12**	**-**	**3.8***	**3.8***	**3.8***	**-**	**-**	**-**	**29.0***	**43.1***	**98.5***	**135.3***

*Table represents rounded values

Refer to **Appendix E** for detailed SWM calculations and **Appendix F** for the control flow roof drain information. As indicated in the table above, the building roof will provide sufficient storage for the 2-year, 5-year and 100-year design events.

2.3.3.5 Area A-4 – Building B - Controlled Flow from Roof

The post-development flow from this sub-catchment area will be attenuated using Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service. **Table 2.2** summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, weir setting, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for the 2-year, 5-year and 100-year design events.

Table 2.2: Building B - Controlled Flow Roof Drains

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
RD-B1	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.7	4.1	9.3	15.7
RD-B2	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.7	4.1	9.3	15.7
RD-B3	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-B4	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-B5	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-B6	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
Total Roof (0.099 ha)*	**6**	**-**	**1.9***	**1.9***	**1.9***	**-**	**-**	**-**	**15.0***	**22.2***	**51.0***	**94.2***

*Table represents rounded values

Refer to **Appendix E** for detailed SWM calculations and **Appendix F** for the control flow roof drain information. As indicated in the table above, the building roof will provide sufficient storage for the 2-year, 5-year and 100-year design events.

2.3.3.6 Area A-5: Controlled Flow from Internal SWM Storage Tank #1

Stormwater runoff from this sub-catchment area will be captured by the various outdoor amenity area drains and/or drive aisles and surface parking area deck drains and directed to the internal SWM storage tank. Stormwater collected within the SWM storage tank will be pumped up to and discharged into the existing drainage ditch running along the west property line via the building service. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 15.8 L/s (250 USGPM). A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency power supply will also be provided. **Table 2.3** summarizes the controlled post-development design flows and approximate storage volumes from area A-5 for the 2-year, 5-year and 100-year design events.

Table 2.3: Internal SWM Storage Tank #1 - Pumped Flow and Volumes

Design Event	Post-Development Conditions		
	Pumped Design Flow (L/s)	Volume Required (m^3)	Volume Provided (m^3)
2-Year	15.8 L/s	69.8 m^3	> 255m^3
5-Year		106.2 m^3	
100-Year		254.6 m^3	
100-Year + 20% IDF increase		322.7 m^3	

As indicated in **Table 2.3** above, the internal stormwater storage tank will provide sufficient storage for the 100-year design event. Refer to **Appendix E** for detailed calculations.

2.3.3.7 Summary of Flows to Existing Drainage Ditch along Hwy 174

Table 2.4 summarizes the post-development site flows tributary to the existing drainage swale along the Hwy 174 during the 2-year, 5-year, and the 100-year design events.

Table 2.4: Stormwater Flow Summary to Existing Drainage Ditch along Hwy 174 Table

Design Event	Drainage Areas A-1 to A-5						
	Post-Development Conditions						
	A-1 Flow (L/s)	A-2A Flow (L/s)	A-3 Flow (L/s)	A-4 Flow (L/s)	A-5 Flow (L/s)	A2B+OS-1B Flow (L/s)	Total Flow (L/s)*
2-Yr	5.3	4.2	3.8	1.9	15.8	5.5	**36.6**
5-Yr	7.2	5.7				7.4	**41.9**
100-Yr	15.5	12.0				15.0	**64.0**

*Table represents rounded values

Refer to the enclosed Pre-Development Storm Drainage & Post-Development Stormwater Management Plan (113020-STM) for sub-catchment areas.

2.3.3.8 Stormwater Quality Control for Flows to Drainage Ditch along Hwy 174

The subject site is located within the jurisdiction of the Rideau Valley Conservation Authority (RVCA). Based on preliminary feedback from the RVCA, surface parking lots and drive aisles will require an 'Enhanced' Level of Protection (i.e.: 80% TSS removal). Landscaped areas and roof tops are considered clean for the purposes of water quality and aquatic habitat protection.

To achieve this level of quality control protection, a new oil-grit separator unit (CDS Model PMSU 2015_4) will be required to treat runoff from drainage area A-5. The water quality treatment unit will be installed along the storm sewer outlet pipe from the site that discharges into the drainage swale running along the west property line (on the west side of building A). Stormwater runoff collected by the on-site storm sewer system (0.739 ha tributary area) will be directed through the proposed treatment unit.

As stated above, the proposed oil-grit separator has been sized to provide an 'Enhanced' Level of water quality treatment prior to discharging the stormwater into the existing drainage ditch. Echelon Environmental and Contech Stormwater Solutions Inc. have modeled and analyzed the tributary area to provide a CDS unit capable of meeting the TSS removal requirements. The model parameters for the TSS removal were based on historical rainfall data for Ottawa from Canadian Station 6105976. It was determined that a CDS Model PMSU 2015_4 will meet the target removal rate, providing a net annual 80.5% TSS removal. The CDS unit has a treatment capacity of approximately 20 L/s, a sediment storage capacity of 0.838 m^3; an oil storage capacity of 232 L and will treat a net annual volume of approximately 96.6% for the tributary area.

Maintenance and Monitoring of the Storm Sewer and Stormwater Management Systems

It is recommended that the client implement a maintenance and monitoring program for both the on-site storm drainage and stormwater management systems: The storm drainage system should be inspected routinely (at least annually); the oil-grit separator should be inspected at regular intervals and maintained when necessary to ensure optimum performance. Refer to **Appendix G** for the CDS unit design parameters, sizing analysis, operation, design, performance, and maintenance summary parameters as well as the annual TSS removal efficiency data.

Flow directed to the municipal storm sewer in St. Joseph Boulevard

This will include uncontrolled direct runoff from the landscaped area B-1, controlled roof flow from sub-catchment areas B-2 and B-3, controlled site flow from area B-4 as well as uncontrolled piped flow from area B-5.

2.3.3.9 Area B-1 – Uncontrolled Site Runoff along South Property Line

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 0.8 L/s during the 2-year design event, 1.1 L/s during the 5-year design event and 2.4 L/s during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.10 Area B-2 – Building C - Controlled Flow from Roof

The post-development flow from this sub-catchment area will be attenuated using Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service. **Table 2.5** summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, weir setting, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for the 2-year, 5-year and 100-year design events.

Table 2.5: Building C - Controlled Flow Roof Drains

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
RD-C1	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.7	4.1	9.3	15.7
RD-C2	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.7	4.1	9.3	15.7
RD-C3	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-C4	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-C5	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
RD-C6	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.09	0.10	0.12	2.4	3.5	8.1	15.7
Total Roof (0.099 ha)*	**6**	**-**	**1.9***	**1.9***	**1.9***	**-**	**-**	**-**	**15.0***	**22.2***	**51.0***	**94.2***

*Table represents rounded values

Refer to **Appendix E** for detailed SWM calculations and **Appendix G** for the control flow roof drain information. As indicated in the table above, the building roof will provide sufficient storage for the 2-year, 5-year and 100-year design events.

2.3.3.11 Area B-3 – Building D - Controlled Flow from Roof

The post-development flow from this sub-catchment area will be attenuated using Watts adjustable 'Accutrol' control flow roof drains (model number RD-100-A-ADJ) prior to being directed to the proposed storm service. **Table 2.6** summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, weir setting, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for the 2-year, 5-year and 100-year design events.

Table 2.6: Building D - Controlled Flow Roof Drains

Roof Drain ID & Drainage Area (ha)	Number of Roof Drains	Watts Roof Drain Model ID (Weir Opening)	Controlled Flow per Drain (L/s)			Approximate Ponding Depth Above Drains (m)			Storage Volume Required (m^3)			Max. Storage Available (m^3)
			2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	2 Yr	5 Yr	100 Yr	
RD-D1	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.14	3.1	4.5	10.2	13.1
RD-D2	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.14	3.3	4.8	10.9	13.4
RD-D3	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.4	3.6	8.2	12.3
RD-D4	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.4	3.6	8.2	12.3
RD-D5	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.15	3.3	4.8	10.9	11.3
RD-D6	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.11	0.12	0.15	3.3	4.8	10.9	11.3
RD-D7	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.14	1.0	1.5	3.6	4.0
RD-D8	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.14	1.0	1.5	3.6	4.0
RD-D9	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.12	2.3	3.5	8.0	14.6
RD-D10	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.08	0.10	0.12	2.3	3.5	8.0	14.6
RD-D11	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.3	3.5	8.0	12.2
RD-D12	1	RD-100-A-ADJ (Closed)	0.32	0.32	0.32	0.10	0.11	0.13	2.3	3.5	8.0	12.2
Total Roof (0.190 ha)*	**12**	**-**	**3.8***	**3.8***	**3.8***	**-**	**-**	**-**	**29.0***	**43.1***	**98.5***	**135.3***

*Table represents rounded values

Refer to **Appendix E** for detailed SWM calculations and **Appendix F** for the control flow roof drain information. As indicated in the table above, the building roof will provide sufficient storage for the 2-year, 5-year and 100-year design events.

2.3.3.12 Area B-4 – Controlled Flow from Internal SWM Tank #2

Stormwater runoff from this sub-catchment area will be captured by the various outdoor amenity area drains and directed to the internal SWM storage tank. Stormwater collected within the SWM storage tank will be pumped up to and discharged into the municipal storm sewer in St Joseph Boulevard via the building service. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 3.8 L/s (60 USGPM). A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency power supply will also be provided. **Table 2.7** summarizes the controlled post-development design flows and approximate storage volumes from area B-4 for the 2-year, 5-year and 100-year design events.

Table 2.7: Controlled Flow from Internal SWM Tank #2 - Pumped Flow and Volumes

Design Event	Post-Development Conditions		
	Pumped Design Flow (L/s)	Volume Required (m^3)	Volume Provided (m^3)
2-Year	3.8 L/s	11.8 m^3	> 46m^3
5-Year		18.3 m^3	
100-Year		45.9 m^3	
100-Year + 20% IDF increase		58.5 m^3	

As indicated in **Table 2.7** above, the internal stormwater storage tank will provide sufficient storage for the 100-year design event. Refer to **Appendix E** for detailed calculations.

2.3.3.1 Area B-5 + OS-1C – Uncontrolled Site Runoff along South Property Line

The uncontrolled post-development flow from these combined sub-catchment areas was calculated using the Rational Method to be approximately 0.7 L/s during the 2-year design event, 1.0 L/s during the 5-year design event and 2.1 L/s during the 100-year design event. Refer to **Appendix E** for detailed SWM calculations.

2.3.3.2 Summary of Flows to Existing Drainage Ditch along Hwy 174

Table 2.8 summarizes the post-development site flows tributary to the municipal storm sewer in St Joseph Boulevard during the 2-year, 5-year, and the 100-year design events.

Table 2.8: Stormwater Flow Summary Table

Design Event	Drainage Areas B-1 to B-5 incl. OS-1B and OS-1C					
	Post-Development Conditions					
	B-1 Flow (L/s)	B-2 Flow (L/s)	B-3 Flow (L/s)	B-4 Flow (L/s)	B-5 +OS-1C Flow (L/s)	Total Flow (L/s)*
2-Yr	0.8	1.9	3.8	3.8	0.7	**11.0**
5-Yr	1.1				1.0	**11.7**
100-Yr	2.4				2.1	**14.1**

*Table represents rounded values

Refer to the enclosed Pre-Development Storm Drainage & Post-Development Stormwater Management Plan (113020-SWM) for sub-catchment areas.

2.3.3.3 Summary of Total Post- Development Flows from Site

Table 2.9 compares the post-development site flows from the proposed development to the uncontrolled pre-development flows and to the maximum allowable release rate specified by the City of Ottawa, during the 2-year, 5-year, and the 100-year design events.

Table 2.9: Stormwater Flow Comparison Table

Design Event	Pre-Development Conditions		Post-Development Conditions Drainage Areas A-1 to A-5 and B-1 to B-5+OS-1C			
	Ex. Site Flows (L/s)	Allowable Release Rate (L/s)	A-1 to A-5 + OS-1B Flow (L/s)	B-1 to B-5 + OS-1C Flow (L/s)	Total Flow (L/s)*	Reduction in Flow (L/s or %)**
2-Yr	86.9	79.9	36.6	11.0	47.6	39.3 or 45%
5-Yr	118.3		41.9	11.7	53.6	64.7 or 55%
100-Yr	249.5		64.0	14.1	78.1	171.4 or 69%

*Represents flows to ex. ditch along Hwy 174 and flows to storm sewer in St Joseph Blvd, excl. OS-1A & OS-2.

** Reduced flow compared to uncontrolled pre-dev. conditions (excl. contributing off-site flows).

As indicated in the table above, the 2-year, 5-year and 100-year post-development flows will be less than the maximum allowable release rate for the site. Furthermore, this represents a significant reduction in total site flow rate when compared to the respective pre-development conditions. Refer to **Appendix E** for detailed SWM calculations and the enclosed Pre-Development Storm Drainage & Post-Development Stormwater Management Plan (113020-SWM) for sub-catchment areas.

3.0 SITE GRADING

The existing site generally slopes in a northeastern direction down from St Joseph Boulevard towards the drainage ditch running along the south side of Hwy 174. The current site is also sunken when compared to the elevation of St Joseph Boulevard to the south and the existing Hwy 174 on ramp to the west. Based on a review of the City's 1:1000 mapping, the southwest corner of the subject site is at an elevation of approximately 60.9m dropping down to an approximate elevation of 56.8m near the northeast property corner.

Under post-development conditions, the site will be raised to ensure it is not sunken when compared to the adjacent streets. The required grade raise will also provide additional cover over the proposed sanitary sewer by filling in the low-lying areas within the northern portion of the site. As a result of raising the site itself, the existing roadway/on-ramp 'dip' at the proposed (west) site entrance will also have to be raised accordingly. These detailed works will be included as part of the RMA. Due to the existing topography in this area, the proposed development will include drainage swales along both the east and west property lines to direct stormwater runoff towards the existing drainage ditch running along the south side of the Hwy 174 ditch. The major overland flow route is shown on the design drawings. Refer to the enclosed Grading and ESC Plan (113020-GR1 & 113020-GR2) for details.

4.0 GEOTECHNICAL CONSIDERATIONS

Based on a review of the Geotechnical Investigation Report (Ref. No. PG5091-1), prepared by Paterson Group Inc. on November 6, 2019, the existing site is suitable for the proposed development. The report indicates that the site has a permissible grade raise restriction of 2.5m.

5.0 EROSION AND SEDIMENT CONTROL

To mitigate erosion and to prevent sediment from entering the storm sewer system, temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags will be placed under the grates of nearby catchbasins, manholes and will remain in place until vegetation has been established and construction is completed.
- Silt fencing will be placed per OPSS 577 and OPSD 219.110 along the surrounding construction limits.
- Mud mats will be installed at the site entrance(s).
- Street sweeping and cleaning will be performed, as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site.
- On-site dewatering is to be directed to a sediment trap and/or gravel splash pad and discharged safely to an approved outlet as directed by the engineer.

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.

In addition, the following measures will provide permanent erosion and sediment control on the proposed site:

A CDS Model PMSU 2015_4 type oil-grit separator will be installed to provide water quality control prior to releasing stormwater from sub-catchment area A-5.

6.0 CONCLUSION

This report is being submitted in support of a Site Plan Control application for the proposed Residential development along St. Joseph Boulevard. The conclusions are as follows:

- The proposed development will be serviced by the 400mm dia. municipal watermain and by the 450mm dia. sanitary sewer in St. Joseph Boulevard and/or by a new connection to the 750mm dia. sanitary trunk sewer to the west.
- Stormwater runoff from the site will be directed to two distinct outlets: the existing drainage ditch running along the south side of Hwy 174 and the 1350mm dia. municipal storm sewer in St Joseph Boulevard, both of which are tributary to Taylor Creek located east of the subject site.
- The four (4) buildings will be sprinklered and supplied with fire department (siamese) connections. The fire department connections for each building will be located within 45m of a nearby fire hydrant (either municipal or private).

- The proposed stormwater design, including both quantity and quality control measures, will ultimately reduce peak flows from the site.
    - Post-development flows from sub-catchment area A-5 will be directed to the SWM Internal Storage Tank #1 and pumped out to the existing ditch along the Highway 174 Ramp.
    - Post-development flows from sub-catchment area B-4 will be directed to the SWM Internal Storage Tank #2 and pumped out to the storm sewer in St. Joseph Boulevard.
    - All building roof areas will be attenuated by control flow roof drains. The flows from the building roofs areas A-3 and A-4 will outlet to the existing ditch along the Highway 174 on ramp while flows from building roof areas B-2 and B-3 will outlet to the storm Sewer in St. Joseph Boulevard.
    - The total post-development flow from the subject site will be approximately 47.6 L/s during the 2-year design event, 53.6 L/s during the 5-year event and 78.1 L/s during the 100-year event, all less than the maximum allowable release rate of 79.9 L/s. The post-development flows are also significantly reduced when compared to current uncontrolled conditions.
    - Erosion and sediment controls will be provided both during construction and on a permanent basis. An oil / grit separator unit (CDS Model PMSU 2015_4C) will provide an 'Enhanced' Level of water quality control for the controlled flows from sub-catchment area A-5 prior to being discharged into the existing ditch along Highway 174.
- Regular inspection and maintenance of the storm sewer system, including the control flow roof drains, water quality treatment unit, internal SWM tanks and pumps is recommended to ensure that the storm drainage system is clean and operational.

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

NOVATECH

Revised by:

François Thauvette, P. Eng.
Senior Project Manager

APPENDIX A

Project Correspondence

Steve Matthews

From: Curry, William <William.Curry@ottawa.ca>
Sent: Thursday, August 19, 2021 2:54 PM
To: Francois Thauvette
Cc: Steve Matthews
Subject: Re: Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Francois,

I was assuming you would connect to the storm sewer on St. Joseph.....controlled and some major spill discharge to the ditch. Whatever you decide.....

Post development storm discharge must be restricted to match the pre-development runoff from site.

You are allowed a 2-year now or you may choose a 5-year. This site will require Quality controls, check with the CA.

We typically use a tc of 20 for pre and a tc of 10 for post.

Will

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: Thursday, August 19, 2021 1:32 PM
To: Curry, William <William.Curry@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>
Subject: RE: Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Will,

We are sending this e-mail to request clarification on the e-mail below. Stormwater runoff from the subject site currently sheet drains overland towards the roadside ditch along the Hwy 174 on-ramp. Stormwater flows east along the ditch and drains into Taylor Creek. As such, it is not being conveyed through a piped sewer system (other than through the culvert that crosses below Hwy 174). Since existing drainage patterns will be maintained and flows will not be directed to a storm sewer system, please confirm the SWM quantity control criteria. The e-mail below is unclear as it appears to suggest 2 different approaches:

- Option 1: Control Post-development flows to Pre-development conditions (i.e. 5-Yr post to 5-Yr pre as well as 100-Yr post to 100-Yr pre) – Typically used when draining overland to a water course, or

- Option 2: Control post-development flows up to and including the 100-Yr post to a 5-Yr allowable release rate (calculated using a Cw=0.5 and a 20 min Tc.) – Typically used for flows being directed to a storm sewer system.

Please review and confirm which of the criteria described above is correct as we want to make certain we are using the correct criteria in our design.

Regards,

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

From: Curry, William <William.Curry@ottawa.ca>
Sent: Monday, October 26, 2020 7:29 AM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Sam Bahia <s.bahia@novatech-eng.com>; Greg Winters <G.Winters@novatech-eng.com>; Paul-André Charbonneau <paul-andre@chartro.ca>
Subject: Re: Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Francois,

I will not comment on any LRT documents. I do not know exactly what Design criteria you were told by other City staff for the pre-consult.

Let me throw my comments in to shorten this entire process.

Post development storm discharge must be restricted to match the pre-development runoff from site and store up to 100-year on site.
Pre to post

Post C of .5

Pre tc 20; post tc 10

Permissible ponding of 350mm for 100-year. At 100-year ponding elevation you must spill. Spill elevation must be 300mm lower than any building opening (includes depressed ramps).

Assuming you will want to design to a permissible 2-year pipe, no surface ponding of the 2-year event is permitted.

All Services are available on St. Joseph Blvd for your connections.

When I look at your parcel, I see that currently surface water from your site and half of the ramp and even some surface water from St. Joseph sheet flows and discharges next to the HWY in the soft area mostly via the roadside ditch adjacent to the ramp. I also see your site is low in relation to the roads. Your current and ultimate major discharge point will be next to the HWY. Your site should be higher than the current and future proposed discharge elevation to facilitate discharge and should you

need to regrade that area between your parcel and the HWY to make it work then that needs to be done.

Contact me if you wish to discuss further.

Thanks
Will

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: Friday, October 23, 2020 12:23 PM
To: Curry, William <William.Curry@ottawa.ca>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Sam Bahia <s.bahia@novatech-eng.com>; Greg Winters <G.Winters@novatech-eng.com>; Paul-André Charbonneau <paul-andre@chartro.ca>
Subject: RE: Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Will,

Thank you for confirming that the outlet for the subject site is Taylor Creek. Could you please confirm the SWM criteria applicable to the 1.78 ha subject site (3459 & 3479 St. Joseph Blvd.)? See attached 3-page mark-up for details.

Regards,

François Thauvette, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

From: Curry, William <William.Curry@ottawa.ca>
Sent: Wednesday, October 21, 2020 1:02 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Sam Bahia <s.bahia@novatech-eng.com>; Greg Winters <G.Winters@novatech-eng.com>; Paul-André Charbonneau <paul-andre@chartro.ca>
Subject: Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Francois,

This file has now been assigned to me by my manager.

Going forward direct all questions to me. Below is a lot of information provided to ask a simple question.

Your site currently discharges to the tributary of Taylor Creek and that will not change.

Definitely contact me if you are making assumptions or second guessing any LRT documents.

thanks

Will Curry, C.E.T.

Planning, Infrastructure and Economic Development /
Planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste16214
110 Laurier Ave., 4th Fl East;
Ottawa ON K1P 1J1

William.Curry@Ottawa.ca

From: Mashaie, Sara <sara.mashaie@ottawa.ca>
Sent: Wednesday, October 21, 2020 12:04 PM
To: Curry, William <William.Curry@ottawa.ca>
Subject: FW: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Sara Mashaie, P.Eng., ing.
Project Manager | Gestionnaire de Projet
Development Review, East Branch | Examen des projets d'aménagement, Secteur est
Planning, Infrastructure and Economic Development Department | Services de la planification, de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 27885, sara.mashaie@ottawa.ca

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: October 19, 2020 4:31 PM
To: Mashaie, Sara <sara.mashaie@ottawa.ca>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Sam Bahia <s.bahia@novatech-eng.com>; Greg Winters <G.Winters@novatech-eng.com>; Paul-André Charbonneau <paul-andre@chartro.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Sara,

We have started our review of the documents provided and noticed some discrepancies within the following report:

Confederation Line Extension – Drainage & Stormwater Management (EJV-S0O174-DAS-RPT-0002.E.CTR.E.01.pdf)

Our subject site (3459 & 3479 St. Joseph Blvd) appears to be shown as being tributary to Brisebois Creek (i.e. Outfall No. 6) on certain figures, yet tributary to Taylor Creek (i.e. Outfall No. 7) on other figures. We believe our site is tributary to Taylor Creek (Outfall No. 7), but want to make certain that drainage from our site is included in the overall SWM design of the LRT project.

Refer to the following excerpt pages for details:

- Exhibit 04 – Existing Conditions - Land Use – Station 208+200 to 212+100 (p. 32 of 454)
- Exhibit 06 – Proposed Conditions – Drainage Mosaic - Station 208+200 to 212+100 (p. 34 of 454)
- Exhibit 08 – Proposed Conditions – Proposed Land Use - Station 208+200 to 212+100 (p. 36 of 454)
- Exhibit 11 – External Catchments -Drainage Mosaic (p. 39 of 454)
- Swale Calculation Sheet – CLE – Roadway Segment 9 – Eastbound (p. 68 of 454)
- Drainage Area Map for Culvert 6 – Brisebois Creek (p. 356 of 454)
- Drainage Area Map for Culvert 7 – Taylor Creek (p. 359 of 454)

The data circles on Exhibit 04 and Exhibit 08 appear to show the drainage ditch on the south side of the Highway (East of the Eastbound On-Ramp) to be tributary to Taylor Creek Outfall #7, yet the blue watercourse line would give the impression that some runoff flows towards Taylor Creek Tributary Outfall #10. As shown on Exhibit 06, it appears that Taylor Creek Tributary Outfall #10 is taking flow from the north side of the Highway, not the south side.

Exhibit 11 does not match Exhibit 04. Based on a review of the existing topography, stormwater runoff from the subject site is tributary to Taylor Creek, as opposed to Brisebois Creek, as the Existing Eastbound On-Ramp acts as the drainage divide between these two outlets. According to Exhibit 06 the intent appears to be for the proposed drainage on the south side of the Highway to be directed towards Taylor Creek Outfall #7, but it is unclear if the subject site has been included in the 'upstream' area tributary to the ditch/outlet being studied. Refer to the spreadsheet (p. 68 of 454 of the report) for details. The area upstream of station 510+620 (i.e. 0.319ha + 0.136 ha identified in the spreadsheet) does not appear to include the subject site. Could this be reviewed and confirmed? Also, the Drainage Area Maps for Culverts 6 and 7 do not appear to be correct, or consistent with some of the other figures within the report.

Confederation Line Extension – Roadway Drainage Plans (EJV-S0O174-RWY-DWG-0001APKG.B.CTR.B.01.pdf)

- Drawing EJV-SO0174-RWY-DWG-3141 (p. 105 of 429)
- Drawing EJV-SO0174-RWY-DWG-3142 (p. 106 of 429)

The plans above indicate how the existing Eastbound On-Ramp is the drainage divide between Brisebois Creek and Taylor Creek, for stormwater runoff on the south side of the Highway. These plans were also used to determine the chainage of the Highway ditch and associated spreadsheets within the **Drainage and Stormwater Management Report.**

Please review and advise if our assumption that our site is tributary to Taylor Creek (Outfall No. 7) is correct, as we would like to proceed with the conceptual servicing, grading and SWM design of the subject site. We will require confirmation of the SWM criteria for the subject site.

Regards,

François Thauvette, P. Eng., Senior Project Manager | Land Development & Public Sector Engineering
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 219 | Cell: 613.276.0310 | Fax: 613.254.5867

From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: Thursday, October 1, 2020 12:53 PM
To: Greg Winters <G.Winters@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>
Cc: Jennifer Luong <j.luong@novatech-eng.com>
Subject: FW: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi All
We obtained LRT/174 widening design drawings and drainage report after signing the NDA. It is 7Gbs, so I will need to delete after we sort out what info we want to keep.

As suspected, they've accounted for Chartro to be tributary to Taylor Creek as opposed to draining to Brisbois Creek through Provenzano.

The drainage report discusses existing and planned land use conditions. For existing, it considers the site pervious. For future it considers the site to have a C of 0.37. Their analysis includes the 100 yr and stress test event for Taylor Cree culvert below 174.

The road side ditch is 56.08m, which should be low enough to drain to but we'd need to confirm outlet elevation desired.

In review of the roadside ditch capacity, it was sized for 10-yr. But the design sheet only includes the road/174 ROW, not the site. Not sure if that missed or not part of their scope. We'd need some back and forth with Sara to make the inquiry.

We'd need to do some high-level grading of the site for the purposes of stormwater outlet, sanitary connection to Cumberland Collector, and tie-in to Terra Nova Estates. Francois can we meet please?

Regards
Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285 | Fax: 613.254.5867

From: Mashaie, Sara <sara.mashaie@ottawa.ca>
Sent: Thursday, October 1, 2020 9:51 AM
To: Sam Bahia <s.bahia@novatech-eng.com>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Sam,

I will follow up with a SharePoint link containing the requested information. You will want to focus on file: **EJV-S0O174-RWY-DWG-0001APKG.B.CTR.B.01.pdf** as drawing sheets 103 to 108 of 429 are for the EB OR174 between Tenth Line and Trim. There are also Geotechnical, Traffic Analysis, Stormwater Management, and Noise reports contained in the link, that are to be consulted as well. Note that the .dwg files have also been included.

A message from the LRT office: *Note that the drawings are not approved as Issued for Construction drawings. We are close but still at the CDS (90%) Construction Document Submittal stage and so the information may change and there is no guarantee on our part.*

There is quite a bit of information, therefore if you have any questions, please advise.

Regards,

Sara Mashaie, P.Eng., ing.
Project Manager | Gestionnaire de Projet
Development Review, East Branch | Examen des projets d'aménagement, Secteur est
Planning, Infrastructure and Economic Development Department | Services de la planification, de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 27885, sara.mashaie@ottawa.ca

From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: September 29, 2020 12:35 PM
To: Mashaie, Sara <sara.mashaie@ottawa.ca>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Paul-André Charbonneau <paul-andre@chartro.ca>; Greg Winters <G.Winters@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Please find attached, as requested. The last page has been duplicated for the proponent and Novatech's acknowledgement.
Let me know if you need anything else.
Thanks

Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285 | Fax: 613.254.5867

From: Mashaie, Sara <sara.mashaie@ottawa.ca>
Sent: Monday, September 28, 2020 3:25 PM
To: Sam Bahia <s.bahia@novatech-eng.com>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Sam,

Please send the form back to me.

As for the "affiliation" portion, that should be Novatech. You can also include the client name for reference, but if the intention is for the client to have access to any of the info being shared, they too should be signing an NDA.

Should you have any additional questions, please advise.

Regards,

Sara Mashaie, P.Eng., ing.
Project Manager | Gestionnaire de Projet
Development Review, East Branch | Examen des projets d'aménagement, Secteur est
Planning, Infrastructure and Economic Development Department | Services de la planification, de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 27885, sara.mashaie@ottawa.ca

From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: September 28, 2020 2:09 PM
To: Mashaie, Sara <sara.mashaie@ottawa.ca>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

I'm confused, should this come back to you or the Contacts listed under item 1a ? And for affiliations, is that our client(s)?
Thanks

Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285 | Fax: 613.254.5867

From: Mashaie, Sara <sara.mashaie@ottawa.ca>
Sent: Monday, September 28, 2020 9:58 AM
To: Sam Bahia <s.bahia@novatech-eng.com>
Cc: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Sam,

To start, please find attached the Non-Disclosure Agreement (NDA) which is to be duly filled out, signed, and returned to my attention prior to the release of the information.

Regards,

Sara Mashaie, P.Eng., ing.
Project Manager | Gestionnaire de Projet
Development Review, East Branch | Examen des projets d'aménagement, Secteur est
Planning, Infrastructure and Economic Development Department | Services de la planification, de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 27885, sara.mashaie@ottawa.ca

From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: September 23, 2020 9:56 AM
To: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Mashaie, Sara <sara.mashaie@ottawa.ca>
Cc: Greg Winters <G.Winters@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>; Nick Sutherland <sutherland@fotenn.com>; Paul-André Charbonneau <paul-andre@chartro.ca>; McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Paudel, Neeti <neeti.paudel@ottawa.ca>; Baird, Natasha <Natasha.Baird@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

In relation to Alternative 4 and storm drainage outlet, we require confirmation the relocated roadside ditch along hwy 174 will be at an elevation/capacity to handle the pre-development flows of the site. See attached excerpt from LRT Stage 2 East EA (highlighted in red is the ditch). We are looking for the roadside ditch profile, cross-section and design flows/hydrology.

I've tried reaching out to that Rail Implementation Group; however, the response was that it would be more appropriate for DRS to obtain the information from them, as opposed to a third party. Can I politely ask you to obtain or review/interpret this information for us?

Please call my cell (6132651696), if you have any questions.

Thanks

Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285 | Fax: 613.254.5867

From: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Sent: Thursday, September 3, 2020 1:58 PM
To: Sam Bahia <s.bahia@novatech-eng.com>
Cc: Greg Winters <G.Winters@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>; Nick Sutherland <sutherland@fotenn.com>; Paul-André Charbonneau <paul-andre@chartro.ca>; McEwen, Jeff <Jeff.McEwen@ottawa.ca>; Mashaie, Sara <sara.mashaie@ottawa.ca>; Paudel, Neeti <neeti.paudel@ottawa.ca>; Baird, Natasha <Natasha.Baird@ottawa.ca>
Subject: RE: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Hi Sam,

Both my engineer and I have the following to comments to offer, regarding the CHS EA offsite servicing solution and possible alternatives, for the Chartro Parcels Blocks C and D (Subject Site).

In response to Novatech's email dated August 10, 2020, we will not be considering or exploring proposed alternatives 1 and 2 at this time. Since an application has not yet been submitted for blocks A and B, it is therefore premature to propose these alternatives. To consider or explore these alternatives, the City, any applicable and abutting landowner(s), Novatech (and any other applicable parties) would have to meet to discuss any development through blocks A and B. As stated, private services and roads would entail a joint-use maintenance agreement (JUMA) that is to be entered into by all involved parties that will bind the owners to deal with the maintenance and liability of the common elements. Note the considerations that come along with a JUMA – flexibility for any changes to development, related easements, restrictions, cost-sharing arrangements. If consideration were to be explored for public services and roads, or a combination of private/public services and roads, then once again, the City, landowner, Novatech, and any other applicable parties, including all abutting landowners, would have to meet together (via a formal pre-consultation) to discuss the applicable and appropriate development applications.

Please consider alternatives 3 and 4, while providing conceptual plans to the City for review.

Regards,

Shoma Murshid, MCIP, RPP
File Lead, Planner II
Responsable de dossier, urbaniste II
City of Ottawa/ Ville d'Ottawa
Development Review (Suburban Services, East)/ Examen des projets d'aménagement (Services suburbains Est)
Planning, Infrastructure, and Economic Development Department/ Service de la planification, de l'infrastructure et du développement économique
110 Laurier Avenue West, 4th Floor, Ottawa ON K1P 1J1/ 110, avenue Laurier Ouest, 4e étage, Ottawa (Ontario) K1P 1J1
Mail Code/ Code de courrier : 01-14
Tel/ Tél: (613) 580-2424 ext. 15430
Fax/ Téléc. : (613) 580-4751
e-mail/ courriel : shoma.murshid@ottawa.ca
www.ottawa.ca

From: Sam Bahia <s.bahia@novatech-eng.com>
Sent: August 20, 2020 9:53 AM
To: Murshid, Shoma <Shoma.Murshid@ottawa.ca>; Mashaie, Sara <sara.mashaie@ottawa.ca>; Warnock, Charles <Charles.Warnock@ottawa.ca>
Cc: Greg Winters <G.Winters@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>; Nick Sutherland <sutherland@fotenn.com>; Paul-André Charbonneau <paul-andre@chartro.ca>
Subject: Re: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Just following up regarding the email below.
Thanks
Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH
Tel: 613.254.9643 x 285

On Aug 10, 2020, at 9:24 AM, Sam Bahia <s.bahia@novatech-eng.com> wrote:

Hi All
My apologies for this late response. As a follow up to the pre-consult minutes, below are our request for clarifications/comments regarding the CHS EA offsite servicing solution and possible alternatives, for the Chartro Parcels Blocks C and D (Subject Site):

1. Maintain the CHS EA Servicing Solution, which identifies the Subject Site as the upstream Owner.
    a. Refer to Figure 1.
    b. Sanitary extension from Point 3 to 2. Based on our discussion during the pre-consult this was going to be private sewer, subject to a JUMA.
    c. Storm extension from Point 3 to 2. Based on our discussion during the pre-consult this was going to be private sewer, subject to a JUMA.
    d. SWM (Section 2.2.2.2.2 of CHS Study): For quantity, utilize Brisbois Creek as an outlet at an allowable release rate of 150L/s/ha. For quality, utilize the existing Brisbois Creek in-line SWMF [based on RVCA comments during the pre-consult, that facility may not be providing the required treatment, an OGS to provide 80% TSS may be required].
    e. Watermain extension from Point 4 to 3 to 2. Watermain looping at the east of the Subject Site may be required onsite to the St. Joseph Blvd. watermain.

2. Maintain the CHS EA Servicing Solution same as above but **with slight modification to the routing, based on Mr. Provenzano website conceptual layout for Blocks A & B** (http://procomrealty.com/#!/images-of-site).
    a. **Refer to Figure 2, where we've modified the routing within Provenzano to be parallel to the existing Cumberland Collector's 30' Easement, allow Mr Provenzano more development table land. This was based on a discussion we had with him on May 29, but will likely require further confirmation with him.**
    b. Sanitary extension from Point 3 to 2**, via revised routing**. Based on our discussion during the pre-consult this was going to be private sewer, subject to a JUMA.

c. Storm extension from Point 3 to 2**, via revised routing**. Based on our discussion during the pre-consult this was going to be private sewer, subject to a JUMA.
d. SWM (Section 2.2.2.2.2 of CHS Study): For quantity, utilize Brisbois Creek as an outlet at an allowable release rate of 150L/s/ha. For quality, utilize the existing Brisbois Creek in-line SWMF [based on RVCA comments during the pre-consult, that facility may not be providing the required treatment, an OGS to provide 80% TSS may be required].
e. Watermain extension from Point 4 to 3 to 2 **via revised routing**. Watermain looping at the east of the Subject Site may be required onsite to the St. Joseph Blvd. watermain.

3. Alternative Servicing Solution, which identifies the Subject Site as the upstream Owner; therefore not affecting downstream owners, and would provide an independent servicing solution for the Chartro Parcel to advance ahead of Provenzano
    a. Refer to Figure 3.
    b. Sanitary connection to Cumberland Collector Refer to CHS EA Section 2.2.2.3 excerpts below:

        In the case of the commercial and institutional blocks identified in Concepts 1 and 2, provided there is sufficient capacity in the existing Cumberland Collector, all buildings are slab on grade construction, and the City will allow the construction of shallow sanitary sewers and service laterals, it may be feasible to connect to the Cumberland Collector.

        The high-density development block proposed in Concept 2, at the corner of St. Joseph Blvd. and the Tenth-Line Road On-Ramp, could not connect by gravity to the Cumberland Collector along the Tenth-Line Road On-Ramp, if conventional depth basements at +/- 2.4m below grade are constructed. Servicing of the high-density residential block, assuming construction of conventional basements, could potentially be serviced using the existing 450mm diameter sanitary sewer on St. Joseph Blvd. that discharges into the Cumberland Collector.

        The objective of the master servicing study is to put forward a sanitary collection system design that meets current City standards and provides ample flexibly for the individual developers given the uncertainties with future zoning, site plan configurations, building design and site servicing requirements. Therefore, servicing of development blocks A through D using the existing Cumberland Collector was not considered further.

        Given the proposed development would not have conventional basements, a connection to the Cumberland Collector would be feasible (with insulation) and will avoid a sanitary extension through Provenzano .
    c. Direct Storm connection to Brisbois Creek, through City On-ramp ROW and CREO Lands (subject to their aspproval), upstream of Hwy174 culvert.
    d. SWM (Section 2.2.2.2.2 of CHS Study): For quantity, utilize Brisbois Creek as an outlet at an allowable release rate of 150L/s/ha. For quality, utilize the existing Brisbois Creek in-line SWMF [based on RVCA comments during the pre-consult, that facility may not be providing the required treatment, an OGS to provide 80% TSS may be required].
    e. Watermain extension from Point 4 to 3 (in the interim) and to 2 (ultimate). Watermain looping at the east of the Subject Site may be required onsite to the St. Joseph Blvd. watermain.

4. Alternative Servicing Solution, similar to the above Solution No. 3 with a revision to the storm outlet.
    a. Refer to Figure 4.
    b. Based on a review of the topographic mapping, it is possible that Chartro Parcel is directed to roadside ditches along the east side of the on-ramp and Hwy 174 under existing conditions, which indicates the site may be tributary to Taylor Creek. The LRT Stage 2 ESR shows new ditches along Hwy 174. Can the detailed design info for that ditch be shared?
    c. This solution would allow the storm drainage to be directed to the Hwy 174 ditches without significant offsite storm infrastructure. Per Section 2.2.2.2.2 of CHS Study, quantity control is not an issue for Taylor Creek, however a release rate based on the capacity of the roadside ditch may be

required. For quality, connections to Taylor Creek require 80% treatment, therefore an OGS Unit will be required u/s of the roadside ditch.

For all the above options, we'd like to have DRS and IPU comment if there are technical issues with the above solutions; and if there are an EA Amendment / MSS Deviation requirements, given that the upstream site will not be impacting any downstream owners.

I'm away this week, but feel free to call if you have any questions or require any further clarifications, which I can attend to early next week.

Thank you

Sam Bahia, P.Eng., Project Manager | Land Development
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 285 | Fax: 613.254.5867

From: Jennifer Luong <j.luong@novatech-eng.com>
Sent: Sunday, July 12, 2020 10:56 PM
To: Sam Bahia <s.bahia@novatech-eng.com>; Francois Thauvette <f.thauvette@novatech-eng.com>
Cc: Greg Winters <G.Winters@novatech-eng.com>
Subject: FW: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Sam and FST,
Pls see Shoma's notes below, you don't appear to be copied on them. Neeti is waiting on a response from the Road Safety group regarding a follow up traffic meeting.
Thanks,

Jennifer Luong, P.Eng., Senior Project Manager | Transportation/Traffic
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 254 | Fax: 613.254.5867

From: Murshid, Shoma <Shoma.Murshid@ottawa.ca>
Sent: Thursday, July 9, 2020 9:36 AM
To: Nick Sutherland <sutherland@fotenn.com>
Cc: Mashaie, Sara <sara.mashaie@ottawa.ca>; Paudel, Neeti <neeti.paudel@ottawa.ca>; Rehman, Sami <Sami.Rehman@ottawa.ca>; Jamie Batchelor <jamie.batchelor@rvca.ca>; Castro, Phil <phil.castro@ottawa.ca>; Wang, Randolph <Randolph.Wang@ottawa.ca>; Richardson, Mark <Mark.Richardson@ottawa.ca>; Warnock, Charles <Charles.Warnock@ottawa.ca>; Rejane Padaratz <padaratz@fotenn.com>; Greg Winters <G.Winters@novatech-eng.com>; Jennifer Luong <j.luong@novatech-eng.com>; Miguel Tremblay <tremblay@fotenn.com>
Subject: 2nd Pre-Consultation Follow-Up for 3459 & 3479 St. Joseph Boulevard (Zoning By-law Amendment and Site Plan Control)

Good afternoon Nick,

Thank you for meeting with us again last Tuesday, June 30th 2020, to discuss the one concept plan of a residential PUD at 3459 & 3479 St. Joseph Boulevard.

The attached concept plan does trigger Site Plan Control, Application for a New Development – Complex (Manager Approval, Public Consultation) and a Major Zoning By-law Amendment.

A Site Plan Control – Complex, Application for New Development's submission fee for this application, is $35,487.53 + Initial Engineering Design Review and Inspection Fee (based on the value of Infrastructure and Landscaping) + the Initial Conservation Authority Fee of $1,015.00.00. A Major Zoning By-law Amendment development review application's submission fee is $20,216.99 + Initial Conservation Authority Fee of $380.00. Both aforementioned development review applications are public consultation-based.

Please note that the comments from the initial pre-consultation, held in 2019, remain applicable, except where discussions have been ongoing related to this site, between that last follow-up and this current follow-up.

If the applications are submitted concurrently, a 10% reduction in the planning fees for both applications apply.

The pre-consultation fee will be refunded to one of the two aforementioned development review applications. Refund of the pre-consultation fee occurs post-submission of the applications. For the zoning amendment and site plan applications to be deemed complete, the following studies and plans will also be required, along with a completed zoning amendment application form and site plan control application form and its corresponding submission fees:

Required Plans and Reports for both Zoning Amendment and Site Plan Control applications, if submitted concurrently, to be deemed complete:

Site Plan – PDF
Landscape Plan– PDF
EIS/TCR, with SAR component included – PDF
Survey Plan – PDF
Topographical Plan of Survey Plan - PDF
Grading & Drainage Plan –PDF
Site Servicing Plan – PDF
Erosion & Sediment Control Plan - PDF
Design Brief and Stormwater Management Report – PDF
Geotechnical Report – PDF
Lighting Plan and/or Memo – PDF
Noise Study (Road) - PDF
TIA – PDF
Planning Rationale, including design statement - PDF
Elevations – PDF
Floor Plans – PDF
Phase 1 ESA – PDF
Archaeological Resource Assessment Study - PDF
Plan(s) showing (Underground) Parking Garage Layout – PDF

Required Plans and Reports for Zoning Amendment, if submitted as a stand-alone application, to be deemed complete:

Site Plan or Concept Plan, showing proposed land uses and landscaping – PDF

EIS, with SAR component included – PDF
Survey Plan – PDF
Topographical Plan of Survey Plan - PDF
TIA - PDF
Design Brief and Stormwater Management Report - PDF
Archaeological Resource Assessment Study - PDF
Phase 1 ESA - PDF
Geotechnical Report - PDF
Noise Study (Road) - PDF
Planning Rationale, including design statement - PDF

Design Comments
Here are urban design comments on the revised site plan concept.

1. Overall, the revised site plan is trending in the right direction and the changes made are appreciated.
2. Please clarify the extent of underground parking. It is important that opportunities for tree planting in the proposed amenity areas will not be compromised by the extent of underground parking.
3. Please clarify accessibility for all modes of transportation, including personal vehicles to buildings located at the southwest corner of the site, with considerations for way finding, pizza delivery, drop-off requirements and taxi stands.
4. The parking ramp for the building fronting St. Joseph BLVD looks very close to a busy road. Please consider relocating the parking ramp as further away as possible from St. Joseph BLVD.
5. Please consider future pedestrian connectivity to properties on the east side of the subject development. Perhaps this should be secured through an easement as part of the approval of this site plan application.
6. Please explore and evaluate alternative massing arrangement of the proposed buildings as indicated in the attached Design Brief Terms of Reference. For example, flipping the 6-storey and 4-storey portion of the northmost building as well as the building fronting St. Joseph BLVD.
7. Please explore design options to better integrate the proposed amenity areas with the buildings. For examples, instead of an asphalt “road” between the amenity areas and the building entrances, considerations should be given to a table top or “woonerf” design for the space.
8. Please provide building face to building face cross sections of the following:
    a. St. Joseph BLVD
    b. The highway ramp
9. A Design Brief is required for these applications. The Terms of Reference is attached for convenience.

Thanks! If you have any questions about these comments, please feel free to reach out.

Traffic Comments
As previously mentioned, since you are proposing a connection to what I am calling an ‘off-ramp’ to the highway, this will still need further review through the TIA, when it has been formally submitted under the aforementioned development review applications. As this TIA is calling for special consideration on certain items related to the CHS Lands study variables, apart from traffic control type and sight lines which are standard requirements of the TIA, you requested a meeting with the

Road Safety Group to further discuss these details. Neeti is awaiting a response from Road Safety in order for you to be able to have this meeting.

Engineering, Planning and Traffic's last thoughts on the following:

What happens and what will be the City's position, if the engineering/servicing deviates from the approved CHS Lands Study/MSS premise of servicing and roads coming from Provenzano's lands?

Answer:
If you are deviating from the approved EA, this will most probably require a new review. However, in order for us to be more specific, we will have to request that you provide us with a concept plan of the works that you see deviating so that we understand the magnitude of the deviation. This will help us review and comment further. Is it the Cumberland collector being relocated or is it the proposed road that is being relocated to where the sanitary collector is? Is it one of these aforementioned premises or a completely different premise that we need to review and comment one? If it is a question of you are attempting to follow the CHS Lands Study, its MSS, etc. except albeit with a deviation, show us the extent of the deviation. A civil and traffic preliminary analysis of this design from your consultants would greatly help us at the City to have a more fruitful discussion and help us better answer this above question.

If I have missed anything, please do not hesitate to contact me.

Sincerely,

Shoma Murshid, MCIP, RPP
File Lead, Planner II
Responsable de dossier, urbaniste II
City of Ottawa/ Ville d'Ottawa
Development Review (Suburban Services, East)/ Examen des projets d'aménagement (Services suburbains Est)
Planning, Infrastructure, and Economic Development Department/ Service de la planification, de l'infrastructure et du développement économique
110 Laurier Avenue West, 4th Floor, Ottawa ON K1P 1J1/ 110, avenue Laurier Ouest, 4e étage, Ottawa (Ontario) K1P 1J1
Mail Code/ Code de courrier : 01-14
Tel/ Tél: (613) 580-2424 ext. 15430
Fax/ Téléc. : (613) 580-4751
e-mail/ courriel : shoma.murshid@ottawa.ca
www.ottawa.ca

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<Figure 2.pdf>
<ProvenzanoConcept.gif>
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<Figure 4.pdf>

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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 Sewage Calculations, Sanitary Sewer Design Sheets

3459 & 3479 St. Joseph Blvd - Buildings A, B, C and D
THEORETICAL SANITARY SEWER FLOWS

Area Identifier	Post-Development Peak Flow (L/s)*
Building A	**2.2**
Building B	**1.3**
Building C	**1.3**
Building D	**2.2**
Total Site Development :	**7.1**

*Includes infiltration allowance of 0.59L/s/ha

3459 & 3479 St. Joseph Blvd - Building A
THEORETICAL SANITARY SEWER FLOWS

Residential Use	**Post-Development**	
Number of One Bedroom Apartments	55	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	48	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	103	
Design Population	178	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.53	
Peak Residential Flow	**2.04**	**L/s**
Extraneous Flow		
Site Area	0.58	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.19**	**L/s**
Total Peak Sanitary Flow	**2.2**	**L/s**

3459 & 3479 St. Joseph Blvd - Building B
THEORETICAL SANITARY SEWER FLOWS

Residential Use	**Post-Development**	
Number of One Bedroom Apartments	31	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	29	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	60	
Design Population	105	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.59	
Peak Residential Flow	**1.22**	**L/s**
Extraneous Flow		
Site Area	0.31	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.10**	**L/s**
Total Peak Sanitary Flow	**1.3**	**L/s**

3459 & 3479 St. Joseph Blvd - Building C
THEORETICAL SANITARY SEWER FLOWS

Residential Use	**Post-Development**	
Number of One Bedroom Apartments	31	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	29	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	60	
Design Population	105	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.59	
Peak Residential Flow	**1.22**	**L/s**
Extraneous Flow		
Site Area	0.31	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.10**	**L/s**
Total Peak Sanitary Flow	**1.3**	**L/s**

3459 & 3479 St. Joseph Blvd - Building D
THEORETICAL SANITARY SEWER FLOWS

Residential Use	**Post-Development**	
Number of One Bedroom Apartments	55	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	48	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	103	
Design Population	178	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.53	
Peak Residential Flow	**2.04**	**L/s**
Extraneous Flow		
Site Area	0.58	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.19**	**L/s**
Total Peak Sanitary Flow	**2.2**	**L/s**

SANITARY SEWER DESIGN SHEET - NORTHERN OUTLET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: 3459 & 3479 St. Joseph Boulevard
Date: May 9, 2025
Input By: K. D'sa
Reviewed By: F. Thauvette
Drawing Reference: 113020-GP1 & 113020-GP2

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Annual Cell Output
- Calculated Rare Cell Output

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location			Demand												Design Capacity							
			Residential Flow										Extraneous Flow Area Method	Total Design Flow	Proposed Sewer Pipe Sizing / Design							
Street	From MH	To MH	Singles	Semis / Towns	Apts	Park Area	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull
Site	CAP	101	0	0	163	0.000	0.283	0.283	0.92	3.47	3.18	0.890	0.890	0.29	3.48	12.9	250 PVC	0.254	0.013	1.00	62.0	1.22	5.6%
Site	101	103	0	0	0	0.000	0.000	0.283	0.92	3.47	3.18	0.000	0.890	0.29	3.48	56.5	250 PVC	0.254	0.013	0.30	34.0	0.67	10.2%
Site	103	105	0	0	0	0.000	0.000	0.283	0.92	3.47	3.18	0.000	0.890	0.29	3.48	26.8	250 PVC	0.254	0.013	0.30	34.0	0.67	10.2%
Highway 174 Ramp	105	EX. MH	0	0	0	0.000	0.000	0.283	0.92	3.47	3.18	0.000	0.890	0.29	3.48	41.9	250 PVC	0.254	0.013	0.30	34.0	0.67	10.2%
Totals			**0**	**0**	**163**	**0.000**	**0.283**	**0.283**	**0.92**	**3.47**	**3.18**	**0.890**	**0.890**	**0.29**	**3.48**	**138.1**							

Demand Equation / Parameters

1. **Q(D), Q(A), Q(R) =** Q(p) + Q(fd) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 (design); 200 (annual and rare)
4. **M = Harmon Formula (maximum of 3.8)**
5. **K =** 0.8 (design); 0.6 (annual and rare)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4
7. **Q(fd) =** 0.45
8. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
9. **Q(e) =** 0.33 (design); 0.30 (annual); 0.55 (rare)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(A) = Peak Annual Flow (L/s)
Q(R) = Peak Rare Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

	Singles	Semis / Towns	Apts (1 Bdrm.)	Apts (2 Bdrm.)	Apts (3 Bdrm.)
P = Residential Population =	3.4	2.7	1.4	2.1	3.1

q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor

Typ. Service Diameter (mm) =	135	
Typ. Service Length (m) =	15	15
I/I Pipe Rate (L/mm dia/m/hr) =	0.007	

Q(fd) = Foundation Flow (L/s)
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

SANITARY SEWER DESIGN SHEET - SOUTHERN OUTLET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: 3459 & 3479 St. Joseph Boulevard
Date: May 9, 2025
Input By: K. D'sa
Reviewed By: F. Thauvette
Drawing Reference: 113020-GP1 & 113020-GP2

Legend:
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- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
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MOE - Design Guidelines for Sewage Works (2008)

Location			Demand												Design Capacity							
			Residential Flow											Extraneous Flow Area Method	Total Design Flow	Proposed Sewer Pipe Sizing / Design							
Street	From MH	To MH	Singles	Semis / Towns	Apts	Park Area	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull
Site	CAP	111	0	0	163	0.000	0.283	0.283	0.92	3.47	3.18	0.890	0.890	0.29	3.48	1.7	250 PVC	0.254	0.013	1.00	62.0	1.22	5.6%
Site	111	EX. SEWER	0	0	0	0.000	0.000	0.283	0.92	3.47	3.18	0.000	0.890	0.29	3.48	7.6	250 PVC	0.254	0.013	1.00	62.0	1.22	5.6%
Totals			**0**	**0**	**163**	**0.000**	**0.283**	**0.283**	**0.92**	**3.47**	**3.18**	**0.890**	**0.890**	**0.29**	**3.48**	**9.3**							

Demand Equation / Parameters

1. **Q(D), Q(A), Q(R) =** Q(p) + Q(fd) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 (design); 200 (annual and rare)
4. **M = Harmon Formula (maximum of 3.8)**
5. **K =** 0.8 (design); 0.6 (annual and rare)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4
7. **Q(fd) =** 0.45
8. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
9. **Q(e) =** 0.33 (design); 0.30 (annual); 0.55 (rare)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(A) = Peak Annual Flow (L/s)
Q(R) = Peak Rare Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

	Singles	Semis / Towns	Apts (1 Bdrm.)	Apts (2 Bdrm.)	Apts (3 Bdrm.)
P = Residential Population =	3.4	2.7	1.4	2.1	3.1
q = Average Capita Flow					
M = Harmon Formula					
K = Harmon Correction Factor					
Typ. Service Diameter (mm) =	135				
Typ. Service Length (m) =	15	15			
I/I Pipe Rate (L/mm dia/m/hr) =	0.007				

Q(fd) = Foundation Flow (L/s)
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

APPENDIX D

Water Demands, FUS Calculations, Watermain Boundary Conditions, E-mail Correspondence, Schematics of the Hydraulic Model and Modelling Results

3459 & 3479 St. Joseph Blvd - Buildings A, B, C and D
THEORETICAL DOMESTIC WATER DEMANDS

	Post Development		
Area Identifier	**Average Day Demand (L/s)**	**Maximum Day Demand (L/s)**	**Peak Hour Demand (L/s)**
Building A	0.6	1.4	3.2
Building B	0.3	0.9	1.9
Building C	0.3	0.9	1.9
Building D	0.6	1.4	3.2
Total Site Development :	**1.8**	**4.7**	**10.2**

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3459 & 3479 St. Joseph Blvd - Building A
THEORETICAL DOMESTIC WATER DEMANDS

DOMESTIC WATER DEMAND

Residential Use	Post-Development	
Number of One Bedroom Apartments	55	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	48	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	103	
Design Population	178	
Average Daily Flow per Resident	280	L/c/day
Average Day Demand	**0.58**	**L/s**
Maximum Day Demand (2.5 x avg. day)	**1.44**	**L/s**
Peak Hour Demand (2.2 x max. day)	**3.17**	**L/s**
TOTAL		
Average Day Demand	**0.6**	**L/s**
Maximum Day Demand	**1.4**	**L/s**
Peak Hour Demand	**3.2**	**L/s**

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Engineers, Planners & Landscape Architects

3459 & 3479 St. Joseph Blvd - Building B
THEORETICAL DOMESTIC WATER DEMANDS

DOMESTIC WATER DEMAND

Residential Use	Post-Development	
Number of One Bedroom Apartments	31	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	29	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	60	
Design Population	105	
Average Daily Flow per Resident	280	L/c/day
Average Day Demand	**0.34**	**L/s**
Maximum Day Demand (2.5 x avg. day)	**0.85**	**L/s**
Peak Hour Demand (2.2 x max. day)	**1.87**	**L/s**
TOTAL		
Average Day Demand	**0.3**	**L/s**
Maximum Day Demand	**0.9**	**L/s**
Peak Hour Demand	**1.9**	**L/s**

NOVATECH
Engineers, Planners & Landscape Architects

3459 & 3479 St. Joseph Blvd - Building C
THEORETICAL DOMESTIC WATER DEMANDS

DOMESTIC WATER DEMAND

Residential Use	Post-Development	
Number of One Bedroom Apartments	31	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	30	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	29	
Design Population	107	
Average Daily Flow per Resident	280	L/c/day
Average Day Demand	**0.35**	**L/s**
Maximum Day Demand (2.5 x avg. day)	**0.87**	**L/s**
Peak Hour Demand (2.2 x max. day)	**1.91**	**L/s**
TOTAL		
Average Day Demand	**0.3**	**L/s**
Maximum Day Demand	**0.9**	**L/s**
Peak Hour Demand	**1.9**	**L/s**

NOVATECH
Engineers, Planners & Landscape Architects

3459 & 3479 St. Joseph Blvd - Building D
THEORETICAL DOMESTIC WATER DEMANDS

DOMESTIC WATER DEMAND

Residential Use	Post-Development	
Number of One Bedroom Apartments	55	
Average Persons per 1-Bdrm Apartment	1.4	
Number of Two Bedroom Apartments	48	
Average Persons per 2-Bdrm Apartment	2.1	
Total Number of Units	103	
Design Population	178	
Average Daily Flow per Resident	280	L/c/day
Average Day Demand	**0.58**	**L/s**
Maximum Day Demand (2.5 x avg. day)	**1.44**	**L/s**
Peak Hour Demand (2.2 x max. day)	**3.17**	**L/s**
TOTAL		
Average Day Demand	**0.6**	**L/s**
Maximum Day Demand	**1.4**	**L/s**
Peak Hour Demand	**3.2**	**L/s**

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: Chartro Lands
Date: July 8, 2024
Input By: Chris Visser
Reviewed By: Francois Thauvette

Legend: Input by User; No Information or Input Required

Building Description: Residential Building A
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1800			
		Total Floors/Storeys (Podium)	4			
		Tower Footprint (m^2)	1045			
		Total Floors/Storeys (Tower)	2			
		Protected Openings (1 hr)	Yes			
		A, Total Effective Floor Area (m^2)			**2,700**	
	F	**Base fire flow without reductions**				**9,000**
		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%	**7,650**
		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%	**-889**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	2,700	29%		
				Cumulative Total	**-12%**	
5	**Exposure Surcharge per**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	>30m		0%	**765**
		East Side	>30m		2%	
		South Side	3.1 - 10 m		8%	
		West Side	>30m		0%	
				Cumulative Total	**10%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**8,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**133**
				or	USGPM	2,114

Novatech Project #:	113020
Project Name:	Chartro Lands
Date:	July 8, 2024
Input By:	Chris Visser
Reviewed By:	Francois Thauvette
Building Description:	Residential Building A
	Type II - Non-combustible construction
Automatic Sprinklers	Yes
	Retail Building B
	Type V - Wood frame

FUS - Table 6 worksheet

To be used only if adjacent *Exposed Building* construction is known

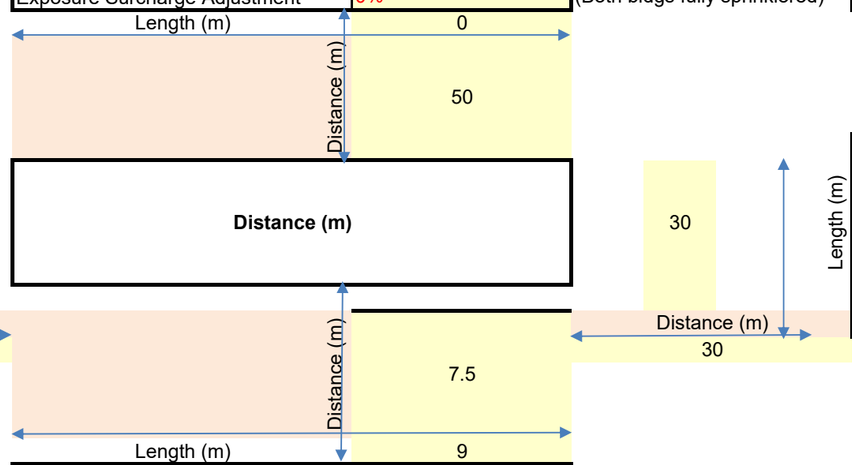
Exposed Building North	
Description/Address	Hwy 174
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	0
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

(Both bldgs fully sprinklered)

Exposed Building West	
Description/Address	Vacant Lands
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	0
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

Exposed Building East	
Description/Address	Ex. Mobile Homes
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	30
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	2%

Exposed Building South	
Description/Address	Residential Building B
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	54
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	8%



Calculated Exposure Charges	
	Table 6
North Side	0%
East Side	2%
South Side	8%
West Side	0%
Total	**10%**

* Storey assumption is based on 4m or fraction thereoff. Adjust number of stories for non-standard storey heights (i.e. 10m single storey warehouse)

Source of Information	

Legend	Input by User
	No Information or Input Required

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: July 8, 2024
Project Name: Chartro Lands
Date: April 15, 2024
Input By: Chris Visser
Reviewed By: Francois Thauvette

Legend: Input by User; No Information or Input Required

Building Description: Residential Building B
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	985			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**1,478**	
	F	**Base fire flow without reductions**				**7,000**
		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%	**5,950**
		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%	**-595**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	1,478	25%		
				Cumulative Total	**-10%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	3.1 - 10 m		8%	**476**
		East Side	>30m		0%	
		South Side	20.1 - 30 m		0%	
		West Side	>30m		0%	
				Cumulative Total	**8%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**6,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**100**
				or	USGPM	1,585

FUS - Table 6 worksheet

To be used only if adjacent *Exposed Building* construction is known

Novatech Project #:	113020
Project Name:	Chartro Lands
Date:	July 8, 2024
Input By:	Chris Visser
Reviewed By:	Francois Thauvette

Building Description:	Residential Building B
	Type II - Non-combustible construction
Automatic Sprinklers	Yes
	Retail Building B
	Type V - Wood frame

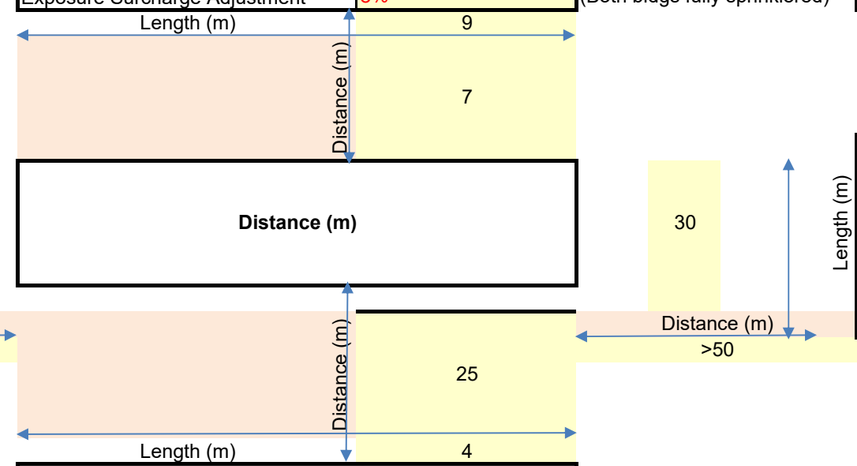
Exposed Building North	
Description/Address	Residential Building B
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	54
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	8%

(Both bldgs fully sprinklered)

Calculated Exposure Charges	
	Table 6
North Side	8%
East Side	0%
South Side	0%
West Side	0%
Total	**8%**

Exposed Building West	
Description/Address	Vacant Lands
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	0
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

Exposed Building East	
Description/Address	Ex. Mobile Homes
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	30
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	0%



Exposed Building South	
Description/Address	Residential Building C
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	24
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	0%

* Storey assumption is based on 4m or fraction thereoff. Adjust number of stories for non-standard storey heights (i.e. 10m single storey warehouse)

Source of Information	

Legend: Input by User

No Information or Input Required

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: Chartro Lands
Date: July 8, 2024
Input By: Chris Visser
Reviewed By: Francois Thauvette

Legend: Input by User; No Information or Input Required

Building Description: Residential Building C
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	985			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**1,478**	
	F	**Base fire flow without reductions**				**7,000**
		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%	**5,950**
		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%	**-595**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	1,478	25%		
				Cumulative Total	**-10%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	20.1 - 30 m		0%	**714**
		East Side	10.1 - 20 m		8%	
		South Side	10.1 - 20 m		4%	
		West Side	>30m		0%	
				Cumulative Total	**12%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**6,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**100**
				or	USGPM	1,585

Novatech Project #:	113020
Project Name:	Chartro Lands
Date:	July 8, 2024
Input By:	Chris Visser
Reviewed By:	Francois Thauvette

Building Description:	Residential Building C
	Type II - Non-combustible construction
Automatic Sprinklers	Yes

FUS - Table 6 worksheet

To be used only if adjacent *Exposed Building* construction is known

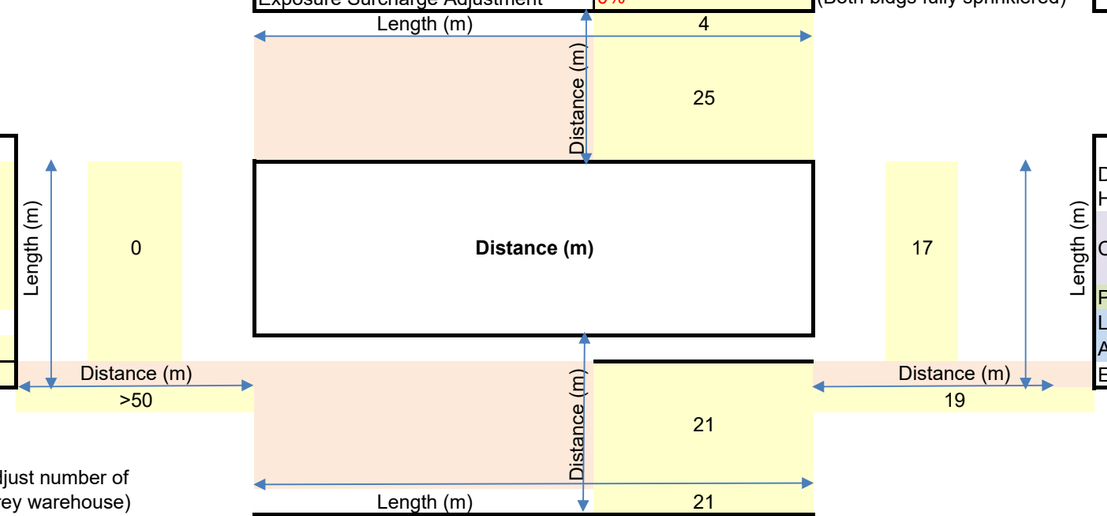
Exposed Building North	
Description/Address	Residential Building B
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	24
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	0%

(Both bldgs fully sprinklered)

Exposed Building West	
Description/Address	Vacant Lands
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	0
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

Exposed Building East	
Description/Address	Residential Building D
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	102
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	8%

Exposed Building South	
Description/Address	Residential Building D
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	126
Automatic Sprinklers	No
Exposure Surcharge Adjustment	4%



Calculated Exposure Charges	
	Table 6
North Side	0%
East Side	8%
South Side	4%
West Side	0%
Total	**12%**

* Storey assumption is based on 4m or fraction thereoff. Adjust number of stories for non-standard storey heights (i.e. 10m single storey warehouse)

Source of Information	

Legend	Input by User
	No Information or Input Required

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: Chartro Lands
Date: July 8, 2024
Input By: Chris Visser
Reviewed By: Francois Thauvette

Legend: Input by User; No Information or Input Required

Building Description: Residential Building D
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1800			
		Total Floors/Storeys (Podium)	4			
		Tower Footprint (m^2)	1045			
		Total Floors/Storeys (Tower)	2			
		Protected Openings (1 hr)	Yes			
		A, Total Effective Floor Area (m^2)			**2,700**	
	F	**Base fire flow without reductions**				**9,000**
		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%	**7,650**
		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%	**-889**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	2,700	29%		
				Cumulative Total	**-12%**	
5	**Exposure Surcharge per**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	>30m		8%	**1,377**
		East Side	10.1 - 20 m		2%	
		South Side	>30m		0%	
		West Side	10.1 - 20 m		8%	
				Cumulative Total	**18%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**8,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**133**
				or	USGPM	2,114

Novatech Project #:	113020
Project Name:	Chartro Lands
Date:	July 8, 2024
Input By:	Chris Visser
Reviewed By:	Francois Thauvette

Building Description:	Residential Building D
	Type II - Non-combustible construction
Automatic Sprinklers	Yes
	Retail Building B
	Type II - Non-combustible construction

FUS - Table 6 worksheet

To be used only if adjacent *Exposed Building* construction is known

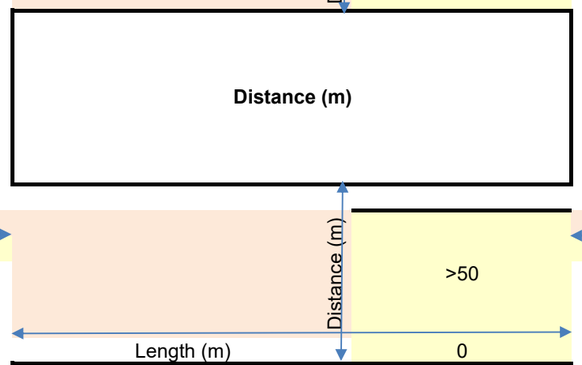
Exposed Building North	
Description/Address	Residential Building C
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	126
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	8%

(Both bldgs fully sprinklered)

Exposed Building West	
Description/Address	Residential Building C
Height (storeys*)	6
Construction Type	Type II - Non-combustible construction
Protected Openings	Yes
Length-Height Factor	102
Automatic Sprinklers	Yes
Exposure Surcharge Adjustment	8%

Exposed Building East	
Description/Address	Ex. Residential
Height (storeys*)	2
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	22
Automatic Sprinklers	No
Exposure Surcharge Adjustment	2%

Exposed Building South	
Description/Address	St. Joseph Boulevard
Height (storeys*)	1
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	0
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%



Calculated Exposure Charges	
	Table 6
North Side	8%
East Side	2%
South Side	0%
West Side	8%
Total	**18%**

* Storey assumption is based on 4m or fraction thereoff. Adjust number of stories for non-standard storey heights (i.e. 10m single storey warehouse)

Source of Information	

Legend	
	Input by User
	No Information or Input Required

Chris Visser

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: Thursday, July 8, 2021 10:00 AM
To: Francois Thauvette
Cc: Steve Matthews
Subject: RE: 3459 & 3479 St. Joseph Boulevard - Watermain Boundary Conditions Request
Attachments: 3459 & 3479 St. Joseph Blvd_29June2021.docx

Good morning,

Please find attached the water boundary conditions for the above noted property.

Best,

Rubina

Rubina Rasool, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review – East Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

---

From: Francois Thauvette <f.thauvette@novatech-eng.com>
Sent: Monday, June 14, 2021 2:23 PM
To: Curry, William <William.Curry@ottawa.ca>
Cc: Steve Matthews <S.Matthews@novatech-eng.com>
Subject: FW: 3459 & 3479 St. Joseph Boulevard - Watermain Boundary Conditions Request

Hi Will,

We are sending this e-mail to request watermain boundary conditions for the proposed development of the 3459 & 3479 St. Joseph Blvd. properties. See e-mail below and attachments for details.

Regards,

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

NOVATECH Engineers, Planners & Landscape Architects

Please note that I am working from home. Email or MS Teams are the best ways to contact me.

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

From: Steve Matthews <S.Matthews@novatech-eng.com>
Sent: Monday, June 14, 2021 1:55 PM
To: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: 3459 & 3479 St. Joseph Boulevard - Watermain Boundary Conditions Request

Hi François,

The proposed re-development of the 3459 & 3479 St. Joseph Boulevard site will include four (4) new multi-storey residential buildings on a common podium between St. Joseph Boulevard and the existing on-ramp to Hwy 174. Refer to the attached Architectural Site Plan for details.

Please request watermain boundary conditions for the 400mm dia. PVC watermain in St. Joseph Boulevard (as shown on geoOttawa). We anticipate requiring a looped on-site watermain with bulk metering at the property line as well as two (2) redundant water service connections for the on-site buildings. The anticipated water demands for the proposed development are as follows (incl. Buildings A, B, C and D):

- Average Day Demand = **2.2 L/s**
- Maximum Day Demand = **5.8 L/s**
- Peak Hour Demand = **12.6 L/s**
- Maximum Fire Flow Demand Range = **183 L/s - 200 L/s**

See attached calculation sheets for details.

A multi-hydrant approach to firefighting is anticipated to be required. As indicated on the geoOttawa website, there are a couple of blue bonnet municipal hydrants within 75m of the subject site as well as two (2) new private hydrants being proposed that could be used for firefighting purposes. See attached Boundary Conditions Sketch for details.

Please review and let us know if you require any additional information.

Regards,
Steve

Stephen Matthews, B.A.(Env), Senior Design Technologist
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 223 | Fax: 613.254.5867

'

'

Boundary Conditions
3459 & 3479 St. Joseph Blvd

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	132	2.20
Maximum Daily Demand	348	5.80
Peak Hour	756	12.60
Fire Flow Demand #1	11,000	183.33
Fire Flow Demand #2	12,000	200.00

Location

Results

Connection 1 – St. Joseph Blvd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	113.9	74.5
Peak Hour	109.1	67.6
Max Day plus Fire 1	104.3	60.8
Max Day plus Fire 2	103.1	59.1

Ground Elevation = 61.5 m

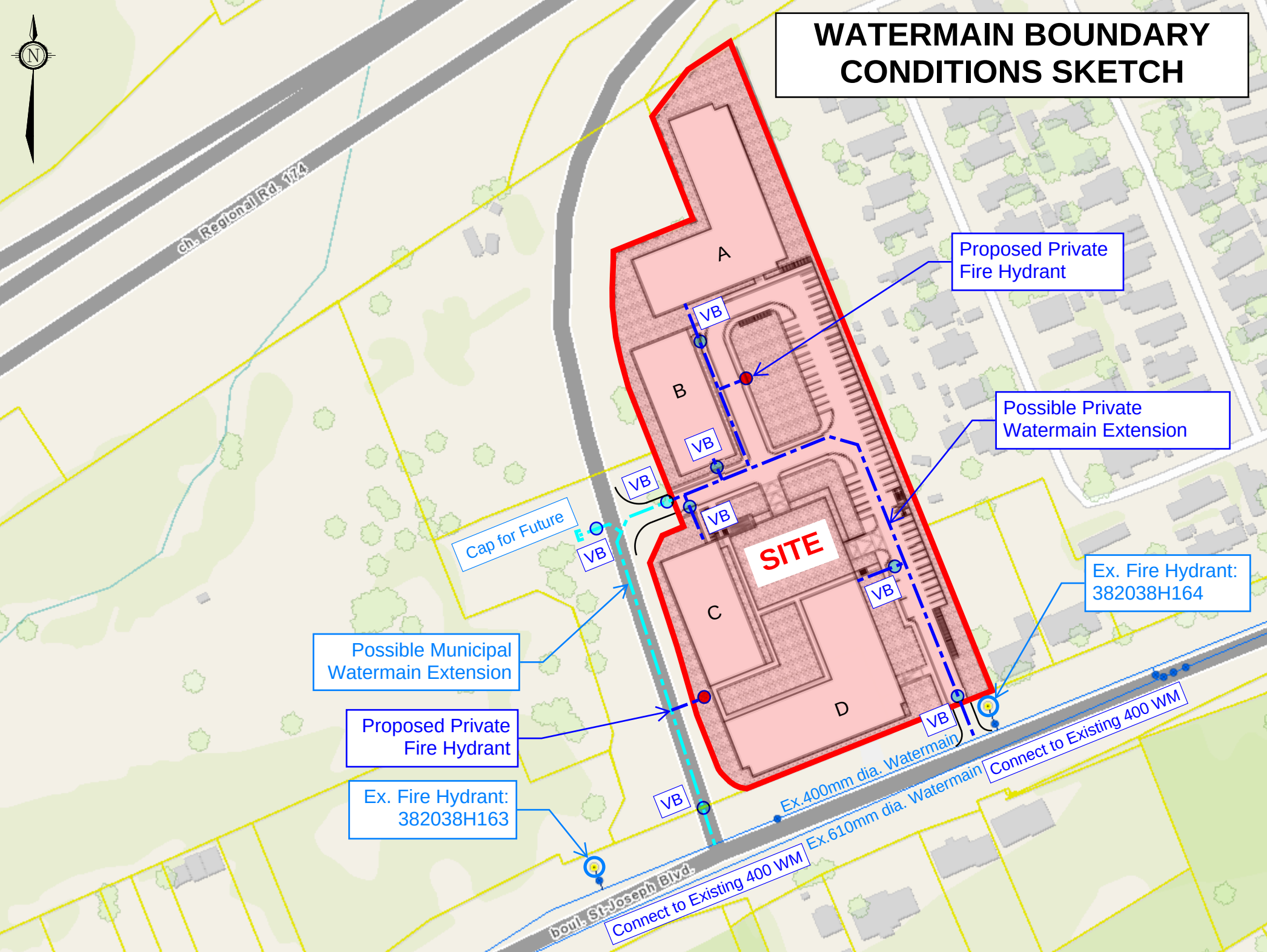
Connection 2 – St. Joseph Blvd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	113.9	75.4
Peak Hour	109.1	68.5
Max Day plus Fire 1	104.2	61.5
Max Day plus Fire 2	103.0	59.8

Ground Elevation = 60.9 m

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.


WATERMAIN BOUNDARY CONDITIONS SKETCH
ch. Regional Rd. 174
boul. St-Joseph Blvd.
A
B
C
D
SITE
VB
Proposed Private Fire Hydrant
Possible Private Watermain Extension
Cap for Future
Possible Municipal Watermain Extension
Proposed Private Fire Hydrant
Ex. Fire Hydrant: 382038H163
Ex. Fire Hydrant: 382038H164
Ex.400mm dia. Watermain
Ex.610mm dia. Watermain
Connect to Existing 400 WM
Connect to Existing 400 WM

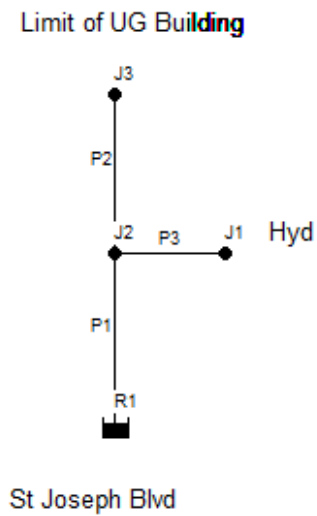
PROJECT #: 113020
PROJECT NAME: 3459 & 3479 St Joseph Blvd
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED:

3459 & 3479 St Joseph Blvd - Proposed Residential Development

Proposed Watermain Schematic



3459 & 3479 St Joseph Blvd - Proposed Residential Development
Water Model Results

Max Day + Fire Flow Demand
Network Table - Nodes

Node ID	Elevation m	Demand L/s	Head m	Pressure m	Pressure kPa	Pressure psi
Junc J1	61	0	98.27	37.27	365.62	53.03
Junc J2	57.9	0	98.27	40.37	396.03	57.44
Junc J3	61	138	89.1	28.1	275.66	39.98
Resvr R1	104	-138	104	0	0.00	0.00
					Min=	39.98
					Max=	57.44

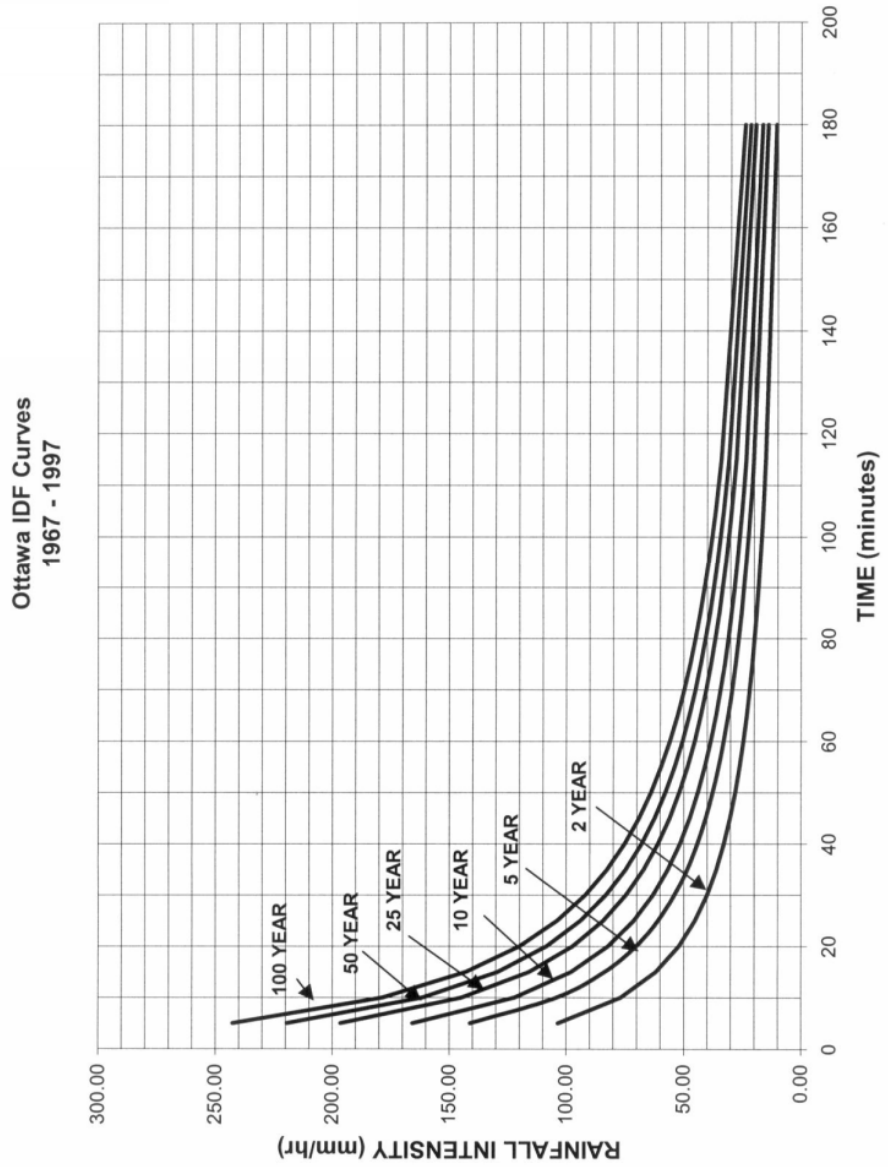
Max Day + Fire Flow Demand
Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow L/s	Velocity m/s	Unit Headloss m/km
Pipe P1	50	200	110	138	4.39	114.58
Pipe P2	80	200	110	138	4.39	114.58
Pipe P3	3.3	150	100	0	0	0

APPENDIX E

IDF Curves, SWM Calculations, Storm Sewer Design Sheets

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



PROJECT #: 113020
PROJECT NAME: 3459 3479 St. Joseph Boulevard
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
3459 & 3479 St. Joseph Boulevard

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}	2-Year Flow (L/s)	5-Year Flow (L/s)	100-Year Flow (L/s)	Allowable $C_{w(pre)}$	Allowable Site Flow (Tc=20 mins.)		
											2-year (L/s)	5-year (L/s)	100-year (L/s)
Site to be Re-Developed	1.781	0.065	0.017	1.699	0.23	0.28	86.9	118.3	249.5	0.23		79.8	
Off-Site Tributary Area OS-1 (West)	0.625	0.232	0.000	0.393	0.46	0.53	61.4	83.2	163.9				
Off-Site Tributary Area OS-2 (East)	0.179	0.000	0.000	0.179	0.20	0.25	33.7	45.7	87.1				

Post - Development : Site Flows

Flow to Existing Ditch

Area	Description	Area (ha)	A_{imp} (ha) C=0.9	$A_{semi\text{-}perv}$ (ha) C=0.6	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Approximate Storage Requirments (m^3)		
								2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year
A-1	Uncontrolled Site Runoff - (North & East)	0.125	0.000	0.000	0.125	0.20	0.25	5.3	7.2	15.5	-	-	-	-	-	-
A-2A	Uncontrolled Site Runoff - (West of Bldg 'B')	0.085	0.004	0.000	0.081	0.23	0.28	4.2	5.7	12.0	-	-	-	-	-	-
A-2B	Uncontrolled Site Runoff - (West OF Bldg 'C') - Direct to Ditch via CICB	0.052	0.007	0.000	0.045	0.30	0.36	-	-	-	-	-	-	-	-	-
A-3	Controlled Flow Building 'A' (RD1-RD12)	0.190	0.190	0.000	0.000	0.90	1.00	-	-	-	3.8	3.8	3.8	28.9	43.2	98.5
A-4	Controlled Flow Building 'B' (RD1-RD6)	0.099	0.099	0.000	0.000	0.90	1.00	-	-	-	1.9	1.9	1.9	15.0	22.3	51.0
A-5	SWM Tank #1 (Controlled Site Runoff)	0.739	0.488	0.000	0.251	0.66	0.75	-	-	-	15.8	15.8	15.8	69.8	106.2	254.6
OS-1A	Off-Site Tributary Area OS-1A (West) - Direct to Ditch	0.595	0.212	0.000	0.383	0.45	0.52	-	-	-	-	-	-	-	-	-
OS-1B	Off-Site Tributary Area OS-1B (West) - Direct to Ditch via DICB	0.026	0.007	0.000	0.019	0.39	0.45	-	-	-	-	-	-	-	-	-
A-2B+OS-1B	Uncontrolled Runoff to Ditch via DICB	0.078	0.014	0.000	0.064	0.33	0.39	5.5	7.4	15.0	-	-	-	-	-	-
	Flows to Existing Ditch	**1.911**						**15.0**	**20.4**	**42.5**	**21.6**	**21.6**	**21.6**	**113.7**	**171.8**	**404.0**
	Sub-Totals - Site Flows to Existing Ditch :										**36.6**	**41.9**	**64.0**			

Flows to St. Joseph Blvd Storm Sewer

Area	Description	Area (ha)	A_{imp} (ha) C=0.9	$A_{semi\text{-}perv}$ (ha) C=0.6	A_{perv} (ha) C=0.2	C_5	C_{100}	Uncontrolled Flow (L/s)			Controlled Flow (L/s)			Approximate Storage Requirments (m^3)		
								2-year	5-year	100-year	2-year	5-year	100-year	2-year	5-year	100-year
B-1	Uncontrolled Site Runoff - (South)	0.019	0.000	0.000	0.019	0.20	0.25	0.8	1.1	2.4	-	-	-	-	-	-
B-2	Controlled Flow Building 'C' (RD1-RD6)	0.099	0.099	0.000	0.000	0.90	1.00	-	-	-	1.9	1.9	1.9	28.9	43.2	98.5
B-3	Controlled Flow Building 'D' (RD1-RD12)	0.190	0.190	0.000	0.000	0.90	1.00	-	-	-	3.8	3.8	3.8	15.0	22.3	51.0
B-4	SWM Tank #2 (Controlled Site Runoff)	0.195	0.077	0.000	0.118	0.48	0.55	-	-	-	3.8	3.8	3.8	11.8	18.3	45.9
B-5	Uncontrolled Runoff - (South)	0.009	0.000	0.000	0.009	0.20	0.25	-	-	-	-	-	-	-	-	-
OS-1C	Off-Site Tributary Area OS-1C (West)	0.004	0.001	0.000	0.003	0.40	0.47	-	-	-	-	-	-	-	-	-
B-5+OS-1C	Uncontrolled Runoff to St. Joseph Sewer via CB-1	0.014	0.001	0.000	0.012	0.26	0.32	0.7	1.0	2.1	-	-	-	-	-	-
	Flows to St. Joseph Blvd Storm Sewer	**0.516**						**1.6**	**2.1**	**4.5**	**9.6**	**9.6**	**9.6**	**55.7**	**83.9**	**195.3**
	Sub-Totals - Site Flows to Storm Sewer :										**11.1**	**11.7**	**14.0**	**169.4**	**255.6**	**599.3**

Total Site Flows :	**47.7**	**53.6**	**78.1**

Post-Development Off-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}	2-Year Flow (L/s)	5-Year Flow (L/s)	100-Year Flow (L/s)
OS-1A	Off-Site Tributary Area OS-1A (West) - Direct to Ditch	0.595	0.212	0.000	0.383	0.45	0.52	57.1	77.5	152.8
OS-1B	Off-Site Tributary Area OS-1B (West)	0.026	0.007	0.000	0.019	0.39	0.45	2.2	2.9	5.8
OS-1C	Off-Site Tributary Area OS-1C (West)	0.004	0.001	0.000	0.003	0.40	0.47	0.4	0.5	1.0
A-2+OS-1B	Uncontrolled Flow (West) + Off-Site Tributary Area (West)	0.111	0.011	0.000	0.100	0.27	0.32	65.6	88.9	175.9
A-1+OS-2	Uncontrolled Flow (North & East) + Off-Site Tributary Area (North & East)	0.304	0.000	0.000	0.304	0.20	0.25	39.0	53.0	102.6

OGS UNIT (A5)	**0.739**	**0.488**	**0.000**		**0.66**	**0.75**			**21.6**	**21.6**	**21.6**			

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA OS-1 Off-Site Tributary Area OS-1 (West)

OTTAWA IDF CURVE

Area =	0.625	ha	Qallow =	61.4	L/s
C =	0.46		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	82.75	21.39	6.42
10	76.81	61.37	0.00	0.00
15	61.77	49.35	-12.01	-10.81
20	52.03	41.57	-19.79	-23.75
25	45.17	36.09	-25.28	-37.92
30	40.04	31.99	-29.37	-52.87
35	36.06	0.03	-61.33	-128.80
40	32.86	26.26	-35.11	-84.26
45	30.24	0.56	-60.81	-164.19
50	28.04	22.40	-38.96	-116.88
55	26.17	20.91	-40.46	-133.50
60	24.56	19.62	-41.74	-150.28
65	23.15	18.50	-42.87	-167.19
70	21.91	17.51	-43.86	-184.20
75	20.81	16.63	-44.74	-201.31
80	19.83	15.84	-45.52	-218.50
85	18.94	15.14	-46.23	-235.77
90	18.14	14.50	-46.87	-253.09

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-1 Off-Site Tributary Area OS-1 (West)

OTTAWA IDF CURVE

Area =	0.625	ha	Qallow =	83.2	L/s
C =	0.46		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	112.80	51.43	15.43
10	104.19	83.25	21.88	13.13
15	83.56	66.76	5.39	4.86
20	70.25	56.13	-5.24	-6.28
25	60.90	48.65	-12.71	-19.07
30	53.93	43.09	-18.28	-32.90
35	48.52	38.76	-22.60	-47.46
40	44.18	35.30	-26.06	-62.55
45	40.63	32.46	-28.90	-78.04
50	37.65	30.08	-31.28	-93.84
55	35.12	28.06	-33.30	-109.90
60	32.94	26.32	-35.04	-126.16
65	31.04	24.80	-36.56	-142.59
70	29.37	23.47	-37.90	-159.17
75	27.89	22.28	-39.08	-175.87
80	26.56	21.22	-40.14	-192.68
85	25.37	20.27	-41.10	-209.59
90	24.29	19.41	-41.96	-226.58

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-1 Off-Site Tributary Area OS-1 (West)

OTTAWA IDF CURVE

Area =	0.625	ha	Qallow =	163.9	L/s
C =	0.53		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	222.83	58.89	17.67
10	178.56	163.93	0.00	0.00
15	142.89	131.19	-32.74	-29.47
20	119.95	110.13	-53.81	-64.57
25	103.85	95.34	-68.59	-102.89
30	91.87	84.34	-79.59	-143.26
35	82.58	75.81	-88.12	-185.05
40	75.15	68.99	-94.94	-227.86
45	69.05	63.39	-100.54	-271.46
50	63.95	58.72	-105.22	-315.65
55	59.62	54.74	-109.19	-360.34
60	55.89	51.32	-112.62	-405.42
65	52.65	48.33	-115.60	-450.84
70	49.79	45.71	-118.22	-496.53
75	47.26	43.39	-120.55	-542.47
80	44.99	41.31	-122.63	-588.62
85	42.95	39.44	-124.50	-634.94
90	41.11	37.74	-126.19	-681.43

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA OS-1 Off-Site Tributary Area OS-1 (West)

OTTAWA IDF CURVE

Area =	0.625	ha	Qallow =	196.7	L/s
C =	0.53	0	Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	291.24	267.39	103.46	31.04
10	214.27	196.72	32.79	19.67
15	171.47	157.43	-6.51	-5.86
20	143.94	132.15	-31.78	-38.14
25	124.62	114.41	-49.52	-74.29
30	110.24	101.21	-62.72	-112.90
35	99.09	90.98	-72.96	-153.21
40	90.17	82.79	-81.15	-194.75
45	82.86	76.07	-87.86	-237.22
50	76.74	70.46	-93.48	-280.43
55	71.55	65.69	-98.25	-324.21
60	67.07	61.58	-102.35	-368.48
65	63.18	58.00	-105.93	-413.14
70	59.75	54.85	-109.08	-458.14
75	56.71	52.06	-111.87	-503.42
80	53.99	49.57	-114.37	-548.96
85	51.54	47.32	-116.61	-594.72
90	49.33	45.29	-118.64	-640.66

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA OS-1A Off-Site Tributary Area OS-1A (West) - Direct to Ditch

OTTAWA IDF CURVE

Area =	0.595	ha	Qallow =	57.1	L/s
C =	0.45		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	76.99	19.90	5.97
10	76.81	57.09	0.00	0.00
15	61.77	45.92	-11.18	-10.06
20	52.03	38.68	-18.42	-22.10
25	45.17	33.58	-23.52	-35.28
30	40.04	29.77	-27.33	-49.19
35	36.06	0.03	-57.06	-119.83
40	32.86	24.43	-32.66	-78.39
45	30.24	0.56	-56.54	-152.66
50	28.04	20.84	-36.25	-108.75
55	26.17	19.45	-37.64	-124.21
60	24.56	18.26	-38.84	-139.82
65	23.15	17.21	-39.88	-155.55
70	21.91	16.29	-40.81	-171.38
75	20.81	15.47	-41.62	-187.30
80	19.83	14.74	-42.35	-203.30
85	18.94	14.08	-43.01	-219.36
90	18.14	13.49	-43.61	-235.48

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-1A Off-Site Tributary Area OS-1A (West) - Direct to Di

OTTAWA IDF CURVE

Area =	0.595	ha	Qallow =	77.5	L/s
C =	0.45		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	104.95	47.85	14.36
10	104.19	77.45	20.36	12.22
15	83.56	62.11	5.02	4.52
20	70.25	52.22	-4.87	-5.85
25	60.90	45.27	-11.83	-17.74
30	53.93	40.09	-17.01	-30.61
35	48.52	36.07	-21.03	-44.16
40	44.18	32.85	-24.25	-58.20
45	40.63	30.20	-26.89	-72.61
50	37.65	27.99	-29.10	-87.31
55	35.12	26.11	-30.98	-102.25
60	32.94	24.49	-32.61	-117.38
65	31.04	23.08	-34.02	-132.67
70	29.37	21.83	-35.26	-148.09
75	27.89	20.73	-36.36	-163.63
80	26.56	19.75	-37.35	-179.28
85	25.37	18.86	-38.24	-195.01
90	24.29	18.06	-39.04	-210.81

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-1A Off-Site Tributary Area OS-1A (West) - Direct to Ditch

OTTAWA IDF CURVE

Area =	0.595	ha	Qallow =	152.8	L/s
C =	0.52		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	207.64	54.88	16.46
10	178.56	152.77	0.00	0.00
15	142.89	122.25	-30.51	-27.46
20	119.95	102.62	-50.14	-60.17
25	103.85	88.85	-63.92	-95.88
30	91.87	78.60	-74.17	-133.50
35	82.58	70.65	-82.12	-172.44
40	75.15	64.29	-88.48	-212.34
45	69.05	59.08	-93.69	-252.96
50	63.95	54.72	-98.05	-294.15
55	59.62	51.01	-101.75	-335.79
60	55.89	47.82	-104.94	-377.80
65	52.65	45.04	-107.72	-420.12
70	49.79	42.60	-110.17	-462.71
75	47.26	40.43	-112.34	-505.51
80	44.99	38.49	-114.27	-548.51
85	42.95	36.75	-116.02	-591.68
90	41.11	35.17	-117.59	-635.00

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA OS-1A Off-Site Tributary Area OS-1A (West) - Direct to Di

OTTAWA IDF CURVE

Area =	0.595	ha	Qallow =	183.3	L/s
C =	0.52	0	Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	291.24	249.17	96.41	28.92
10	214.27	183.32	30.55	18.33
15	171.47	146.70	-6.06	-5.46
20	143.94	123.15	-29.62	-35.54
25	124.62	106.62	-46.15	-69.23
30	110.24	94.32	-58.45	-105.21
35	99.09	84.78	-67.99	-142.77
40	90.17	77.15	-75.62	-181.48
45	82.86	70.89	-81.87	-221.06
50	76.74	65.66	-87.11	-261.32
55	71.55	61.21	-91.55	-302.12
60	67.07	57.38	-95.38	-343.37
65	63.18	54.05	-98.72	-384.99
70	59.75	51.12	-101.65	-426.92
75	56.71	48.52	-104.25	-469.13
80	53.99	46.19	-106.58	-511.56
85	51.54	44.10	-108.67	-554.20
90	49.33	42.21	-110.56	-597.02

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA OS-1B Off-Site Tributary Area OS-1B (West)

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	2.2	L/s
C =	0.39		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	2.91	0.75	0.23
10	76.81	2.16	0.00	0.00
15	61.77	1.73	-0.42	-0.38
20	52.03	1.46	-0.70	-0.83
25	45.17	1.27	-0.89	-1.33
30	40.04	1.12	-1.03	-1.86
35	36.06	0.03	-2.12	-4.46
40	32.86	0.92	-1.23	-2.96
45	30.24	0.56	-1.60	-4.32
50	28.04	0.79	-1.37	-4.11
55	26.17	0.73	-1.42	-4.69
60	24.56	0.69	-1.47	-5.28
65	23.15	0.65	-1.51	-5.88
70	21.91	0.62	-1.54	-6.47
75	20.81	0.58	-1.57	-7.07
80	19.83	0.56	-1.60	-7.68
85	18.94	0.53	-1.62	-8.29
90	18.14	0.51	-1.65	-8.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-1B Off-Site Tributary Area OS-1B (West)

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	2.9	L/s
C =	0.39		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	3.96	1.81	0.54
10	104.19	2.93	0.77	0.46
15	83.56	2.35	0.19	0.17
20	70.25	1.97	-0.18	-0.22
25	60.90	1.71	-0.45	-0.67
30	53.93	1.51	-0.64	-1.16
35	48.52	1.36	-0.79	-1.67
40	44.18	1.24	-0.92	-2.20
45	40.63	1.14	-1.02	-2.74
50	37.65	1.06	-1.10	-3.30
55	35.12	0.99	-1.17	-3.86
60	32.94	0.92	-1.23	-4.43
65	31.04	0.87	-1.28	-5.01
70	29.37	0.82	-1.33	-5.59
75	27.89	0.78	-1.37	-6.18
80	26.56	0.75	-1.41	-6.77
85	25.37	0.71	-1.44	-7.37
90	24.29	0.68	-1.47	-7.96

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-1B Off-Site Tributary Area OS-1B (West)

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	5.8	L/s
C =	0.45		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	7.93	2.10	0.63
10	178.56	5.83	0.00	0.00
15	142.89	4.67	-1.16	-1.05
20	119.95	3.92	-1.91	-2.30
25	103.85	3.39	-2.44	-3.66
30	91.87	3.00	-2.83	-5.10
35	82.58	2.70	-3.14	-6.58
40	75.15	2.45	-3.38	-8.11
45	69.05	2.26	-3.58	-9.66
50	63.95	2.09	-3.74	-11.23
55	59.62	1.95	-3.89	-12.82
60	55.89	1.83	-4.01	-14.42
65	52.65	1.72	-4.11	-16.04
70	49.79	1.63	-4.21	-17.67
75	47.26	1.54	-4.29	-19.30
80	44.99	1.47	-4.36	-20.94
85	42.95	1.40	-4.43	-22.59
90	41.11	1.34	-4.49	-24.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA OS-1B Off-Site Tributary Area OS-1B (West)

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	7.0	L/s
C =	0.45	0	Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	291.24	9.51	3.68	1.10
10	214.27	7.00	1.17	0.70
15	171.47	5.60	-0.23	-0.21
20	143.94	4.70	-1.13	-1.36
25	124.62	4.07	-1.76	-2.64
30	110.24	3.60	-2.23	-4.02
35	99.09	3.24	-2.60	-5.45
40	90.17	2.95	-2.89	-6.93
45	82.86	2.71	-3.13	-8.44
50	76.74	2.51	-3.33	-9.98
55	71.55	2.34	-3.50	-11.54
60	67.07	2.19	-3.64	-13.11
65	63.18	2.06	-3.77	-14.70
70	59.75	1.95	-3.88	-16.30
75	56.71	1.85	-3.98	-17.91
80	53.99	1.76	-4.07	-19.53
85	51.54	1.68	-4.15	-21.16
90	49.33	1.61	-4.22	-22.79

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA OS-1C Off-Site Tributary Area OS-1C (West)

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	0.4	L/s
C =	0.39		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	0.48	0.12	0.04
10	76.81	0.35	0.00	0.00
15	61.77	0.28	-0.07	-0.06
20	52.03	0.24	-0.11	-0.14
25	45.17	0.21	-0.15	-0.22
30	40.04	0.18	-0.17	-0.31
35	36.06	0.03	-0.32	-0.67
40	32.86	0.15	-0.20	-0.49
45	30.24	0.56	0.20	0.54
50	28.04	0.13	-0.22	-0.67
55	26.17	0.12	-0.23	-0.77
60	24.56	0.11	-0.24	-0.87
65	23.15	0.11	-0.25	-0.96
70	21.91	0.10	-0.25	-1.06
75	20.81	0.10	-0.26	-1.16
80	19.83	0.09	-0.26	-1.26
85	18.94	0.09	-0.27	-1.36
90	18.14	0.08	-0.27	-1.46

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-1C Off-Site Tributary Area OS-1C (West)

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	0.5	L/s
C =	0.39		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	0.65	0.30	0.09
10	104.19	0.48	0.13	0.08
15	83.56	0.39	0.03	0.03
20	70.25	0.32	-0.03	-0.04
25	60.90	0.28	-0.07	-0.11
30	53.93	0.25	-0.11	-0.19
35	48.52	0.22	-0.13	-0.27
40	44.18	0.20	-0.15	-0.36
45	40.63	0.19	-0.17	-0.45
50	37.65	0.17	-0.18	-0.54
55	35.12	0.16	-0.19	-0.63
60	32.94	0.15	-0.20	-0.73
65	31.04	0.14	-0.21	-0.82
70	29.37	0.14	-0.22	-0.92
75	27.89	0.13	-0.23	-1.02
80	26.56	0.12	-0.23	-1.11
85	25.37	0.12	-0.24	-1.21
90	24.29	0.11	-0.24	-1.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-1C Off-Site Tributary Area OS-1C (West)

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	1.0	L/s
C =	0.45		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	1.30	0.34	0.10
10	178.56	0.96	0.00	0.00
15	142.89	0.77	-0.19	-0.17
20	119.95	0.64	-0.31	-0.38
25	103.85	0.56	-0.40	-0.60
30	91.87	0.49	-0.47	-0.84
35	82.58	0.44	-0.51	-1.08
40	75.15	0.40	-0.55	-1.33
45	69.05	0.37	-0.59	-1.59
50	63.95	0.34	-0.61	-1.84
55	59.62	0.32	-0.64	-2.11
60	55.89	0.30	-0.66	-2.37
65	52.65	0.28	-0.68	-2.63
70	49.79	0.27	-0.69	-2.90
75	47.26	0.25	-0.70	-3.17
80	44.99	0.24	-0.72	-3.44
85	42.95	0.23	-0.73	-3.71
90	41.11	0.22	-0.74	-3.98

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA OS-1C Off-Site Tributary Area OS-1C (West)

OTTAWA IDF CURVE

Area =	0.004	ha	Qallow =	1.1	L/s
C =	0.45	0	Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	291.24	1.56	0.60	0.18
10	214.27	1.15	0.19	0.11
15	171.47	0.92	-0.04	-0.03
20	143.94	0.77	-0.19	-0.22
25	124.62	0.67	-0.29	-0.43
30	110.24	0.59	-0.37	-0.66
35	99.09	0.53	-0.43	-0.90
40	90.17	0.48	-0.47	-1.14
45	82.86	0.44	-0.51	-1.39
50	76.74	0.41	-0.55	-1.64
55	71.55	0.38	-0.57	-1.89
60	67.07	0.36	-0.60	-2.15
65	63.18	0.34	-0.62	-2.41
70	59.75	0.32	-0.64	-2.68
75	56.71	0.30	-0.65	-2.94
80	53.99	0.29	-0.67	-3.21
85	51.54	0.28	-0.68	-3.48
90	49.33	0.26	-0.69	-3.74

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA OS-2 Off-Site Tributary Area OS-2 (East)

OTTAWA IDF CURVE

Area =	0.179	ha	Qallow =	33.7	L/s
C =	0.88		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	103.57	45.44	11.74	3.52
10	76.81	33.70	0.00	0.00
15	61.77	27.10	-6.60	-5.94
20	52.03	22.83	-10.87	-13.04
25	45.17	19.82	-13.88	-20.82
30	40.04	17.57	-16.13	-29.03
35	36.06	0.03	-33.67	-70.70
40	32.86	14.42	-19.28	-46.27
45	30.24	0.56	-33.14	-89.49
50	28.04	12.30	-21.40	-64.19
55	26.17	11.48	-22.22	-73.32
60	24.56	10.78	-22.92	-82.53
65	23.15	10.16	-23.54	-91.81
70	21.91	9.61	-24.09	-101.16
75	20.81	9.13	-24.57	-110.55
80	19.83	8.70	-25.00	-120.00
85	18.94	8.31	-25.39	-129.48
90	18.14	7.96	-25.74	-138.99

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA OS-2 Off-Site Tributary Area OS-2 (East)

OTTAWA IDF CURVE

Area =	0.179	ha	Qallow =	45.7	L/s
C =	0.88		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	61.95	28.25	8.47
10	104.19	45.72	12.02	7.21
15	83.56	36.66	2.96	2.67
20	70.25	30.82	-2.88	-3.45
25	60.90	26.72	-6.98	-10.47
30	53.93	23.66	-10.04	-18.07
35	48.52	21.29	-12.41	-26.06
40	44.18	19.39	-14.31	-34.35
45	40.63	17.83	-15.87	-42.86
50	37.65	16.52	-17.18	-51.54
55	35.12	15.41	-18.29	-60.35
60	32.94	14.45	-19.25	-69.28
65	31.04	13.62	-20.08	-78.31
70	29.37	12.89	-20.81	-87.41
75	27.89	12.24	-21.46	-96.58
80	26.56	11.65	-22.05	-105.82
85	25.37	11.13	-22.57	-115.10
90	24.29	10.66	-23.04	-124.43

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA OS-2 Off-Site Tributary Area OS-2 (East)

OTTAWA IDF CURVE

Area =	0.179	ha	Qallow =	87.1	L/s
C =	0.98		Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	118.41	31.30	9.39
10	178.56	87.12	0.00	0.00
15	142.89	69.72	-17.40	-15.66
20	119.95	58.52	-28.59	-34.31
25	103.85	50.67	-36.45	-54.68
30	91.87	44.82	-42.30	-76.13
35	82.58	40.29	-46.83	-98.34
40	75.15	36.66	-50.45	-121.09
45	69.05	33.69	-53.43	-144.25
50	63.95	31.20	-55.91	-167.74
55	59.62	29.09	-58.03	-191.49
60	55.89	27.27	-59.85	-215.45
65	52.65	25.69	-61.43	-239.58
70	49.79	24.29	-62.82	-263.86
75	47.26	23.06	-64.06	-288.27
80	44.99	21.95	-65.17	-312.80
85	42.95	20.96	-66.16	-337.41
90	41.11	20.06	-67.06	-362.12

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA OS-2 Off-Site Tributary Area OS-2 (East)

OTTAWA IDF CURVE

Area =	0.179	ha	Qallow =	104.5	L/s
C =	0.98	0	Vol(max) =	-	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	291.24	142.09	54.98	16.49
10	214.27	104.54	17.42	10.45
15	171.47	83.66	-3.46	-3.11
20	143.94	70.23	-16.89	-20.27
25	124.62	60.80	-26.32	-39.48
30	110.24	53.79	-33.33	-60.00
35	99.09	48.35	-38.77	-81.42
40	90.17	43.99	-43.12	-103.49
45	82.86	40.43	-46.69	-126.06
50	76.74	37.44	-49.67	-149.02
55	71.55	34.91	-52.21	-172.29
60	67.07	32.72	-54.39	-195.81
65	63.18	30.82	-56.29	-219.55
70	59.75	29.15	-57.97	-243.46
75	56.71	27.67	-59.45	-267.52
80	53.99	26.34	-60.78	-291.72
85	51.54	25.15	-61.97	-316.04
90	49.33	24.07	-63.05	-340.46

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-1 **Uncontrolled Direct Runoff - North Side**

OTTAWA IDF CURVE

Area =	0.125	ha	Qallow =	5.3	L/s
C =	0.20		Vol(max) =	0.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	7.20	1.86	0.56
10	76.81	5.34	0.00	0.00
15	61.77	4.29	-1.05	-0.94
20	52.03	3.62	-1.72	-2.07
25	45.17	3.14	-2.20	-3.30
30	40.04	2.78	-2.55	-4.60
35	36.06	2.51	-2.83	-5.95
40	32.86	2.28	-3.05	-7.33
45	30.24	2.10	-3.24	-8.74
50	28.04	1.95	-3.39	-10.17
55	26.17	1.82	-3.52	-11.61
60	24.56	1.71	-3.63	-13.07
65	23.15	1.61	-3.73	-14.54
70	21.91	1.52	-3.82	-16.02
75	20.81	1.45	-3.89	-17.51
90	18.14	1.26	-4.08	-22.02
105	16.13	1.12	-4.22	-26.56
120	14.56	1.01	-4.33	-31.15
135	13.30	0.92	-4.41	-35.75
150	12.25	0.85	-4.49	-40.38

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 **Uncontrolled Direct Runoff - North Side**

OTTAWA IDF CURVE

Area =	0.125	ha	Qallow =	7.2	L/s
C =	0.20		Vol(max) =	0.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	9.81	2.57	0.77
10	104.19	7.24	0.00	0.00
15	83.56	5.81	-1.43	-1.29
20	70.25	4.88	-2.36	-2.83
25	60.90	4.23	-3.01	-4.51
30	53.93	3.75	-3.49	-6.29
35	48.52	3.37	-3.87	-8.13
40	44.18	3.07	-4.17	-10.01
45	40.63	2.82	-4.42	-11.93
50	37.65	2.62	-4.62	-13.87
55	35.12	2.44	-4.80	-15.84
60	32.94	2.29	-4.95	-17.83
65	31.04	2.16	-5.08	-19.83
70	29.37	2.04	-5.20	-21.84
75	27.89	1.94	-5.30	-23.86
90	24.29	1.69	-5.55	-29.99
105	21.58	1.50	-5.74	-36.17
120	19.47	1.35	-5.89	-42.40
135	17.76	1.23	-6.01	-48.65
150	16.36	1.14	-6.10	-54.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 **Uncontrolled Direct Runoff - North Side**

OTTAWA IDF CURVE

Area =	0.125	ha	Qallow =	15.5	L/s
C =	0.25		Vol(max) =	1.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	21.08	5.57	1.67
10	178.56	15.51	0.00	0.00
15	142.89	12.41	-3.10	-2.79
20	119.95	10.42	-5.09	-6.11
25	103.85	9.02	-6.49	-9.74
30	91.87	7.98	-7.53	-13.56
35	82.58	7.17	-8.34	-17.51
40	75.15	6.53	-8.98	-21.56
45	69.05	6.00	-9.51	-25.69
50	63.95	5.56	-9.96	-29.87
55	59.62	5.18	-10.33	-34.10
60	55.89	4.86	-10.66	-38.36
65	52.65	4.57	-10.94	-42.66
70	49.79	4.33	-11.19	-46.98
75	47.26	4.11	-11.41	-51.33
90	41.11	3.57	-11.94	-64.48
105	36.50	3.17	-12.34	-77.75
120	32.89	2.86	-12.65	-91.11
135	30.00	2.61	-12.91	-104.54
150	27.61	2.40	-13.11	-118.02

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-1 **Uncontrolled Direct Runoff - North Side**

OTTAWA IDF CURVE 0

Area =	0.125	ha	Qallow =	18.6	L/s
C =	0.25		Vol(max) =	2.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	25.30	6.69	2.01
10	214.27	18.61	0.00	0.00
15	171.47	14.90	-3.72	-3.35
20	143.94	12.50	-6.11	-7.33
25	124.62	10.83	-7.79	-11.68
30	110.24	9.58	-9.04	-16.27
35	99.09	8.61	-10.01	-21.01
40	90.17	7.83	-10.78	-25.87
45	82.86	7.20	-11.42	-30.82
50	76.74	6.67	-11.95	-35.84
55	71.55	6.22	-12.40	-40.92
60	67.07	5.83	-12.79	-46.04
65	63.18	5.49	-13.13	-51.19
70	59.75	5.19	-13.42	-56.38
75	56.71	4.93	-13.69	-61.60
90	49.33	4.29	-14.33	-77.38
105	43.80	3.80	-14.81	-93.30
120	39.47	3.43	-15.19	-109.34
135	36.00	3.13	-15.49	-125.45
150	33.13	2.88	-15.74	-141.63

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-2A Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.085	ha	Qallow =	4.2	L/s
C =	0.23		Vol(max) =	0.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.66	1.46	0.44
10	76.81	4.20	0.00	0.00
15	61.77	3.38	-0.82	-0.74
20	52.03	2.84	-1.35	-1.62
25	45.17	2.47	-1.73	-2.59
30	40.04	2.19	-2.01	-3.62
35	36.06	1.97	-2.23	-4.68
40	32.86	1.80	-2.40	-5.76
45	30.24	1.65	-2.55	-6.87
50	28.04	1.53	-2.67	-8.00
55	26.17	1.43	-2.77	-9.13
60	24.56	1.34	-2.86	-10.28
65	23.15	1.27	-2.93	-11.44
70	21.91	1.20	-3.00	-12.60
75	20.81	1.14	-3.06	-13.77
90	18.14	0.99	-3.21	-17.31
105	16.13	0.88	-3.32	-20.89
120	14.56	0.80	-3.40	-24.49
135	13.30	0.73	-3.47	-28.12
150	12.25	0.67	-3.53	-31.75

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2A Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.085	ha	Qallow =	5.7	L/s
C =	0.23		Vol(max) =	0.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.72	2.02	0.61
10	104.19	5.69	0.00	0.00
15	83.56	4.57	-1.13	-1.02
20	70.25	3.84	-1.86	-2.23
25	60.90	3.33	-2.37	-3.55
30	53.93	2.95	-2.75	-4.95
35	48.52	2.65	-3.04	-6.39
40	44.18	2.41	-3.28	-7.87
45	40.63	2.22	-3.47	-9.38
50	37.65	2.06	-3.64	-10.91
55	35.12	1.92	-3.77	-12.46
60	32.94	1.80	-3.89	-14.02
65	31.04	1.70	-4.00	-15.59
70	29.37	1.61	-4.09	-17.18
75	27.89	1.52	-4.17	-18.77
90	24.29	1.33	-4.37	-23.58
105	21.58	1.18	-4.52	-28.44
120	19.47	1.06	-4.63	-33.34
135	17.76	0.97	-4.72	-38.26
150	16.36	0.89	-4.80	-43.20

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2A Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.085	ha	Qallow =	12.0	L/s
C =	0.28		Vol(max) =	1.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	16.26	4.30	1.29
10	178.56	11.96	0.00	0.00
15	142.89	9.57	-2.39	-2.15
20	119.95	8.04	-3.93	-4.71
25	103.85	6.96	-5.01	-7.51
30	91.87	6.15	-5.81	-10.45
35	82.58	5.53	-6.43	-13.50
40	75.15	5.03	-6.93	-16.63
45	69.05	4.63	-7.34	-19.81
50	63.95	4.28	-7.68	-23.03
55	59.62	3.99	-7.97	-26.30
60	55.89	3.74	-8.22	-29.59
65	52.65	3.53	-8.44	-32.90
70	49.79	3.34	-8.63	-36.23
75	47.26	3.17	-8.80	-39.59
90	41.11	2.75	-9.21	-49.73
105	36.50	2.45	-9.52	-59.96
120	32.89	2.20	-9.76	-70.27
135	30.00	2.01	-9.95	-80.62
150	27.61	1.85	-10.11	-91.02

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-2A Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE 0

Area =	0.085	ha	Qallow =	14.4	L/s
C =	0.28		Vol(max) =	1.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	19.51	5.16	1.55
10	214.27	14.36	0.00	0.00
15	171.47	11.49	-2.87	-2.58
20	143.94	9.64	-4.71	-5.65
25	124.62	8.35	-6.01	-9.01
30	110.24	7.39	-6.97	-12.55
35	99.09	6.64	-7.72	-16.20
40	90.17	6.04	-8.31	-19.95
45	82.86	5.55	-8.80	-23.77
50	76.74	5.14	-9.21	-27.64
55	71.55	4.79	-9.56	-31.55
60	67.07	4.49	-9.86	-35.50
65	63.18	4.23	-10.12	-39.48
70	59.75	4.00	-10.35	-43.48
75	56.71	3.80	-10.56	-47.50
90	49.33	3.31	-11.05	-59.67
105	43.80	2.93	-11.42	-71.95
120	39.47	2.64	-11.71	-84.32
135	36.00	2.41	-11.94	-96.75
150	33.13	2.22	-12.14	-109.22

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-2B Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.052	ha	Qallow =	3.3	L/s
C =	0.30		Vol(max) =	0.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.47	1.15	0.35
10	76.81	3.31	0.00	0.00
15	61.77	2.66	-0.65	-0.58
20	52.03	2.24	-1.07	-1.28
25	45.17	1.95	-1.36	-2.05
30	40.04	1.73	-1.59	-2.85
35	36.06	1.55	-1.76	-3.69
40	32.86	1.42	-1.89	-4.55
45	30.24	1.30	-2.01	-5.42
50	28.04	1.21	-2.10	-6.31
55	26.17	1.13	-2.18	-7.20
60	24.56	1.06	-2.25	-8.11
65	23.15	1.00	-2.31	-9.02
70	21.91	0.94	-2.37	-9.94
75	20.81	0.90	-2.41	-10.86
90	18.14	0.78	-2.53	-13.66
105	16.13	0.70	-2.62	-16.48
120	14.56	0.63	-2.68	-19.32
135	13.30	0.57	-2.74	-22.18
150	12.25	0.53	-2.78	-25.05

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2B Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.052	ha	Qallow =	4.5	L/s
C =	0.30		Vol(max) =	0.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.09	1.59	0.48
10	104.19	4.49	0.00	0.00
15	83.56	3.60	-0.89	-0.80
20	70.25	3.03	-1.46	-1.76
25	60.90	2.63	-1.87	-2.80
30	53.93	2.33	-2.17	-3.90
35	48.52	2.09	-2.40	-5.04
40	44.18	1.91	-2.59	-6.21
45	40.63	1.75	-2.74	-7.40
50	37.65	1.62	-2.87	-8.61
55	35.12	1.51	-2.98	-9.83
60	32.94	1.42	-3.07	-11.06
65	31.04	1.34	-3.15	-12.30
70	29.37	1.27	-3.23	-13.55
75	27.89	1.20	-3.29	-14.81
90	24.29	1.05	-3.45	-18.60
105	21.58	0.93	-3.56	-22.44
120	19.47	0.84	-3.65	-26.30
135	17.76	0.77	-3.73	-30.19
150	16.36	0.71	-3.79	-34.08

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2B Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE

Area =	0.052	ha	Qallow =	9.2	L/s
C =	0.36		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	12.47	3.29	0.99
10	178.56	9.17	0.00	0.00
15	142.89	7.34	-1.83	-1.65
20	119.95	6.16	-3.01	-3.61
25	103.85	5.33	-3.84	-5.76
30	91.87	4.72	-4.45	-8.01
35	82.58	4.24	-4.93	-10.35
40	75.15	3.86	-5.31	-12.75
45	69.05	3.55	-5.62	-15.19
50	63.95	3.28	-5.89	-17.66
55	59.62	3.06	-6.11	-20.16
60	55.89	2.87	-6.30	-22.68
65	52.65	2.70	-6.47	-25.22
70	49.79	2.56	-6.61	-27.78
75	47.26	2.43	-6.74	-30.35
90	41.11	2.11	-7.06	-38.12
105	36.50	1.87	-7.30	-45.97
120	32.89	1.69	-7.48	-53.87
135	30.00	1.54	-7.63	-61.80
150	27.61	1.42	-7.75	-69.78

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-2B Uncontrolled Direct Runoff - West Side

OTTAWA IDF CURVE 0

Area =	0.052	ha	Qallow =	11.0	L/s
C =	0.36		Vol(max) =	1.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	14.96	3.95	1.19
10	214.27	11.01	0.00	0.00
15	171.47	8.81	-2.20	-1.98
20	143.94	7.39	-3.61	-4.33
25	124.62	6.40	-4.60	-6.91
30	110.24	5.66	-5.34	-9.62
35	99.09	5.09	-5.92	-12.42
40	90.17	4.63	-6.37	-15.30
45	82.86	4.26	-6.75	-18.22
50	76.74	3.94	-7.06	-21.19
55	71.55	3.67	-7.33	-24.19
60	67.07	3.44	-7.56	-27.22
65	63.18	3.24	-7.76	-30.27
70	59.75	3.07	-7.94	-33.33
75	56.71	2.91	-8.09	-36.42
90	49.33	2.53	-8.47	-45.74
105	43.80	2.25	-8.76	-55.16
120	39.47	2.03	-8.98	-64.64
135	36.00	1.85	-9.16	-74.17
150	33.13	1.70	-9.30	-83.73

NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.92	4.60	1.38
10	76.81	3.65	3.33	2.00
15	61.77	2.94	2.62	2.35
20	52.03	2.47	2.15	2.58
25	45.17	2.15	1.83	2.74
30	40.04	1.90	1.58	2.85
35	36.06	1.71	1.39	2.93
40	32.86	1.56	1.24	2.98
45	30.24	1.44	1.12	3.02
50	28.04	1.33	1.01	3.04
55	26.17	1.24	0.92	3.05
60	24.56	1.17	0.85	3.05
65	23.15	1.10	0.78	3.04
70	21.91	1.04	0.72	3.03
75	20.81	0.99	0.67	3.01
90	18.14	0.86	0.54	2.93
105	16.13	0.77	0.45	2.82
120	14.56	0.69	0.37	2.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.71	6.39	1.92
10	104.19	4.95	4.63	2.78
15	83.56	3.97	3.65	3.29
20	70.25	3.34	3.02	3.62
25	60.90	2.89	2.57	3.86
30	53.93	2.56	2.24	4.04
35	48.52	2.31	1.99	4.17
40	44.18	2.10	1.78	4.27
45	40.63	1.93	1.61	4.35
50	37.65	1.79	1.47	4.41
55	35.12	1.67	1.35	4.45
60	32.94	1.57	1.25	4.49
65	31.04	1.48	1.16	4.51
70	29.37	1.40	1.08	4.52
75	27.89	1.33	1.01	4.53
90	24.29	1.15	0.83	4.51
105	21.58	1.03	0.71	4.45
120	19.47	0.93	0.61	4.36

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	12.82	12.50	3.75
10	178.56	9.43	9.11	5.47
15	142.89	7.55	7.23	6.50
20	119.95	6.34	6.02	7.22
25	103.85	5.49	5.17	7.75
30	91.87	4.85	4.53	8.16
35	82.58	4.36	4.04	8.49
40	75.15	3.97	3.65	8.76
45	69.05	3.65	3.33	8.98
50	63.95	3.38	3.06	9.17
55	59.62	3.15	2.83	9.34
60	55.89	2.95	2.63	9.48
65	52.65	2.78	2.46	9.60
70	49.79	2.63	2.31	9.70
75	47.26	2.50	2.18	9.79
90	41.11	2.17	1.85	10.00
105	36.50	1.93	1.61	10.13
120	32.89	1.74	1.42	10.21

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.00	L/s
C =	1.00		Vol(max) =	15.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	15.38	15.38	4.62
10	214.27	11.32	11.32	6.79
15	171.47	9.06	9.06	8.15
20	143.94	7.60	7.60	9.12
25	124.62	6.58	6.58	9.87
30	110.24	5.82	5.82	10.48
35	99.09	5.23	5.23	10.99
40	90.17	4.76	4.76	11.43
45	82.86	4.38	4.38	11.82
50	76.74	4.05	4.05	12.16
55	71.55	3.78	3.78	12.47
60	67.07	3.54	3.54	12.75
65	63.18	3.34	3.34	13.01
70	59.75	3.16	3.16	13.25
75	56.71	3.00	3.00	13.48
90	49.33	2.61	2.61	14.07
105	43.80	2.31	2.31	14.57
120	39.47	2.09	2.09	15.01

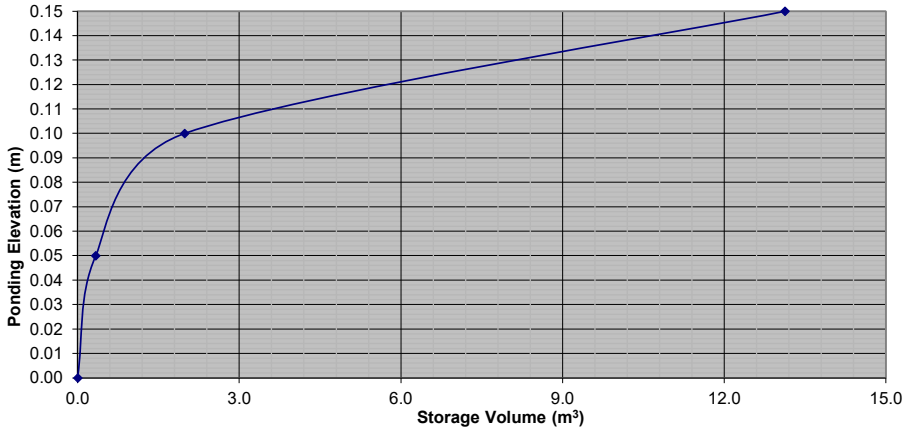
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.1	13.1
1:5 Year	0.32	0.32	12	4.5	
1:100 Year	0.32	0.32	14	10.2	

Roof Drain Storage Table for Area RD-A1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	13.384	0.3
0.10	52.535	2.0
0.15	393.048	13.1

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A1



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

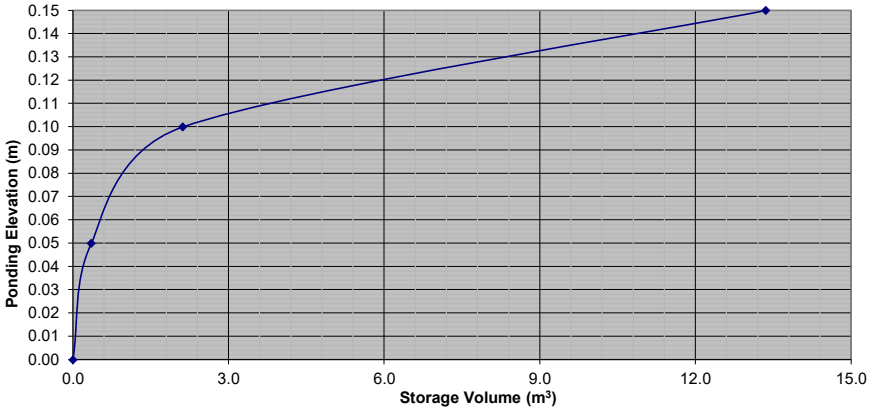
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.3	
1:5 Year	0.32	0.32	12	4.8	13.4
1:100 Year	0.32	0.32	14	10.9	

Roof Drain Storage Table for Area RD-A2

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.128	0.4
0.10	56.512	2.1
0.15	393.048	13.4

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A2



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

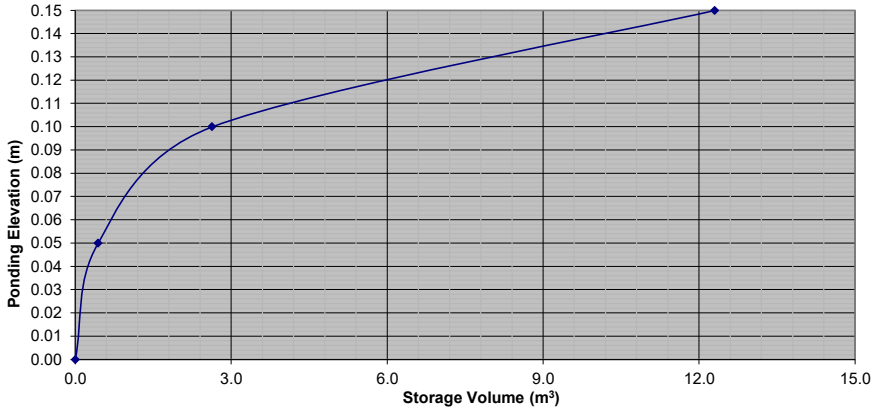
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.4	
1:5 Year	0.32	0.32	11	3.6	12.3
1:100 Year	0.32	0.32	13	8.2	

Roof Drain Storage Table for Area RD-A3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.533	0.4
0.10	70.131	2.6
0.15	316.669	12.3

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A3



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

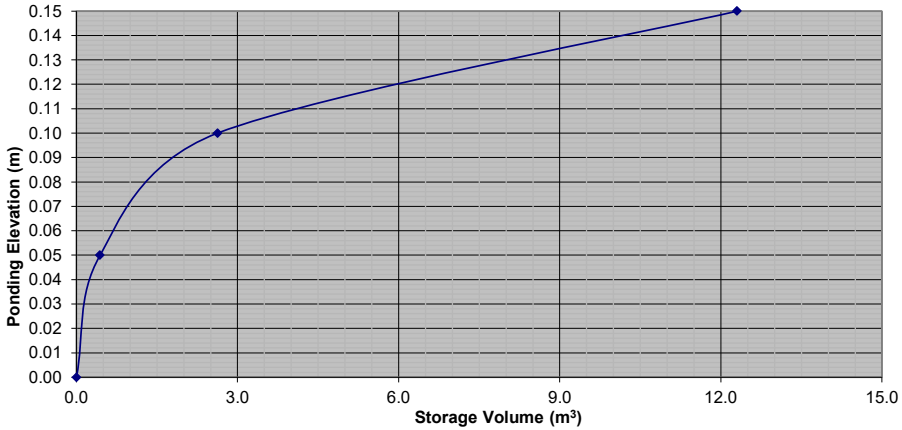
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.4	
1:5 Year	0.32	0.32	11	3.6	12.3
1:100 Year	0.32	0.32	13	8.2	

Roof Drain Storage Table for Area RD-A4

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.533	0.4
0.10	70.131	2.6
0.15	316.669	12.3

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A4



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

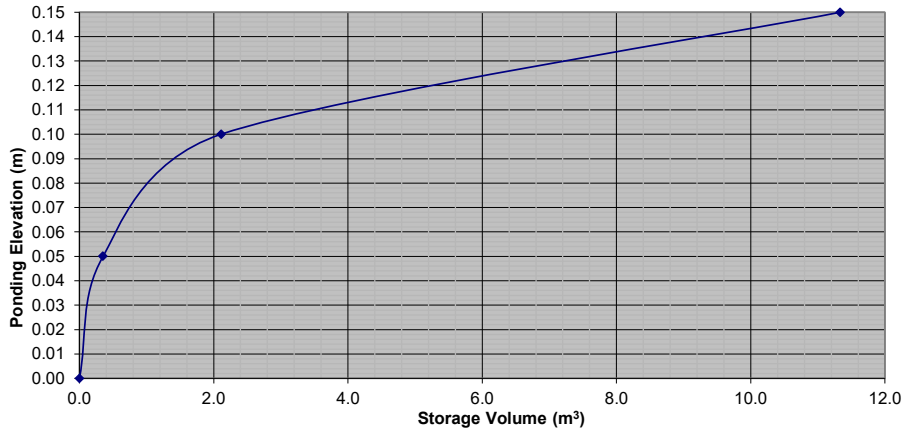
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.3	
1:5 Year	0.32	0.32	12	4.8	11.3
1:100 Year	0.32	0.32	15	10.9	

Roof Drain Storage Table for AreaRD-A5

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.091	0.4
0.10	56.363	2.1
0.15	312.401	11.3

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A5



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

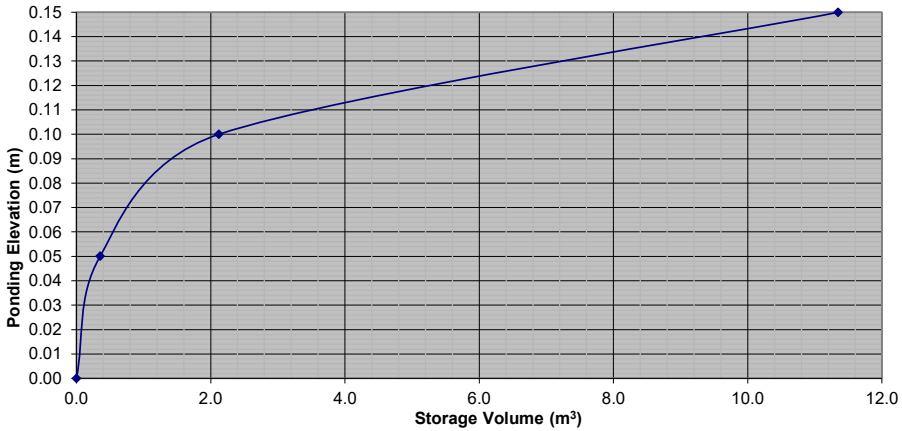
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.3	11.3
1:5 Year	0.32	0.32	12	4.8	
1:100 Year	0.32	0.32	15	10.9	

Roof Drain Storage Table for Area RD-A6

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.159	0.4
0.10	56.637	2.1
0.15	312.401	11.3

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A6



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	2.20	1.88	0.56
10	76.81	1.63	1.31	0.79
15	61.77	1.31	0.99	0.89
20	52.03	1.11	0.79	0.94
25	45.17	0.96	0.64	0.96
30	40.04	0.85	0.53	0.96
35	36.06	0.77	0.45	0.94
40	32.86	0.70	0.38	0.91
45	30.24	0.64	0.32	0.87
50	28.04	0.60	0.28	0.83
55	26.17	0.56	0.24	0.78
60	24.56	0.52	0.20	0.73
65	23.15	0.49	0.17	0.67
70	21.91	0.47	0.15	0.61
75	20.81	0.44	0.12	0.55
90	18.14	0.39	0.07	0.36
105	16.13	0.34	0.02	0.15
120	14.56	0.31	-0.01	-0.07

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.00	2.68	0.80
10	104.19	2.22	1.90	1.14
15	83.56	1.78	1.46	1.31
20	70.25	1.49	1.17	1.41
25	60.90	1.30	0.98	1.46
30	53.93	1.15	0.83	1.49
35	48.52	1.03	0.71	1.49
40	44.18	0.94	0.62	1.49
45	40.63	0.86	0.54	1.47
50	37.65	0.80	0.48	1.44
55	35.12	0.75	0.43	1.41
60	32.94	0.70	0.38	1.37
65	31.04	0.66	0.34	1.33
70	29.37	0.62	0.30	1.28
75	27.89	0.59	0.27	1.23
90	24.29	0.52	0.20	1.06
105	21.58	0.46	0.14	0.88
120	19.47	0.41	0.09	0.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	5.74	5.42	1.62
10	178.56	4.22	3.90	2.34
15	142.89	3.38	3.06	2.75
20	119.95	2.83	2.51	3.02
25	103.85	2.45	2.13	3.20
30	91.87	2.17	1.85	3.33
35	82.58	1.95	1.63	3.43
40	75.15	1.78	1.46	3.49
45	69.05	1.63	1.31	3.54
50	63.95	1.51	1.19	3.57
55	59.62	1.41	1.09	3.59
60	55.89	1.32	1.00	3.60
65	52.65	1.24	0.92	3.60
70	49.79	1.18	0.86	3.60
75	47.26	1.12	0.80	3.58
90	41.11	0.97	0.65	3.52
105	36.50	0.86	0.54	3.42
120	32.89	0.78	0.46	3.29

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	6.88	6.56	1.97
10	214.27	5.06	4.74	2.85
15	171.47	4.05	3.73	3.36
20	143.94	3.40	3.08	3.70
25	124.62	2.94	2.62	3.94
30	110.24	2.61	2.29	4.11
35	99.09	2.34	2.02	4.25
40	90.17	2.13	1.81	4.35
45	82.86	1.96	1.64	4.42
50	76.74	1.81	1.49	4.48
55	71.55	1.69	1.37	4.52
60	67.07	1.58	1.26	4.55
65	63.18	1.49	1.17	4.57
70	59.75	1.41	1.09	4.59
75	56.71	1.34	1.02	4.59
90	49.33	1.17	0.85	4.57
105	43.80	1.03	0.71	4.50
120	39.47	0.93	0.61	4.41

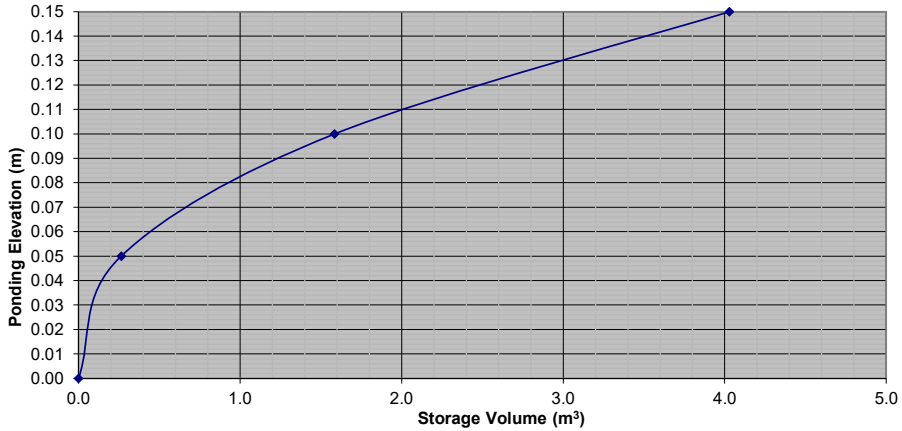
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	1.0	4.0
1:5 Year	0.32	0.32	10	1.5	
1:100 Year	0.32	0.32	14	3.6	

Roof Drain Storage Table for Area RD-A7

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.583	0.3
0.10	42.207	1.6
0.15	55.572	4.0

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A7



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 Building A - Roof Drain #8

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	2.20	1.88	0.56
10	76.81	1.63	1.31	0.79
15	61.77	1.31	0.99	0.89
20	52.03	1.11	0.79	0.94
25	45.17	0.96	0.64	0.96
30	40.04	0.85	0.53	0.96
35	36.06	0.77	0.45	0.94
40	32.86	0.70	0.38	0.91
45	30.24	0.64	0.32	0.87
50	28.04	0.60	0.28	0.83
55	26.17	0.56	0.24	0.78
60	24.56	0.52	0.20	0.73
65	23.15	0.49	0.17	0.67
70	21.91	0.47	0.15	0.61
75	20.81	0.44	0.12	0.55
90	18.14	0.39	0.07	0.36
105	16.13	0.34	0.02	0.15
120	14.56	0.31	-0.01	-0.07

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Building A - Roof Drain #8

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.00	2.68	0.80
10	104.19	2.22	1.90	1.14
15	83.56	1.78	1.46	1.31
20	70.25	1.49	1.17	1.41
25	60.90	1.30	0.98	1.46
30	53.93	1.15	0.83	1.49
35	48.52	1.03	0.71	1.49
40	44.18	0.94	0.62	1.49
45	40.63	0.86	0.54	1.47
50	37.65	0.80	0.48	1.44
55	35.12	0.75	0.43	1.41
60	32.94	0.70	0.38	1.37
65	31.04	0.66	0.34	1.33
70	29.37	0.62	0.30	1.28
75	27.89	0.59	0.27	1.23
90	24.29	0.52	0.20	1.06
105	21.58	0.46	0.14	0.88
120	19.47	0.41	0.09	0.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Building A - Roof Drain #8

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	5.74	5.42	1.62
10	178.56	4.22	3.90	2.34
15	142.89	3.38	3.06	2.75
20	119.95	2.83	2.51	3.02
25	103.85	2.45	2.13	3.20
30	91.87	2.17	1.85	3.33
35	82.58	1.95	1.63	3.43
40	75.15	1.78	1.46	3.49
45	69.05	1.63	1.31	3.54
50	63.95	1.51	1.19	3.57
55	59.62	1.41	1.09	3.59
60	55.89	1.32	1.00	3.60
65	52.65	1.24	0.92	3.60
70	49.79	1.18	0.86	3.60
75	47.26	1.12	0.80	3.58
90	41.11	0.97	0.65	3.52
105	36.50	0.86	0.54	3.42
120	32.89	0.78	0.46	3.29

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 Building A - Roof Drain #8

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	6.88	6.56	1.97
10	214.27	5.06	4.74	2.85
15	171.47	4.05	3.73	3.36
20	143.94	3.40	3.08	3.70
25	124.62	2.94	2.62	3.94
30	110.24	2.61	2.29	4.11
35	99.09	2.34	2.02	4.25
40	90.17	2.13	1.81	4.35
45	82.86	1.96	1.64	4.42
50	76.74	1.81	1.49	4.48
55	71.55	1.69	1.37	4.52
60	67.07	1.58	1.26	4.55
65	63.18	1.49	1.17	4.57
70	59.75	1.41	1.09	4.59
75	56.71	1.34	1.02	4.59
90	49.33	1.17	0.85	4.57
105	43.80	1.03	0.71	4.50
120	39.47	0.93	0.61	4.41

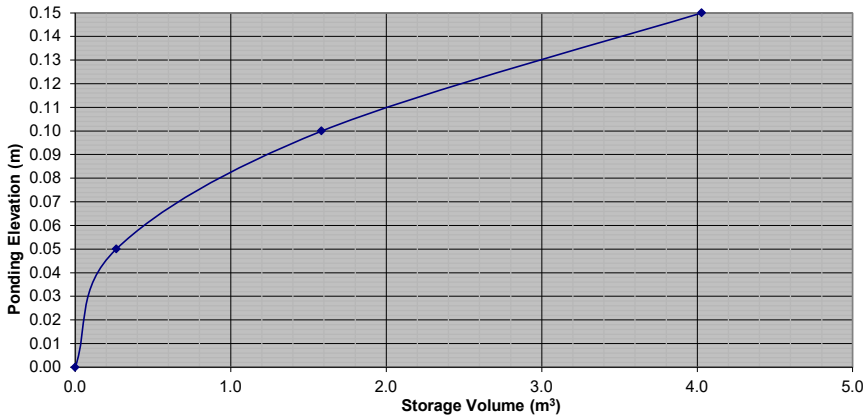
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	1.0	
1:5 Year	0.32	0.32	10	1.5	4.0
1:100 Year	0.32	0.32	14	3.6	

Roof Drain Storage Table for Area RD-A8

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.583	0.3
0.10	42.207	1.6
0.15	55.572	4.0

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A8



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3.3 Building A - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.04	3.72	1.12
10	76.81	3.00	2.68	1.61
15	61.77	2.41	2.09	1.88
20	52.03	2.03	1.71	2.05
25	45.17	1.76	1.44	2.16
30	40.04	1.56	1.24	2.24
35	36.06	1.41	1.09	2.28
40	32.86	1.28	0.96	2.31
45	30.24	1.18	0.86	2.32
50	28.04	1.09	0.77	2.32
55	26.17	1.02	0.70	2.31
60	24.56	0.96	0.64	2.30
65	23.15	0.90	0.58	2.28
70	21.91	0.86	0.54	2.25
75	20.81	0.81	0.49	2.22
90	18.14	0.71	0.39	2.10
105	16.13	0.63	0.31	1.95
120	14.56	0.57	0.25	1.79

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3.3 Building A - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.51	5.19	1.56
10	104.19	4.07	3.75	2.25
15	83.56	3.26	2.94	2.65
20	70.25	2.74	2.42	2.91
25	60.90	2.38	2.06	3.09
30	53.93	2.10	1.78	3.21
35	48.52	1.89	1.57	3.30
40	44.18	1.72	1.40	3.37
45	40.63	1.59	1.27	3.42
50	37.65	1.47	1.15	3.45
55	35.12	1.37	1.05	3.47
60	32.94	1.29	0.97	3.48
65	31.04	1.21	0.89	3.48
70	29.37	1.15	0.83	3.47
75	27.89	1.09	0.77	3.46
90	24.29	0.95	0.63	3.39
105	21.58	0.84	0.52	3.29
120	19.47	0.76	0.44	3.17

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3.3 Building A - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.53	10.21	3.06
10	178.56	7.74	7.42	4.45
15	142.89	6.20	5.88	5.29
20	119.95	5.20	4.88	5.86
25	103.85	4.50	4.18	6.28
30	91.87	3.98	3.66	6.60
35	82.58	3.58	3.26	6.85
40	75.15	3.26	2.94	7.05
45	69.05	2.99	2.67	7.22
50	63.95	2.77	2.45	7.36
55	59.62	2.59	2.27	7.48
60	55.89	2.42	2.10	7.57
65	52.65	2.28	1.96	7.66
70	49.79	2.16	1.84	7.72
75	47.26	2.05	1.73	7.78
90	41.11	1.78	1.46	7.90
105	36.50	1.58	1.26	7.96
120	32.89	1.43	1.11	7.97

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3.3 Building A - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.63	12.31	3.69
10	214.27	9.29	8.97	5.38
15	171.47	7.44	7.12	6.40
20	143.94	6.24	5.92	7.11
25	124.62	5.40	5.08	7.63
30	110.24	4.78	4.46	8.03
35	99.09	4.30	3.98	8.35
40	90.17	3.91	3.59	8.62
45	82.86	3.59	3.27	8.84
50	76.74	3.33	3.01	9.02
55	71.55	3.10	2.78	9.18
60	67.07	2.91	2.59	9.32
65	63.18	2.74	2.42	9.44
70	59.75	2.59	2.27	9.54
75	56.71	2.46	2.14	9.63
90	49.33	2.14	1.82	9.83
105	43.80	1.90	1.58	9.95
120	39.47	1.71	1.39	10.02

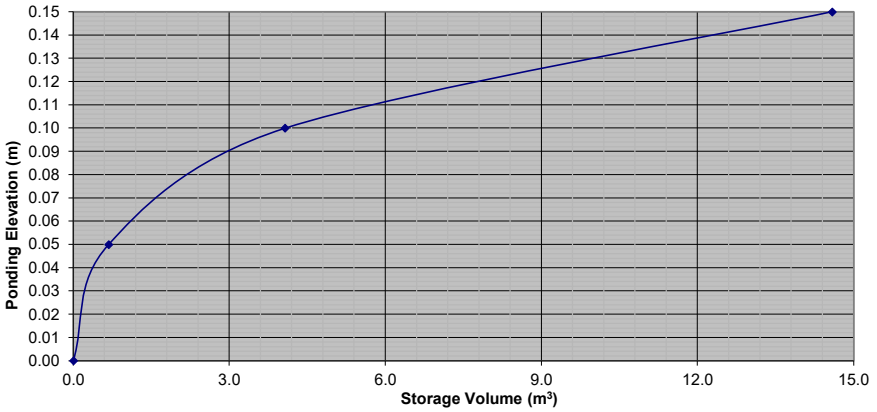
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	2.3	
1:5 Year	0.32	0.32	10	3.5	14.6
1:100 Year	0.32	0.32	12	8.0	

Roof Drain Storage Table for Area RD-A9

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	27.255	0.7
0.10	108.283	4.1
0.15	312.294	14.6

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A9



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.04	3.72	1.12
10	76.81	3.00	2.68	1.61
15	61.77	2.41	2.09	1.88
20	52.03	2.03	1.71	2.05
25	45.17	1.76	1.44	2.16
30	40.04	1.56	1.24	2.24
35	36.06	1.41	1.09	2.28
40	32.86	1.28	0.96	2.31
45	30.24	1.18	0.86	2.32
50	28.04	1.09	0.77	2.32
55	26.17	1.02	0.70	2.31
60	24.56	0.96	0.64	2.30
65	23.15	0.90	0.58	2.28
70	21.91	0.86	0.54	2.25
75	20.81	0.81	0.49	2.22
90	18.14	0.71	0.39	2.10
105	16.13	0.63	0.31	1.95
120	14.56	0.57	0.25	1.79

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.51	5.19	1.56
10	104.19	4.07	3.75	2.25
15	83.56	3.26	2.94	2.65
20	70.25	2.74	2.42	2.91
25	60.90	2.38	2.06	3.09
30	53.93	2.10	1.78	3.21
35	48.52	1.89	1.57	3.30
40	44.18	1.72	1.40	3.37
45	40.63	1.59	1.27	3.42
50	37.65	1.47	1.15	3.45
55	35.12	1.37	1.05	3.47
60	32.94	1.29	0.97	3.48
65	31.04	1.21	0.89	3.48
70	29.37	1.15	0.83	3.47
75	27.89	1.09	0.77	3.46
90	24.29	0.95	0.63	3.39
105	21.58	0.84	0.52	3.29
120	19.47	0.76	0.44	3.17

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.53	10.21	3.06
10	178.56	7.74	7.42	4.45
15	142.89	6.20	5.88	5.29
20	119.95	5.20	4.88	5.86
25	103.85	4.50	4.18	6.28
30	91.87	3.98	3.66	6.60
35	82.58	3.58	3.26	6.85
40	75.15	3.26	2.94	7.05
45	69.05	2.99	2.67	7.22
50	63.95	2.77	2.45	7.36
55	59.62	2.59	2.27	7.48
60	55.89	2.42	2.10	7.57
65	52.65	2.28	1.96	7.66
70	49.79	2.16	1.84	7.72
75	47.26	2.05	1.73	7.78
90	41.11	1.78	1.46	7.90
105	36.50	1.58	1.26	7.96
120	32.89	1.43	1.11	7.97

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.63	12.31	3.69
10	214.27	9.29	8.97	5.38
15	171.47	7.44	7.12	6.40
20	143.94	6.24	5.92	7.11
25	124.62	5.40	5.08	7.63
30	110.24	4.78	4.46	8.03
35	99.09	4.30	3.98	8.35
40	90.17	3.91	3.59	8.62
45	82.86	3.59	3.27	8.84
50	76.74	3.33	3.01	9.02
55	71.55	3.10	2.78	9.18
60	67.07	2.91	2.59	9.32
65	63.18	2.74	2.42	9.44
70	59.75	2.59	2.27	9.54
75	56.71	2.46	2.14	9.63
90	49.33	2.14	1.82	9.83
105	43.80	1.90	1.58	9.95
120	39.47	1.71	1.39	10.02

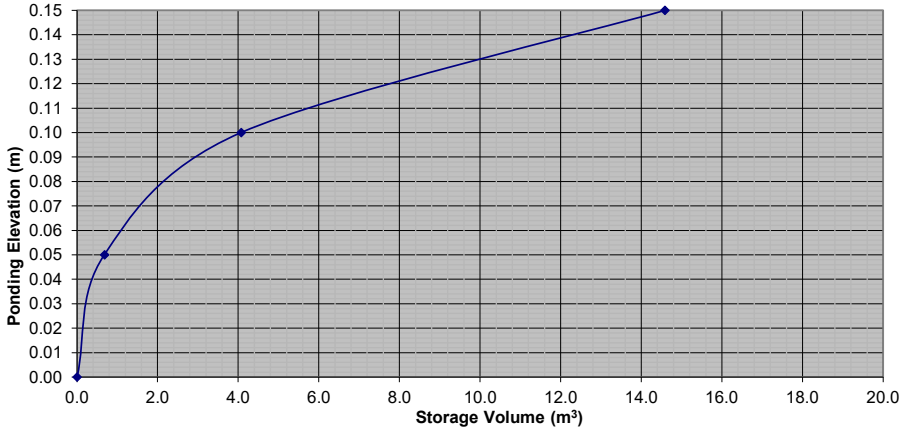
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	2.3	
1:5 Year	0.32	0.32	10	3.5	14.6
1:100 Year	0.32	0.32	12	8.0	

Roof Drain Storage Table for Area RD-A10

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	27.255	0.7
0.10	108.283	4.1
0.15	312.294	14.6

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A10



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.07	3.75	1.12
10	76.81	3.02	2.70	1.62
15	61.77	2.43	2.11	1.90
20	52.03	2.04	1.72	2.07
25	45.17	1.77	1.45	2.18
30	40.04	1.57	1.25	2.26
35	36.06	1.42	1.10	2.30
40	32.86	1.29	0.97	2.33
45	30.24	1.19	0.87	2.34
50	28.04	1.10	0.78	2.34
55	26.17	1.03	0.71	2.34
60	24.56	0.96	0.64	2.32
65	23.15	0.91	0.59	2.30
70	21.91	0.86	0.54	2.27
75	20.81	0.82	0.50	2.24
90	18.14	0.71	0.39	2.12
105	16.13	0.63	0.31	1.98
120	14.56	0.57	0.25	1.81

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.55	5.23	1.57
10	104.19	4.09	3.77	2.26
15	83.56	3.28	2.96	2.67
20	70.25	2.76	2.44	2.93
25	60.90	2.39	2.07	3.11
30	53.93	2.12	1.80	3.24
35	48.52	1.91	1.59	3.33
40	44.18	1.74	1.42	3.40
45	40.63	1.60	1.28	3.45
50	37.65	1.48	1.16	3.48
55	35.12	1.38	1.06	3.50
60	32.94	1.29	0.97	3.51
65	31.04	1.22	0.90	3.51
70	29.37	1.15	0.83	3.50
75	27.89	1.10	0.78	3.49
90	24.29	0.95	0.63	3.42
105	21.58	0.85	0.53	3.33
120	19.47	0.76	0.44	3.20

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.59	10.27	3.08
10	178.56	7.79	7.47	4.48
15	142.89	6.24	5.92	5.33
20	119.95	5.24	4.92	5.90
25	103.85	4.53	4.21	6.32
30	91.87	4.01	3.69	6.64
35	82.58	3.60	3.28	6.90
40	75.15	3.28	2.96	7.10
45	69.05	3.01	2.69	7.27
50	63.95	2.79	2.47	7.41
55	59.62	2.60	2.28	7.53
60	55.89	2.44	2.12	7.63
65	52.65	2.30	1.98	7.71
70	49.79	2.17	1.85	7.78
75	47.26	2.06	1.74	7.84
90	41.11	1.79	1.47	7.96
105	36.50	1.59	1.27	8.02
120	32.89	1.44	1.12	8.03

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.71	12.39	3.72
10	214.27	9.35	9.03	5.42
15	171.47	7.48	7.16	6.45
20	143.94	6.28	5.96	7.15
25	124.62	5.44	5.12	7.68
30	110.24	4.81	4.49	8.08
35	99.09	4.33	4.01	8.41
40	90.17	3.94	3.62	8.68
45	82.86	3.62	3.30	8.90
50	76.74	3.35	3.03	9.09
55	71.55	3.12	2.80	9.25
60	67.07	2.93	2.61	9.39
65	63.18	2.76	2.44	9.51
70	59.75	2.61	2.29	9.61
75	56.71	2.48	2.16	9.70
90	49.33	2.15	1.83	9.90
105	43.80	1.91	1.59	10.03
120	39.47	1.72	1.40	10.10

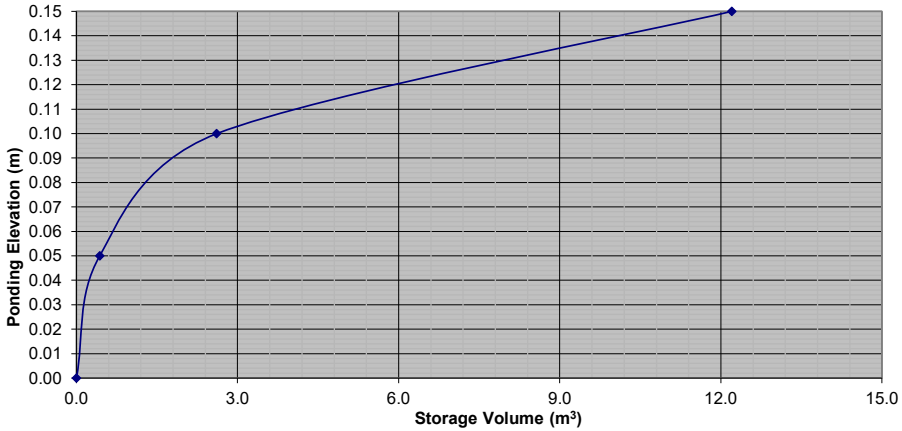
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.3	
1:5 Year	0.32	0.32	11	3.5	12.2
1:100 Year	0.32	0.32	13	8.0	

Roof Drain Storage Table for Area RD-A11

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.436	0.4
0.10	69.743	2.6
0.15	313.844	12.2

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A11



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 **Building A - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.07	3.75	1.12
10	76.81	3.02	2.70	1.62
15	61.77	2.43	2.11	1.90
20	52.03	2.04	1.72	2.07
25	45.17	1.77	1.45	2.18
30	40.04	1.57	1.25	2.26
35	36.06	1.42	1.10	2.30
40	32.86	1.29	0.97	2.33
45	30.24	1.19	0.87	2.34
50	28.04	1.10	0.78	2.34
55	26.17	1.03	0.71	2.34
60	24.56	0.96	0.64	2.32
65	23.15	0.91	0.59	2.30
70	21.91	0.86	0.54	2.27
75	20.81	0.82	0.50	2.24
90	18.14	0.71	0.39	2.12
105	16.13	0.63	0.31	1.98
120	14.56	0.57	0.25	1.81

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 **Building A - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.55	5.23	1.57
10	104.19	4.09	3.77	2.26
15	83.56	3.28	2.96	2.67
20	70.25	2.76	2.44	2.93
25	60.90	2.39	2.07	3.11
30	53.93	2.12	1.80	3.24
35	48.52	1.91	1.59	3.33
40	44.18	1.74	1.42	3.40
45	40.63	1.60	1.28	3.45
50	37.65	1.48	1.16	3.48
55	35.12	1.38	1.06	3.50
60	32.94	1.29	0.97	3.51
65	31.04	1.22	0.90	3.51
70	29.37	1.15	0.83	3.50
75	27.89	1.10	0.78	3.49
90	24.29	0.95	0.63	3.42
105	21.58	0.85	0.53	3.33
120	19.47	0.76	0.44	3.20

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 **Building A - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.59	10.27	3.08
10	178.56	7.79	7.47	4.48
15	142.89	6.24	5.92	5.33
20	119.95	5.24	4.92	5.90
25	103.85	4.53	4.21	6.32
30	91.87	4.01	3.69	6.64
35	82.58	3.60	3.28	6.90
40	75.15	3.28	2.96	7.10
45	69.05	3.01	2.69	7.27
50	63.95	2.79	2.47	7.41
55	59.62	2.60	2.28	7.53
60	55.89	2.44	2.12	7.63
65	52.65	2.30	1.98	7.71
70	49.79	2.17	1.85	7.78
75	47.26	2.06	1.74	7.84
90	41.11	1.79	1.47	7.96
105	36.50	1.59	1.27	8.02
120	32.89	1.44	1.12	8.03

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-3 **Building A - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.71	12.39	3.72
10	214.27	9.35	9.03	5.42
15	171.47	7.48	7.16	6.45
20	143.94	6.28	5.96	7.15
25	124.62	5.44	5.12	7.68
30	110.24	4.81	4.49	8.08
35	99.09	4.33	4.01	8.41
40	90.17	3.94	3.62	8.68
45	82.86	3.62	3.30	8.90
50	76.74	3.35	3.03	9.09
55	71.55	3.12	2.80	9.25
60	67.07	2.93	2.61	9.39
65	63.18	2.76	2.44	9.51
70	59.75	2.61	2.29	9.61
75	56.71	2.48	2.16	9.70
90	49.33	2.15	1.83	9.90
105	43.80	1.91	1.59	10.03
120	39.47	1.72	1.40	10.10

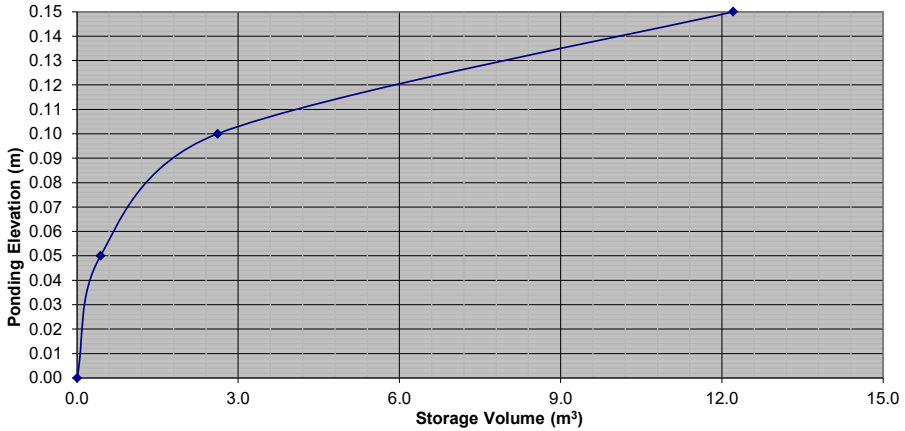
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.3	
1:5 Year	0.32	0.32	11	3.5	12.2
1:100 Year	0.32	0.32	13	8.0	

Roof Drain Storage Table for Area RD-A12

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.436	0.4
0.10	69.743	2.6
0.15	313.844	12.2

Stage Storage Curve: Area A-3
Controlled Roof Drain RD-A12



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 **Building B - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.56	4.24	1.27
10	76.81	3.38	3.06	1.84
15	61.77	2.72	2.40	2.16
20	52.03	2.29	1.97	2.37
25	45.17	1.99	1.67	2.50
30	40.04	1.76	1.44	2.60
35	36.06	1.59	1.27	2.66
40	32.86	1.45	1.13	2.71
45	30.24	1.33	1.01	2.73
50	28.04	1.23	0.91	2.74
55	26.17	1.15	0.83	2.75
60	24.56	1.08	0.76	2.74
65	23.15	1.02	0.70	2.73
70	21.91	0.96	0.64	2.71
75	20.81	0.92	0.60	2.68
90	18.14	0.80	0.48	2.59
105	16.13	0.71	0.39	2.46
120	14.56	0.64	0.32	2.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 **Building B - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.22	5.90	1.77
10	104.19	4.59	4.27	2.56
15	83.56	3.68	3.36	3.02
20	70.25	3.09	2.77	3.33
25	60.90	2.68	2.36	3.54
30	53.93	2.37	2.05	3.70
35	48.52	2.14	1.82	3.81
40	44.18	1.95	1.63	3.90
45	40.63	1.79	1.47	3.97
50	37.65	1.66	1.34	4.01
55	35.12	1.55	1.23	4.05
60	32.94	1.45	1.13	4.07
65	31.04	1.37	1.05	4.08
70	29.37	1.29	0.97	4.09
75	27.89	1.23	0.91	4.09
90	24.29	1.07	0.75	4.05
105	21.58	0.95	0.63	3.97
120	19.47	0.86	0.54	3.87

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 **Building B - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	9.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.88	11.56	3.47
10	178.56	8.74	8.42	5.05
15	142.89	6.99	6.67	6.00
20	119.95	5.87	5.55	6.66
25	103.85	5.08	4.76	7.14
30	91.87	4.49	4.17	7.51
35	82.58	4.04	3.72	7.81
40	75.15	3.68	3.36	8.06
45	69.05	3.38	3.06	8.26
50	63.95	3.13	2.81	8.43
55	59.62	2.92	2.60	8.57
60	55.89	2.73	2.41	8.69
65	52.65	2.58	2.26	8.80
70	49.79	2.44	2.12	8.89
75	47.26	2.31	1.99	8.96
90	41.11	2.01	1.69	9.13
105	36.50	1.79	1.47	9.23
120	32.89	1.61	1.29	9.28

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 **Building B - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	11.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	14.25	13.93	4.18
10	214.27	10.48	10.16	6.10
15	171.47	8.39	8.07	7.26
20	143.94	7.04	6.72	8.07
25	124.62	6.10	5.78	8.67
30	110.24	5.39	5.07	9.13
35	99.09	4.85	4.53	9.51
40	90.17	4.41	4.09	9.82
45	82.86	4.05	3.73	10.08
50	76.74	3.75	3.43	10.30
55	71.55	3.50	3.18	10.50
60	67.07	3.28	2.96	10.66
65	63.18	3.09	2.77	10.81
70	59.75	2.92	2.60	10.93
75	56.71	2.77	2.45	11.05
90	49.33	2.41	2.09	11.31
105	43.80	2.14	1.82	11.48
120	39.47	1.93	1.61	11.60

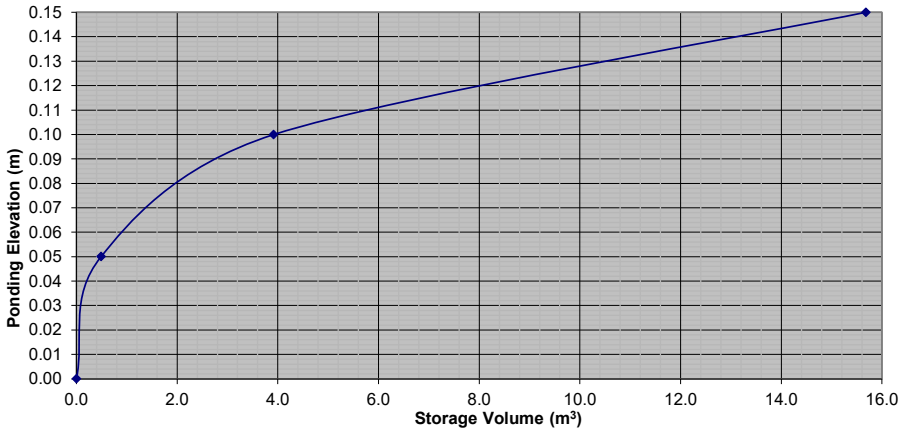
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.7	
1:5 Year	0.32	0.32	10	4.1	15.7
1:100 Year	0.32	0.32	12	9.3	

Roof Drain Storage Table for Area RD-B1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B1



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 Building B - Roof Drain #2

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.56	4.24	1.27
10	76.81	3.38	3.06	1.84
15	61.77	2.72	2.40	2.16
20	52.03	2.29	1.97	2.37
25	45.17	1.99	1.67	2.50
30	40.04	1.76	1.44	2.60
35	36.06	1.59	1.27	2.66
40	32.86	1.45	1.13	2.71
45	30.24	1.33	1.01	2.73
50	28.04	1.23	0.91	2.74
55	26.17	1.15	0.83	2.75
60	24.56	1.08	0.76	2.74
65	23.15	1.02	0.70	2.73
70	21.91	0.96	0.64	2.71
75	20.81	0.92	0.60	2.68
90	18.14	0.80	0.48	2.59
105	16.13	0.71	0.39	2.46
120	14.56	0.64	0.32	2.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 Building B - Roof Drain #2

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.22	5.90	1.77
10	104.19	4.59	4.27	2.56
15	83.56	3.68	3.36	3.02
20	70.25	3.09	2.77	3.33
25	60.90	2.68	2.36	3.54
30	53.93	2.37	2.05	3.70
35	48.52	2.14	1.82	3.81
40	44.18	1.95	1.63	3.90
45	40.63	1.79	1.47	3.97
50	37.65	1.66	1.34	4.01
55	35.12	1.55	1.23	4.05
60	32.94	1.45	1.13	4.07
65	31.04	1.37	1.05	4.08
70	29.37	1.29	0.97	4.09
75	27.89	1.23	0.91	4.09
90	24.29	1.07	0.75	4.05
105	21.58	0.95	0.63	3.97
120	19.47	0.86	0.54	3.87

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 Building B - Roof Drain #2

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	9.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.88	11.56	3.47
10	178.56	8.74	8.42	5.05
15	142.89	6.99	6.67	6.00
20	119.95	5.87	5.55	6.66
25	103.85	5.08	4.76	7.14
30	91.87	4.49	4.17	7.51
35	82.58	4.04	3.72	7.81
40	75.15	3.68	3.36	8.06
45	69.05	3.38	3.06	8.26
50	63.95	3.13	2.81	8.43
55	59.62	2.92	2.60	8.57
60	55.89	2.73	2.41	8.69
65	52.65	2.58	2.26	8.80
70	49.79	2.44	2.12	8.89
75	47.26	2.31	1.99	8.96
90	41.11	2.01	1.69	9.13
105	36.50	1.79	1.47	9.23
120	32.89	1.61	1.29	9.28

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 Building B - Roof Drain #2

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	11.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	14.25	13.93	4.18
10	214.27	10.48	10.16	6.10
15	171.47	8.39	8.07	7.26
20	143.94	7.04	6.72	8.07
25	124.62	6.10	5.78	8.67
30	110.24	5.39	5.07	9.13
35	99.09	4.85	4.53	9.51
40	90.17	4.41	4.09	9.82
45	82.86	4.05	3.73	10.08
50	76.74	3.75	3.43	10.30
55	71.55	3.50	3.18	10.50
60	67.07	3.28	2.96	10.66
65	63.18	3.09	2.77	10.81
70	59.75	2.92	2.60	10.93
75	56.71	2.77	2.45	11.05
90	49.33	2.41	2.09	11.31
105	43.80	2.14	1.82	11.48
120	39.47	1.93	1.61	11.60

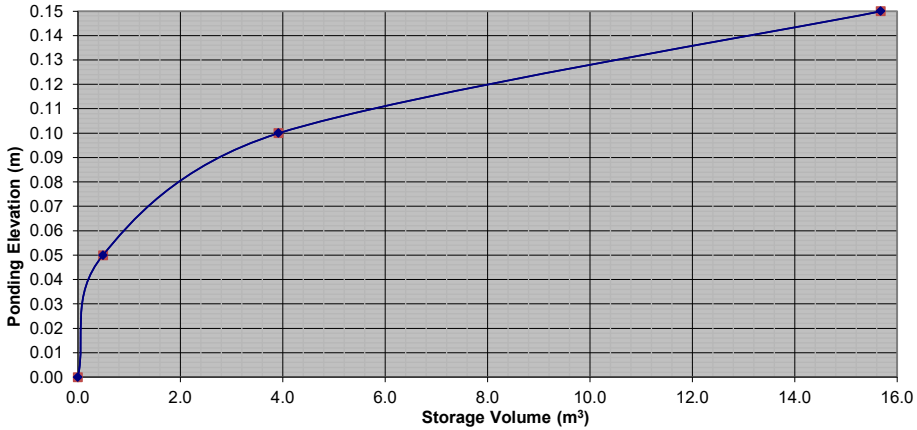
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.7	
1:5 Year	0.32	0.32	10	4.1	15.7
1:100 Year	0.32	0.32	12	9.3	

Roof Drain Storage Table for Area RD-B2

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B2



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 **Building B - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 **Building B - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 **Building B - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 **Building B - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

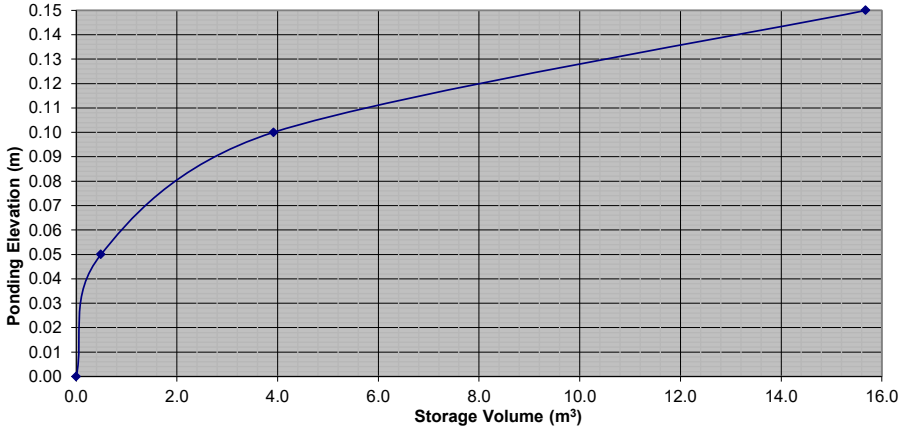
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-B3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B3



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 **Building B - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 **Building B - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 **Building B - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 **Building B - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

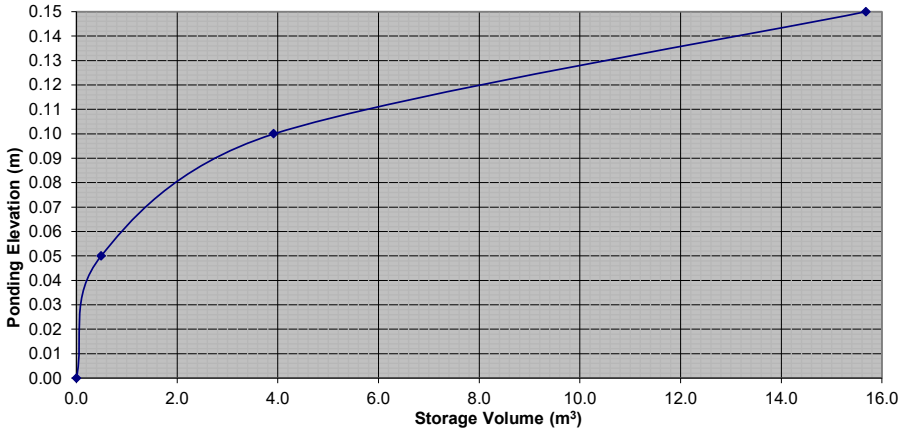
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-B4

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B4



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 **Building B - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 **Building B - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 **Building B - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 **Building B - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

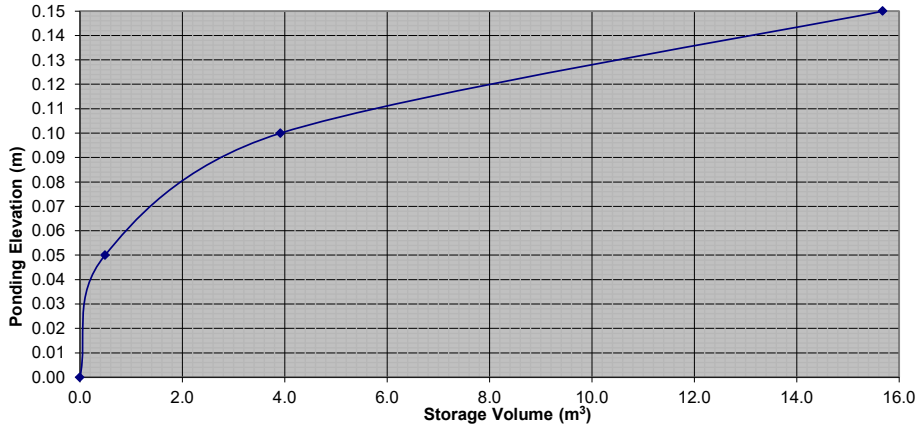
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-B5

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B5



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 **Building B - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 **Building B - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 **Building B - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-4 **Building B - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

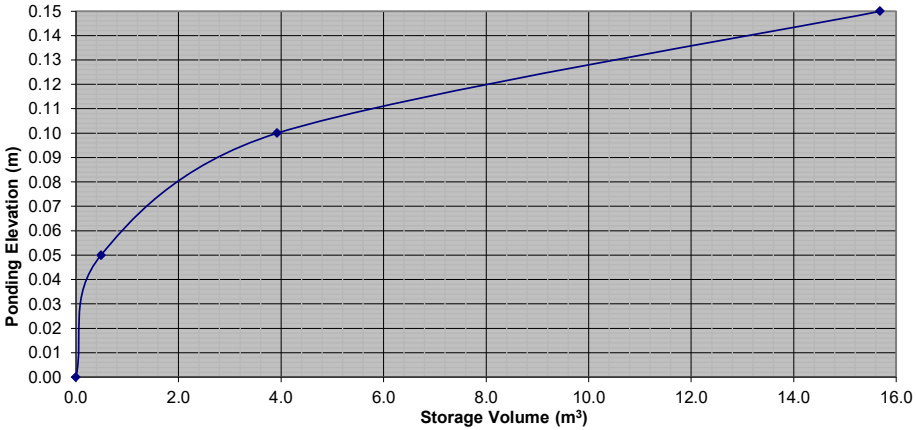
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-B6

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area A-4
Controlled Roof Drain RD-B6



Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-5 Controlled Site - Internal SWM Tank #1

OTTAWA IDF CURVE

Area =	0.739	ha	Qallow =	15.8	L/s
C =	0.66		Vol(max) =	69.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	140.81	125.01	37.50
10	76.81	104.42	88.62	53.17
15	61.77	83.97	68.17	61.36
20	52.03	70.74	54.94	65.93
25	45.17	61.41	45.61	68.41
30	40.04	54.44	38.64	69.55
35	36.06	49.02	33.22	69.77
40	32.86	44.68	28.88	69.31
60	24.56	33.39	17.59	63.31
80	19.83	26.96	11.16	53.56
100	16.75	22.77	6.97	41.80
125	14.11	19.18	3.38	25.38
150	12.25	16.66	0.86	7.71
175	10.86	14.77	-1.03	-10.82
200	9.78	13.30	-2.50	-29.99
250	8.21	11.16	-4.64	-69.66
300	7.10	9.66	-6.14	-110.59
350	6.28	8.54	-7.26	-152.40
400	5.65	7.68	-8.12	-194.87
450	5.14	6.99	-8.81	-237.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-5 Controlled Site - Internal SWM Tank #1

OTTAWA IDF CURVE

Area =	0.739	ha	Qallow =	15.8	L/s
C =	0.66		Vol(max) =	106.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	191.94	176.14	52.84
10	104.19	141.65	125.85	75.51
15	83.56	113.60	97.80	88.02
20	70.25	95.51	79.71	95.65
25	60.90	82.79	66.99	100.49
30	53.93	73.32	57.52	103.53
35	48.52	65.96	50.16	105.34
40	44.18	60.07	44.27	106.25
60	32.94	44.79	28.99	104.36
80	26.56	36.11	20.31	97.50
100	22.41	30.46	14.66	87.98
125	18.86	25.64	9.84	73.81
150	16.36	22.24	6.44	58.00
175	14.50	19.71	3.91	41.06
200	13.05	17.74	1.94	23.29
250	10.93	14.87	-0.93	-14.02
300	9.46	12.86	-2.94	-52.99
350	8.36	11.37	-4.43	-93.11
400	7.51	10.21	-5.59	-134.08
450	6.83	9.29	-6.51	-175.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-5 Controlled Site - Internal SWM Tank #1

OTTAWA IDF CURVE

Area =	0.739	ha	Qallow =	15.8	L/s
C =	0.75		Vol(max) =	254.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	371.33	355.53	106.66
10	178.56	273.19	257.39	154.43
15	142.89	218.62	202.82	182.54
20	119.95	183.52	167.72	201.27
25	103.85	158.88	143.08	214.62
30	91.87	140.56	124.76	224.56
35	82.58	126.34	110.54	232.14
40	75.15	114.97	99.17	238.01
60	55.89	85.52	69.72	250.98
80	44.99	68.83	53.03	254.57
100	37.90	57.99	42.19	253.14
125	31.86	48.75	32.95	247.11
150	27.61	42.24	26.44	237.99
175	24.44	37.40	21.60	226.76
200	21.98	33.63	17.83	213.99
250	18.39	28.14	12.34	185.15
300	15.89	24.31	8.51	153.24
350	14.04	21.48	5.68	119.19
400	12.60	19.28	3.48	83.57
450	11.46	17.53	1.73	46.72

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-5 Controlled Site - Internal SWM Tank #1

OTTAWA IDF CURVE

Area =	0.739	ha	Qallow =	15.8	L/s
C =	0.75		Vol(max) =	322.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	445.60	429.80	128.94
10	214.27	327.83	312.03	187.22
15	171.47	262.35	246.55	221.89
20	143.94	220.23	204.43	245.31
25	124.62	190.66	174.86	262.29
30	110.24	168.67	152.87	275.16
35	99.09	151.61	135.81	285.20
40	90.17	137.96	122.16	293.19
60	67.07	102.62	86.82	312.55
80	53.99	82.60	66.80	320.65
100	45.48	69.59	53.79	322.73
125	38.23	58.50	42.70	320.23
150	33.13	50.69	34.89	314.03
175	29.33	44.88	29.08	305.30
200	26.38	40.36	24.56	294.71
250	22.07	33.77	17.97	269.58
300	19.07	29.18	13.38	240.77
350	16.84	25.77	9.97	209.39
400	15.12	23.14	7.34	176.12
450	13.75	21.04	5.24	141.39

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-1 Uncontrolled Direct Runoff - South Side

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.8	L/s
C =	0.20		Vol(max) =	0.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	1.09	0.28	0.08
10	76.81	0.81	0.00	0.00
15	61.77	0.65	-0.16	-0.14
20	52.03	0.55	-0.26	-0.31
25	45.17	0.48	-0.33	-0.50
30	40.04	0.42	-0.39	-0.70
35	36.06	0.38	-0.43	-0.90
40	32.86	0.35	-0.46	-1.11
45	30.24	0.32	-0.49	-1.33
50	28.04	0.30	-0.52	-1.55
55	26.17	0.28	-0.53	-1.77
60	24.56	0.26	-0.55	-1.99
65	23.15	0.24	-0.57	-2.21
70	21.91	0.23	-0.58	-2.44
75	20.81	0.22	-0.59	-2.66
90	18.14	0.19	-0.62	-3.35
105	16.13	0.17	-0.64	-4.04
120	14.56	0.15	-0.66	-4.73
135	13.30	0.14	-0.67	-5.43
150	12.25	0.13	-0.68	-6.14

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-1 Uncontrolled Direct Runoff - South Side

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	1.1	L/s
C =	0.20		Vol(max) =	0.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	1.49	0.39	0.12
10	104.19	1.10	0.00	0.00
15	83.56	0.88	-0.22	-0.20
20	70.25	0.74	-0.36	-0.43
25	60.90	0.64	-0.46	-0.69
30	53.93	0.57	-0.53	-0.96
35	48.52	0.51	-0.59	-1.24
40	44.18	0.47	-0.63	-1.52
45	40.63	0.43	-0.67	-1.81
50	37.65	0.40	-0.70	-2.11
55	35.12	0.37	-0.73	-2.41
60	32.94	0.35	-0.75	-2.71
65	31.04	0.33	-0.77	-3.01
70	29.37	0.31	-0.79	-3.32
75	27.89	0.29	-0.81	-3.63
90	24.29	0.26	-0.84	-4.56
105	21.58	0.23	-0.87	-5.50
120	19.47	0.21	-0.90	-6.44
135	17.76	0.19	-0.91	-7.40
150	16.36	0.17	-0.93	-8.35

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-1 Uncontrolled Direct Runoff - South Side

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	2.4	L/s
C =	0.25		Vol(max) =	0.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	3.20	0.85	0.25
10	178.56	2.36	0.00	0.00
15	142.89	1.89	-0.47	-0.42
20	119.95	1.58	-0.77	-0.93
25	103.85	1.37	-0.99	-1.48
30	91.87	1.21	-1.14	-2.06
35	82.58	1.09	-1.27	-2.66
40	75.15	0.99	-1.37	-3.28
45	69.05	0.91	-1.45	-3.90
50	63.95	0.84	-1.51	-4.54
55	59.62	0.79	-1.57	-5.18
60	55.89	0.74	-1.62	-5.83
65	52.65	0.70	-1.66	-6.48
70	49.79	0.66	-1.70	-7.14
75	47.26	0.62	-1.73	-7.80
90	41.11	0.54	-1.82	-9.80
105	36.50	0.48	-1.88	-11.82
120	32.89	0.43	-1.92	-13.85
135	30.00	0.40	-1.96	-15.89
150	27.61	0.36	-1.99	-17.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA B-1 Uncontrolled Direct Runoff - South Side

OTTAWA IDF CURVE 0

Area =	0.019	ha	Qallow =	2.8	L/s
C =	0.25		Vol(max) =	0.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	3.85	1.02	0.30
10	214.27	2.83	0.00	0.00
15	171.47	2.26	-0.57	-0.51
20	143.94	1.90	-0.93	-1.11
25	124.62	1.65	-1.18	-1.78
30	110.24	1.46	-1.37	-2.47
35	99.09	1.31	-1.52	-3.19
40	90.17	1.19	-1.64	-3.93
45	82.86	1.09	-1.74	-4.69
50	76.74	1.01	-1.82	-5.45
55	71.55	0.94	-1.88	-6.22
60	67.07	0.89	-1.94	-7.00
65	63.18	0.83	-2.00	-7.78
70	59.75	0.79	-2.04	-8.57
75	56.71	0.75	-2.08	-9.36
90	49.33	0.65	-2.18	-11.76
105	43.80	0.58	-2.25	-14.18
120	39.47	0.52	-2.31	-16.62
135	36.00	0.48	-2.35	-19.07
150	33.13	0.44	-2.39	-21.53

NOVATECH
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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.56	4.24	1.27
10	76.81	3.38	3.06	1.84
15	61.77	2.72	2.40	2.16
20	52.03	2.29	1.97	2.37
25	45.17	1.99	1.67	2.50
30	40.04	1.76	1.44	2.60
35	36.06	1.59	1.27	2.66
40	32.86	1.45	1.13	2.71
45	30.24	1.33	1.01	2.73
50	28.04	1.23	0.91	2.74
55	26.17	1.15	0.83	2.75
60	24.56	1.08	0.76	2.74
65	23.15	1.02	0.70	2.73
70	21.91	0.96	0.64	2.71
75	20.81	0.92	0.60	2.68
90	18.14	0.80	0.48	2.59
105	16.13	0.71	0.39	2.46
120	14.56	0.64	0.32	2.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.22	5.90	1.77
10	104.19	4.59	4.27	2.56
15	83.56	3.68	3.36	3.02
20	70.25	3.09	2.77	3.33
25	60.90	2.68	2.36	3.54
30	53.93	2.37	2.05	3.70
35	48.52	2.14	1.82	3.81
40	44.18	1.95	1.63	3.90
45	40.63	1.79	1.47	3.97
50	37.65	1.66	1.34	4.01
55	35.12	1.55	1.23	4.05
60	32.94	1.45	1.13	4.07
65	31.04	1.37	1.05	4.08
70	29.37	1.29	0.97	4.09
75	27.89	1.23	0.91	4.09
90	24.29	1.07	0.75	4.05
105	21.58	0.95	0.63	3.97
120	19.47	0.86	0.54	3.87

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	9.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.88	11.56	3.47
10	178.56	8.74	8.42	5.05
15	142.89	6.99	6.67	6.00
20	119.95	5.87	5.55	6.66
25	103.85	5.08	4.76	7.14
30	91.87	4.49	4.17	7.51
35	82.58	4.04	3.72	7.81
40	75.15	3.68	3.36	8.06
45	69.05	3.38	3.06	8.26
50	63.95	3.13	2.81	8.43
55	59.62	2.92	2.60	8.57
60	55.89	2.73	2.41	8.69
65	52.65	2.58	2.26	8.80
70	49.79	2.44	2.12	8.89
75	47.26	2.31	1.99	8.96
90	41.11	2.01	1.69	9.13
105	36.50	1.79	1.47	9.23
120	32.89	1.61	1.29	9.28

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	11.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	14.25	13.93	4.18
10	214.27	10.48	10.16	6.10
15	171.47	8.39	8.07	7.26
20	143.94	7.04	6.72	8.07
25	124.62	6.10	5.78	8.67
30	110.24	5.39	5.07	9.13
35	99.09	4.85	4.53	9.51
40	90.17	4.41	4.09	9.82
45	82.86	4.05	3.73	10.08
50	76.74	3.75	3.43	10.30
55	71.55	3.50	3.18	10.50
60	67.07	3.28	2.96	10.66
65	63.18	3.09	2.77	10.81
70	59.75	2.92	2.60	10.93
75	56.71	2.77	2.45	11.05
90	49.33	2.41	2.09	11.31
105	43.80	2.14	1.82	11.48
120	39.47	1.93	1.61	11.60

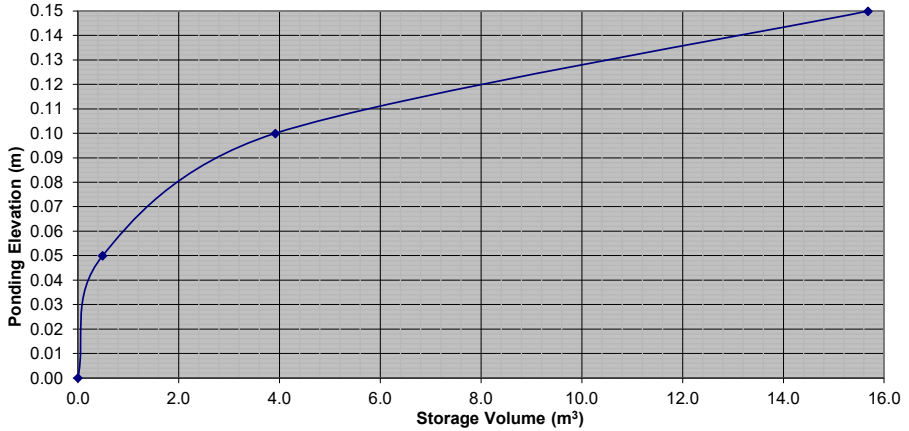
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.7	
1:5 Year	0.32	0.32	10	4.1	15.7
1:100 Year	0.32	0.32	12	9.3	

Roof Drain Storage Table for Area RD-C1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C1



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.56	4.24	1.27
10	76.81	3.38	3.06	1.84
15	61.77	2.72	2.40	2.16
20	52.03	2.29	1.97	2.37
25	45.17	1.99	1.67	2.50
30	40.04	1.76	1.44	2.60
35	36.06	1.59	1.27	2.66
40	32.86	1.45	1.13	2.71
45	30.24	1.33	1.01	2.73
50	28.04	1.23	0.91	2.74
55	26.17	1.15	0.83	2.75
60	24.56	1.08	0.76	2.74
65	23.15	1.02	0.70	2.73
70	21.91	0.96	0.64	2.71
75	20.81	0.92	0.60	2.68
90	18.14	0.80	0.48	2.59
105	16.13	0.71	0.39	2.46
120	14.56	0.64	0.32	2.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.22	5.90	1.77
10	104.19	4.59	4.27	2.56
15	83.56	3.68	3.36	3.02
20	70.25	3.09	2.77	3.33
25	60.90	2.68	2.36	3.54
30	53.93	2.37	2.05	3.70
35	48.52	2.14	1.82	3.81
40	44.18	1.95	1.63	3.90
45	40.63	1.79	1.47	3.97
50	37.65	1.66	1.34	4.01
55	35.12	1.55	1.23	4.05
60	32.94	1.45	1.13	4.07
65	31.04	1.37	1.05	4.08
70	29.37	1.29	0.97	4.09
75	27.89	1.23	0.91	4.09
90	24.29	1.07	0.75	4.05
105	21.58	0.95	0.63	3.97
120	19.47	0.86	0.54	3.87

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	9.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.88	11.56	3.47
10	178.56	8.74	8.42	5.05
15	142.89	6.99	6.67	6.00
20	119.95	5.87	5.55	6.66
25	103.85	5.08	4.76	7.14
30	91.87	4.49	4.17	7.51
35	82.58	4.04	3.72	7.81
40	75.15	3.68	3.36	8.06
45	69.05	3.38	3.06	8.26
50	63.95	3.13	2.81	8.43
55	59.62	2.92	2.60	8.57
60	55.89	2.73	2.41	8.69
65	52.65	2.58	2.26	8.80
70	49.79	2.44	2.12	8.89
75	47.26	2.31	1.99	8.96
90	41.11	2.01	1.69	9.13
105	36.50	1.79	1.47	9.23
120	32.89	1.61	1.29	9.28

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	11.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	14.25	13.93	4.18
10	214.27	10.48	10.16	6.10
15	171.47	8.39	8.07	7.26
20	143.94	7.04	6.72	8.07
25	124.62	6.10	5.78	8.67
30	110.24	5.39	5.07	9.13
35	99.09	4.85	4.53	9.51
40	90.17	4.41	4.09	9.82
45	82.86	4.05	3.73	10.08
50	76.74	3.75	3.43	10.30
55	71.55	3.50	3.18	10.50
60	67.07	3.28	2.96	10.66
65	63.18	3.09	2.77	10.81
70	59.75	2.92	2.60	10.93
75	56.71	2.77	2.45	11.05
90	49.33	2.41	2.09	11.31
105	43.80	2.14	1.82	11.48
120	39.47	1.93	1.61	11.60

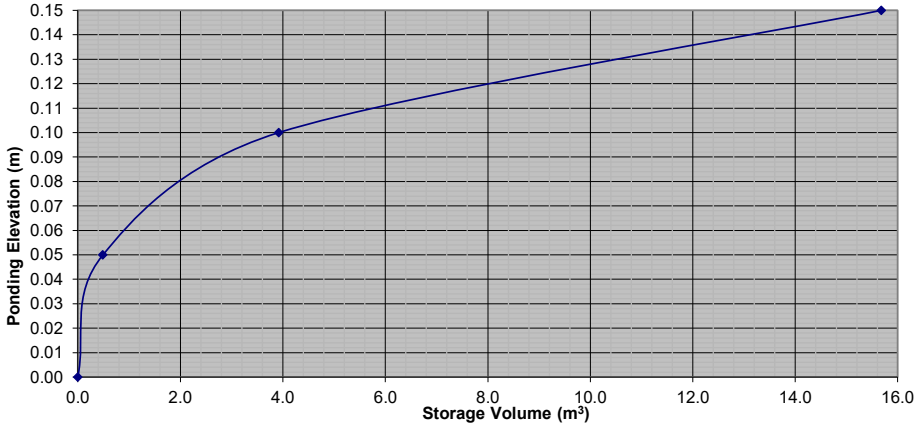
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.7	
1:5 Year	0.32	0.32	10	4.1	15.7
1:100 Year	0.32	0.32	12	9.3	

Roof Drain Storage Table for Area RD-C2

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C2



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

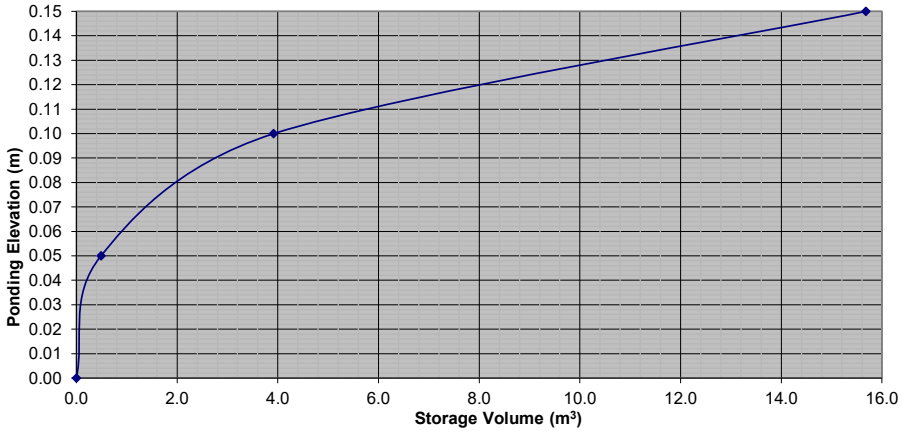
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-C3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C3



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

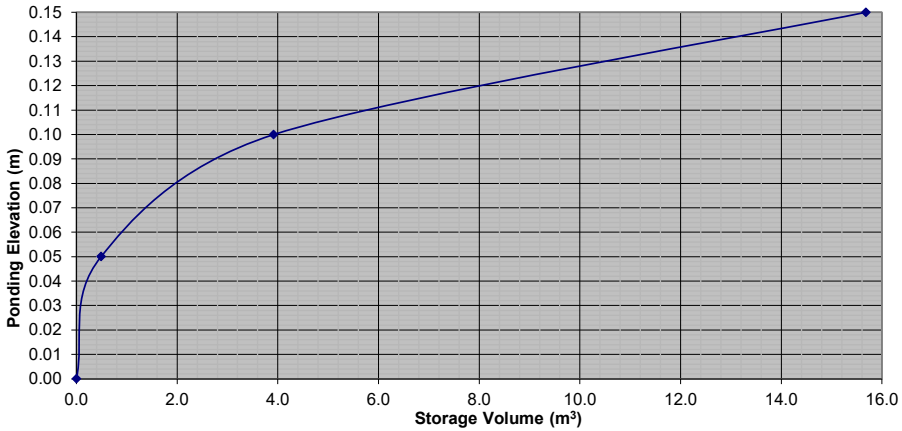
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-C4

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C4



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

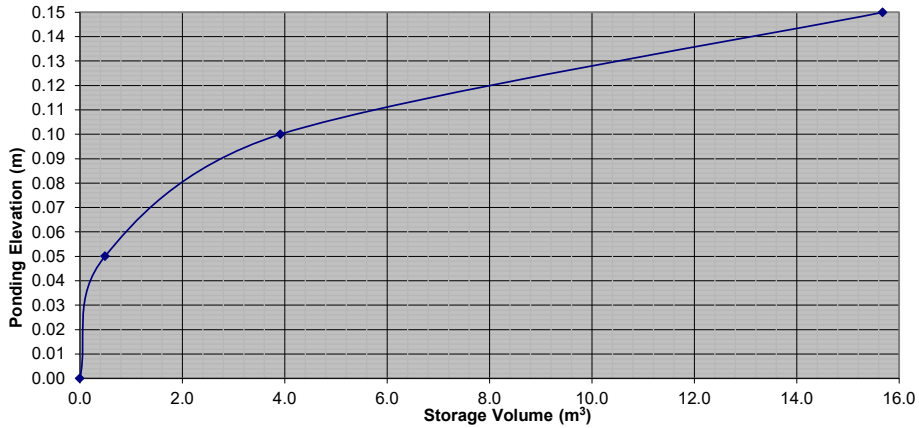
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-C5

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C5



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-2 **Building C - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.09	3.77	1.13
10	76.81	3.04	2.72	1.63
15	61.77	2.44	2.12	1.91
20	52.03	2.06	1.74	2.08
25	45.17	1.79	1.47	2.20
30	40.04	1.58	1.26	2.27
35	36.06	1.43	1.11	2.32
40	32.86	1.30	0.98	2.35
45	30.24	1.20	0.88	2.36
50	28.04	1.11	0.79	2.37
55	26.17	1.03	0.71	2.36
60	24.56	0.97	0.65	2.34
65	23.15	0.92	0.60	2.32
70	21.91	0.87	0.55	2.29
75	20.81	0.82	0.50	2.26
90	18.14	0.72	0.40	2.14
105	16.13	0.64	0.32	2.00
120	14.56	0.58	0.26	1.84

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-2 **Building C - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.58	5.26	1.58
10	104.19	4.12	3.80	2.28
15	83.56	3.30	2.98	2.68
20	70.25	2.78	2.46	2.95
25	60.90	2.41	2.09	3.13
30	53.93	2.13	1.81	3.26
35	48.52	1.92	1.60	3.36
40	44.18	1.75	1.43	3.42
45	40.63	1.61	1.29	3.47
50	37.65	1.49	1.17	3.51
55	35.12	1.39	1.07	3.53
60	32.94	1.30	0.98	3.54
65	31.04	1.23	0.91	3.54
70	29.37	1.16	0.84	3.53
75	27.89	1.10	0.78	3.52
90	24.29	0.96	0.64	3.46
105	21.58	0.85	0.53	3.36
120	19.47	0.77	0.45	3.24

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-2 **Building C - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.66	10.34	3.10
10	178.56	7.84	7.52	4.51
15	142.89	6.28	5.96	5.36
20	119.95	5.27	4.95	5.94
25	103.85	4.56	4.24	6.36
30	91.87	4.04	3.72	6.69
35	82.58	3.63	3.31	6.95
40	75.15	3.30	2.98	7.15
45	69.05	3.03	2.71	7.33
50	63.95	2.81	2.49	7.47
55	59.62	2.62	2.30	7.59
60	55.89	2.46	2.14	7.69
65	52.65	2.31	1.99	7.77
70	49.79	2.19	1.87	7.84
75	47.26	2.08	1.76	7.90
90	41.11	1.81	1.49	8.02
105	36.50	1.60	1.28	8.08
120	32.89	1.44	1.12	8.10

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-2 **Building C - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.79	12.47	3.74
10	214.27	9.41	9.09	5.45
15	171.47	7.53	7.21	6.49
20	143.94	6.32	6.00	7.20
25	124.62	5.47	5.15	7.73
30	110.24	4.84	4.52	8.14
35	99.09	4.35	4.03	8.47
40	90.17	3.96	3.64	8.74
45	82.86	3.64	3.32	8.96
50	76.74	3.37	3.05	9.15
55	71.55	3.14	2.82	9.31
60	67.07	2.95	2.63	9.45
65	63.18	2.77	2.45	9.57
70	59.75	2.62	2.30	9.68
75	56.71	2.49	2.17	9.77
90	49.33	2.17	1.85	9.97
105	43.80	1.92	1.60	10.10
120	39.47	1.73	1.41	10.18

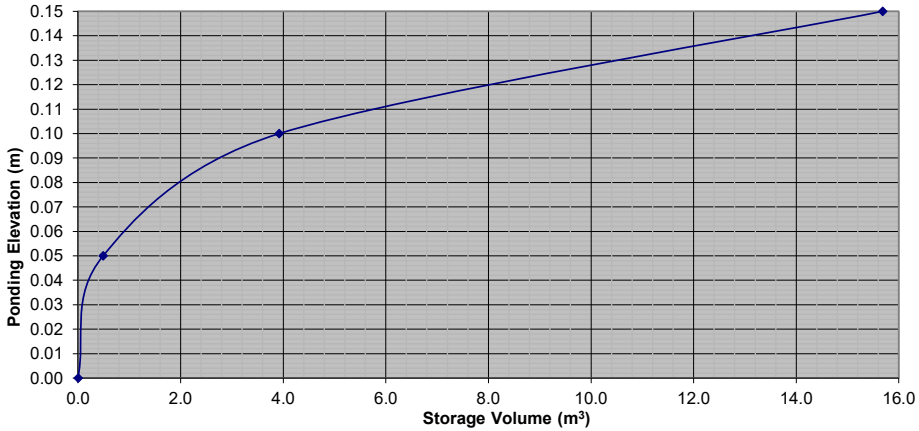
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	2.4	
1:5 Year	0.32	0.32	10	3.5	15.7
1:100 Year	0.32	0.32	12	8.1	

Roof Drain Storage Table for Area RD-C6

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	19.601	0.5
0.10	117.608	3.9
0.15	352.84	15.7

Stage Storage Curve: Area B-2
Controlled Roof Drain RD-C6



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.92	4.60	1.38
10	76.81	3.65	3.33	2.00
15	61.77	2.94	2.62	2.35
20	52.03	2.47	2.15	2.58
25	45.17	2.15	1.83	2.74
30	40.04	1.90	1.58	2.85
35	36.06	1.71	1.39	2.93
40	32.86	1.56	1.24	2.98
45	30.24	1.44	1.12	3.02
50	28.04	1.33	1.01	3.04
55	26.17	1.24	0.92	3.05
60	24.56	1.17	0.85	3.05
65	23.15	1.10	0.78	3.04
70	21.91	1.04	0.72	3.03
75	20.81	0.99	0.67	3.01
90	18.14	0.86	0.54	2.93
105	16.13	0.77	0.45	2.82
120	14.56	0.69	0.37	2.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.71	6.39	1.92
10	104.19	4.95	4.63	2.78
15	83.56	3.97	3.65	3.29
20	70.25	3.34	3.02	3.62
25	60.90	2.89	2.57	3.86
30	53.93	2.56	2.24	4.04
35	48.52	2.31	1.99	4.17
40	44.18	2.10	1.78	4.27
45	40.63	1.93	1.61	4.35
50	37.65	1.79	1.47	4.41
55	35.12	1.67	1.35	4.45
60	32.94	1.57	1.25	4.49
65	31.04	1.48	1.16	4.51
70	29.37	1.40	1.08	4.52
75	27.89	1.33	1.01	4.53
90	24.29	1.15	0.83	4.51
105	21.58	1.03	0.71	4.45
120	19.47	0.93	0.61	4.36

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	12.82	12.50	3.75
10	178.56	9.43	9.11	5.47
15	142.89	7.55	7.23	6.50
20	119.95	6.34	6.02	7.22
25	103.85	5.49	5.17	7.75
30	91.87	4.85	4.53	8.16
35	82.58	4.36	4.04	8.49
40	75.15	3.97	3.65	8.76
45	69.05	3.65	3.33	8.98
50	63.95	3.38	3.06	9.17
55	59.62	3.15	2.83	9.34
60	55.89	2.95	2.63	9.48
65	52.65	2.78	2.46	9.60
70	49.79	2.63	2.31	9.70
75	47.26	2.50	2.18	9.79
90	41.11	2.17	1.85	10.00
105	36.50	1.93	1.61	10.13
120	32.89	1.74	1.42	10.21

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #1**

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	12.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	15.38	15.06	4.52
10	214.27	11.32	11.00	6.60
15	171.47	9.06	8.74	7.86
20	143.94	7.60	7.28	8.74
25	124.62	6.58	6.26	9.39
30	110.24	5.82	5.50	9.91
35	99.09	5.23	4.91	10.32
40	90.17	4.76	4.44	10.66
45	82.86	4.38	4.06	10.95
50	76.74	4.05	3.73	11.20
55	71.55	3.78	3.46	11.42
60	67.07	3.54	3.22	11.60
65	63.18	3.34	3.02	11.77
70	59.75	3.16	2.84	11.91
75	56.71	3.00	2.68	12.04
90	49.33	2.61	2.29	12.34
105	43.80	2.31	1.99	12.56
120	39.47	2.09	1.77	12.71

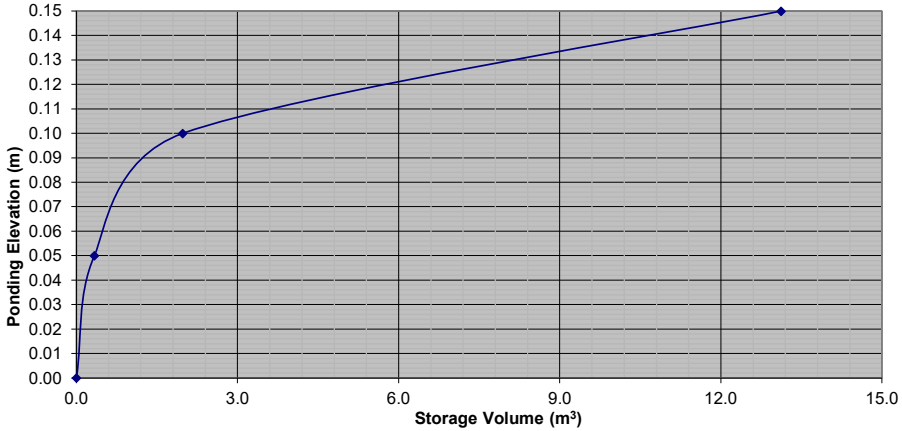
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.1	
1:5 Year	0.32	0.32	12	4.5	13.1
1:100 Year	0.32	0.32	14	10.2	

Roof Drain Storage Table for Area RD-D1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	13.384	0.3
0.10	52.535	2.0
0.15	393.048	13.1

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D1



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #2**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

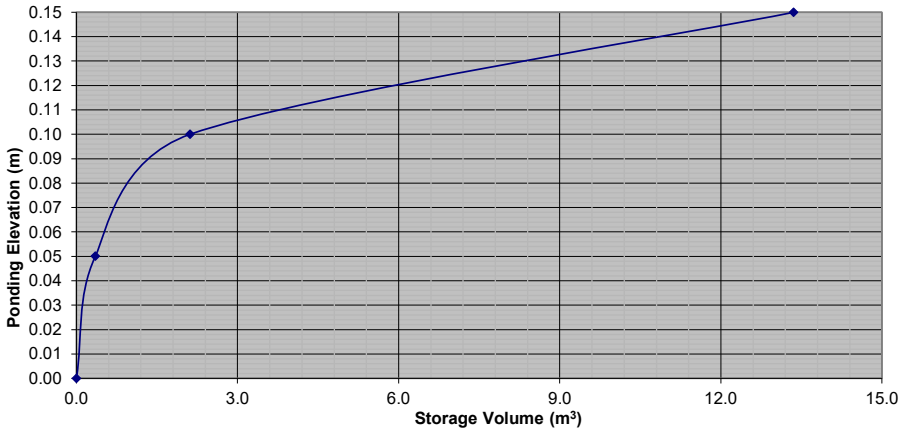
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	11	3.3	13.4
1:5 Year	0.32	0.32	12	4.8	
1:100 Year	0.32	0.32	14	10.9	

Roof Drain Storage Table for Area RD-D2

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.128	0.4
0.10	56.512	2.1
0.15	393.048	13.4

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D2



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Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #3**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

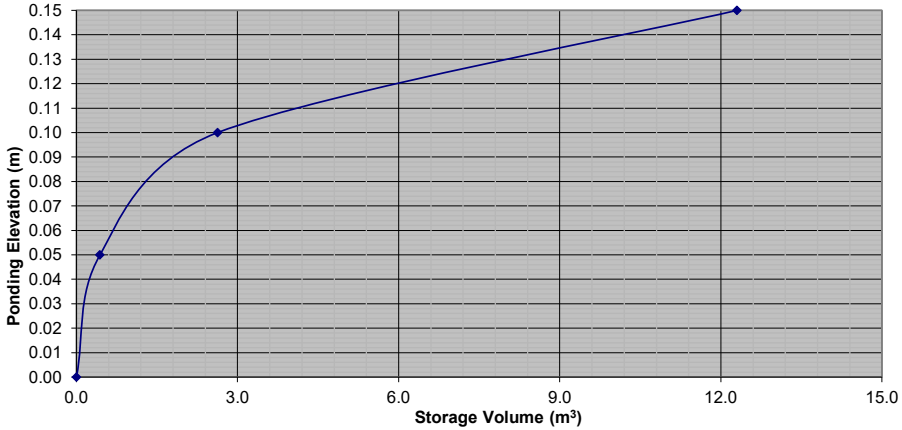
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.4	
1:5 Year	0.32	0.32	11	3.6	12.3
1:100 Year	0.32	0.32	13	8.2	

Roof Drain Storage Table for Area RD-D3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.533	0.4
0.10	70.131	2.6
0.15	316.669	12.3

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D3



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #4**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

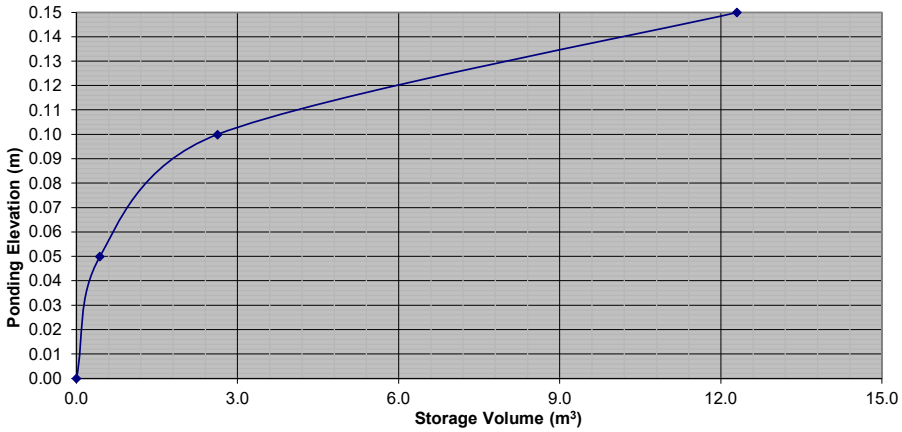
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.4	
1:5 Year	0.32	0.32	11	3.6	12.3
1:100 Year	0.32	0.32	13	8.2	

Roof Drain Storage Table for Area RD-D4

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.533	0.4
0.10	70.131	2.6
0.15	316.669	12.3

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D4



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #5**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

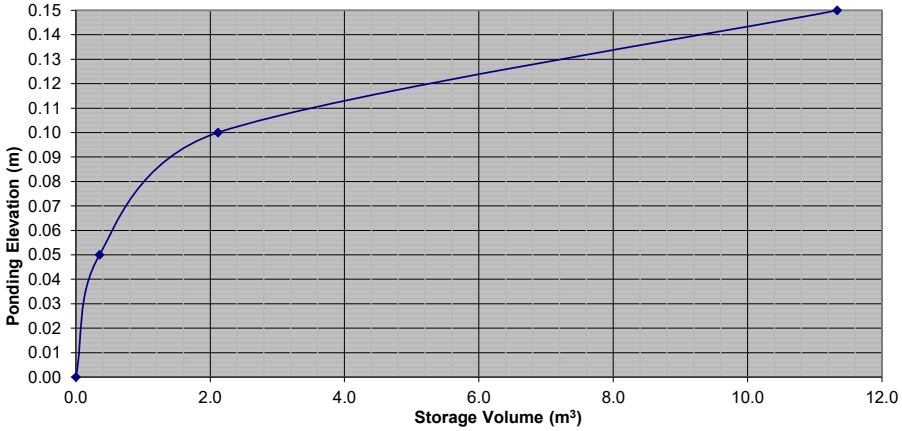
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	9	3.3	
1:5 Year	0.32	0.32	11	4.8	11.3
1:100 Year	0.32	0.32	15	10.9	

Roof Drain Storage Table for Area RD-D5

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.091	0.4
0.10	56.363	2.1
0.15	312.401	11.3

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D5



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	5.18	4.86	1.46
10	76.81	3.84	3.52	2.11
15	61.77	3.09	2.77	2.49
20	52.03	2.60	2.28	2.74
25	45.17	2.26	1.94	2.91
30	40.04	2.00	1.68	3.03
35	36.06	1.80	1.48	3.12
40	32.86	1.64	1.32	3.18
45	30.24	1.51	1.19	3.22
50	28.04	1.40	1.08	3.25
55	26.17	1.31	0.99	3.27
60	24.56	1.23	0.91	3.27
65	23.15	1.16	0.84	3.27
70	21.91	1.10	0.78	3.26
75	20.81	1.04	0.72	3.25
90	18.14	0.91	0.59	3.17
105	16.13	0.81	0.49	3.07
120	14.56	0.73	0.41	2.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	4.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.06	6.74	2.02
10	104.19	5.21	4.89	2.94
15	83.56	4.18	3.86	3.48
20	70.25	3.52	3.20	3.83
25	60.90	3.05	2.73	4.09
30	53.93	2.70	2.38	4.28
35	48.52	2.43	2.11	4.43
40	44.18	2.21	1.89	4.54
45	40.63	2.03	1.71	4.63
50	37.65	1.88	1.56	4.69
55	35.12	1.76	1.44	4.74
60	32.94	1.65	1.33	4.78
65	31.04	1.55	1.23	4.81
70	29.37	1.47	1.15	4.83
75	27.89	1.40	1.08	4.84
90	24.29	1.22	0.90	4.84
105	21.58	1.08	0.76	4.79
120	19.47	0.97	0.65	4.71

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	13.49	13.17	3.95
10	178.56	9.93	9.61	5.76
15	142.89	7.94	7.62	6.86
20	119.95	6.67	6.35	7.62
25	103.85	5.77	5.45	8.18
30	91.87	5.11	4.79	8.62
35	82.58	4.59	4.27	8.97
40	75.15	4.18	3.86	9.26
45	69.05	3.84	3.52	9.50
50	63.95	3.56	3.24	9.71
55	59.62	3.32	3.00	9.88
60	55.89	3.11	2.79	10.04
65	52.65	2.93	2.61	10.17
70	49.79	2.77	2.45	10.28
75	47.26	2.63	2.31	10.38
90	41.11	2.29	1.97	10.62
105	36.50	2.03	1.71	10.77
120	32.89	1.83	1.51	10.86

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #6**

OTTAWA IDF CURVE

Area =	0.020	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	13.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	16.19	15.87	4.76
10	214.27	11.91	11.59	6.96
15	171.47	9.53	9.21	8.29
20	143.94	8.00	7.68	9.22
25	124.62	6.93	6.61	9.91
30	110.24	6.13	5.81	10.46
35	99.09	5.51	5.19	10.90
40	90.17	5.01	4.69	11.26
45	82.86	4.61	4.29	11.58
50	76.74	4.27	3.95	11.84
55	71.55	3.98	3.66	12.07
60	67.07	3.73	3.41	12.27
65	63.18	3.51	3.19	12.45
70	59.75	3.32	3.00	12.61
75	56.71	3.15	2.83	12.75
90	49.33	2.74	2.42	13.08
105	43.80	2.44	2.12	13.33
120	39.47	2.19	1.87	13.50

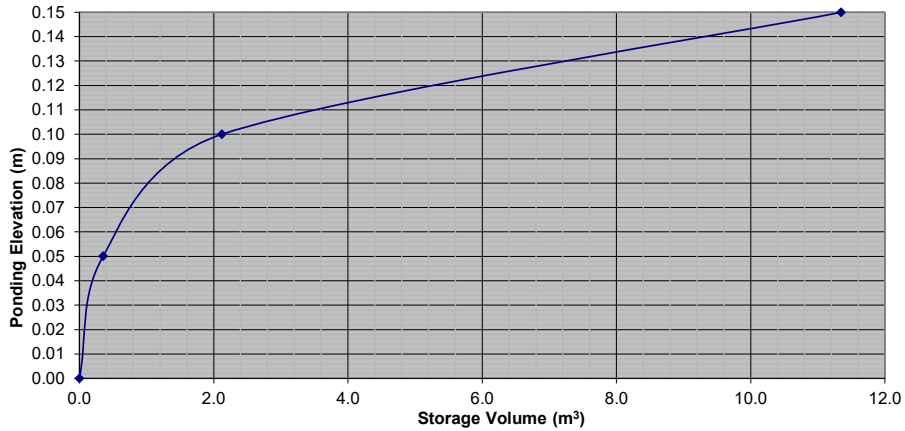
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	3.3	11.3
1:5 Year	0.32	0.32	12	4.8	
1:100 Year	0.32	0.32	15	10.9	

Roof Drain Storage Table for Area RD-D6

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.159	0.4
0.10	56.637	2.1
0.15	312.401	11.3

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D6



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	2.20	1.88	0.56
10	76.81	1.63	1.31	0.79
15	61.77	1.31	0.99	0.89
20	52.03	1.11	0.79	0.94
25	45.17	0.96	0.64	0.96
30	40.04	0.85	0.53	0.96
35	36.06	0.77	0.45	0.94
40	32.86	0.70	0.38	0.91
45	30.24	0.64	0.32	0.87
50	28.04	0.60	0.28	0.83
55	26.17	0.56	0.24	0.78
60	24.56	0.52	0.20	0.73
65	23.15	0.49	0.17	0.67
70	21.91	0.47	0.15	0.61
75	20.81	0.44	0.12	0.55
90	18.14	0.39	0.07	0.36
105	16.13	0.34	0.02	0.15
120	14.56	0.31	-0.01	-0.07

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.00	2.68	0.80
10	104.19	2.22	1.90	1.14
15	83.56	1.78	1.46	1.31
20	70.25	1.49	1.17	1.41
25	60.90	1.30	0.98	1.46
30	53.93	1.15	0.83	1.49
35	48.52	1.03	0.71	1.49
40	44.18	0.94	0.62	1.49
45	40.63	0.86	0.54	1.47
50	37.65	0.80	0.48	1.44
55	35.12	0.75	0.43	1.41
60	32.94	0.70	0.38	1.37
65	31.04	0.66	0.34	1.33
70	29.37	0.62	0.30	1.28
75	27.89	0.59	0.27	1.23
90	24.29	0.52	0.20	1.06
105	21.58	0.46	0.14	0.88
120	19.47	0.41	0.09	0.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	5.74	5.42	1.62
10	178.56	4.22	3.90	2.34
15	142.89	3.38	3.06	2.75
20	119.95	2.83	2.51	3.02
25	103.85	2.45	2.13	3.20
30	91.87	2.17	1.85	3.33
35	82.58	1.95	1.63	3.43
40	75.15	1.78	1.46	3.49
45	69.05	1.63	1.31	3.54
50	63.95	1.51	1.19	3.57
55	59.62	1.41	1.09	3.59
60	55.89	1.32	1.00	3.60
65	52.65	1.24	0.92	3.60
70	49.79	1.18	0.86	3.60
75	47.26	1.12	0.80	3.58
90	41.11	0.97	0.65	3.52
105	36.50	0.86	0.54	3.42
120	32.89	0.78	0.46	3.29

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #7**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	4.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	6.88	6.56	1.97
10	214.27	5.06	4.74	2.85
15	171.47	4.05	3.73	3.36
20	143.94	3.40	3.08	3.70
25	124.62	2.94	2.62	3.94
30	110.24	2.61	2.29	4.11
35	99.09	2.34	2.02	4.25
40	90.17	2.13	1.81	4.35
45	82.86	1.96	1.64	4.42
50	76.74	1.81	1.49	4.48
55	71.55	1.69	1.37	4.52
60	67.07	1.58	1.26	4.55
65	63.18	1.49	1.17	4.57
70	59.75	1.41	1.09	4.59
75	56.71	1.34	1.02	4.59
90	49.33	1.17	0.85	4.57
105	43.80	1.03	0.71	4.50
120	39.47	0.93	0.61	4.41

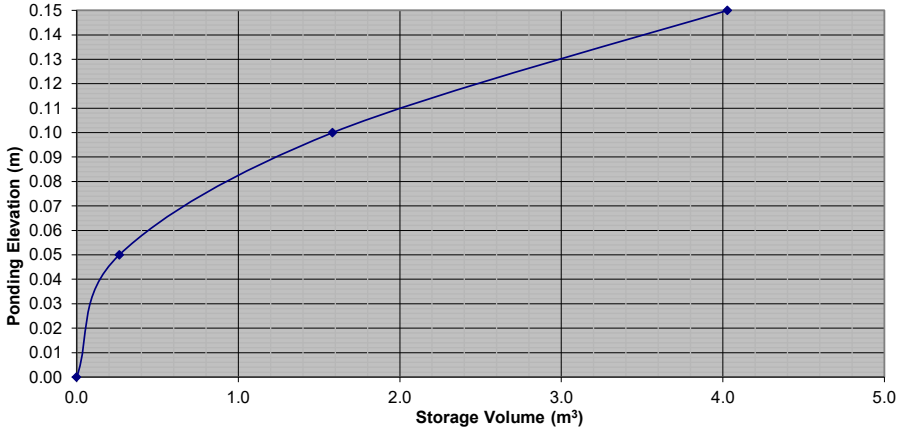
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	1.0	
1:5 Year	0.32	0.32	10	1.5	4.0
1:100 Year	0.32	0.32	14	3.6	

Roof Drain Storage Table for Area RD-D7

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.583	0.3
0.10	42.207	1.6
0.15	55.572	4.0

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D7



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #8**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	2.20	1.88	0.56
10	76.81	1.63	1.31	0.79
15	61.77	1.31	0.99	0.89
20	52.03	1.11	0.79	0.94
25	45.17	0.96	0.64	0.96
30	40.04	0.85	0.53	0.96
35	36.06	0.77	0.45	0.94
40	32.86	0.70	0.38	0.91
45	30.24	0.64	0.32	0.87
50	28.04	0.60	0.28	0.83
55	26.17	0.56	0.24	0.78
60	24.56	0.52	0.20	0.73
65	23.15	0.49	0.17	0.67
70	21.91	0.47	0.15	0.61
75	20.81	0.44	0.12	0.55
90	18.14	0.39	0.07	0.36
105	16.13	0.34	0.02	0.15
120	14.56	0.31	-0.01	-0.07

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #8**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	1.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	3.00	2.68	0.80
10	104.19	2.22	1.90	1.14
15	83.56	1.78	1.46	1.31
20	70.25	1.49	1.17	1.41
25	60.90	1.30	0.98	1.46
30	53.93	1.15	0.83	1.49
35	48.52	1.03	0.71	1.49
40	44.18	0.94	0.62	1.49
45	40.63	0.86	0.54	1.47
50	37.65	0.80	0.48	1.44
55	35.12	0.75	0.43	1.41
60	32.94	0.70	0.38	1.37
65	31.04	0.66	0.34	1.33
70	29.37	0.62	0.30	1.28
75	27.89	0.59	0.27	1.23
90	24.29	0.52	0.20	1.06
105	21.58	0.46	0.14	0.88
120	19.47	0.41	0.09	0.68

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #8**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.96	L/s
C =	1.00		Vol(max) =	2.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	5.74	4.78	1.43
10	178.56	4.22	3.26	1.96
15	142.89	3.38	2.42	2.17
20	119.95	2.83	1.87	2.25
25	103.85	2.45	1.49	2.24
30	91.87	2.17	1.21	2.18
35	82.58	1.95	0.99	2.08
40	75.15	1.78	0.82	1.96
45	69.05	1.63	0.67	1.81
50	63.95	1.51	0.55	1.65
55	59.62	1.41	0.45	1.48
60	55.89	1.32	0.36	1.30
65	52.65	1.24	0.28	1.11
70	49.79	1.18	0.22	0.91
75	47.26	1.12	0.16	0.70
90	41.11	0.97	0.01	0.06
105	36.50	0.86	-0.10	-0.61
120	32.89	0.78	-0.18	-1.32

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #8**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.96	L/s
C =	1.00		Vol(max) =	3.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	6.88	5.92	1.78
10	214.27	5.06	4.10	2.46
15	171.47	4.05	3.09	2.78
20	143.94	3.40	2.44	2.93
25	124.62	2.94	1.98	2.98
30	110.24	2.61	1.65	2.96
35	99.09	2.34	1.38	2.90
40	90.17	2.13	1.17	2.81
45	82.86	1.96	1.00	2.69
50	76.74	1.81	0.85	2.56
55	71.55	1.69	0.73	2.41
60	67.07	1.58	0.62	2.25
65	63.18	1.49	0.53	2.08
70	59.75	1.41	0.45	1.90
75	56.71	1.34	0.38	1.71
90	49.33	1.17	0.21	1.11
105	43.80	1.03	0.07	0.47
120	39.47	0.93	-0.03	-0.20

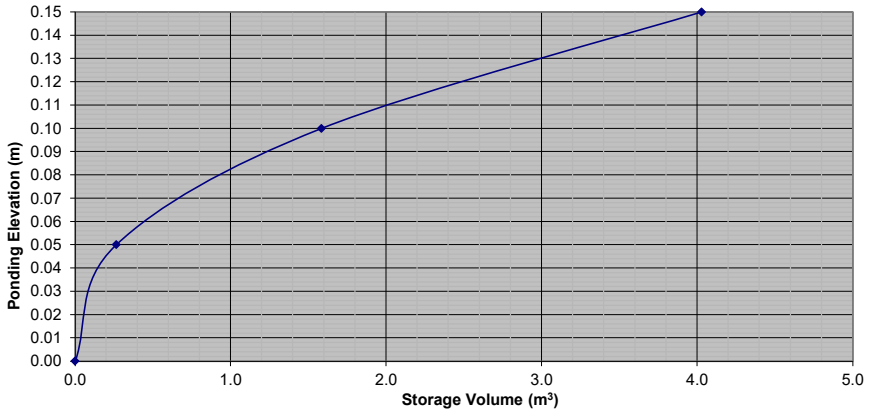
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.96	8	1.0	
1:5 Year	0.32	0.96	10	1.5	4.0
1:100 Year	0.32	0.96	14	2.2	

Roof Drain Storage Table for Area RD-D8

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	10.583	0.3
0.10	42.207	1.6
0.15	55.572	4.0

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D8



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 Building D - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 Building D - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 Building D - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.96	L/s
C =	1.00		Vol(max) =	5.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	9.84	2.95
10	178.56	7.94	6.98	4.19
15	142.89	6.36	5.40	4.86
20	119.95	5.34	4.38	5.25
25	103.85	4.62	3.66	5.49
30	91.87	4.09	3.13	5.63
35	82.58	3.67	2.71	5.70
40	75.15	3.34	2.38	5.72
45	69.05	3.07	2.11	5.70
50	63.95	2.84	1.88	5.65
55	59.62	2.65	1.69	5.58
60	55.89	2.49	1.53	5.49
65	52.65	2.34	1.38	5.39
70	49.79	2.21	1.25	5.27
75	47.26	2.10	1.14	5.14
90	41.11	1.83	0.87	4.69
105	36.50	1.62	0.66	4.18
120	32.89	1.46	0.50	3.62

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 Building D - Roof Drain #9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.96	L/s
C =	1.00		Vol(max) =	7.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	11.99	3.60
10	214.27	9.53	8.57	5.14
15	171.47	7.63	6.67	6.00
20	143.94	6.40	5.44	6.53
25	124.62	5.54	4.58	6.87
30	110.24	4.90	3.94	7.10
35	99.09	4.41	3.45	7.24
40	90.17	4.01	3.05	7.32
45	82.86	3.69	2.73	7.36
50	76.74	3.41	2.45	7.36
55	71.55	3.18	2.22	7.33
60	67.07	2.98	2.02	7.28
65	63.18	2.81	1.85	7.22
70	59.75	2.66	1.70	7.13
75	56.71	2.52	1.56	7.03
90	49.33	2.19	1.23	6.67
105	43.80	1.95	0.99	6.22
120	39.47	1.76	0.80	5.73

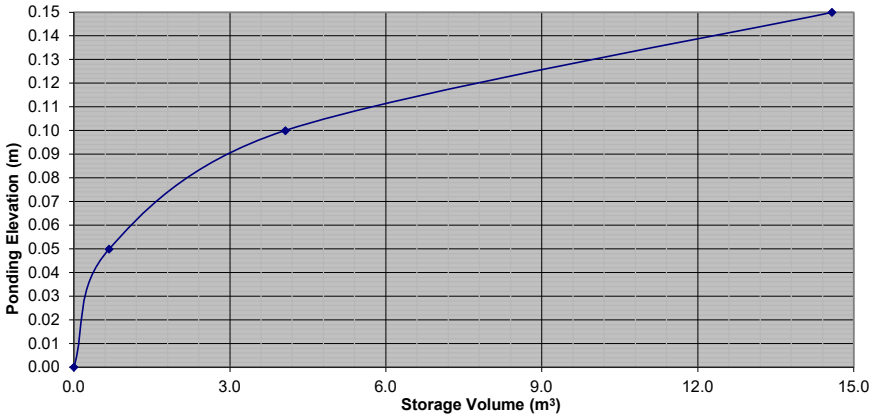
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.96	12	2.4	
1:5 Year	0.32	0.96	13	3.6	14.6
1:100 Year	0.32	0.96	15	5.7	

Roof Drain Storage Table for Area RD-D9

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	27.255	0.7
0.10	108.283	4.1
0.15	312.294	14.6

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D9



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #10**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

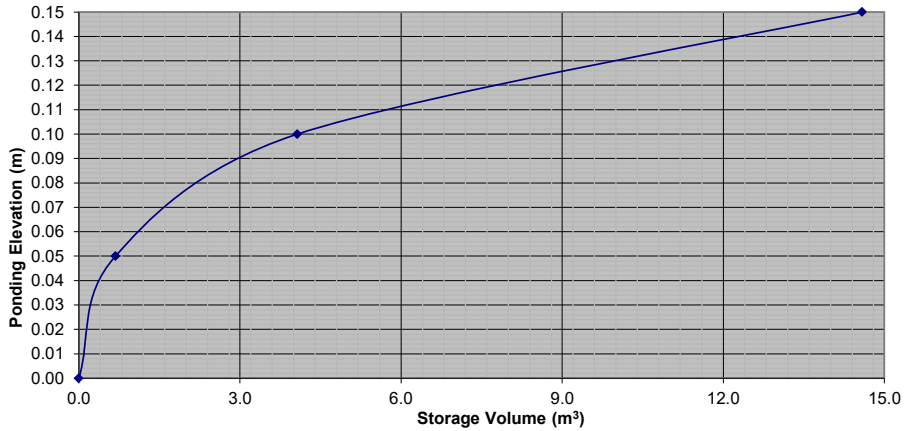
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	8	2.4	
1:5 Year	0.32	0.32	10	3.6	14.6
1:100 Year	0.32	0.32	12	8.2	

Roof Drain Storage Table for Area RD-D10

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	27.255	0.7
0.10	108.283	4.1
0.15	312.294	14.6

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D10



PROJECT #: 113020
PROJECT NAME: Chartro
LOCATION: OTTAWA

NOVATECH
Engineers, Planners & Landscape Architects

DATE PREPARED: 5/9/2025

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #11**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

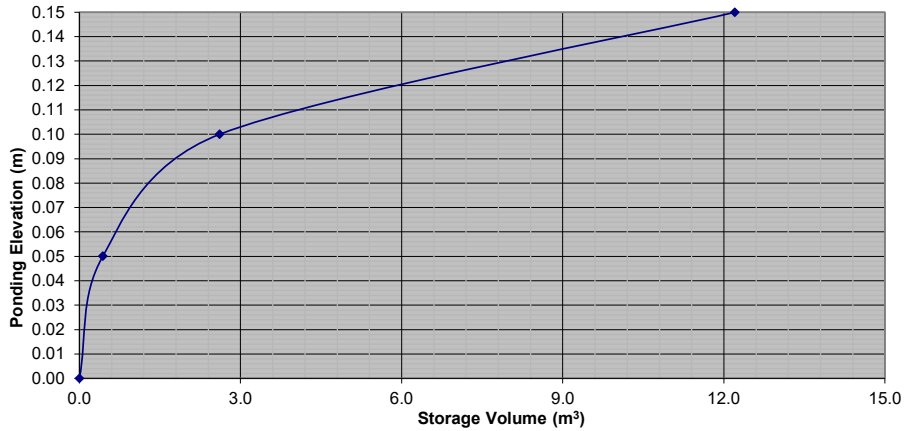
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	10	2.4	
1:5 Year	0.32	0.32	11	3.6	12.2
1:100 Year	0.32	0.32	13	8.2	

Roof Drain Storage Table for Area RD-D11

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.436	0.4
0.10	69.743	2.6
0.15	313.844	12.2

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D11



NOVATECH
Engineers, Planners & Landscape Architects

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-3 **Building D - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	2.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.15	3.83	1.15
10	76.81	3.07	2.75	1.65
15	61.77	2.47	2.15	1.94
20	52.03	2.08	1.76	2.12
25	45.17	1.81	1.49	2.23
30	40.04	1.60	1.28	2.31
35	36.06	1.44	1.12	2.36
40	32.86	1.32	1.00	2.39
45	30.24	1.21	0.89	2.40
50	28.04	1.12	0.80	2.41
55	26.17	1.05	0.73	2.40
60	24.56	0.98	0.66	2.39
65	23.15	0.93	0.61	2.37
70	21.91	0.88	0.56	2.34
75	20.81	0.83	0.51	2.31
90	18.14	0.73	0.41	2.19
105	16.13	0.65	0.33	2.05
120	14.56	0.58	0.26	1.89

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-3 **Building D - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	5.33	1.60
10	104.19	4.17	3.85	2.31
15	83.56	3.34	3.02	2.72
20	70.25	2.81	2.49	2.99
25	60.90	2.44	2.12	3.18
30	53.93	2.16	1.84	3.31
35	48.52	1.94	1.62	3.41
40	44.18	1.77	1.45	3.48
45	40.63	1.63	1.31	3.53
50	37.65	1.51	1.19	3.56
55	35.12	1.41	1.09	3.58
60	32.94	1.32	1.00	3.60
65	31.04	1.24	0.92	3.60
70	29.37	1.18	0.86	3.59
75	27.89	1.12	0.80	3.58
90	24.29	0.97	0.65	3.52
105	21.58	0.86	0.54	3.43
120	19.47	0.78	0.46	3.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-3 **Building D - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	8.2	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	10.48	3.14
10	178.56	7.94	7.62	4.57
15	142.89	6.36	6.04	5.43
20	119.95	5.34	5.02	6.02
25	103.85	4.62	4.30	6.45
30	91.87	4.09	3.77	6.78
35	82.58	3.67	3.35	7.04
40	75.15	3.34	3.02	7.25
45	69.05	3.07	2.75	7.43
50	63.95	2.84	2.52	7.57
55	59.62	2.65	2.33	7.70
60	55.89	2.49	2.17	7.80
65	52.65	2.34	2.02	7.88
70	49.79	2.21	1.89	7.96
75	47.26	2.10	1.78	8.02
90	41.11	1.83	1.51	8.15
105	36.50	1.62	1.30	8.21
120	32.89	1.46	1.14	8.23

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA B-3 **Building D - Roof Drain #12**

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.32	L/s
C =	1.00		Vol(max) =	10.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	12.95	12.63	3.79
10	214.27	9.53	9.21	5.53
15	171.47	7.63	7.31	6.58
20	143.94	6.40	6.08	7.30
25	124.62	5.54	5.22	7.83
30	110.24	4.90	4.58	8.25
35	99.09	4.41	4.09	8.58
40	90.17	4.01	3.69	8.86
45	82.86	3.69	3.37	9.09
50	76.74	3.41	3.09	9.28
55	71.55	3.18	2.86	9.45
60	67.07	2.98	2.66	9.59
65	63.18	2.81	2.49	9.71
70	59.75	2.66	2.34	9.82
75	56.71	2.52	2.20	9.91
90	49.33	2.19	1.87	10.12
105	43.80	1.95	1.63	10.26
120	39.47	1.76	1.44	10.34

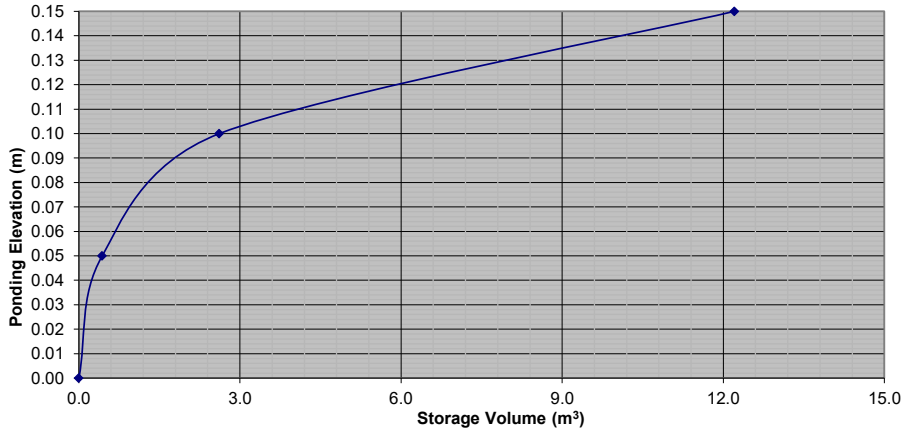
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Closed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:2 Year	0.32	0.32	12	2.4	
1:5 Year	0.32	0.32	13	3.6	12.2
1:100 Year	0.32	0.32	15	8.2	

Roof Drain Storage Table for Area RD-D12

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.436	0.4
0.10	69.743	2.6
0.15	313.844	12.2

Stage Storage Curve: Area B-3
Controlled Roof Drain RD-D12



Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-4 Controlled Site - Internal SWM Tank #2

OTTAWA IDF CURVE

Area =	0.195	ha	Qallow =	3.8	L/s
C =	0.48		Vol(max) =	11.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	26.75	22.95	6.88
10	76.81	19.84	16.04	9.62
15	61.77	15.95	12.15	10.94
20	52.03	13.44	9.64	11.57
25	45.17	11.66	7.86	11.80
30	40.04	10.34	6.54	11.78
35	36.06	9.31	5.51	11.58
40	32.86	8.49	4.69	11.25
60	24.56	6.34	2.54	9.15
80	19.83	5.12	1.32	6.34
100	16.75	4.32	0.52	3.15
125	14.11	3.64	-0.16	-1.17
150	12.25	3.16	-0.64	-5.72
175	10.86	2.81	-0.99	-10.44
200	9.78	2.53	-1.27	-15.28
250	8.21	2.12	-1.68	-25.21
300	7.10	1.83	-1.97	-35.38
350	6.28	1.62	-2.18	-45.72
400	5.65	1.46	-2.34	-56.18
450	5.14	1.33	-2.47	-66.74

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-4 Controlled Site - Internal SWM Tank #2

OTTAWA IDF CURVE

Area =	0.195	ha	Qallow =	3.8	L/s
C =	0.48		Vol(max) =	18.3	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	36.46	32.66	9.80
10	104.19	26.91	23.11	13.87
15	83.56	21.58	17.78	16.00
20	70.25	18.14	14.34	17.21
25	60.90	15.73	11.93	17.89
30	53.93	13.93	10.13	18.23
35	48.52	12.53	8.73	18.33
40	44.18	11.41	7.61	18.27
60	32.94	8.51	4.71	16.95
80	26.56	6.86	3.06	14.69
100	22.41	5.79	1.99	11.92
125	18.86	4.87	1.07	8.03
150	16.36	4.23	0.43	3.83
175	14.50	3.74	-0.06	-0.59
200	13.05	3.37	-0.43	-5.16
250	10.93	2.82	-0.98	-14.64
300	9.46	2.44	-1.36	-24.44
350	8.36	2.16	-1.64	-34.46
400	7.51	1.94	-1.86	-44.64
450	6.83	1.77	-2.03	-54.94

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-4 Controlled Site - Internal SWM Tank #2

OTTAWA IDF CURVE

Area =	0.195	ha	Qallow =	3.8	L/s
C =	0.55		Vol(max) =	45.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	71.86	68.06	20.42
10	178.56	52.87	49.07	29.44
15	142.89	42.31	38.51	34.66
20	119.95	35.51	31.71	38.06
25	103.85	30.75	26.95	40.42
30	91.87	27.20	23.40	42.12
35	82.58	24.45	20.65	43.36
40	75.15	22.25	18.45	44.28
60	55.89	16.55	12.75	45.90
80	44.99	13.32	9.52	45.70
100	37.90	11.22	7.42	44.53
125	31.86	9.43	5.63	42.25
150	27.61	8.17	4.37	39.37
175	24.44	7.24	3.44	36.09
200	21.98	6.51	2.71	32.50
250	18.39	5.45	1.65	24.69
300	15.89	4.70	0.90	16.29
350	14.04	4.16	0.36	7.47
400	12.60	3.73	-0.07	-1.65
450	11.46	3.39	-0.41	-11.01

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA B-4 Controlled Site - Internal SWM Tank #2

OTTAWA IDF CURVE

Area =	0.195	ha	Qallow =	3.8	L/s
C =	0.55		Vol(max) =	58.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	86.23	82.43	24.73
10	214.27	63.44	59.64	35.78
15	171.47	50.77	46.97	42.27
20	143.94	42.62	38.82	46.58
25	124.62	36.90	33.10	49.64
30	110.24	32.64	28.84	51.91
35	99.09	29.34	25.54	53.63
40	90.17	26.70	22.90	54.96
60	67.07	19.86	16.06	57.81
80	53.99	15.98	12.18	58.49
100	45.48	13.47	9.67	58.00
125	38.23	11.32	7.52	56.40
150	33.13	9.81	6.01	54.09
175	29.33	8.68	4.88	51.28
200	26.38	7.81	4.01	48.12
250	22.07	6.54	2.74	41.03
300	19.07	5.65	1.85	33.23
350	16.84	4.99	1.19	24.93
400	15.12	4.48	0.68	16.26
450	13.75	4.07	0.27	7.31

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA B-5 **Uncontrolled Runoff to STM Sewer (St. Joseph)**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.4	L/s
C =	0.20		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	0.53	0.14	0.04
10	76.81	0.40	0.00	0.00
15	61.77	0.32	-0.08	-0.07
20	52.03	0.27	-0.13	-0.15
25	45.17	0.23	-0.16	-0.24
30	40.04	0.21	-0.19	-0.34
35	36.06	0.19	-0.21	-0.44
40	32.86	0.17	-0.23	-0.54
45	30.24	0.16	-0.24	-0.65
50	28.04	0.14	-0.25	-0.75
55	26.17	0.13	-0.26	-0.86
60	24.56	0.13	-0.27	-0.97
65	23.15	0.12	-0.28	-1.08
70	21.91	0.11	-0.28	-1.19
75	20.81	0.11	-0.29	-1.30
90	18.14	0.09	-0.30	-1.63
105	16.13	0.08	-0.31	-1.97
120	14.56	0.07	-0.32	-2.30
135	13.30	0.07	-0.33	-2.65
150	12.25	0.06	-0.33	-2.99

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA B-5 **Uncontrolled Runoff to STM Sewer (St. Joseph)**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	0.5	L/s
C =	0.20		Vol(max) =	0.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	0.73	0.19	0.06
10	104.19	0.54	0.00	0.00
15	83.56	0.43	-0.11	-0.10
20	70.25	0.36	-0.17	-0.21
25	60.90	0.31	-0.22	-0.33
30	53.93	0.28	-0.26	-0.47
35	48.52	0.25	-0.29	-0.60
40	44.18	0.23	-0.31	-0.74
45	40.63	0.21	-0.33	-0.88
50	37.65	0.19	-0.34	-1.03
55	35.12	0.18	-0.36	-1.17
60	32.94	0.17	-0.37	-1.32
65	31.04	0.16	-0.38	-1.47
70	29.37	0.15	-0.38	-1.62
75	27.89	0.14	-0.39	-1.77
90	24.29	0.12	-0.41	-2.22
105	21.58	0.11	-0.42	-2.68
120	19.47	0.10	-0.44	-3.14
135	17.76	0.09	-0.44	-3.60
150	16.36	0.08	-0.45	-4.07

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA B-5 **Uncontrolled Runoff to STM Sewer (St. Joseph)**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	1.1	L/s
C =	0.25		Vol(max) =	0.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	1.56	0.41	0.12
10	178.56	1.15	0.00	0.00
15	142.89	0.92	-0.23	-0.21
20	119.95	0.77	-0.38	-0.45
25	103.85	0.67	-0.48	-0.72
30	91.87	0.59	-0.56	-1.00
35	82.58	0.53	-0.62	-1.30
40	75.15	0.48	-0.66	-1.60
45	69.05	0.44	-0.70	-1.90
50	63.95	0.41	-0.74	-2.21
55	59.62	0.38	-0.76	-2.52
60	55.89	0.36	-0.79	-2.84
65	52.65	0.34	-0.81	-3.16
70	49.79	0.32	-0.83	-3.48
75	47.26	0.30	-0.84	-3.80
90	41.11	0.26	-0.88	-4.77
105	36.50	0.23	-0.91	-5.75
120	32.89	0.21	-0.94	-6.74
135	30.00	0.19	-0.96	-7.74
150	27.61	0.18	-0.97	-8.73

Proposed Residential Development
Novatech Project No. 113020
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA B-5 **Uncontrolled Runoff to STM Sewer (St. Joseph)**

OTTAWA IDF CURVE

Area =	0.009	ha	Qallow =	1.4	L/s
C =	0.25		Vol(max) =	0.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	1.87	0.49	0.15
10	214.27	1.38	0.00	0.00
15	171.47	1.10	-0.28	-0.25
20	143.94	0.93	-0.45	-0.54
25	124.62	0.80	-0.58	-0.86
30	110.24	0.71	-0.67	-1.20
35	99.09	0.64	-0.74	-1.55
40	90.17	0.58	-0.80	-1.91
45	82.86	0.53	-0.84	-2.28
50	76.74	0.49	-0.88	-2.65
55	71.55	0.46	-0.92	-3.03
60	67.07	0.43	-0.95	-3.41
65	63.18	0.41	-0.97	-3.79
70	59.75	0.38	-0.99	-4.17
75	56.71	0.36	-1.01	-4.56
90	49.33	0.32	-1.06	-5.73
105	43.80	0.28	-1.10	-6.90
120	39.47	0.25	-1.12	-8.09
135	36.00	0.23	-1.15	-9.28
150	33.13	0.21	-1.16	-10.48

STORM SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: 3459 & 3479 St. Joseph Boulevard
Date: 5/8/2025
Input By: KD
Reviewed By: FST
Drawing Reference: 113020-GP1 & 113020-GP2

Storm Design Event = 5 Year

3459 & 3479 St. Joseph Boulevard
Northern Outlet to Existing Swale
1:5 Year Storm Event

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Uncontrolled Peak Flow Cell Output
- Design Input Restricted Peak Flow Cell

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Flow								Design Capacity / Proposed Sewer Pipe Sizing / Design								
Location	Area ID	From MH	To MH	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Total Restricted Peak Flow (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Site	A-5	SWM TANK #1	OGS	0.74	0.66	1.36	1.36	10.00	104.19	Controlled by Mech. Pump	**15.8**	1.0	250 PVC	0.254	0.013	1.00	62.0	1.22	0.01	25.5%
Site	A-5	OGS	STMMH 1	0.00	-	0.00	0.00	10.01	104.12		**15.8**	5.8	250 PVC	0.254	0.013	1.00	62.0	1.22	0.08	25.5%
Site	A-3	BLDG A	STMMH 1	0.19	0.90	0.48	0.48	10.00	104.19	Controlled by 12 RDs	**3.8**	5.1	250 PVC	0.254	0.013	1.00	62.0	1.22	0.07	6.1%
Site	A-4	BLDG B	STMMH 1	0.10	0.90	0.25	0.25	10.00	104.19	Controlled by 6 RDs	**1.9**	8.6	250 PVC	0.254	0.013	1.00	62.0	1.22	0.12	3.1%
Site	A-3, A-4, A-5	STMMH 1	HW-1	0.00	-	0.00	0.00	10.12	103.58		**21.5**	11.3	250 PVC	0.254	0.013	1.00	62.0	1.22	0.15	34.7%
Totals				**1.03**								**31.8**								

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year to a maximum of 1.0)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

Notes

1) Refer to the Novatech Report "Development Servicing Study and Stormwater Management Report - Proposed Residential Development - 3459 & 3479 St. Joseph Boulevard" (R-2023-086) for stormwater management calculations.
2) Refer to Novatech Drawings 113020-GP1 and 113020-GP2 for the storm structure designations, storm pipe details and control structure tables.
3) Refer to Novatech Drawings 113020-SWM for storm drainage areas.

STORM SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 113020
Project Name: 3459 & 3479 St. Joseph Boulevard
Date: 5/8/2025
Input By: KD
Reviewed By: FST
Drawing Reference: 113020-GP1 & 113020-GP2

3459 & 3479 St. Joseph Boulevard
Southern Outlet to Municipal Storm Sewer
1:5 Year Storm Event

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Uncontrolled Peak Flow Cell Output
- Design Input Restricted Peak Flow Cell

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Storm Design Event = 5 Year

Location				Flow								Design Capacity / Proposed Sewer Pipe Sizing / Design								
Location	Area ID	From MH	To MH	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Total Restricted Peak Flow (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Site	B-5, OS-1C	CB-2	STMMH 106	0.01	0.28	0.01	0.01	10.00	104.19	0.9		4.2	250 PVC	0.254	0.013	0.50	43.9	0.87	0.08	2.1%
Site	B-2, B-3, B-4	STM CAP	STMMH 106	0.48	0.73	0.98	0.98	10.00	104.19	Controlled by RDs / Pump	**9.5**	1.7	250 PVC	0.254	0.013	1.00	62.0	1.22	0.02	15.3%
Site	B-2, B-3, B-4, B-5, OS-1C	STMMH 106	EX. SEWER	0.00	-	0.00	0.00	10.08	103.77	0.9	**9.5**	25.0	250 PVC	0.254	0.013	1.00	62.0	1.22	0.34	16.8%
Totals				**0.50**								**30.9**								

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year to a maximum of 1.0)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

Notes

1) Refer to the Novatech Report "Development Servicing Study and Stormwater Management Report - Proposed Residential Development - 3459 & 3479 St. Joseph Boulevard" (R-2023-086) for stormwater management calculations.
2) Refer to Novatech Drawings 113020-GP1 and 113020-GP2 for the storm structure designations, storm pipe details and control structure tables.
3) Refer to Novatech Drawings 113020-SWM for storm drainage areas.

APPENDIX F

Control Flow Roof Drain Information

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

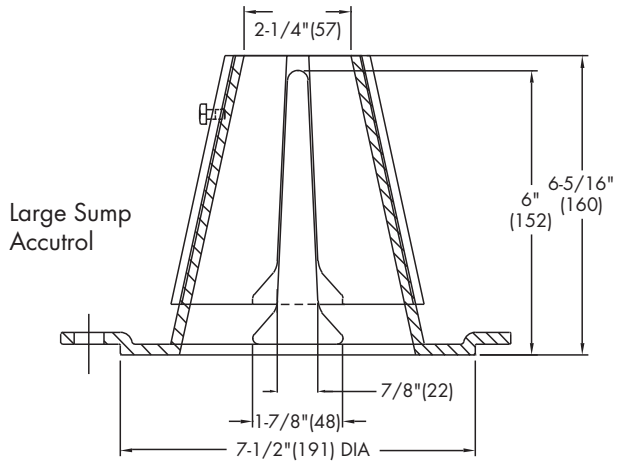
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

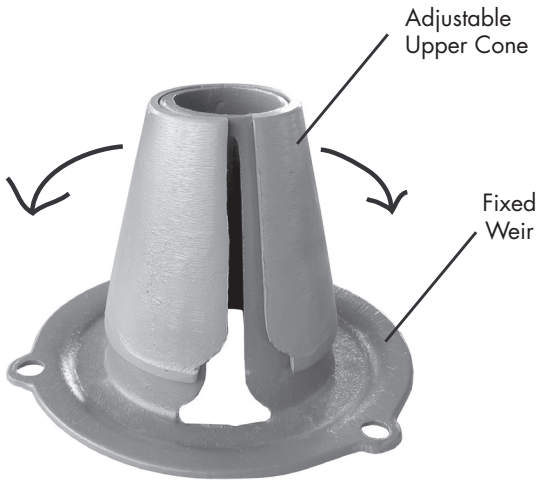
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the 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

Water Quality Treatment Unit Information

Leonel Perez

From: Patrick <patrick@echelonenvironmental.ca>
Sent: Monday, December 16, 2024 4:13 PM
To: Leonel Perez
Subject: RE: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa
Attachments: 2023 UPDATE CDS Specification Template - PMSU 2015_4 .pdf; CDS TSSR - 3459-3479 St. Joseph Blvd - PMSU 2015_4 (R2 16-Dec-24).pdf; (SAMPLE) CDS Operations & Maintenance Guidelines (INLINE).pdf

Good afternoon Leonel,

I hope all is well! For this revision of the project at 3459-3479 St. Joseph Blvd we still recommend a CDS PMSU2015-4 unit which has a treatment flow rate of 20L/s and an approximate budget price of $18500. This unit has a sediment capacity of 838L an oil capacity of 232L and a total holding capacity of 1590L. Attached you will find a copy of our CDS TSS calculations, sample drawing, O&M manual, and standard unit specification. Please let me know if you have any questions or comments!

Best regards,

Patrick Graham
Project Manager
ECHELON ENVIRONMENTAL
*****Please note our new addresses*****

Echelon Environmental Inc.
55 Albert Street
Suite 200
Markham, ON
L3P 2T4
Phone: 1-905-948-0000
Cell: 416-460-5819
Fax: 1-905-948-0577
email patrick@echelonenvironmental.ca

Mailing Address:
Echelon Environmental Inc.
5694 Hwy #7 East
Suite 354
Markham, ON
L3P 0E3

From: Leonel Perez <l.perez@novatech-eng.com>
Sent: Friday, December 13, 2024 2:28 PM
To: Patrick <patrick@echelonenvironmental.ca>
Subject: RE: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa

Good day Patrick,

We had to do some adjustments to the drainage areas.

The updated tributary area that needs treatment = 0.739 ha, and its respective Cw5=0.66.

Please let us know if the current unit suffices the requirement or if you recommend another unit.

We are looking to submit the report early next week, so we appreciate your quick response.

Thanks in advance,

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

From: Patrick <patrick@echelonenvironmental.ca>
Sent: Wednesday, July 17, 2024 4:05 PM
To: Chris Visser <c.visser@novatech-eng.com>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa

Hi Chris,

Updated design is attached. No change in our unit recommendation. Enjoy the rest of your day!

Best regards,

Patrick Graham
Project Manager
ECHELON ENVIRONMENTAL
*****Please note our new addresses*****

Echelon Environmental Inc.
55 Albert Street
Suite 200
Markham, ON
L3P 2T4
Phone: 1-905-948-0000
Cell: 416-460-5819
Fax: 1-905-948-0577
email patrick@echelonenvironmental.ca

Mailing Address:
Echelon Environmental Inc.
5694 Hwy #7 East

Suite 354
Markham, ON
L3P 0E3

From: Chris Visser <c.visser@novatech-eng.com>
Sent: Wednesday, July 17, 2024 3:17 PM
To: Patrick <patrick@echelonenvironmental.ca>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa

Patrick,

We are finalizing the report and noticed that the Cvalue for has changed from 0.59 to 0.66. All other number are the same.

Can you update the calculations based on this change. We are looking to submit the report tomorrow.

Thanks for your cooperation in the matter.

Chris Visser, Project Coordinator | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 245

From: Patrick <patrick@echelonenvironmental.ca>
Sent: Friday, July 5, 2024 8:24 AM
To: Chris Visser <c.visser@novatech-eng.com>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa

Good morning Chris,

Thank you for reaching out! For this site I recommend a CDS PMSU 2015_4 which has a budget price of $18,500. All requested information is noted below. If you have any questions please let me know!

- % of net annual TSS removal – 83.2%
- % of net annual treatment volume for the tributary area 98.1%
- The treatment capacity in L/s - 20L/s
- The sediment storage capacity in m3 0.838m3
- The oil storage capacity in L - 232 L
- The total unit storage capacity in L – 1590 L

Best regards,

Patrick Graham
Project Manager
ECHELON ENVIRONMENTAL

*****Please note our new addresses*****

Echelon Environmental Inc.
55 Albert Street
Suite 200
Markham, ON
L3P 2T4
Phone: 1-905-948-0000
Cell: 416-460-5819
Fax: 1-905-948-0577
email patrick@echelonenvironmental.ca

Mailing Address:
Echelon Environmental Inc.
5694 Hwy #7 East
Suite 354
Markham, ON
L3P 0E3

From: Chris Visser <c.visser@novatech-eng.com>
Sent: Thursday, July 4, 2024 10:17 AM
To: Patrick <patrick@echelonenvironmental.ca>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: CDS Sizing Request - 3459 & 3479 St. Joseph Boulevard Residential Development in Ottawa

Hi Patrick,

We are currently working on a project that requires a stormwater quality control unit to treat water from the top of the parking garage and landscaped areas.
The project proposes to develop 4 residential buildings and is located at 3459 & 3479 St. Joseph Boulevard in the City of Ottawa.
The project details are as follows:

Tributary area = 0.645 ha
Imperviousness = 66% or Cw5=0.59
Time of concentration = 10min
IDF Curve = City of Ottawa (104.2mm/hr Intensity for 5yr) (178.6mm/hr Intensity for 100yr)

We have a requirement to provide a level of quality control treatment to meet the MOE 'Enhanced' Level of Protection guidelines (i.e. 80% TSS removal and 90% of annual runoff treated). The proposed unit will be installed on a new 250mm dia. PVC outlet pipe with one 250mm dia. PVC inlet pipes (see attached SWM drawing for more information). A standard particle distribution (Fines) should be adequate for the design. Anticipated peak flows should be in the order of 29.0 L/s based on the City's requirement to control the site to a predevelopment level of the 5-yr allowable to the municipal sewer. See attached mark-up the proposed site servicing plan for a sketch of the area and proposed water quality treatment unit location (highlighted in yellow).

Can you please size a EFO unit for us and provide the design details as well as an approximate cost estimate.

We will also need the following information on the unit for our SWM Report:
- % of net annual TSS removal
- % of net annual treatment volume for the tributary area
- The treatment capacity in L/s
- The sediment storage capacity in m3

- The oil storage capacity in L
- The total unit storage capacity in L

Thank you for your time and consideration in this matter. We are looking to submit to the city at the end of next week, if you could get us something by then, it would be greatly appreciated.
If there is any further information you require, please do not hesitate to call.

Chris Visser, Project Coordinator|Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext: 245

CDS ESTIMATED NET ANNUAL TSS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
AND A FINE PARTICLE SIZE DISTRIBUTION

Echelon Environmental
55 Albert Street, Suite #200 | Markham, ON, L3P 2T4
www.echelonenvironmental.ca info@echelonenvironmental.ca 905-948-0000

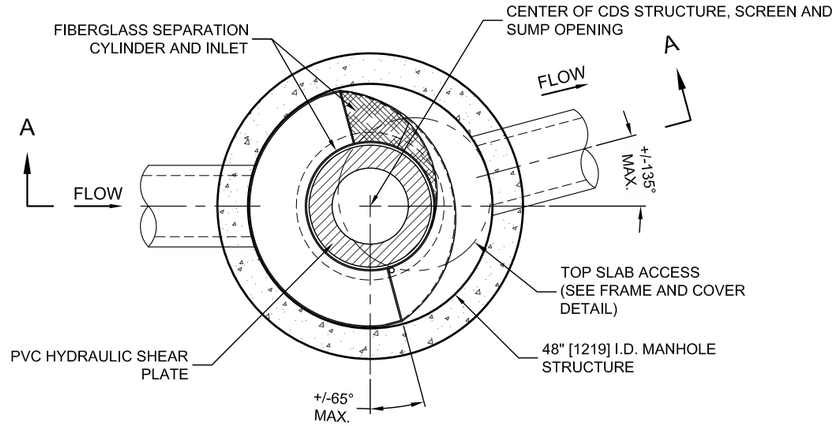
Project Name:	3459-3479 St. Joseph Blvd	**Engineer:**	**Novatech**
Location:	Ottawa, ON	**Contact:**	Leonel Perez
OGS ID:	1	**Report Date:**	16-Dec-24

Area:	0.739	ha	**Rainfall Station #**	215	
C Value:	0.66		**Particle Size Distribution**	FINE	
CDS Model:	PMSU2015-4		**CDS Treatment Capacity:**	20	l/s

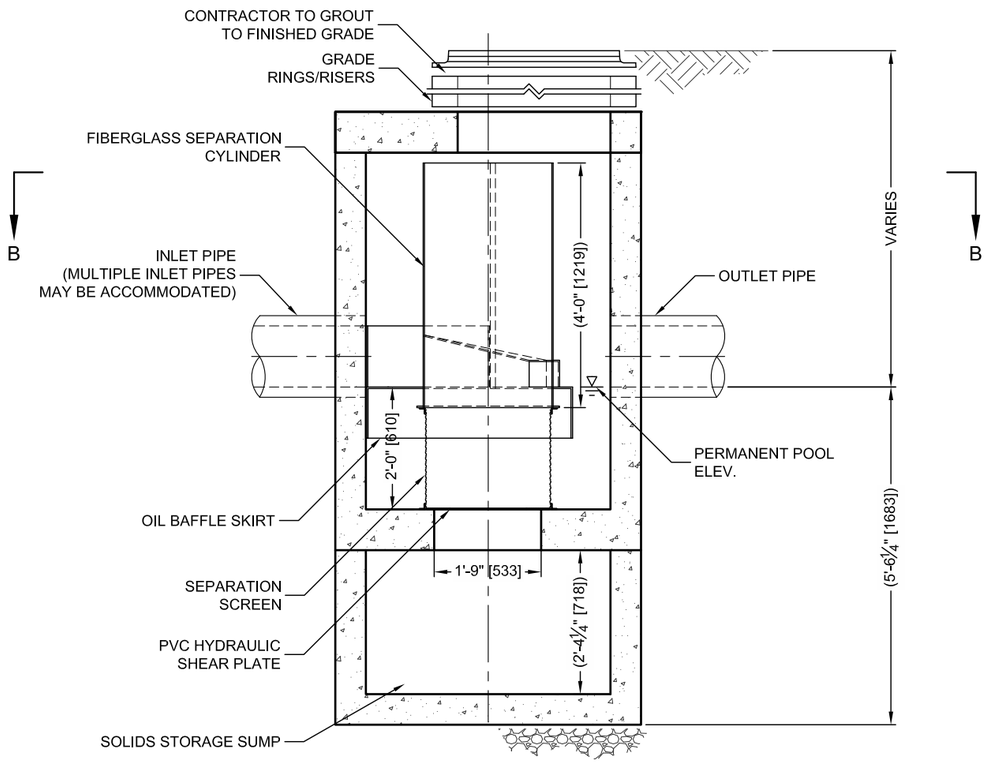
Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.5	9.2%	9.2%	0.7	0.7	3.4	97.9	9.0
1.0	10.6%	19.8%	1.4	1.4	6.8	96.9	10.3
1.5	9.9%	29.7%	2.0	2.0	10.3	95.9	9.5
2.0	8.4%	38.1%	2.7	2.7	13.7	94.9	8.0
2.5	7.7%	45.8%	3.4	3.4	17.1	94.0	7.2
3.0	5.9%	51.7%	4.1	4.1	20.5	93.0	5.5
3.5	4.4%	56.1%	4.7	4.7	23.9	92.0	4.0
4.0	4.7%	60.7%	5.4	5.4	27.4	91.0	4.2
4.5	3.3%	64.0%	6.1	6.1	30.8	90.0	3.0
5.0	3.0%	67.1%	6.8	6.8	34.2	89.1	2.7
6.0	5.4%	72.4%	8.1	8.1	41.0	87.1	4.7
7.0	4.4%	76.8%	9.5	9.5	47.9	85.1	3.7
8.0	3.5%	80.3%	10.8	10.8	54.7	83.2	2.9
9.0	2.8%	83.2%	12.2	12.2	61.6	81.2	2.3
10.0	2.2%	85.3%	13.6	13.6	68.4	79.3	1.7
15.0	7.0%	92.3%	20.3	19.8	100.0	68.4	4.8
20.0	4.5%	96.9%	27.1	19.8	100.0	51.3	2.3
25.0	1.4%	98.3%	33.9	19.8	100.0	41.0	0.6
30.0	0.7%	99.0%	40.7	19.8	100.0	34.2	0.2
35.0	0.5%	99.5%	47.5	19.8	100.0	29.3	0.1
40.0	0.5%	100.0%	54.2	19.8	100.0	25.7	0.1
45.0	0.0%	100.0%	61.0	19.8	100.0	22.8	0.0
50.0	0.0%	100.0%	67.8	19.8	100.0	20.5	0.0

Removal Efficiency Adjustment[2] = 6.5%
Predicted Net Annual TSS Removal Efficiency = 80.5%
Predicted Annual Rainfall Treated = 96.6%

1 - Based on 42 years of hourly rainfall data from Canadian Station 6105976, Ottawa ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications



PLAN VIEW B-B
N.T.S.



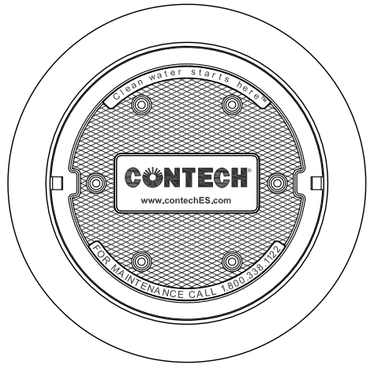
ELEVATION A-A
N.T.S.

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 8,511,500; 8,581,783; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CDS PMSU2015-4-C DESIGN NOTES

THE STANDARD CDS PMSU2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
CUSTOMIZABLE SUMP DEPTH AVAILABLE
ANTI-FLOTATION DESIGN AVAILABLE UPON REQUEST



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (2400 OR 4700)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS PMSU2015-4-C INLINE CDS STANDARD DETAIL

INFORMATION SUPERSEDED

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name: 3459 & 3479 St. Joseph Boulevard
Location: Ottawa, ON
OGS #: 1

Engineer: NOVATECH
Contact: Chris Visser
Report Date: 17-Jul-24

Area	0.645	ha	**Rainfall Station #**	215	
Weighted C	0.66		**Particle Size Distribution**	FINE	
CDS Model	2015-4		**CDS Treatment Capacity**	20	l/s

Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	10.6%	19.8%	1.2	1.2	6.0	97.1	10.3
1.5	9.9%	29.7%	1.8	1.8	9.0	96.3	9.5
2.0	8.4%	38.1%	2.4	2.4	11.9	95.4	8.0
2.5	7.7%	45.8%	3.0	3.0	14.9	94.6	7.3
3.0	5.9%	51.7%	3.6	3.6	17.9	93.7	5.6
3.5	4.4%	56.1%	4.1	4.1	20.9	92.9	4.0
4.0	4.7%	60.7%	4.7	4.7	23.9	92.0	4.3
4.5	3.3%	64.0%	5.3	5.3	26.9	91.2	3.0
5.0	3.0%	67.1%	5.9	5.9	29.8	90.3	2.7
6.0	5.4%	72.4%	7.1	7.1	35.8	88.6	4.8
7.0	4.4%	76.8%	8.3	8.3	41.8	86.9	3.8
8.0	3.5%	80.3%	9.5	9.5	47.8	85.2	3.0
9.0	2.8%	83.2%	10.7	10.7	53.7	83.5	2.4
10.0	2.2%	85.3%	11.8	11.8	59.7	81.7	1.8
15.0	7.0%	92.3%	17.8	17.8	89.5	73.2	5.1
20.0	4.5%	96.9%	23.7	19.8	100.0	58.8	2.7
25.0	1.4%	98.3%	29.6	19.8	100.0	47.0	0.7
30.0	0.7%	99.0%	35.5	19.8	100.0	39.2	0.3
35.0	0.5%	99.5%	41.4	19.8	100.0	33.6	0.2
40.0	0.5%	100.0%	47.3	19.8	100.0	29.4	0.2
45.0	0.0%	100.0%	53.3	19.8	100.0	26.1	0.0
50.0	0.0%	100.0%	59.2	19.8	100.0	23.5	0.0
							88.5

Removal Efficiency Adjustment[2] = 6.5%
Predicted Net Annual Load Removal Efficiency = 82.0%
Predicted Annual Rainfall Treated = 97.5%

1 - Based on 42 years of hourly rainfall data from Canadian Station 6105976, Ottawa ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

INFORMATION SUPERSEDED

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
BASED ON A FINE PARTICLE SIZE DISTRIBUTION

Project Name: 3459 & 3479 St. Joseph Boulevard
Location: Ottawa, ON
OGS #: 1

Engineer: NOVATECH
Contact: Chris Visser
Report Date: 5-Jul-24

Area 0.645 ha
Weighted C 0.59
CDS Model 2015-4

Rainfall Station # 215
Particle Size Distribution FINE
CDS Treatment Capacity 20 l/s

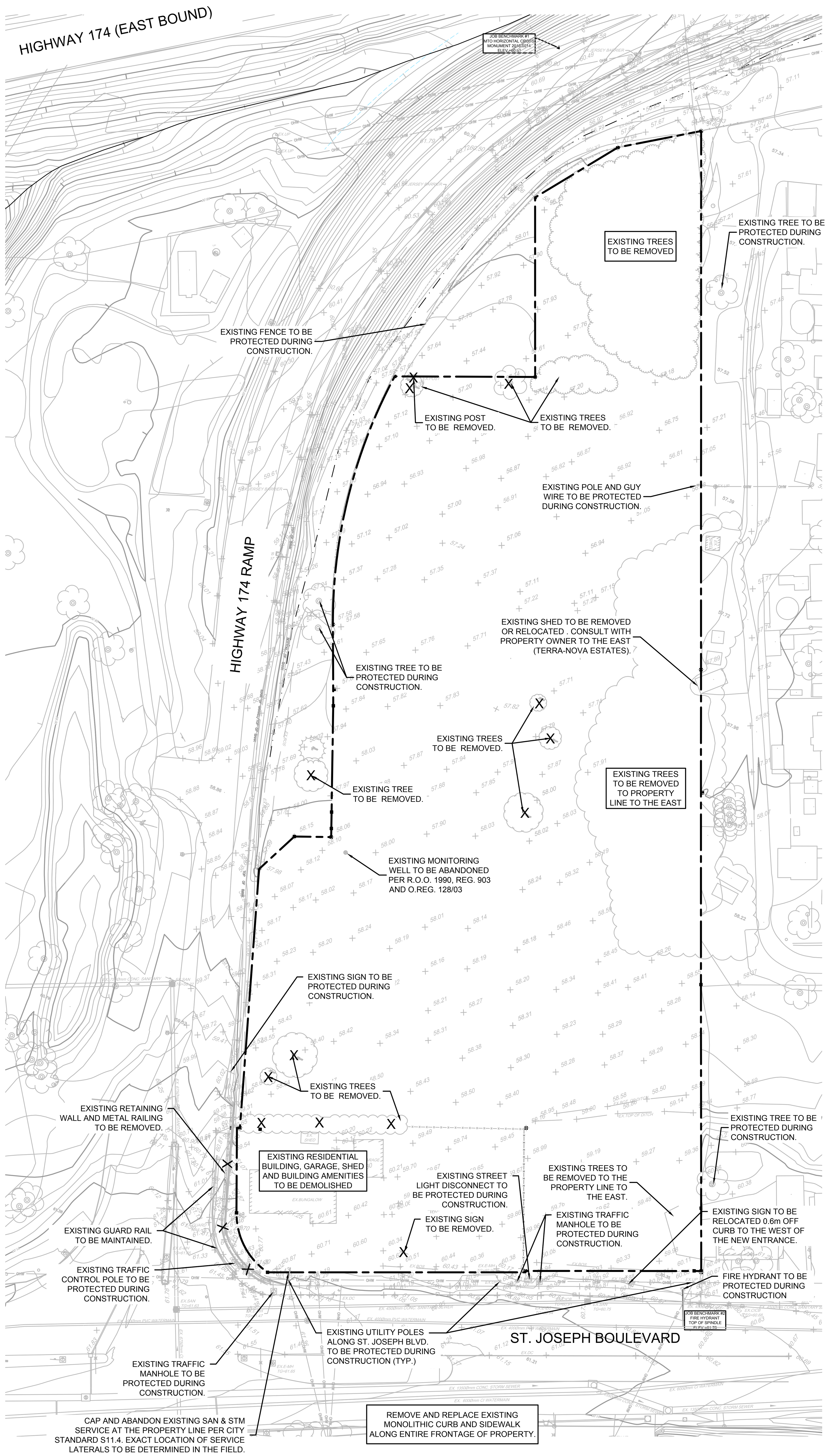
Rainfall Intensity[1] (mm/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (l/s)	Treated Flowrate (l/s)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
1.0	10.6%	19.8%	1.1	1.1	5.3	97.3	10.3
1.5	9.9%	29.7%	1.6	1.6	8.0	96.6	9.6
2.0	8.4%	38.1%	2.1	2.1	10.7	95.8	8.0
2.5	7.7%	45.8%	2.6	2.6	13.3	95.0	7.3
3.0	5.9%	51.7%	3.2	3.2	16.0	94.3	5.6
3.5	4.4%	56.1%	3.7	3.7	18.7	93.5	4.1
4.0	4.7%	60.7%	4.2	4.2	21.3	92.7	4.3
4.5	3.3%	64.0%	4.8	4.8	24.0	92.0	3.1
5.0	3.0%	67.1%	5.3	5.3	26.7	91.2	2.8
6.0	5.4%	72.4%	6.3	6.3	32.0	89.7	4.8
7.0	4.4%	76.8%	7.4	7.4	37.4	88.1	3.8
8.0	3.5%	80.3%	8.5	8.5	42.7	86.6	3.1
9.0	2.8%	83.2%	9.5	9.5	48.0	85.1	2.4
10.0	2.2%	85.3%	10.6	10.6	53.4	83.6	1.8
15.0	7.0%	92.3%	15.9	15.9	80.0	75.9	5.3
20.0	4.5%	96.9%	21.2	19.8	100.0	65.8	3.0
25.0	1.4%	98.3%	26.4	19.8	100.0	52.6	0.8
30.0	0.7%	99.0%	31.7	19.8	100.0	43.8	0.3
35.0	0.5%	99.5%	37.0	19.8	100.0	37.6	0.2
40.0	0.5%	100.0%	42.3	19.8	100.0	32.9	0.2
45.0	0.0%	100.0%	47.6	19.8	100.0	29.2	0.0
50.0	0.0%	100.0%	52.9	19.8	100.0	26.3	0.0
							89.7

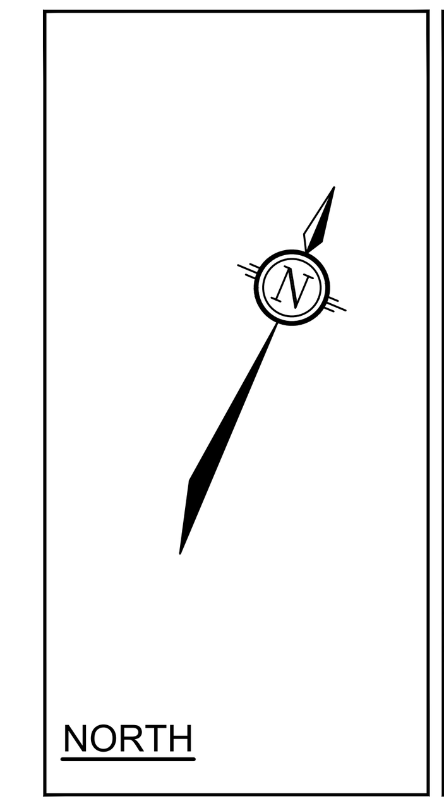
Removal Efficiency Adjustment[2] = 6.5%
Predicted Net Annual Load Removal Efficiency = 83.2%
Predicted Annual Rainfall Treated = 98.1%

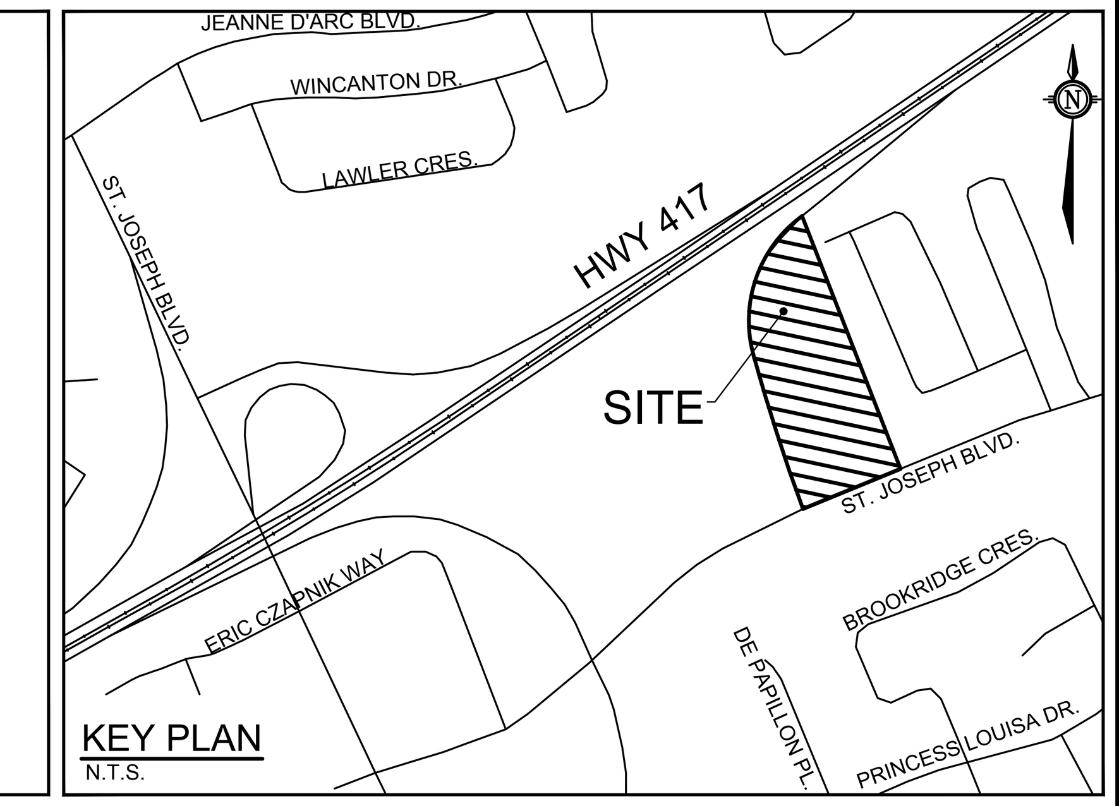
1 - Based on 42 years of hourly rainfall data from Canadian Station 6105976, Ottawa ON
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.
3 - CDS Efficiency based on testing conducted at the University of Central Florida
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

APPENDIX H

Engineering Drawings







LEGEND

Symbol	Description
X	REMOVALS
	EXISTING CONCRETE CURB
V&VB	EXISTING VALVE & VALVE BOX
SP	EXISTING SERVICE POST
HYD	EXISTING HYDRANT
CBMH	EXISTING CATCHBASIN
CB	EXISTING CATCHBASIN MH
EX UP	EXISTING UTILITY POLE C/W GUY WIRES
	EXISTING TREES / VEGETATION

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. ALL ELEVATIONS ARE GEODETIC.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ONPLAN OF SURVEY PART OF LOT 33, CONCESSION 1 (OLD SURVEY) GEOGRAPHIC TOWNSHIP OF CUMBERLAND, CITY OF OTTAWA, SURVEYED BY STANTEC GEOMATICS LTD.

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

OWNER INFORMATION
8417709 CANADA INC.
430 boulevard de l'hôpital, Suite 310
Gatineau, QC J8V 1T7
NAME: PAUL-ANDRÉ CHARBONNEAU
PHONE: (819) 955-8032

EMAIL: paul-andre@chartro.ca

No.	REVISION	DATE	BY
1.	ISSUED FOR SPC APPLICATION	JUL 19/24	FST

SCALE 1:600

DESIGN	CV
CHECKED	FST
DRAWN	CV
CHECKED	FST
APPROVED	FST

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
July 19, 2024
PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
EXISTING CONDITIONS AND REMOVALS PLAN

PROJECT No. 113020-00
REV REV # 1
DRAWING No. 113020-REM

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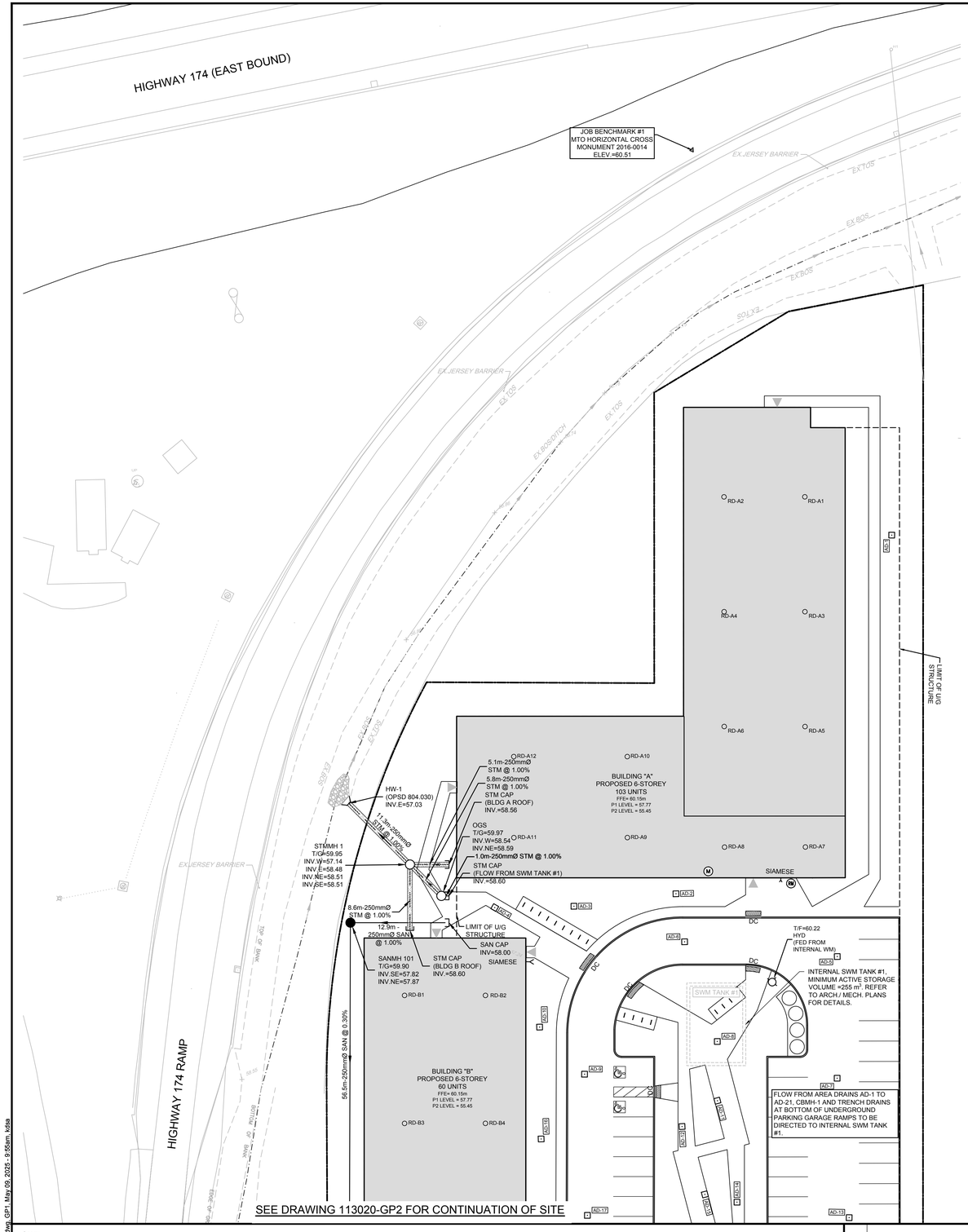
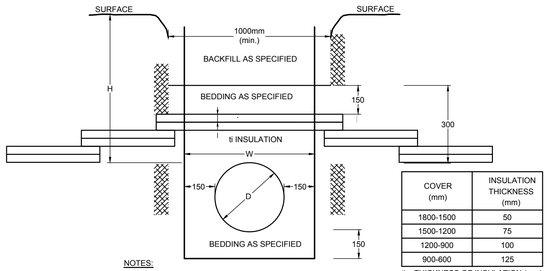


SEE DRAWING 113020-GP2 FOR CONTINUATION OF SITE

LEGEND

- PROPERTY LINE
- PROPOSED SANITARY SERVICE
- PROPOSED STORM SERVICE
- AD-1 — PROPOSED AREA DECK DRAIN
- M / RM — PROPOSED WATER METER AND REMOTE METER
- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- 150mmØ — PROPOSED WATER SERVICE AND DIAMETER
- VB — PROPOSED VALVE & VALVE BOX
- PROPOSED CAP
- PROPOSED BUILDING ENTRANCE
- X — REMOVALS
- THERMAL INSULATION FOR SHALLOW SEWERS AND WATERMAIN CROSSINGS
- RAISED PLANTER BED
- RIP RAP AS PER OPSD

- OHW — EXISTING OVERHEAD WIRES
- EXISTING CONCRETE CURB
- SAMMH — EXISTING SANITARY MANHOLE & SEWER
- CBMH — EXISTING CATCHBASIN MANHOLE
- STMMH — EXISTING STORM MANHOLE & SEWER
- CB — EXISTING CATCHBASIN C/W CATCHBASIN LEAD
- HYD / VAV/B — EXISTING HYDRANT & VALVE
- EXISTING TREES / VEGETATION
- EX.UP — EXISTING UTILITY POLE
- EXISTING FENCE
- 300mmØ WM — EXISTING WATERMAIN
- HYD — EXISTING HYDRANT C/W VALVE & LEAD
- FFE — FINISHED FLOOR ELEVATION
- P1 LEVEL — PARKING GARAGE LEVEL ELEVATION
- RAMP TO UNDERGROUND PARKING



NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 1.8m COVER WITH EXPANDED POLYSTYRENE INSULATION AS SHOWN.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER (SEE TABLE)

COVER (mm)	INSULATION THICKNESS (mm)
1800-1500	50
1500-1200	75
1200-900	100
900-600	125

ti = THICKNESS OF INSULATION (mm)
h = DEPTH OF COVER
W = D + 300 (1000 min.)
W = WIDTH OF INSULATION (mm)
D = O.D OF PIPE (mm)

PROPOSED STEPPED INSULATION DETAIL FOR SHALLOW SEWERS ONLY

NOT TO SCALE

INTERNAL SWM STORAGE TANK #1 SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES REQUIRED	STORAGE VOLUMES PROVIDED
1:2 YR	15.8 L/s	69.8 m³	>255 m³
1:5 YR		106.8 m³	
1:100 YR		254.6 m³	
1:100+20%		322.7 m³	

NOTES:

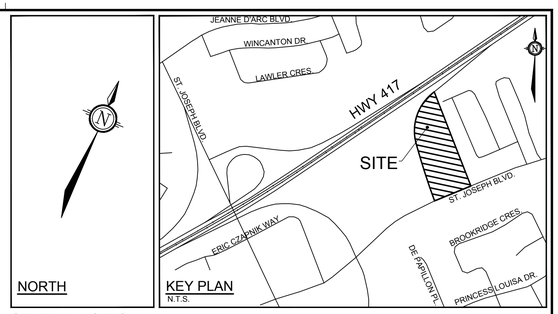
1. ALL DRAINAGE FROM AREA A-5 TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

ROOF DRAIN TABLE

AREA ID *	BUILDING	ROOF DRAIN No. (WATTS MODEL)**	ROOF DRAIN OPENING SETTING	2 YEAR RELEASE RATE	APPROX. 2-YR PONDING DEPTH	5-YEAR RELEASE RATE	APPROX. 5-YEAR PONDING DEPTH	100-YEAR RELEASE RATE	APPROX. 100-YR PONDING DEPTH
A-3	A	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 7 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 8 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 9 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 10 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 11 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 12 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
A-4	B	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 2 (RD-100-A-ADJ)	**CLOSED**	**0.32 L/s**	9 cm	**0.32 L/s**	10 cm	**0.32 L/s**	12 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
B-2	C	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 2 (RD-100-A-ADJ)	**CLOSED**	**0.32 L/s**	9 cm	**0.32 L/s**	10 cm	**0.32 L/s**	12 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
B-3	D	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 7 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 8 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 9 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 10 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 11 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 12 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-086) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.

**ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDING TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.



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 MUNICIPAL AUTHORITIES AND OWNER.
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 (REF.NO. PG5091-1, REVISION 1, DATED NOVEMBER 6, 2019, AND TREE PLANTING SETBACK RECOMMENDATIONS (REF.NO. PG5091-MEMO-01), PREPARED BY PATERSON GROUP INC. 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 SURFACED AREAS AND DIMENSIONS.
10. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-086) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL 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, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
13. PROVIDE LINE/PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

SEWER NOTES:

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

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600X600MM)	705.010	OPSD
STORM / SANITARY MANHOLE (1200MMØ)	701.010	OPSD
CB. FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
WATERTIGHT MH FRAME AND COVER	401.030	OPSD
SEWER TRENCH	S6	CITY OF OTTAWA
EXTERIOR MECHANICAL AREA DECK DRAIN	FD-490-F-4 (OR APPROVED EQUIVALENT)	WATTS CANADA
STORM SEWER	PVC DR 35, CONC. (> 450mmØ)	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	

3. THE SANITARY SERVICE LATERAL SHALL BE EQUIPPED WITH BACKFLOW PREVENTERS WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
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. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
6. 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.
7. FOR ON-SITE SEWERS, INSULATE ALL PIPES (SAN / STM) THAT HAVE LESS THAN 1.5m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION. FOR OFF-SITE SEWERS, INSULATE ALL PIPES (SAN / STM) THAT HAVE LESS THAN 1.8m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150MM CLEARANCE BETWEEN PIPE AND INSULATION.
8. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
9. TYPICAL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
10. THE CONTRACTOR IS TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES. PROVIDE A COPY OF ALL CCTV INSPECTION REPORTS TO THE ENGINEER FOR REVIEW.
11. 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.
12. 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 MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
FIRE HYDRANT INSTALLATION	W19	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
INSULATION ADJACENT TO OPEN STRUCTURES	W23	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN	PVC DR 18	
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING ABOVE SEWER	W25.2	CITY OF OTTAWA

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.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ONPLAN OF SURVEY PART OF LOT 33, CONCESSION 1 (OLD SURVEY) GEOGRAPHIC TOWNSHIP OF CUMBERLAND, CITY OF OTTAWA, SURVEYED BY STANTEC GEOMATICS LTD.

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

OWNER INFORMATION
8417709 CANADA INC.
430 boulevard de l'hôpital, Suite 310
Gatineau, QC J8V 1T7
NAME: PAUL-ANDRÉ CHARBONNEAU
PHONE: (819) 955-8032

EMAIL: paul-andre@chartro.ca

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	MAY 09/25	FST
2.	REVISED PER CITY COMMENTS	DEC 23/24	FST
1.	ISSUED FOR SPC APPLICATION	JUL 19/24	FST

SCALE 1:300

1:300
0 3 6 9 12

DESIGN CV
CHECKED FST
DRAWN CV
CHECKED FST
APPROVED FST

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
Daniel Thauvette
F.S. THAUVETTE
100041399
May 09, 2025
PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 113020-00
REV REV # 3
DRAWING No. 113020-GP1

PLAN NBR # 19167

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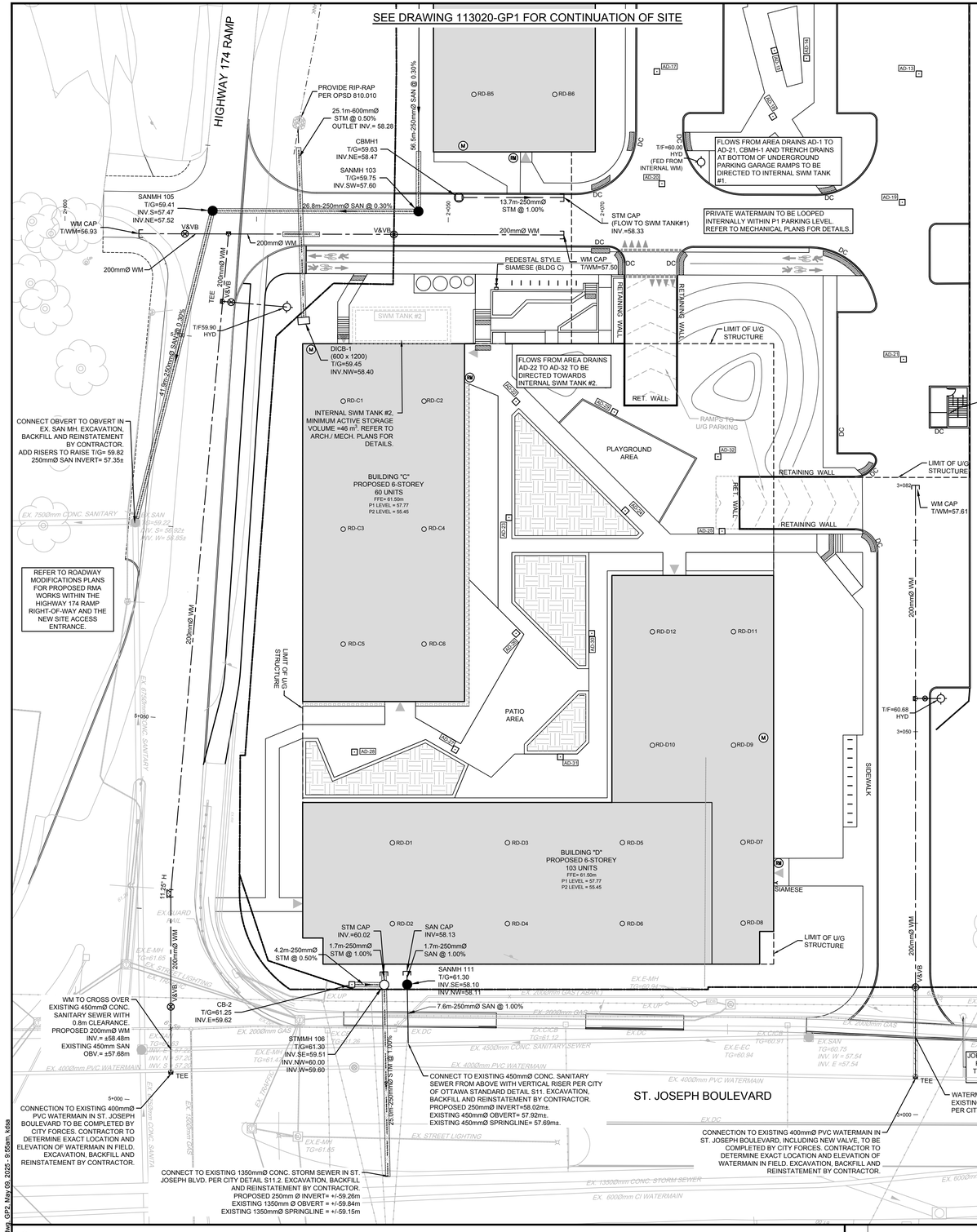

LEGEND

━ ━ ━	PROPERTY LINE
──►	PROPOSED SANITARY SERVICE
- - ► - -	PROPOSED STORM SERVICE
⊡ AD-1	PROPOSED AREA DECK DRAIN
Ⓜ RM	PROPOSED WATER METER AND REMOTE METER
═	PROPOSED BARRIER CURB
DC	PROPOSED DEPRESSED CURB
150mmØ	PROPOSED WATER SERVICE AND DIAMETER
VB	PROPOSED VALVE & VALVE BOX
[	PROPOSED CAP
▼	PROPOSED BUILDING ENTRANCE
X	REMOVALS
▨	THERMAL INSULATION FOR SHALLOW SEWERS AND WATERMAIN CROSSINGS
▦	RAISED PLANTER BED
●	RIP RAP AS PER OPSD 801.010
▦	CLEAR STONE
— 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*
─x─x─x─	*EXISTING FENCE*
300mmØ WM	*EXISTING WATERMAIN*
HYD ⊕──⊗	*EXISTING HYDRANT C/W VALVE & LEAD*
FFE	FINISHED FLOOR ELEVATION
P1 LEVEL	PARKING GARAGE LEVEL ELEVATION
⋙	RAMP TO UNDERGROUND PARKING

PROPOSED 200mmØ WATER SERVICE TABLE

Station	F/G ELEVATION	TOP OF WATERMAIN	DESCRIPTION
5+003.93	61.60	✱ 58.68	200mmØ WM CONNECTION TEE TO EX. 400mmØ PVC WM
5+006.89	61.59	58.68	WATERMAIN OVER EX. 450mmØ SAN. SEWER (±0.8m CLEARANCE)
5+009.61	61.58	58.67	WATERMAIN UNDER EX. 200mmØ GAS LINE (±1.2m CLEARANCE)
5+012.42	61.55	58.67	200mmØ VALVE AND VALVE BOX
5+015.98	61.48	58.67	WATERMAIN UNDER STREET LIGHT DUCT (±1.4m CLEARANCE)
5+027.19	61.18	58.66	11.25° HORIZONTAL BEND
5+050.00	60.33	57.91	—
5+075.00	59.89	57.43	—
5+104.90	59.52	57.07	TEE CONNECTION FOR FIRE HYDRANT
5+113.75	59.41	56.96	TEE CONNECTION FOR 200mmØ WATERMAIN

PROPOSED 200mmØ WATER SERVICE TABLE

Station	F/G ELEVATION	TOP OF WATERMAIN	DESCRIPTION
2+009.65	59.48	56.93	CAP FOR FUTURE EXTENSION TO THE WEST
2+014.39	59.47	56.94	200mmØ VALVE AND VALVE BOX
2+015.65	59.47	56.94	WATERMAIN UNDER PROPOSED 250mmØ SAN. SEWER (±0.5m CLEARANCE)
2+017.24	59.41	56.96	TEE CONNECTION FOR 200mmØ WATERMAIN
2+030.82	59.64	✱✱ 57.08	WATERMAIN UNDER PROPOSED 600mmØ CULVERT (±1.2m CLEARANCE)
2+042.92	59.83	57.23	200mmØ VALVE AND VALVE BOX
2+065.09	59.90	57.50	CAP 1.0m FROM FOUNDATION WALL

PROPOSED 200mmØ WATER SERVICE TABLE

Station	F/G ELEVATION	TOP OF WATERMAIN	DESCRIPTION
3+005.00	60.75	✱ ✱✱ 58.35	200mmØ WM CONNECTION TO EX. 400mmØ PVC WM
3+006.20	60.73	✱✱ 58.35	11.25° VERTICAL BEND
3+008.70	60.69	✱✱ 58.78	11.25° VERTICAL BEND
3+009.95	60.66	✱✱ 58.78	WATERMAIN CROSSING OVER EX. 450mmØ CONC. SAN (±0.5m CLEARANCE)
3+011.20	60.69	✱✱ 58.78	11.25° VERTICAL BEND
3+011.97	60.70	✱✱ 58.66	WATERMAIN UNDER EX. GAS LINE (±1.1m CLEARANCE)
3+012.60	60.72	✱✱ 58.56	11.25° VERTICAL BEND
3+015.44	60.79	✱✱ 58.54	WATERMAIN CROSSING UNDER ABANDONED GASLINE (±0.9m CLEARANCE)
3+016.64	60.82	58.54	200mmØ VALVE AND VALVE BOX
3+030.00	60.77	58.47	—
3+054.34	60.34	57.93	TEE CONNECTION FOR FIRE HYDRANT
3+080.00	60.03	57.63	—
3+082.16	60.01	57.61	CAP 1.0m FROM FOUNDATION WALL

✱ CONNECTIONS TO EXISTING 400mmØ PVC. EXACT ELEVATIONS TO BE FIELD DETERMINED.

✱✱ PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 IN SHALLOW TRENCHES AND/OR CITY OF OTTAWA DETAIL W23 ADJACENT TO OPEN STRUCTURES.

INTERNAL SWM STORAGE TANK #2 SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	3.8 L/s	11.8 m³	>46 m³
1:5 YR		18.3 m³	
1:100 YR		45.9 m³	
1:100+20%		58.5 m³	

NOTES:

1. ALL DRAINAGE FROM AREA B-4 TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

NORTH

KEY PLAN
N.T.S.

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
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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 MUNICIPAL AUTHORITIES AND OWNER.
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.
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9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
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13. PROVIDE LINE/PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
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9. TYPICAL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
10. THE CONTRACTOR IS TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES. PROVIDE A COPY OF ALL CCTV INSPECTION REPORTS TO THE ENGINEER FOR REVIEW.
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WATERMAIN NOTES:

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

ITEM	SPEC. No.	REFERENCE
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INSULATION ADJACENT TO OPEN STRUCTURES	W23	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN	PVC DR 18	
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING ABOVE SEWER	W25.2	CITY OF OTTAWA

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.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ONPLAN OF SURVEY PART OF LOT 33, CONCESSION 1 (OLD SURVEY) GEOGRAPHIC TOWNSHIP OF CUMBERLAND, CITY OF OTTAWA, SURVEYED BY STANTEC GEOMATICS LTD.

NOTE:
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OWNER INFORMATION
8417709 CANADA INC.
430 boulevard de l'hôpital, Suite 310
Gatineau, QC J8V 1T7
NAME: PAUL-ANDRÉ CHARBONNEAU
PHONE: (819) 955-8032

EMAIL: paul-andre@chartro.ca

No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	MAY 09/25	FST
2.	REVISED PER CITY COMMENTS	DEC 23/24	FST
1.	ISSUED FOR SPC APPLICATION	JUL 19/24	FST

SCALE
1:300

1:300
0 3 6 9 12

DESIGN	CV/LP
CHECKED	FST
DRAWN	CV/LP
CHECKED	FST
APPROVED	FST

FOR REVIEW ONLY

F.S. THAUVETTE
100041399
May 09, 2025

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

LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 113020-00
REV: REV # 3
DRAWING No. 113020-GP2

D07-12-24-0069

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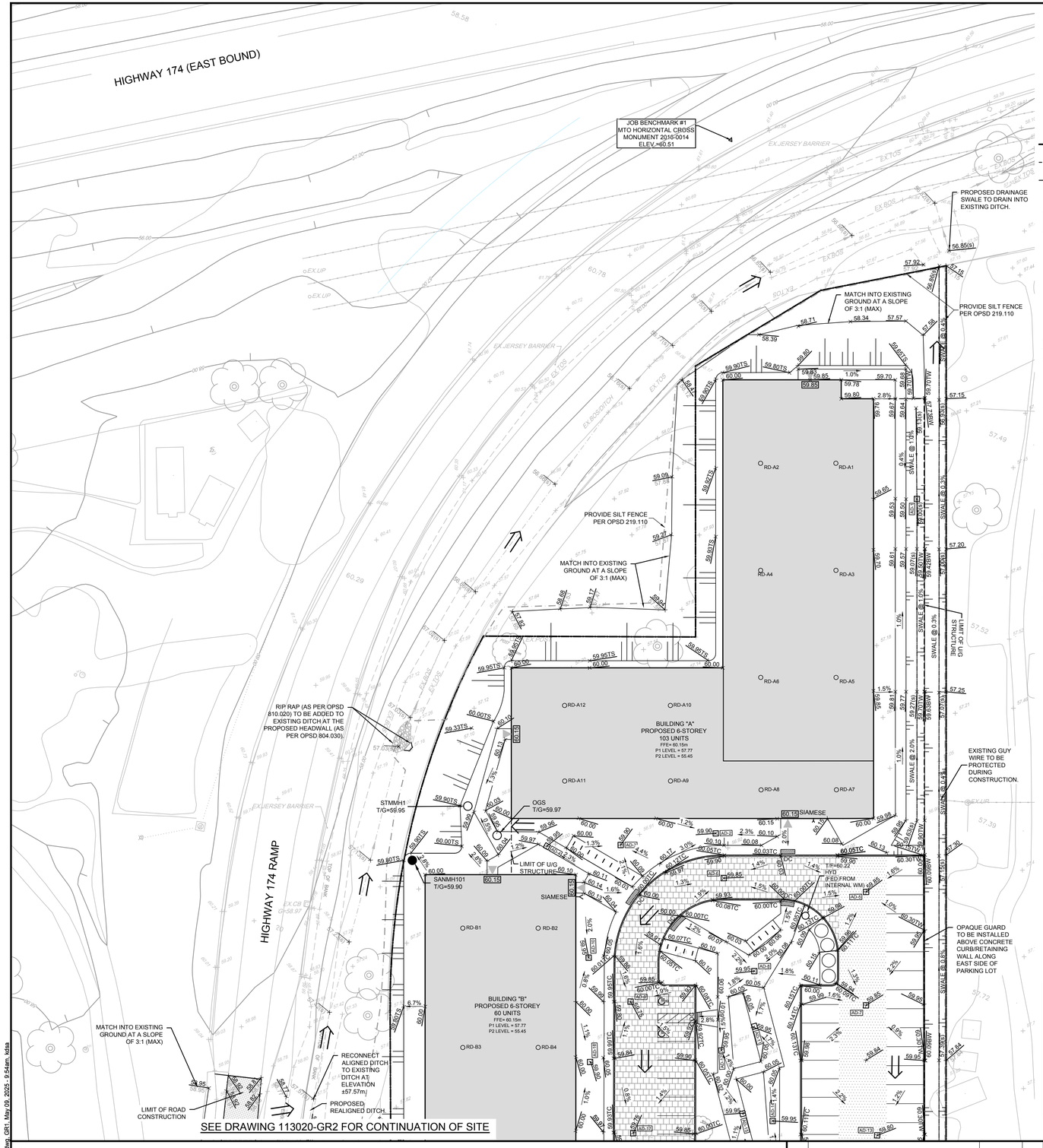
PLAN NBR # 19167



LEGEND

70.05	PROPOSED ELEVATION		EXISTING CONCRETE CURB
69.90	EXISTING ELEVATION	VALVE	EXISTING VALVE & VALVE BOX
2.0%	GRADE AND DIRECTION	SP	EXISTING SERVICE POST
	MAXIMUM 3:1 SIDESLOPE	HYD	EXISTING HYDRANT
AD-29	PROPOSED MECHANICAL AREA DRAIN	COMB MH	EXISTING COMBINED MH
DD-29	PROPOSED PLANTER DECK DRAIN	CBMH	EXISTING CATCHBASIN
	DIRECTION OF MAJOR SYSTEM OVERLAND FLOW	CB	EXISTING CATCHBASIN MH
	PROPERTY LINE	EX UP	EXISTING UTILITY POLE C/W GUY WIRES
	UNDERGROUND STRUCTURE		EXISTING FENCE
	BUILDING ABOVE	O/H WIRES	EXISTING OVERHEAD WIRES
	BUILDING ENTRANCE / EXIT	FFE	FINISHED FLOOR ELEVATION
	RAISED PLANTER BED	P1 LEVEL	PARKING GARAGE LEVEL ELEVATION
	RIP RAP AS PER OPSD 801.010	USF	UNDERSIDE OF FOOTING ELEVATION

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. 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. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY SURFACE CATCHBASINS AND MANHOLE STRUCTURES. TERRAFIX 8" ULTRA SILT SOCK (FILTER SOCK) IS TO BE USED AT THE OPENING OF ALL CURB INLET CATACHBASINS. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED (PER OPSD 219.110) AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE). IN AREAS WHERE SILT FENCING CANNOT BE INSTALLED PER OPSD 219.110 (i.e. HARD SURFACES), A FILTER SOCK SHALL BE SUBSTITUTED. THESE CONTROL MEASURES WILL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
4. 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.
5. 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.
6. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
7. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR MUNICIPALITY.
8. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ONPLAN OF SURVEY PART OF LOT 33, CONCESSION 1 (OLD SURVEY) GEOGRAPHIC TOWNSHIP OF CUMBERLAND, CITY OF OTTAWA, SURVEYED BY STANTEC GEOMATICS LTD.

PAVEMENT STRUCTURE:

LIGHT DUTY PAVEMENT (CAR ONLY PARKING AREAS)
50mm HL3 or SUPERPAVE 12.5
150mm GRANULAR "A" CRUSHED STONE
300mm GRANULAR "B" TYPE II

HEAVY DUTY PAVEMENT
(ACCESS LANES AND HEAVY TRUCK PARKING AREAS)
40mm HL3 or SUPERPAVE 12.5
50mm HL8 or SUPERPAVE 19.0
150mm GRANULAR "A" CRUSHED STONE
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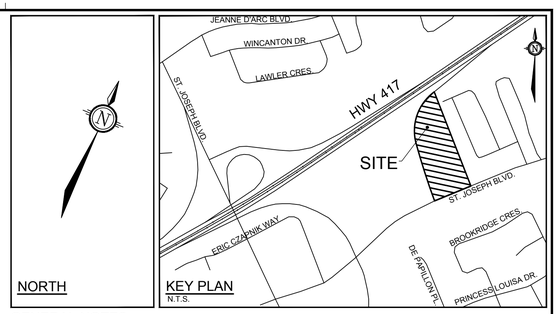

GENERAL NOTES:

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 MUNICIPAL AUTHORITIES.
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 (Ref.No. PG5091-1, REVISION 1, DATED NOVEMBER 6, 2019, AND TREE PLANTING SETBACK RECOMMENDATIONS (Ref.No. PG5091-MEMO-01) PREPARED BY PATERSON GROUP INC. 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 SURFACED AREAS AND DIMENSIONS.
10. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-086) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).PROVIDE LINE/PARKING PAINTING.
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL 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, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

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 99% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% 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. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
10. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING THE AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

Erosion and Sediment Control Responsibilities:

	ESC Measure	Symbol	Specification	During Construction: Installation Responsibility	During Construction: Inspection/Maintenance Responsibility	During Construction: Inspection Frequency	After Construction Prior to Final Acceptance: Approval to Remove	After Construction Prior to Final Acceptance: Removal Responsibility	After Final Acceptance: 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 On Plans	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Mud Mat	M M	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Dust Control	Location as Required 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

NOTE:
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SCALE
1:300
1:300
0 3 6 9 12

DESIGN CV
CHECKED FST
DRAWN CV
CHECKED FST
APPROVED FST

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041599
May 09, 2025
PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 113020-00
REV REV # 3
DRAWING No. 113020-GR1

D07-12-24-0069

PLAN NBR # 19167

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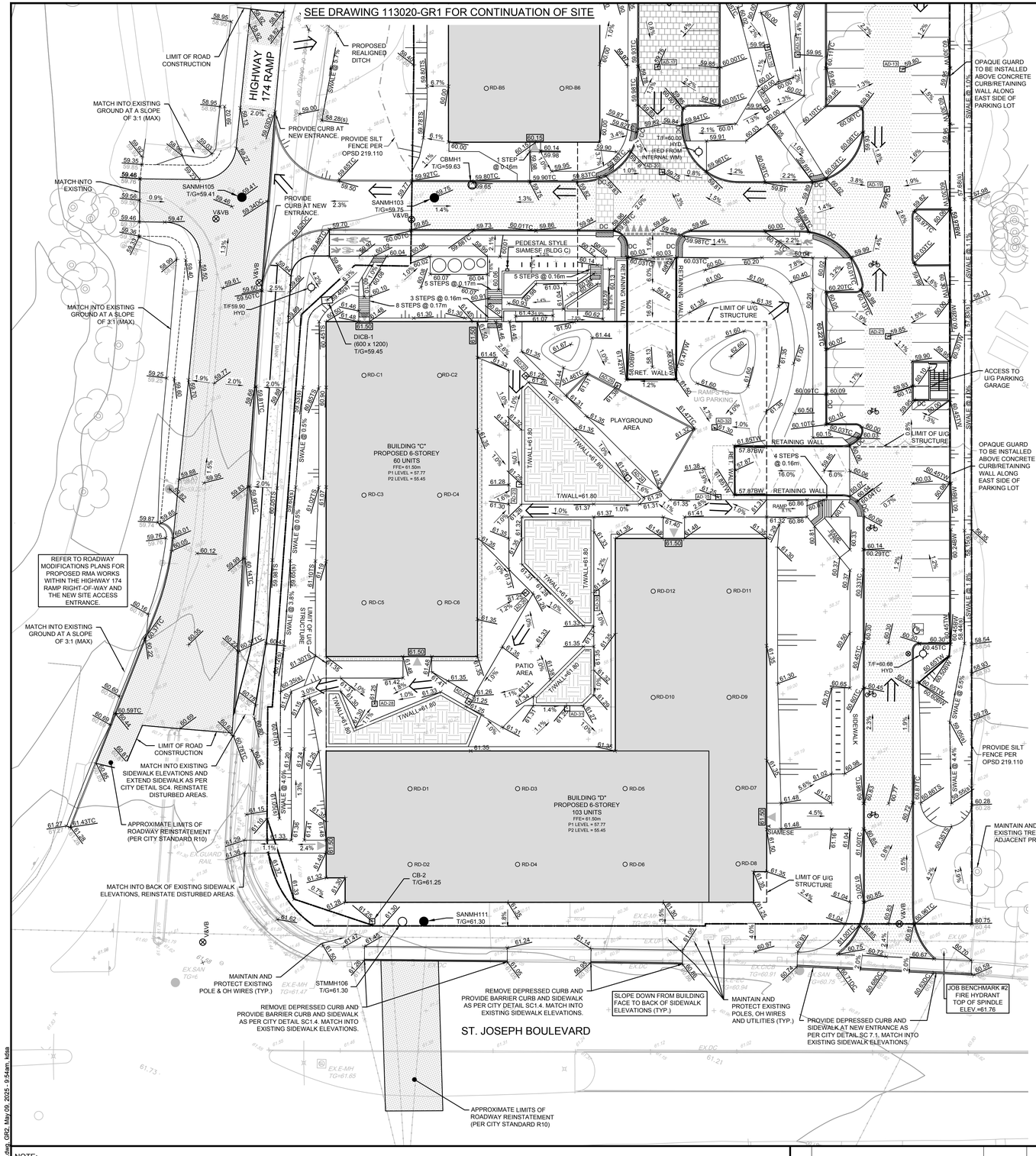

LEGEND

70.05	PROPOSED ELEVATION		EXISTING CONCRETE CURB
69.90	EXISTING ELEVATION	VALVE	EXISTING VALVE & VALVE BOX
2.0%	GRADE AND DIRECTION	SP	EXISTING SERVICE POST
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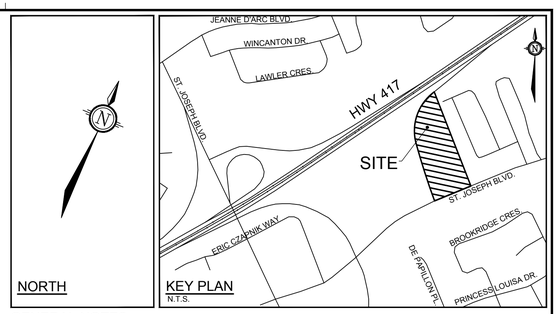
AD-2x	PROPOSED MECHANICAL AREA DRAIN	COMB MH	EXISTING COMBINED MH
DC-2x	PROPOSED PLANTER DECK DRAIN	CBMH	EXISTING CATCHBASIN
	DIRECTION OF MAJOR SYSTEM OVERLAND FLOW	CB	EXISTING CATCHBASIN MH
	PROPERTY LINE	EX UP	EXISTING UTILITY POLE C/W GUY WIRES
	UNDERGROUND STRUCTURE		EXISTING FENCE
	BUILDING ENTRANCE / EXIT	O/H WIRES	EXISTING OVERHEAD WIRES
	RAISED PLANTER BED	FFE	FINISHED FLOOR ELEVATION
	RIP RAP AS PER OPSD 801.010	P1 LEVEL	PARKING GARAGE LEVEL ELEVATION
		USF	UNDERSIDE OF FOOTING ELEVATION



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PAVEMENT STRUCTURE:

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50mm HL3 or SUPERPAVE 12.5
150mm GRANULAR "A" CRUSHED STONE
300mm GRANULAR "B" TYPE II

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(ACCESS LANES AND HEAVY TRUCK PARKING AREAS)
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GENERAL NOTES:

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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 MUNICIPAL AUTHORITIES AND OWNER.
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.
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11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10) PROVIDE LINE/PARKING PAINTING.
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL 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, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

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4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 99% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% 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. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
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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 On Plans	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Mud Mat	M M	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Dust Control	Location as Required 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

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

OWNER INFORMATION
8417709 CANADA INC.
430 boulevard de l'hôpital, Suite 310
Gatineau, QC J8V 1T7
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No.	REVISION	DATE	BY
3.	REVISED PER CITY COMMENTS	MAY 09/25	FST
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1.	ISSUED FOR SPC APPLICATION	JUL 19/24	FST

SCALE 1:300
1:300
0 3 6 9 12

DESIGN CV
CHECKED FST
DRAWN CV
CHECKED FST
APPROVED FST

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
F.S. THAUVETTE
100041399
May 09, 2025
PROVINCE OF ONTARIO

NOVATECH
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LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 113020-00
REV # 3
DRAWING No. 113020-GR2

D07-12-24-0069
PLAN NBR # 19167

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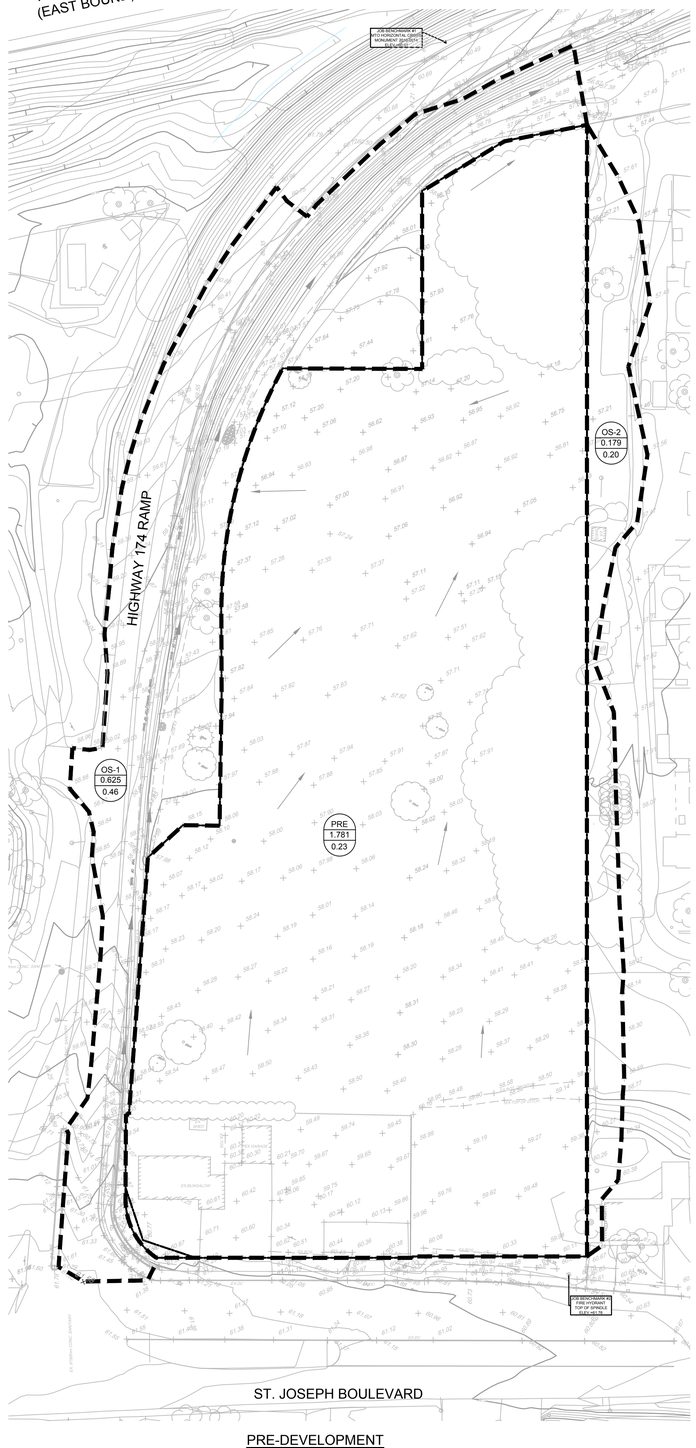
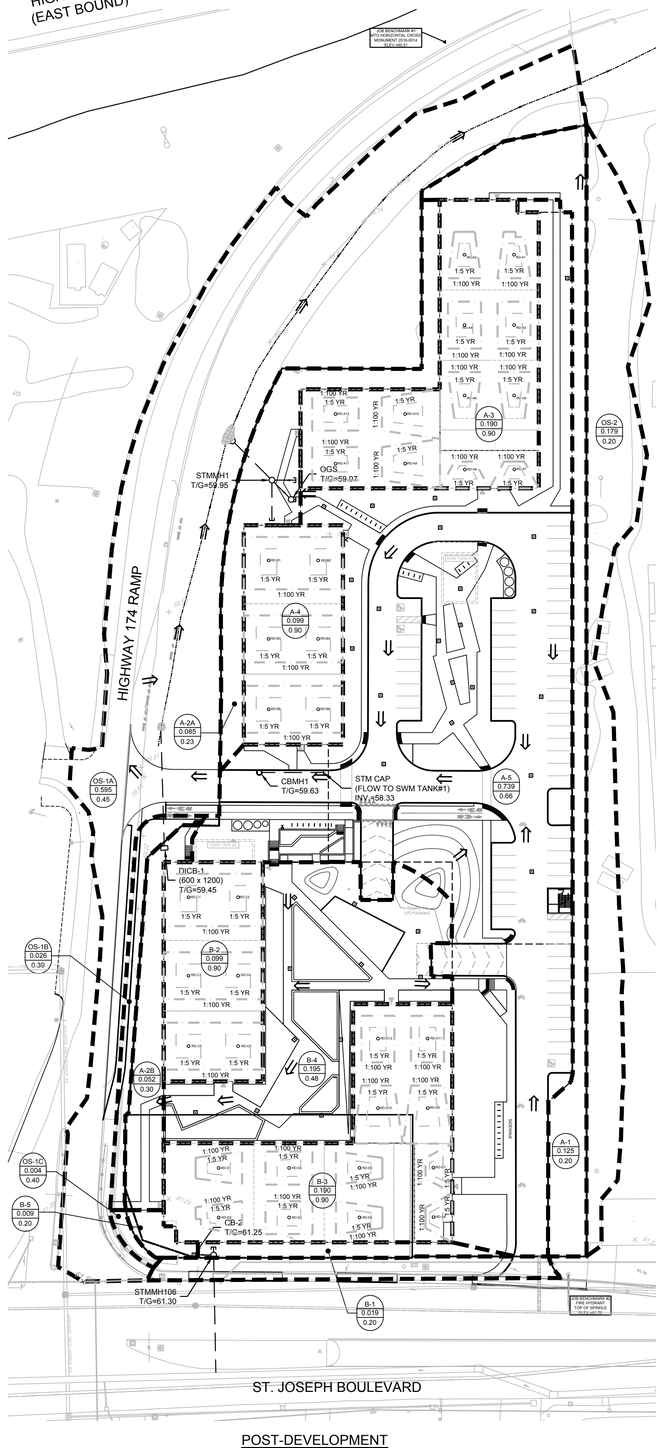


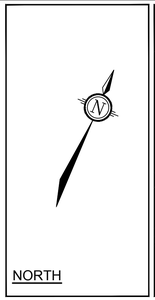
PRE-DEVELOPMENT

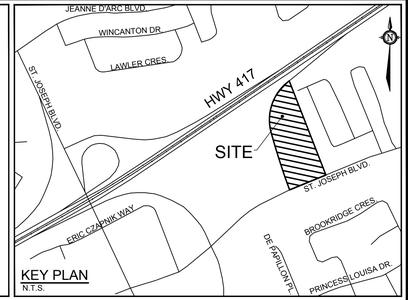


POST-DEVELOPMENT

LEGEND

- PROPOSED BARRIER CURB
- DC — PROPOSED DEPRESSED CURB
- DRAINAGE AREA LIMITS
- 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- PRE / 0.600 / 0.30 — PRE-DEVELOPMENT AREA ID; PRE-DEVELOPMENT DRAINAGE AREA (ha); 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- A-2 / 0.129 / 0.82 — POST-DEVELOPMENT AREA ID; POST-DEVELOPMENT DRAINAGE AREA (ha); 1:5 YEAR WEIGHTED RUNOFF COEFICIENT
- STM MH — PROPOSED STORM MANHOLE (WT=WATERTIGHT COVER)
- CBMH — PROPOSED CATCHBASIN MANHOLE
- CB — PROPOSED CATCHBASIN
- RD — CONTROLLED FLOW ROOF DRAIN
- PROPOSED STORM SEWER AND FLOW DIRECTION
- ICD — PROPOSED INLET CONTROL DEVICE
- EMERGENCY OVERLAND FLOW ROUTE
- PROPOSED LANDSCAPE WALL
- PROPOSED BUILDING ENTRANCE / EXIT
- MAXIMUM 3:1 SIDESLOPE
- FFE — FINISHED FLOOR ELEVATION
- USF — UNDERSIDE OF FOOTING ELEVATION
- STM MH — *EXISTING STORM MH & SEWER*
- CB — *EXISTING CATCHBASIN C/W CATCHBASIN LEAD*
- *EXISTING CONCRETE CURB*
- VEVB — *EXISTING VALVE & VALVE BOX*
- SP — *EXISTING SERVICE POST*
- HYD — *EXISTING HYDRANT*
- CBMH — *EXISTING CATCHBASIN*
- CB — *EXISTING CATCHBASIN MH*
- EX UP — *EXISTING UTILITY POLE C/W GUY WIRES*
- *EXISTING DRAINAGE DIRECTION ARROWS*
- *EXISTING OVERLAND FLOW*





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 MUNICIPAL AUTHORITIES.
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 (REF.NO. PG5091-1, REVISION 1, DATED NOVEMBER 6, 2019, AND TREE PLANTING SETBACK RECOMMENDATIONS (REF.NO. PG5091-MEMO-01), PREPARED BY PATERSON GROUP INC. 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 SURFACED AREAS AND DIMENSIONS.
10. REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-086) PREPARED BY NOVATECH.
11. SAW CUT AND KEYGRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE-IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL 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, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
13. PROVIDE LINE/PARKING PAINTING AS REQUIRED PER THE ARCHITECTURAL SITE PLAN.

BENCHMARK NOTES:

1. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM.
2. IT IS THE RESPONSIBILITY OF THE USER OF THIS INFORMATION TO VERIFY THAT THE JOB BENCHMARK HAS NOT BEEN ALTERED OR DISTURBED AND THAT IT'S RELATIVE ELEVATION AND DESCRIPTION AGREES WITH THE INFORMATION SHOWN ON THIS DRAWING.
3. BENCHMARK WAS PROVIDED ONPLAN OF SURVEY PART OF LOT 33, CONCESSION 1 (OLD SURVEY) GEOGRAPHIC TOWNSHIP OF CUMBERLAND, CITY OF OTTAWA, SURVEYED BY STANTEC GEOMATICS LTD.

INTERNAL SWM STORAGE TANK #1 SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	15.8 L/s	69.8 m³	>255 m³
1:5 YR		106.8 m³	
1:100 YR		254.6 m³	
1:100+20%		322.7 m³	

NOTES:
1. ALL DRAINAGE FROM AREA A-5 TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

INTERNAL SWM STORAGE TANK #2 SYSTEM

DESIGN EVENT	STORAGE SYSTEM CONTROLLED FLOW	STORAGE VOLUMES	
		REQUIRED	PROVIDED
1:2 YR	3.8 L/s	11.8 m³	>46 m³
1:5 YR		18.3 m³	
1:100 YR		45.9 m³	
1:100+20%		58.5 m³	

NOTES:
1. ALL DRAINAGE FROM AREA B-4 TO BE DIRECTED TO THE INTERNAL STORMWATER STORAGE SYSTEM. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
2. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR EXACT SIZE AND DETAILS OF INTERNAL STORMWATER STORAGE SYSTEM.
3. REFER TO MECHANICAL PLANS FOR PUMP INFORMATION AND DETAILS OF THE INTERNAL STORMWATER STORAGE SYSTEM.

ROOF DRAIN TABLE

AREA ID *	BUILDING	ROOF DRAIN No. (WATTS DMODEL)**	ROOF DRAIN OPENING SETTING	2 YEAR RELEASE RATE	APPROX. 2-YR PONDING DEPTH	5-YEAR RELEASE RATE	APPROX. 5-YEAR PONDING DEPTH	100-YEAR RELEASE RATE	APPROX. 100-YR PONDING DEPTH
A-3	A	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	15 cm
		RD 7 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 8 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	14 cm
		RD 9 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 10 (RD-100-A-ADJ)	CLOSED	0.32 L/s	8 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 11 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 12 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
A-4	B	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
B-2	C	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 5 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
		RD 6 (RD-100-A-ADJ)	CLOSED	0.32 L/s	9 cm	0.32 L/s	10 cm	0.32 L/s	12 cm
B-3	D	RD 1 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 2 (RD-100-A-ADJ)	CLOSED	0.32 L/s	11 cm	0.32 L/s	12 cm	0.32 L/s	14 cm
		RD 3 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 4 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
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		RD 11 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm
		RD 12 (RD-100-A-ADJ)	CLOSED	0.32 L/s	10 cm	0.32 L/s	11 cm	0.32 L/s	13 cm

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-086) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.

** ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDING TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.

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LOCATION
CITY OF OTTAWA
3459 & 3479 ST. JOSEPH BOULEVARD

DRAWING NAME
PRE-DEVELOPMENT STORM DRAINAGE & POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

PROJECT No. 113020-00
REV REV # 3
DRAWING No. 113020-SWM

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