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PROPOSED WAREHOUSE DEVELOPMENT 575 DEALERSHIP DRIVE

Site Servicing and Stormwater Management Report

Prepared for: ROSEFELLOW

PROPOSED WAREHOUSE DEVELOPMENT

575 DEALERSHIP DRIVE

OTTAWA, ONTARIO

SITE SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared By:

NOVATECH

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Issued: May 03, 2023

Novatech File: 119123
Ref: R-2023-070

May 03, 2023

City of Ottawa
Planning Infrastructure and Economic Development Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON
K1P 1J1

Attention: Kelby Lodoen Unseth

**Reference: Proposed Warehouse Development
575 Dealership Drive, Ottawa
Site Servicing and Stormwater Management Report
Our File No.: 119123**

Please find enclosed the 'Site Servicing and Stormwater Management Report' for the above noted project. This report is prepared in support of the Site Plan Application and is hereby submitted for review and approval.

Should you have any questions or comments, please do not hesitate to contact us.

Yours truly,

NOVATECH



Drew Blair, P.Eng.
Senior Project Manager

cc: Julian Nini, Rosefellow

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| General Plan of Services | (119123-GP1, GP2) |
| Grading Plan | (119123-GR1, GR2) |
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1.0 INTRODUCTION

Novatech has been retained to prepare a Site Servicing and Stormwater Management Report for the proposed development located at 575 Dealership Drive within Ottawa, Ontario. This report is submitted in support of a Site Plan Application for the proposed development.

Figure 1 – Key Plan shows the site location in respect to the CitiGate Corporate Campus.

This report outlines the site sanitary and water servicing, along with the proposed storm drainage and stormwater management strategy for the proposed development.

1.1 Existing Conditions

The total site area is approximately 6.26 hectares in size and is located within the CitiGate 416 Corporate Campus development southeast of the Highway 416 and Strandherd Drive interchange. Within the CitiGate development, the subject site is located west of the Dealership Drive and CitiGate Drive intersection. The site is bounded by undeveloped lands to the north and south, CitiGate Drive to the east, and Highway 416 to the west. The topography of the site slopes downwards from west to east from Highway 416 to CitiGate Drive.

Figure 2 – Existing Conditions Plan highlights the site's existing conditions.

It should be noted that the CitiGate development has been designed, approved, and constructed to provide sanitary, storm and water servicing including stormwater management for the subject site.

1.2 Proposed Development

The proposed development consists of two (2) large warehouses (Building A and Building B), associated truck and trailer parking, and surface parking lots. The proposed warehouse buildings cover approximately 3.00 hectares of the 6.26-hectare site. Access to the site will be provided by three (3) entrances; the first from Dealership Drive, the second at the northeastern portion of the site to CitiGate Drive, and the third from the Building A parking lot to the midpoint on CitiGate Drive.

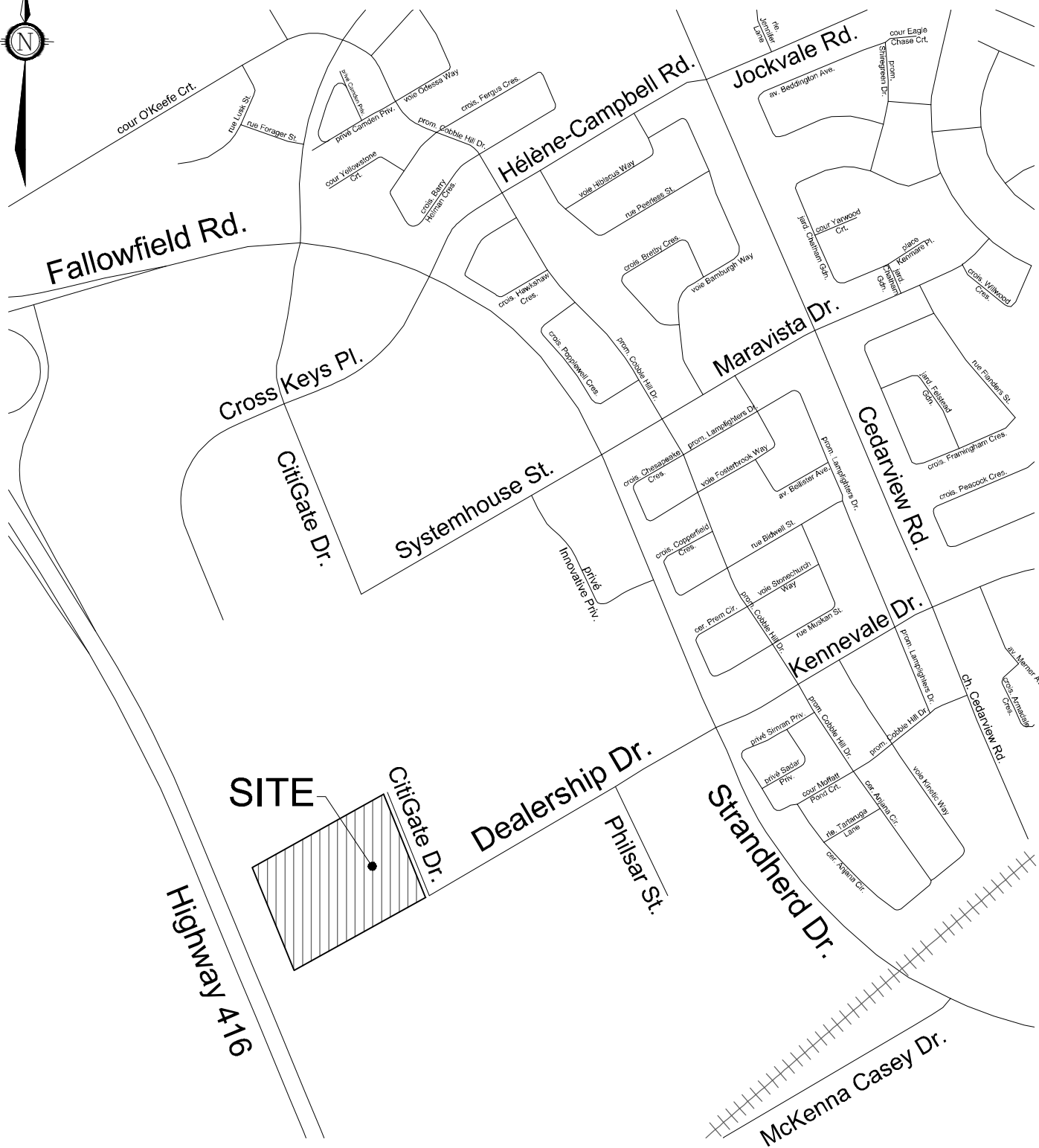
Figure 3 – Concept Plan presents the proposed warehouse development at 575 Dealership Drive.

This report should be read in conjunction with the following engineering drawing set which can be found in **Appendix F**.

| | |
|------------|---|
| 119123-NLD | Notes, Legends, and Details |
| 119123-ESC | Erosion and Sediment Control Plan |
| 119123-GP1 | General Plan of Services |
| 119123-GP2 | General Plan of Services |
| 119123-GR1 | Grading Plan |
| 119123-GR2 | Grading Plan |
| 119123-SWM | Post-Development Stormwater Management Plan |

1.3 Site Design and Constraints

As indicated previously, the subject site is part of the CitiGate 416 Corporate Campus development. Design criteria and information for the overall development is provided in the approved report '*CitiGate 416 Corporate Campus – Detailed Servicing and Stormwater Management Report (Phase 1)*' prepared by Novatech dated January 9, 2015. This site servicing report conforms to design criteria and constraints based on the CitiGate Servicing and Stormwater Management Report for each sewer and watermain system. Design criteria and constraints for each system are discussed in more detail in the appropriate sections of this report.



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575 DEALERSHIP DRIVE

KEY PLAN

| | | |
|--------------|--------|----------|
| SCALE | | |
| NOT TO SCALE | | |
| DATE | JOB | FIGURE |
| MAY 2023 | 119123 | FIGURE 1 |

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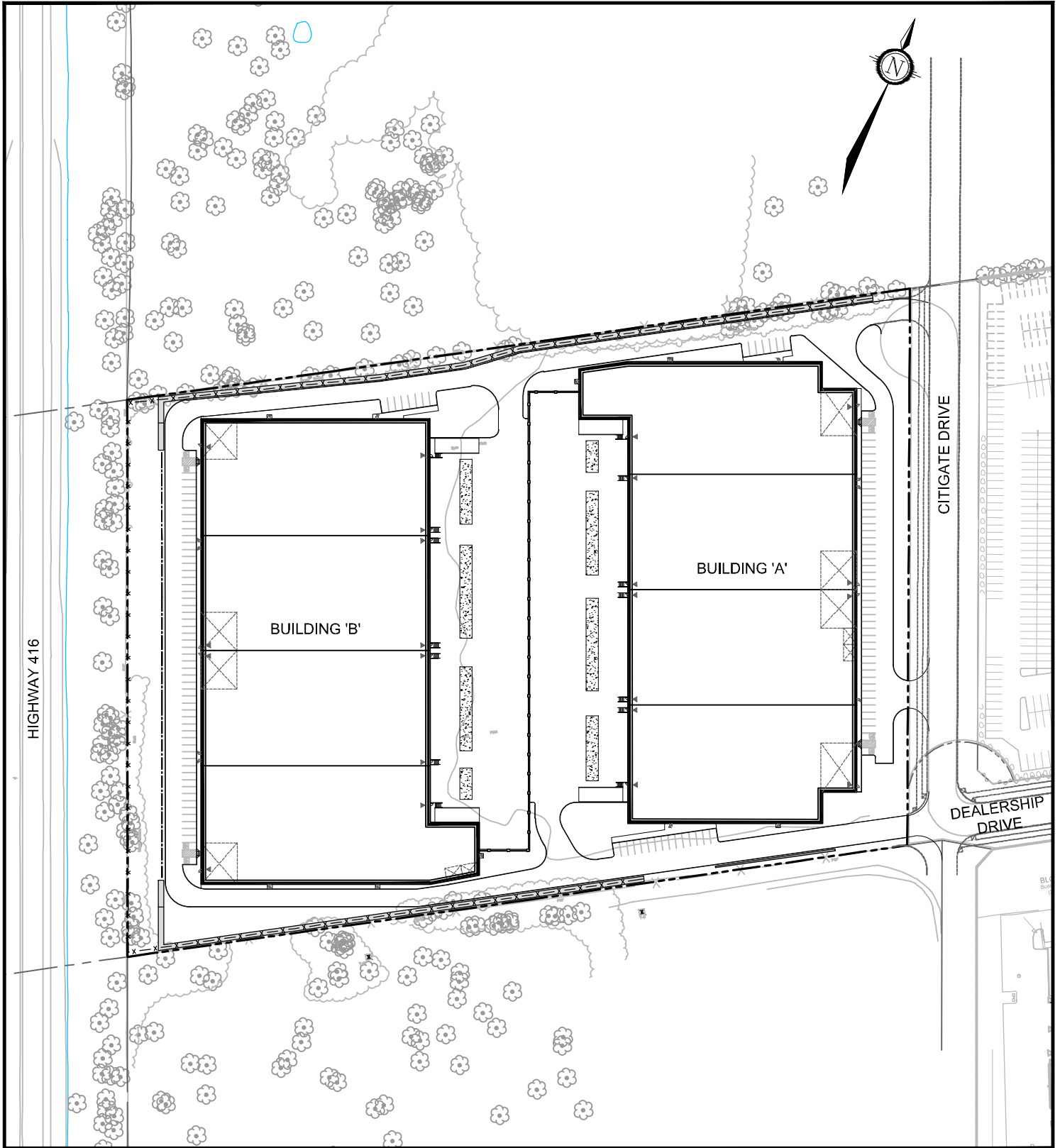
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575 DEALERSHIP DRIVE

EXISTING CONDITIONS
 PLAN



| | | |
|------------------|---------------|--------------------|
| DATE MAY 2023 | JOB 119123 | FIGURE FIGURE 2 |
|------------------|---------------|--------------------|



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575 DEALERSHIP DRIVE

CONCEPT PLAN

SCALE 1 : 2000

| | | |
|----------|--------|----------|
| DATE | JOB | FIGURE |
| MAY 2023 | 119123 | FIGURE 3 |

1.4 Geotechnical Investigation

The report titled '*Geotechnical Investigation – Proposed Commercial Development, 575 Dealership Drive*' prepared by Paterson Group dated January 11, 2023, provides geotechnical recommendations for the proposed development. A summary of the geotechnical investigation's findings are as follows:

- The ground surface across the site slopes gradually upwards from east to west from an approximate geodetic elevation of 97m to 109m.
- The site consists of a thin layer of topsoil underlain by a fill layer of silty sand to sandy silt with gravel, cobbles, and boulders. The thickness of the fill layer ranges between 0.5m to 1.8m.
- The eastern portion of the site is underlain by a hard brown deposit of silty clay which is underlain by a compact to very dense glacial till deposit.
- Bedrock information is based on available geological mapping of the site's location. The bedrock consists of interbedded limestone and dolomite of the Gull River formation with overburden drift thickness of 1m to 15m.
- Long-term groundwater levels are estimated to be at depths of 1.1m to 4.5m below existing grade.
- A permissible grade raise restriction of 2.0m is recommended for the site.

The report provides engineering guidelines based on Paterson Group's interpretation of the geotechnical information and project requirements. Refer to the Geotechnical Investigation for complete details.

1.5 Consultations and Approvals

The proposed site plan was presented at a pre-consultation meeting with the City of Ottawa on July 12, 2022. Notes from the meeting were received and incorporated into the site plan submission. The pre-consultation notes are included in **Appendix A**.

As part of the site plan approval process, the Rideau Valley Conservation Authority (RVCA) will be included in the circulation by the City of Ottawa for review and comments. Clearance from the RVCA will be required as part of the site plan approval process.

Following site plan approval, an Environmental Compliance Approval (ECA) application may be submitted for approval (if required) to the Ministry of the Environment, Conservation and Parks (MECP). An ECA may be required as the subject site is zoned as an industrial development and may not qualify for an ECA exemption. The ECA requirement to be reviewed with the City.

1.6 Background Reports

This report provides information on the considerations and approach by which Novatech has designed and evaluated the proposed servicing and stormwater management strategies. This report should be read in conjunction with the following:

- CitiGate 416 Corporate Campus Detailed Servicing and Stormwater Management Report (Phase 1), prepared by Novatech revised date January 9, 2015.
- Geotechnical Investigation, Proposed Commercial Development, 575 Dealership Drive, Ottawa, ON, prepared by Paterson Group dated January 11, 2023.

2.0 WATER SERVICING

2.1 Introduction

The municipal watermain network for the general area surrounding the proposed development was designed as part of the CitiGate 416 Corporate Campus development. The water distribution system for the sites located on Dealership Drive are fed by an existing 250mm dia. watermain that connects to the 400mm dia. watermain within Strandherd Drive. There is an existing 250mm dia. watermain extended north on CitiGate Drive adjacent to the site. Currently, the watermain within CitiGate Drive is a dead-end run with multiple service stubs leading to the subject site.

2.2 Proposed Watermain System

Water servicing for the proposed development includes on-site watermain installation. A 250mm dia. on-site watermain will encircle the entire site with two (2) connections to the existing watermain on CitiGate Drive. Proposed on-site 250mm dia. watermains will connect to the existing 200mm dia. watermain service stub at the northeast entrance on CitiGate Drive and to the 250mm dia. service stub at the southeast entrance on Dealership Drive.

Building A will be serviced directly with 150mm dia. watermain connecting to the existing 200mm dia. service stub in the middle of CitiGate Drive.

Refer to **Figure 4** – Watermain Network Plan for details.

There are three (3) proposed on-site fire hydrants to service the subject site. Additionally, there are three (3) existing hydrants northeast of the Subject Site on CitiGate Drive. The location and details of the proposed hydrants are illustrated on the drawings **119123-GP1** and **119123-GP2** in **Appendix F**. The combination of the proposed and existing hydrants will be sufficient to service the 575 Dealership Drive development based on a 150m radius from each hydrant as shown on **Figure 5** – Hydrant Coverage Plan. Buildings A and B will both be provided with sprinklers and supplied with fire department (siamese) connections.

2.2.1 Proposed Domestic Water Demands

Design Criteria from the City of Ottawa Water Distribution Guidelines and Section 8 of the Ontario Building Code were used to calculate the theoretical water demands for the proposed development. The demand calculations are based on flow requirements from the proposed different uses on site.

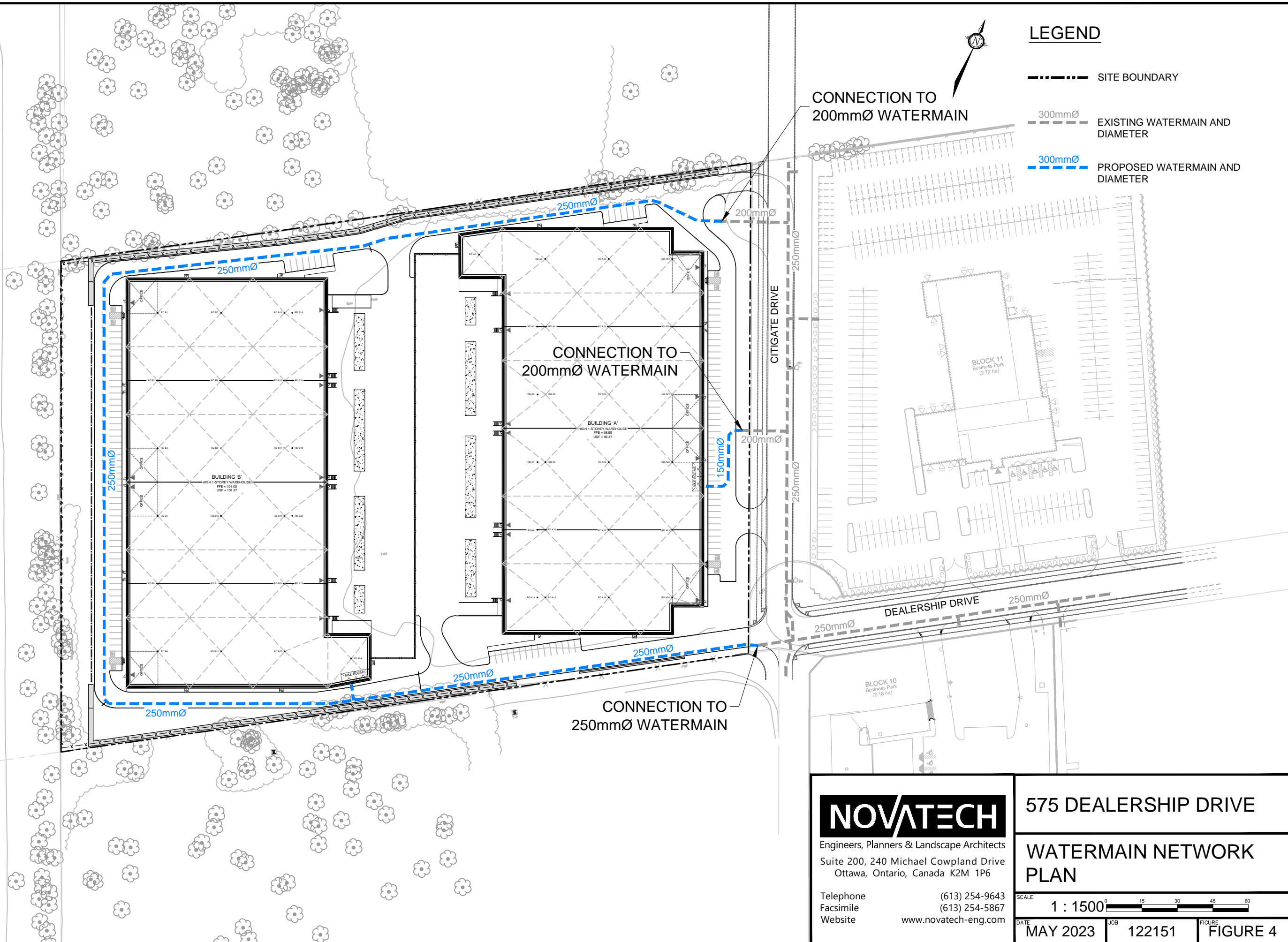
The water demand calculations for the proposed development are calculated based on the following criteria:

- Industrial Water Demand
 - Per each water closet = 950L/day
 - Per each loading bay = 150L/day (each)
- Commercial Office Water Demand
 - Per each 9.3m² floor space = 75L/day
- Peaking Factor
 - Max Day = 1.5
 - Peak Hour = 1.8

It is recognised that the City of Ottawa recommends using the Fire Underwriters Survey (FUS) to calculate fire flow demands for proposed site plans. For sites that consist of very large warehouse buildings that are constructed of non-combustible materials, the FUS fire flow calculations are very conservative and result in large fire flow demands (greater than 300 L/s) that are unreasonable. Fire flows of this magnitude are typically not acceptable to the city. To determine

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HIGHWAY 416

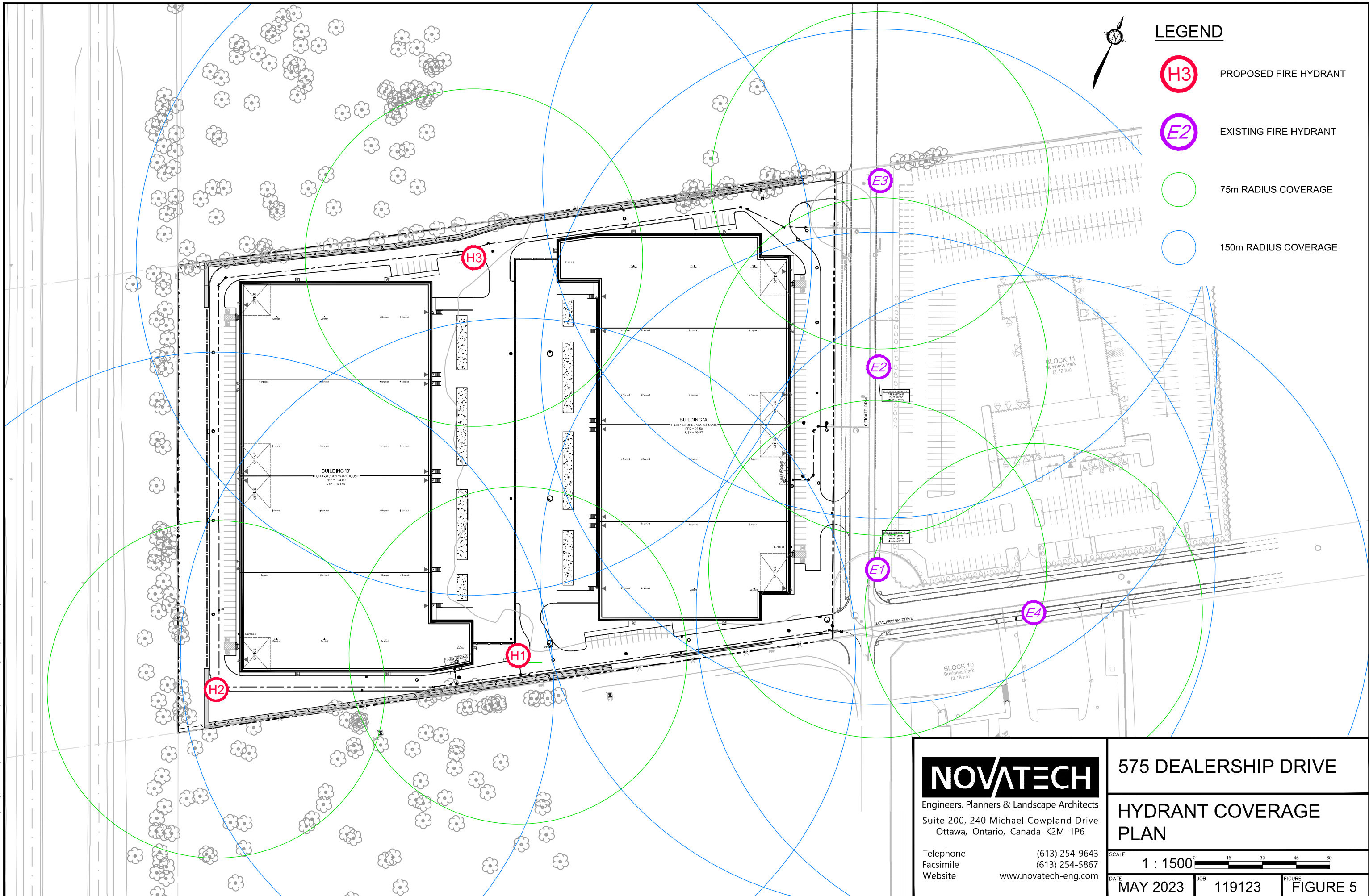


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LEGEND

-  PROPOSED FIRE HYDRANT
-  EXISTING FIRE HYDRANT
-  75m RADIUS COVERAGE
-  150m RADIUS COVERAGE



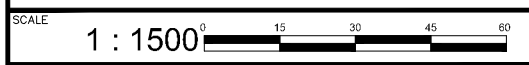
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575 DEALERSHIP DRIVE

HYDRANT COVERAGE PLAN



| | | |
|----------|--------|----------|
| DATE | JOB | FIGURE |
| MAY 2023 | 119123 | FIGURE 5 |

a more realistic and attainable fire flow, the client has retained a fire consultant (Superior Sprinkler Co. Ltd.) to analyze the sprinkler system for each building within the proposed development. In the sprinkler consultant's report, it is determined that a maximum fire flow of 150 L/s is required for Buildings A and B based on information provided by the architect. The hydraulic analysis for the proposed development has been completed based on the fire flow provided by the fire consultant. (150 L/s). Reports from the fire consultant are included in **Appendix B**.

The domestic water demands and fire flow for the proposed development are summarized in **Table 2.1** below.

Table 2.1: Domestic Water Demand Summary

| Proposed Use | Ave. Daily Demand (L/s) | Max. Daily Demand (L/s) | Peak Hour Demand (L/s) | Fire flow (L/s) |
|-------------------------------|-------------------------|-------------------------|------------------------|------------------|
| Building A | | | | |
| Industrial Flows | 0.26 | 0.39 | 0.70 | 150 |
| Commercial Flows | 0.08 | 0.13 | 0.23 | |
| Sub-Total | 0.34 | 0.52 | 0.93 | |
| Building B | | | | |
| Industrial Flows | 0.26 | 0.39 | 0.70 | 150 |
| Commercial Flows | 0.08 | 0.12 | 0.22 | |
| Sub-Total | 0.34 | 0.51 | 0.92 | |
| Total Domestic Demands | 0.68 | 1.03 | 2.02 | 150 (Max) |

2.3 Boundary Conditions and Hydraulic Analysis

The boundary conditions provided by the City of Ottawa are specific to the southeastern connection point to the 250mm diameter watermain in Dealership Drive. These boundary conditions were determined based on the proposed domestic water demands as shown in **Table 2.1**. Municipal watermain boundary conditions provided by the City of Ottawa can be found in **Appendix B**.

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

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

The hydraulic model EPANET was used to analyze the performance of the proposed watermain configuration for three (3) theoretical conditions:

- Maximum HGL
- Peak Hour
- Maximum Day + Fire Flow Demand (150 L/s)

A schematic representation of the hydraulic network depicts the node and pipe numbers used in the model. The model is based on hydraulic boundary conditions provided by the City of Ottawa.

The model indicates that adequate pressure will exist throughout the watermain system under the specified design conditions. Refer to **Appendix B** for the hydraulic modeling schematic and modeling results.

The hydraulic requirements and hydraulic model results are summarized in **Table 2.2** below.

Table 2.2: Hydraulic Model Summary

| Operating Conditions | Demand (L/s) | Fire Flow (L/s) | Min. / Max. Allowable Pressure (kPa/psi) | Min. / Max. Pressure (kPa/psi) |
|---|--------------|-----------------|--|--------------------------------|
| High Pressure (Max HGL) | 0.68 | N/A | 690/80 (Max) | 498.4 / 72.3 (Max) |
| Peak Hour | 2.02 | N/A | 276/40 (Min) | 423.8 / 61.5 (Min) |
| Max Daily + Fire Flow Demand (Building B) | 1.03 | 150 | 138/20 (Min) | 236.0 / 34.2 (Min) |

The proposed water distribution system was checked for high pressures during average daily demand using a hydraulic boundary condition provided by the City of Ottawa. The model indicated that no pressures were above 550 kPa (80 psi) exist within the site.

The downstream system was checked for headloss, and the results are provided in **Appendix B**.

The model indicates that the municipal watermain within Dealership Drive and CitiGate Drive along with the on-site watermain will provide adequate fire flows and system pressures to service the subject site under each operating condition.

It should be noted that the existing watermain within CitiGate Drive adjacent to the proposed development will be extended in the future by the adjacent property at 444 CitiGate Drive and ultimately connect to the north at the CitiGate Drive and Systemhouse Street intersection. As this future connection will provide a looped system to Dealership Drive, it is anticipated that watermain system pressures within the proposed development may improve as a direct result of the future connection.

3.0 SANITARY SERVICING

3.1 Introduction

The Subject Site is within the CitiGate 416 Corporate Campus that designed the sanitary wastewater outlet for the area. The sanitary flows ultimately outlet to the South Nepean Collector (SNC) within Strandherd Drive. The CitiGate Detailed Servicing and Stormwater Management Report (Phase 1) dated January 9, 2015, outlined allowable release rates for the subject site within its design. Sanitary drainage plans and design sheets from the CitiGate 416 Corporate Campus servicing report are included in **Appendix C**.

For the purposes of this report, sanitary flow analysis will focus on the subject site and the contributing flows to the overall CitiGate development.

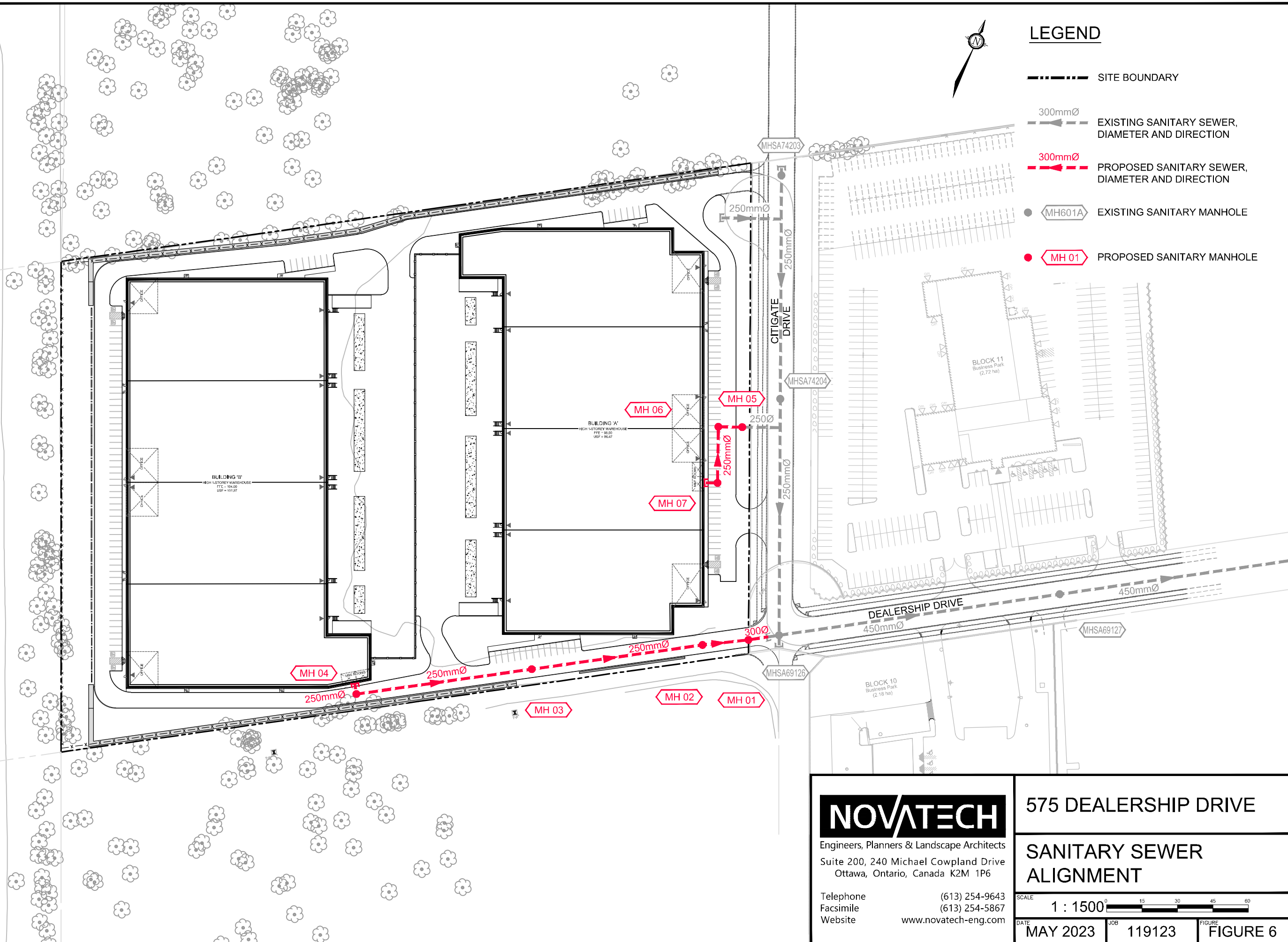
The 575 Dealership Drive development will be serviced by 250mm dia. gravity on-site sanitary sewers. Buildings A and B will have separate service connections, ultimately outletting to existing sanitary sewers within Dealership Drive.

- Building A 250mm dia. sanitary service will connect to the existing 250mm dia. sanitary service stub and 250mm sanitary sewer on CitiGate Drive.
- Building B sanitary flows will be directed by 250mm dia. sewers to connect to the existing 300mm dia. sanitary sewer at the CitiGate Drive and Dealership Drive intersection.

Refer to **Figure 6** – Sanitary Sewer Alignment for details.

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HIGHWAY 416



3.2 Proposed On-Site Sanitary Servicing

The proposed sanitary servicing for 575 Dealership Drive follows the sanitary servicing design provided in the 'CitiGate 416 Corporate Campus – Detailed Servicing and Stormwater Management Report (Phase 1)' prepared by Novatech (January 9, 2015) and conforms to the recommendations from the *Ottawa Sewer Design Guidelines (October 2012)* and technical bulletin *ISTB-2018-01 (March 2018)*.

3.2.1 Proposed Peak Sanitary Flows

Design Criteria

The total theoretical peak sanitary flow from the proposed development was calculated based on the following criteria from Section 4 of the City of Ottawa Sewer Design Guidelines and Section 8 of the Ontario Building Code:

- Site Area = 6.26 ha
- Industrial Sanitary Flow
 - Per each water closet = 950L/day
 - Per each loading bay = 150L/day (each)
- Commercial Office Water Demand
 - Per each water closet = 950L/day
- Commercial Peaking Factor = 1.5
- Industrial Peak Factor = per MOE/City of Ottawa graph (included in **Appendix C**)
- Infiltration Rate = 0.33 L/s/ha
- Minimum Velocity = 0.6 m/s
- Manning's n = 0.013

Sanitary Flows

The proposed sanitary peak flows are provided in **Table 3.1** below.

Table 3.1: Proposed Sanitary Peak Flow Summary

| Proposed Use | Unit Count | Peaking Factor ⁽¹⁾ | Peak Design Flow (L/s) |
|--------------------------------|------------|-------------------------------|------------------------|
| Building A | | | |
| No. Loading Docks/Washrooms | 23 / 20 | 4.6 | 1.20 |
| Office Space (m ²) | 910 | 1.5 | 0.13 |
| Infiltration (ha) | 2.09 | - | 0.69 |
| Building A Total | - | - | 2.01 |
| Building B | | | |
| No. Loading Docks/Washrooms | 23 / 20 | 4.6 | 1.20 |
| Office Space (m ²) | 850 | 1.5 | 0.12 |
| Infiltration (ha) | 4.17 | - | 1.38 |
| Building B Total | - | - | 2.69 |

⁽¹⁾ Peaking Factor for industrial and commercial areas as per Section 3.2.1

As shown in **Table 3.1**, Buildings A and B will produce peak design flows of 2.01 L/s and 2.69 L/s, respectively for a total design flow of **4.70 L/s**. The buildings' sanitary flows ultimately outlet to the existing maintenance hole MH501 on Dealership Drive. The light industrial peaking factor has been calculated to be 4.6 based on a total site area of 6.26 ha using the MOE/City of Ottawa Appendix 4-B.1 graph included in **Appendix C**.

Refer to **Appendix C** for sanitary sewer design sheets and the sanitary drainage area plan of the subject site.

3.3 CitiGate Sanitary Flow Allotment

In the report titled 'CitiGate 416 Corporate Campus – Detailed Servicing and Stormwater Management Report' (January 9, 2015), sanitary peak flow allotments are outlined for future sites within the overall CitiGate development. The CitiGate drainage area plan and sanitary design sheets assigned the subject site to drainage area B-1 with a drainage area of 27.06 ha and an allowable peak design flow of 31.07 L/s.

The proposed sanitary peak flows in comparison to the allowable sanitary peak flows from the CitiGate 416 Corporate Campus are shown in **Table 3.2** below.

Table 3.2: Allowable and Proposed Peak Flow Summary

| | Sanitary Outlet | Service | Drainage Area | Sanitary Peak Design Flow |
|---|------------------------|-------------------|---------------|---------------------------|
| Original Giti Gate Allowable Sanitary Flow | Dealership Drive MH501 | Drainage Area B-1 | 27.06 ha | 31.07 L/s |
| Proposed 575 Dealership Drive Sanitary Flow | | Buildings A & B | 6.26 ha | 4.70 L/s |
| Allowable vs. Proposed Percentage | | | 23.1% | 15.1% |

As indicated in the table above, the calculated proposed sanitary peak flows are significantly less than the CitiGate 416 Corporate Campus allowable peak flows. Since the proposed development is only 6.26 ha it is necessary to compare the allowable versus proposed percentages for the drainage areas and peak design flows. The drainage area and peak design flows for the proposed development are 23.1% and 15.1%, respectively, of the sanitary allotment from the CitiGate 416 Corporate Campus. The sanitary flow percentage is lower than the drainage area percentage, that indicates the proposed sanitary flow for this site is less than the allowable amount determined in the overall CitiGate Servicing Report (2015) and should have no net negative affect on the downstream sanitary sewer system.

As a result, a 250mm dia. sanitary sewer at a minimum slope of 0.24% has a full flow conveyance capacity of 30.4 L/s and will be able to service the proposed development.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

The 575 Dealership Drive development will be serviced by on-site gravity storm sewer system with pipe sizes ranging from 200mm dia. catchbasin leads up to 1200mm dia. storage pipes. Buildings A and B will have separate services with different outlets. The Building A 300mm dia. storm service will connect to the existing 525mm dia. storm service stub at the mid-point of the east property line which outlets to the existing City of Ottawa storm maintenance hole MHST81658 within CitiGate Drive. The 300mm dia. storm service for Building B will connect to the existing 1350mm dia. storm service stub at the south end of the east property line which outlets to the existing City of Ottawa storm maintenance hole MHST74434 in Dealership Drive located at the intersection with CitiGate Drive. The CitiGate storm sewer system flows east along Dealership Drive and discharges into the existing CitiGate SWM Facility (providing both water quantity and quality control measures for the business park prior to discharging into the O'Keefe Drain) approximately 220m east of the subject site. The approach for the stormwater management design for the site is discussed in the subsequent sections of the report.

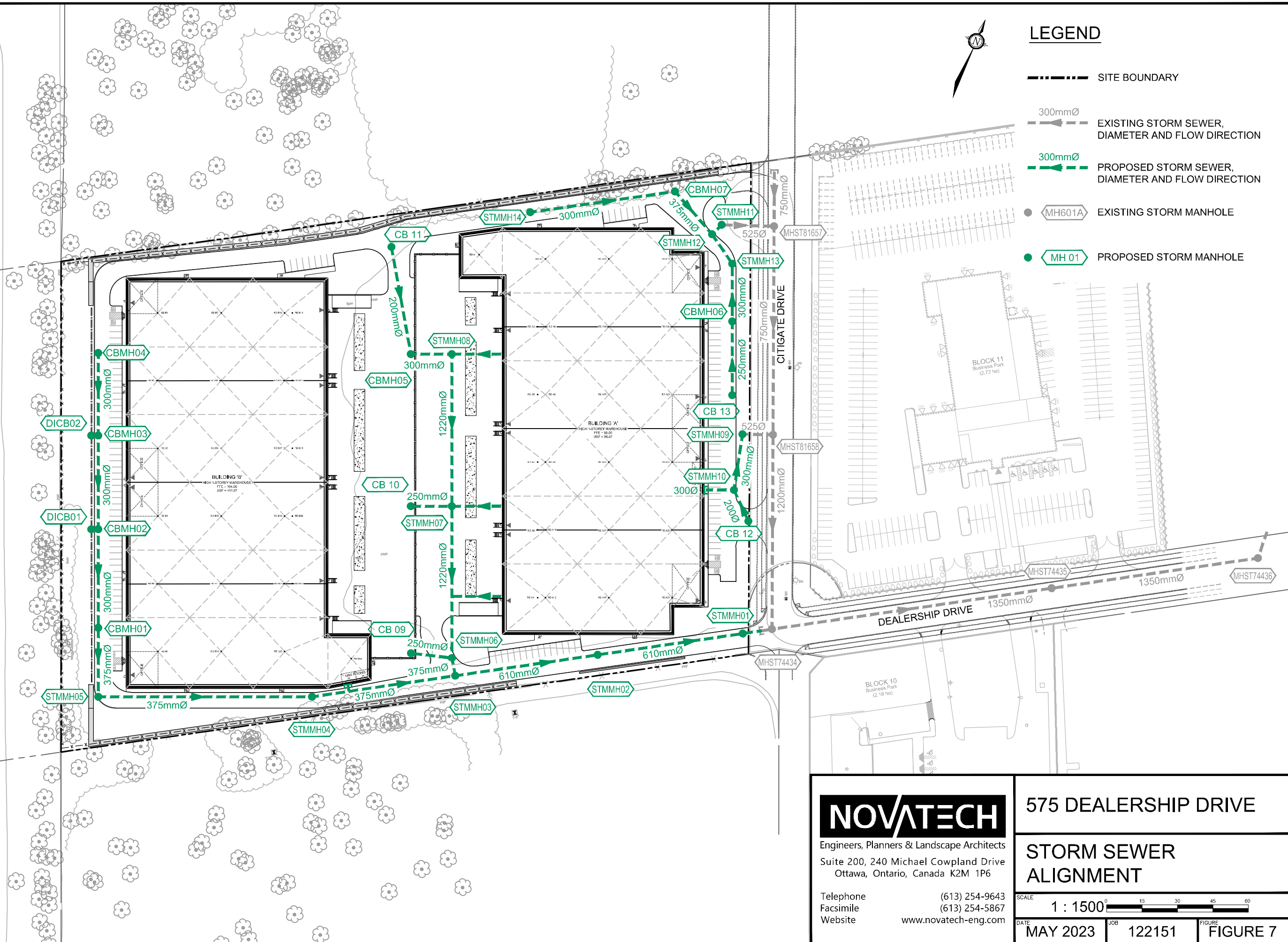
Refer to **Figure 7** – Storm Sewer Alignment for details.

4.1 Stormwater Management Criteria and Objectives

The proposed storm servicing and stormwater management for 575 Dealership Drive follows the design guidelines provided in the 'CitiGate 416 Corporate Campus – Detailed Servicing and

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HIGHWAY 416



LEGEND

- SITE BOUNDARY
- 300mmØ EXISTING STORM SEWER, DIAMETER AND FLOW DIRECTION
- 300mmØ PROPOSED STORM SEWER, DIAMETER AND FLOW DIRECTION
- MH601A EXISTING STORM MANHOLE
- MH 01 PROPOSED STORM MANHOLE

NOVATECH

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575 DEALERSHIP DRIVE

STORM SEWER ALIGNMENT

SCALE 1 : 1500

| | | |
|----------|--------|----------|
| DATE | JOB | FIGURE |
| MAY 2023 | 122151 | FIGURE 7 |

Stormwater Management Report (Phase 1) dated January 9, 2015, prepared by Novatech and conforms to RVCA criteria as well as the City of Ottawa *Sewer Design Guidelines (October 2012)* and technical bulletins *ISTB-2018-01* (March 2018).

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

- Allowable release rates and storage requirements for individual sites are to be calculated based on a runoff coefficient of $C = 0.80$.
- The 5-year peak flow can be released uncontrolled.
- The maximum release rate is not to exceed 120% of the 5-year peak flow for all storms up to and including the 100-year event.
- Ensure no overland flow for all storms up to and including the 100-year event.
- Flows to the storm sewer in excess of the 5-year + 20% storm release rate, up to and including the 100-year storm event, must be detained on-site.
- The 2-year storm or 5-year storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
- A calculated time of concentration (Cannot be less than 10 minutes).
- Quality control objectives to be confirmed with the Rideau Valley Conservation Authority (RVCA).

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

4.2 Pre-Development Conditions and Allowable Release Rates

In accordance with the CitiGate Detailed Servicing and SWM Report (Phase 1), allowable release rates and storage requirements for individual site developments are to be calculated as based on a runoff coefficient of $C=0.80$. The anticipated on-site storage should be approximately 100 m³/ha to sufficiently prevent major system (overland) flows during the 100-year event.

There are currently no on-site stormwater quantity or stormwater quality control measures in place on the subject site. The uncontrolled pre-development flows from the 8.67 ha site have been calculated using the Rational Method to be approximately 257.9 L/s during the 2-year design event, 349.9 L/s during the 5-year design event and 749.7 L/s during the 100-year design event. The allowable release rate for the 6.04 ha site, as specified in the CitiGate Detailed Servicing and SWM Report (Phase 1), was calculated to be 1,399.6 L/s for the 5-year storm event, and 1,679.5 L/s for the 100-year storm event. There is an off-site tributary area west of the subject site that currently drains through the property (Area identified as OS-1). Stormwater flows from OS-1 will need to be captured and conveyed through the proposed on-site storm sewer system at rates not exceeding the existing flows of 12.7 L/s (5-yr) and 27.3 L/s (100-yr). These allowable release rates sum to a total allowable release rate of 1,412.4 L/s during the 1:5 year event and 1,706.8 L/s during the 1:100 year event. Refer to **Appendix D** for detailed calculations.

4.3 Post-Development conditions

The proposed development will be serviced by new on-site storm sewers connecting to the two existing 525mm dia. concrete service stubs off CitiGate Drive and extending the existing 1350mm dia. concrete service stub in Dealership Drive. Stormwater runoff from the site will be directed to various catchbasins and trench drains located within the paved drive aisles and depressed loading docks. To mitigate the stormwater related impacts due to the increase in imperviousness of the site, stormwater runoff will be attenuated using control flow drains on the proposed building roofs as well as an inlet control device (ICD) within the on-site storm sewer system servicing the loading dock areas. Flows will be controlled for storms up to and including the 100-year design

event. Due to the existing grades, runoff from a minor portion of the perimeter of the site along CitiGate Drive will sheet drain uncontrolled off the eastern side of the site to the CitiGate Drive right-of-way (ROW).

4.3.1 Area A-0: Un-controlled Direct Runoff

The uncontrolled post-development direct runoff flow from this sub-catchment area was calculated using the Rational Method to be approximately 10.9 L/s during the 2-year design event, 14.8 L/s during the 5-year design event and 29.8 L/s during the 100-year design event. Refer to **Appendix D** for detailed SWM calculations.

4.3.2 Area A-1: Un-controlled Flow from Building 'B' Parking + OS-1

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 63.6 L/s during the 2-year design event, 86.3 L/s during the 5-year design event and 171.3 L/s during the 100-year design event. The post-development site flows will be discharged from this area to the existing 1350mm dia. south site service stub off Dealership Drive. Refer to **Appendix D** for detailed SWM calculations.

4.3.3 Area A-2: Un-controlled Flow from the South Drive Aisle

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 69.4 L/s during the 2-year design event, 94.1 L/s during the 5-year design event and 182.4 L/s during the 100-year design event. The post-development site flows will similarly be discharged from this area to the existing 1350mm dia. south site service stub off Dealership Drive. Refer to **Appendix D** for detailed SWM calculations.

4.3.4 Area A-3: Un-controlled Flow from Building 'A' Parking Area

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 19.2 L/s during the 2-year design event, 26.1 L/s during the 5-year design event and 49.6 L/s during the 100-year design event. The post-development site flows will be discharged from this area to the existing 525mm dia. central site service stub in CitiGate Drive. Refer to **Appendix D** for detailed SWM calculations.

4.3.5 Area A-4: Un-controlled Flow from the North Drive Aisle

The uncontrolled post-development flow from this sub-catchment area was calculated using the Rational Method to be approximately 58.7 L/s during the 2-year design event, 79.7 L/s during the 5-year design event and 152.6 L/s during the 100-year design event. The post-development site flows will be discharged from this area to the existing 525mm dia. north site service stub in CitiGate Drive. Refer to **Appendix D** for detailed SWM calculations.

4.3.6 Area A-5: Controlled Flow from Loading Dock Areas

The post-development flow from this sub-catchment area will be attenuated by an ICD installed in the outlet pipe of STM MH 06. Stormwater runoff from this sub-catchment area will be temporarily stored underground within the on-site storm sewer system and on the surface of the depressed loading docks prior to being discharged into the downstream storm sewer system.

Table 4.1 summarizes the post-development design flow from this sub-catchment area as well as the ICD specifications, the anticipated ponding elevations, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events. Refer to **Appendix D** for detailed SWM calculations.

Table 4.1: Stormwater Flows, ICD & Surface Storage

| Design Event | Controlled Site Flows from Area A-5 | | | | | |
|-----------------|-------------------------------------|-----------|---------------------|---------------------------------------|-----------------------|-----------------------|
| | ICD Type | Peak Flow | Ponding Depth/Elev. | Average Flow (50% Q _{peak}) | Storage Vol. Required | Storage Provided* |
| 2-Year | 230mm dia. circular orifice plug | 122.0 L/s | 0.00 m (96.11 m) | 61.0 L/s | 129.4 m ³ | >1,375 m ³ |
| 5-Year | | 165.4 L/s | 0.00 m (97.07 m) | 82.7 L/s | 174.3 m ³ | |
| 100-Year | | 181.6 L/s | 0.27 m (97.50 m) | 90.8 L/s | 436.0 m ³ | |
| 100-Year (+20%) | | 184.1 L/s | 0.45 m (97.68m) | 92.1 L/s | 561.2 m ³ | |

* Storage available to a depth of 0.40m within the loading docks, and 0.60m in the overall system

As indicated in the table above, this sub-catchment area will provide sufficient storage for the 2-year, 5-year and 100-year design events. The site has been designed to ensure that maximum surface ponding depths will be approximately 0.67m below the finished floor elevation of Building A and 6.17m below the finished floor elevation of Building B during the 100-year+20% stress test.

4.3.7 Area R-1: Controlled Flow from Roof of Building A

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: individual roof drains are to be set either ¾ exposed, or fully exposed as indicated in the tables below) prior to being directed to the proposed storm service.

Table 4.2 summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for both the 5-year and the 100-year design events.

Table 4.2: Building A - Controlled Flow Roof Drains

| Roof Drain ID & Drainage Area (ha) | Number of Roof Drains | Watts Roof Drain Model ID RD-100-A-ADJ (Weir Opening) | Controlled Flow per Drain (L/s) | | Approximate Ponding Depth Above Drains (m) | | Storage Volume Required (m ³) | | Max. Storage Available (m ³) |
|------------------------------------|-----------------------|---|---------------------------------|-------------|--|------------|---|------------|--|
| | | | 1:5 Year | 1:100 Year | 1:5 Year | 1:100 Year | 1:5 Year | 1:100 Year | |
| RD A1 | 1 | (¾ Exposed) | 1.26 | 1.34 | 0.11 | 0.13 | 7.2 | 15.9 | 19.5 |
| RD A2 & A13 | 2 | (Fully Exposed) | 1.34 | 1.89 | 0.11 | 0.15 | 32.2 | 79.8 | 85.4 |
| RD A3 – A12 | 10 | (¾ Exposed) | 1.10 | 1.58 | 0.11 | 0.15 | 104.8 | 205.8 | 242.0 |
| RD A14 – A17 | 4 | (¾ Exposed) | 1.34 | 1.58 | 0.11 | 0.15 | 77.2 | 157.2 | 162.4 |
| RD A18, A19 & A24 | 3 | (Fully Exposed) | 1.34 | 1.89 | 0.11 | 0.14 | 47.8 | 96.7 | 106.8 |
| RD A20 - A23 | 4 | (¾ Exposed) | 1.34 | 1.58 | 0.11 | 0.15 | 77.2 | 157.2 | 164.0 |
| Total Roof | 24 | - | 28.5 | 38.0 | - | - | 393 | 555 | 780 |

* Table represents rounded values

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

4.3.8 Area R-2: Controlled Flow from Roof of Building B

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: individual roof drains are to be set either $\frac{3}{4}$ exposed, or fully exposed as indicated in the tables below) prior to being directed to the proposed storm service.

Table 4.3 summarizes the post-development design flows from this sub-catchment area as well as the type of roof drains, the maximum anticipated ponding depths, storage volumes required and storage volumes provided for both the 5-year and the 100-year design events.

Table 4.3: Building B - Controlled Flow Roof Drains

| Roof Drain ID & Drainage Area (ha) | Number of Roof Drains | Watts Roof Drain Model ID RD-100-A-ADJ (Weir Opening) | Controlled Flow per Drain (L/s) | | Approximate Ponding Depth Above Drains (m) | | Storage Volume Required (m ³) | | Max. Storage Available (m ³) |
|------------------------------------|-----------------------|---|---------------------------------|-------------|--|------------|---|------------|--|
| | | | 1:5 Year | 1:100 Year | 1:5 Year | 1:100 Year | 1:5 Year | 1:100 Year | |
| RD B1, B6, B7 & B12 | 4 | (Fully Exposed) | 1.34 | 1.89 | 0.11 | 0.14 | 75.8 | 152.9 | 166.1 |
| RD B2 – B5 | 4 | (3/4 Exposed) | 1.34 | 1.58 | 0.11 | 0.15 | 77.2 | 157.2 | 162.4 |
| RD B8 – B11 | 4 | (3/4 Exposed) | 1.34 | 1.58 | 0.11 | 0.15 | 77.2 | 157.2 | 162.4 |
| RD B13 – B22 | 10 | (3/4 Exposed) | 1.10 | 1.58 | 0.11 | 0.14 | 103.9 | 204.0 | 240.4 |
| RD B23 | 1 | (Fully Exposed) | 1.34 | 1.89 | 0.11 | 0.15 | 24.4 | 48.9 | 50.0 |
| RD B24 | 1 | (Fully Exposed) | 1.34 | 1.58 | 0.11 | 0.13 | 8.2 | 16.1 | 20.6 |
| Total Roof | 24 | - | 28.6 | 38.3 | - | - | 386 | 736 | 802 |

* Table represents rounded values

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

4.4 Stormwater Temperature Mitigation

The CitiGate 416 Corporate Campus Detailed Servicing and Stormwater Management Report (2015) states “the O’Keefe Drain has been designated as “cool-water fish habitat” ... To ensure that the O’Keefe Drain remains a hospitable fish environment, any increase in the water temperature in the drain should be kept to a minimum”. As the ultimate stormwater outlet for the subject site, after the stormwater management pond, is the O’Keefe Drain, temperature mitigation practices should be implemented for the proposed development.

Surface ponding on the asphalt is susceptible to an increase in stormwater temperature which can be minimized by storing stormwater in the underground sewer system. To mitigate the stormwater temperature increase prior to leaving the subject site, the 2-year and 5-years storm events are captured underground in the proposed storm sewer system with no surface ponding.

The roofs of Buildings A and B are designed to be light-colored. Stormwater collected and stored on the buildings’ roofs are exposed to sunlight warming and by providing a light-colored roof, there is reduced sunlight warming resulting in lower stormwater temperatures.

5.0 EROSION AND SEDIMENT CONTROL

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 socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- Strawbale or rock check dams will be installed in swales and ditches;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair, or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (119123-ESC) for additional information.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This Site Servicing and Stormwater Management Report has evaluated the servicing (water, sanitary and storm servicing) and stormwater management for the proposed warehouse development at 575 Dealership Drive within the CitiGate 416 Corporate Campus.

The principal findings and conclusions of this report are as follows:

- The proposed warehouse development will be serviced by municipal watermain, sanitary and storm sewers located in Dealership Drive and CitiGate Drive.
- Buildings A and B will be sprinklered and supplied with fire department (Siamese) connections. The Siamese connections will be located within 45m of a nearby fire hydrant. The proposed development includes three (3) proposed on-site fire hydrants.
- A 250mm dia. watermain encircling the site will require two (2) connections to existing watermain servicing stubs on CitiGate Drive. An additional watermain is required to service building A connecting directly to an existing servicing stub on CitiGate Drive.
- The sanitary sewer design servicing the proposed warehouse buildings conforms to the allowable release rates outlined in the CitiGate 416 Corporate Campus sanitary design. Buildings A and B will both ultimately discharge to the existing sanitary sewers on Dealership Drive.
- The proposed development includes various methods of controlled and uncontrolled conveyance of stormwater.
 - Storm sewers (minor system) in the parking lots for the two (2) warehouses have been designed to convey the uncontrolled 5-year peak flow using the rational method.
 - The loading bay between the warehouses will include controlled oversized storm sewers to prevent ponding within the loading bay during the 2-year and 5-year storm events.
 - Flows from the warehouse roofs will be attenuated by controlled flow roof drains outletting into the minor storm sewer system.
 - Release rates from the proposed development conform to the allowable release rates outlined in the CitiGate 416 Corporate Campus stormwater management design.
- Stormwater temperature mitigation measures will be implemented to protect the O'Keefe Drain fish environment.
- Temporary erosion and sediment control measures will be implemented on-site during construction.

7.0 CLOSURE

The preceding report is respectfully submitted for review and approval in support of the Site Plan Application for the Proposed Warehouse Development at 575 Dealership Drive. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:



Billy McEwen, B.Eng., E.I.T.
Land Development



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

Reviewed by:



Drew Blair, P.Eng.
Senior Project Manager

Appendix A Correspondence

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

City Attendees:

Kelby Lodoen Unseth – Planner
Eric Harrold – Infrastructure Project
Manager
Sami Rehman – Environmental Planner

Ann O'Connor – Urban Design
Jeannette Krabicka – Parks and Facilities
Planning

Location:

575 Dealership Drive

Property Overview and Discussion:

The property is split zoned IP[1219] H(33)-h and IP[2545] H(33)-h, (Business Park Industrial Zone, Urban Exceptions 1219 and 2545, Maximum Height 33m, with holding provision.

Purpose of the Zone The purpose of the IP – Business Park Industrial Zone is to:

- 1) accommodate mixed office, office-type uses and low impact, light industrial uses in a business park setting, in accordance with the Enterprise Area designations of the Official Plan or, the Employment Area or the General Urban Area designation where applicable;
- 2) allow in certain Enterprise or General Urban Areas, a variety of complementary uses such as recreational, health and fitness uses and service commercial (e.g. convenience store, personal service business, restaurant, automobile service station and gas bar), occupying small sites as individual occupancies or in groupings as part of a small plaza, to serve the employees of the Enterprise, Employment or General Urban Area, the general public in the immediate vicinity, and passing traffic;
- 3) prohibit retail uses in areas designated as Enterprise Area but allow limited sample and showroom space that is secondary and subordinate to the primary use of buildings for the manufacturing or warehousing of the product;
- 4) prohibit uses which are likely to generate noise, fumes, odours, or other similar obnoxious impacts, or are hazardous; and
- 5) provide development standards that would ensure compatibility between uses and would minimize the negative impact of the uses on adjacent non-industrial areas.

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Urban Exceptions:

| I Exception Number | II Applicable Zones | Exception Provisions | | |
|---|----------------------------|---|---|--|
| | | III Additional Land Uses Permitted | IV Land Uses Prohibited | V Provisions |
| 1219 (By-law 2019-449) (By-law 2019-16) (By-law 2018-334) (By-law 2009-164) (By-law 2008-462) | IP[1219] IP[1219] H(11) | - snow disposal facility on lot 16, concession 4 the following uses limited to 4451 Fallowfield: - automobile service station - car wash - drive through facility - gas bar -place of worship | all uses in subsection 205(1) except: - day care - hotel - light industrial uses - medical office - office - place of assembly -research and development centre -technology industry all uses in subsection 205(2) except: - bank - bank machine - instructional facility - personal service business - recreational and athletic facility - restaurant, full service - restaurant, take out -place of worship -all permitted uses until the 'h' symbol has been removed | - minimum lot area of 10,000 m ² and minimum lot width of 100 m -full-service restaurant, take-out restaurant, personal service business and recreational and athletic facility are permitted only within a large complex containing a research and development centre, technology industry, light industrial use, office, bank, instructional facility, hotel or place of assembly. -the 'h' symbol will not be removed until the following documents have been submitted to and approved by the City: i A transportation impact study ii A servicing study and associated funding agreement iii A master concept plan and a draft plan of subdivision. -a place of worship is subject to 203(2)(g) or 205(2)(g), as applicable. |

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| I Exception Number | II Applicable Zones | Exception Provisions | | |
|---|---------------------------|---|--|---|
| | | III Additional Land Uses Permitted | IV Land Uses Prohibited | V Provisions |
| 2545 (By-law 2019-449) (By-law 2019-16) | IP[2545] H(33)-h | - automobile body shop -place of worship | -All uses until such time as the 'h' symbol has been removed. -All uses except: -automobile | - minimum lot area: 10,000m ² - minimum lot width: 94 m - All operations of an automobile body shop must be within an enclosed building. - No vehicle storage is permitted |
| | | | dealership -automobile rental establishment -bank - bank machine -day care -hotel -instructional facility -light industrial uses -medical facility -office -personal service business -place of assembly -place of worship -research and development centre -restaurant, full service -restaurant, take out -technology industry | within the front yard. - The following uses are only permitted within a large complex containing a research and development centre or technology industry: i. light industrial use ii. office iii. bank iv. payday loan establishment v. instructional facility vi. place of assembly. - The 'h' symbol will not be removed until the following have been submitted to and approved by the City: i. a transportation impact study ii. a servicing study and associated funding agreement iii. a master concept plan and a draft plan of subdivision. -a place of worship is subject to 203(2)(g) or 205(2)(g), as applicable. |

From both Urban Exceptions, it is noted that the 'h' symbol will not be removed until the following have been submitted to and approved by the City:

- A Transportation Impact Study
- A Servicing Study and associated funding agreement
- A master concept plan and a draft plan of subdivision

It is noted however that a Plan of Subdivision is not part of this proposal/concept.

The current City of Ottawa Official Plan designates the property as Urban Employment, which identifies lands for a range of employment uses.

The new City of Ottawa Official Plan designates the property as Industrial and Logistics (Section 6.4) under Transect B6 (Southwest Suburban Transect). The Industrial and Logistics designation is characterized by traditional land uses such as warehousing, distribution, among other uses, requiring a range of parcel sizes.

Pre-consultation Notes

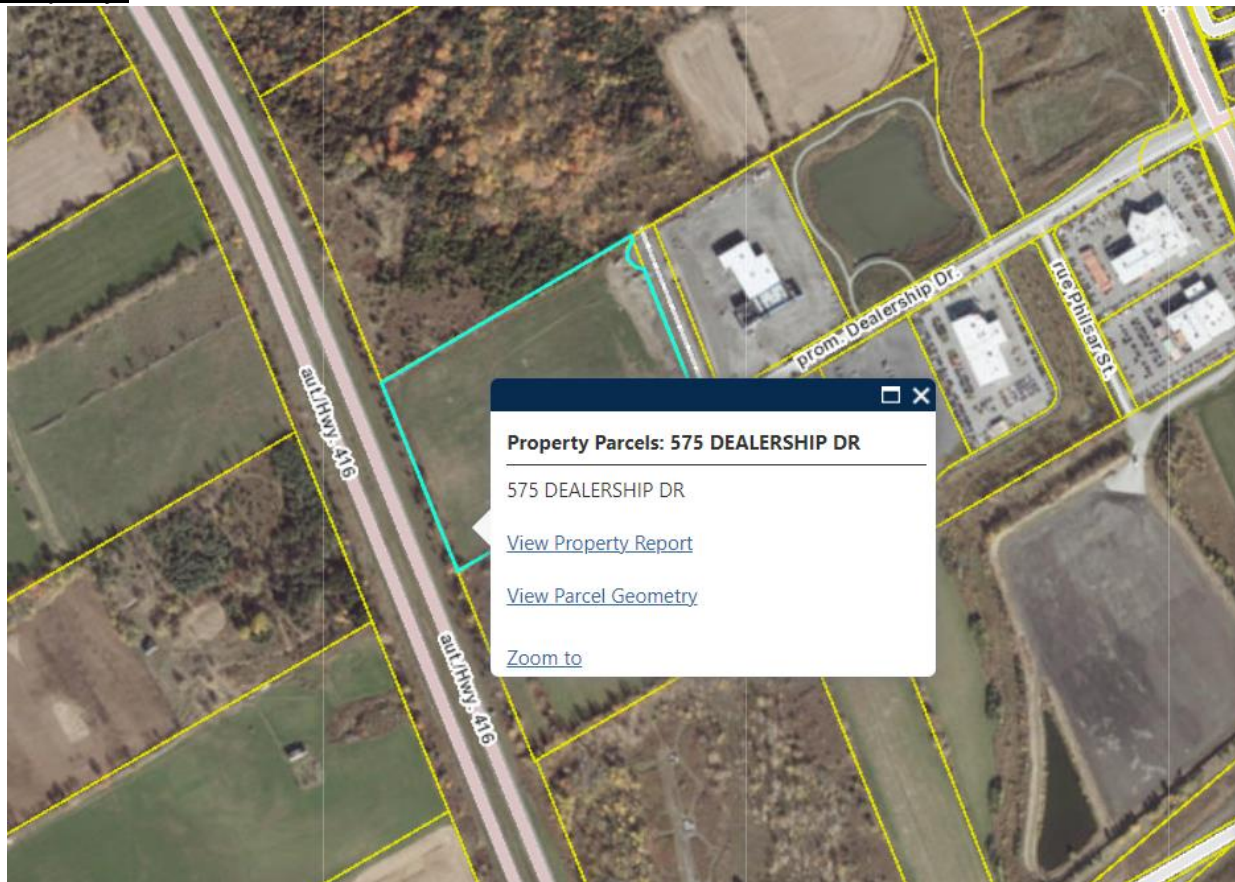
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The City's new Official Plan permits 'warehousing' on the subject property in its land-use policies, however the new OP has yet to be approved by the Ministry and thus is not in full force and effect. An application to rezone the property to permit warehousing can be circulated, with comments provided to the applicant, but will be put on hold until such time as the new OP is in full force and effect, thus allowing the rezoning application to advance to the City's Planning Committee.

South Nepean Secondary Plan (Area 10) will likely not be in effect when the new Official Plan is adopted, however the plan does outline Principles for Design and Development for properties in proximity to Highway 416 to enhance buildings that are visible from the highway (Section 3.0): <https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan/volume-2a-secondary-plans/former-nepean/south-nepean-urban-area/areas-9-and-10#section-3-0-urban-design-policies>

There also appears to be a reserve along the eastern boundary of the property adjacent to Citigate Drive which would need to be removed with a Lifting of 30cm Reserve application with an associated Site Plan Control application prior to site plan registration.

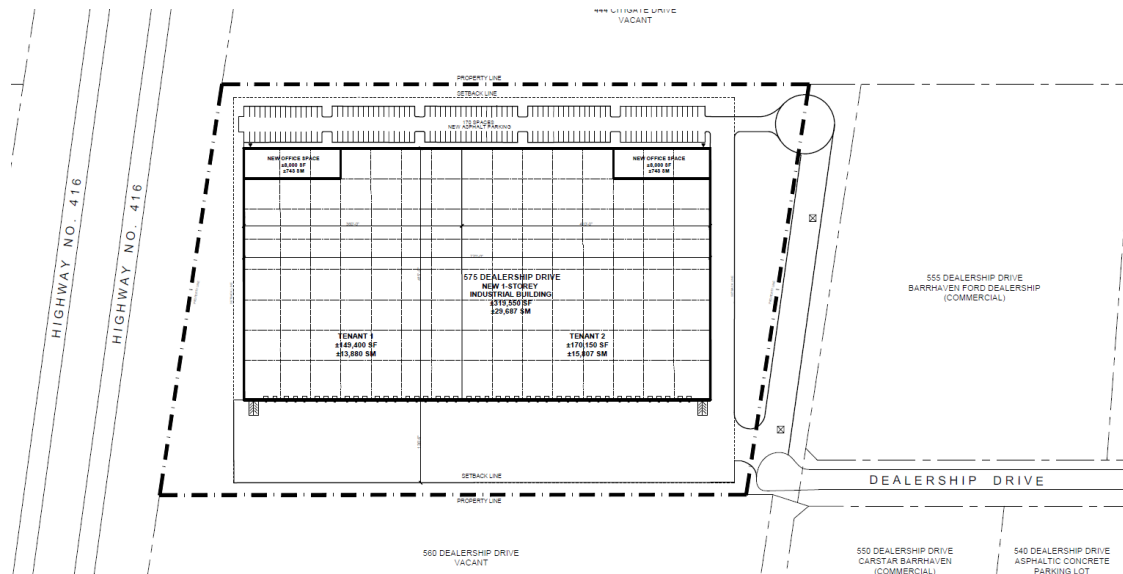
Property:



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Site Plan Concept:



Transportation:

1. A TIA is warranted, please proceed to Step 2 (scoping).
2. The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package. Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
3. Synchro files are required at Step 4.
4. An RMA and detailed design are required for any new road and intersection construction.

Parks

5. Parkland Dedication:
 - a) The amount of parkland dedication that is required is to be calculated as per the City of Ottawa Parkland Dedication By-law No 2009-95 (as amended or superceded).
 - b) Parkland requirement for commercial and industrial uses is calculated as 2% of the gross land area of the site being developed.
 - c) Parks & Facilities Planning estimates the area of the property parcel to be approximately 60,188 square metres.

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- d) Therefore, the preliminary Parkland Dedication Requirement is calculated to be approximately 1,204 square metres:
 - $60,188 \text{ m}^2 \times 2\% = 1,204 \text{ m}^2$
- e) The actual parkland dedication requirement will be based on the exact gross land area of the property being developed. If the development application moves forward, please provide the City with a surveyor's area certificate/memo which specifies this area with the first submission.
- f) Please note that the park comments are preliminary and will be finalized (and subject to change) upon receipt of the development application and the requested supporting documentation. Additionally, if the proposed commercial product or land use changes, then the parkland dedication requirement be re-evaluated accordingly.
- g) Parks and Facilities Planning is currently undertaking a legislated replacement of the Parkland Dedication By-law, with the new by-law to be considered by City Council on August 31, 2022. The by-law recommended for approval by Council increases the required parkland conveyance for midrise and high-rise residential development, and includes one-year transition policies for in-stream development and building permit applications or those that will be submitted and meet the requirements for completeness by September 1, 2022.

To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the staff report and recommended by-law that were recommended for Council approval by Planning Committee on July 7, 2022. For any questions or information, please contact the project lead at Kersten.Nitsche@ottawa.ca

- 6. Form of Parkland Dedication: a. Parks & Facilities Planning will be requesting Cash-in-Lieu of Parkland for this proposal.
- 7. Planning Rationale / Design Brief: a. Please address parkland dedication in the planning rationale / design brief that will be submitted with the development application.

Forestry:

TCR requirements:

- 8. a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - a) an approved TCR is a requirement of Site Plan approval.
 - b) The TCR may be combined with the LP provided all information is supplied

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9. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
10. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
 - a) If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
 - b) Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
11. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
12. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
13. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
14. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at [Tree Protection Specification](#) or by searching [Ottawa.ca](#)
 - a) the location of tree protection fencing must be shown on the plan
 - b) show the critical root zone of the retained trees
 - c) if excavation will occur within the critical root zone, please show the limits of excavation
15. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
16. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on [City of Ottawa](#)

LP tree planting requirements:

For additional information on the following please contact adam.palmer@Ottawa.ca

17. Minimum Setbacks
 - a) Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
 - b) Maintain 2.5m from curb
 - c) Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.

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- d) Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

18. Tree specifications

- a) Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- b) Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- c) Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- d) Plant native trees whenever possible
- e) No root barriers, dead-man anchor systems, or planters are permitted.
- f) No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

19. Hard surface planting

- a) Curb style planter is highly recommended
- b) No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- c) are to be planted at grade

20. Soil Volume

- a) Please document on the LP that adequate soil volumes can be met:

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

- b) Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

21. Sensitive Marine Clay

- a) Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

22. Tree Canopy Cover

- a) The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40%
- b) At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.
- c) Indicate on the plan the projected future canopy cover at 40 years for the site.

Engineering:

List of Reports and Plans (Site Plan Control and Re-zoning) :*

- Site Servicing Plan
- Grading Plan
- Erosion and Sediment Control Plan
- Storm Drainage / Ponding Plan
- Stormwater Management and Site Servicing Report
- Geotechnical Investigation Report

* Please note that the above submission requirements are based on the Site Plan Control and Re-zoning applications being submitted concurrently. A modified submission list can be provided if re-zoning will occur prior to Site Plan Control.

Please note the following information regarding the engineering design submissions for the above noted site:

23. The Servicing Study Guidelines for Development Applications are available at the following address:

<https://ottawa.ca/en/city-hall/planning-and-development/how-develop-property/development-application-review-process-2/guide-preparing-studies-and-plans>

24. Servicing and site works shall be in accordance with the following documents:

- Ottawa Sewer Design Guidelines (October 2012) and all the Technical Bulletins including ISDTB-2014-01, PIEDTB-2016-01, ISTB 2018-01, ISTB-2018-04, and ISTB-2019-02
- Ottawa Design Guidelines – Water Distribution (2010) and Technical Bulletins ISD-2010-2, ISDTB-2014-02 and ISTB-2018-02, and ISTB-2021-03
- Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2008)
- City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- City of Ottawa Environmental Noise Control Guidelines (January, 2016)
- City of Ottawa Hydrogeological and Terrain Analysis Guidelines (March 2021)

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

- City of Ottawa Park and Pathway Development Manual (2012)
- City of Ottawa Accessibility Design Standards (2012)
- Ottawa Standard Tender Documents (latest version)
- Ontario Provincial Standards for Roads & Public Works (2013)

25. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at geoinformation@ottawa.ca or by phone at (613) 580-2424 x 44455

26. The Stormwater Management Criteria, for the subject site, is to be based on the following (as established in the Citigate Centre Site Servicing Report):

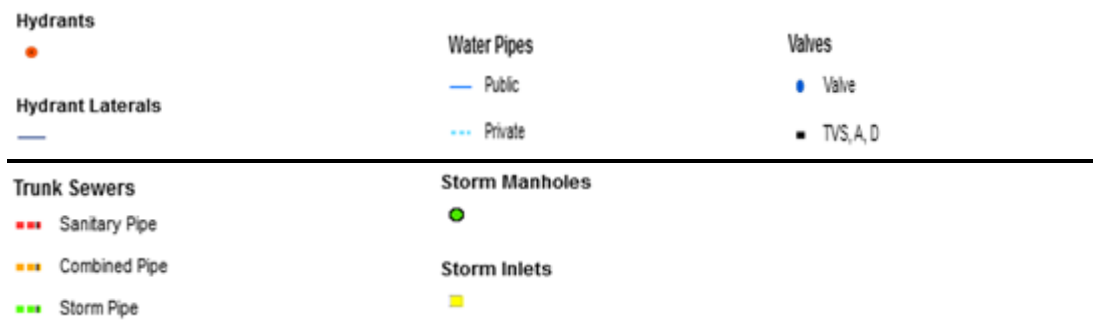
- a) Allowable release rates and storage requirements for individual sites are to be calculated based on a runoff coefficient of $C=0.80$:
- b) The maximum release rate is not to exceed 120% of the 5-year peak flow for all storms up to and including the 100-year event.
- c) The 5-year peak flow can be released uncontrolled.
- d) Ensure no overland flow for all storms up to and including the 100-year event.
- e) Flows to the storm sewer in excess of the 5-year + 20% storm release rate, up to and including the 100-year storm event, must be detained on site.
- f) The 2-yr storm or 5-yr storm event using the IDF information derived from the Meteorological Services of Canada rainfall data, taken from the MacDonald Cartier Airport, collected 1966 to 1997.
- g) A calculated time of concentration (Cannot be less than 10 minutes).
- h) Quality control objectives to be confirmed with the Rideau Valley Conservation Authority (RVCA).

27. Deep Services:



Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm



- i. *A plan view of the approximate services may be seen above. Services should ideally be grouped in a common trench to minimize the number of road cuts. The sizing of available future services is:*
 - a. *Connections (Citigate Drive – Preferred):*
 - i. Existing 1200 mm dia. STM (Conc.)
 - ii. Existing 254 mm dia. Watermain (PVC)
 - iii. Existing 250 mm dia. SAN (PVC)
 - ii. *Provide existing servicing information and the recommended location for the proposed connections. Services should ideally be grouped in a common trench to minimize the number of road cuts.*
 - iii. *Provide information on the monitoring manhole requirements – should be located in an accessible location on private property near the property line (ie. Not in a parking area).*
 - iv. *Provide information on the type of connection permitted*

Sewer connections to be made above the springline of the sewermain as per:

 - a) Std Dwg S11.1 for flexible main sewers – *connections made using approved tee or wye fittings.*
 - b) Std Dwg S11 (For rigid main sewers) – *lateral must be less than 50% the diameter of the sewermain,*
 - c) Std Dwg S11.2 (for rigid main sewers using bell end insert method) – *for larger diameter laterals where manufactured inserts are not available; lateral must be less than 50% the diameter of the sewermain,*
 - d) Connections to manholes permitted when the connection is to rigid main sewers where the lateral exceeds 50% the diameter of the sewermain. – *Connect obvert to obvert with the outlet pipe unless pipes are a similar size.*
 - e) *No submerged outlet connections.*
28. Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

- i. Location of service(s)
- ii. Type of development and the amount of fire flow required (as per FUS, 2020).
- iii. Average daily demand: ____ l/s.
- iv. Maximum daily demand: ____ l/s.
- v. Maximum hourly daily demand: ____ l/s.
- vi. Hydrant location and spacing to meet City's Water Design guidelines.
- vii. Water supply redundancy will be required for more than 50 m³/day water demand.

29. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

30. If applicable, MECP ECA Requirements –

All development applications should be considered for an Environmental Compliance Approval (ECA) by the Ministry of the Environment, Conservation, and Parks (MECP);

- a) Consultant determines if an approval for sewage works under Section 53 of OWRA is required. Consultant then determines what type of application is required and the City's project manager confirms. (If the consultant is not clear if an ECA is required, they will work with the City to determine what is required. If the consultant it is still unclear or there is a difference of opinion only then will the City PM approach the MECP.
- b) The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
- c) Pre-consultation is not required. d. Standard Works ToR Draft ECA's are sent to the local MECP office (moeccottawasewage@ontario.ca) for information only
- d) Additional ToR draft ECAs require a project summary/design brief and require a response from the local MECP (10 business day window)
- e) Site plan Approval, or Draft Approval, is required before an application is sent to the MECP

Urban Design:

31. A Design Brief that follows the provided Terms of Reference is required upon submission of the application.

32. Consider ways to enhance the relationship between the building and the public street by creating engagement. For example, consider including an entry way into the office in the north-east corner of the building that faces Dealership Dr and adding a pedestrian pathway from this entranceway to Citygate Drive.

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

33. Explore ways to integrate soft landscaping and trees onsite in areas not required for parking or driving aisles, particularly on the portion of the site fronting Dealership Drive.
34. As the design progresses, consider how the western façade, abutting hwy 416, will be viewed from the cars on the highway. There appears to be a grading change with trees along this western edge; please illustrate this on the Site Plan and explain whether the development will be visible from the highway.
35. Consider wayfinding measures, such as signage, to clearly demarcate where office parking vs. trucks should enter the site. Signage also can clearly identify both tenants from the street.
36. Consider the way the property will be seen as the view terminus from Dealership Dr. Explore the option of flipping the entrances for the trucks vs standard cars in order to allow for the view at the end of Dealership Dr to be screened surface parking, as opposed to the truck access.
37. It appears the directions identified on the elevations of the facades are incorrect. For example, the southern façade is shown on the Site Plan to have multiple garage doors; however, on the elevations this facade is labelled as the east facade. Please also ensure all plans also have English labels.

Planning:

38. Zoning By-law Amendment: <https://ottawa.ca/en/planning-development-and-construction/development-information-residents/development-application-review-process/development-application-submission/development-applications/zoning-law-amendment>
39. Site Plan Control: <https://ottawa.ca/en/planning-development-and-construction/development-information-residents/development-application-review-process/development-application-submission/development-applications/site-plan-control>
40. Lifting 30 Centimetre Reserve: <https://ottawa.ca/en/planning-development-and-construction/development-information-residents/development-application-review-process/development-application-submission/development-applications/lifting-30-centimetre-reserve>
41. City of Ottawa Accessibility Design Standards: https://documents.ottawa.ca/sites/documents/files/documents/accessibility_design_standards_en.pdf

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

42. Please ensure that the Parking, Queuing and Loading Provisions are following and appropriate vehicle and bicycle parking is provided on-site (<https://ottawa.ca/en/part-4-parking-queuing-and-loading-provisions-sections-100-114#bicycle-parking-space-rates-and-provisions-sec-111>).
43. Please ensure that the Landscaping Provisions for Parking Lots is followed (<https://ottawa.ca/en/part-4-parking-queuing-and-loading-provisions-sections-100-114#section-110-landscaping-provisions-parking-lots>).
44. The Planning Rationale Terms of Reference may be found [here](#).
45. For information on Applications, including fees, please visit: <https://ottawa.ca/en/planning-development-and-construction/developing-property/development-application-review-process/development-application-submission/development-application-forms#site-plan-control>
46. The application processing timeline generally depends on the quality of the submission. For more information on standard processing timelines, please visit: <https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/development-application-forms#site-plan-control>
47. Bird-safe design guidelines: https://documents.ottawa.ca/sites/documents/files/birdsafe_designguidelines_en.pdf
48. The local Ward 3 Councillor Jan Harder (jan.harder@ottawa.ca) should be consulted prior to an application submission

Environmental:

49. Full comments are outstanding at this time, however it was noted in the meeting discussion that an Environmental Impact Study will be required due to the proximity of the site to a neighbouring woodlot and potential species at risk. Other considerations include enhancing the urban tree canopy and including Bird-safe design guidelines for buildings on the site. I will update this section will full comments once received.

Attachments:

- Plan and study list

Pre-consultation Notes

Meeting: Tuesday July 12, 2022 @ 3pm

For any questions, please feel free to contact me at the information below. Please provide all submission documents electronically as paper copies of plans and reports are not being requested at this time.

Best regards,



Kelby Lodoen Unseth MCIP, RPP

Planner II | Urbaniste II

Development Review (South Services) | Examen des projets d'aménagement (services sud)

Planning, Infrastructure and Economic Development | Services de planification, d'infrastructure et de développement économique

City of Ottawa | Ville d'Ottawa

☎ 613.580.2424 ext./poste 12852

ottawa.ca/planning / ottawa.ca/urbanisme

Enc.

Appendix B Water Servicing

Boundary Conditions 575 Dealership

Provided Information

| Scenario | Demand | |
|----------------------|--------|-------|
| | L/min | L/s |
| Average Daily Demand | 26.4 | 0.44 |
| Maximum Daily Demand | 39.6 | 0.66 |
| Peak Hour | 71.4 | 1.19 |
| Fire Flow Demand #1 | 9000 | 150 |
| Fire Flow Demand #2 | 12000 | 200 |
| Fire Flow Demand #3 | 16000 | 266.7 |

Location



Results

Connection 1 – Dealership Drive

| Demand Scenario | Head (m) | Pressure¹ (psi) |
|------------------------|-----------------|-----------------------------------|
| Maximum HGL | 154.2 | 82.4 |
| Peak Hour | 147.0 | 72.2 |
| Max Day plus Fire #1 | 132.1 | 51.0 |
| Max Day plus Fire #2 | 117.3 | 30.0 |
| Max Day plus Fire #3 | 92.0 | -6.1 |

Ground Elevation = 96.2 m

Notes

1. Headloss calculations downstream of the connection location are required.
2. A second feed to this location should be planned to avoid the creation of a vulnerable service area.

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.

Domestic Water Demands

Daily Demands from OBC Table 8.2.1.3

| Establishment | Daily Demand Volume | |
|---------------|---------------------|-------------------|
| Industrial : | 150 | L/day/loading bay |
| | 950 | L/day/washroom |
| Office Space | 75 | L/day/9.3sq.m. |

Industrial Peaking Factors City of Ottawa Water Distribution Guidelines

| Conditions | Peaking Factor | |
|-------------|----------------|------------|
| Maximum Day | 1.5 | x Avg. Day |
| Peak Hour | 1.8 | x Max Day |

Proposed Development Conditions

| | Warehouse 1 | Totals |
|-----------------------------|-------------|--------|
| No. Loading Bays | 45 | 45 |
| No. Washrooms | 20 | 20 |
| Office Space ~sq. m. | 1530 | 1530 |
| Total Daily Volume (Liters) | 38,089 | 38,089 |
| Avg Day Demand (L/s) | 0.44 | 0.44 |
| Max Day Demand (L/s) | 0.66 | 0.66 |
| Peak Hour Demand (L/s) | 1.19 | 1.19 |

575 DEALERSHIP DR

Show search results for 575 Dealershi...



Watermain Boundary
Conditions Request
575 Dealership Drive

Proposed Site Connection to
Ex. 200mm dia. PVC WM Stub

Optional Site Connection to
Ex. 200mm dia. PVC WM Stub

Proposed Site Connection to
Ex. 250mm dia. PVC WM Stub

City Fire Hydrant ID:
360013H042 approximately
95m from New Warehouse

City Fire Hydrant ID:
360013H041 approximately
55m from New Warehouse

City Fire Hydrant ID:
360013H040 approximately
45m from New Warehouse

City Fire Hydrant ID:
360013H032 approximately
135m from New Warehouse

575 Dealership Drive
Proposed Warehouse
Development

Ex. 250mm dia. PVC WM

Ex. 250mm dia. PVC WM

40m

-8436873.652 5663073.648 Meters

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines



Novatech Project #: 119123
 Project Name: 575 Dealership Drive
 Date: 11/10/2022
 Input By: S. Matthews
 Reviewed By: D. Blair

Legend

Input by User
 No Information or Input Required

Building Description: 1-Storey Warehouse Building
 Type II - Non-combustible construction

| Step | Input | | Value Used | Total Fire Flow (L/min) | |
|--|---|---|----------------------------|-------------------------|--------|
| Base Fire Flow | | | | | |
| 1 | Construction Material | | Multiplier | 0.8 | |
| | Coefficient related to type of construction C | Type V - Wood frame | 1.5 | | |
| | | 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 | | 30,435 | 31,000 | |
| | A | Building Footprint (m ²) | | | 30,435 |
| | | Number of Floors/Storeys | | | 1 |
| | | Area of structure considered (m ²) | | | 30,435 |
| F | Base fire flow without reductions $F = 220 C (A)^{0.5}$ | 31,000 | | | |
| Reductions or Surcharges | | | | | |
| 3 | Occupancy hazard reduction or surcharge | | Reduction/Surcharge | 31,000 | |
| | (1) | Non-combustible | -25% | | |
| | | Limited combustible | -15% | | |
| | | Combustible | Yes 0% | | |
| | | Free burning | 15% | | |
| Rapid burning | | 25% | | | |
| 4 | Sprinkler Reduction (100% sprinkler coverage of building used) | | Reduction | -15,500 | |
| | (2) | Adequately Designed System (NFPA 13) | Yes -30% | | |
| | | Standard Water Supply | Yes -10% | | |
| | | Fully Supervised System | Yes -10% | | |
| Cumulative Total | | | -50% | | |
| 5 | Exposure Surcharge (cumulative %, Maximum Exposure Adjustment Charge Used) | | Surcharge | 0 | |
| | (3) | North Side | > 45.1m 0% | | |
| | | East Side | > 45.1m 0% | | |
| | | South Side | 30.1- 45 m 0% | | |
| | | West Side | > 45.1m 0% | | |
| Cumulative Total | | | 0% | | |
| Results | | | | | |
| 6 | (1) + (2) + (3) | Total Required Fire Flow, rounded to nearest 1000L/min | | L/min | |
| | | (2,000 L/min < Fire Flow < 45,000 L/min) | | 16,000 | |
| | | | | or | |
| | | or | L/s | 267 | |
| | | or | USGPM | 4,227 | |
| 7 | Storage Volume | Required Duration of Fire Flow (hours) | | Hours | |
| | | Required Volume of Fire Flow (m ³) | | m ³ | |
| | | | | 3.5 | |
| | | | | 3360 | |



FLOW TEST REPORT

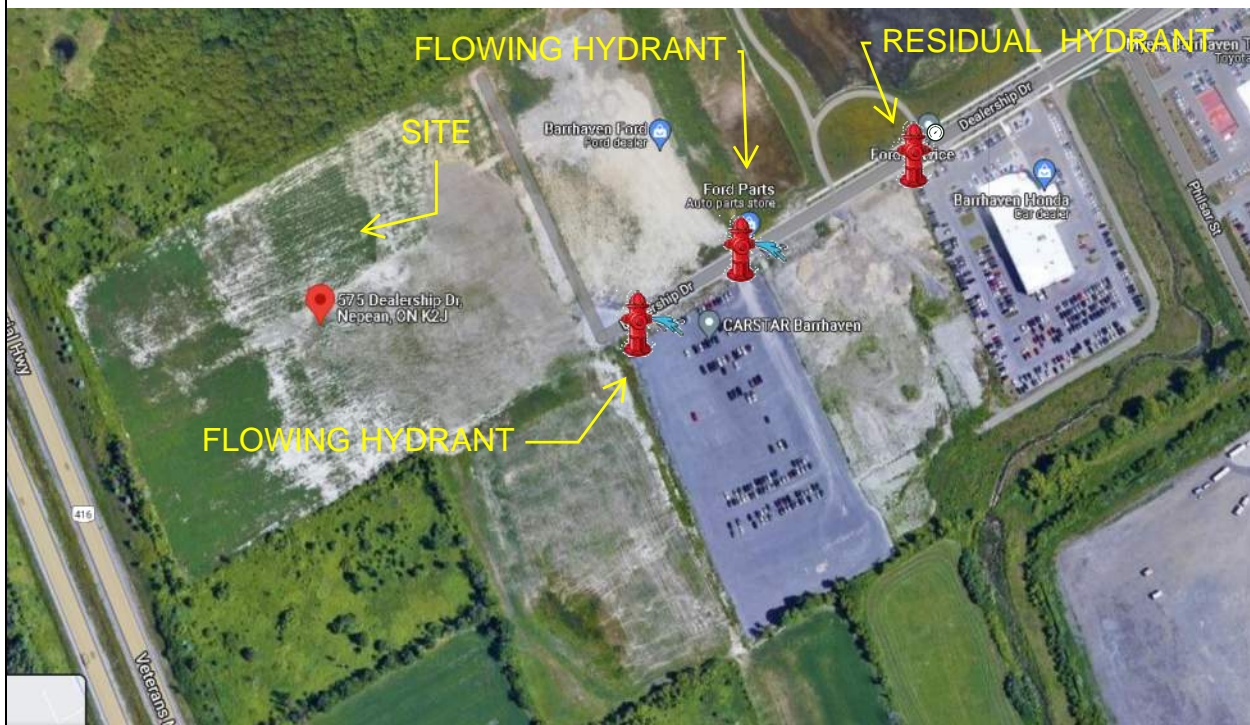
Form SD-003A RevDate: Dec 01, 2021

PROJECT INFORMATION

| | | | |
|--------------------|--------------------------------|-------------------|---------------|
| Project Name: | 575 Dealership Drive Flow Test | Design Project #: | 2022-SSCL-162 |
| Site Address: | 575 Dealership Drive Nepean ON | Const. Project #: | NA |
| City Contact: | City of Ottawa | Phone #: | |
| Flow Tester: | Trevor Brownrigg | Phone #: | |
| Technical Contact: | John Killeen | Phone #: | 416 795-5799 |

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

| ITEMS TO LABEL ON MAP | HYDRANTS USED | MAIN SIZE |
|---|---|-----------|
| <input checked="" type="checkbox"/> Static / Residual & Flow Hydrants | <input checked="" type="checkbox"/> City Hydrant(s) | City: 6" |
| <input type="checkbox"/> Flow Direction (if the main is dead end) | <input type="checkbox"/> Site Hydrant(s) | Site: |

SITE NOTES



FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

TEST INFORMATION

| | | | |
|--------------------------|------------------|------------|---------------|
| Minimum Required Flow: | | Min Ports: | 4 |
| Personnel Present: | Trevor Brownrigg | Test Date: | Nov 07th 2022 |
| City / External Company: | City of Ottawa | Test Time: | 11:00am |

TEST EQUIPMENT

| | |
|---|---|
| <input checked="" type="checkbox"/> Hose Monsters with built in Pitot | Hose length used: 20 ft |
| <input type="checkbox"/> Hand held pitot gauge | <input type="checkbox"/> Pollard diffuser elbow with built in Pitot |
| <input type="checkbox"/> Other: | |

TEST RESULTS

| Number of Ports | Outlet Size (IN) | Discharge Coefficient | Pitot Reading (PSI) | | | | Total Flow (GPM) | Static / Residual Pressure (PSI) |
|-----------------|------------------------|-----------------------|---------------------|----|----|-------|------------------|----------------------------------|
| 0 Ports | STATIC | | | | | | 77 | |
| 1 Port | 2.5 | 0.9 | 38 | | | | 1,035 | 75 |
| 2 Ports | 2.5 | 0.9 | 34 | | 33 | | 1,943 | 74 |
| 3 Ports | 2.5 | 0.9 | 31 | 29 | 29 | 2,742 | 68 | |
| 4 Ports | 2.5 | 0.9 | 27 | 25 | 26 | 25 | 3,407 | 52 |
| 0 Ports | STATIC RE-CHECK | | | | | | 77 | |

TEST NOTES

| |
|--|
| |
|--|

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)

ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)

| | | | |
|--------------------------------|---|--------------------------------------|---|
| Reservoir HGL (m): | | Site Elevation (m): | |
| Theoretical Static Head (PSI): | 0 | PSI to subtract from test pressures: | 0 |

OTHER HYDRAULIC ADJUSTMENTS

| | |
|---|--|
| Other adjustment as required by the City / AHJ: | |
|---|--|

Main Office
2175 Teston Road
Maple Ontario L4W 2A6
Phone : 905-602-5798
www.superiorsprinkler.ca



Calgary Branch
Bay 4, 1826-25th Avenue NE
Calgary AB, T2M 7K1
Phone: 403-464-3486
www.superiorsprinkler.ca

MEMO

To: J. Fede *Leeswood*

From: John Killeen

Re: Firefighting Water Analysis

Date: November 4th 2022

Re: 575 Dealership Drive, Nepean ON

Required Fire Flow Calculations

The following report contains the required fire flows for firefighting based on the **Ontario Building Code** Section A-3.2.5.7 Water Supply (Reference NFPA #13(2013)).

For sprinklered buildings, water supply additional to that required by the sprinkler system should be provided for firefighting using fire hoses in accordance with the hose stream demands and water supply durations for different hazard classifications as specified in NFPA #13 "Installation of Sprinkler Systems".

We are basing our calculations on the following information:

- No high hazardous materials such as aerosols, flammable or combustible liquids will be stored at this location.
- The most hazardous storage commodity will be Cartoned nonexpanded plastics, in a 30'-0" / 32'-0" clear height building with no solid shelves or open top containers.

Based on Table 17.3.3.1 of NFPA#13 (2013) the minimum water supply is as follows:

Sprinkler Design: 12 K16.8 sprinklers flowing at 52 psi + 250 USgpm for hose streams.

Total Water: $Q = K\sqrt{P}$

$$Q = 16.8\sqrt{52}$$

$$Q = 121.1465228 \text{ USgpm} \times 12 = 1453.758273 \text{ USgpm}$$

$$+ 10\% \text{ for system balancing } 145.3758273 \text{ USgpm}$$

$$+ 250 \text{ USgpm for hose streams } \underline{250.0} \text{ USgpm}$$

Total required firefighting water Based on the Ontario Building Code 1849.13 USgpm (6,999.73 Litres/min.)

Please note that based on NFPA #13, Table 12.8.6.1 (Hose Stream Allowance and Water Supply Duration) the above water supply must be available from the municipal water system for a duration of 60 min. (no monitoring).

If any additional information is required, please do not hesitate to contact us.

Should you require any further assistance in this matter, please contact the undersigned at your earliest convenience.

Yours truly,

John Killeen



Main Office
2175 Teston Road
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The following report contains the required fire flows for firefighting based on the **Ontario Building Code** Section A-3.2.5.7 Water Supply (Reference NFPA #13(2013)).

For sprinklered buildings, water supply additional to that required by the sprinkler system should be provided for firefighting using fire hoses in accordance with the hose stream demands and water supply durations for different hazard classifications as specified in NFPA #13 "Installation of Sprinkler Systems".

We are basing our calculations on the following information:

- No high hazardous materials such as aerosols, flammable or combustible liquids will be stored at this location.
- The most hazardous storage commodity will be Cartoned nonexpanded plastics, in a 40'-0" clear height building with no solid shelves or open top containers.

Based on Table 17.3.3.1 of NFPA#13 (2013) the minimum water supply is as follows:

Sprinkler Design: Twelve K=25.2 sprinklers flowing at 40 psi with 250 USgpm for hose Streams.

Total Water: $Q = K\sqrt{P}$
 $Q = 25.2\sqrt{40}$
 $Q = 159.4 \text{ USgpm} \times 12 = 1912.8 \text{ USgpm}$
10% for system balancing 191.2 USgpm
250 USgpm for hose streams 250.0 USgpm

Total required firefighting water 2354 USgpm (8911 Litres/min.)

Please note that based on NFPA #13, Table 12.8.6.1 (Hose Stream Allowance and Water Supply Duration) the above water supply must be available from the municipal water system for a duration of 60 min. (no monitoring).

If any additional information is required, please do not hesitate to contact us.

Should you require any further assistance in this matter, please contact the undersigned at your earliest convenience.

Yours truly,

John Killeen



Domestic Water Demands

Daily Demands from OBC Table 8.2.1.3

| Establishment | Daily Demand Volume | |
|---------------|---------------------|-------------------|
| Industrial : | 150 | L/day/loading bay |
| | 950 | L/day/washroom |
| Office Space | 75 | L/day/9.3sq.m. |

Industrial Peaking Factors City of Ottawa Water Distribution Guidelines

| Conditions | Peaking Factor | |
|-------------|----------------|------------|
| Maximum Day | 1.5 | x Avg. Day |
| Peak Hour | 1.8 | x Max Day |

Proposed Development Conditions

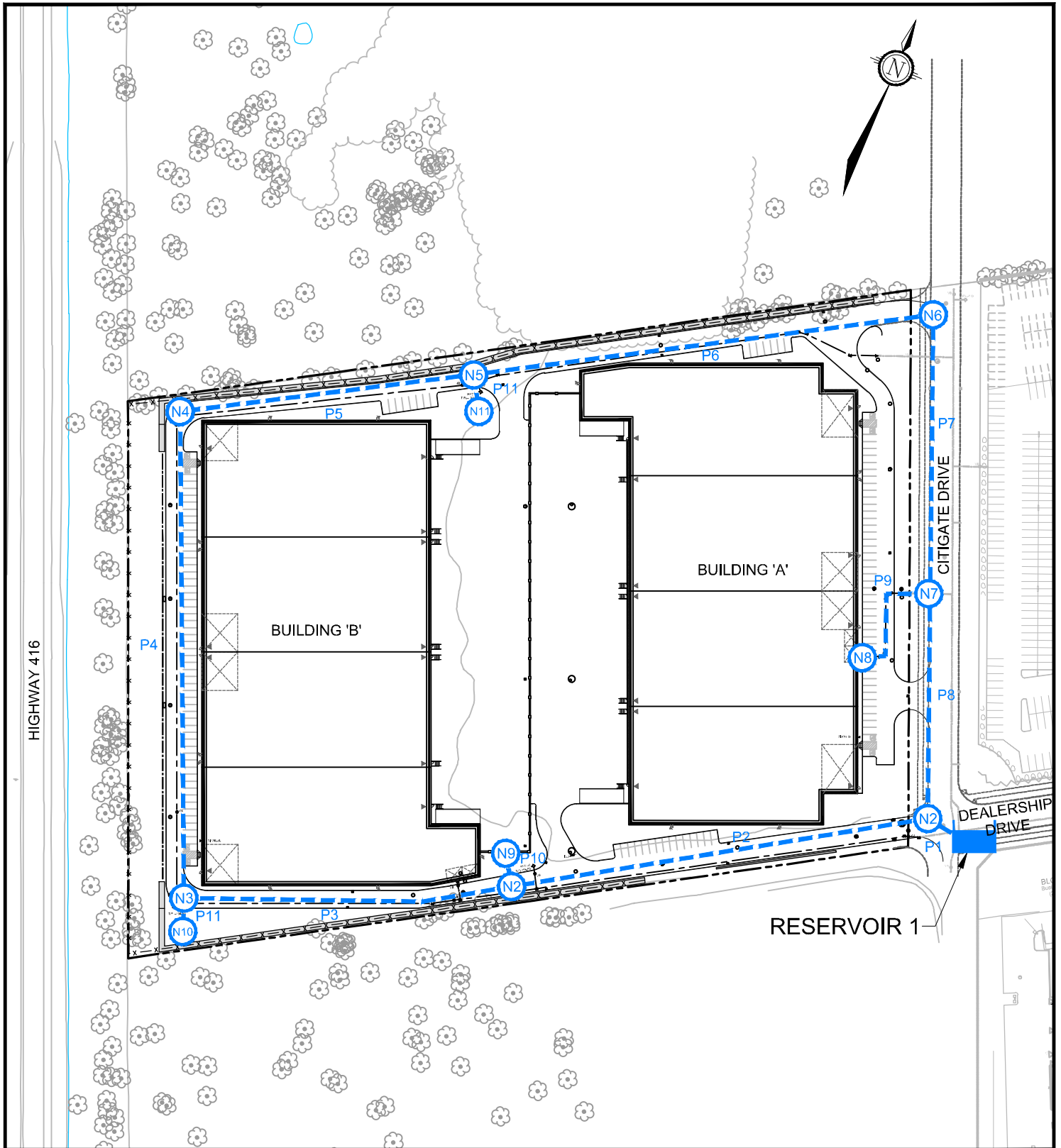
| | Warehouse A | Warehouse B | Totals |
|-----------------------------|-------------|-------------|--------|
| No. Loading Bays | 23 | 23 | 46 |
| No. Washrooms | 20 | 20 | 40 |
| Office Space ~sq. m. | 910 | 850 | 1420 |
| Total Daily Volume (Liters) | 29,789 | 29,305 | 59094 |
| Avg Day Demand (L/s) | 0.34 | 0.34 | 0.68 |
| Max Day Demand (L/s) | 0.52 | 0.51 | 1.03 |
| Peak Hour Demand (L/s) | 0.93 | 0.92 | 1.85 |

MAXIMUM DAY + FIREFLOW DEMAND SUMMARY

Maximum day plus fire flow demand was modeled for node N10.
The following is a summary of the minimum pressures that occurred for this operating condition.

| Fire at Junction | Demand (L/s) | | | Minimum Pressure | | | |
|------------------|---------------|-----------|----------------|------------------|--------|-------|------|
| | Maximum Daily | Fire Flow | Max Day + Fire | (m) | kPa | psi | Node |
| | | | | | | | |
| N10 | 1.03 | 150.00 | 151.03 | 24.06 | 236.03 | 34.23 | N10 |





M:\2019\119123\CAD\Design\Figures\Design Brief\119123-WM-Nodes.dwg, WM Node Network, May 02, 2023 - 5:20pm, bmcwewen



Engineers, Planners & Landscape Architects
 Suite 200, 240 Michael Cowpland Drive
 Ottawa, Ontario, Canada K2M 1P6

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

LEGEND

-  SITE BOUNDARY
-  WATERMAIN NODE ID
-  RESERVOIR
-  WATERMAIN AND LINK ID

575 DEALERSHIP DRIVE

WATERMAIN NODE NETWORK SKETCH

SCALE 1 : 2000 

| | | |
|----------|--------|----------|
| DATE | JOB | FIGURE |
| MAY 2023 | 119123 | WM Nodes |

MAXIMUM DAY + FIREFLOW DEMAND AT 575 DEALERSHIP DRIVE
Downstream Headloss Check To Strandherd Drive

Junction Report

| Node ID | Elevation m | Demand LPS | Head m | Pressure m | Pressure kPa | Pressure psi |
|----------|----------------|---------------|-----------|---------------|-----------------|-----------------|
| Resvr 26 | 142.3 | -160.24 | 142.30 | 0.00 | 0.00 | 0.00 |
| Junc 6 | 96.2 | 0.00 | 134.15 | 37.94 | 372.19 | 53.98 |
| Junc 7 | 96.0 | 0.00 | 127.92 | 31.92 | 313.14 | 45.42 |
| Junc 8 | 95.4 | 0.00 | 126.94 | 31.54 | 309.41 | 44.88 |
| Junc 9 | 94.8 | 0.00 | 126.03 | 31.22 | 306.27 | 44.42 |
| Junc 10 | 95.9 | 0.00 | 125.86 | 30.01 | 294.40 | 42.70 |
| Junc 11 | 95.8 | 0.00 | 123.67 | 27.87 | 273.40 | 39.65 |
| Junc 12 | 95.7 | 0.00 | 122.59 | 26.85 | 263.40 | 38.20 |
| Junc 13 | 95.9 | 0.00 | 120.92 | 24.98 | 245.05 | 35.54 |
| Junc 18 | 95.1 | 1.94 | 134.14 | 39.04 | 382.98 | 55.55 |
| Junc 19 | 94.5 | 1.09 | 126.94 | 32.44 | 318.24 | 46.16 |
| Junc 20 | 93.5 | 0.97 | 126.03 | 32.53 | 319.12 | 46.28 |
| Junc 21 | 95.0 | 0.79 | 125.86 | 30.86 | 302.74 | 43.91 |
| Junc 22 | 95.0 | 0.79 | 123.67 | 28.67 | 281.25 | 40.79 |
| Junc 23 | 95.0 | 1.82 | 120.92 | 25.92 | 254.28 | 36.88 |
| Junc 24 | 95.3 | 0.91 | 120.39 | 25.09 | 246.13 | 35.70 |
| Junc 29 | 95.3 | 0.91 | 119.89 | 24.59 | 241.23 | 34.99 |
| Junc 30 | 96.4 | 150.51 | 118.85 | 22.49 | 220.63 | 32.00 |
| Junc 31 | 96.5 | 0.00 | 118.96 | 22.49 | 220.63 | 32.00 |
| Junc 32 | 96.9 | 0.00 | 119.13 | 22.28 | 218.57 | 31.70 |
| Junc 33 | 96.9 | 0.00 | 119.11 | 22.23 | 218.08 | 31.63 |
| Junc 36 | 96.7 | 0.51 | 119.02 | 22.33 | 219.06 | 31.77 |

| | |
|--|-------------------|
| | Minimum Pressure |
| | Applied Fire Flow |

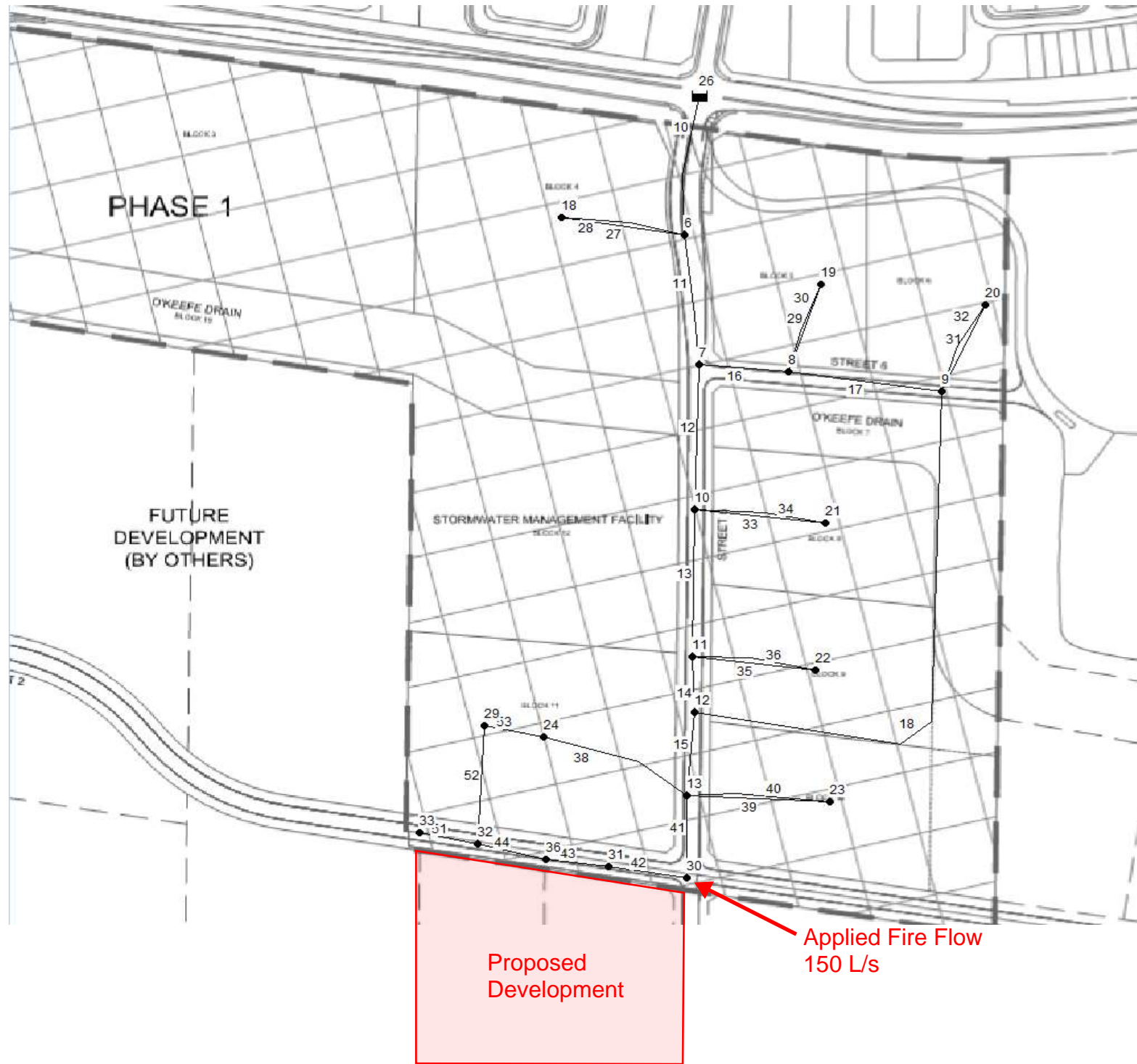
MAXIMUM DAY + FIREFLOW DEMAND AT 575 DEALERSHIP DRIVE
Downstream Headloss Check To Strandherd Drive

Pipe Report

| Link ID | Length m | Diameter mm | Roughness | Flow LPS | Velocity m/s | Headloss m/km | Friction Factor |
|---------|-------------|----------------|-----------|-------------|-----------------|------------------|--------------------|
| Pipe 10 | 160.0 | 250 | 110 | 160.24 | 3.26 | 50.96 | 0.023 |
| Pipe 11 | 125.0 | 250 | 110 | 158.30 | 3.22 | 49.82 | 0.024 |
| Pipe 12 | 102.0 | 250 | 110 | 97.26 | 1.98 | 20.21 | 0.025 |
| Pipe 13 | 110.0 | 250 | 110 | 96.47 | 1.97 | 19.91 | 0.025 |
| Pipe 14 | 55.0 | 250 | 110 | 95.68 | 1.95 | 19.61 | 0.025 |
| Pipe 15 | 35.0 | 250 | 110 | 154.66 | 3.15 | 47.72 | 0.024 |
| Pipe 16 | 115.0 | 250 | 110 | 61.04 | 1.24 | 8.53 | 0.027 |
| Pipe 17 | 110.0 | 250 | 110 | 59.95 | 1.22 | 8.25 | 0.027 |
| Pipe 18 | 430.0 | 250 | 110 | 58.98 | 1.20 | 8.00 | 0.027 |
| Pipe 27 | 100.0 | 200 | 110 | -0.97 | 0.03 | 0.01 | 0.049 |
| Pipe 28 | 100.0 | 200 | 110 | -0.97 | 0.03 | 0.01 | 0.049 |
| Pipe 29 | 80.0 | 200 | 110 | 0.55 | 0.02 | 0.00 | 0.053 |
| Pipe 30 | 80.0 | 200 | 110 | -0.55 | 0.02 | 0.00 | 0.053 |
| Pipe 31 | 80.0 | 200 | 110 | 0.49 | 0.02 | 0.00 | 0.054 |
| Pipe 32 | 80.0 | 200 | 110 | -0.49 | 0.02 | 0.00 | 0.054 |
| Pipe 33 | 80.0 | 200 | 110 | 0.40 | 0.01 | 0.00 | 0.055 |
| Pipe 34 | 80.0 | 200 | 110 | -0.39 | 0.01 | 0.00 | 0.055 |
| Pipe 35 | 80.0 | 200 | 110 | 0.40 | 0.01 | 0.00 | 0.058 |
| Pipe 36 | 80.0 | 200 | 110 | -0.39 | 0.01 | 0.00 | 0.058 |
| Pipe 38 | 50.0 | 200 | 110 | -37.95 | 1.21 | 10.49 | 0.028 |
| Pipe 39 | 80.0 | 200 | 110 | 0.91 | 0.03 | 0.01 | 0.050 |
| Pipe 40 | 80.0 | 200 | 110 | -0.91 | 0.03 | 0.01 | 0.050 |
| Pipe 41 | 75.0 | 250 | 110 | 114.89 | 2.34 | 27.52 | 0.025 |
| Pipe 42 | 65.0 | 250 | 110 | -24.94 | 0.51 | 1.63 | 0.031 |
| Pipe 43 | 40.0 | 250 | 110 | -24.94 | 0.51 | 1.63 | 0.031 |
| Pipe 44 | 60.0 | 250 | 110 | -25.45 | 0.52 | 1.69 | 0.031 |
| Pipe 51 | 40.0 | 250 | 110 | 10.68 | 0.22 | 0.34 | 0.035 |
| Pipe 52 | 80.0 | 200 | 110 | -36.13 | 1.15 | 9.58 | 0.028 |
| Pipe 53 | 50.0 | 200 | 110 | 37.04 | 1.18 | 10.03 | 0.028 |

 Downstream Headloss to Strandheard Drive

MAXIMUM DAY + FIREFLOW DEMAND AT 575 DEALERSHIP DRIVE
Downstream Headloss Check To Strandherd Drive

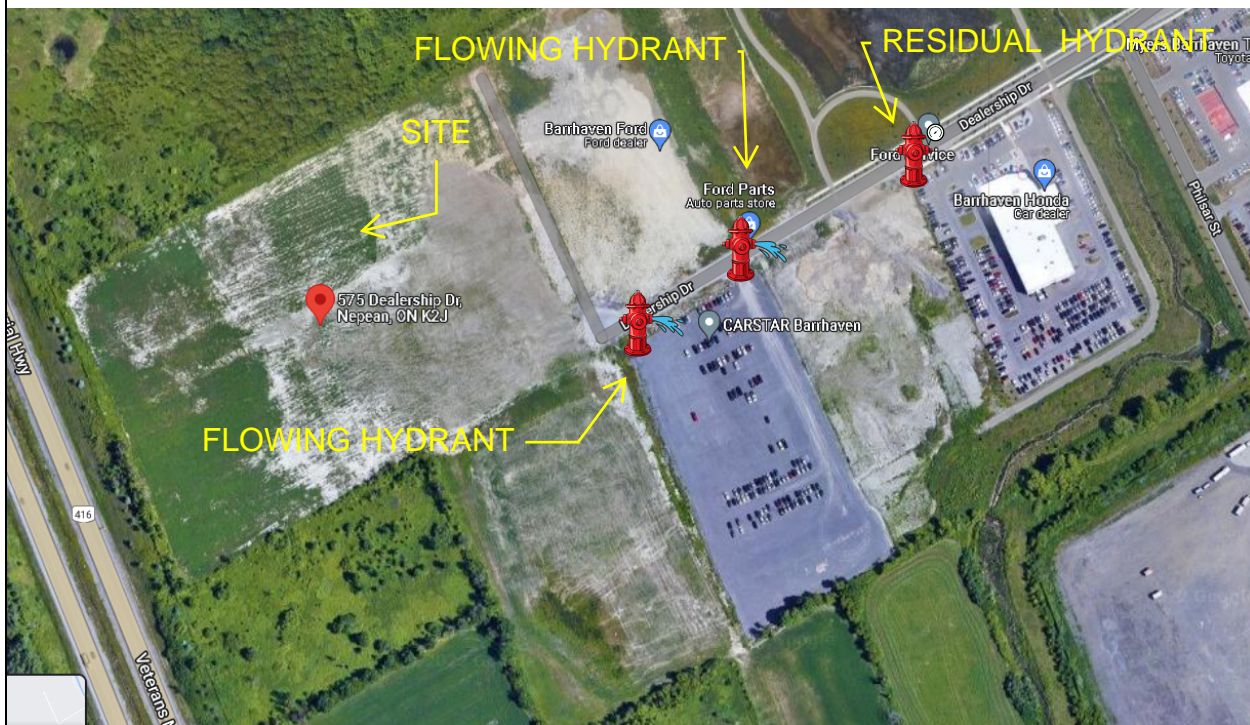


PROJECT INFORMATION

| | | | |
|--------------------|--------------------------------|-------------------|---------------|
| Project Name: | 575 Dealership Drive Flow Test | Design Project #: | 2022-SSCL-162 |
| Site Address: | 575 Dealership Drive Nepean ON | Const. Project #: | NA |
| City Contact: | City of Ottawa | Phone #: | |
| Flow Tester: | Trevor Brownrigg | Phone #: | |
| Technical Contact: | John Killeen | Phone #: | 416 795-5799 |

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

| ITEMS TO LABEL ON MAP | HYDRANTS USED | MAIN SIZE |
|---|---|-----------|
| <input checked="" type="checkbox"/> Static / Residual & Flow Hydrants | <input checked="" type="checkbox"/> City Hydrant(s) | City: 6" |
| <input type="checkbox"/> Flow Direction (if the main is dead end) | <input type="checkbox"/> Site Hydrant(s) | Site: |

SITE NOTES



FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

TEST INFORMATION

| | | | |
|--------------------------|------------------|------------|---------------|
| Minimum Required Flow: | | Min Ports: | 4 |
| Personnel Present: | Trevor Brownrigg | Test Date: | Nov 07th 2022 |
| City / External Company: | City of Ottawa | Test Time: | 11:00am |

TEST EQUIPMENT

| | |
|---|---|
| <input checked="" type="checkbox"/> Hose Monsters with built in Pitot | Hose length used: 20 ft |
| <input type="checkbox"/> Hand held pitot gauge | <input type="checkbox"/> Pollard diffuser elbow with built in Pitot |
| <input type="checkbox"/> Other: | |

TEST RESULTS

| Number of Ports | Outlet Size (IN) | Discharge Coefficient | Pitot Reading (PSI) | | | | Total Flow (GPM) | Static / Residual Pressure (PSI) |
|-----------------|------------------------|-----------------------|---------------------|----|----|-------|------------------|----------------------------------|
| 0 Ports | STATIC | | | | | | | 77 |
| 1 Port | 2.5 | 0.9 | 38 | | | | 1,035 | 75 |
| 2 Ports | 2.5 | 0.9 | 34 | | 33 | | 1,943 | 74 |
| 3 Ports | 2.5 | 0.9 | 31 | 29 | 29 | 2,742 | 68 | |
| 4 Ports | 2.5 | 0.9 | 27 | 25 | 26 | 25 | 3,407 | 52 |
| 0 Ports | STATIC RE-CHECK | | | | | | | 77 |

TEST NOTES

| |
|--|
| |
|--|

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)

ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)

| | | | |
|--------------------------------|---|--------------------------------------|---|
| Reservoir HGL (m): | | Site Elevation (m): | |
| Theoretical Static Head (PSI): | 0 | PSI to subtract from test pressures: | 0 |

OTHER HYDRAULIC ADJUSTMENTS

| | |
|---|--|
| Other adjustment as required by the City / AHJ: | |
|---|--|

Appendix C

Sanitary Servicing

SANITARY SEWER DESIGN SHEET
575 Dealership Drive



PROJECT # : 119123
 DESIGNED BY : BM
 CHECKED BY : DDB
 DATE PREPARED : 3-May-23

| LOCATION | | | | LIGHT INDUSTRIAL | | | | | COMMERCIAL | | | INFILTRATION | | FLOW | | PROPOSED SEWER | | | | | | | | |
|--------------------|------------|-------|---------|------------------|----------------|-------------|------------|----------------|---------------------------------------|---------------------|----------------|-------------------------------------|------------------|------------------------------|-----------------------------|----------------|----------------|--------------|--------------|---------|----------------|--------------------------|------------|---------|
| STREET | FROM MH | TO MH | Area ID | Total Area (ha.) | Loading Bays L | Washrooms W | AREA (ha.) | PEAK FACTOR Mi | PEAK LIGHT INDUSTRIAL FLOW Qind (L/s) | OFFICE AREA (m2) Ao | PEAK FACTOR Mc | PEAK COMM/INST/PARK FLOW Qcom (L/s) | Total Area (ha.) | PEAK EXTRAN. FLOW Qinf (L/s) | PEAK DESIGN FLOW Q(d) (L/s) | LENGTH (m) | PIPE SIZE (mm) | PIPE ID (mm) | TYPE OF PIPE | GRADE % | CAPACITY (L/s) | FULL FLOW VELOCITY (m/s) | Qpeak/Qcap | d/Dfull |
| Building A | | | | | | | | | | | | | | | | | | | | | | | | |
| CitiGate Dr | Building A | MH 07 | | 2.09 | 23 | 20 | 1.48 | 4.6 | 1.20 | 910 | 1.5 | 0.13 | 2.09 | 0.69 | 2.01 | 4.7 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 1.9% | |
| | MH 07 | MH 06 | | | 0 | 0 | 0.00 | 4.6 | 0.00 | 0 | 1.5 | 0.13 | 0.00 | 0.00 | 0.13 | 23.7 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 0.1% | |
| | MH 06 | MH 05 | | 0.00 | 0 | 0 | 0.00 | 4.6 | 0.00 | 0 | 1.5 | 0.13 | 0.00 | 0.00 | 0.13 | 10.1 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 0.1% | |
| Building B | | | | | | | | | | | | | | | | | | | | | | | | |
| Dealership Dr | Building B | MH 04 | | 2.44 | 23 | 20 | 1.52 | 4.6 | 1.20 | 850 | 1.5 | 0.12 | 2.44 | 0.81 | 2.12 | 4.1 | 250 | 254.00 | DR 35 | 2.00 | 87.7 | 1.73 | 2.4% | |
| | MH 04 | MH 03 | | 1.56 | 0 | 0 | 0.00 | 4.6 | 1.20 | 0 | 1.5 | 0.12 | 1.56 | 1.32 | 2.63 | 75.0 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 2.5% | |
| | MH 03 | MH 02 | | 0.12 | 0 | 0 | 0.00 | 4.6 | 1.20 | 0 | 1.5 | 0.12 | 0.12 | 1.36 | 2.67 | 73.0 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 2.5% | |
| | MH 02 | MH 01 | | 0.04 | 0 | 0 | 0.00 | 4.6 | 1.20 | 0 | 1.5 | 0.12 | 0.04 | 1.37 | 2.69 | 19.6 | 250 | 254.00 | DR 35 | 3.00 | 107.5 | 2.12 | 2.5% | |
| Total Flows | | | | | | | | | | | | | | | | | | | | | | | | |

Notes:
 1. $Q(d) = Qind + Qcom + Qinf$
 2. $Qind = (L * 150 + W * 950) * Mi / 86,400$
 3. $Qcom = (Ao / 9.3) * 75 * Mc / 86,400$
 2. $Qinf = 0.33 \text{ L/sec/ha}$

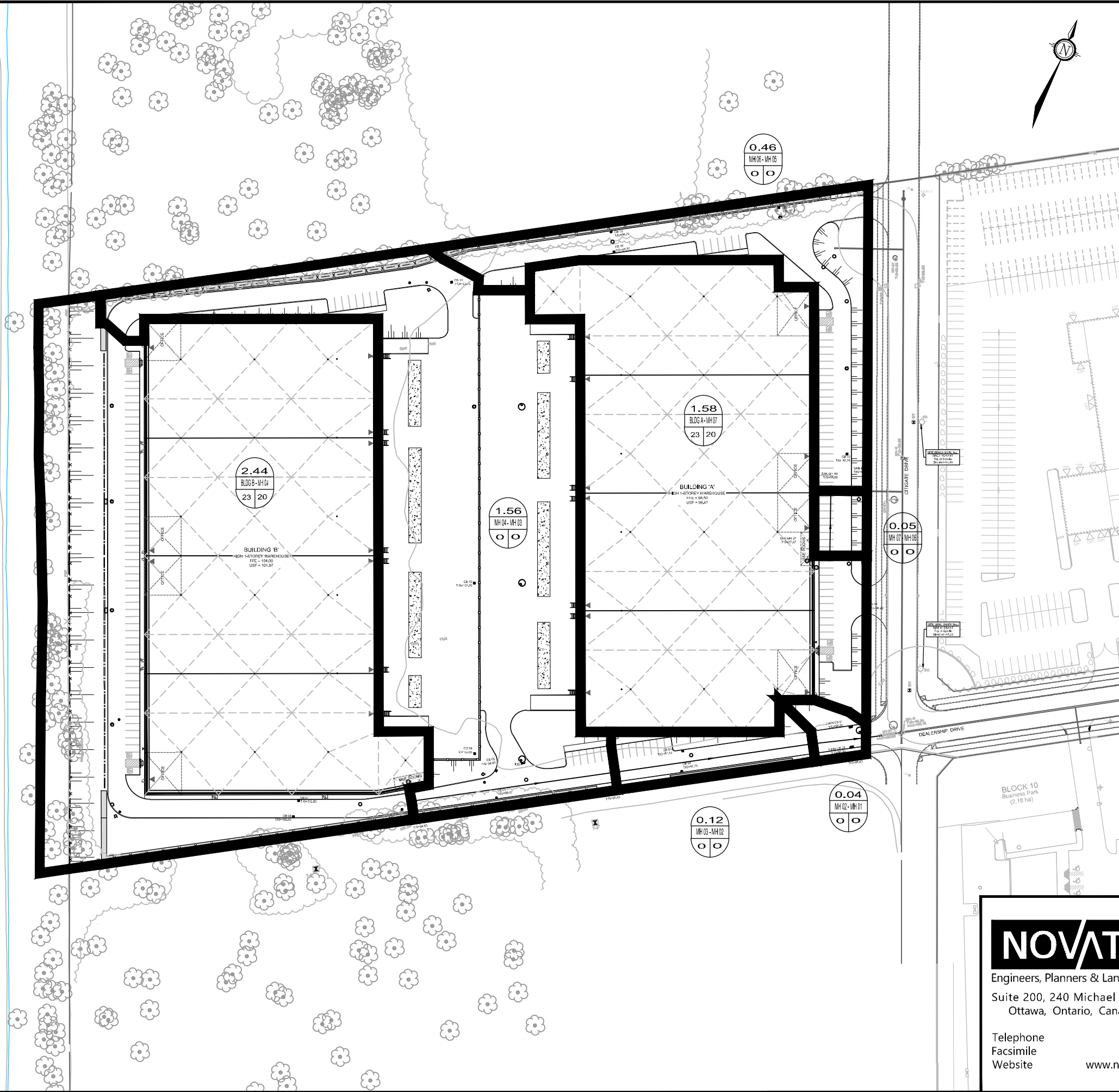
Definitions:
 $Q(d)$ = Design Flow (L/sec)
 $Qind$ = Light Industrial Flow (L/sec)
 $Qcom$ = Commercial Flow (L/sec)
 $Qinf$ = Extraneous Flow (L/sec)

L = No. Loading Bay
W = No. Washroom
Mi = Light Industrial Peak Factor (as per Appendix 4-B.1 of the City of Ottawa Sewer Design Guidelines)
 $Qind = [(150 \text{ L / d / Loading Bay}) + (950 \text{ L / d / Washroom})] * Mi$






Ao = Office Area (m2)
Mc = Commercial Peak Factor = 1.5 (as per City of Ottawa Sewer Design Guidelines)
 $Qcom = (75 \text{ L / d}) * (Ao / 9.3m2) * Mc$

Min pipe size 250mm @ min. slope 0.4%
 Mannings n = 0.013

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LEGEND


-  DRAINAGE AREA I.D.
-  TRIBUTARY DRAINAGE AREA (ha)
-  # LOADING BAYS / # WASHROOMS
-  SANITARY SEWER & FLOW DIRECTION
-  SANITARY DRAINAGE AREA BOUNDARY

NOVATECH
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 Suite 200, 240 Michael Cowpland Drive
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 Website www.novatech-eng.com

575 DEALERSHIP

ON-SITE SANITARY DRAINAGE AREAS

SCALE 1 : 1500 

DATE MAY 2023 JOB 119123 FIGURE SAN-1

Proposed Peak Sanitary Flows

Daily Demands from OBC Table 8.2.1.3

| Type of Use | Daily Demand Volume | |
|---------------------------|---------------------|--------------------------------|
| Industrial (warehouse) | 150 | L/day/loading bay |
| | 950 | L/day/washroom |
| Commercial (office Space) | 75 | L/ day/ 9.3 m2 of Office Space |

Industrial & Commercial Sanitary Peaking Factors

| Conditions | Peaking Factor |
|------------------------------|----------------|
| Office Space/Commercial | 1.5 |
| Light Industrial (warehouse) | 4.6 |

Proposed Development Conditions

| | Building A | Building B |
|--|-------------|-------------|
| No. Loading Bays | 23 | 23 |
| No. Washrooms | 20 | 20 |
| Peak Industrial Flows (L/s) | 1.20 | 1.20 |
| Office Space ~sq. m. | 910 | 850 |
| Peak Commercial Flows (L/s) | 0.13 | 0.12 |
| Site Area (ha) | 2.09 | 4.17 |
| Extraneous Flows (0.33 L/s/ha) | 0.69 | 1.38 |
| Total Peak Sanitary Flows (L/s) | 2.01 | 2.69 |

LEGEND

- 0.36 — DRAINAGE AREA (hectares)
- 4-A — AREA ID
- 305-307 — MANHOLE TO MANHOLE
- SANITARY DRAINAGE AREA BOUNDARY
- ▲ — SANITARY SERVICE LOCATION
- PROPOSED SANITARY MANHOLE AND PIPE (WITH FLOW DIRECTION)

REFER TO DRAWING 109203-CG-NTB FOR NOTES AND TABLES

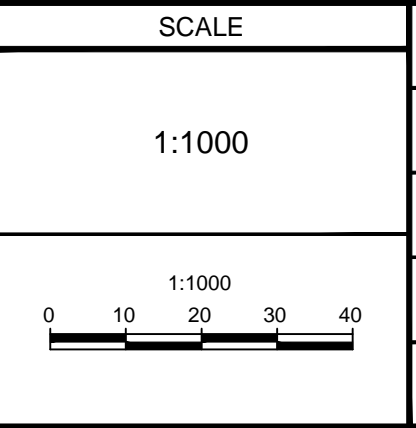
SEE DRAWING No. 109203-CG-SAN1



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



| No. | REVISION | DATE | BY |
|-----|--|------------|-----|
| 4. | ISSUED FOR SWM APPROVAL | AUG 10/14 | MER |
| 3. | ISSUED FOR APPROVAL | JUL 23/14 | MER |
| 2. | REV. PER CITY COMMENTS / ISS. FOR MDE APPROVAL | JUNE 27/14 | MER |
| 1. | ISSUED FOR CITY REVIEW | MAR 31/14 | MER |



DESIGN LAB

CHECKED: MER

DRAWN: MTM/BET

CHECKED: MER

APPROVED: JGR

PROFESSIONAL ENGINEER
 M.E. MIDDLETT
 100040125
 REG. NO. OF ONTARIO

PROFESSIONAL ENGINEER
 J.G. RIDDELL
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 Telephone: (613) 254-9643
 Facsimile: (613) 254-5867
 Website: www.novatech-eng.com

LOCATION
 CITY OF OTTAWA
 CITI GATE 416 CORPORATE CAMPUS

DRAWING NAME
SANITARY DRAINAGE AREA PLAN (OUTLET B)

PROJECT No.: 109203-00
 REV: 4
 DRAWING No.: 109203-CG-SAN2

C:\Users\109203\Documents\109203-CG-SAN.dwg SAN.dwg SA02 Aug 11, 2014 - 6:03pm thurday

NOVATECH FILE NO.: 109203-0
 CITY FILE NO.: D07-16-12-0023
 DESIGNED BY: LAB
 CHECKED BY: MER/MSP
 PREPARED March 31, 2014
 REVISED: August 10, 2014
 REVISED: September 25, 2015

SANITARY SEWER DESIGN SHEET
 Citi Gate 416 Corporate Campus
 Phase 1 - As-Built



AS-BUILT

| Location | | | | | | Wastewater Flow Q(w) | | Extraneous Flow Q(i) | | Design Flow Q(d) | Proposed Sanitary Sewer | | | | | | |
|---|--------------------|--------------|---------|-------|-----------|---|---------------------------------|--|------------------------------------|------------------------|-------------------------|----------------|--------------|---------|----------------|--------------------------|------------------------|
| Area I.D. | Street | Block Number | From MH | To MH | Area (ha) | Individual Peak Flow Rate 50,000 L/ha/d (L/s) | Cumulative Peak Flow Rate (L/s) | Individual Infiltration Rate 0.28 L/s/ha (L/s) | Cumulative Infiltration Rate (L/s) | Peak Design Flow (L/s) | Length (m) | Pipe Size (mm) | Type of Pipe | Grade % | Capacity (L/s) | Full Flow Velocity (m/s) | Percentage of Capacity |
| Sanitary Outlet A to Strandherd Drive at Maravista Drive | | | | | | | | | | | | | | | | | |
| Plan Reference: Sanitary Drainage Area Plan (109203-CG-SAN1) | | | | | | | | | | | | | | | | | |
| A-1 | Nortel Drive | | 201 | 203 | 0.40 | 0.35 | 0.35 | 0.11 | 0.11 | 0.46 | | | | | | | |
| A-2 | Nortel Drive | Block 1 | 201 | 203 | 3.49 | 3.03 | 3.38 | 0.98 | 1.09 | 4.47 | | | | | | | |
| A-3 | Nortel Drive | Block 16 | 201 | 203 | 2.50 | 2.17 | 5.55 | 0.70 | 1.79 | 7.34 | | | | | | | |
| A-4 | Nortel Drive | | 201 | 203 | 0.09 | 0.08 | 5.63 | 0.03 | 1.81 | 7.44 | 36.0 | 250 | PVC | 0.53 | 45.16 | 0.89 | 16% |
| A-5 | Nortel Drive | | 203 | 205 | 0.13 | 0.11 | 5.74 | 0.04 | 1.85 | 7.59 | 57.5 | 250 | PVC | 0.28 | 32.83 | 0.65 | 23% |
| A-6 | Nortel Drive | Block 17 | 205 | 101 | 1.17 | 1.02 | 6.75 | 0.33 | 2.18 | 8.93 | | | | | | | |
| A-7 | Nortel Drive | | 205 | 101 | 0.20 | 0.17 | 6.93 | 0.06 | 2.23 | 9.16 | 37.3 | 250 | PVC | 0.21 | 28.43 | 0.56 | 32% |
| A-9 | Crosskey Place | | 101 | 207 | 0.92 | 0.80 | 7.73 | 0.26 | 7.54 | 15.27 | | | | | | | |
| A-8 | Crosskey Place | Block 14 | 101 | 207 | 18.03 | 15.65 | 23.38 | 5.05 | 5.05 | 28.43 | 29.0 | 300 | PVC | 0.17 | 41.59 | 0.57 | 68% |
| A-10 | Nortel Drive | Block 15 | 207 | 209 | 7.98 | 6.93 | 30.30 | 2.23 | 9.77 | 40.08 | | | | | | | |
| A-11 | Nortel Drive | | 207 | 209 | 0.30 | 0.26 | 30.56 | 0.08 | 9.86 | 40.42 | 106.5 | 300 | PVC | 0.27 | 52.42 | 0.72 | 77% |
| A-12 | Nortel Drive | | 209 | 211 | 0.31 | 0.27 | 30.83 | 0.09 | 9.95 | 40.78 | 118.8 | 300 | PVC | 0.29 | 54.33 | 0.74 | 75% |
| A-13 | Nortel Drive | | 211 | 213 | 0.31 | 0.27 | 31.10 | 0.09 | 10.03 | 41.13 | 114.6 | 300 | PVC | 0.22 | 47.32 | 0.65 | 87% |
| A-14 | Systemhouse Street | | 213 | 401 | 0.07 | 0.06 | 31.16 | 0.02 | 10.05 | 41.22 | 26.4 | 300 | PVC | 0.23 | 48.38 | 0.66 | 85% |
| A-15 | Systemhouse Street | | 401 | 403 | 0.21 | 0.18 | 31.35 | 0.06 | 10.11 | 41.46 | 86.8 | 300 | PVC | 0.28 | 53.38 | 0.73 | 78% |
| A-16 | Systemhouse Street | | 403 | 405 | 0.29 | 0.25 | 31.60 | 0.08 | 10.19 | 41.79 | 118.8 | 300 | PVC | 0.32 | 57.07 | 0.78 | 73% |
| A-17 | Systemhouse Street | Block 18 | 405 | 407 | 2.29 | 1.99 | 33.59 | 0.64 | 10.83 | 44.42 | | | | | | | |
| A-18 | Systemhouse Street | | 405 | 407 | 0.20 | 0.17 | 33.76 | 0.06 | 10.89 | 44.65 | 80.4 | 375 | PVC | 0.14 | 68.44 | 0.60 | 65% |
| A-19 | Systemhouse Street | Block 2 | 407 | 409 | 11.95 | 10.37 | 44.13 | 3.35 | 14.24 | 58.37 | | | | | | | |
| A-20 | Systemhouse Street | Block 3 | 407 | 409 | 5.28 | 4.58 | 48.72 | 1.48 | 15.71 | 64.43 | | | | | | | |
| A-21 | Systemhouse Street | | 407 | 409 | 0.30 | 0.26 | 48.98 | 0.08 | 15.80 | 64.77 | 117.2 | 375 | PVC | 0.25 | 91.46 | 0.80 | 71% |
| A-22 | Systemhouse Street | | 409 | 101 | 0.16 | 0.14 | 49.11 | 0.04 | 15.84 | 64.96 | 54.8 | 375 | PVC | 0.24 | 89.61 | 0.79 | 72% |
| | | | | | | | | | | 64.96 | | | | | | | |

56.58

Notes:

1. $Q(d) = Q(w) + Q(i)$, where
2. $Q(i) = 0.28 \text{ L/s/ha}$
3. Peaking Factor = 1.5

Legend

- $Q(d)$ = Design Flow (L/s)
 $Q(w)$ = Peak Wastewater Flow (L/s)
 $Q(i)$ = Extraneous Flow (L/s)
- 0.20** As-built pipe grade (%) or length (m)



NOVATECH FILE NO.: 109203-0
 CITY FILE NO.: D07-16-12-0023
 DESIGNED BY: LAB
 CHECKED BY: MER/MSP
 DATE (Issued with report): March 31, 2014
 REVISED : August 10, 2014
 REVISED : September 25, 2015

SANITARY SEWER DESIGN SHEET
 Citi Gate 416 Corporate Campus
 Phase 1 - As-Built



AS-BUILT

| Area I.D. | Location | | | | | Wastewater Flow Q(w) | | Extraneous Flow Q(i) | | Design Flow Q(d) | Proposed Sanitary Sewer | | | | | | |
|---|------------------------|-----------------------|---------|-------|-----------|---|---------------------------------|--|------------------------------------|------------------------|-------------------------|----------------|--------------|---------|----------------|--------------------------|------------------------|
| | Street | Block Number | From MH | To MH | Area (ha) | Individual Peak Flow Rate 50,000 L/ha/d (L/s) | Cumulative Peak Flow Rate (L/s) | Individual Infiltration Rate 0.28 L/s/ha (L/s) | Cumulative Infiltration Rate (L/s) | Peak Design Flow (L/s) | Length (m) | Pipe Size (mm) | Type of Pipe | Grade % | Capacity (L/s) | Full Flow Velocity (m/s) | Percentage of Capacity |
| Sanitary Outlet B to Strandherd Drive at Kennevale Drive Reference: Sanitary Drainage Area Plan (109203-CG-SAN2) | | | | | | | | | | | | | | | | | |
| Plan | | | | | | | | | | | | | | | | | |
| C-1 | Nortel Drive | Lands Owned by Others | Fut | 501 | 22.68 | 19.69 | 19.69 | 6.35 | 6.35 | 26.04 | 4.0 | 300 | PVC | 0.20 | 45.12 | 0.62 | 58% |
| B-1 | Dealership Street | Lands Owned by Others | Fut | 501 | 27.06 | 23.49 | 23.49 | 7.58 | 7.58 | 31.07 | 12.5 | 300 | PVC | 0.20 | 45.12 | 0.62 | 69% |
| B-2 | Dealership Street | Block 11 | 501 | 503 | 2.72 | 2.36 | 45.54 | 0.76 | 14.69 | 60.23 | | | | | | | |
| B-3 | Dealership Street | Block 10 | 501 | 503 | 2.14 | 1.86 | 47.40 | 0.60 | 15.29 | 62.68 | | | | | | | |
| B-4 | Dealership Street | | 501 | 503 | 0.28 | 0.24 | 47.64 | 0.08 | 15.37 | 63.01 | 119.5 | 450 | PVC | 0.14 | 111.29 | 0.68 | 57% |
| B-5 | Dealership Street | Block 9 | 503 | 505 | 1.84 | 1.60 | 49.24 | 0.52 | 15.88 | 65.12 | | | | | | | |
| B-6 | Dealership Street | | 503 | 505 | 0.29 | 0.25 | 49.49 | 0.08 | 15.96 | 65.45 | 119.2 | 450 | PVC | 0.16 | 118.97 | 0.72 | 55% |
| B-7 | Dealership Street | Block 12 (SWM) | 505 | 507 | 3.20 | 2.78 | 52.27 | 0.90 | 16.86 | 69.12 | | | | | | | |
| B-8 | Dealership Street | Block 8 | 505 | 507 | 1.64 | 1.42 | 53.69 | 0.46 | 17.32 | 71.01 | | | | | | | |
| B-9 | Dealership Street | | 505 | 507 | 0.20 | 0.17 | 53.86 | 0.06 | 17.37 | 71.24 | 85.7 | 450 | PVC | 0.12 | 103.03 | 0.63 | 69% |
| B-10 | Dealership Street | Block 19 | 507 | 509 | 2.51 | 2.18 | 56.04 | 0.70 | 18.08 | 74.12 | | | | | | | |
| B-11 | Dealership Street | | 507 | 509 | 0.13 | 0.11 | 56.15 | 0.04 | 18.11 | 74.27 | 55.9 | 450 | PVC | 0.16 | 118.97 | 0.72 | 62% |
| B-12 | Philsar Street | Block 6 | 603 | 601 | 1.62 | 1.41 | 1.41 | 0.45 | 0.45 | 1.86 | | | | | | | |
| B-13 | Philsar Street | | 603 | 601 | 0.23 | 0.20 | 1.61 | 0.06 | 0.52 | 2.12 | 41.2 | 250 | PVC | 0.19 | 27.04 | 0.53 | 8% |
| B-15 | Philsar Street | | 601 | 509 | 0.19 | 0.16 | 1.77 | 0.05 | 0.57 | 2.34 | 101.2 | 250 | PVC | 0.25 | 31.02 | 0.61 | 8% |
| B-16 | Dealership Street | Block 4 | 509 | 511 | 3.39 | 2.94 | 60.87 | 0.95 | 19.63 | 80.50 | | | | | | | |
| B-17 | Dealership Street | | 509 | 511 | 0.24 | 0.21 | 61.08 | 0.07 | 19.70 | 80.78 | 99.5 | 450 | PVC | 0.17 | 122.63 | 0.75 | 66% |
| B-14 | Dealership Street | Block 5 | 511 | 513 | 2.14 | 1.86 | 62.93 | 0.60 | 20.30 | 83.23 | | | | | | | |
| B-18 | Dealership Street | | 511 | 513 | 0.20 | 0.17 | 63.11 | 0.06 | 20.36 | 83.46 | 75.9 | 450 | PVC | 0.20 | 133.02 | 0.81 | 63% |
| B-19 | Outlet to Lift Station | | 513 | 515 | 0.04 | 0.03 | 63.14 | 0.01 | 20.37 | 83.51 | 35.5 | 450 | PVC | 0.42 | 192.76 | 1.17 | 43% |

72.74

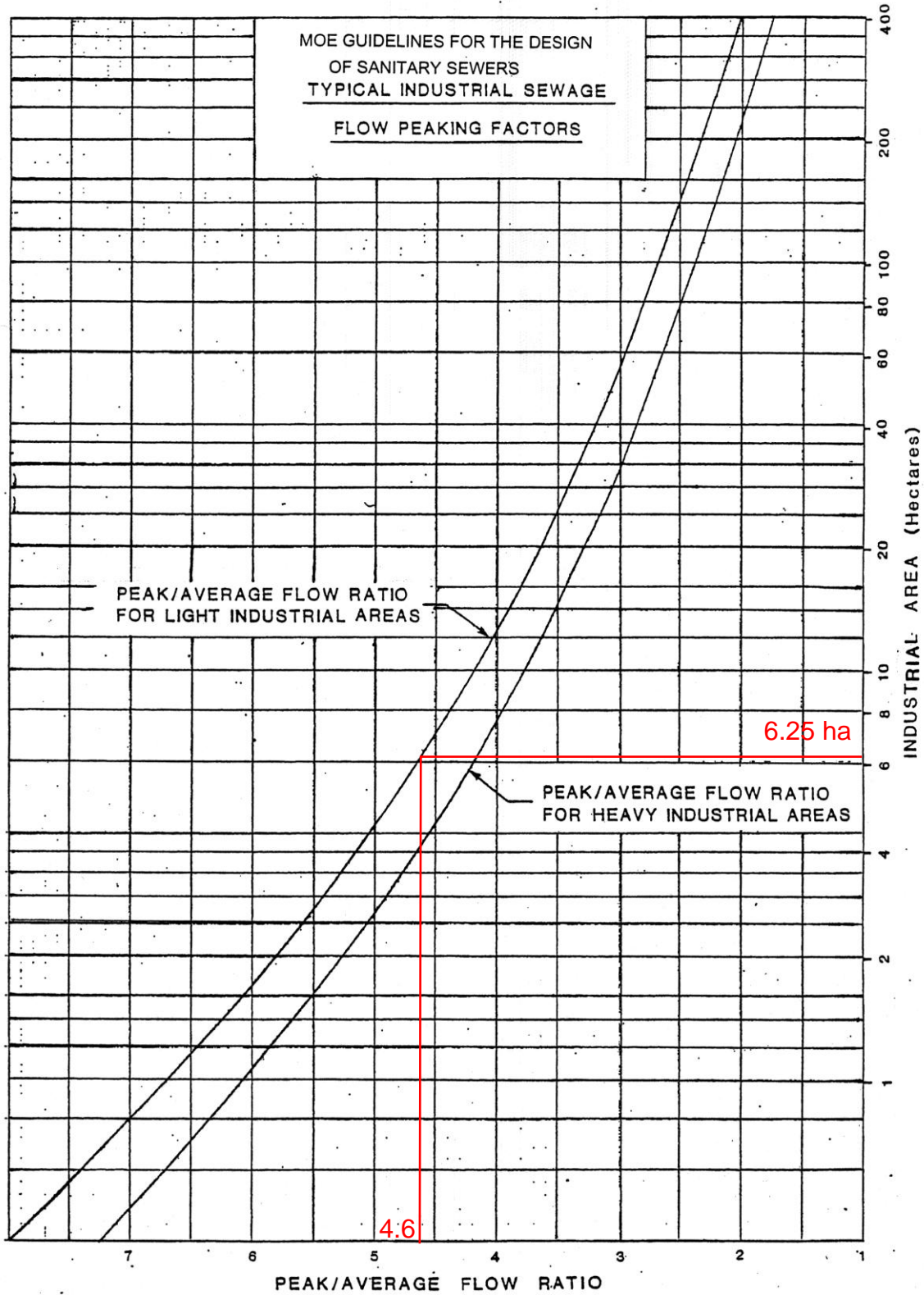
Notes:

1. $Q(d) = Q(w) + Q(i)$, where
2. $Q(i) = 0.28 \text{ L/s/ha}$
3. Peaking Factor = 1.5

Legend:

- $Q(d)$ = Design Flow (L/s)
 $Q(w)$ = Peak Wastewater Flow (L/s)
 $Q(i)$ = Extraneous Flow (L/s)
- 0.20** As-built pipe grade (%) or length (m)





Appendix D

Storm Servicing and Stormwater Management

STORM SEWER DESIGN SHEET
575 Dealership Drive Servicing Strategy
 FLOW RATES BASED ON RATIONAL METHOD



| LOCATION | | | AREA (ha) | | | FLOW | | | | | | | | TOTAL FLOW | SEWER DATA | | | | | | | | | |
|---|--------------|------------|-----------|------|---------|---------------|---------------|-----------------------|-----------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------|--------------------------|-----------------|-----------|------|-----------|------------|----------------|----------------|-----------------|----------------|-----|
| Catchment ID | From Manhole | To Manhole | Area (ha) | C | AC (ha) | Indiv 2.78 AC | Accum 2.78 AC | Time of Concentration | Rainfall Intensity 2 Year (mm/hr) | Rainfall Intensity 5 Year (mm/hr) | Rainfall Intensity 10 Year (mm/hr) | Rainfall Intensity 100 Year (mm/hr) | Peak Flow (L/s) | Total Peak Flow, Q (L/s) | Dia. (m) Actual | Dia. (mm) | Type | Slope (%) | Length (m) | Capacity (L/s) | Velocity (m/s) | Flow Time (min) | Ratio Q/Q full | |
| NORTH CORNER OF SUBJECT SITE TO CITIGATE DRIVE | | | | | | | | | | | | | | | | | | | | | | | | |
| AREA 4-1 | CB 13 | CBMH 06 | 0.04 | 0.90 | 0.04 | 0.000 | 0.000 | 10.00 | | | | | | 10 | 10 | 0.254 | 250 | PVC | 1.00 | 30.9 | 62.0 | 1.22 | 0.42 | 17% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 4-2 | CBMH 06 | MH 13 | 0.05 | 0.90 | 0.05 | 0.000 | 0.000 | 10.42 | | | | | | 23.0 | 23 | 0.305 | 300 | PVC | 1.30 | 24.4 | 114.9 | 1.58 | 0.26 | 20% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | | | | | | | | | | |
| | MH 13 | MH 12 | | | 0.00 | 0.000 | 0.000 | 10.68 | | | | | | 23 | 23 | 0.381 | 375 | PVC | 3.00 | 15.1 | 316.6 | 2.78 | 0.09 | 7% |
| | | | | | 0.00 | 0.000 | 0.225 | 10.68 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.68 | | | | | | | | | | | | | | | | |
| | | | | | | | | 10.77 | | | | | | | | | | | | | | | | |
| AREA 4-3 | MH 14 | CBMH 07 | 0.09 | 0.70 | 0.06 | 0.000 | 0.000 | 10.00 | | | | | | 18.2 | 18 | 0.305 | 300 | PVC | 3.00 | 61.8 | 174.6 | 2.39 | 0.43 | 10% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 4-4 | CBMH 07 | MH 12 | 0.18 | 0.72 | 0.13 | 0.000 | 0.000 | 10.43 | | | | | | 54.6 | 55 | 0.381 | 375 | PVC | 2.00 | 24.0 | 258.5 | 2.27 | 0.18 | 21% |
| | | | | | 0.00 | 0.000 | 0.535 | 10.43 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.43 | | | | | | | | | | | | | | | | |
| | | | | | | | | 10.61 | | | | | | | | | | | | | | | | |
| | MH 12 | MH 11 | | | 0.00 | 0.000 | 0.000 | 10.77 | | | | | | 76 | 76 | 0.457 | 450 | Conc | 2.00 | 5.6 | 420.3 | 2.56 | 0.04 | 18% |
| | | | | | 0.00 | 0.000 | 0.761 | 10.77 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.77 | | | | | | | | | | | | | | | | |
| | MH 11 | EX STM MH | | | 0.00 | 0.000 | 0.000 | 10.81 | | | | | | 76.2 | 76 | 0.533 | 525 | Conc | 0.60 | 20.5 | 347.3 | 1.55 | 0.22 | 22% |
| | | | | | 0.00 | 0.000 | 0.761 | 10.81 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.81 | | | | | | | | | | | | | | | | |
| | | | | | | | | 11.03 | | | | | | | | | | | | | | | | |

STORM SEWER DESIGN SHEET
575 Dealership Drive Servicing Strategy
 FLOW RATES BASED ON RATIONAL METHOD



| LOCATION | | | AREA (ha) | | | FLOW | | | | | | | | TOTAL FLOW | SEWER DATA | | | | | | | | | |
|--|--------------|------------------|-----------|------|---------|---------------|---------------|-----------------------|-----------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------|--------------------------|-----------------|-----------|------|-----------|------------|----------------|----------------|-----------------|----------------|-----|
| Catchment ID | From Manhole | To Manhole | Area (ha) | C | AC (ha) | Indiv 2.78 AC | Accum 2.78 AC | Time of Concentration | Rainfall Intensity 2 Year (mm/hr) | Rainfall Intensity 5 Year (mm/hr) | Rainfall Intensity 10 Year (mm/hr) | Rainfall Intensity 100 Year (mm/hr) | Peak Flow (L/s) | Total Peak Flow, Q (L/s) | Dia. (m) Actual | Dia. (mm) | Type | Slope (%) | Length (m) | Capacity (L/s) | Velocity (m/s) | Flow Time (min) | Ratio Q/Q full | |
| BUILDING A ROOF TO CITIGATE DRIVE | | | | | | | | | | | | | | | | | | | | | | | | |
| ** AREA 3-RA ** | BUILDING A | MH 10 | 1.48 | 0.90 | 1.33 | 0.000 | 0.000 | 10.00 | | | | | | 386 | 28.5 | 0.305 | 300 | PVC | 2.00 | 11.7 | 142.5 | 1.95 | 0.10 | 20% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 3-1 | MH 10 | MH 09 | 0.10 | 0.90 | 0.09 | 0.000 | 0.250 | 10.10 | | | | | | 26 | 54 | 0.305 | 300 | PVC | 0.50 | 23.8 | 71.3 | 0.98 | 0.41 | 76% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.10 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.10 | | | | | | | | | | | | | | | | |
| | MH 09 | EX STM MHST81658 | | | 0.00 | 0.000 | 0.250 | 10.51 | | | | | | 25 | 54 | 0.533 | 525 | Conc | 0.60 | 12.9 | 347.3 | 1.55 | 0.14 | 16% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.51 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.51 | | | | | | | | | | | | | | | | |
| | | | | | | | | 10.64 | | | | | | | | | | | | | | | | |
| BUILDING B PARKING LOT, BUILDING B ROOF, LOADING DOCK TO DEALERSHIP DRIVE | | | | | | | | | | | | | | | | | | | | | | | | |
| AREA 1-1 | CBMH 04 | CBMH 03 | 0.19 | 0.41 | 0.08 | 0.000 | 0.217 | 10.00 | | | | | | 23 | 23 | 0.305 | 300 | PVC | 1.00 | 34.5 | 100.8 | 1.38 | 0.42 | 22% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 1-2 | CBMH 03 | CBMH 02 | 0.15 | 0.45 | 0.07 | 0.000 | 0.188 | 10.42 | | | | | | 41 | 41 | 0.305 | 300 | PVC | 1.00 | 39.6 | 100.8 | 1.38 | 0.48 | 41% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | | | | | | | | | | |
| AREA 1-3 | CBMH 02 | CBMH 01 | 0.15 | 0.45 | 0.07 | 0.000 | 0.188 | 10.89 | | | | | | 59 | 59 | 0.305 | 300 | PVC | 1.00 | 41.7 | 100.8 | 1.38 | 0.50 | 59% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.89 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.89 | | | | | | | | | | | | | | | | |
| AREA 1-4 | CBMH 01 | MH 05 | 0.23 | 0.37 | 0.09 | 0.000 | 0.237 | 11.40 | | | | | | 81 | 81 | 0.381 | 375 | PVC | 1.00 | 29.2 | 182.8 | 1.60 | 0.30 | 44% |
| | | | | | 0.00 | 0.000 | 0.000 | 11.40 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 11.40 | | | | | | | | | | | | | | | | |
| AREA 2-1 | MH 05 | MH 04 | 0.15 | 0.54 | 0.08 | 0.000 | 0.225 | 11.70 | | | | | | 101 | 101 | 0.381 | 375 | PVC | 3.00 | 90.5 | 316.6 | 2.78 | 0.54 | 32% |
| | | | | | 0.00 | 0.000 | 0.000 | 11.70 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 11.70 | | | | | | | | | | | | | | | | |
| ** AREA 2-RB ** | MH 04 | MH 03 | 1.52 | 0.90 | 1.37 | 0.000 | 3.803 | 10.00 | | | | | | 396 | 28.6 | 0.381 | 375 | PVC | 3.00 | 61.2 | 316.6 | 2.78 | 0.37 | 56% |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 2-2 | | | 0.13 | 0.67 | 0.09 | 0.000 | 0.242 | 12.24 | | | | | | 121 | 150 | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 12.24 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 12.24 | | | | | | | | | | | | | | | | |
| | | | | | | | | 12.61 | | | | | | | | | | | | | | | | |

STORM SEWER DESIGN SHEET
575 Dealership Drive Servicing Strategy
 FLOW RATES BASED ON RATIONAL METHOD



| LOCATION | | | AREA (ha) | | | FLOW | | | | | | | | TOTAL FLOW | SEWER DATA | | | | | | | | | |
|----------------|--------------|------------|-----------|------|---------|---------------|---------------|-----------------------|-----------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------|--------------------------|-----------------|-----------|------|-----------|------------|----------------|----------------|-----------------|----------------|-----|
| Catchment ID | From Manhole | To Manhole | Area (ha) | C | AC (ha) | Indiv 2.78 AC | Accum 2.78 AC | Time of Concentration | Rainfall Intensity 2 Year (mm/hr) | Rainfall Intensity 5 Year (mm/hr) | Rainfall Intensity 10 Year (mm/hr) | Rainfall Intensity 100 Year (mm/hr) | Peak Flow (L/s) | Total Peak Flow, Q (L/s) | Dia. (m) Actual | Dia. (mm) | Type | Slope (%) | Length (m) | Capacity (L/s) | Velocity (m/s) | Flow Time (min) | Ratio Q/Q full | |
| AREA 5-1 | CB 11 | CBMH 05 | 0.27 | 0.61 | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | 48 | 0.203 | 200 | PVC | 3.00 | 45.8 | 59.2 | 1.83 | 0.42 | 81% |
| | | | | | 0.16 | 0.458 | 0.458 | 10.00 | 104.19 | 47.7 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| AREA 5-2 | CBMH 04 | MH 08 | 0.22 | 0.90 | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | 151 | 0.305 | 300 | PVC | 3.00 | 16.2 | 174.6 | 2.39 | 0.11 | 86% |
| | | | | | 0.20 | 0.550 | 1.008 | 10.42 | 102.03 | 102.9 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.42 | | | | | | | | | | | | | | | | |
| AREA 5-3 | MH 08 | MH 07 | 0.38 | 0.90 | 0.00 | 0.000 | 0.000 | 10.53 | | | | | | | 349 | 1.245 | 1220 | Conc | 0.20 | 62.3 | 1,921.0 | 1.58 | 0.66 | 18% |
| | | | | | 0.34 | 0.951 | 1.959 | 10.53 | 101.47 | 198.8 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.53 | | | | | | | | | | | | | | | | |
| | | | | | | | | 11.19 | | | | | | | | | | | | | | | | |
| AREA 5-4 | CB 10 | MH 07 | 0.23 | 0.90 | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | 60 | 0.254 | 250 | PVC | 3.00 | 15.9 | 107.4 | 2.12 | 0.13 | 56% |
| | | | | | 0.21 | 0.575 | 0.575 | 10.00 | 104.19 | 60.0 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | | | | 10.13 | | | | | | | | | | | | | | | | |
| AREA 5-5 | MH 07 | MH 06 | 0.19 | 0.86 | 0.00 | 0.000 | 0.000 | 11.19 | | | | | | | 643 | 1.245 | 1220 | Conc | 0.20 | 62.2 | 1,921.0 | 1.58 | 0.66 | 33% |
| | | | | | 0.16 | 0.454 | 2.989 | 11.19 | 98.31 | 293.8 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 11.19 | | | | | | | | | | | | | | | | |
| | | | | | | | | 11.85 | | | | | | | | | | | | | | | | |
| AREA 5-6 | CB 09 | MH 06 | 0.11 | 0.90 | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | 29 | 0.254 | 250 | PVC | 3.00 | 16.0 | 107.4 | 2.12 | 0.13 | 27% |
| | | | | | 0.10 | 0.275 | 0.275 | 10.00 | 104.19 | 28.7 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 10.00 | | | | | | | | | | | | | | | | |
| | | | | | | | | 10.13 | | | | | | | | | | | | | | | | |
| ** AREA 2-3 ** | MH 06 | MH 03 | | | 0.00 | 0.000 | 0.000 | 11.85 | | | | | | | 165.4 | 0.381 | 375 | PVC | 1.00 | 7.6 | 182.8 | 1.60 | 0.08 | 90% |
| | | | | | 0.00 | 0.000 | 3.264 | 11.85 | 95.36 | 311.3 | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 11.85 | | | | | | | | | | | | | | | | |
| | | | | | | | | 11.92 | | | | | | | | | | | | | | | | |

STORM SEWER DESIGN SHEET
575 Dealership Drive Servicing Strategy
 FLOW RATES BASED ON RATIONAL METHOD



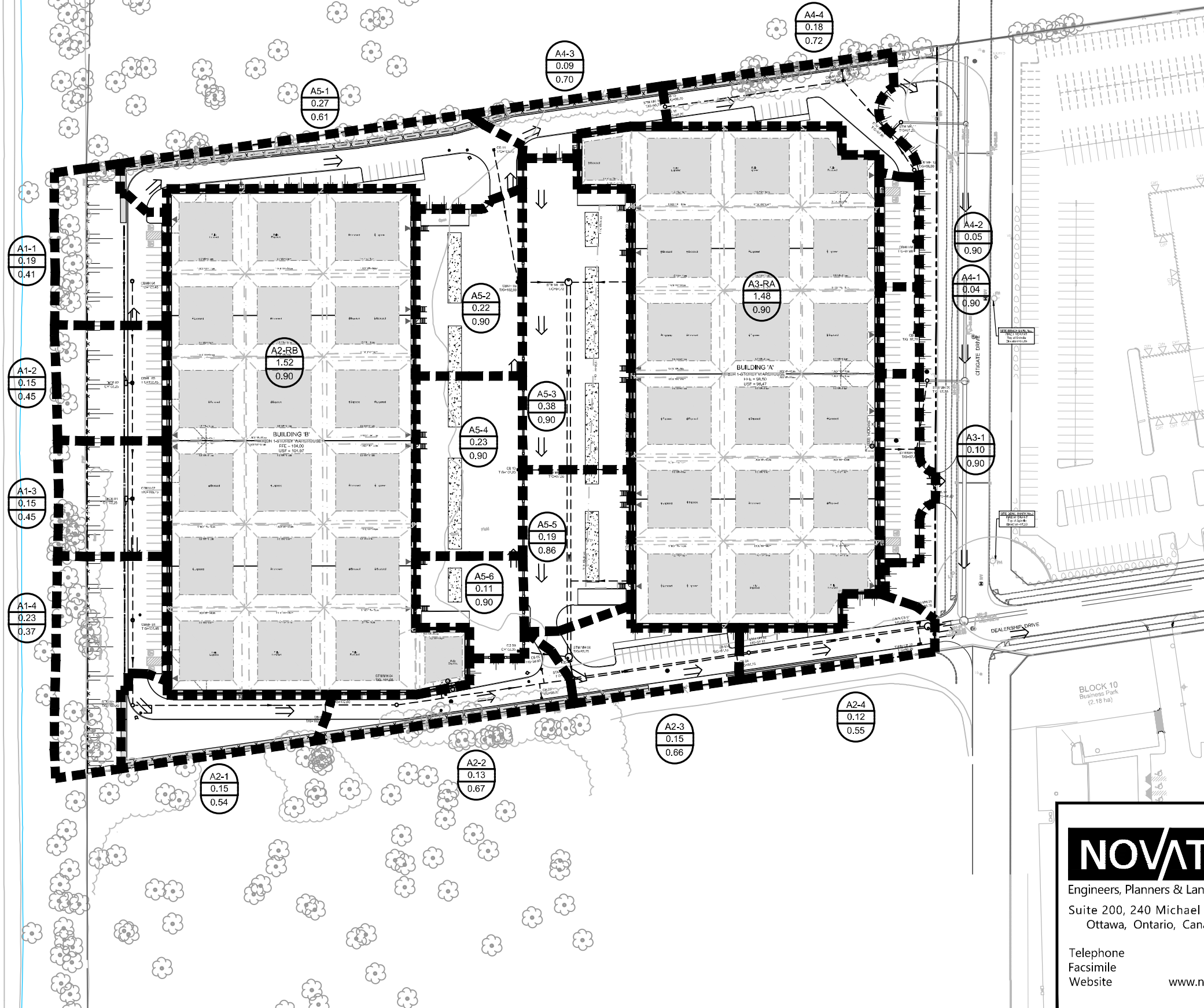
| LOCATION | | | AREA (ha) | | | FLOW | | | | | | | | TOTAL FLOW | SEWER DATA | | | | | | | | | |
|--------------|--------------|-------------------|-----------|------|---------|---------------|---------------|-----------------------|-----------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------|--------------------------|-----------------|-----------|------|-----------|------------|----------------|----------------|-----------------|----------------|-----|
| Catchment ID | From Manhole | To Manhole | Area (ha) | C | AC (ha) | Indiv 2.78 AC | Accum 2.78 AC | Time of Concentration | Rainfall Intensity 2 Year (mm/hr) | Rainfall Intensity 5 Year (mm/hr) | Rainfall Intensity 10 Year (mm/hr) | Rainfall Intensity 100 Year (mm/hr) | Peak Flow (L/s) | Total Peak Flow, Q (L/s) | Dia. (m) Actual | Dia. (mm) | Type | Slope (%) | Length (m) | Capacity (L/s) | Velocity (m/s) | Flow Time (min) | Ratio Q/Q full | |
| AREA 2-3 | MH 03 | MH 02 | 0.15 | 0.66 | 0.10 | 0.000 | 0.000 | 12.61 | | | | | | 144.8 | 339 | 0.635 | 610 | Conc | 0.50 | 60.9 | 504.7 | 1.59 | 0.64 | 67% |
| | | | | | 0.00 | 0.000 | 0.000 | 12.61 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 12.61 | | | | | | | | | | | | | | | | |
| AREA 2-4 | MH 02 | MH 01 | 0.12 | 0.55 | 0.07 | 0.000 | 0.000 | 13.25 | | | | | | 157.3 | 351 | 0.635 | 610 | Conc | 0.50 | 60.9 | 504.7 | 1.59 | 0.64 | 70% |
| | | | | | 0.00 | 0.000 | 0.000 | 13.25 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 13.25 | | | | | | | | | | | | | | | | |
| | MH 01 | CAP | | | 0.00 | 0.000 | 0.000 | 13.89 | | | | | | 153.2 | 347 | 1.372 | 1350 | Conc | 0.10 | 7.0 | 1,760.2 | 1.19 | 0.10 | 20% |
| | | | | | 0.00 | 0.000 | 0.000 | 13.89 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 13.89 | | | | | | | | | | | | | | | | |
| | CAP | EX STM MHSTM74434 | | | 0.00 | 0.000 | 0.000 | 13.98 | | | | | | 152.6 | 347 | 1.372 | 1350 | Conc | 0.10 | 4.5 | 1,760.2 | 1.19 | 0.06 | 20% |
| | | | | | 0.00 | 0.000 | 0.000 | 13.98 | | | | | | | | | | | | | | | | |
| | | | | | 0.00 | 0.000 | 0.000 | 13.98 | | | | | | | | | | | | | | | | |
| | | | | | | | | | 14.05 | | | | | | | | | | | | | | | |

Q = 2.78 AIC, where
 Q = Peak Flow in Litres per Second (L/s)
 A = Area in hectares (ha)
 I = Rainfall Intensity (mm/hr), 5 year storm
 C = Runoff Coefficient
 ** AREA R-A ** = Controlled Flow Release Rate


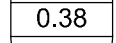
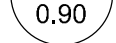


| | |
|------------------------|-----------------|
| Consultant: | Novatech |
| Issued Date: | May 3, 2023 |
| Review Date: | |
| Design By: | BM |
| Client: | ROSEFELLOW |
| Dwg. Reference: | 119123-STM |
| Checked By: | DDB |

Legend:
 10.00 Storm sewers designed to the 2 year event (without ponding) for local roads
 10.00 Storm sewers designed to the 5 year event (without ponding) for collector roads
 10.00 Storm sewers designed to the 10 year event (without ponding) for arterial roads
 10.00 Storm sewers designed to the 100 year event (without ponding)

M:\2019\119123\CAD\Design\119123-SWM.dwg, STM, May 02, 2023 - 3:58pm, smathews



LEGEND

-  DRAINAGE AREA I.D.
-  TRIBUTARY DRAINAGE AREA (ha)
-  1:5 YEAR WEIGHTED RUNOFF COEFFICIENT
-  STORM SEWER & FLOW DIRECTION
-  STORM DRAINAGE AREA BOUNDARY

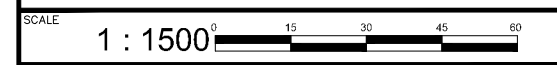
NOVATECH

Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

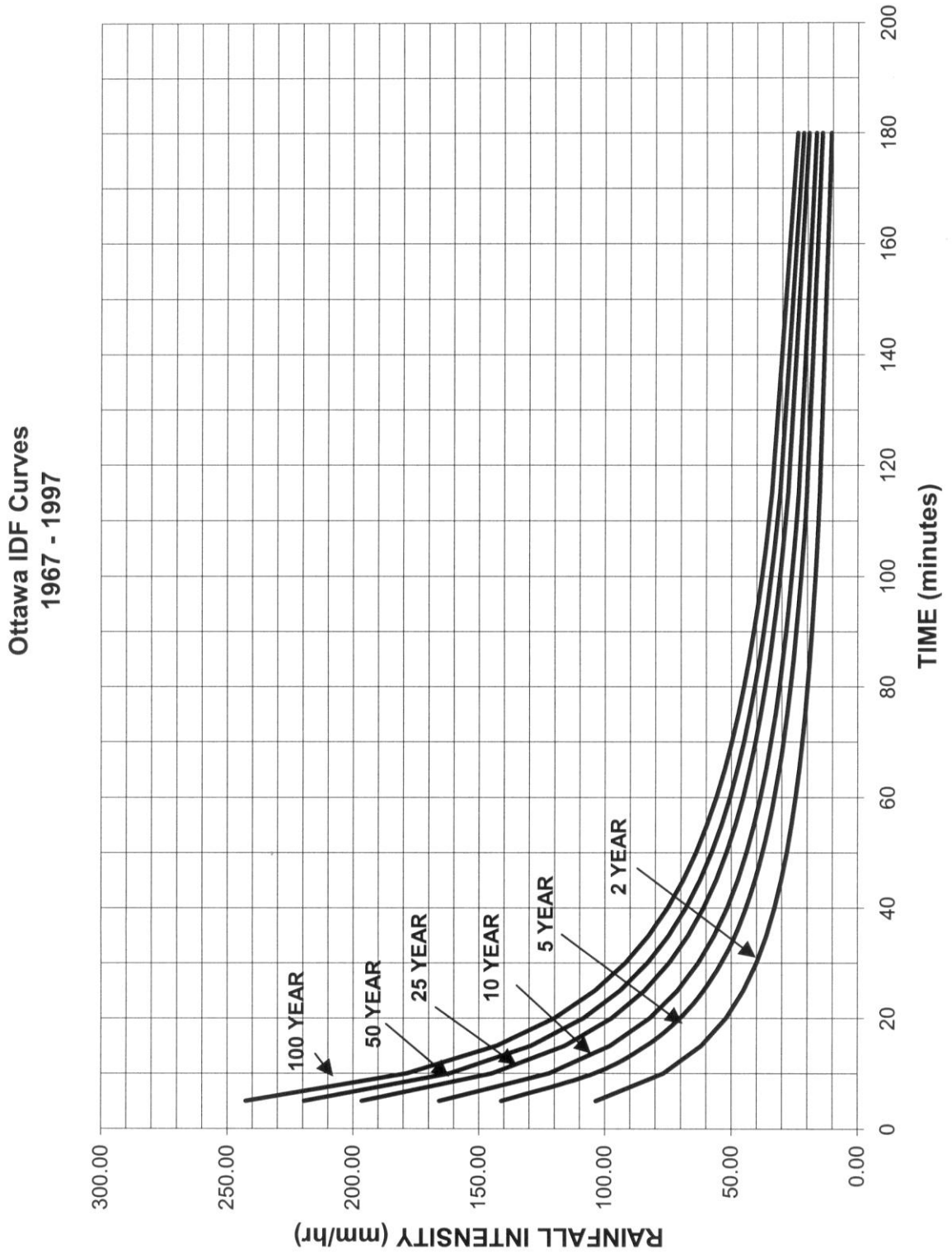
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

575 DEALERSHIP

ON-SITE STORM DRAINAGE AREAS



| | | |
|----------|--------|--------|
| DATE | JOB | FIGURE |
| MAY 2023 | 119123 | STM-1 |



Proposed Industrial Development 575 Dealership Drive - Warehouses 'A' and 'B'

| Pre - Development Site Flows | | | | | | | | | | | | |
|---------------------------------|-----------|--------------------------------|----------------------------|------------------------------|----------------------|------------------------|---|------------------------|--------------------------|--------------------|----------------|----------------|
| Description | Area (ha) | $A_{impervious}$ (ha) C=0.9 | A_{gravel} (ha) C=0.6 | $A_{pervious}$ (ha) C=0.2 | Weighted C_{w5} | Weighted C_{w100} | 1:2 Year Flow (L/s) | 1:5 Year Flow (L/s) | 1:100 Year Flow (L/s) | Allowable C_w | Allowable Flow | |
| | | | | | | | | | | | 5-year (L/s) | 100-year (L/s) |
| Total Site Area to be Developed | 6.04 | 0.00 | 0.00 | 6.04 | 0.20 | 0.25 | 257.9 | 349.9 | 749.7 | 0.8 | 1399.6 | 1679.5 |
| Off-Site Tributary Area (OS-1) | 0.22 | 0.00 | 0.00 | 0.22 | 0.20 | 0.25 | 9.4 | 12.7 | 27.3 | - | 12.7 | 27.3 |
| | 6.26 | | | | | | * Allowable Site Flow + Off-Site Flows conveyed to Dealership Drive = | | | | 1412.4 | 1706.8 |

* Allowable Site Flows are based on design criteria provided in the CitiGate Campus SWM Report.

| Post - Development Site Flows | | | | | | | | | | | | | | | | |
|-------------------------------|--------------------------------------|-----------|-------------------------|--------------------------|-------|-----------|---------------------------------|--------|----------|-----------------------|--------|----------|------------------------------------|--------|----------|---------------------------------------|
| Area | Description | Area (ha) | A_{imp} (ha) C=0.9 | A_{perv} (ha) C=0.2 | C_5 | C_{100} | Uncontrolled Flow (L/s) | | | Controlled Flow (L/s) | | | Storage Required (m ³) | | | Storage Provided (m ³) |
| | | | | | | | 2-year | 5-year | 100-year | 2-year | 5-year | 100-year | 2-year | 5-year | 100-year | |
| A-0 | Un-Controlled Direct Runoff | 0.15 | 0.03 | 0.12 | 0.34 | 0.40 | 10.9 | 14.8 | 29.8 | - | - | - | - | - | - | - |
| A-1 | Un-Controlled Bldg 'B' Parking + OS1 | 0.72 | 0.22 | 0.50 | 0.41 | 0.48 | 63.6 | 86.3 | 171.3 | - | - | - | - | - | - | - |
| A-2 | Un-Controlled South Drive Aisle | 0.54 | 0.31 | 0.23 | 0.60 | 0.68 | 69.4 | 94.1 | 182.4 | - | - | - | - | - | - | - |
| A-3 | Un-Controlled Bldg 'A' Parking | 0.10 | 0.10 | 0.00 | 0.90 | 1.00 | 19.2 | 26.1 | 49.6 | - | - | - | - | - | - | - |
| A-4 | Un-Controlled North Drive Aisle | 0.36 | 0.29 | 0.07 | 0.76 | 0.85 | 58.7 | 79.7 | 152.6 | - | - | - | - | - | - | - |
| A-5 | Controlled Loading Docks | 1.39 | 1.27 | 0.12 | 0.84 | 0.94 | - | - | - | 122.0 | 165.4 | 181.6 | 129 | 174 | 436 | 1377 |
| R-1 | Controlled Flow Roof - Building 'A' | 1.48 | 1.48 | 0.00 | 0.90 | 1.00 | - | - | - | 24.9 | 28.5 | 38.0 | 239 | 393 | 555 | 780 |
| R-2 | Controlled Flow Roof - Building 'B' | 1.52 | 1.52 | 0.00 | 0.90 | 1.00 | - | - | - | 24.8 | 28.6 | 38.3 | 248 | 386 | 736 | 802 |
| Totals : | | 6.26 | - | - | - | - | 221.8 | 301.0 | 585.7 | 171.7 | 222.5 | 257.9 | 616 | 953 | 1728 | 2958 |
| | | | | | | | Total Stormwater Flows : | | | 393.5 | 523.5 | 843.6 | | | | |

$T_c = 10$ mins

| Proposed Industrial Development | | | | |
|-----------------------------------|-------------------|-----------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | |
| AREA A-0 | | Un-Controlled Direct Runoff | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.15 | ha | Qallow = | 10.9 L/s |
| C = | 0.34 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 103.57 | 14.68 | 3.79 | 1.14 |
| 10 | 76.81 | 10.89 | 0.00 | 0.00 |
| 15 | 61.77 | 8.76 | -2.13 | -1.92 |
| 20 | 52.03 | 7.38 | -3.51 | -4.21 |
| 25 | 45.17 | 6.40 | -4.49 | -6.73 |
| 30 | 40.04 | 5.68 | -5.21 | -9.38 |
| 35 | 36.06 | 5.11 | -5.78 | -12.13 |
| 40 | 32.86 | 4.66 | -6.23 | -14.95 |
| 45 | 30.24 | 4.29 | -6.60 | -17.83 |
| 50 | 28.04 | 3.98 | -6.91 | -20.74 |
| 55 | 26.17 | 3.71 | -7.18 | -23.69 |
| 60 | 24.56 | 3.48 | -7.41 | -26.67 |
| 75 | 20.81 | 2.95 | -7.94 | -35.72 |
| 90 | 18.14 | 2.57 | -8.32 | -44.91 |
| 120 | 14.56 | 2.06 | -8.82 | -63.54 |
| 150 | 12.25 | 1.74 | -9.15 | -82.37 |
| 180 | 10.63 | 1.51 | -9.38 | -101.33 |
| 210 | 9.42 | 1.33 | -9.55 | -120.39 |

| Proposed Industrial Development | | | | |
|-----------------------------------|-------------------|-----------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | |
| AREA A-0 | | Un-Controlled Direct Runoff | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.15 | ha | Qallow = | 14.8 L/s |
| C = | 0.34 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 141.18 | 20.02 | 5.24 | 1.57 |
| 10 | 104.19 | 14.77 | 0.00 | 0.00 |
| 15 | 83.56 | 11.85 | -2.93 | -2.63 |
| 20 | 70.25 | 9.96 | -4.81 | -5.77 |
| 25 | 60.90 | 8.63 | -6.14 | -9.21 |
| 30 | 53.93 | 7.65 | -7.13 | -12.83 |
| 35 | 48.52 | 6.88 | -7.89 | -16.58 |
| 40 | 44.18 | 6.26 | -8.51 | -20.42 |
| 45 | 40.63 | 5.76 | -9.01 | -24.33 |
| 50 | 37.65 | 5.34 | -9.43 | -28.30 |
| 55 | 35.12 | 4.98 | -9.79 | -32.32 |
| 60 | 32.94 | 4.67 | -10.10 | -36.37 |
| 75 | 27.89 | 3.95 | -10.82 | -48.68 |
| 90 | 24.29 | 3.44 | -11.33 | -61.18 |
| 120 | 19.47 | 2.76 | -12.01 | -86.49 |
| 150 | 16.36 | 2.32 | -12.45 | -112.07 |
| 180 | 14.18 | 2.01 | -12.76 | -137.83 |
| 210 | 12.56 | 1.78 | -12.99 | -163.70 |

| Proposed Industrial Development | | | | |
|-------------------------------------|-------------------|-----------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | |
| AREA A-0 | | Un-Controlled Direct Runoff | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.15 | ha | Qallow = | 29.8 L/s |
| C = | 0.40 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 242.70 | 40.48 | 10.70 | 3.21 |
| 10 | 178.56 | 29.78 | 0.00 | 0.00 |
| 15 | 142.89 | 23.83 | -5.95 | -5.35 |
| 20 | 119.95 | 20.01 | -9.78 | -11.73 |
| 25 | 103.85 | 17.32 | -12.46 | -18.69 |
| 30 | 91.87 | 15.32 | -14.46 | -26.03 |
| 35 | 82.58 | 13.77 | -16.01 | -33.62 |
| 40 | 75.15 | 12.53 | -17.25 | -41.40 |
| 45 | 69.05 | 11.52 | -18.27 | -49.32 |
| 50 | 63.95 | 10.67 | -19.12 | -57.35 |
| 55 | 59.62 | 9.95 | -19.84 | -65.47 |
| 60 | 55.89 | 9.32 | -20.46 | -73.66 |
| 75 | 47.26 | 7.88 | -21.90 | -98.56 |
| 90 | 41.11 | 6.86 | -22.93 | -123.80 |
| 120 | 32.89 | 5.49 | -24.30 | -174.94 |
| 150 | 27.61 | 4.61 | -25.18 | -226.60 |
| 180 | 23.90 | 3.99 | -25.80 | -278.60 |
| 210 | 21.14 | 3.53 | -26.26 | -330.84 |

| Proposed Industrial Development | | | | |
|-------------------------------------|-------------------|-----------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | |
| AREA A-0 | | Un-Controlled Direct Runoff | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.15 | ha | Qallow = | 35.7 L/s |
| C = | 0.40 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 291.24 | 48.58 | 12.84 | 3.85 |
| 10 | 214.27 | 35.74 | 0.00 | 0.00 |
| 15 | 171.47 | 28.60 | -7.14 | -6.42 |
| 20 | 143.94 | 24.01 | -11.73 | -14.08 |
| 25 | 124.62 | 20.79 | -14.95 | -22.43 |
| 30 | 110.24 | 18.39 | -17.35 | -31.23 |
| 35 | 99.09 | 16.53 | -19.21 | -40.34 |
| 40 | 90.17 | 15.04 | -20.70 | -49.68 |
| 45 | 82.86 | 13.82 | -21.92 | -59.18 |
| 50 | 76.74 | 12.80 | -22.94 | -68.82 |
| 55 | 71.55 | 11.93 | -23.81 | -78.56 |
| 60 | 67.07 | 11.19 | -24.55 | -88.39 |
| 75 | 56.71 | 9.46 | -26.28 | -118.27 |
| 90 | 49.33 | 8.23 | -27.51 | -148.56 |
| 120 | 39.47 | 6.58 | -29.16 | -209.92 |
| 150 | 33.13 | 5.53 | -30.21 | -271.92 |
| 180 | 28.68 | 4.78 | -30.96 | -334.33 |
| 210 | 25.37 | 4.23 | -31.51 | -397.00 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-1 Un-Controlled Parking + Area OS1 | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.72 | ha | Qallow = | 63.6 L/s |
| C = | 0.41 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 103.57 | 85.80 | 22.17 | 6.65 |
| 10 | 76.81 | 63.63 | 0.00 | 0.00 |
| 15 | 61.77 | 51.17 | -12.46 | -11.21 |
| 20 | 52.03 | 43.10 | -20.52 | -24.63 |
| 25 | 45.17 | 37.42 | -26.21 | -39.32 |
| 30 | 40.04 | 33.17 | -30.45 | -54.82 |
| 35 | 36.06 | 29.87 | -33.76 | -70.89 |
| 40 | 32.86 | 27.23 | -36.40 | -87.37 |
| 45 | 30.24 | 25.05 | -38.58 | -104.16 |
| 50 | 28.04 | 23.23 | -40.40 | -121.19 |
| 55 | 26.17 | 21.68 | -41.95 | -138.43 |
| 60 | 24.56 | 20.34 | -43.28 | -155.82 |
| 75 | 20.81 | 17.24 | -46.39 | -208.74 |
| 90 | 18.14 | 15.03 | -48.60 | -262.43 |
| 120 | 14.56 | 12.06 | -51.56 | -371.27 |
| 150 | 12.25 | 10.15 | -53.48 | -481.31 |
| 180 | 10.63 | 8.80 | -54.82 | -592.11 |
| 210 | 9.42 | 7.80 | -55.83 | -703.43 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-1 Un-Controlled Parking + Area OS1 | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.72 | ha | Qallow = | 86.3 L/s |
| C = | 0.41 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 141.18 | 116.96 | 30.64 | 9.19 |
| 10 | 104.19 | 86.32 | 0.00 | 0.00 |
| 15 | 83.56 | 69.22 | -17.10 | -15.39 |
| 20 | 70.25 | 58.20 | -28.12 | -33.74 |
| 25 | 60.90 | 50.45 | -35.87 | -53.80 |
| 30 | 53.93 | 44.68 | -41.64 | -74.96 |
| 35 | 48.52 | 40.19 | -46.12 | -96.86 |
| 40 | 44.18 | 36.60 | -49.71 | -119.31 |
| 45 | 40.63 | 33.66 | -52.66 | -142.18 |
| 50 | 37.65 | 31.19 | -55.12 | -165.37 |
| 55 | 35.12 | 29.10 | -57.22 | -188.83 |
| 60 | 32.94 | 27.29 | -59.03 | -212.49 |
| 75 | 27.89 | 23.10 | -63.21 | -284.46 |
| 90 | 24.29 | 20.12 | -66.20 | -357.46 |
| 120 | 19.47 | 16.13 | -70.19 | -505.37 |
| 150 | 16.36 | 13.55 | -72.76 | -654.86 |
| 180 | 14.18 | 11.75 | -74.57 | -805.36 |
| 210 | 12.56 | 10.40 | -75.92 | -956.55 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-1 Un-Controlled Parking + Area OS1 | | | | |
|--|-------------------|---------|------------|-----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.72 | ha | Qallow = | 171.3 L/s |
| C = | 0.48 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 242.70 | 232.78 | 61.52 | 18.46 |
| 10 | 178.56 | 171.26 | 0.00 | 0.00 |
| 15 | 142.89 | 137.05 | -34.21 | -30.79 |
| 20 | 119.95 | 115.04 | -56.21 | -67.45 |
| 25 | 103.85 | 99.60 | -71.66 | -107.48 |
| 30 | 91.87 | 88.11 | -83.15 | -149.66 |
| 35 | 82.58 | 79.20 | -92.05 | -193.32 |
| 40 | 75.15 | 72.07 | -99.18 | -238.04 |
| 45 | 69.05 | 66.23 | -105.03 | -283.58 |
| 50 | 63.95 | 61.34 | -109.92 | -329.75 |
| 55 | 59.62 | 57.19 | -114.07 | -376.43 |
| 60 | 55.89 | 53.61 | -117.65 | -423.53 |
| 75 | 47.26 | 45.32 | -125.93 | -566.70 |
| 90 | 41.11 | 39.43 | -131.83 | -711.86 |
| 120 | 32.89 | 31.55 | -139.71 | -1005.89 |
| 150 | 27.61 | 26.48 | -144.77 | -1302.97 |
| 180 | 23.90 | 22.92 | -148.33 | -1601.98 |
| 210 | 21.14 | 20.28 | -150.98 | -1902.30 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR + 20% AREA A-1 Un-Controlled Parking + Area OS1 | | | | |
|--|-------------------|---------|------------|-----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.72 | ha | Qallow = | 205.5 L/s |
| C = | 0.48 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 291.24 | 279.33 | 73.83 | 22.15 |
| 10 | 214.27 | 205.51 | 0.00 | 0.00 |
| 15 | 171.47 | 164.46 | -41.05 | -36.94 |
| 20 | 143.94 | 138.05 | -67.45 | -80.94 |
| 25 | 124.62 | 119.52 | -85.99 | -128.98 |
| 30 | 110.24 | 105.73 | -99.77 | -179.59 |
| 35 | 99.09 | 95.04 | -110.47 | -231.98 |
| 40 | 90.17 | 86.49 | -119.02 | -285.65 |
| 45 | 82.86 | 79.47 | -126.04 | -340.30 |
| 50 | 76.74 | 73.61 | -131.90 | -395.70 |
| 55 | 71.55 | 68.62 | -136.88 | -451.72 |
| 60 | 67.07 | 64.33 | -141.18 | -508.24 |
| 75 | 56.71 | 54.39 | -151.12 | -680.04 |
| 90 | 49.33 | 47.32 | -158.19 | -854.24 |
| 120 | 39.47 | 37.86 | -167.65 | -1207.06 |
| 150 | 33.13 | 31.78 | -173.73 | -1563.56 |
| 180 | 28.68 | 27.51 | -178.00 | -1922.37 |
| 210 | 25.37 | 24.34 | -181.17 | -2282.76 |

| Proposed Industrial Development | | | | |
|-----------------------------------|-------------------|---------------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | |
| AREA A-2 | | Un-Controlled South Drive Aisle | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.54 | ha | Qallow = | 69.4 L/s |
| C = | 0.60 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 103.57 | 93.58 | 24.18 | 7.26 |
| 10 | 76.81 | 69.39 | 0.00 | 0.00 |
| 15 | 61.77 | 55.81 | -13.59 | -12.23 |
| 20 | 52.03 | 47.01 | -22.38 | -26.86 |
| 25 | 45.17 | 40.81 | -28.58 | -42.88 |
| 30 | 40.04 | 36.18 | -33.21 | -59.79 |
| 35 | 36.06 | 32.58 | -36.81 | -77.31 |
| 40 | 32.86 | 29.69 | -39.70 | -95.28 |
| 45 | 30.24 | 27.32 | -42.07 | -113.59 |
| 50 | 28.04 | 25.34 | -44.06 | -132.17 |
| 55 | 26.17 | 23.65 | -45.75 | -150.97 |
| 60 | 24.56 | 22.19 | -47.21 | -169.94 |
| 75 | 20.81 | 18.80 | -50.59 | -227.65 |
| 90 | 18.14 | 16.39 | -53.00 | -286.21 |
| 120 | 14.56 | 13.16 | -56.24 | -404.90 |
| 150 | 12.25 | 11.07 | -58.32 | -524.92 |
| 180 | 10.63 | 9.60 | -59.79 | -645.76 |
| 210 | 9.42 | 8.51 | -60.89 | -767.17 |

| Proposed Industrial Development | | | | |
|-----------------------------------|-------------------|---------------------------------|------------|----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | |
| AREA A-2 | | Un-Controlled South Drive Aisle | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.54 | ha | Qallow = | 94.1 L/s |
| C = | 0.60 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 141.18 | 127.55 | 33.42 | 10.02 |
| 10 | 104.19 | 94.14 | 0.00 | 0.00 |
| 15 | 83.56 | 75.49 | -18.64 | -16.78 |
| 20 | 70.25 | 63.47 | -30.67 | -36.80 |
| 25 | 60.90 | 55.02 | -39.12 | -58.68 |
| 30 | 53.93 | 48.72 | -45.41 | -81.75 |
| 35 | 48.52 | 43.84 | -50.30 | -105.64 |
| 40 | 44.18 | 39.92 | -54.22 | -130.12 |
| 45 | 40.63 | 36.71 | -57.43 | -155.06 |
| 50 | 37.65 | 34.02 | -60.12 | -180.36 |
| 55 | 35.12 | 31.73 | -62.40 | -205.93 |
| 60 | 32.94 | 29.76 | -64.37 | -231.75 |
| 75 | 27.89 | 25.20 | -68.94 | -310.24 |
| 90 | 24.29 | 21.94 | -72.19 | -389.85 |
| 120 | 19.47 | 17.59 | -76.55 | -551.16 |
| 150 | 16.36 | 14.78 | -79.36 | -714.20 |
| 180 | 14.18 | 12.81 | -81.33 | -878.33 |
| 210 | 12.56 | 11.34 | -82.79 | -1043.21 |

| Proposed Industrial Development | | | | |
|-------------------------------------|-------------------|---------------------------------|------------|-----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | |
| AREA A-2 | | Un-Controlled South Drive Aisle | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.54 | ha | Qallow = | 182.4 L/s |
| C = | 0.68 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 242.70 | 247.96 | 65.53 | 19.66 |
| 10 | 178.56 | 182.42 | 0.00 | 0.00 |
| 15 | 142.89 | 145.99 | -36.44 | -32.79 |
| 20 | 119.95 | 122.55 | -59.88 | -71.85 |
| 25 | 103.85 | 106.10 | -76.33 | -114.49 |
| 30 | 91.87 | 93.86 | -88.57 | -159.42 |
| 35 | 82.58 | 84.37 | -98.06 | -205.92 |
| 40 | 75.15 | 76.77 | -105.65 | -253.57 |
| 45 | 69.05 | 70.55 | -111.88 | -302.07 |
| 50 | 63.95 | 65.34 | -117.09 | -351.26 |
| 55 | 59.62 | 60.91 | -121.51 | -400.98 |
| 60 | 55.89 | 57.10 | -125.32 | -451.15 |
| 75 | 47.26 | 48.28 | -134.15 | -603.66 |
| 90 | 41.11 | 42.00 | -140.42 | -758.29 |
| 120 | 32.89 | 33.61 | -148.82 | -1071.49 |
| 150 | 27.61 | 28.21 | -154.22 | -1387.95 |
| 180 | 23.90 | 24.42 | -158.00 | -1706.45 |
| 210 | 21.14 | 21.60 | -160.82 | -2026.36 |

| Proposed Industrial Development | | | | |
|-------------------------------------|-------------------|---------------------------------|------------|-----------|
| Novatech Project No. 119123 | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | |
| AREA A-2 | | Un-Controlled South Drive Aisle | | |
| OTTAWA IDF CURVE | | | | |
| Area = | 0.54 | ha | Qallow = | 218.9 L/s |
| C = | 0.68 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 291.24 | 297.55 | 78.64 | 23.59 |
| 10 | 214.27 | 218.91 | 0.00 | 0.00 |
| 15 | 171.47 | 175.19 | -43.72 | -39.35 |
| 20 | 143.94 | 147.06 | -71.85 | -86.22 |
| 25 | 124.62 | 127.31 | -91.60 | -137.39 |
| 30 | 110.24 | 112.63 | -106.28 | -191.31 |
| 35 | 99.09 | 101.24 | -117.67 | -247.11 |
| 40 | 90.17 | 92.13 | -126.78 | -304.28 |
| 45 | 82.86 | 84.65 | -134.26 | -362.49 |
| 50 | 76.74 | 78.41 | -140.50 | -421.51 |
| 55 | 71.55 | 73.10 | -145.81 | -481.18 |
| 60 | 67.07 | 68.53 | -150.38 | -541.38 |
| 75 | 56.71 | 57.93 | -160.98 | -724.39 |
| 90 | 49.33 | 50.40 | -168.51 | -909.95 |
| 120 | 39.47 | 40.33 | -178.58 | -1285.79 |
| 150 | 33.13 | 33.85 | -185.06 | -1665.54 |
| 180 | 28.68 | 29.30 | -189.61 | -2047.74 |
| 210 | 25.37 | 25.92 | -192.99 | -2431.64 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-3 Un-Controlled Parking & Drive Aisles | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.10 | ha | Qallow = | 19.2 L/s |
| C = | 0.90 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 103.57 | 25.91 | 6.70 | 2.01 |
| 10 | 76.81 | 19.22 | 0.00 | 0.00 |
| 15 | 61.77 | 15.45 | -3.76 | -3.39 |
| 20 | 52.03 | 13.02 | -6.20 | -7.44 |
| 25 | 45.17 | 11.30 | -7.92 | -11.87 |
| 30 | 40.04 | 10.02 | -9.20 | -16.56 |
| 35 | 36.06 | 9.02 | -10.19 | -21.41 |
| 40 | 32.86 | 8.22 | -10.99 | -26.39 |
| 45 | 30.24 | 7.57 | -11.65 | -31.46 |
| 50 | 28.04 | 7.02 | -12.20 | -36.60 |
| 55 | 26.17 | 6.55 | -12.67 | -41.81 |
| 60 | 24.56 | 6.14 | -13.07 | -47.06 |
| 75 | 20.81 | 5.21 | -14.01 | -63.04 |
| 90 | 18.14 | 4.54 | -14.68 | -79.26 |
| 120 | 14.56 | 3.64 | -15.57 | -112.13 |
| 150 | 12.25 | 3.07 | -16.15 | -145.36 |
| 180 | 10.63 | 2.66 | -16.56 | -178.82 |
| 210 | 9.42 | 2.36 | -16.86 | -212.45 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-3 Un-Controlled Parking & Drive Aisles | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.10 | ha | Qallow = | 26.1 L/s |
| C = | 0.90 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 141.18 | 35.32 | 9.25 | 2.78 |
| 10 | 104.19 | 26.07 | 0.00 | 0.00 |
| 15 | 83.56 | 20.91 | -5.16 | -4.65 |
| 20 | 70.25 | 17.58 | -8.49 | -10.19 |
| 25 | 60.90 | 15.24 | -10.83 | -16.25 |
| 30 | 53.93 | 13.49 | -12.58 | -22.64 |
| 35 | 48.52 | 12.14 | -13.93 | -29.25 |
| 40 | 44.18 | 11.05 | -15.01 | -36.03 |
| 45 | 40.63 | 10.17 | -15.90 | -42.94 |
| 50 | 37.65 | 9.42 | -16.65 | -49.94 |
| 55 | 35.12 | 8.79 | -17.28 | -57.03 |
| 60 | 32.94 | 8.24 | -17.83 | -64.18 |
| 75 | 27.89 | 6.98 | -19.09 | -85.91 |
| 90 | 24.29 | 6.08 | -19.99 | -107.96 |
| 120 | 19.47 | 4.87 | -21.20 | -152.63 |
| 150 | 16.36 | 4.09 | -21.98 | -197.78 |
| 180 | 14.18 | 3.55 | -22.52 | -243.23 |
| 210 | 12.56 | 3.14 | -22.93 | -288.89 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-3 Un-Controlled Parking & Drive Aisles | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.10 | ha | Qallow = | 49.6 L/s |
| C = | 1.00 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 242.70 | 67.47 | 17.83 | 5.35 |
| 10 | 178.56 | 49.64 | 0.00 | 0.00 |
| 15 | 142.89 | 39.72 | -9.91 | -8.92 |
| 20 | 119.95 | 33.35 | -16.29 | -19.55 |
| 25 | 103.85 | 28.87 | -20.77 | -31.15 |
| 30 | 91.87 | 25.54 | -24.10 | -43.38 |
| 35 | 82.58 | 22.96 | -26.68 | -56.03 |
| 40 | 75.15 | 20.89 | -28.75 | -69.00 |
| 45 | 69.05 | 19.20 | -30.44 | -82.20 |
| 50 | 63.95 | 17.78 | -31.86 | -95.58 |
| 55 | 59.62 | 16.58 | -33.06 | -109.11 |
| 60 | 55.89 | 15.54 | -34.10 | -122.76 |
| 75 | 47.26 | 13.14 | -36.50 | -164.26 |
| 90 | 41.11 | 11.43 | -38.21 | -206.34 |
| 120 | 32.89 | 9.14 | -40.49 | -291.56 |
| 150 | 27.61 | 7.68 | -41.96 | -377.67 |
| 180 | 23.90 | 6.64 | -42.99 | -464.34 |
| 210 | 21.14 | 5.88 | -43.76 | -551.39 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR + 20% AREA A-3 Un-Controlled Parking & Drive Aisles | | | | |
|--|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.10 | ha | Qallow = | 59.6 L/s |
| C = | 1.00 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 291.24 | 80.97 | 21.40 | 6.42 |
| 10 | 214.27 | 59.57 | 0.00 | 0.00 |
| 15 | 171.47 | 47.67 | -11.90 | -10.71 |
| 20 | 143.94 | 40.02 | -19.55 | -23.46 |
| 25 | 124.62 | 34.64 | -24.92 | -37.39 |
| 30 | 110.24 | 30.65 | -28.92 | -52.06 |
| 35 | 99.09 | 27.55 | -32.02 | -67.24 |
| 40 | 90.17 | 25.07 | -34.50 | -82.80 |
| 45 | 82.86 | 23.04 | -36.53 | -98.64 |
| 50 | 76.74 | 21.34 | -38.23 | -114.70 |
| 55 | 71.55 | 19.89 | -39.68 | -130.93 |
| 60 | 67.07 | 18.65 | -40.92 | -147.32 |
| 75 | 56.71 | 15.76 | -43.80 | -197.11 |
| 90 | 49.33 | 13.71 | -45.85 | -247.60 |
| 120 | 39.47 | 10.97 | -48.59 | -349.87 |
| 150 | 33.13 | 9.21 | -50.36 | -453.21 |
| 180 | 28.68 | 7.97 | -51.59 | -557.21 |
| 210 | 25.37 | 7.05 | -52.51 | -661.67 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:2 YEAR EVENT AREA A-4 Un-Controlled North Drive Aisle | | | | |
|---|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.36 | ha | Qallow = | 58.7 L/s |
| C = | 0.76 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 103.57 | 79.18 | 20.46 | 6.14 |
| 10 | 76.81 | 58.72 | 0.00 | 0.00 |
| 15 | 61.77 | 47.22 | -11.50 | -10.35 |
| 20 | 52.03 | 39.78 | -18.94 | -22.73 |
| 25 | 45.17 | 34.53 | -24.19 | -36.28 |
| 30 | 40.04 | 30.61 | -28.10 | -50.59 |
| 35 | 36.06 | 27.57 | -31.15 | -65.42 |
| 40 | 32.86 | 25.12 | -33.59 | -80.62 |
| 45 | 30.24 | 23.12 | -35.60 | -96.12 |
| 50 | 28.04 | 21.44 | -37.28 | -111.84 |
| 55 | 26.17 | 20.01 | -38.71 | -127.74 |
| 60 | 24.56 | 18.77 | -39.94 | -143.80 |
| 75 | 20.81 | 15.91 | -42.81 | -192.63 |
| 90 | 18.14 | 13.87 | -44.85 | -242.17 |
| 120 | 14.56 | 11.13 | -47.58 | -342.61 |
| 150 | 12.25 | 9.37 | -49.35 | -444.16 |
| 180 | 10.63 | 8.12 | -50.59 | -546.41 |
| 210 | 9.42 | 7.20 | -51.52 | -649.14 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:5 YEAR EVENT AREA A-4 Un-Controlled North Drive Aisle | | | | |
|---|-------------------|---------|------------|----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.36 | ha | Qallow = | 79.7 L/s |
| C = | 0.76 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 141.18 | 107.93 | 28.28 | 8.48 |
| 10 | 104.19 | 79.66 | 0.00 | 0.00 |
| 15 | 83.56 | 63.88 | -15.78 | -14.20 |
| 20 | 70.25 | 53.71 | -25.95 | -31.14 |
| 25 | 60.90 | 46.56 | -33.10 | -49.65 |
| 30 | 53.93 | 41.23 | -38.43 | -69.17 |
| 35 | 48.52 | 37.09 | -42.56 | -89.38 |
| 40 | 44.18 | 33.78 | -45.88 | -110.10 |
| 45 | 40.63 | 31.06 | -48.59 | -131.21 |
| 50 | 37.65 | 28.79 | -50.87 | -152.61 |
| 55 | 35.12 | 26.85 | -52.80 | -174.25 |
| 60 | 32.94 | 25.19 | -54.47 | -196.09 |
| 75 | 27.89 | 21.32 | -58.33 | -262.51 |
| 90 | 24.29 | 18.57 | -61.09 | -329.87 |
| 120 | 19.47 | 14.88 | -64.77 | -466.36 |
| 150 | 16.36 | 12.51 | -67.15 | -604.32 |
| 180 | 14.18 | 10.84 | -68.81 | -743.20 |
| 210 | 12.56 | 9.60 | -70.06 | -882.72 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR EVENT AREA A-4 Un-Controlled North Drive Aisle | | | | |
|---|-------------------|---------|------------|-----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.36 | ha | Qallow = | 152.6 L/s |
| C = | 0.85 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 242.70 | 207.48 | 54.83 | 16.45 |
| 10 | 178.56 | 152.64 | 0.00 | 0.00 |
| 15 | 142.89 | 122.15 | -30.49 | -27.44 |
| 20 | 119.95 | 102.54 | -50.10 | -60.12 |
| 25 | 103.85 | 88.77 | -63.87 | -95.80 |
| 30 | 91.87 | 78.53 | -74.11 | -133.39 |
| 35 | 82.58 | 70.59 | -82.05 | -172.30 |
| 40 | 75.15 | 64.24 | -88.40 | -212.17 |
| 45 | 69.05 | 59.03 | -93.61 | -252.76 |
| 50 | 63.95 | 54.67 | -97.97 | -293.91 |
| 55 | 59.62 | 50.97 | -101.67 | -335.52 |
| 60 | 55.89 | 47.78 | -104.86 | -377.49 |
| 75 | 47.26 | 40.40 | -112.24 | -505.10 |
| 90 | 41.11 | 35.14 | -117.50 | -634.49 |
| 120 | 32.89 | 28.12 | -124.52 | -896.55 |
| 150 | 27.61 | 23.60 | -129.04 | -1161.34 |
| 180 | 23.90 | 20.43 | -132.21 | -1427.85 |
| 210 | 21.14 | 18.08 | -134.57 | -1695.53 |

| Proposed Industrial Development Novatech Project No. 119123 REQUIRED STORAGE - 1:100 YEAR + 20% AREA A-4 Un-Controlled North Drive Aisle | | | | |
|---|-------------------|---------|------------|-----------|
| OTTAWA IDF CURVE | | | | |
| Area = | 0.36 | ha | Qallow = | 183.2 L/s |
| C = | 0.85 | | Vol(max) = | 0.0 m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
| 5 | 291.24 | 248.97 | 65.80 | 19.74 |
| 10 | 214.27 | 183.17 | 0.00 | 0.00 |
| 15 | 171.47 | 146.58 | -36.59 | -32.93 |
| 20 | 143.94 | 123.05 | -60.12 | -72.15 |
| 25 | 124.62 | 106.53 | -76.64 | -114.96 |
| 30 | 110.24 | 94.24 | -88.93 | -160.07 |
| 35 | 99.09 | 84.71 | -98.46 | -206.76 |
| 40 | 90.17 | 77.09 | -106.08 | -254.60 |
| 45 | 82.86 | 70.83 | -112.34 | -303.31 |
| 50 | 76.74 | 65.61 | -117.56 | -352.69 |
| 55 | 71.55 | 61.16 | -122.01 | -402.62 |
| 60 | 67.07 | 57.34 | -125.83 | -452.99 |
| 75 | 56.71 | 48.48 | -134.69 | -606.12 |
| 90 | 49.33 | 42.17 | -141.00 | -761.38 |
| 120 | 39.47 | 33.74 | -149.43 | -1075.86 |
| 150 | 33.13 | 28.32 | -154.85 | -1393.61 |
| 180 | 28.68 | 24.52 | -158.65 | -1713.42 |
| 210 | 25.37 | 21.69 | -161.48 | -2034.64 |

Proposed Industrial Development Storage Calculations Using Average
Novatech Project No. 119123 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT

AREA A-5 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 1.39 ha Qpeak = 122.0 L/s
 C = 0.84 Qavg = 61.0 L/s
 Vol(max) = 129.4 m3
 (Vol calculated for Qallow-avg)

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 336.01 | 275.01 | 82.50 |
| 10 | 76.81 | 249.18 | 188.18 | 112.91 |
| 15 | 61.77 | 200.39 | 139.39 | 125.45 |
| 20 | 52.03 | 168.80 | 107.80 | 129.36 |
| 25 | 45.17 | 146.53 | 85.53 | 128.30 |
| 30 | 40.04 | 129.91 | 68.91 | 124.04 |
| 35 | 36.06 | 116.99 | 55.99 | 117.57 |
| 40 | 32.86 | 106.62 | 45.62 | 109.49 |
| 45 | 30.24 | 98.10 | 37.10 | 100.18 |
| 50 | 28.04 | 90.97 | 29.97 | 89.92 |
| 55 | 26.17 | 84.90 | 23.90 | 78.88 |
| 60 | 24.56 | 79.67 | 18.67 | 67.22 |
| 65 | 23.15 | 75.11 | 14.11 | 55.02 |
| 70 | 21.91 | 71.09 | 10.09 | 42.38 |
| 75 | 20.81 | 67.52 | 6.52 | 29.36 |
| 80 | 19.84 | 64.38 | 3.38 | 15.92 |
| 85 | 18.98 | 61.64 | 0.64 | 2.10 |
| 90 | 18.14 | 58.86 | -2.14 | -11.55 |
| 95 | 17.41 | 56.04 | -4.86 | -23.55 |
| 100 | 16.78 | 53.18 | -7.58 | -35.00 |
| 105 | 16.13 | 52.34 | -8.66 | -45.55 |
| 110 | 15.56 | 51.45 | -9.75 | -55.10 |
| 115 | 15.04 | 50.51 | -10.81 | -63.75 |
| 120 | 14.56 | 49.52 | -11.84 | -71.50 |
| 125 | 14.12 | 48.48 | -12.84 | -78.35 |
| 130 | 13.71 | 47.39 | -13.81 | -84.30 |
| 135 | 13.30 | 46.25 | -14.75 | -89.35 |
| 140 | 12.91 | 45.06 | -15.66 | -93.50 |
| 145 | 12.55 | 43.82 | -16.52 | -96.75 |
| 150 | 12.25 | 42.53 | -17.35 | -99.10 |

Proposed Industrial Development Storage Calculations Using Average
Novatech Project No. 119123 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT

AREA A-5 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 1.39 ha Qpeak = 181.6 L/s
 C = 0.94 Qavg = 90.8 L/s
 Vol(max) = 436.0 m3
 (Vol calculated for Qallow-avg)

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 877.13 | 786.33 | 235.90 |
| 10 | 178.56 | 645.31 | 554.51 | 332.71 |
| 15 | 142.89 | 516.42 | 425.62 | 383.06 |
| 20 | 119.95 | 433.50 | 342.70 | 411.24 |
| 25 | 103.85 | 375.30 | 284.50 | 426.76 |
| 30 | 91.87 | 332.01 | 241.21 | 434.18 |
| 35 | 82.58 | 298.44 | 207.64 | 436.04 |
| 40 | 75.15 | 271.58 | 180.78 | 433.86 |
| 45 | 69.05 | 249.55 | 158.75 | 428.62 |
| 50 | 63.95 | 231.13 | 140.33 | 420.99 |
| 55 | 59.62 | 215.48 | 124.68 | 411.45 |
| 60 | 55.89 | 202.00 | 111.20 | 400.33 |
| 65 | 52.65 | 190.26 | 99.46 | 387.91 |
| 70 | 49.79 | 179.94 | 89.14 | 374.39 |
| 75 | 47.26 | 170.78 | 79.98 | 359.92 |
| 80 | 44.98 | 162.66 | 71.86 | 344.50 |
| 85 | 42.84 | 155.58 | 64.78 | 328.14 |
| 90 | 40.84 | 149.54 | 58.74 | 310.84 |
| 95 | 38.98 | 144.54 | 53.74 | 292.60 |
| 100 | 37.26 | 140.58 | 49.78 | 273.42 |
| 105 | 35.68 | 137.66 | 46.86 | 253.30 |
| 110 | 34.24 | 134.78 | 44.00 | 232.24 |
| 115 | 32.94 | 131.94 | 41.20 | 210.24 |
| 120 | 31.78 | 129.14 | 38.46 | 187.30 |
| 125 | 30.76 | 126.38 | 35.78 | 163.42 |
| 130 | 29.88 | 123.66 | 33.16 | 138.60 |
| 135 | 29.14 | 121.00 | 30.60 | 112.94 |
| 140 | 28.54 | 118.40 | 28.10 | 86.44 |
| 145 | 28.08 | 115.86 | 25.66 | 59.10 |
| 150 | 27.61 | 113.38 | 23.28 | 30.92 |

Proposed Industrial Development Storage Calculations Using Average
Novatech Project No. 119123 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT

AREA A-5 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 1.39 ha Qpeak = 165.4 L/s
 C = 0.84 Qavg = 82.7 L/s
 Vol(max) = 174.3 m3
 (Vol calculated for Qallow-avg)

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 458.02 | 375.32 | 112.60 |
| 10 | 104.19 | 338.03 | 255.33 | 153.20 |
| 15 | 83.56 | 271.08 | 188.38 | 169.54 |
| 20 | 70.25 | 227.91 | 145.21 | 174.26 |
| 25 | 60.90 | 197.56 | 114.86 | 172.29 |
| 30 | 53.93 | 174.96 | 92.26 | 166.06 |
| 35 | 48.52 | 157.40 | 74.70 | 156.88 |
| 40 | 44.18 | 143.35 | 60.65 | 145.55 |
| 45 | 40.63 | 131.81 | 49.11 | 132.60 |
| 50 | 37.65 | 122.16 | 39.46 | 118.37 |
| 55 | 35.12 | 113.95 | 31.25 | 103.12 |
| 60 | 32.94 | 106.88 | 24.18 | 87.04 |
| 65 | 31.04 | 100.71 | 18.01 | 70.25 |
| 70 | 29.37 | 95.29 | 12.59 | 52.88 |
| 75 | 27.89 | 90.48 | 7.78 | 35.00 |
| 80 | 26.56 | 86.24 | 3.54 | 16.66 |
| 85 | 25.38 | 82.56 | -1.16 | -2.10 |
| 90 | 24.29 | 78.86 | -3.90 | -21.07 |
| 95 | 23.28 | 75.14 | -6.64 | -40.50 |
| 100 | 22.34 | 71.40 | -9.38 | -59.38 |
| 105 | 21.58 | 70.02 | -12.68 | -79.89 |
| 110 | 20.97 | 68.61 | -16.43 | -102.00 |
| 115 | 20.49 | 67.18 | -20.64 | -125.71 |
| 120 | 19.47 | 63.16 | -19.54 | -140.70 |
| 125 | 18.76 | 57.63 | -25.07 | -203.03 |
| 130 | 18.17 | 52.58 | -30.02 | -261.50 |
| 135 | 17.76 | 47.00 | -34.40 | -316.10 |
| 140 | 17.41 | 41.89 | -38.21 | -366.83 |
| 145 | 17.12 | 37.24 | -41.46 | -413.60 |
| 150 | 16.36 | 53.08 | -29.62 | -266.56 |

Proposed Industrial Development Storage Calculations Using Average
Novatech Project No. 119123 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase

AREA A-5 Controlled Site Flows + Underground Storage

OTTAWA IDF CURVE
 Area = 1.39 ha Qpeak = 184.1 L/s
 C = 0.94 Qavg = 92.1 L/s
 Vol(max) = 561.2 m3
 (Vol calculated for Qallow-avg)

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 1052.56 | 960.51 | 288.15 |
| 10 | 214.27 | 774.37 | 682.32 | 409.39 |
| 15 | 171.47 | 619.70 | 527.65 | 474.89 |
| 20 | 143.94 | 520.20 | 428.15 | 513.78 |
| 25 | 124.62 | 450.36 | 358.31 | 537.47 |
| 30 | 110.24 | 398.41 | 306.36 | 551.46 |
| 35 | 99.09 | 358.13 | 266.08 | 558.76 |
| 40 | 90.17 | 325.89 | 233.84 | 561.22 |
| 45 | 82.86 | 299.46 | 207.41 | 560.00 |
| 50 | 76.74 | 277.36 | 185.31 | 555.92 |
| 55 | 71.55 | 258.58 | 166.53 | 549.54 |
| 60 | 67.07 | 242.40 | 150.35 | 541.27 |
| 65 | 63.18 | 228.32 | 136.27 | 531.44 |
| 70 | 59.75 | 215.93 | 123.88 | 520.29 |
| 75 | 56.71 | 204.94 | 112.89 | 507.99 |
| 80 | 53.98 | 195.24 | 103.20 | 494.54 |
| 85 | 51.54 | 186.81 | 94.81 | 479.94 |
| 90 | 49.33 | 178.29 | 86.24 | 465.70 |
| 95 | 47.34 | 170.68 | 78.49 | 450.82 |
| 100 | 45.56 | 163.98 | 71.56 | 435.30 |
| 105 | 43.80 | 158.28 | 66.23 | 417.26 |
| 110 | 42.17 | 152.58 | 61.34 | 397.70 |
| 115 | 40.68 | 146.88 | 56.80 | 376.62 |
| 120 | 39.47 | 142.66 | 50.61 | 364.38 |
| 125 | 38.44 | 138.94 | 44.78 | 350.00 |
| 130 | 36.00 | 130.09 | 38.04 | 308.13 |
| 135 | 33.13 | 119.74 | 27.69 | 249.23 |

| Structures | Size (mm) | Area (m ²) | T/G | Inv IN | Inv OUT |
|------------|-----------|------------------------|--------|--------|---------|
| STM MH 06 | 2438 | 4.67 | 97.75 | 94.97 | 94.78 |
| STM MH 07 | 2438 | 4.67 | 97.66 | 95.10 | 95.09 |
| STM MH 08 | 2438 | 4.67 | 97.72 | 96.50 | 95.22 |
| CBMH 05 | 1220 | 1.17 | 102.00 | 97.55 | 97.00 |

Area A-5: Storage Table

| Elevation (m) | System Depth (m) | STM MH 06 Volume (m ³) | STM MH 07 Volume (m ³) | STM MH 08 Volume (m ³) | CBMH 05 Volume (m ³) | Combined Volume (m ³) | Surface Storage | | Total Storage | |
|---------------|------------------|------------------------------------|------------------------------------|------------------------------------|----------------------------------|-----------------------------------|--|--------------------------|----------------------------------|--------------------------------|
| | | | | | | | Building 'A' Loading Dock Area (m ²) | Volume (m ³) | Ponding Volume (m ³) | Total Volume (m ³) |
| 94.78 | 0.00 | - | - | - | - | - | - | - | - | 0 |
| 94.97 | 0.19 | 0.89 | - | - | - | 0.89 | - | - | - | 0.9 |
| 95.58 | 0.80 | 3.73 | 2.29 | 1.68 | - | 68.10 | - | - | - | 68.1 |
| 96.19 | 1.41 | 6.58 | 5.14 | 4.53 | - | 137.04 | - | - | - | 137.0 |
| 96.44 | 1.66 | 7.75 | 6.30 | 5.70 | - | 165.29 | - | - | - | 165.3 |
| 96.61 | 1.83 | 8.54 | 7.10 | 6.49 | - | 167.67 | - | - | - | 167.7 |
| 97.23 | 2.45 | 11.44 | 9.99 | 9.38 | 0.27 | 176.62 | 0.0 | 0.0 | 0.0 | 176.6 |
| 97.33 | 2.55 | 11.90 | 10.46 | 9.85 | 0.39 | 178.14 | 725.95 | 36.30 | 36.3 | 214.4 |
| 97.43 | 2.65 | 12.37 | 10.92 | 10.32 | 0.50 | 179.65 | 1342.77 | 139.73 | 139.7 | 319.4 |
| 97.53 | 2.75 | 12.84 | 11.39 | 10.78 | 0.62 | 181.17 | 1960.42 | 304.89 | 304.9 | 486.1 |
| 97.63 | 2.85 | 13.30 | 11.86 | 11.25 | 0.74 | 182.69 | 2600.84 | 532.96 | 533.0 | 715.6 |
| 97.69 | 2.91 | 13.58 | 12.14 | 11.53 | 0.81 | 183.60 | 2977.03 | 700.29 | 700.3 | 883.9 |
| 97.75 | 2.97 | - | - | - | 0.88 | 183.67 | 3431.61 | 892.55 | 892.6 | 1076.2 |
| 97.80 | 3.02 | - | - | - | 0.94 | 183.73 | 3838.58 | 1074.31 | 1074.3 | 1258.0 |
| 97.83 | 3.05 | - | - | - | 0.97 | 183.76 | 4091.23 | 1193.25 | 1193.3 | 1377.0 |

| | | |
|------------------------------------|------------------------------|--------------------------------------|
| PI = 3.141592654 | pipe I.D. = 1220 (conc pipe) | U/G Storage Pipe Volume 06 to 07 |
| End Area = 1.169 (m ²) | Pipe Length = 62.2 (m) | Pipe Volume = 72.7 (m ³) |

| | | |
|------------------------------------|------------------------------|--------------------------------------|
| PI = 3.141592654 | pipe I.D. = 1220 (conc pipe) | U/G Storage Pipe Volume 07 to 08 |
| End Area = 1.169 (m ²) | Pipe Length = 62.3 (m) | Pipe Volume = 72.8 (m ³) |

Maximum Ponding Depths (cm)

| | |
|----------|------|
| 1:100 Yr | 27 |
| 1:5 Yr | -16 |
| 1:2 Yr | -112 |

230mm Circular Plug Type ICD

1:100 Yr
 Flow (L/s) = 181.6
 Head (m) = 2.53
 Elevation (m) = 97.50
 Outlet Pipe Dia.(mm) = 375
 Volume (m3) = 436.0

1:5 Yr
 Flow (L/s) = 165.4
 Head (m) = 2.10
 Elevation (m) = 97.07
 Outlet Pipe Dia.(mm) = 375
 Volume (m3) = 174.3

1:2 Yr
 Flow (L/s) = 122.0
 Head (m) = 1.14
 Elevation (m) = 96.11
 Outlet Pipe Dia.(mm) = 375
 Volume (m3) = 129.4

Orifice Size - 1:100 yr Flow Check
 $Q=0.62 \times A \times \sqrt{2gh}^{0.5}$

| 1:100 yr | Flow Check |
|--------------------------------|------------|
| Q (m ³ /s) = 0.1816 | 0.1816 |
| g (m/s ²) = 9.81 | 9.81 |
| h (m) = 2.53 | 2.53 |

| | |
|-----------------------------------|---------|
| A (m ²) = 0.041552765 | 0.04155 |
| D (m) = 0.230014398 | 0.23000 |
| D (mm) = 230 | 230.0 |

1:5 yr Flow Check

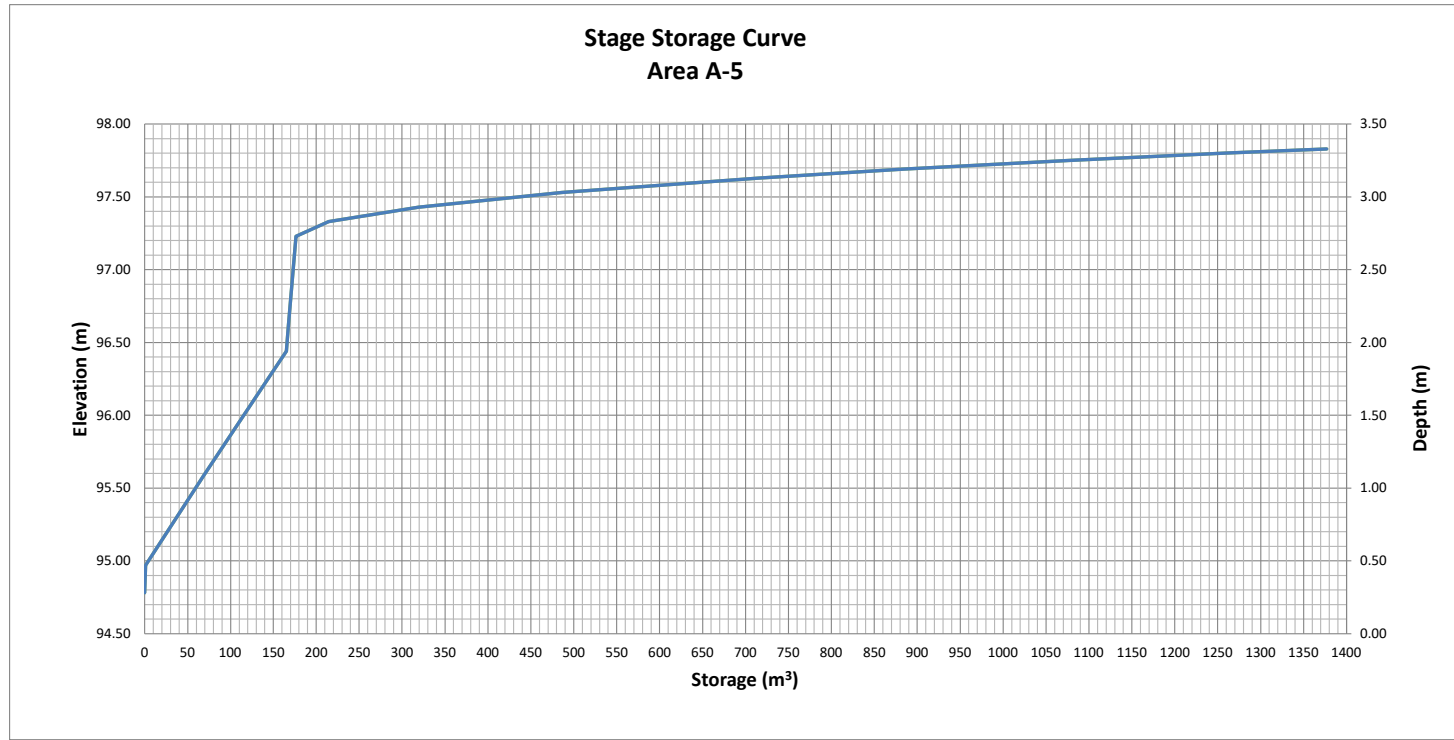
| 1:5 yr |
|--------------------------------|
| Q (m ³ /s) = 0.1654 |
| g (m/s ²) = 9.81 |
| h (m) = 2.10 |

| |
|-------------------------------|
| A (m ²) = 0.04155 |
| D (m) = 0.23 |
| D (mm) = 230 |

1:2 yr Flow Check

| 1:2 yr |
|--------------------------------|
| Q (m ³ /s) = 0.1220 |
| g (m/s ²) = 9.81 |
| h (m) = 1.14 |

| |
|-------------------------------|
| A (m ²) = 0.04155 |
| D (m) = 0.23 |
| D (mm) = 230 |



Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-1: Building A Controlled Roof Drain A1

OTTAWA IDF CURVE
 Area = 0.037 ha Qallow = 1.10 L/s
 C = 0.90 Vol(max) = 4.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 9.59 | 8.49 | 2.55 |
| 10 | 76.81 | 7.11 | 6.01 | 3.61 |
| 15 | 61.77 | 5.72 | 4.62 | 4.16 |
| 20 | 52.03 | 4.82 | 3.72 | 4.46 |
| 25 | 45.17 | 4.18 | 3.08 | 4.62 |
| 30 | 40.04 | 3.71 | 2.61 | 4.69 |
| 35 | 36.06 | 3.34 | 2.24 | 4.70 |
| 40 | 32.86 | 3.04 | 1.94 | 4.66 |
| 45 | 30.24 | 2.80 | 1.70 | 4.59 |
| 50 | 28.04 | 2.60 | 1.50 | 4.49 |
| 55 | 26.17 | 2.42 | 1.32 | 4.36 |
| 60 | 24.56 | 2.27 | 1.17 | 4.22 |
| 75 | 20.81 | 1.93 | 0.83 | 3.72 |
| 90 | 18.14 | 1.68 | 0.58 | 3.13 |
| 120 | 14.56 | 1.35 | 0.25 | 1.79 |
| 150 | 12.25 | 1.13 | 0.03 | 0.31 |
| 180 | 10.63 | 0.98 | -0.12 | -1.26 |
| 210 | 9.42 | 0.87 | -0.23 | -2.88 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-1: Building A Controlled Roof Drain A1

OTTAWA IDF CURVE
 Area = 0.037 ha Qallow = 1.26 L/s
 C = 0.90 Vol(max) = 7.2 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 13.07 | 11.97 | 3.59 |
| 10 | 104.19 | 9.65 | 8.55 | 5.13 |
| 15 | 83.56 | 7.74 | 6.64 | 5.97 |
| 20 | 70.25 | 6.50 | 5.40 | 6.48 |
| 25 | 60.90 | 5.64 | 4.54 | 6.81 |
| 30 | 53.93 | 4.99 | 3.89 | 7.01 |
| 35 | 48.52 | 4.49 | 3.39 | 7.12 |
| 40 | 44.18 | 4.09 | 2.99 | 7.18 |
| 45 | 40.63 | 3.76 | 2.66 | 7.19 |
| 50 | 37.65 | 3.49 | 2.39 | 7.16 |
| 55 | 35.12 | 3.25 | 2.15 | 7.10 |
| 60 | 32.94 | 3.05 | 1.95 | 7.02 |
| 75 | 27.89 | 2.58 | 1.48 | 6.67 |
| 90 | 24.29 | 2.25 | 1.15 | 6.20 |
| 120 | 19.47 | 1.80 | 0.70 | 5.06 |
| 150 | 16.36 | 1.51 | 0.41 | 3.73 |
| 180 | 14.18 | 1.31 | 0.21 | 2.30 |
| 210 | 12.56 | 1.16 | 0.06 | 0.78 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|------------------|------------------|--------------|---------------------------|----------|
| | | | | Required | Provided |
| 1:2 Year | 1.10 | 1.10 | 9 | 4.7 | 19.5 |
| 1:5 Year | 1.26 | 1.26 | 11 | 7.2 | 19.5 |
| 1:100 Year | 1.34 | 1.34 | 13 | 15.9 | 19.5 |

Roof Drain Storage Table for Area RD A1

| Elevation | Area RD A1 | Total Volume |
|-----------|----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 41.26 | 1.0 |
| 0.10 | 164.38 | 6.2 |
| 0.15 | 369.86 | 19.5 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-1: Building A Controlled Roof Drain A1

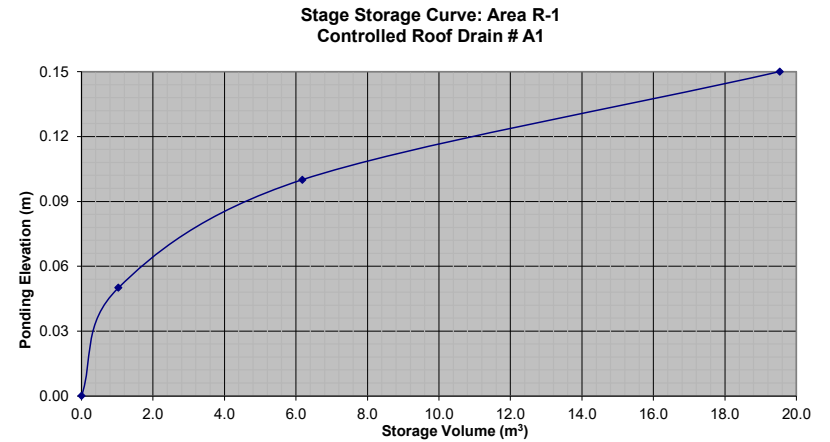
OTTAWA IDF CURVE
 Area = 0.037 ha Qallow = 1.34 L/s
 C = 1.00 Vol(max) = 15.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 24.96 | 23.62 | 7.09 |
| 10 | 178.56 | 18.37 | 17.03 | 10.22 |
| 15 | 142.89 | 14.70 | 13.36 | 12.02 |
| 20 | 119.95 | 12.34 | 11.00 | 13.20 |
| 25 | 103.85 | 10.68 | 9.34 | 14.01 |
| 30 | 91.87 | 9.45 | 8.11 | 14.60 |
| 35 | 82.58 | 8.49 | 7.15 | 15.02 |
| 40 | 75.15 | 7.73 | 6.39 | 15.33 |
| 45 | 69.05 | 7.10 | 5.76 | 15.56 |
| 50 | 63.95 | 6.58 | 5.24 | 15.71 |
| 55 | 59.62 | 6.13 | 4.79 | 15.82 |
| 60 | 55.89 | 5.75 | 4.41 | 15.87 |
| 75 | 47.26 | 4.86 | 3.52 | 15.84 |
| 90 | 41.11 | 4.23 | 2.89 | 15.60 |
| 120 | 32.89 | 3.38 | 2.04 | 14.71 |
| 150 | 27.61 | 2.84 | 1.50 | 13.50 |
| 180 | 23.90 | 2.46 | 1.12 | 12.08 |
| 210 | 21.14 | 2.17 | 0.83 | 10.52 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-1: Building A Controlled Roof Drain A1

OTTAWA IDF CURVE
 Area = 0.037 ha Qallow = 1.34 L/s
 C = 1.00 Vol(max) = 20.2 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 29.96 | 28.62 | 8.59 |
| 10 | 214.27 | 22.04 | 20.70 | 12.42 |
| 15 | 171.47 | 17.64 | 16.30 | 14.67 |
| 20 | 143.94 | 14.81 | 13.47 | 16.16 |
| 25 | 124.62 | 12.82 | 11.48 | 17.22 |
| 30 | 110.24 | 11.34 | 10.00 | 18.00 |
| 35 | 99.09 | 10.19 | 8.85 | 18.59 |
| 40 | 90.17 | 9.28 | 7.94 | 19.04 |
| 45 | 82.86 | 8.52 | 7.18 | 19.39 |
| 50 | 76.74 | 7.89 | 6.55 | 19.66 |
| 55 | 71.55 | 7.36 | 6.02 | 19.86 |
| 60 | 67.07 | 6.90 | 5.56 | 20.01 |
| 75 | 56.71 | 5.83 | 4.49 | 20.22 |
| 90 | 49.33 | 5.07 | 3.73 | 20.17 |
| 120 | 39.47 | 4.06 | 2.72 | 19.59 |
| 150 | 33.13 | 3.41 | 2.07 | 18.61 |
| 180 | 28.68 | 2.95 | 1.61 | 17.39 |
| 210 | 25.37 | 2.61 | 1.27 | 16.00 |



| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A2 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.088 | ha | Qallow = | 1.26 | L/s |
| C = | 0.90 | | Vol(max) = | 15.0 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 22.80 | 21.54 | 6.46 | |
| 10 | 76.81 | 16.91 | 15.65 | 9.39 | |
| 15 | 61.77 | 13.60 | 12.34 | 11.11 | |
| 20 | 52.03 | 11.46 | 10.20 | 12.24 | |
| 25 | 45.17 | 9.94 | 8.68 | 13.03 | |
| 30 | 40.04 | 8.82 | 7.56 | 13.60 | |
| 35 | 36.06 | 7.94 | 6.68 | 14.03 | |
| 40 | 32.86 | 7.24 | 5.98 | 14.34 | |
| 45 | 30.24 | 6.66 | 5.40 | 14.57 | |
| 50 | 28.04 | 6.17 | 4.91 | 14.74 | |
| 55 | 26.17 | 5.76 | 4.50 | 14.86 | |
| 60 | 24.56 | 5.41 | 4.15 | 14.93 | |
| 75 | 20.81 | 4.58 | 3.32 | 14.95 | |
| 90 | 18.14 | 3.99 | 2.73 | 14.77 | |
| 120 | 14.56 | 3.21 | 1.95 | 14.01 | |
| 150 | 12.25 | 2.70 | 1.44 | 12.94 | |
| 180 | 10.63 | 2.34 | 1.08 | 11.66 | |
| 210 | 9.42 | 2.07 | 0.81 | 10.24 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A2 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.088 | ha | Qallow = | 1.34 | L/s |
| C = | 0.90 | | Vol(max) = | 22.1 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 31.08 | 29.82 | 8.95 | |
| 10 | 104.19 | 22.94 | 21.68 | 13.01 | |
| 15 | 83.56 | 18.40 | 17.14 | 15.42 | |
| 20 | 70.25 | 15.47 | 14.21 | 17.05 | |
| 25 | 60.90 | 13.41 | 12.15 | 18.22 | |
| 30 | 53.93 | 11.87 | 10.61 | 19.10 | |
| 35 | 48.52 | 10.68 | 9.42 | 19.79 | |
| 40 | 44.18 | 9.73 | 8.47 | 20.32 | |
| 45 | 40.63 | 8.95 | 7.69 | 20.75 | |
| 50 | 37.65 | 8.29 | 7.03 | 21.09 | |
| 55 | 35.12 | 7.73 | 6.47 | 21.36 | |
| 60 | 32.94 | 7.25 | 5.99 | 21.58 | |
| 75 | 27.89 | 6.14 | 4.88 | 21.96 | |
| 90 | 24.29 | 5.35 | 4.09 | 22.07 | |
| 120 | 19.47 | 4.29 | 3.03 | 21.79 | |
| 150 | 16.36 | 3.60 | 2.34 | 21.08 | |
| 180 | 14.18 | 3.12 | 1.86 | 20.11 | |
| 210 | 12.56 | 2.76 | 1.50 | 18.96 | |

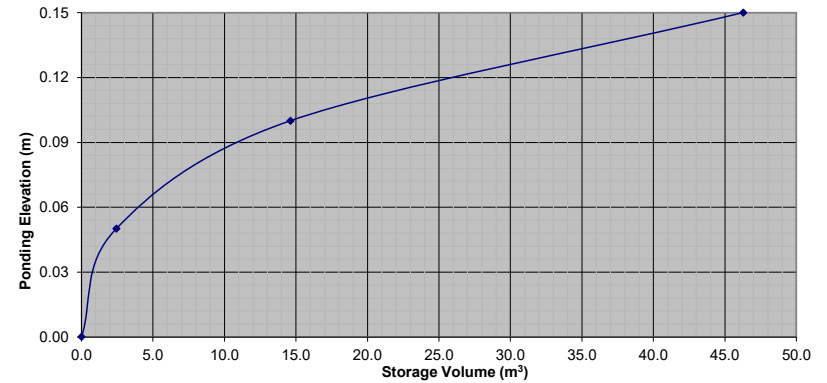
| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A2 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.088 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 44.3 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 59.38 | 57.49 | 17.25 | |
| 10 | 178.56 | 43.68 | 41.79 | 25.08 | |
| 15 | 142.89 | 34.96 | 33.07 | 29.76 | |
| 20 | 119.95 | 29.34 | 27.45 | 32.95 | |
| 25 | 103.85 | 25.41 | 23.52 | 35.27 | |
| 30 | 91.87 | 22.47 | 20.58 | 37.05 | |
| 35 | 82.58 | 20.20 | 18.31 | 38.46 | |
| 40 | 75.15 | 18.38 | 16.49 | 39.58 | |
| 45 | 69.05 | 16.89 | 15.00 | 40.51 | |
| 50 | 63.95 | 15.65 | 13.76 | 41.27 | |
| 55 | 59.62 | 14.59 | 12.70 | 41.90 | |
| 60 | 55.89 | 13.67 | 11.78 | 42.42 | |
| 75 | 47.26 | 11.56 | 9.67 | 43.52 | |
| 90 | 41.11 | 10.06 | 8.17 | 44.10 | |
| 120 | 32.89 | 8.05 | 6.16 | 44.33 | |
| 150 | 27.61 | 6.75 | 4.86 | 43.78 | |
| 180 | 23.90 | 5.85 | 3.96 | 42.74 | |
| 210 | 21.14 | 5.17 | 3.28 | 41.36 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drain A2 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.088 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 55.9 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 71.25 | 69.36 | 20.81 | |
| 10 | 214.27 | 52.42 | 50.53 | 30.32 | |
| 15 | 171.47 | 41.95 | 40.06 | 36.05 | |
| 20 | 143.94 | 35.21 | 33.32 | 39.99 | |
| 25 | 124.62 | 30.49 | 28.60 | 42.89 | |
| 30 | 110.24 | 26.97 | 25.08 | 45.14 | |
| 35 | 99.09 | 24.24 | 22.35 | 46.94 | |
| 40 | 90.17 | 22.06 | 20.17 | 48.41 | |
| 45 | 82.86 | 20.27 | 18.38 | 49.63 | |
| 50 | 76.74 | 18.77 | 16.88 | 50.65 | |
| 55 | 71.55 | 17.50 | 15.61 | 51.52 | |
| 60 | 67.07 | 16.41 | 14.52 | 52.27 | |
| 75 | 56.71 | 13.87 | 11.98 | 53.92 | |
| 90 | 49.33 | 12.07 | 10.18 | 54.97 | |
| 120 | 39.47 | 9.66 | 7.77 | 55.92 | |
| 150 | 33.13 | 8.11 | 6.22 | 55.94 | |
| 180 | 28.68 | 7.02 | 5.13 | 55.37 | |
| 210 | 25.37 | 6.21 | 4.32 | 54.40 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 15.0 | 46.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 22.1 | 46.3 |
| 1:100 Year | 1.89 | 1.89 | 15 | 44.3 | 46.3 |

| Roof Drain Storage Table for Area RD A2 | | |
|---|----------------|----------------|
| Elevation | Area RD A2 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 97.4 | 2.4 |
| 0.10 | 389.57 | 14.6 |
| 0.15 | 876.74 | 46.3 |

Stage Storage Curve: Area R-1
Controlled Roof Drain # A2



| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A3 + A4 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.74 | L/s |
| C = | 0.90 | | Vol(max) = | 13.9 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 103.57 | 23.58 | 21.84 | 6.55 | |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 | |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 | |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 | |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 | |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 | |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 | |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 | |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 | |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 | |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 | |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 | |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 | |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 | |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 | |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 | |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 | |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 | |

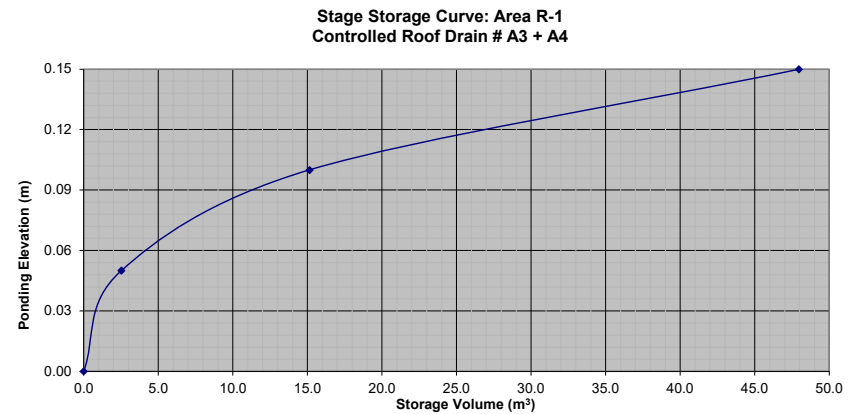
| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A3 + A4 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.97 | L/s |
| C = | 0.90 | | Vol(max) = | 20.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 141.18 | 32.14 | 30.40 | 9.12 | |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 | |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 | |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 | |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 | |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 | |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 | |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 | |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 | |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 | |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 | |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 | |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 | |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 | |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 | |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 | |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 | |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | | |
|--|--------------------|--------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain A3(L/s) | Flow/Drain A4(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | | Required | Provided |
| 1:2 Year | 0.79 | 0.95 | 1.74 | 9 | 13.9 | 48.0 |
| 1:5 Year | 0.87 | 1.10 | 1.97 | 11 | 20.7 | 48.0 |
| 1:100 Year | 1.34 | 1.58 | 2.92 | 14 | 40.7 | 48.0 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|----------------|----------------|
| Elevation | Area RD A3+A4 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 101.05 | 2.5 |
| 0.10 | 403.87 | 15.1 |
| 0.15 | 909 | 48.0 |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A3 + A4 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 40.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 242.70 | 61.40 | 58.48 | 17.54 | |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 | |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 | |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 | |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 | |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 | |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 | |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 | |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 | |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 | |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 | |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 | |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 | |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 | |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 | |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 | |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 | |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drains A3 + A4 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 51.6 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 291.24 | 73.68 | 70.76 | 21.23 | |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 | |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 | |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 | |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 | |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 | |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 | |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 | |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 | |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 | |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 | |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 | |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 | |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 | |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 | |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 | |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 | |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 | |



| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A5 + A6 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.74 | L/s |
| C = | 0.90 | | Vol(max) = | 13.9 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 103.57 | 23.58 | 21.84 | 6.55 | |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 | |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 | |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 | |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 | |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 | |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 | |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 | |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 | |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 | |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 | |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 | |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 | |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 | |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 | |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 | |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 | |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 | |

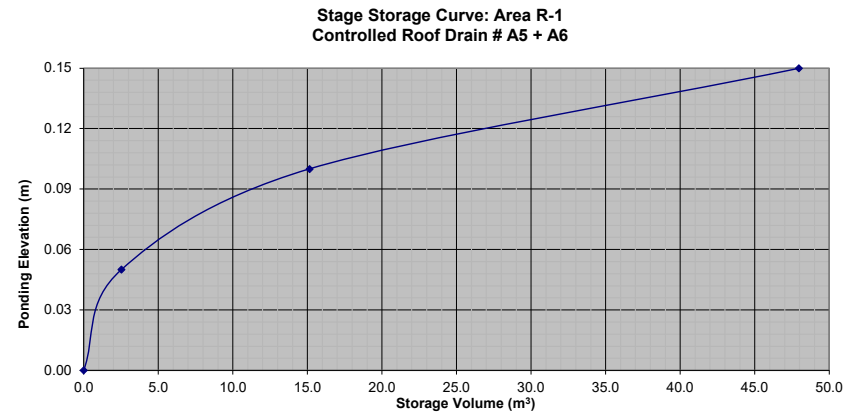
| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A5 + A6 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.97 | L/s |
| C = | 0.90 | | Vol(max) = | 20.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 141.18 | 32.14 | 30.40 | 9.12 | |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 | |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 | |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 | |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 | |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 | |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 | |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 | |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 | |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 | |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 | |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 | |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 | |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 | |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 | |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 | |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 | |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | | |
|--|--------------------|--------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain A5(L/s) | Flow/Drain A6(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | | Required | Provided |
| 1:2 Year | 0.79 | 0.95 | 1.74 | 9 | 13.9 | 48.0 |
| 1:5 Year | 0.87 | 1.10 | 1.97 | 11 | 20.7 | 48.0 |
| 1:100 Year | 1.34 | 1.58 | 2.92 | 14 | 40.7 | 48.0 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|----------------|----------------|
| Elevation | Area RD A5+A6 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 101.05 | 2.5 |
| 0.10 | 403.87 | 15.1 |
| 0.15 | 909 | 48.0 |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A5 + A6 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 40.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 242.70 | 61.40 | 58.48 | 17.54 | |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 | |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 | |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 | |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 | |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 | |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 | |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 | |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 | |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 | |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 | |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 | |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 | |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 | |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 | |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 | |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 | |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drains A5 + A6 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 51.6 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 291.24 | 73.68 | 70.76 | 21.23 | |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 | |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 | |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 | |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 | |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 | |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 | |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 | |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 | |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 | |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 | |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 | |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 | |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 | |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 | |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 | |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 | |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 | |



| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A7 + A8 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.74 | L/s |
| C = | 0.90 | | Vol(max) = | 13.9 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 103.57 | 23.58 | 21.84 | 6.55 | |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 | |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 | |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 | |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 | |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 | |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 | |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 | |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 | |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 | |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 | |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 | |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 | |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 | |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 | |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 | |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 | |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 | |

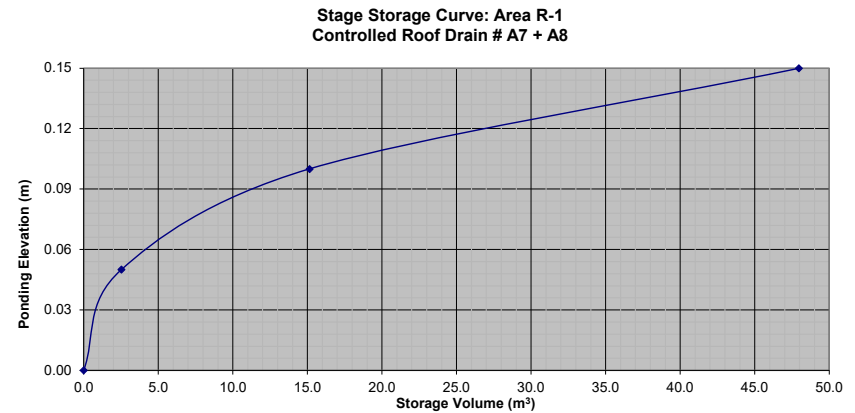
| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A7 + A8 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 1.97 | L/s |
| C = | 0.90 | | Vol(max) = | 20.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 141.18 | 32.14 | 30.40 | 9.12 | |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 | |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 | |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 | |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 | |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 | |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 | |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 | |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 | |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 | |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 | |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 | |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 | |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 | |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 | |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 | |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 | |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | | |
|--|--------------------|--------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain A7(L/s) | Flow/Drain A8(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | | Required | Provided |
| 1:2 Year | 0.79 | 0.95 | 1.74 | 9 | 13.9 | 48.0 |
| 1:5 Year | 0.87 | 1.10 | 1.97 | 11 | 20.7 | 48.0 |
| 1:100 Year | 1.34 | 1.58 | 2.92 | 14 | 40.7 | 48.0 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|----------------|----------------|
| Elevation | Area RD A7+A8 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 101.05 | 2.5 |
| 0.10 | 403.87 | 15.1 |
| 0.15 | 909 | 48.0 |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drains A7 + A8 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 40.7 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 242.70 | 61.40 | 58.48 | 17.54 | |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 | |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 | |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 | |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 | |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 | |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 | |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 | |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 | |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 | |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 | |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 | |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 | |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 | |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 | |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 | |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 | |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drains A7 + A8 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.091 | ha | Qallow = | 2.92 | L/s |
| C = | 1.00 | | Vol(max) = | 51.6 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 291.24 | 73.68 | 70.76 | 21.23 | |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 | |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 | |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 | |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 | |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 | |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 | |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 | |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 | |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 | |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 | |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 | |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 | |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 | |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 | |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 | |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 | |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 | |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A9 + A10

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 13.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.58 | 21.84 | 6.55 |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A9 + A10

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 20.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.14 | 30.40 | 9.12 |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain A9(L/s) | Flow/Drain A10(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|--------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.79 | 0.95 | 1.74 | 9 | 13.9 | 48.0 |
| 1:5 Year | 0.87 | 1.10 | 1.97 | 11 | 20.7 | 48.0 |
| 1:100 Year | 1.34 | 1.58 | 2.92 | 14 | 40.7 | 48.0 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD A9+A10 | Total Volume |
|-----------|----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 101.05 | 2.5 |
| 0.10 | 403.87 | 15.1 |
| 0.15 | 909 | 48.0 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A9 + A10

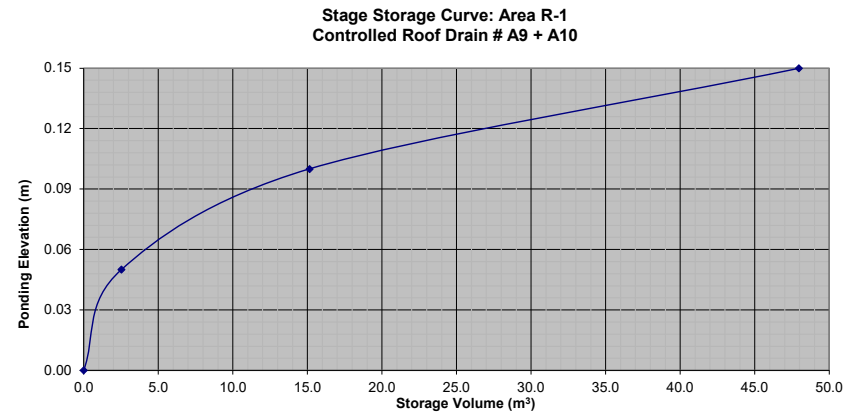
OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 40.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 61.40 | 58.48 | 17.54 |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-1: Building A Controlled Roof Drains A9 + A10

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 51.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 73.68 | 70.76 | 21.23 |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A11 + A12

OTTAWA IDF CURVE
 Area = 0.095 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 14.8 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 24.62 | 22.88 | 6.86 |
| 10 | 76.81 | 18.26 | 16.52 | 9.91 |
| 15 | 61.77 | 14.68 | 12.94 | 11.65 |
| 20 | 52.03 | 12.37 | 10.63 | 12.75 |
| 25 | 45.17 | 10.74 | 9.00 | 13.49 |
| 30 | 40.04 | 9.52 | 7.78 | 14.00 |
| 35 | 36.06 | 8.57 | 6.83 | 14.34 |
| 40 | 32.86 | 7.81 | 6.07 | 14.57 |
| 45 | 30.24 | 7.19 | 5.45 | 14.71 |
| 50 | 28.04 | 6.67 | 4.93 | 14.78 |
| 55 | 26.17 | 6.22 | 4.48 | 14.79 |
| 60 | 24.56 | 5.84 | 4.10 | 14.75 |
| 75 | 20.81 | 4.95 | 3.21 | 14.43 |
| 90 | 18.14 | 4.31 | 2.57 | 13.89 |
| 120 | 14.56 | 3.46 | 1.72 | 12.39 |
| 150 | 12.25 | 2.91 | 1.17 | 10.55 |
| 180 | 10.63 | 2.53 | 0.79 | 8.49 |
| 210 | 9.42 | 2.24 | 0.50 | 6.27 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A11 + A12

OTTAWA IDF CURVE
 Area = 0.095 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 22.0 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 33.56 | 31.82 | 9.55 |
| 10 | 104.19 | 24.77 | 23.03 | 13.82 |
| 15 | 83.56 | 19.86 | 18.12 | 16.31 |
| 20 | 70.25 | 16.70 | 14.96 | 17.95 |
| 25 | 60.90 | 14.47 | 12.73 | 19.10 |
| 30 | 53.93 | 12.82 | 11.08 | 19.94 |
| 35 | 48.52 | 11.53 | 9.79 | 20.56 |
| 40 | 44.18 | 10.50 | 8.76 | 21.03 |
| 45 | 40.63 | 9.66 | 7.92 | 21.38 |
| 50 | 37.65 | 8.95 | 7.21 | 21.63 |
| 55 | 35.12 | 8.35 | 6.61 | 21.81 |
| 60 | 32.94 | 7.83 | 6.09 | 21.93 |
| 75 | 27.89 | 6.63 | 4.89 | 22.00 |
| 90 | 24.29 | 5.77 | 4.03 | 21.78 |
| 120 | 19.47 | 4.63 | 2.89 | 20.79 |
| 150 | 16.36 | 3.89 | 2.15 | 19.34 |
| 180 | 14.18 | 3.37 | 1.63 | 17.61 |
| 210 | 12.56 | 2.98 | 1.24 | 15.68 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain A11(L/s) | Flow/Drain A12(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.79 | 0.95 | 1.74 | 9 | 14.8 | 50.0 |
| 1:5 Year | 0.87 | 1.10 | 1.97 | 11 | 22.0 | 50.0 |
| 1:100 Year | 1.34 | 1.58 | 2.92 | 14 | 43.0 | 50.0 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD A11+A12 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 105.11 | 2.6 |
| 0.10 | 420.66 | 15.8 |
| 0.15 | 946.47 | 50.0 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-1: Building A Controlled Roof Drains A11 + A12

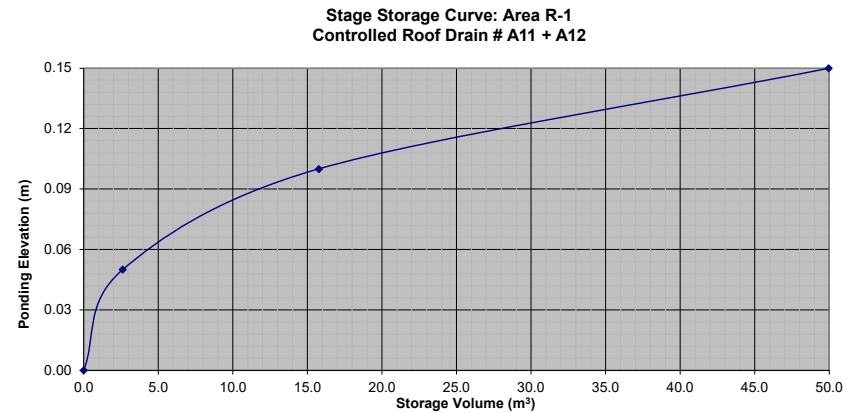
OTTAWA IDF CURVE
 Area = 0.095 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 43.0 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 64.10 | 61.18 | 18.35 |
| 10 | 178.56 | 47.16 | 44.24 | 26.54 |
| 15 | 142.89 | 37.74 | 34.82 | 31.34 |
| 20 | 119.95 | 31.68 | 28.76 | 34.51 |
| 25 | 103.85 | 27.43 | 24.51 | 36.76 |
| 30 | 91.87 | 24.26 | 21.34 | 38.42 |
| 35 | 82.58 | 21.81 | 18.89 | 39.67 |
| 40 | 75.15 | 19.85 | 16.93 | 40.62 |
| 45 | 69.05 | 18.24 | 15.32 | 41.35 |
| 50 | 63.95 | 16.89 | 13.97 | 41.91 |
| 55 | 59.62 | 15.75 | 12.83 | 42.33 |
| 60 | 55.89 | 14.76 | 11.84 | 42.63 |
| 75 | 47.26 | 12.48 | 9.56 | 43.02 |
| 90 | 41.11 | 10.86 | 7.94 | 42.86 |
| 120 | 32.89 | 8.69 | 5.77 | 41.53 |
| 150 | 27.61 | 7.29 | 4.37 | 39.35 |
| 180 | 23.90 | 6.31 | 3.39 | 36.64 |
| 210 | 21.14 | 5.58 | 2.66 | 33.57 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-1: Building A Controlled Roof Drains A11 + A12

OTTAWA IDF CURVE
 Area = 0.095 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 54.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 76.92 | 74.00 | 22.20 |
| 10 | 214.27 | 56.59 | 53.67 | 32.20 |
| 15 | 171.47 | 45.29 | 42.37 | 38.13 |
| 20 | 143.94 | 38.01 | 35.09 | 42.11 |
| 25 | 124.62 | 32.91 | 29.99 | 44.99 |
| 30 | 110.24 | 29.11 | 26.19 | 47.15 |
| 35 | 99.09 | 26.17 | 23.25 | 48.83 |
| 40 | 90.17 | 23.82 | 20.90 | 50.15 |
| 45 | 82.86 | 21.88 | 18.96 | 51.20 |
| 50 | 76.74 | 20.27 | 17.35 | 52.05 |
| 55 | 71.55 | 18.90 | 15.98 | 52.72 |
| 60 | 67.07 | 17.71 | 14.79 | 53.26 |
| 75 | 56.71 | 14.98 | 12.06 | 54.25 |
| 90 | 49.33 | 13.03 | 10.11 | 54.59 |
| 120 | 39.47 | 10.43 | 7.51 | 54.04 |
| 150 | 33.13 | 8.75 | 5.83 | 52.47 |
| 180 | 28.68 | 7.58 | 4.66 | 50.28 |
| 210 | 25.37 | 6.70 | 3.78 | 47.64 |



| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A13 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.074 | ha | Qallow = | 1.26 | L/s |
| C = | 0.90 | | Vol(max) = | 11.8 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 103.57 | 19.18 | 17.92 | 5.37 | |
| 10 | 76.81 | 14.22 | 12.96 | 7.78 | |
| 15 | 61.77 | 11.44 | 10.18 | 9.16 | |
| 20 | 52.03 | 9.63 | 8.37 | 10.05 | |
| 25 | 45.17 | 8.36 | 7.10 | 10.65 | |
| 30 | 40.04 | 7.41 | 6.15 | 11.08 | |
| 35 | 36.06 | 6.68 | 5.42 | 11.37 | |
| 40 | 32.86 | 6.08 | 4.82 | 11.58 | |
| 45 | 30.24 | 5.60 | 4.34 | 11.71 | |
| 50 | 28.04 | 5.19 | 3.93 | 11.80 | |
| 55 | 26.17 | 4.85 | 3.59 | 11.83 | |
| 60 | 24.56 | 4.55 | 3.29 | 11.83 | |
| 75 | 20.81 | 3.85 | 2.59 | 11.67 | |
| 90 | 18.14 | 3.36 | 2.10 | 11.34 | |
| 120 | 14.56 | 2.70 | 1.44 | 10.34 | |
| 150 | 12.25 | 2.27 | 1.01 | 9.08 | |
| 180 | 10.63 | 1.97 | 0.71 | 7.64 | |
| 210 | 9.42 | 1.74 | 0.48 | 6.09 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A13 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.074 | ha | Qallow = | 1.34 | L/s |
| C = | 0.90 | | Vol(max) = | 17.6 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 141.18 | 26.14 | 24.88 | 7.46 | |
| 10 | 104.19 | 19.29 | 18.03 | 10.82 | |
| 15 | 83.56 | 15.47 | 14.21 | 12.79 | |
| 20 | 70.25 | 13.01 | 11.75 | 14.10 | |
| 25 | 60.90 | 11.27 | 10.01 | 15.02 | |
| 30 | 53.93 | 9.98 | 8.72 | 15.70 | |
| 35 | 48.52 | 8.98 | 7.72 | 16.22 | |
| 40 | 44.18 | 8.18 | 6.92 | 16.61 | |
| 45 | 40.63 | 7.52 | 6.26 | 16.91 | |
| 50 | 37.65 | 6.97 | 5.71 | 17.13 | |
| 55 | 35.12 | 6.50 | 5.24 | 17.30 | |
| 60 | 32.94 | 6.10 | 4.84 | 17.42 | |
| 75 | 27.89 | 5.16 | 3.90 | 17.57 | |
| 90 | 24.29 | 4.50 | 3.24 | 17.48 | |
| 120 | 19.47 | 3.60 | 2.34 | 16.88 | |
| 150 | 16.36 | 3.03 | 1.77 | 15.92 | |
| 180 | 14.18 | 2.63 | 1.37 | 14.75 | |
| 210 | 12.56 | 2.32 | 1.06 | 13.41 | |

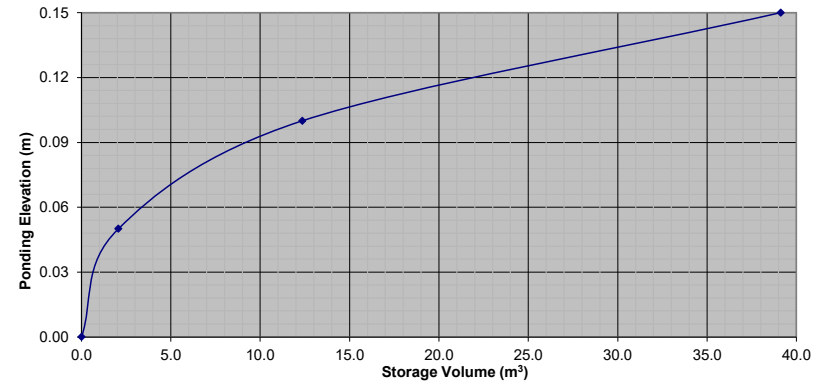
| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A13 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.074 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 35.5 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 242.70 | 49.93 | 48.04 | 14.41 | |
| 10 | 178.56 | 36.73 | 34.84 | 20.91 | |
| 15 | 142.89 | 29.40 | 27.51 | 24.76 | |
| 20 | 119.95 | 24.68 | 22.79 | 27.34 | |
| 25 | 103.85 | 21.36 | 19.47 | 29.21 | |
| 30 | 91.87 | 18.90 | 17.01 | 30.62 | |
| 35 | 82.58 | 16.99 | 15.10 | 31.71 | |
| 40 | 75.15 | 15.46 | 13.57 | 32.57 | |
| 45 | 69.05 | 14.21 | 12.32 | 33.25 | |
| 50 | 63.95 | 13.16 | 11.27 | 33.80 | |
| 55 | 59.62 | 12.27 | 10.38 | 34.24 | |
| 60 | 55.89 | 11.50 | 9.61 | 34.59 | |
| 75 | 47.26 | 9.72 | 7.83 | 35.24 | |
| 90 | 41.11 | 8.46 | 6.57 | 35.46 | |
| 120 | 32.89 | 6.77 | 4.88 | 35.12 | |
| 150 | 27.61 | 5.68 | 3.79 | 34.11 | |
| 180 | 23.90 | 4.92 | 3.03 | 32.69 | |
| 210 | 21.14 | 4.35 | 2.46 | 30.99 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drain A13 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.074 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 44.9 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 291.24 | 59.91 | 58.02 | 17.41 | |
| 10 | 214.27 | 44.08 | 42.19 | 25.31 | |
| 15 | 171.47 | 35.28 | 33.39 | 30.05 | |
| 20 | 143.94 | 29.61 | 27.72 | 33.27 | |
| 25 | 124.62 | 25.64 | 23.75 | 35.62 | |
| 30 | 110.24 | 22.68 | 20.79 | 37.42 | |
| 35 | 99.09 | 20.39 | 18.50 | 38.84 | |
| 40 | 90.17 | 18.55 | 16.66 | 39.99 | |
| 45 | 82.86 | 17.05 | 15.16 | 40.92 | |
| 50 | 76.74 | 15.79 | 13.90 | 41.69 | |
| 55 | 71.55 | 14.72 | 12.83 | 42.34 | |
| 60 | 67.07 | 13.80 | 11.91 | 42.87 | |
| 75 | 56.71 | 11.67 | 9.78 | 43.99 | |
| 90 | 49.33 | 10.15 | 8.26 | 44.60 | |
| 120 | 39.47 | 8.12 | 6.23 | 44.86 | |
| 150 | 33.13 | 6.82 | 4.93 | 44.33 | |
| 180 | 28.68 | 5.90 | 4.01 | 43.32 | |
| 210 | 25.37 | 5.22 | 3.33 | 41.96 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 11.8 | 39.1 |
| 1:5 Year | 1.34 | 1.34 | 11 | 17.6 | 39.1 |
| 1:100 Year | 1.89 | 1.89 | 15 | 35.5 | 39.1 |

| Roof Drain Storage Table for Area RD A13 | | |
|--|----------------|----------------|
| Elevation | Area RD A13 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 82.43 | 2.1 |
| 0.10 | 329.38 | 12.4 |
| 0.15 | 741.09 | 39.1 |

Stage Storage Curve: Area R-1
Controlled Roof Drain # A13



| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A14 to A17 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.10 L/s | | | |
| C = 0.90 | | Vol(max) = 13.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 19.95 | 18.85 | 5.66 | |
| 10 | 76.81 | 14.80 | 13.70 | 8.22 | |
| 15 | 61.77 | 11.90 | 10.80 | 9.72 | |
| 20 | 52.03 | 10.02 | 8.92 | 10.71 | |
| 25 | 45.17 | 8.70 | 7.60 | 11.40 | |
| 30 | 40.04 | 7.71 | 6.61 | 11.91 | |
| 35 | 36.06 | 6.95 | 5.85 | 12.28 | |
| 40 | 32.86 | 6.33 | 5.23 | 12.56 | |
| 45 | 30.24 | 5.83 | 4.73 | 12.76 | |
| 50 | 28.04 | 5.40 | 4.30 | 12.91 | |
| 55 | 26.17 | 5.04 | 3.94 | 13.01 | |
| 60 | 24.56 | 4.73 | 3.63 | 13.07 | |
| 75 | 20.81 | 4.01 | 2.91 | 13.09 | |
| 90 | 18.14 | 3.50 | 2.40 | 12.93 | |
| 120 | 14.56 | 2.81 | 1.71 | 12.28 | |
| 150 | 12.25 | 2.36 | 1.26 | 11.34 | |
| 180 | 10.63 | 2.05 | 0.95 | 10.23 | |
| 210 | 9.42 | 1.81 | 0.71 | 9.00 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A14 to A17 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 19.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.20 | 26.10 | 7.83 | |
| 10 | 104.19 | 20.07 | 18.97 | 11.38 | |
| 15 | 83.56 | 16.10 | 15.00 | 13.50 | |
| 20 | 70.25 | 13.53 | 12.43 | 14.92 | |
| 25 | 60.90 | 11.73 | 10.63 | 15.95 | |
| 30 | 53.93 | 10.39 | 9.29 | 16.72 | |
| 35 | 48.52 | 9.35 | 8.25 | 17.32 | |
| 40 | 44.18 | 8.51 | 7.41 | 17.79 | |
| 45 | 40.63 | 7.83 | 6.73 | 18.16 | |
| 50 | 37.65 | 7.25 | 6.15 | 18.46 | |
| 55 | 35.12 | 6.77 | 5.67 | 18.70 | |
| 60 | 32.94 | 6.35 | 5.25 | 18.89 | |
| 75 | 27.89 | 5.37 | 4.27 | 19.23 | |
| 90 | 24.29 | 4.68 | 3.58 | 19.33 | |
| 120 | 19.47 | 3.75 | 2.65 | 19.08 | |
| 150 | 16.36 | 3.15 | 2.05 | 18.47 | |
| 180 | 14.18 | 2.73 | 1.63 | 17.62 | |
| 210 | 12.56 | 2.42 | 1.32 | 16.62 | |

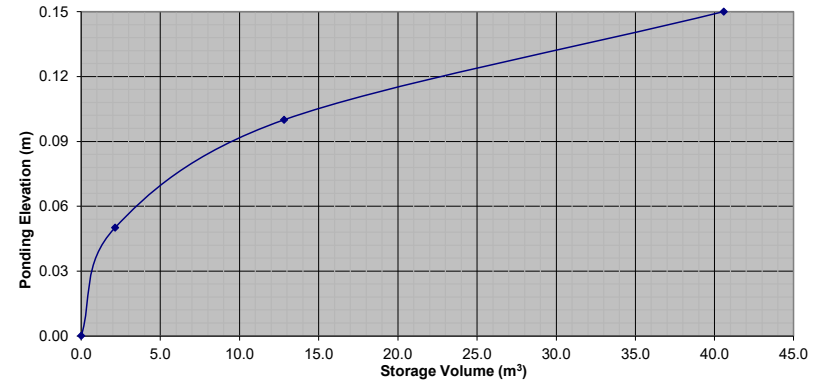
| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A14 to A17 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 39.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 51.95 | 50.37 | 15.11 | |
| 10 | 178.56 | 38.22 | 36.64 | 21.99 | |
| 15 | 142.89 | 30.59 | 29.01 | 26.11 | |
| 20 | 119.95 | 25.68 | 24.10 | 28.92 | |
| 25 | 103.85 | 22.23 | 20.65 | 30.97 | |
| 30 | 91.87 | 19.67 | 18.09 | 32.55 | |
| 35 | 82.58 | 17.68 | 16.10 | 33.80 | |
| 40 | 75.15 | 16.09 | 14.51 | 34.81 | |
| 45 | 69.05 | 14.78 | 13.20 | 35.64 | |
| 50 | 63.95 | 13.69 | 12.11 | 36.33 | |
| 55 | 59.62 | 12.76 | 11.18 | 36.90 | |
| 60 | 55.89 | 11.96 | 10.38 | 37.39 | |
| 75 | 47.26 | 10.12 | 8.54 | 38.41 | |
| 90 | 41.11 | 8.80 | 7.22 | 38.99 | |
| 120 | 32.89 | 7.04 | 5.46 | 39.32 | |
| 150 | 27.61 | 5.91 | 4.33 | 38.97 | |
| 180 | 23.90 | 5.12 | 3.54 | 38.20 | |
| 210 | 21.14 | 4.53 | 2.95 | 37.12 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Roof Drains A14 to A17 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 49.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 62.34 | 60.76 | 18.23 | |
| 10 | 214.27 | 45.87 | 44.29 | 26.57 | |
| 15 | 171.47 | 36.71 | 35.13 | 31.61 | |
| 20 | 143.94 | 30.81 | 29.23 | 35.08 | |
| 25 | 124.62 | 26.68 | 25.10 | 37.64 | |
| 30 | 110.24 | 23.60 | 22.02 | 39.63 | |
| 35 | 99.09 | 21.21 | 19.63 | 41.23 | |
| 40 | 90.17 | 19.30 | 17.72 | 42.53 | |
| 45 | 82.86 | 17.74 | 16.16 | 43.62 | |
| 50 | 76.74 | 16.43 | 14.85 | 44.54 | |
| 55 | 71.55 | 15.32 | 13.74 | 45.33 | |
| 60 | 67.07 | 14.36 | 12.78 | 46.00 | |
| 75 | 56.71 | 12.14 | 10.56 | 47.51 | |
| 90 | 49.33 | 10.56 | 8.98 | 48.49 | |
| 120 | 39.47 | 8.45 | 6.87 | 49.46 | |
| 150 | 33.13 | 7.09 | 5.51 | 49.61 | |
| 180 | 28.68 | 6.14 | 4.56 | 49.25 | |
| 210 | 25.37 | 5.43 | 3.85 | 48.53 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | |
|--|------------------|------------------|--------------|--------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.10 | 4.40 | 10 | 13.1 | 40.6 |
| 1:5 Year | 1.34 | 5.36 | 11 | 19.3 | 40.6 |
| 1:100 Year | 1.58 | 6.32 | 15 | 39.3 | 40.6 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|------------------|--------------|
| Elevation | Area Roof Drains | Total Volume |
| m | m² | m³ |
| 0.00 | 0 | 0 |
| 0.05 | 85.39 | 2.1 |
| 0.10 | 341.68 | 12.8 |
| 0.15 | 768.48 | 40.6 |

Stage Storage Curve: Area R-1
Controlled Roof Drains #A14 to A17



| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A18 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.080 | ha | Qallow = | 1.26 | L/s |
| C = | 0.90 | | Vol(max) = | 13.2 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 103.57 | 20.73 | 19.47 | 5.84 | |
| 10 | 76.81 | 15.37 | 14.11 | 8.47 | |
| 15 | 61.77 | 12.36 | 11.10 | 9.99 | |
| 20 | 52.03 | 10.41 | 9.15 | 10.99 | |
| 25 | 45.17 | 9.04 | 7.78 | 11.67 | |
| 30 | 40.04 | 8.02 | 6.76 | 12.16 | |
| 35 | 36.06 | 7.22 | 5.96 | 12.51 | |
| 40 | 32.86 | 6.58 | 5.32 | 12.76 | |
| 45 | 30.24 | 6.05 | 4.79 | 12.94 | |
| 50 | 28.04 | 5.61 | 4.35 | 13.06 | |
| 55 | 26.17 | 5.24 | 3.98 | 13.13 | |
| 60 | 24.56 | 4.92 | 3.66 | 13.16 | |
| 75 | 20.81 | 4.17 | 2.91 | 13.08 | |
| 90 | 18.14 | 3.63 | 2.37 | 12.81 | |
| 120 | 14.56 | 2.91 | 1.65 | 11.91 | |
| 150 | 12.25 | 2.45 | 1.19 | 10.73 | |
| 180 | 10.63 | 2.13 | 0.87 | 9.36 | |
| 210 | 9.42 | 1.88 | 0.62 | 7.87 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A18 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.080 | ha | Qallow = | 1.34 | L/s |
| C = | 0.90 | | Vol(max) = | 19.4 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 141.18 | 28.26 | 27.00 | 8.10 | |
| 10 | 104.19 | 20.86 | 19.60 | 11.76 | |
| 15 | 83.56 | 16.72 | 15.46 | 13.92 | |
| 20 | 70.25 | 14.06 | 12.80 | 15.36 | |
| 25 | 60.90 | 12.19 | 10.93 | 16.39 | |
| 30 | 53.93 | 10.79 | 9.53 | 17.16 | |
| 35 | 48.52 | 9.71 | 8.45 | 17.75 | |
| 40 | 44.18 | 8.84 | 7.58 | 18.20 | |
| 45 | 40.63 | 8.13 | 6.87 | 18.56 | |
| 50 | 37.65 | 7.54 | 6.28 | 18.83 | |
| 55 | 35.12 | 7.03 | 5.77 | 19.04 | |
| 60 | 32.94 | 6.59 | 5.33 | 19.20 | |
| 75 | 27.89 | 5.58 | 4.32 | 19.45 | |
| 90 | 24.29 | 4.86 | 3.60 | 19.45 | |
| 120 | 19.47 | 3.90 | 2.64 | 18.98 | |
| 150 | 16.36 | 3.28 | 2.02 | 18.14 | |
| 180 | 14.18 | 2.84 | 1.58 | 17.05 | |
| 210 | 12.56 | 2.51 | 1.25 | 15.79 | |

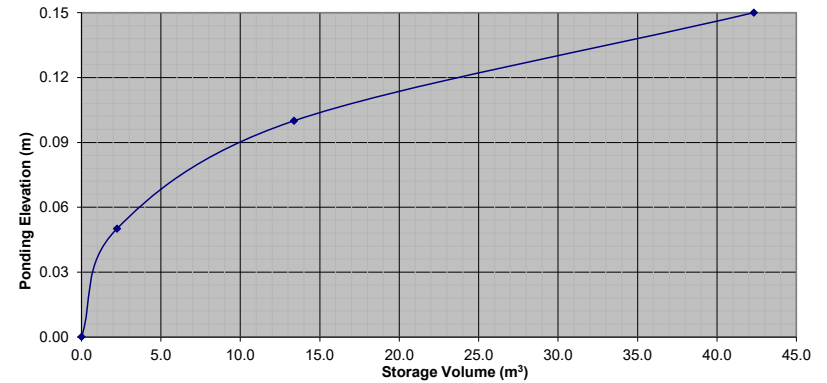
| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A18 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.080 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 39.2 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 242.70 | 53.98 | 52.09 | 15.63 | |
| 10 | 178.56 | 39.71 | 37.82 | 22.69 | |
| 15 | 142.89 | 31.78 | 29.89 | 26.90 | |
| 20 | 119.95 | 26.68 | 24.79 | 29.74 | |
| 25 | 103.85 | 23.10 | 21.21 | 31.81 | |
| 30 | 91.87 | 20.43 | 18.54 | 33.37 | |
| 35 | 82.58 | 18.37 | 16.48 | 34.60 | |
| 40 | 75.15 | 16.71 | 14.82 | 35.57 | |
| 45 | 69.05 | 15.36 | 13.47 | 36.36 | |
| 50 | 63.95 | 14.22 | 12.33 | 37.00 | |
| 55 | 59.62 | 13.26 | 11.37 | 37.52 | |
| 60 | 55.89 | 12.43 | 10.54 | 37.95 | |
| 75 | 47.26 | 10.51 | 8.62 | 38.79 | |
| 90 | 41.11 | 9.14 | 7.25 | 39.17 | |
| 120 | 32.89 | 7.32 | 5.43 | 39.07 | |
| 150 | 27.61 | 6.14 | 4.25 | 38.26 | |
| 180 | 23.90 | 5.32 | 3.43 | 37.00 | |
| 210 | 21.14 | 4.70 | 2.81 | 35.44 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|-----------------------|----------------|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drain A18 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.080 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 49.6 | m ³ |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m ³) | |
| 5 | 291.24 | 64.77 | 62.88 | 18.86 | |
| 10 | 214.27 | 47.65 | 45.76 | 27.46 | |
| 15 | 171.47 | 38.14 | 36.25 | 32.62 | |
| 20 | 143.94 | 32.01 | 30.12 | 36.15 | |
| 25 | 124.62 | 27.71 | 25.82 | 38.74 | |
| 30 | 110.24 | 24.52 | 22.63 | 40.73 | |
| 35 | 99.09 | 22.04 | 20.15 | 42.31 | |
| 40 | 90.17 | 20.05 | 18.16 | 43.60 | |
| 45 | 82.86 | 18.43 | 16.54 | 44.65 | |
| 50 | 76.74 | 17.07 | 15.18 | 45.53 | |
| 55 | 71.55 | 15.91 | 14.02 | 46.27 | |
| 60 | 67.07 | 14.92 | 13.03 | 46.90 | |
| 75 | 56.71 | 12.61 | 10.72 | 48.25 | |
| 90 | 49.33 | 10.97 | 9.08 | 49.04 | |
| 120 | 39.47 | 8.78 | 6.89 | 49.60 | |
| 150 | 33.13 | 7.37 | 5.48 | 49.31 | |
| 180 | 28.68 | 6.38 | 4.49 | 48.48 | |
| 210 | 25.37 | 5.64 | 3.75 | 47.29 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 13.2 | 42.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 19.4 | 42.3 |
| 1:100 Year | 1.89 | 1.89 | 14 | 39.2 | 42.3 |

| Roof Drain Storage Table for Area RD A18 | | |
|--|----------------|----------------|
| Elevation | Area RD A18 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 89.14 | 2.2 |
| 0.10 | 356.54 | 13.4 |
| 0.15 | 801.35 | 42.3 |

Stage Storage Curve: Area R-1
Controlled Roof Drain # A18



| Proposed Industrial Development | | | | | |
|--|-------------------|-------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A19 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.061 ha | | Qallow = 1.26 L/s | | | |
| C = 0.90 | | Vol(max) = 9.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 15.81 | 14.55 | 4.36 | |
| 10 | 76.81 | 11.72 | 10.46 | 6.28 | |
| 15 | 61.77 | 9.43 | 8.17 | 7.35 | |
| 20 | 52.03 | 7.94 | 6.68 | 8.02 | |
| 25 | 45.17 | 6.89 | 5.63 | 8.45 | |
| 30 | 40.04 | 6.11 | 4.85 | 8.73 | |
| 35 | 36.06 | 5.50 | 4.24 | 8.91 | |
| 40 | 32.86 | 5.02 | 3.76 | 9.01 | |
| 45 | 30.24 | 4.62 | 3.36 | 9.06 | |
| 50 | 28.04 | 4.28 | 3.02 | 9.06 | |
| 55 | 26.17 | 3.99 | 2.73 | 9.02 | |
| 60 | 24.56 | 3.75 | 2.49 | 8.96 | |
| 75 | 20.81 | 3.18 | 1.92 | 8.62 | |
| 90 | 18.14 | 2.77 | 1.51 | 8.15 | |
| 120 | 14.56 | 2.22 | 0.96 | 6.93 | |
| 150 | 12.25 | 1.87 | 0.61 | 5.49 | |
| 180 | 10.63 | 1.62 | 0.36 | 3.91 | |
| 210 | 9.42 | 1.44 | 0.18 | 2.23 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A19 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.061 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 13.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 21.55 | 20.29 | 6.09 | |
| 10 | 104.19 | 15.90 | 14.64 | 8.79 | |
| 15 | 83.56 | 12.75 | 11.49 | 10.34 | |
| 20 | 70.25 | 10.72 | 9.46 | 11.35 | |
| 25 | 60.90 | 9.29 | 8.03 | 12.05 | |
| 30 | 53.93 | 8.23 | 6.97 | 12.55 | |
| 35 | 48.52 | 7.40 | 6.14 | 12.90 | |
| 40 | 44.18 | 6.74 | 5.48 | 13.16 | |
| 45 | 40.63 | 6.20 | 4.94 | 13.34 | |
| 50 | 37.65 | 5.75 | 4.49 | 13.46 | |
| 55 | 35.12 | 5.36 | 4.10 | 13.53 | |
| 60 | 32.94 | 5.03 | 3.77 | 13.56 | |
| 75 | 27.89 | 4.26 | 3.00 | 13.48 | |
| 90 | 24.29 | 3.71 | 2.45 | 13.21 | |
| 120 | 19.47 | 2.97 | 1.71 | 12.32 | |
| 150 | 16.36 | 2.50 | 1.24 | 11.13 | |
| 180 | 14.18 | 2.16 | 0.90 | 9.77 | |
| 210 | 12.56 | 1.92 | 0.66 | 8.27 | |

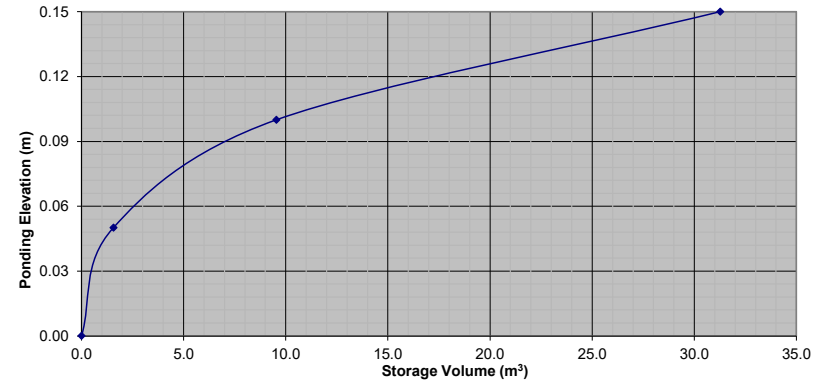
| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A19 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.061 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 27.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 41.16 | 39.27 | 11.78 | |
| 10 | 178.56 | 30.28 | 28.39 | 17.03 | |
| 15 | 142.89 | 24.23 | 22.34 | 20.11 | |
| 20 | 119.95 | 20.34 | 18.45 | 22.14 | |
| 25 | 103.85 | 17.61 | 15.72 | 23.58 | |
| 30 | 91.87 | 15.58 | 13.69 | 24.64 | |
| 35 | 82.58 | 14.00 | 12.11 | 25.44 | |
| 40 | 75.15 | 12.74 | 10.85 | 26.05 | |
| 45 | 69.05 | 11.71 | 9.82 | 26.51 | |
| 50 | 63.95 | 10.85 | 8.96 | 26.87 | |
| 55 | 59.62 | 10.11 | 8.22 | 27.13 | |
| 60 | 55.89 | 9.48 | 7.59 | 27.32 | |
| 75 | 47.26 | 8.01 | 6.12 | 27.56 | |
| 90 | 41.11 | 6.97 | 5.08 | 27.44 | |
| 120 | 32.89 | 5.58 | 3.69 | 26.56 | |
| 150 | 27.61 | 4.68 | 2.79 | 25.13 | |
| 180 | 23.90 | 4.05 | 2.16 | 23.36 | |
| 210 | 21.14 | 3.59 | 1.70 | 21.37 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drain A19 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.061 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 35.0 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 49.39 | 47.50 | 14.25 | |
| 10 | 214.27 | 36.34 | 34.45 | 20.67 | |
| 15 | 171.47 | 29.08 | 27.19 | 24.47 | |
| 20 | 143.94 | 24.41 | 22.52 | 27.02 | |
| 25 | 124.62 | 21.13 | 19.24 | 28.86 | |
| 30 | 110.24 | 18.69 | 16.80 | 30.25 | |
| 35 | 99.09 | 16.80 | 14.91 | 31.32 | |
| 40 | 90.17 | 15.29 | 13.40 | 32.16 | |
| 45 | 82.86 | 14.05 | 12.16 | 32.84 | |
| 50 | 76.74 | 13.01 | 11.12 | 33.37 | |
| 55 | 71.55 | 12.13 | 10.24 | 33.80 | |
| 60 | 67.07 | 11.37 | 9.48 | 34.14 | |
| 75 | 56.71 | 9.62 | 7.73 | 34.77 | |
| 90 | 49.33 | 8.37 | 6.48 | 34.97 | |
| 120 | 39.47 | 6.69 | 4.80 | 34.59 | |
| 150 | 33.13 | 5.62 | 3.73 | 33.56 | |
| 180 | 28.68 | 4.86 | 2.97 | 32.12 | |
| 210 | 25.37 | 4.30 | 2.41 | 30.40 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 9.1 | 31.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 13.6 | 31.3 |
| 1:100 Year | 1.89 | 1.89 | 14 | 27.6 | 31.3 |

| Roof Drain Storage Table for Area RD A19 | | |
|--|----------------|----------------|
| Elevation | Area RD A19 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 62.54 | 1.6 |
| 0.10 | 256.67 | 9.5 |
| 0.15 | 612.24 | 31.3 |

Stage Storage Curve: Area R-1
Controlled Roof Drain # A19



| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A20 to A23 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.10 L/s | | | |
| C = 0.90 | | Vol(max) = 13.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 19.95 | 18.85 | 5.66 | |
| 10 | 76.81 | 14.80 | 13.70 | 8.22 | |
| 15 | 61.77 | 11.90 | 10.80 | 9.72 | |
| 20 | 52.03 | 10.02 | 8.92 | 10.71 | |
| 25 | 45.17 | 8.70 | 7.60 | 11.40 | |
| 30 | 40.04 | 7.71 | 6.61 | 11.91 | |
| 35 | 36.06 | 6.95 | 5.85 | 12.28 | |
| 40 | 32.86 | 6.33 | 5.23 | 12.56 | |
| 45 | 30.24 | 5.83 | 4.73 | 12.76 | |
| 50 | 28.04 | 5.40 | 4.30 | 12.91 | |
| 55 | 26.17 | 5.04 | 3.94 | 13.01 | |
| 60 | 24.56 | 4.73 | 3.63 | 13.07 | |
| 75 | 20.81 | 4.01 | 2.91 | 13.09 | |
| 90 | 18.14 | 3.50 | 2.40 | 12.93 | |
| 120 | 14.56 | 2.81 | 1.71 | 12.28 | |
| 150 | 12.25 | 2.36 | 1.26 | 11.34 | |
| 180 | 10.63 | 2.05 | 0.95 | 10.23 | |
| 210 | 9.42 | 1.81 | 0.71 | 9.00 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A20 to A23 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 19.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.20 | 26.10 | 7.83 | |
| 10 | 104.19 | 20.07 | 18.97 | 11.38 | |
| 15 | 83.56 | 16.10 | 15.00 | 13.50 | |
| 20 | 70.25 | 13.53 | 12.43 | 14.92 | |
| 25 | 60.90 | 11.73 | 10.63 | 15.95 | |
| 30 | 53.93 | 10.39 | 9.29 | 16.72 | |
| 35 | 48.52 | 9.35 | 8.25 | 17.32 | |
| 40 | 44.18 | 8.51 | 7.41 | 17.79 | |
| 45 | 40.63 | 7.83 | 6.73 | 18.16 | |
| 50 | 37.65 | 7.25 | 6.15 | 18.46 | |
| 55 | 35.12 | 6.77 | 5.67 | 18.70 | |
| 60 | 32.94 | 6.35 | 5.25 | 18.89 | |
| 75 | 27.89 | 5.37 | 4.27 | 19.23 | |
| 90 | 24.29 | 4.68 | 3.58 | 19.33 | |
| 120 | 19.47 | 3.75 | 2.65 | 19.08 | |
| 150 | 16.36 | 3.15 | 2.05 | 18.47 | |
| 180 | 14.18 | 2.73 | 1.63 | 17.62 | |
| 210 | 12.56 | 2.42 | 1.32 | 16.62 | |

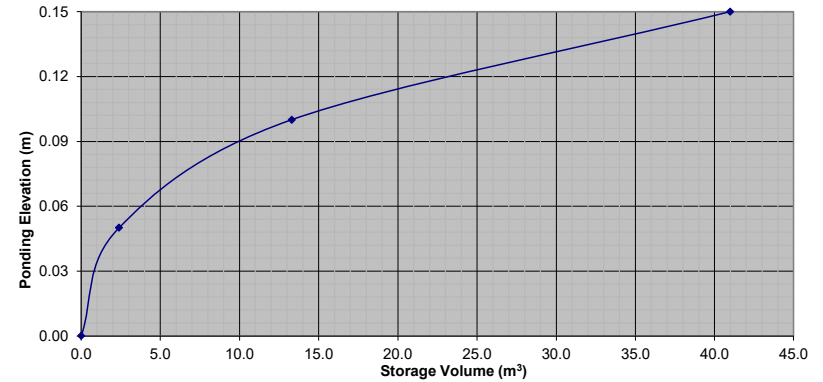
| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Roof Drains A20 to A23 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 39.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 51.95 | 50.37 | 15.11 | |
| 10 | 178.56 | 38.22 | 36.64 | 21.99 | |
| 15 | 142.89 | 30.59 | 29.01 | 26.11 | |
| 20 | 119.95 | 25.68 | 24.10 | 28.92 | |
| 25 | 103.85 | 22.23 | 20.65 | 30.97 | |
| 30 | 91.87 | 19.67 | 18.09 | 32.55 | |
| 35 | 82.58 | 17.68 | 16.10 | 33.80 | |
| 40 | 75.15 | 16.09 | 14.51 | 34.81 | |
| 45 | 69.05 | 14.78 | 13.20 | 35.64 | |
| 50 | 63.95 | 13.69 | 12.11 | 36.33 | |
| 55 | 59.62 | 12.76 | 11.18 | 36.90 | |
| 60 | 55.89 | 11.96 | 10.38 | 37.39 | |
| 75 | 47.26 | 10.12 | 8.54 | 38.41 | |
| 90 | 41.11 | 8.80 | 7.22 | 38.99 | |
| 120 | 32.89 | 7.04 | 5.46 | 39.32 | |
| 150 | 27.61 | 5.91 | 4.33 | 38.97 | |
| 180 | 23.90 | 5.12 | 3.54 | 38.20 | |
| 210 | 21.14 | 4.53 | 2.95 | 37.12 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Roof Drains A20 to A23 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 49.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 62.34 | 60.76 | 18.23 | |
| 10 | 214.27 | 45.87 | 44.29 | 26.57 | |
| 15 | 171.47 | 36.71 | 35.13 | 31.61 | |
| 20 | 143.94 | 30.81 | 29.23 | 35.08 | |
| 25 | 124.62 | 26.68 | 25.10 | 37.64 | |
| 30 | 110.24 | 23.60 | 22.02 | 39.63 | |
| 35 | 99.09 | 21.21 | 19.63 | 41.23 | |
| 40 | 90.17 | 19.30 | 17.72 | 42.53 | |
| 45 | 82.86 | 17.74 | 16.16 | 43.62 | |
| 50 | 76.74 | 16.43 | 14.85 | 44.54 | |
| 55 | 71.55 | 15.32 | 13.74 | 45.33 | |
| 60 | 67.07 | 14.36 | 12.78 | 46.00 | |
| 75 | 56.71 | 12.14 | 10.56 | 47.51 | |
| 90 | 49.33 | 10.56 | 8.98 | 48.49 | |
| 120 | 39.47 | 8.45 | 6.87 | 49.46 | |
| 150 | 33.13 | 7.09 | 5.51 | 49.61 | |
| 180 | 28.68 | 6.14 | 4.56 | 49.25 | |
| 210 | 25.37 | 5.43 | 3.85 | 48.53 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.10 | 4.40 | 10 | 13.1 | 41.0 |
| 1:5 Year | 1.34 | 5.36 | 11 | 19.3 | 41.0 |
| 1:100 Year | 1.58 | 6.32 | 15 | 39.3 | 41.0 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|------------------|----------------|
| Elevation | Area Roof Drains | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 95.26 | 2.4 |
| 0.10 | 340.93 | 13.3 |
| 0.15 | 767.08 | 41.0 |

Stage Storage Curve: Area R-1
Controlled Roof Drains #A20 to A23



| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.065 | ha | Qallow = | 1.26 | L/s |
| C = | 0.90 | | Vol(max) = | 9.9 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 16.84 | 15.58 | 4.68 | |
| 10 | 76.81 | 12.49 | 11.23 | 6.74 | |
| 15 | 61.77 | 10.05 | 8.79 | 7.91 | |
| 20 | 52.03 | 8.46 | 7.20 | 8.64 | |
| 25 | 45.17 | 7.35 | 6.09 | 9.13 | |
| 30 | 40.04 | 6.51 | 5.25 | 9.45 | |
| 35 | 36.06 | 5.86 | 4.60 | 9.67 | |
| 40 | 32.86 | 5.34 | 4.08 | 9.80 | |
| 45 | 30.24 | 4.92 | 3.66 | 9.88 | |
| 50 | 28.04 | 4.56 | 3.30 | 9.90 | |
| 55 | 26.17 | 4.26 | 3.00 | 9.89 | |
| 60 | 24.56 | 3.99 | 2.73 | 9.84 | |
| 75 | 20.81 | 3.38 | 2.12 | 9.56 | |
| 90 | 18.14 | 2.95 | 1.69 | 9.13 | |
| 120 | 14.56 | 2.37 | 1.11 | 7.98 | |
| 150 | 12.25 | 1.99 | 0.73 | 6.59 | |
| 180 | 10.63 | 1.73 | 0.47 | 5.06 | |
| 210 | 9.42 | 1.53 | 0.27 | 3.42 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.065 | ha | Qallow = | 1.34 | L/s |
| C = | 0.90 | | Vol(max) = | 14.8 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 22.96 | 21.70 | 6.51 | |
| 10 | 104.19 | 16.94 | 15.68 | 9.41 | |
| 15 | 83.56 | 13.59 | 12.33 | 11.10 | |
| 20 | 70.25 | 11.42 | 10.16 | 12.20 | |
| 25 | 60.90 | 9.90 | 8.64 | 12.97 | |
| 30 | 53.93 | 8.77 | 7.51 | 13.52 | |
| 35 | 48.52 | 7.89 | 6.63 | 13.92 | |
| 40 | 44.18 | 7.19 | 5.93 | 14.22 | |
| 45 | 40.63 | 6.61 | 5.35 | 14.44 | |
| 50 | 37.65 | 6.12 | 4.86 | 14.59 | |
| 55 | 35.12 | 5.71 | 4.45 | 14.69 | |
| 60 | 32.94 | 5.36 | 4.10 | 14.75 | |
| 75 | 27.89 | 4.54 | 3.28 | 14.74 | |
| 90 | 24.29 | 3.95 | 2.69 | 14.53 | |
| 120 | 19.47 | 3.17 | 1.91 | 13.72 | |
| 150 | 16.36 | 2.66 | 1.40 | 12.61 | |
| 180 | 14.18 | 2.31 | 1.05 | 11.30 | |
| 210 | 12.56 | 2.04 | 0.78 | 9.85 | |

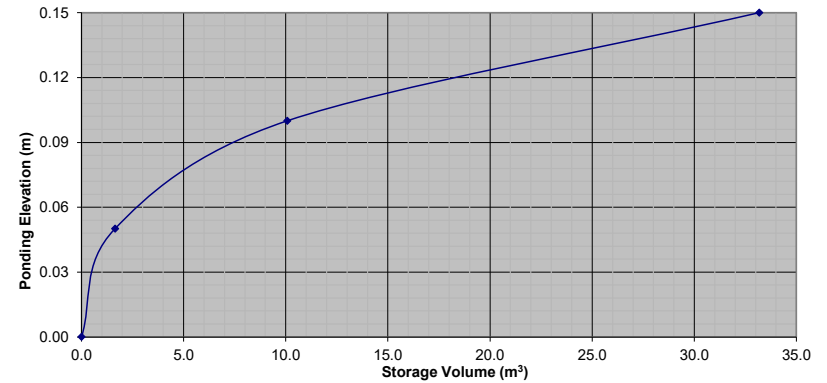
| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-1: Building A Controlled Roof Drain A24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.065 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 29.9 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 43.86 | 41.97 | 12.59 | |
| 10 | 178.56 | 32.27 | 30.38 | 18.23 | |
| 15 | 142.89 | 25.82 | 23.93 | 21.54 | |
| 20 | 119.95 | 21.68 | 19.79 | 23.74 | |
| 25 | 103.85 | 18.77 | 16.88 | 25.31 | |
| 30 | 91.87 | 16.60 | 14.71 | 26.48 | |
| 35 | 82.58 | 14.92 | 13.03 | 27.37 | |
| 40 | 75.15 | 13.58 | 11.69 | 28.05 | |
| 45 | 69.05 | 12.48 | 10.59 | 28.59 | |
| 50 | 63.95 | 11.56 | 9.67 | 29.00 | |
| 55 | 59.62 | 10.77 | 8.88 | 29.32 | |
| 60 | 55.89 | 10.10 | 8.21 | 29.56 | |
| 75 | 47.26 | 8.54 | 6.65 | 29.92 | |
| 90 | 41.11 | 7.43 | 5.54 | 29.91 | |
| 120 | 32.89 | 5.94 | 4.05 | 29.19 | |
| 150 | 27.61 | 4.99 | 3.10 | 27.89 | |
| 180 | 23.90 | 4.32 | 2.43 | 26.24 | |
| 210 | 21.14 | 3.82 | 1.93 | 24.33 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-1: Building A Controlled Roof Drain A24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.065 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 37.9 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 52.63 | 50.74 | 15.22 | |
| 10 | 214.27 | 38.72 | 36.83 | 22.10 | |
| 15 | 171.47 | 30.99 | 29.10 | 26.19 | |
| 20 | 143.94 | 26.01 | 24.12 | 28.94 | |
| 25 | 124.62 | 22.52 | 20.63 | 30.94 | |
| 30 | 110.24 | 19.92 | 18.03 | 32.46 | |
| 35 | 99.09 | 17.91 | 16.02 | 33.63 | |
| 40 | 90.17 | 16.29 | 14.40 | 34.57 | |
| 45 | 82.86 | 14.97 | 13.08 | 35.32 | |
| 50 | 76.74 | 13.87 | 11.98 | 35.93 | |
| 55 | 71.55 | 12.93 | 11.04 | 36.43 | |
| 60 | 67.07 | 12.12 | 10.23 | 36.83 | |
| 75 | 56.71 | 10.25 | 8.36 | 37.61 | |
| 90 | 49.33 | 8.91 | 7.02 | 37.93 | |
| 120 | 39.47 | 7.13 | 5.24 | 37.75 | |
| 150 | 33.13 | 5.99 | 4.10 | 36.87 | |
| 180 | 28.68 | 5.18 | 3.29 | 35.56 | |
| 210 | 25.37 | 4.58 | 2.69 | 33.96 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 9.9 | 33.2 |
| 1:5 Year | 1.34 | 1.34 | 11 | 14.8 | 33.2 |
| 1:100 Year | 1.89 | 1.89 | 14 | 29.9 | 33.2 |

| Roof Drain Storage Table for Area RD A19 | | |
|--|----------------|----------------|
| Elevation | Area RD A24 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 65.67 | 1.6 |
| 0.10 | 271.75 | 10.1 |
| 0.15 | 652.42 | 33.2 |

Stage Storage Curve: Area R-1
Controlled Roof Drain # A24



| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B1 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.078 | ha | Qallow = | 1.26 | L/s |
| C = | 0.90 | | Vol(max) = | 12.7 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 20.21 | 18.95 | 5.69 | |
| 10 | 76.81 | 14.99 | 13.73 | 8.24 | |
| 15 | 61.77 | 12.05 | 10.79 | 9.71 | |
| 20 | 52.03 | 10.15 | 8.89 | 10.67 | |
| 25 | 45.17 | 8.81 | 7.55 | 11.33 | |
| 30 | 40.04 | 7.81 | 6.55 | 11.80 | |
| 35 | 36.06 | 7.04 | 5.78 | 12.13 | |
| 40 | 32.86 | 6.41 | 5.15 | 12.37 | |
| 45 | 30.24 | 5.90 | 4.64 | 12.53 | |
| 50 | 28.04 | 5.47 | 4.21 | 12.64 | |
| 55 | 26.17 | 5.11 | 3.85 | 12.70 | |
| 60 | 24.56 | 4.79 | 3.53 | 12.72 | |
| 75 | 20.81 | 4.06 | 2.80 | 12.61 | |
| 90 | 18.14 | 3.54 | 2.28 | 12.32 | |
| 120 | 14.56 | 2.84 | 1.58 | 11.39 | |
| 150 | 12.25 | 2.39 | 1.13 | 10.18 | |
| 180 | 10.63 | 2.07 | 0.81 | 8.79 | |
| 210 | 9.42 | 1.84 | 0.58 | 7.28 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B1 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.078 | ha | Qallow = | 1.34 | L/s |
| C = | 0.90 | | Vol(max) = | 18.8 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.55 | 26.29 | 7.89 | |
| 10 | 104.19 | 20.33 | 19.07 | 11.44 | |
| 15 | 83.56 | 16.31 | 15.05 | 13.54 | |
| 20 | 70.25 | 13.71 | 12.45 | 14.94 | |
| 25 | 60.90 | 11.88 | 10.62 | 15.94 | |
| 30 | 53.93 | 10.52 | 9.26 | 16.68 | |
| 35 | 48.52 | 9.47 | 8.21 | 17.24 | |
| 40 | 44.18 | 8.62 | 7.36 | 17.67 | |
| 45 | 40.63 | 7.93 | 6.67 | 18.01 | |
| 50 | 37.65 | 7.35 | 6.09 | 18.26 | |
| 55 | 35.12 | 6.85 | 5.59 | 18.46 | |
| 60 | 32.94 | 6.43 | 5.17 | 18.61 | |
| 75 | 27.89 | 5.44 | 4.18 | 18.82 | |
| 90 | 24.29 | 4.74 | 3.48 | 18.79 | |
| 120 | 19.47 | 3.80 | 2.54 | 18.28 | |
| 150 | 16.36 | 3.19 | 1.93 | 17.40 | |
| 180 | 14.18 | 2.77 | 1.51 | 16.28 | |
| 210 | 12.56 | 2.45 | 1.19 | 15.00 | |

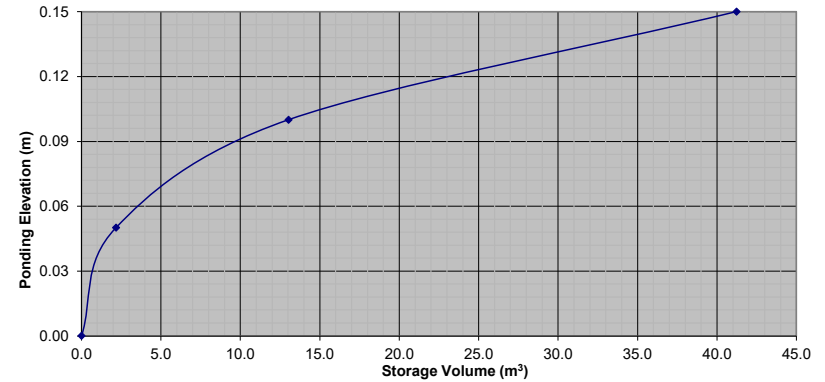
| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B1 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.078 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 37.9 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 52.63 | 50.74 | 15.22 | |
| 10 | 178.56 | 38.72 | 36.83 | 22.10 | |
| 15 | 142.89 | 30.99 | 29.10 | 26.19 | |
| 20 | 119.95 | 26.01 | 24.12 | 28.94 | |
| 25 | 103.85 | 22.52 | 20.63 | 30.94 | |
| 30 | 91.87 | 19.92 | 18.03 | 32.46 | |
| 35 | 82.58 | 17.91 | 16.02 | 33.63 | |
| 40 | 75.15 | 16.29 | 14.40 | 34.57 | |
| 45 | 69.05 | 14.97 | 13.08 | 35.32 | |
| 50 | 63.95 | 13.87 | 11.98 | 35.93 | |
| 55 | 59.62 | 12.93 | 11.04 | 36.43 | |
| 60 | 55.89 | 12.12 | 10.23 | 36.83 | |
| 75 | 47.26 | 10.25 | 8.36 | 37.61 | |
| 90 | 41.11 | 8.91 | 7.02 | 37.93 | |
| 120 | 32.89 | 7.13 | 5.24 | 37.75 | |
| 150 | 27.61 | 5.99 | 4.10 | 36.87 | |
| 180 | 23.90 | 5.18 | 3.29 | 35.56 | |
| 210 | 21.14 | 4.58 | 2.69 | 33.96 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|---------|------------|----------|-----|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Controlled Roof Drain B1 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = | 0.078 | ha | Qallow = | 1.89 | L/s |
| C = | 1.00 | | Vol(max) = | 48.0 | m3 |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 63.15 | 61.26 | 18.38 | |
| 10 | 214.27 | 46.46 | 44.57 | 26.74 | |
| 15 | 171.47 | 37.18 | 35.29 | 31.76 | |
| 20 | 143.94 | 31.21 | 29.32 | 35.19 | |
| 25 | 124.62 | 27.02 | 25.13 | 37.70 | |
| 30 | 110.24 | 23.90 | 22.01 | 39.63 | |
| 35 | 99.09 | 21.49 | 19.60 | 41.15 | |
| 40 | 90.17 | 19.55 | 17.66 | 42.39 | |
| 45 | 82.86 | 17.97 | 16.08 | 43.41 | |
| 50 | 76.74 | 16.64 | 14.75 | 44.25 | |
| 55 | 71.55 | 15.51 | 13.62 | 44.96 | |
| 60 | 67.07 | 14.54 | 12.65 | 45.56 | |
| 75 | 56.71 | 12.30 | 10.41 | 46.83 | |
| 90 | 49.33 | 10.70 | 8.81 | 47.56 | |
| 120 | 39.47 | 8.56 | 6.67 | 48.02 | |
| 150 | 33.13 | 7.18 | 5.29 | 47.65 | |
| 180 | 28.68 | 6.22 | 4.33 | 46.76 | |
| 210 | 25.37 | 5.50 | 3.61 | 45.51 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 12.7 | 41.2 |
| 1:5 Year | 1.34 | 1.34 | 11 | 18.8 | 41.2 |
| 1:100 Year | 1.89 | 1.89 | 14 | 37.9 | 41.2 |

| Roof Drain Storage Table for Area RD B1 | | |
|---|----------------|----------------|
| Elevation | Area RD B1 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 86.79 | 2.2 |
| 0.10 | 347.15 | 13.0 |
| 0.15 | 781.11 | 41.2 |

Stage Storage Curve: Area R-2
Controlled Roof Drain # B1



| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B2 to B5 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.10 L/s | | | |
| C = 0.90 | | Vol(max) = 13.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 19.95 | 18.85 | 5.66 | |
| 10 | 76.81 | 14.80 | 13.70 | 8.22 | |
| 15 | 61.77 | 11.90 | 10.80 | 9.72 | |
| 20 | 52.03 | 10.02 | 8.92 | 10.71 | |
| 25 | 45.17 | 8.70 | 7.60 | 11.40 | |
| 30 | 40.04 | 7.71 | 6.61 | 11.91 | |
| 35 | 36.06 | 6.95 | 5.85 | 12.28 | |
| 40 | 32.86 | 6.33 | 5.23 | 12.56 | |
| 45 | 30.24 | 5.83 | 4.73 | 12.76 | |
| 50 | 28.04 | 5.40 | 4.30 | 12.91 | |
| 55 | 26.17 | 5.04 | 3.94 | 13.01 | |
| 60 | 24.56 | 4.73 | 3.63 | 13.07 | |
| 75 | 20.81 | 4.01 | 2.91 | 13.09 | |
| 90 | 18.14 | 3.50 | 2.40 | 12.93 | |
| 120 | 14.56 | 2.81 | 1.71 | 12.28 | |
| 150 | 12.25 | 2.36 | 1.26 | 11.34 | |
| 180 | 10.63 | 2.05 | 0.95 | 10.23 | |
| 210 | 9.42 | 1.81 | 0.71 | 9.00 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B2 to B5 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 19.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.20 | 26.10 | 7.83 | |
| 10 | 104.19 | 20.07 | 18.97 | 11.38 | |
| 15 | 83.56 | 16.10 | 15.00 | 13.50 | |
| 20 | 70.25 | 13.53 | 12.43 | 14.92 | |
| 25 | 60.90 | 11.73 | 10.63 | 15.95 | |
| 30 | 53.93 | 10.39 | 9.29 | 16.72 | |
| 35 | 48.52 | 9.35 | 8.25 | 17.32 | |
| 40 | 44.18 | 8.51 | 7.41 | 17.79 | |
| 45 | 40.63 | 7.83 | 6.73 | 18.16 | |
| 50 | 37.65 | 7.25 | 6.15 | 18.46 | |
| 55 | 35.12 | 6.77 | 5.67 | 18.70 | |
| 60 | 32.94 | 6.35 | 5.25 | 18.89 | |
| 75 | 27.89 | 5.37 | 4.27 | 19.23 | |
| 90 | 24.29 | 4.68 | 3.58 | 19.33 | |
| 120 | 19.47 | 3.75 | 2.65 | 19.08 | |
| 150 | 16.36 | 3.15 | 2.05 | 18.47 | |
| 180 | 14.18 | 2.73 | 1.63 | 17.62 | |
| 210 | 12.56 | 2.42 | 1.32 | 16.62 | |

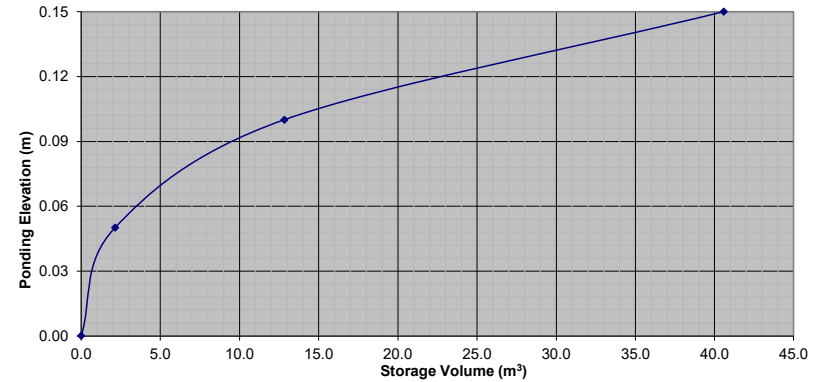
| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B2 to B5 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 39.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 51.95 | 50.37 | 15.11 | |
| 10 | 178.56 | 38.22 | 36.64 | 21.99 | |
| 15 | 142.89 | 30.59 | 29.01 | 26.11 | |
| 20 | 119.95 | 25.68 | 24.10 | 28.92 | |
| 25 | 103.85 | 22.23 | 20.65 | 30.97 | |
| 30 | 91.87 | 19.67 | 18.09 | 32.55 | |
| 35 | 82.58 | 17.68 | 16.10 | 33.80 | |
| 40 | 75.15 | 16.09 | 14.51 | 34.81 | |
| 45 | 69.05 | 14.78 | 13.20 | 35.64 | |
| 50 | 63.95 | 13.69 | 12.11 | 36.33 | |
| 55 | 59.62 | 12.76 | 11.18 | 36.90 | |
| 60 | 55.89 | 11.96 | 10.38 | 37.39 | |
| 75 | 47.26 | 10.12 | 8.54 | 38.41 | |
| 90 | 41.11 | 8.80 | 7.22 | 38.99 | |
| 120 | 32.89 | 7.04 | 5.46 | 39.32 | |
| 150 | 27.61 | 5.91 | 4.33 | 38.97 | |
| 180 | 23.90 | 5.12 | 3.54 | 38.20 | |
| 210 | 21.14 | 4.53 | 2.95 | 37.12 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Roof Drains B2 to B5 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 49.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 62.34 | 60.76 | 18.23 | |
| 10 | 214.27 | 45.87 | 44.29 | 26.57 | |
| 15 | 171.47 | 36.71 | 35.13 | 31.61 | |
| 20 | 143.94 | 30.81 | 29.23 | 35.08 | |
| 25 | 124.62 | 26.68 | 25.10 | 37.64 | |
| 30 | 110.24 | 23.60 | 22.02 | 39.63 | |
| 35 | 99.09 | 21.21 | 19.63 | 41.23 | |
| 40 | 90.17 | 19.30 | 17.72 | 42.53 | |
| 45 | 82.86 | 17.74 | 16.16 | 43.62 | |
| 50 | 76.74 | 16.43 | 14.85 | 44.54 | |
| 55 | 71.55 | 15.32 | 13.74 | 45.33 | |
| 60 | 67.07 | 14.36 | 12.78 | 46.00 | |
| 75 | 56.71 | 12.14 | 10.56 | 47.51 | |
| 90 | 49.33 | 10.56 | 8.98 | 48.49 | |
| 120 | 39.47 | 8.45 | 6.87 | 49.46 | |
| 150 | 33.13 | 7.09 | 5.51 | 49.61 | |
| 180 | 28.68 | 6.14 | 4.56 | 49.25 | |
| 210 | 25.37 | 5.43 | 3.85 | 48.53 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.10 | 4.40 | 10 | 13.1 | 40.6 |
| 1:5 Year | 1.34 | 5.36 | 11 | 19.3 | 40.6 |
| 1:100 Year | 1.58 | 6.32 | 15 | 39.3 | 40.6 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|------------------|----------------|
| Elevation | Area Roof Drains | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 85.34 | 2.1 |
| 0.10 | 341.98 | 12.8 |
| 0.15 | 768.5 | 40.6 |

Stage Storage Curve: Area R-2
Controlled Roof Drains #B2 to B5



Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B6

OTTAWA IDF CURVE
 Area = 0.080 ha Qallow = 1.26 L/s
 C = 0.90 Vol(max) = 13.2 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 20.73 | 19.47 | 5.84 |
| 10 | 76.81 | 15.37 | 14.11 | 8.47 |
| 15 | 61.77 | 12.36 | 11.10 | 9.99 |
| 20 | 52.03 | 10.41 | 9.15 | 10.99 |
| 25 | 45.17 | 9.04 | 7.78 | 11.67 |
| 30 | 40.04 | 8.02 | 6.76 | 12.16 |
| 35 | 36.06 | 7.22 | 5.96 | 12.51 |
| 40 | 32.86 | 6.58 | 5.32 | 12.76 |
| 45 | 30.24 | 6.05 | 4.79 | 12.94 |
| 50 | 28.04 | 5.61 | 4.35 | 13.06 |
| 55 | 26.17 | 5.24 | 3.98 | 13.13 |
| 60 | 24.56 | 4.92 | 3.66 | 13.16 |
| 75 | 20.81 | 4.17 | 2.91 | 13.08 |
| 90 | 18.14 | 3.63 | 2.37 | 12.81 |
| 120 | 14.56 | 2.91 | 1.65 | 11.91 |
| 150 | 12.25 | 2.45 | 1.19 | 10.73 |
| 180 | 10.63 | 2.13 | 0.87 | 9.36 |
| 210 | 9.42 | 1.88 | 0.62 | 7.87 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B6

OTTAWA IDF CURVE
 Area = 0.080 ha Qallow = 1.34 L/s
 C = 0.90 Vol(max) = 19.4 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 28.26 | 27.00 | 8.10 |
| 10 | 104.19 | 20.86 | 19.60 | 11.76 |
| 15 | 83.56 | 16.72 | 15.46 | 13.92 |
| 20 | 70.25 | 14.06 | 12.80 | 15.36 |
| 25 | 60.90 | 12.19 | 10.93 | 16.39 |
| 30 | 53.93 | 10.79 | 9.53 | 17.16 |
| 35 | 48.52 | 9.71 | 8.45 | 17.75 |
| 40 | 44.18 | 8.84 | 7.58 | 18.20 |
| 45 | 40.63 | 8.13 | 6.87 | 18.56 |
| 50 | 37.65 | 7.54 | 6.28 | 18.83 |
| 55 | 35.12 | 7.03 | 5.77 | 19.04 |
| 60 | 32.94 | 6.59 | 5.33 | 19.20 |
| 75 | 27.89 | 5.58 | 4.32 | 19.45 |
| 90 | 24.29 | 4.86 | 3.60 | 19.45 |
| 120 | 19.47 | 3.90 | 2.64 | 18.98 |
| 150 | 16.36 | 3.28 | 2.02 | 18.14 |
| 180 | 14.18 | 2.84 | 1.58 | 17.05 |
| 210 | 12.56 | 2.51 | 1.25 | 15.79 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B6

OTTAWA IDF CURVE
 Area = 0.080 ha Qallow = 1.89 L/s
 C = 1.00 Vol(max) = 39.2 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 53.98 | 52.09 | 15.63 |
| 10 | 178.56 | 39.71 | 37.82 | 22.69 |
| 15 | 142.89 | 31.78 | 29.89 | 26.90 |
| 20 | 119.95 | 26.68 | 24.79 | 29.74 |
| 25 | 103.85 | 23.10 | 21.21 | 31.81 |
| 30 | 91.87 | 20.43 | 18.54 | 33.37 |
| 35 | 82.58 | 18.37 | 16.48 | 34.60 |
| 40 | 75.15 | 16.71 | 14.82 | 35.57 |
| 45 | 69.05 | 15.36 | 13.47 | 36.36 |
| 50 | 63.95 | 14.22 | 12.33 | 37.00 |
| 55 | 59.62 | 13.26 | 11.37 | 37.52 |
| 60 | 55.89 | 12.43 | 10.54 | 37.95 |
| 75 | 47.26 | 10.51 | 8.62 | 38.79 |
| 90 | 41.11 | 9.14 | 7.25 | 39.17 |
| 120 | 32.89 | 7.32 | 5.43 | 39.07 |
| 150 | 27.61 | 6.14 | 4.25 | 38.26 |
| 180 | 23.90 | 5.32 | 3.43 | 37.00 |
| 210 | 21.14 | 4.70 | 2.81 | 35.44 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drain B6

OTTAWA IDF CURVE
 Area = 0.080 ha Qallow = 1.89 L/s
 C = 1.00 Vol(max) = 49.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 64.77 | 62.88 | 18.86 |
| 10 | 214.27 | 47.65 | 45.76 | 27.46 |
| 15 | 171.47 | 38.14 | 36.25 | 32.62 |
| 20 | 143.94 | 32.01 | 30.12 | 36.15 |
| 25 | 124.62 | 27.71 | 25.82 | 38.74 |
| 30 | 110.24 | 24.52 | 22.63 | 40.73 |
| 35 | 99.09 | 22.04 | 20.15 | 42.31 |
| 40 | 90.17 | 20.05 | 18.16 | 43.60 |
| 45 | 82.86 | 18.43 | 16.54 | 44.65 |
| 50 | 76.74 | 17.07 | 15.18 | 45.53 |
| 55 | 71.55 | 15.91 | 14.02 | 46.27 |
| 60 | 67.07 | 14.92 | 13.03 | 46.90 |
| 75 | 56.71 | 12.61 | 10.72 | 48.25 |
| 90 | 49.33 | 10.97 | 9.08 | 49.04 |
| 120 | 39.47 | 8.78 | 6.89 | 49.60 |
| 150 | 33.13 | 7.37 | 5.48 | 49.31 |
| 180 | 28.68 | 6.38 | 4.49 | 48.48 |
| 210 | 25.37 | 5.64 | 3.75 | 47.29 |

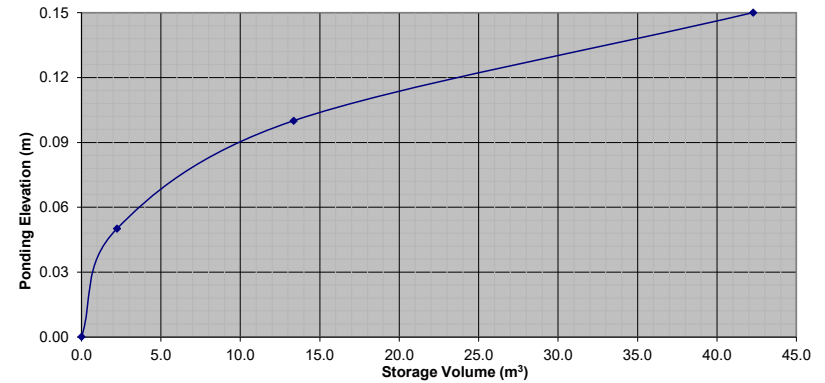
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed

| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|------------------|------------------|--------------|---------------------------|----------|
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 13.2 | 42.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 19.4 | 42.3 |
| 1:100 Year | 1.89 | 1.89 | 14 | 39.2 | 42.3 |

Roof Drain Storage Table for Area RD B6

| Elevation | Area RD B6 | Total Volume |
|-----------|----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 88.99 | 2.2 |
| 0.10 | 355.97 | 13.3 |
| 0.15 | 800.92 | 42.3 |

**Stage Storage Curve: Area R-2
 Controlled Roof Drain # B6**



| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B7 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.26 L/s | | | |
| C = 0.90 | | Vol(max) = 12.7 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 20.21 | 18.95 | 5.69 | |
| 10 | 76.81 | 14.99 | 13.73 | 8.24 | |
| 15 | 61.77 | 12.05 | 10.79 | 9.71 | |
| 20 | 52.03 | 10.15 | 8.89 | 10.67 | |
| 25 | 45.17 | 8.81 | 7.55 | 11.33 | |
| 30 | 40.04 | 7.81 | 6.55 | 11.80 | |
| 35 | 36.06 | 7.04 | 5.78 | 12.13 | |
| 40 | 32.86 | 6.41 | 5.15 | 12.37 | |
| 45 | 30.24 | 5.90 | 4.64 | 12.53 | |
| 50 | 28.04 | 5.47 | 4.21 | 12.64 | |
| 55 | 26.17 | 5.11 | 3.85 | 12.70 | |
| 60 | 24.56 | 4.79 | 3.53 | 12.72 | |
| 75 | 20.81 | 4.06 | 2.80 | 12.61 | |
| 90 | 18.14 | 3.54 | 2.28 | 12.32 | |
| 120 | 14.56 | 2.84 | 1.58 | 11.39 | |
| 150 | 12.25 | 2.39 | 1.13 | 10.18 | |
| 180 | 10.63 | 2.07 | 0.81 | 8.79 | |
| 210 | 9.42 | 1.84 | 0.58 | 7.28 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B7 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 18.8 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.55 | 26.29 | 7.89 | |
| 10 | 104.19 | 20.33 | 19.07 | 11.44 | |
| 15 | 83.56 | 16.31 | 15.05 | 13.54 | |
| 20 | 70.25 | 13.71 | 12.45 | 14.94 | |
| 25 | 60.90 | 11.88 | 10.62 | 15.94 | |
| 30 | 53.93 | 10.52 | 9.26 | 16.68 | |
| 35 | 48.52 | 9.47 | 8.21 | 17.24 | |
| 40 | 44.18 | 8.62 | 7.36 | 17.67 | |
| 45 | 40.63 | 7.93 | 6.67 | 18.01 | |
| 50 | 37.65 | 7.35 | 6.09 | 18.26 | |
| 55 | 35.12 | 6.85 | 5.59 | 18.46 | |
| 60 | 32.94 | 6.43 | 5.17 | 18.61 | |
| 75 | 27.89 | 5.44 | 4.18 | 18.82 | |
| 90 | 24.29 | 4.74 | 3.48 | 18.79 | |
| 120 | 19.47 | 3.80 | 2.54 | 18.28 | |
| 150 | 16.36 | 3.19 | 1.93 | 17.40 | |
| 180 | 14.18 | 2.77 | 1.51 | 16.28 | |
| 210 | 12.56 | 2.45 | 1.19 | 15.00 | |

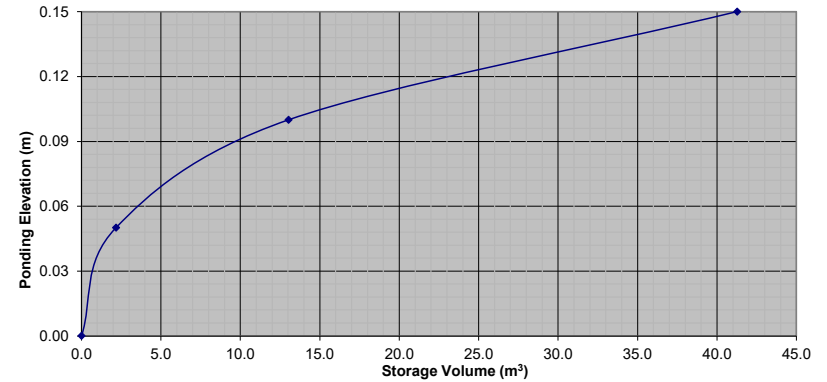
| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B7 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 37.9 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 52.63 | 50.74 | 15.22 | |
| 10 | 178.56 | 38.72 | 36.83 | 22.10 | |
| 15 | 142.89 | 30.99 | 29.10 | 26.19 | |
| 20 | 119.95 | 26.01 | 24.12 | 28.94 | |
| 25 | 103.85 | 22.52 | 20.63 | 30.94 | |
| 30 | 91.87 | 19.92 | 18.03 | 32.46 | |
| 35 | 82.58 | 17.91 | 16.02 | 33.63 | |
| 40 | 75.15 | 16.29 | 14.40 | 34.57 | |
| 45 | 69.05 | 14.97 | 13.08 | 35.32 | |
| 50 | 63.95 | 13.87 | 11.98 | 35.93 | |
| 55 | 59.62 | 12.93 | 11.04 | 36.43 | |
| 60 | 55.89 | 12.12 | 10.23 | 36.83 | |
| 75 | 47.26 | 10.25 | 8.36 | 37.61 | |
| 90 | 41.11 | 8.91 | 7.02 | 37.93 | |
| 120 | 32.89 | 7.13 | 5.24 | 37.75 | |
| 150 | 27.61 | 5.99 | 4.10 | 36.87 | |
| 180 | 23.90 | 5.18 | 3.29 | 35.56 | |
| 210 | 21.14 | 4.58 | 2.69 | 33.96 | |

| Proposed Industrial Development | | | | | |
|---|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Controlled Roof Drain B7 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 48.0 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 63.15 | 61.26 | 18.38 | |
| 10 | 214.27 | 46.46 | 44.57 | 26.74 | |
| 15 | 171.47 | 37.18 | 35.29 | 31.76 | |
| 20 | 143.94 | 31.21 | 29.32 | 35.19 | |
| 25 | 124.62 | 27.02 | 25.13 | 37.70 | |
| 30 | 110.24 | 23.90 | 22.01 | 39.63 | |
| 35 | 99.09 | 21.49 | 19.60 | 41.15 | |
| 40 | 90.17 | 19.55 | 17.66 | 42.39 | |
| 45 | 82.86 | 17.97 | 16.08 | 43.41 | |
| 50 | 76.74 | 16.64 | 14.75 | 44.25 | |
| 55 | 71.55 | 15.51 | 13.62 | 44.96 | |
| 60 | 67.07 | 14.54 | 12.65 | 45.56 | |
| 75 | 56.71 | 12.30 | 10.41 | 46.83 | |
| 90 | 49.33 | 10.70 | 8.81 | 47.56 | |
| 120 | 39.47 | 8.56 | 6.67 | 48.02 | |
| 150 | 33.13 | 7.18 | 5.29 | 47.65 | |
| 180 | 28.68 | 6.22 | 4.33 | 46.76 | |
| 210 | 25.37 | 5.50 | 3.61 | 45.51 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 12.7 | 41.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 18.8 | 41.3 |
| 1:100 Year | 1.89 | 1.89 | 14 | 37.9 | 41.3 |

| Roof Drain Storage Table for Area RD B7 | | |
|---|----------------|----------------|
| Elevation | Area RD B7 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 86.81 | 2.2 |
| 0.10 | 347.71 | 13.0 |
| 0.15 | 781.33 | 41.3 |

Stage Storage Curve: Area R-2
Controlled Roof Drain # B7



| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B8 to B11 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.10 L/s | | | |
| C = 0.90 | | Vol(max) = 13.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 19.95 | 18.85 | 5.66 | |
| 10 | 76.81 | 14.80 | 13.70 | 8.22 | |
| 15 | 61.77 | 11.90 | 10.80 | 9.72 | |
| 20 | 52.03 | 10.02 | 8.92 | 10.71 | |
| 25 | 45.17 | 8.70 | 7.60 | 11.40 | |
| 30 | 40.04 | 7.71 | 6.61 | 11.91 | |
| 35 | 36.06 | 6.95 | 5.85 | 12.28 | |
| 40 | 32.86 | 6.33 | 5.23 | 12.56 | |
| 45 | 30.24 | 5.83 | 4.73 | 12.76 | |
| 50 | 28.04 | 5.40 | 4.30 | 12.91 | |
| 55 | 26.17 | 5.04 | 3.94 | 13.01 | |
| 60 | 24.56 | 4.73 | 3.63 | 13.07 | |
| 75 | 20.81 | 4.01 | 2.91 | 13.09 | |
| 90 | 18.14 | 3.50 | 2.40 | 12.93 | |
| 120 | 14.56 | 2.81 | 1.71 | 12.28 | |
| 150 | 12.25 | 2.36 | 1.26 | 11.34 | |
| 180 | 10.63 | 2.05 | 0.95 | 10.23 | |
| 210 | 9.42 | 1.81 | 0.71 | 9.00 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B8 to B11 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 19.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.20 | 26.10 | 7.83 | |
| 10 | 104.19 | 20.07 | 18.97 | 11.38 | |
| 15 | 83.56 | 16.10 | 15.00 | 13.50 | |
| 20 | 70.25 | 13.53 | 12.43 | 14.92 | |
| 25 | 60.90 | 11.73 | 10.63 | 15.95 | |
| 30 | 53.93 | 10.39 | 9.29 | 16.72 | |
| 35 | 48.52 | 9.35 | 8.25 | 17.32 | |
| 40 | 44.18 | 8.51 | 7.41 | 17.79 | |
| 45 | 40.63 | 7.83 | 6.73 | 18.16 | |
| 50 | 37.65 | 7.25 | 6.15 | 18.46 | |
| 55 | 35.12 | 6.77 | 5.67 | 18.70 | |
| 60 | 32.94 | 6.35 | 5.25 | 18.89 | |
| 75 | 27.89 | 5.37 | 4.27 | 19.23 | |
| 90 | 24.29 | 4.68 | 3.58 | 19.33 | |
| 120 | 19.47 | 3.75 | 2.65 | 19.08 | |
| 150 | 16.36 | 3.15 | 2.05 | 18.47 | |
| 180 | 14.18 | 2.73 | 1.63 | 17.62 | |
| 210 | 12.56 | 2.42 | 1.32 | 16.62 | |

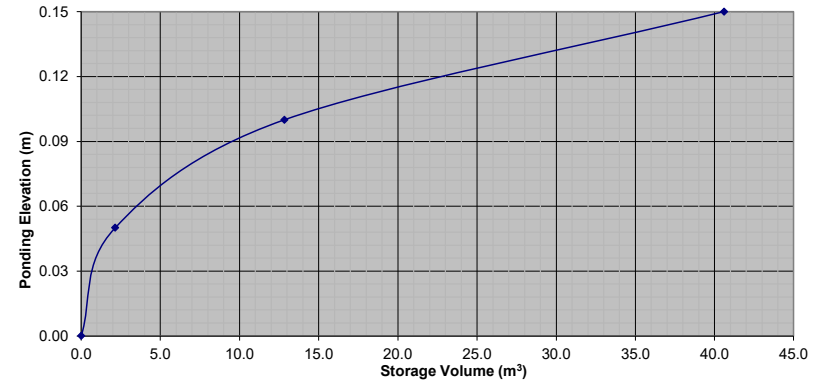
| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Roof Drains B8 to B11 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 39.3 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 51.95 | 50.37 | 15.11 | |
| 10 | 178.56 | 38.22 | 36.64 | 21.99 | |
| 15 | 142.89 | 30.59 | 29.01 | 26.11 | |
| 20 | 119.95 | 25.68 | 24.10 | 28.92 | |
| 25 | 103.85 | 22.23 | 20.65 | 30.97 | |
| 30 | 91.87 | 19.67 | 18.09 | 32.55 | |
| 35 | 82.58 | 17.68 | 16.10 | 33.80 | |
| 40 | 75.15 | 16.09 | 14.51 | 34.81 | |
| 45 | 69.05 | 14.78 | 13.20 | 35.64 | |
| 50 | 63.95 | 13.69 | 12.11 | 36.33 | |
| 55 | 59.62 | 12.76 | 11.18 | 36.90 | |
| 60 | 55.89 | 11.96 | 10.38 | 37.39 | |
| 75 | 47.26 | 10.12 | 8.54 | 38.41 | |
| 90 | 41.11 | 8.80 | 7.22 | 38.99 | |
| 120 | 32.89 | 7.04 | 5.46 | 39.32 | |
| 150 | 27.61 | 5.91 | 4.33 | 38.97 | |
| 180 | 23.90 | 5.12 | 3.54 | 38.20 | |
| 210 | 21.14 | 4.53 | 2.95 | 37.12 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Roof Drains B8 to B11 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.077 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 49.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 62.34 | 60.76 | 18.23 | |
| 10 | 214.27 | 45.87 | 44.29 | 26.57 | |
| 15 | 171.47 | 36.71 | 35.13 | 31.61 | |
| 20 | 143.94 | 30.81 | 29.23 | 35.08 | |
| 25 | 124.62 | 26.68 | 25.10 | 37.64 | |
| 30 | 110.24 | 23.60 | 22.02 | 39.63 | |
| 35 | 99.09 | 21.21 | 19.63 | 41.23 | |
| 40 | 90.17 | 19.30 | 17.72 | 42.53 | |
| 45 | 82.86 | 17.74 | 16.16 | 43.62 | |
| 50 | 76.74 | 16.43 | 14.85 | 44.54 | |
| 55 | 71.55 | 15.32 | 13.74 | 45.33 | |
| 60 | 67.07 | 14.36 | 12.78 | 46.00 | |
| 75 | 56.71 | 12.14 | 10.56 | 47.51 | |
| 90 | 49.33 | 10.56 | 8.98 | 48.49 | |
| 120 | 39.47 | 8.45 | 6.87 | 49.46 | |
| 150 | 33.13 | 7.09 | 5.51 | 49.61 | |
| 180 | 28.68 | 6.14 | 4.56 | 49.25 | |
| 210 | 25.37 | 5.43 | 3.85 | 48.53 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed | | | | | |
|--|------------------|------------------|--------------|--------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.10 | 4.40 | 10 | 13.1 | 40.6 |
| 1:5 Year | 1.34 | 5.36 | 11 | 19.3 | 40.6 |
| 1:100 Year | 1.58 | 6.32 | 15 | 39.3 | 40.6 |

| Roof Drain Storage Table for Area RDs | | |
|---------------------------------------|------------------|--------------|
| Elevation | Area Roof Drains | Total Volume |
| m | m² | m³ |
| 0.00 | 0 | 0 |
| 0.05 | 85.59 | 2.1 |
| 0.10 | 341.9 | 12.8 |
| 0.15 | 768.48 | 40.6 |

Stage Storage Curve: Area R-2
Controlled Roof Drains #B8 to B11



| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B12 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.26 L/s | | | |
| C = 0.90 | | Vol(max) = 12.7 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 20.21 | 18.95 | 5.69 | |
| 10 | 76.81 | 14.99 | 13.73 | 8.24 | |
| 15 | 61.77 | 12.05 | 10.79 | 9.71 | |
| 20 | 52.03 | 10.15 | 8.89 | 10.67 | |
| 25 | 45.17 | 8.81 | 7.55 | 11.33 | |
| 30 | 40.04 | 7.81 | 6.55 | 11.80 | |
| 35 | 36.06 | 7.04 | 5.78 | 12.13 | |
| 40 | 32.86 | 6.41 | 5.15 | 12.37 | |
| 45 | 30.24 | 5.90 | 4.64 | 12.53 | |
| 50 | 28.04 | 5.47 | 4.21 | 12.64 | |
| 55 | 26.17 | 5.11 | 3.85 | 12.70 | |
| 60 | 24.56 | 4.79 | 3.53 | 12.72 | |
| 75 | 20.81 | 4.06 | 2.80 | 12.61 | |
| 90 | 18.14 | 3.54 | 2.28 | 12.32 | |
| 120 | 14.56 | 2.84 | 1.58 | 11.39 | |
| 150 | 12.25 | 2.39 | 1.13 | 10.18 | |
| 180 | 10.63 | 2.07 | 0.81 | 8.79 | |
| 210 | 9.42 | 1.84 | 0.58 | 7.28 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B12 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 18.8 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 27.55 | 26.29 | 7.89 | |
| 10 | 104.19 | 20.33 | 19.07 | 11.44 | |
| 15 | 83.56 | 16.31 | 15.05 | 13.54 | |
| 20 | 70.25 | 13.71 | 12.45 | 14.94 | |
| 25 | 60.90 | 11.88 | 10.62 | 15.94 | |
| 30 | 53.93 | 10.52 | 9.26 | 16.68 | |
| 35 | 48.52 | 9.47 | 8.21 | 17.24 | |
| 40 | 44.18 | 8.62 | 7.36 | 17.67 | |
| 45 | 40.63 | 7.93 | 6.67 | 18.01 | |
| 50 | 37.65 | 7.35 | 6.09 | 18.26 | |
| 55 | 35.12 | 6.85 | 5.59 | 18.46 | |
| 60 | 32.94 | 6.43 | 5.17 | 18.61 | |
| 75 | 27.89 | 5.44 | 4.18 | 18.82 | |
| 90 | 24.29 | 4.74 | 3.48 | 18.79 | |
| 120 | 19.47 | 3.80 | 2.54 | 18.28 | |
| 150 | 16.36 | 3.19 | 1.93 | 17.40 | |
| 180 | 14.18 | 2.77 | 1.51 | 16.28 | |
| 210 | 12.56 | 2.45 | 1.19 | 15.00 | |

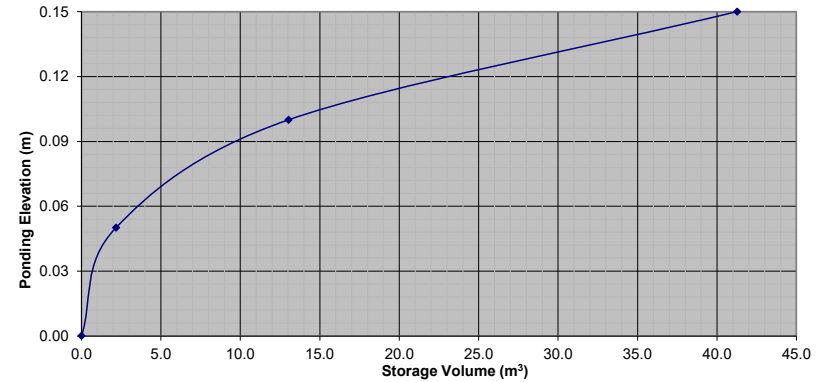
| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B12 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 37.9 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 52.63 | 50.74 | 15.22 | |
| 10 | 178.56 | 38.72 | 36.83 | 22.10 | |
| 15 | 142.89 | 30.99 | 29.10 | 26.19 | |
| 20 | 119.95 | 26.01 | 24.12 | 28.94 | |
| 25 | 103.85 | 22.52 | 20.63 | 30.94 | |
| 30 | 91.87 | 19.92 | 18.03 | 32.46 | |
| 35 | 82.58 | 17.91 | 16.02 | 33.63 | |
| 40 | 75.15 | 16.29 | 14.40 | 34.57 | |
| 45 | 69.05 | 14.97 | 13.08 | 35.32 | |
| 50 | 63.95 | 13.87 | 11.98 | 35.93 | |
| 55 | 59.62 | 12.93 | 11.04 | 36.43 | |
| 60 | 55.89 | 12.12 | 10.23 | 36.83 | |
| 75 | 47.26 | 10.25 | 8.36 | 37.61 | |
| 90 | 41.11 | 8.91 | 7.02 | 37.93 | |
| 120 | 32.89 | 7.13 | 5.24 | 37.75 | |
| 150 | 27.61 | 5.99 | 4.10 | 36.87 | |
| 180 | 23.90 | 5.18 | 3.29 | 35.56 | |
| 210 | 21.14 | 4.58 | 2.69 | 33.96 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Controlled Roof Drain B12 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.078 ha | | Qallow = 1.89 L/s | | | |
| C = 1.00 | | Vol(max) = 48.0 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 63.15 | 61.26 | 18.38 | |
| 10 | 214.27 | 46.46 | 44.57 | 26.74 | |
| 15 | 171.47 | 37.18 | 35.29 | 31.76 | |
| 20 | 143.94 | 31.21 | 29.32 | 35.19 | |
| 25 | 124.62 | 27.02 | 25.13 | 37.70 | |
| 30 | 110.24 | 23.90 | 22.01 | 39.63 | |
| 35 | 99.09 | 21.49 | 19.60 | 41.15 | |
| 40 | 90.17 | 19.55 | 17.66 | 42.39 | |
| 45 | 82.86 | 17.97 | 16.08 | 43.41 | |
| 50 | 76.74 | 16.64 | 14.75 | 44.25 | |
| 55 | 71.55 | 15.51 | 13.62 | 44.96 | |
| 60 | 67.07 | 14.54 | 12.65 | 45.56 | |
| 75 | 56.71 | 12.30 | 10.41 | 46.83 | |
| 90 | 49.33 | 10.70 | 8.81 | 47.56 | |
| 120 | 39.47 | 8.56 | 6.67 | 48.02 | |
| 150 | 33.13 | 7.18 | 5.29 | 47.65 | |
| 180 | 28.68 | 6.22 | 4.33 | 46.76 | |
| 210 | 25.37 | 5.50 | 3.61 | 45.51 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 12.7 | 41.3 |
| 1:5 Year | 1.34 | 1.34 | 11 | 18.8 | 41.3 |
| 1:100 Year | 1.89 | 1.89 | 14 | 37.9 | 41.3 |

| Roof Drain Storage Table for Area RD B12 | | |
|--|----------------|----------------|
| Elevation | Area RD B12 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 86.81 | 2.2 |
| 0.10 | 347.71 | 13.0 |
| 0.15 | 781.33 | 41.3 |

Stage Storage Curve: Area R-2
Controlled Roof Drain # B12



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B13 + B14

OTTAWA IDF CURVE
 Area = 0.092 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 14.1 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.84 | 22.10 | 6.63 |
| 10 | 76.81 | 17.68 | 15.94 | 9.56 |
| 15 | 61.77 | 14.22 | 12.48 | 11.23 |
| 20 | 52.03 | 11.98 | 10.24 | 12.28 |
| 25 | 45.17 | 10.40 | 8.66 | 12.99 |
| 30 | 40.04 | 9.22 | 7.48 | 13.46 |
| 35 | 36.06 | 8.30 | 6.56 | 13.78 |
| 40 | 32.86 | 7.56 | 5.82 | 13.98 |
| 45 | 30.24 | 6.96 | 5.22 | 14.10 |
| 50 | 28.04 | 6.45 | 4.71 | 14.14 |
| 55 | 26.17 | 6.02 | 4.28 | 14.14 |
| 60 | 24.56 | 5.65 | 3.91 | 14.09 |
| 75 | 20.81 | 4.79 | 3.05 | 13.73 |
| 90 | 18.14 | 4.18 | 2.44 | 13.16 |
| 120 | 14.56 | 3.35 | 1.61 | 11.61 |
| 150 | 12.25 | 2.82 | 1.08 | 9.72 |
| 180 | 10.63 | 2.45 | 0.71 | 7.63 |
| 210 | 9.42 | 2.17 | 0.43 | 5.38 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B13 + B14

OTTAWA IDF CURVE
 Area = 0.092 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 21.1 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.50 | 30.76 | 9.23 |
| 10 | 104.19 | 23.98 | 22.24 | 13.35 |
| 15 | 83.56 | 19.23 | 17.49 | 15.74 |
| 20 | 70.25 | 16.17 | 14.43 | 17.32 |
| 25 | 60.90 | 14.02 | 12.28 | 18.42 |
| 30 | 53.93 | 12.41 | 10.67 | 19.21 |
| 35 | 48.52 | 11.17 | 9.43 | 19.80 |
| 40 | 44.18 | 10.17 | 8.43 | 20.23 |
| 45 | 40.63 | 9.35 | 7.61 | 20.55 |
| 50 | 37.65 | 8.67 | 6.93 | 20.78 |
| 55 | 35.12 | 8.08 | 6.34 | 20.94 |
| 60 | 32.94 | 7.58 | 5.84 | 21.03 |
| 75 | 27.89 | 6.42 | 4.68 | 21.06 |
| 90 | 24.29 | 5.59 | 3.85 | 20.79 |
| 120 | 19.47 | 4.48 | 2.74 | 19.74 |
| 150 | 16.36 | 3.77 | 2.03 | 18.24 |
| 180 | 14.18 | 3.26 | 1.52 | 16.46 |
| 210 | 12.56 | 2.89 | 1.15 | 14.49 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B13 + B14

OTTAWA IDF CURVE
 Area = 0.092 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 41.2 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 62.07 | 59.15 | 17.75 |
| 10 | 178.56 | 45.67 | 42.75 | 25.65 |
| 15 | 142.89 | 36.55 | 33.63 | 30.26 |
| 20 | 119.95 | 30.68 | 27.76 | 33.31 |
| 25 | 103.85 | 26.56 | 23.64 | 35.46 |
| 30 | 91.87 | 23.50 | 20.58 | 37.04 |
| 35 | 82.58 | 21.12 | 18.20 | 38.22 |
| 40 | 75.15 | 19.22 | 16.30 | 39.12 |
| 45 | 69.05 | 17.66 | 14.74 | 39.80 |
| 50 | 63.95 | 16.36 | 13.44 | 40.31 |
| 55 | 59.62 | 15.25 | 12.33 | 40.69 |
| 60 | 55.89 | 14.30 | 11.38 | 40.95 |
| 75 | 47.26 | 12.09 | 9.17 | 41.25 |
| 90 | 41.11 | 10.51 | 7.59 | 41.01 |
| 120 | 32.89 | 8.41 | 5.49 | 39.55 |
| 150 | 27.61 | 7.06 | 4.14 | 37.28 |
| 180 | 23.90 | 6.11 | 3.19 | 34.49 |
| 210 | 21.14 | 5.41 | 2.49 | 31.35 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drains B13 + B14

OTTAWA IDF CURVE
 Area = 0.092 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 52.4 m3

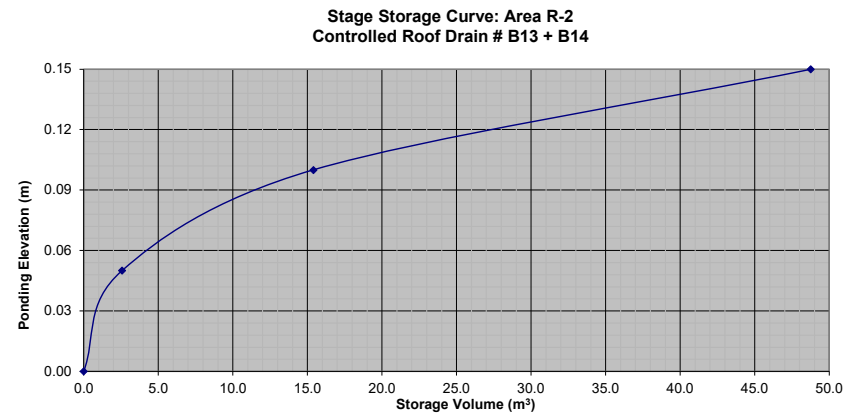
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 74.49 | 71.57 | 21.47 |
| 10 | 214.27 | 54.80 | 51.88 | 31.13 |
| 15 | 171.47 | 43.86 | 40.94 | 36.84 |
| 20 | 143.94 | 36.81 | 33.89 | 40.67 |
| 25 | 124.62 | 31.87 | 28.95 | 43.43 |
| 30 | 110.24 | 28.20 | 25.28 | 45.50 |
| 35 | 99.09 | 25.34 | 22.42 | 47.09 |
| 40 | 90.17 | 23.06 | 20.14 | 48.34 |
| 45 | 82.86 | 21.19 | 18.27 | 49.34 |
| 50 | 76.74 | 19.63 | 16.71 | 50.12 |
| 55 | 71.55 | 18.30 | 15.38 | 50.75 |
| 60 | 67.07 | 17.15 | 14.23 | 51.25 |
| 75 | 56.71 | 14.50 | 11.58 | 52.12 |
| 90 | 49.33 | 12.62 | 9.70 | 52.37 |
| 120 | 39.47 | 10.10 | 7.18 | 51.67 |
| 150 | 33.13 | 8.47 | 5.55 | 49.99 |
| 180 | 28.68 | 7.34 | 4.42 | 47.69 |
| 210 | 25.37 | 6.49 | 3.57 | 44.98 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain B13(L/s) | Flow/Drain B14(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.79 | 1.74 | 9 | 14.1 | 48.8 |
| 1:5 Year | 1.10 | 0.87 | 1.97 | 11 | 21.1 | 48.8 |
| 1:100 Year | 1.58 | 1.34 | 2.92 | 14 | 41.2 | 48.8 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD B13+B14 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 102.73 | 2.6 |
| 0.10 | 410.94 | 15.4 |
| 0.15 | 923.38 | 48.8 |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B15 + B16

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 13.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.58 | 21.84 | 6.55 |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B15 + B16

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 20.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.14 | 30.40 | 9.12 |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain B15(L/s) | Flow/Drain B16(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.79 | 1.74 | 9 | 13.9 | 47.9 |
| 1:5 Year | 1.10 | 0.87 | 1.97 | 11 | 20.7 | 47.9 |
| 1:100 Year | 1.58 | 1.34 | 2.92 | 14 | 40.7 | 47.9 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD B15+B16 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 100.9 | 2.5 |
| 0.10 | 403.65 | 15.1 |
| 0.15 | 908.22 | 47.9 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B15 + B16

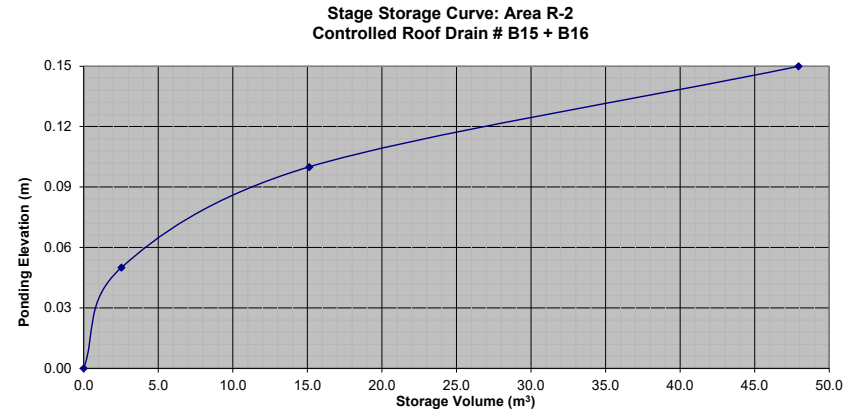
OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 40.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 61.40 | 58.48 | 17.54 |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drains B15 + B16

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 51.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 73.68 | 70.76 | 21.23 |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B17 + B18

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 13.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.58 | 21.84 | 6.55 |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B17 + B18

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 20.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.14 | 30.40 | 9.12 |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain B17(L/s) | Flow/Drain B18(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.79 | 1.74 | 9 | 13.9 | 47.9 |
| 1:5 Year | 1.10 | 0.87 | 1.97 | 11 | 20.7 | 47.9 |
| 1:100 Year | 1.58 | 1.34 | 2.92 | 14 | 40.7 | 47.9 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD B17+B18 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 100.9 | 2.5 |
| 0.10 | 403.65 | 15.1 |
| 0.15 | 908.22 | 47.9 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B17 + B18

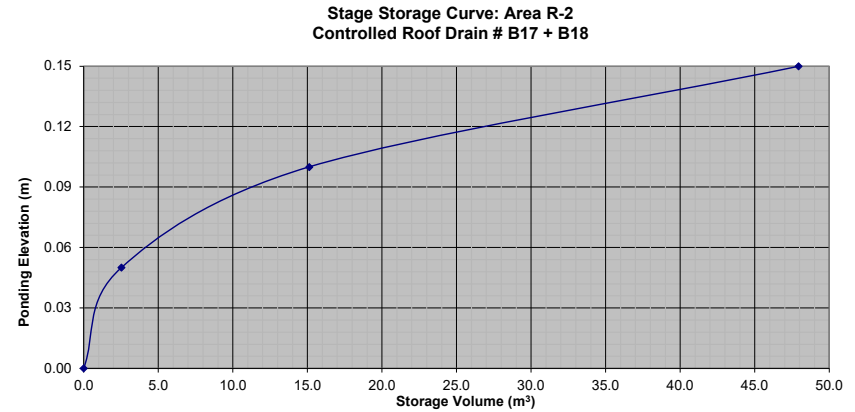
OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 40.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 61.40 | 58.48 | 17.54 |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drains B17 + B18

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 51.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 73.68 | 70.76 | 21.23 |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B19 + B20

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 13.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.58 | 21.84 | 6.55 |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B19 + B20

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 20.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.14 | 30.40 | 9.12 |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain B19(L/s) | Flow/Drain B20(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.79 | 1.74 | 9 | 13.9 | 47.9 |
| 1:5 Year | 1.10 | 0.87 | 1.97 | 11 | 20.7 | 47.9 |
| 1:100 Year | 1.58 | 1.34 | 2.92 | 14 | 40.7 | 47.9 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD B19+B20 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 100.9 | 2.5 |
| 0.10 | 403.65 | 15.1 |
| 0.15 | 908.22 | 47.9 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B19 + B20

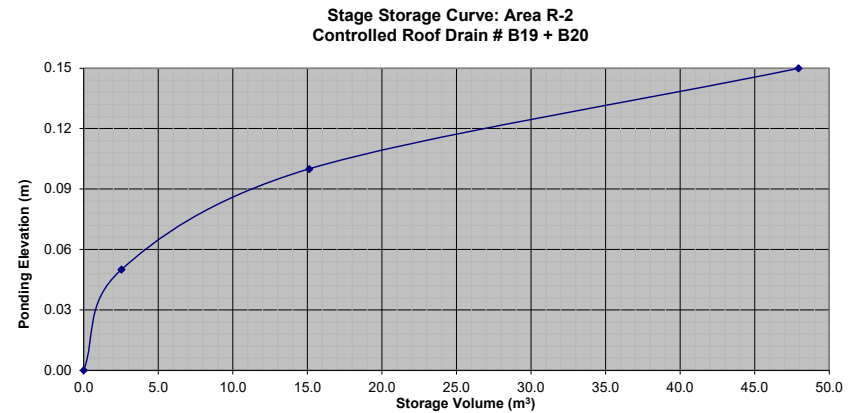
OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 40.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 61.40 | 58.48 | 17.54 |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drains B19 + B20

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 51.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 73.68 | 70.76 | 21.23 |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 |



Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B21 + B22

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.74 L/s
 C = 0.90 Vol(max) = 13.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 23.58 | 21.84 | 6.55 |
| 10 | 76.81 | 17.49 | 15.75 | 9.45 |
| 15 | 61.77 | 14.06 | 12.32 | 11.09 |
| 20 | 52.03 | 11.85 | 10.11 | 12.13 |
| 25 | 45.17 | 10.28 | 8.54 | 12.82 |
| 30 | 40.04 | 9.12 | 7.38 | 13.28 |
| 35 | 36.06 | 8.21 | 6.47 | 13.59 |
| 40 | 32.86 | 7.48 | 5.74 | 13.78 |
| 45 | 30.24 | 6.88 | 5.14 | 13.89 |
| 50 | 28.04 | 6.38 | 4.64 | 13.93 |
| 55 | 26.17 | 5.96 | 4.22 | 13.92 |
| 60 | 24.56 | 5.59 | 3.85 | 13.86 |
| 75 | 20.81 | 4.74 | 3.00 | 13.49 |
| 90 | 18.14 | 4.13 | 2.39 | 12.91 |
| 120 | 14.56 | 3.32 | 1.58 | 11.34 |
| 150 | 12.25 | 2.79 | 1.05 | 9.45 |
| 180 | 10.63 | 2.42 | 0.68 | 7.34 |
| 210 | 9.42 | 2.14 | 0.40 | 5.09 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B21 + B22

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 1.97 L/s
 C = 0.90 Vol(max) = 20.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 32.14 | 30.40 | 9.12 |
| 10 | 104.19 | 23.72 | 21.98 | 13.19 |
| 15 | 83.56 | 19.02 | 17.28 | 15.56 |
| 20 | 70.25 | 15.99 | 14.25 | 17.11 |
| 25 | 60.90 | 13.86 | 12.12 | 18.19 |
| 30 | 53.93 | 12.28 | 10.54 | 18.97 |
| 35 | 48.52 | 11.05 | 9.31 | 19.54 |
| 40 | 44.18 | 10.06 | 8.32 | 19.97 |
| 45 | 40.63 | 9.25 | 7.51 | 20.28 |
| 50 | 37.65 | 8.57 | 6.83 | 20.50 |
| 55 | 35.12 | 8.00 | 6.26 | 20.65 |
| 60 | 32.94 | 7.50 | 5.76 | 20.74 |
| 75 | 27.89 | 6.35 | 4.61 | 20.74 |
| 90 | 24.29 | 5.53 | 3.79 | 20.47 |
| 120 | 19.47 | 4.43 | 2.69 | 19.39 |
| 150 | 16.36 | 3.73 | 1.99 | 17.87 |
| 180 | 14.18 | 3.23 | 1.49 | 16.08 |
| 210 | 12.56 | 2.86 | 1.12 | 14.09 |

Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 3/4 Exposed

| Design Event | Flow/Drain B21(L/s) | Flow/Drain B22(L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|---------------------|---------------------|------------------|--------------|---------------------------|----------|
| | | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.79 | 1.74 | 9 | 13.9 | 47.9 |
| 1:5 Year | 1.10 | 0.87 | 1.97 | 11 | 20.7 | 47.9 |
| 1:100 Year | 1.58 | 1.34 | 2.92 | 14 | 40.7 | 47.9 |

Roof Drain Storage Table for Area RDs

| Elevation | Area RD B21+B22 | Total Volume |
|-----------|-----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 100.9 | 2.5 |
| 0.10 | 403.65 | 15.1 |
| 0.15 | 908.22 | 47.9 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drains B21 + B22

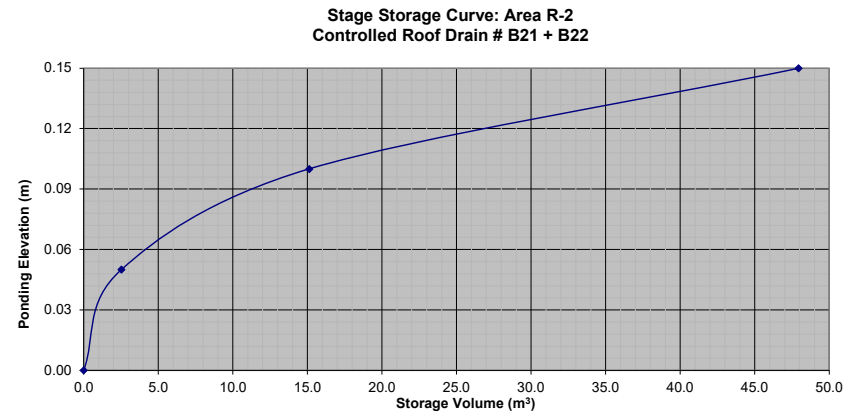
OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 40.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 61.40 | 58.48 | 17.54 |
| 10 | 178.56 | 45.17 | 42.25 | 25.35 |
| 15 | 142.89 | 36.15 | 33.23 | 29.91 |
| 20 | 119.95 | 30.35 | 27.43 | 32.91 |
| 25 | 103.85 | 26.27 | 23.35 | 35.03 |
| 30 | 91.87 | 23.24 | 20.32 | 36.58 |
| 35 | 82.58 | 20.89 | 17.97 | 37.74 |
| 40 | 75.15 | 19.01 | 16.09 | 38.62 |
| 45 | 69.05 | 17.47 | 14.55 | 39.28 |
| 50 | 63.95 | 16.18 | 13.26 | 39.78 |
| 55 | 59.62 | 15.08 | 12.16 | 40.14 |
| 60 | 55.89 | 14.14 | 11.22 | 40.39 |
| 75 | 47.26 | 11.95 | 9.03 | 40.66 |
| 90 | 41.11 | 10.40 | 7.48 | 40.39 |
| 120 | 32.89 | 8.32 | 5.40 | 38.89 |
| 150 | 27.61 | 6.98 | 4.06 | 36.58 |
| 180 | 23.90 | 6.05 | 3.13 | 33.77 |
| 210 | 21.14 | 5.35 | 2.43 | 30.61 |

Proposed Industrial Development
 Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drains B21 + B22

OTTAWA IDF CURVE
 Area = 0.091 ha Qallow = 2.92 L/s
 C = 1.00 Vol(max) = 51.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 73.68 | 70.76 | 21.23 |
| 10 | 214.27 | 54.21 | 51.29 | 30.77 |
| 15 | 171.47 | 43.38 | 40.46 | 36.41 |
| 20 | 143.94 | 36.41 | 33.49 | 40.19 |
| 25 | 124.62 | 31.53 | 28.61 | 42.91 |
| 30 | 110.24 | 27.89 | 24.97 | 44.94 |
| 35 | 99.09 | 25.07 | 22.15 | 46.51 |
| 40 | 90.17 | 22.81 | 19.89 | 47.74 |
| 45 | 82.86 | 20.96 | 18.04 | 48.71 |
| 50 | 76.74 | 19.41 | 16.49 | 49.48 |
| 55 | 71.55 | 18.10 | 15.18 | 50.10 |
| 60 | 67.07 | 16.97 | 14.05 | 50.57 |
| 75 | 56.71 | 14.35 | 11.43 | 51.42 |
| 90 | 49.33 | 12.48 | 9.56 | 51.63 |
| 120 | 39.47 | 9.99 | 7.07 | 50.88 |
| 150 | 33.13 | 8.38 | 5.46 | 49.16 |
| 180 | 28.68 | 7.26 | 4.34 | 46.83 |
| 210 | 25.37 | 6.42 | 3.50 | 44.09 |



Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B23

OTTAWA IDF CURVE
Area = 0.095 ha Qallow = 1.26 L/s
C = 0.90 Vol(max) = 16.6 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 103.57 | 24.62 | 23.36 | 7.01 |
| 10 | 76.81 | 18.26 | 17.00 | 10.20 |
| 15 | 61.77 | 14.68 | 13.42 | 12.08 |
| 20 | 52.03 | 12.37 | 11.11 | 13.33 |
| 25 | 45.17 | 10.74 | 9.48 | 14.21 |
| 30 | 40.04 | 9.52 | 8.26 | 14.86 |
| 35 | 36.06 | 8.57 | 7.31 | 15.35 |
| 40 | 32.86 | 7.81 | 6.55 | 15.72 |
| 45 | 30.24 | 7.19 | 5.93 | 16.00 |
| 50 | 28.04 | 6.67 | 5.41 | 16.22 |
| 55 | 26.17 | 6.22 | 4.96 | 16.37 |
| 60 | 24.56 | 5.84 | 4.58 | 16.48 |
| 75 | 20.81 | 4.95 | 3.69 | 16.59 |
| 90 | 18.14 | 4.31 | 3.05 | 16.48 |
| 120 | 14.56 | 3.46 | 2.20 | 15.85 |
| 150 | 12.25 | 2.91 | 1.65 | 14.87 |
| 180 | 10.63 | 2.53 | 1.27 | 13.67 |
| 210 | 9.42 | 2.24 | 0.98 | 12.32 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B23

OTTAWA IDF CURVE
Area = 0.095 ha Qallow = 1.34 L/s
C = 0.90 Vol(max) = 24.4 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 141.18 | 33.56 | 32.30 | 9.69 |
| 10 | 104.19 | 24.77 | 23.51 | 14.10 |
| 15 | 83.56 | 19.86 | 18.60 | 16.74 |
| 20 | 70.25 | 16.70 | 15.44 | 18.53 |
| 25 | 60.90 | 14.47 | 13.21 | 19.82 |
| 30 | 53.93 | 12.82 | 11.56 | 20.80 |
| 35 | 48.52 | 11.53 | 10.27 | 21.57 |
| 40 | 44.18 | 10.50 | 9.24 | 22.18 |
| 45 | 40.63 | 9.66 | 8.40 | 22.67 |
| 50 | 37.65 | 8.95 | 7.69 | 23.07 |
| 55 | 35.12 | 8.35 | 7.09 | 23.39 |
| 60 | 32.94 | 7.83 | 6.57 | 23.65 |
| 75 | 27.89 | 6.63 | 5.37 | 24.16 |
| 90 | 24.29 | 5.77 | 4.51 | 24.37 |
| 120 | 19.47 | 4.63 | 3.37 | 24.24 |
| 150 | 16.36 | 3.89 | 2.63 | 23.66 |
| 180 | 14.18 | 3.37 | 2.11 | 22.79 |
| 210 | 12.56 | 2.98 | 1.72 | 21.73 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2: Building B Controlled Roof Drain B23

OTTAWA IDF CURVE
Area = 0.095 ha Qallow = 1.89 L/s
C = 1.00 Vol(max) = 48.9 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 242.70 | 64.10 | 62.21 | 18.66 |
| 10 | 178.56 | 47.16 | 45.27 | 27.16 |
| 15 | 142.89 | 37.74 | 35.85 | 32.26 |
| 20 | 119.95 | 31.68 | 29.79 | 35.75 |
| 25 | 103.85 | 27.43 | 25.54 | 38.30 |
| 30 | 91.87 | 24.26 | 22.37 | 40.27 |
| 35 | 82.58 | 21.81 | 19.92 | 41.83 |
| 40 | 75.15 | 19.85 | 17.96 | 43.09 |
| 45 | 69.05 | 18.24 | 16.35 | 44.13 |
| 50 | 63.95 | 16.89 | 15.00 | 45.00 |
| 55 | 59.62 | 15.75 | 13.86 | 45.73 |
| 60 | 55.89 | 14.76 | 12.87 | 46.34 |
| 75 | 47.26 | 12.48 | 10.59 | 47.66 |
| 90 | 41.11 | 10.86 | 8.97 | 48.42 |
| 120 | 32.89 | 8.69 | 6.80 | 48.94 |
| 150 | 27.61 | 7.29 | 5.40 | 48.62 |
| 180 | 23.90 | 6.31 | 4.42 | 47.76 |
| 210 | 21.14 | 5.58 | 3.69 | 46.55 |

Proposed Industrial Development
Novatech Project No. 119123
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA R-2: Building B Controlled Roof Drain B23

OTTAWA IDF CURVE
Area = 0.095 ha Qallow = 1.89 L/s
C = 1.00 Vol(max) = 61.7 m3

| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) |
|------------|-------------------|---------|------------|----------|
| 5 | 291.24 | 76.92 | 75.03 | 22.51 |
| 10 | 214.27 | 56.59 | 54.70 | 32.82 |
| 15 | 171.47 | 45.29 | 43.40 | 39.06 |
| 20 | 143.94 | 38.01 | 36.12 | 43.35 |
| 25 | 124.62 | 32.91 | 31.02 | 46.53 |
| 30 | 110.24 | 29.11 | 27.22 | 49.00 |
| 35 | 99.09 | 26.17 | 24.28 | 50.99 |
| 40 | 90.17 | 23.82 | 21.93 | 52.62 |
| 45 | 82.86 | 21.88 | 19.99 | 53.98 |
| 50 | 76.74 | 20.27 | 18.38 | 55.14 |
| 55 | 71.55 | 18.90 | 17.01 | 56.12 |
| 60 | 67.07 | 17.71 | 15.82 | 56.97 |
| 75 | 56.71 | 14.98 | 13.09 | 58.89 |
| 90 | 49.33 | 13.03 | 11.14 | 60.15 |
| 120 | 39.47 | 10.43 | 8.54 | 61.45 |
| 150 | 33.13 | 8.75 | 6.86 | 61.74 |
| 180 | 28.68 | 7.58 | 5.69 | 61.40 |
| 210 | 25.37 | 6.70 | 4.81 | 60.62 |

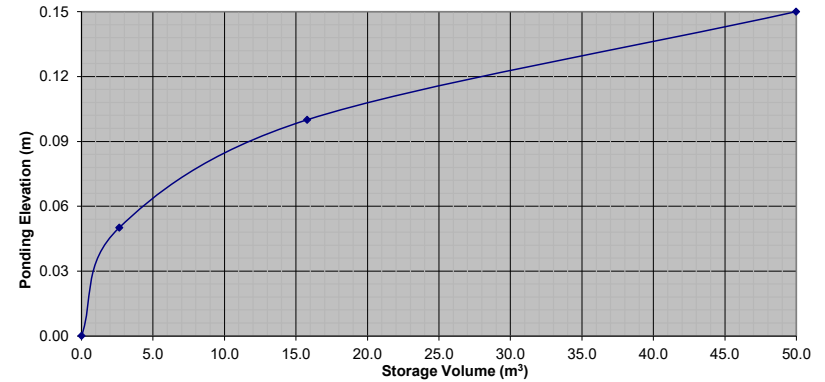
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed

| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
|--------------|------------------|------------------|--------------|---------------------------|----------|
| | | | | Required | Provided |
| 1:2 Year | 1.26 | 1.26 | 10 | 16.6 | 50.0 |
| 1:5 Year | 1.34 | 1.34 | 11 | 24.4 | 50.0 |
| 1:100 Year | 1.89 | 1.89 | 15 | 48.9 | 50.0 |

Roof Drain Storage Table for Area RD B23

| Elevation | Area RD B23 | Total Volume |
|-----------|----------------|----------------|
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 105.21 | 2.6 |
| 0.10 | 420.86 | 15.8 |
| 0.15 | 946.93 | 50.0 |

**Stage Storage Curve: Area R-2
Controlled Roof Drain # B23**



| Proposed Industrial Development | | | | | |
|--|-------------------|-------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:2 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.039 ha | | Qallow = 0.95 L/s | | | |
| C = 0.90 | | Vol(max) = 5.4 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 103.57 | 10.11 | 9.16 | 2.75 | |
| 10 | 76.81 | 7.49 | 6.54 | 3.93 | |
| 15 | 61.77 | 6.03 | 5.08 | 4.57 | |
| 20 | 52.03 | 5.08 | 4.13 | 4.95 | |
| 25 | 45.17 | 4.41 | 3.46 | 5.19 | |
| 30 | 40.04 | 3.91 | 2.96 | 5.32 | |
| 35 | 36.06 | 3.52 | 2.57 | 5.39 | |
| 40 | 32.86 | 3.21 | 2.26 | 5.42 | |
| 45 | 30.24 | 2.95 | 2.00 | 5.40 | |
| 50 | 28.04 | 2.74 | 1.79 | 5.36 | |
| 55 | 26.17 | 2.55 | 1.60 | 5.29 | |
| 60 | 24.56 | 2.40 | 1.45 | 5.21 | |
| 75 | 20.81 | 2.03 | 1.08 | 4.86 | |
| 90 | 18.14 | 1.77 | 0.82 | 4.43 | |
| 120 | 14.56 | 1.42 | 0.47 | 3.39 | |
| 150 | 12.25 | 1.20 | 0.25 | 2.21 | |
| 180 | 10.63 | 1.04 | 0.09 | 0.94 | |
| 210 | 9.42 | 0.92 | -0.03 | -0.39 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|-------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:5 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.039 ha | | Qallow = 1.34 L/s | | | |
| C = 0.90 | | Vol(max) = 8.2 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 141.18 | 13.78 | 12.83 | 3.85 | |
| 10 | 104.19 | 10.17 | 9.22 | 5.53 | |
| 15 | 83.56 | 8.15 | 7.20 | 6.48 | |
| 20 | 70.25 | 6.85 | 5.90 | 7.09 | |
| 25 | 60.90 | 5.94 | 4.99 | 7.49 | |
| 30 | 53.93 | 5.26 | 4.31 | 7.76 | |
| 35 | 48.52 | 4.73 | 3.78 | 7.95 | |
| 40 | 44.18 | 4.31 | 3.36 | 8.07 | |
| 45 | 40.63 | 3.96 | 3.01 | 8.14 | |
| 50 | 37.65 | 3.67 | 2.72 | 8.17 | |
| 55 | 35.12 | 3.43 | 2.48 | 8.17 | |
| 60 | 32.94 | 3.21 | 2.26 | 8.15 | |
| 75 | 27.89 | 2.72 | 1.77 | 7.97 | |
| 90 | 24.29 | 2.37 | 1.42 | 7.67 | |
| 120 | 19.47 | 1.90 | 0.95 | 6.84 | |
| 150 | 16.36 | 1.60 | 0.65 | 5.82 | |
| 180 | 14.18 | 1.38 | 0.43 | 4.68 | |
| 210 | 12.56 | 1.23 | 0.28 | 3.47 | |

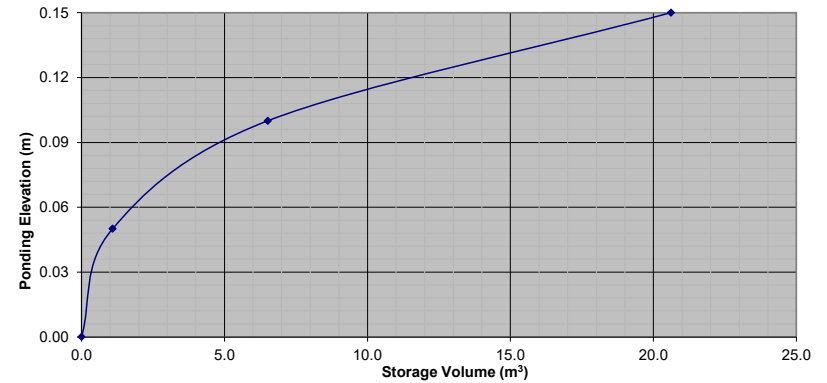
| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR EVENT | | | | | |
| AREA R-2: Building B Controlled Roof Drain B24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.039 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 16.1 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 242.70 | 26.31 | 24.73 | 7.42 | |
| 10 | 178.56 | 19.36 | 17.78 | 10.67 | |
| 15 | 142.89 | 15.49 | 13.91 | 12.52 | |
| 20 | 119.95 | 13.01 | 11.43 | 13.71 | |
| 25 | 103.85 | 11.26 | 9.68 | 14.52 | |
| 30 | 91.87 | 9.96 | 8.38 | 15.08 | |
| 35 | 82.58 | 8.95 | 7.37 | 15.48 | |
| 40 | 75.15 | 8.15 | 6.57 | 15.76 | |
| 45 | 69.05 | 7.49 | 5.91 | 15.95 | |
| 50 | 63.95 | 6.93 | 5.35 | 16.06 | |
| 55 | 59.62 | 6.46 | 4.88 | 16.12 | |
| 60 | 55.89 | 6.06 | 4.48 | 16.13 | |
| 75 | 47.26 | 5.12 | 3.54 | 15.95 | |
| 90 | 41.11 | 4.46 | 2.88 | 15.54 | |
| 120 | 32.89 | 3.57 | 1.99 | 14.30 | |
| 150 | 27.61 | 2.99 | 1.41 | 12.72 | |
| 180 | 23.90 | 2.59 | 1.01 | 10.92 | |
| 210 | 21.14 | 2.29 | 0.71 | 8.98 | |

| Proposed Industrial Development | | | | | |
|--|-------------------|--------------------|------------|----------|--|
| Novatech Project No. 119123 | | | | | |
| REQUIRED STORAGE - 1:100 YEAR + 20% | | | | | |
| AREA R-2: Building B Controlled Roof Drain B24 | | | | | |
| OTTAWA IDF CURVE | | | | | |
| Area = 0.039 ha | | Qallow = 1.58 L/s | | | |
| C = 1.00 | | Vol(max) = 20.6 m3 | | | |
| Time (min) | Intensity (mm/hr) | Q (L/s) | Qnet (L/s) | Vol (m3) | |
| 5 | 291.24 | 31.58 | 30.00 | 9.00 | |
| 10 | 214.27 | 23.23 | 21.65 | 12.99 | |
| 15 | 171.47 | 18.59 | 17.01 | 15.31 | |
| 20 | 143.94 | 15.61 | 14.03 | 16.83 | |
| 25 | 124.62 | 13.51 | 11.93 | 17.90 | |
| 30 | 110.24 | 11.95 | 10.37 | 18.67 | |
| 35 | 99.09 | 10.74 | 9.16 | 19.24 | |
| 40 | 90.17 | 9.78 | 8.20 | 19.67 | |
| 45 | 82.86 | 8.98 | 7.40 | 19.99 | |
| 50 | 76.74 | 8.32 | 6.74 | 20.22 | |
| 55 | 71.55 | 7.76 | 6.18 | 20.39 | |
| 60 | 67.07 | 7.27 | 5.69 | 20.49 | |
| 75 | 56.71 | 6.15 | 4.57 | 20.56 | |
| 90 | 49.33 | 5.35 | 3.77 | 20.35 | |
| 120 | 39.47 | 4.28 | 2.70 | 19.44 | |
| 150 | 33.13 | 3.59 | 2.01 | 18.11 | |
| 180 | 28.68 | 3.11 | 1.53 | 16.52 | |
| 210 | 25.37 | 2.75 | 1.17 | 14.75 | |

| Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to Fully Exposed | | | | | |
|--|------------------|------------------|--------------|---------------------------|----------|
| Design Event | Flow/Drain (L/s) | Total Flow (L/s) | Ponding (cm) | Storage (m ³) | |
| | | | | Required | Provided |
| 1:2 Year | 0.95 | 0.95 | 9 | 5.4 | 20.6 |
| 1:5 Year | 1.34 | 1.34 | 11 | 8.2 | 20.6 |
| 1:100 Year | 1.58 | 1.58 | 13 | 16.1 | 20.6 |

| Roof Drain Storage Table for Area RD B24 | | |
|--|----------------|----------------|
| Elevation | Area RD B24 | Total Volume |
| m | m ² | m ³ |
| 0.00 | 0 | 0 |
| 0.05 | 43.36 | 1.1 |
| 0.10 | 173.7 | 6.5 |
| 0.15 | 390.37 | 20.6 |

Stage Storage Curve: Area R-2
Controlled Roof Drain # B24



Appendix E

Development Servicing Study Checklist

Development Servicing Study Checklist

| 4.1 General Content | Addressed (Y/N/NA) | Section | Comments |
|--|---------------------------|----------------|-----------------------------|
| Executive Summary (for larger reports only). | NA | | |
| Date and revision number of the report. | Y | Cover | |
| Location map and plan showing municipal address, boundary, and layout of proposed development. | Y | 1 | Fig 1, Fig 2 |
| Plan showing the site and location of all existing services. | Y | 1 | Fig 2, Engineering Drawings |
| 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. | N | | |
| Summary of Pre-consultation Meetings with City and other approval agencies. | Y | 1.0 | Appendix A |
| Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria. | Y | 1.0 | |
| Statement of objectives and servicing criteria. | Y | 1.0 | |
| Identification of existing and proposed infrastructure available in the immediate area. | Y | | Engineering Drawings |
| 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). | Y | 4.0 | |
| 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 neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths. | Y | | Engineering Drawings |

Development Servicing Study Checklist

| 4.1 General Content | Addressed (Y/N/NA) | Section | Comments |
|--|--------------------|---------|--|
| Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts. | N/A | | |
| Proposed phasing of the development, if applicable. | N/A | | |
| Reference to geotechnical studies and recommendations concerning servicing. | Y | 1.0 | Geotechnical Report submitted under separate cover |
| All preliminary and formal site plan submissions should have the following information: | | | |
| Metric scale | Y | | Engineering Drawings |
| North arrow (including construction North) | Y | | Engineering Drawings |
| Key plan | Y | | Engineering Drawings, Fig 1 |
| Name and contact information of applicant and property owner | Y | | Engineering Drawings |
| Property limits including bearings and dimensions | Y | | Engineering Drawings |
| Existing and proposed structures and parking areas | Y | | Engineering Drawings |
| Easements, road widening and rights-of-way | Y | | Engineering Drawings |
| Adjacent street names | Y | | Engineering Drawings, Fig 1 |

Development Servicing Study Checklist

| 4.2 Water | Addressed (Y/N/NA) | Section | Comments |
|---|--------------------|---------|--------------|
| Confirm consistency with Master Servicing Study, if available. | Na | | |
| Availability of public infrastructure to service proposed development. | Y | 2.0 | |
| Identification of system constraints. | Y | 2.0 | |
| Identify boundary conditions. | Y | 2.0 | Appendix B |
| Confirmation of adequate domestic supply and pressure. | Y | 2.0 | |
| 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. | Y | 2.0 | Appendix B |
| 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. | Y | 2.0 | |
| Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design. | Y | 2.0 | |
| Address reliability requirements such as appropriate location of shut-off valves. | Y | 2.0 | |
| Check on the necessity of a pressure zone boundary modification. | NA | | |
| 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. | Y | 2.0 | Appendix B |
| 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. | Y | 2.0 | Fig 4, Fig 5 |
| Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation. | Y | 2.0 | |
| Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines. | Y | 2.0 | Appendix B |
| Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference. | Y | 2.0 | Appendix B |

Development Servicing Study Checklist

| 4.3 Wastewater | Addressed (Y/N/NA) | Section | Comments |
|--|-----------------------|---------|------------|
| 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). | Y | 3.0 | |
| Confirm consistency with Master Servicing Study and/or justifications for deviations. | Y | 3.0 | |
| 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. | NA | | |
| Description of existing sanitary sewer available for discharge of wastewater from proposed development. | Y | 3.0 | |
| 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) | Y | 3.0 | |
| Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format. | Y | 3.0 | Appendix C |
| Description of proposed sewer network including sewers, pumping stations, and forcemains. | Y | 3.0 | Appendix C |
| 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). | NA | | |
| Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development. | NA | | |
| Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity. | NA | | |
| Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding. | NA | | |
| Special considerations such as contamination, corrosive environment etc. | NA | | |

Development Servicing Study Checklist

| 4.4 Stormwater | Addressed (Y/N/NA) | Section | Comments |
|--|---------------------------|----------------|--------------------------------------|
| Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property). | Y | 4.0 | |
| Analysis of the available capacity in existing public infrastructure. | Y | 4.0 | Appendix D |
| A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns. | Y | | Fig 1, Fig 2 Engineering Drawings |
| 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. | Y | 4.0 | |
| Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements. | Y | 4.0 | |
| Description of stormwater management concept with facility locations and descriptions with references and supporting information. | Y | 4.0 | |
| Set-back from private sewage disposal systems. | N/A | | |
| Watercourse and hazard lands setbacks. | N/A | | |
| Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed. | Y | 1.0 | Appendix A |
| Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists. | N/A | | |
| Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events. | Y | 4.0 | Appendix D |
| Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals. | N/A | | |
| 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. | Y | 4.0 | Appendix D |
| Any proposed diversion of drainage catchment areas from one outlet to another. | Y | 4.0 | |
| Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities. | Y | 4.0 | Fig 7 Engineering Drawings |
| 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. | NA | | |

Development Servicing Study Checklist

| 4.4 Stormwater | Addressed (Y/N/NA) | Section | Comments |
|---|-----------------------|---------|----------------------|
| Identification of municipal drains and related approval requirements. | N/A | | |
| Description of how the conveyance and storage capacity will be achieved for the development. | Y | 4.0 | |
| 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading. | Y | | |
| Inclusion of hydraulic analysis including HGL elevations. | N | | |
| Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors. | Y | 5.0 | Engineering Drawings |
| Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions. | N/A | | |
| Identification of fill constrains related to floodplain and geotechnical investigation. | NA | | |

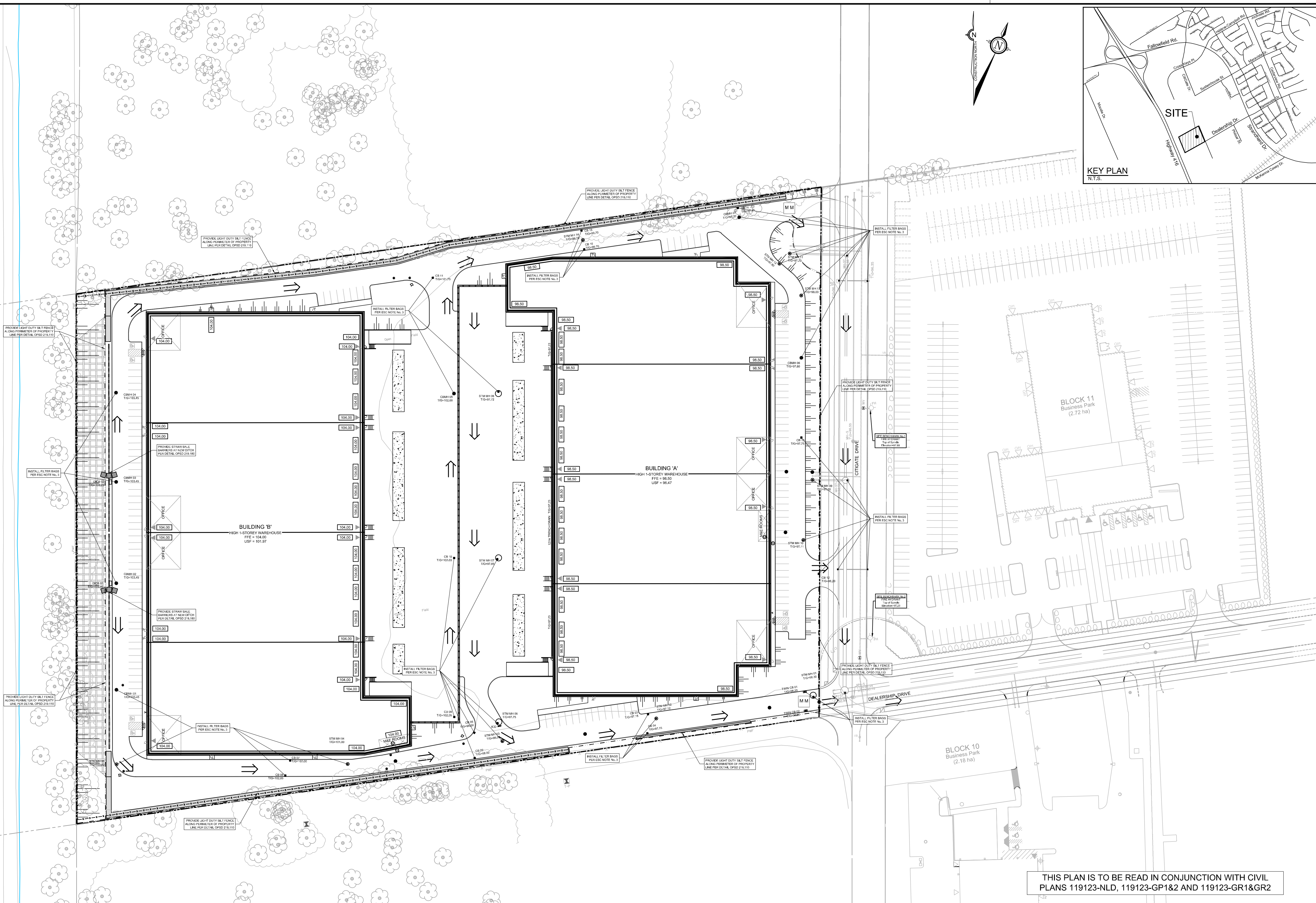
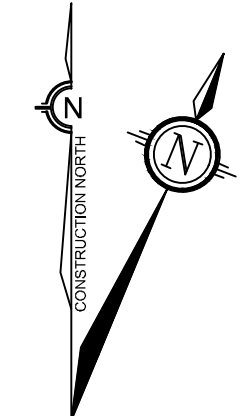
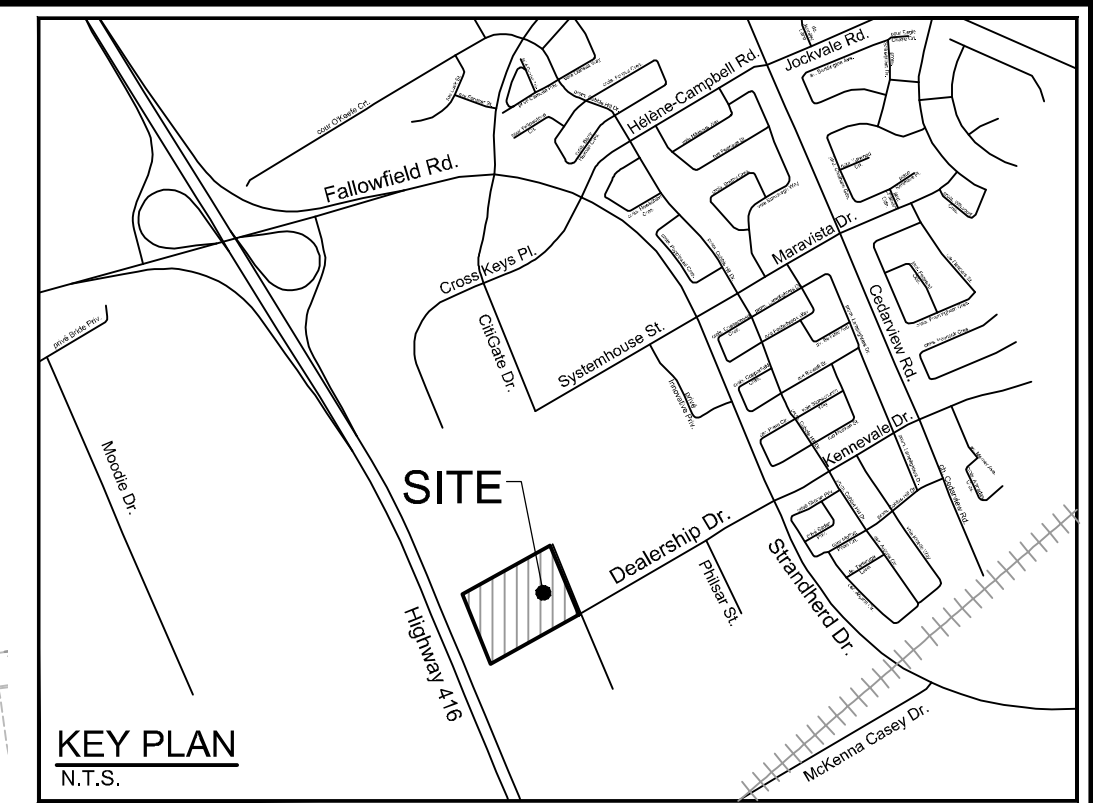
Development Servicing Study Checklist

| 4.5 Approval and Permit Requirements | Addressed (Y/N/NA) | Section | Comments |
|--|---------------------------|----------------|-----------------|
| 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. | Y | 1.0 | Appendix A |
| Application for Certificate of Approval (CofA) under the Ontario Water Resources Act. | NA | | |
| Changes to Municipal Drains. | NA | | |
| Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.) | NA | | |

| 4.6 Conclusion | Addressed (Y/N/NA) | Section | Comments |
|---|---------------------------|----------------|-----------------|
| Clearly stated conclusions and recommendations. | Y | 6.0 | |
| 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. | N | | |
| All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario. | Y | 7.0 | Appendices |

Appendix F

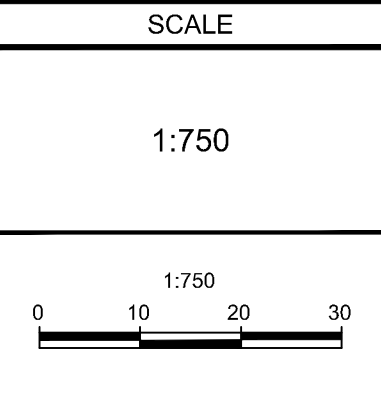
Drawings



THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 119123-NLD, 119123-GP1&2 AND 119123-GR1&GR2

NOTE:
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| 1 | ISSUED FOR CITY OF OTTAWA REVIEW | MAY 3/23 | DDB |



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| DRAWN | SM |
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| APPROVED | DDB |



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|--|--|--|
| <p>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</p> | <p>LOCATION CITY OF OTTAWA 575 DEALERSHIP DRIVE - PROPOSED WAREHOUSES</p> <p>DRAWING NAME EROSION AND SEDIMENT CONTROL PLAN</p> | <p>PROJECT No. 119123</p> <p>REV # 1</p> <p>DRAWING No. 119123-ESC</p> |
|--|--|--|

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INLET CONTROL DEVICE DATA TABLE: AREA A-5 (OUTLET PIPE OF STM MH 06)

| DESIGN EVENT | ICD TYPE (PLUG TYPE) | DIAMETER OF OUTLET PIPE (mm) | PEAK DESIGN FLOW (L/s) | PEAK DESIGN FLOW (L/s) | DESIGN HEAD (m) | WATER ELEVATION (m) | VOLUME (m³) | AVAILABLE STORAGE |
|--------------|----------------------|------------------------------|------------------------|------------------------|-----------------|---------------------|-------------|-------------------|
| 1:2 YR | CIRCULAR | 230mm | 122.0 | 61.0 | 1.14 | 96.11 | 129 | > 1.375 m³ |
| 1:5 YR | CIRCULAR | 230mm | 165.4 | 82.7 | 2.10 | 97.07 | 174 | |
| 1:100 YR | ORIFICE PLUG | 230mm | 181.6 | 90.8 | 2.53 | 97.50 | 436 | |

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 119123-NLD1&2 AND 119123-GR1&2

NOTE:
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| 1 | ISSUED FOR CITY OF OTTAWA REVIEW | MAY 3/23 | DDB |

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APPROVED: DDB

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

LOCATION: CITY OF OTTAWA, 575 DEALERSHIP DRIVE - PROPOSED WAREHOUSES

DRAWING NAME: GENERAL PLAN OF SERVICES

PROJECT No.: 119123
REV # 1
DRAWING No.: 119123-GP1

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| BUILDING 'A' ROOF DRAIN TABLE: AREA R-1 (ROOF DRAINS A1 to A24) | | | | | | |
|---|------------------------------|----------------------------|-----------------------|----------------------------|-------------------------|------------------------------|
| AREA ID | ROOF DRAIN NO. (WATTS MODEL) | ROOF DRAIN OPENING SETTING | 1.5 YEAR RELEASE RATE | APPROX. 5-YR PONDING DEPTH | 1-100 YEAR RELEASE RATE | APPROX. 100-YR PONDING DEPTH |
| R-1 | RD 1 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.26 L/s | 11 cm | 1.34 L/s | 13 cm |
| R-1 | RD 2 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
| R-1 | RD 3 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 4 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 5 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 6 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 7 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 8 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 9 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 10 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 11 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 12 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 13 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
| R-1 | RD 14 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 15 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 16 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 17 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 18 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-1 | RD 19 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-1 | RD 20 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 21 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 22 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 23 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 24 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |

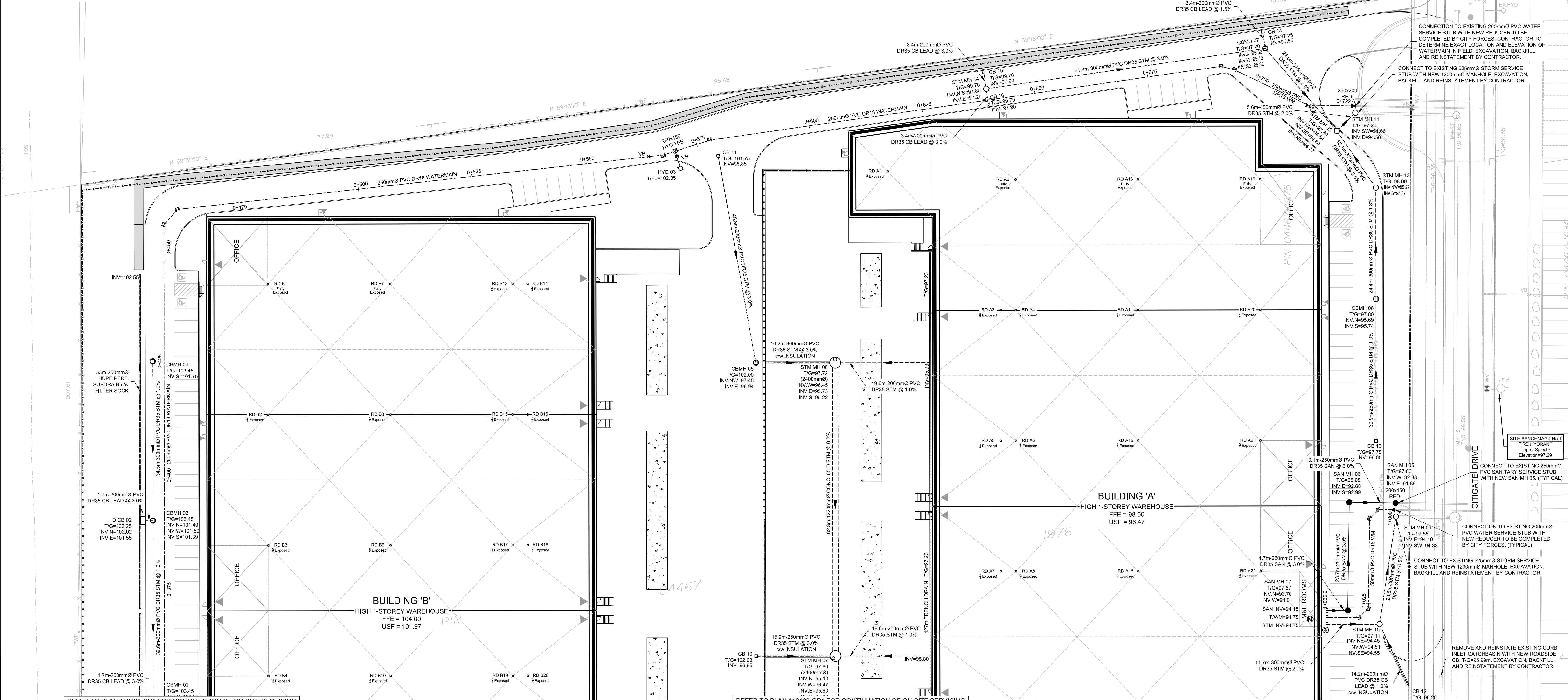
| BUILDING 'B' ROOF DRAIN TABLE: AREA R-2 (ROOF DRAINS B1 to B24) | | | | | | |
|---|------------------------------|----------------------------|-----------------------|----------------------------|-------------------------|------------------------------|
| AREA ID | ROOF DRAIN NO. (WATTS MODEL) | ROOF DRAIN OPENING SETTING | 1.5 YEAR RELEASE RATE | APPROX. 5-YR PONDING DEPTH | 1-100 YEAR RELEASE RATE | APPROX. 100-YR PONDING DEPTH |
| R-2 | RD 1 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 2 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 3 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 4 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 5 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 6 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 7 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 8 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 9 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 10 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 11 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 12 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 13 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 14 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 15 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 16 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 17 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 18 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 19 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
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| R-2 | RD 22 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 23 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
| R-2 | RD 24 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 13 cm |

| CRITICAL SEWER PIPE CROSSING TABLE | | | | |
|------------------------------------|----------------------|----------------------|-----------|-------------------|
| CROSSING | LOWER PIPE | HIGHER PIPE | CLEARANCE | SURFACE ELEVATION |
| Ⓐ | 150mmØ TWM#95.80 | 250mmØ SAN INV#96.53 | ± 0.7m | 98.30 m |
| Ⓑ | 375mmØ STM OBV#96.45 | 150mmØ U/S WM#95.75 | ± 0.3m | 98.30 m |
| Ⓒ | 375mmØ STM OBV#96.27 | 250mmØ SAN INV#97.75 | ± 1.5m | 99.93 m |
| Ⓓ | 375mmØ STM OBV#96.32 | 150mmØ U/S WM#97.28 | ± 1.0m | 100.03 m |
| Ⓔ | 250mmØ TWM#94.50 | 375mmØ STM MH#94.50 | ± 0.5m | 97.68 m |

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 119123-NLD1&2 AND 119123-GR1&2

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-069) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.
 ** ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDINGS TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-069) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.
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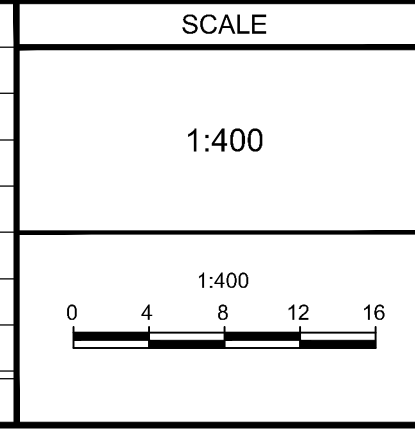


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REFER TO PLAN 119123-GP1 FOR CONTINUATION OF ON-SITE SERVICING

REFER TO PLAN 119123-GP1 FOR CONTINUATION OF ON-SITE SERVICING

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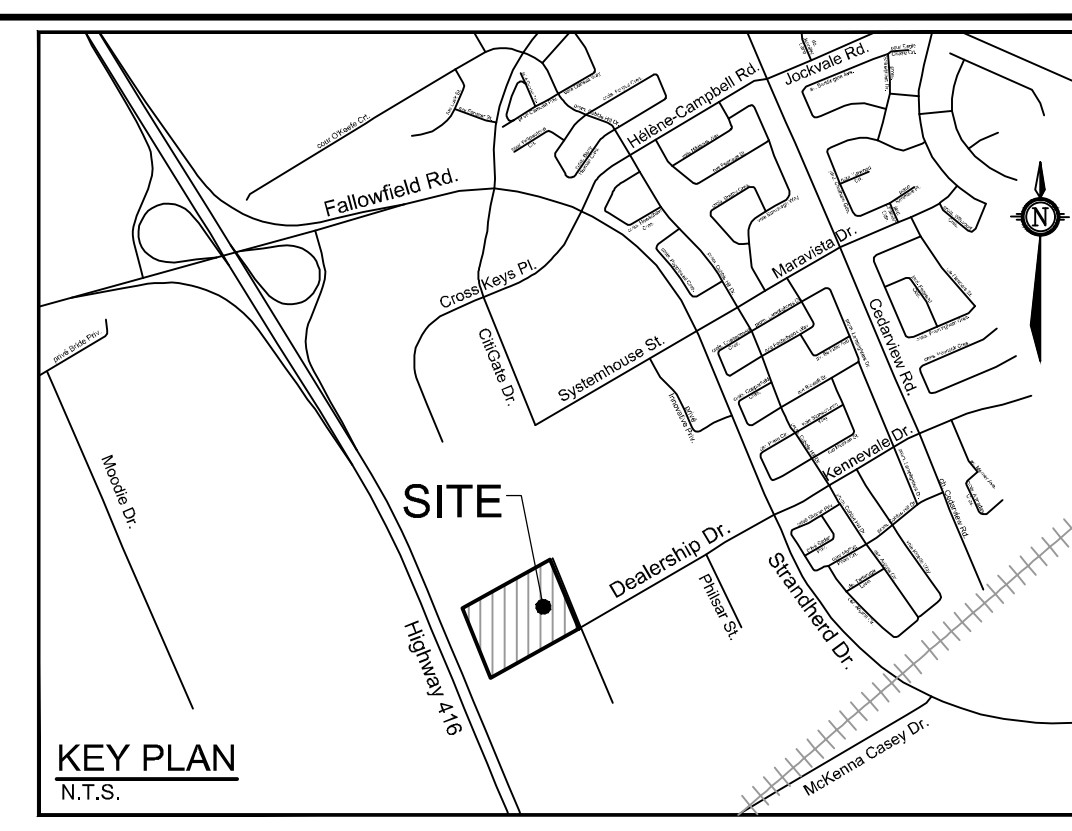
PROFESSIONAL ENGINEER
 D. D. BLAIR
 100122737
 May 3 2023
 PROVINCE OF ONTARIO

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

LOCATION: CITY OF OTTAWA
 575 DEALERSHIP DRIVE - PROPOSED WAREHOUSES

DRAWING NAME: GENERAL PLAN OF SERVICES

PROJECT No.: 119123
 REV #1
 DRAWING No.: 119123-GP2



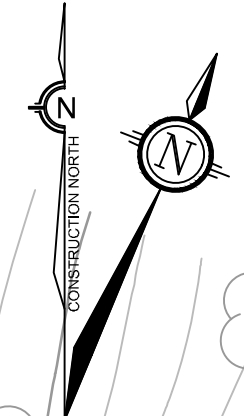
PART 3 PLAN AR-31718
 PIN 04467-1974

PIN 04467 - 0021

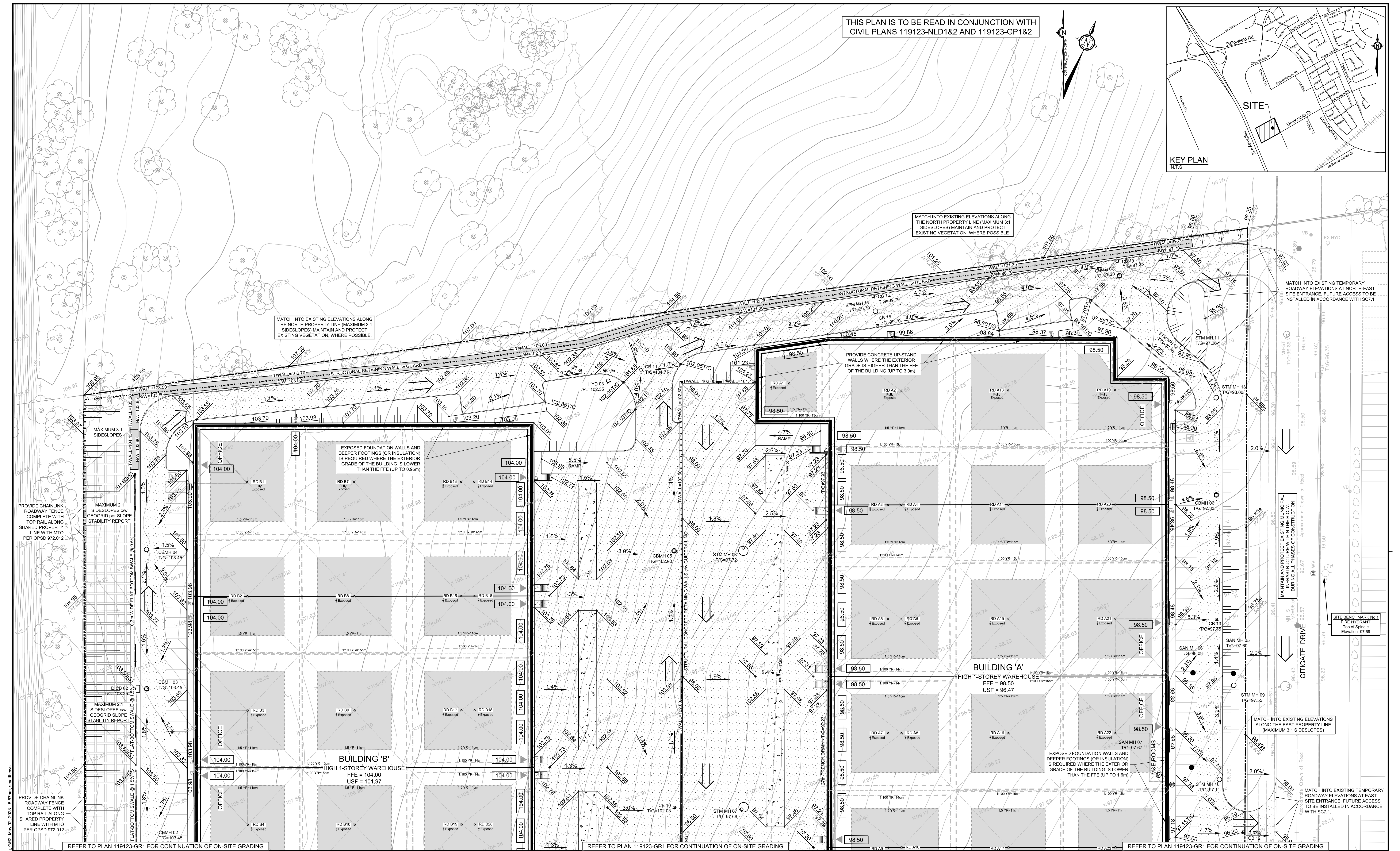
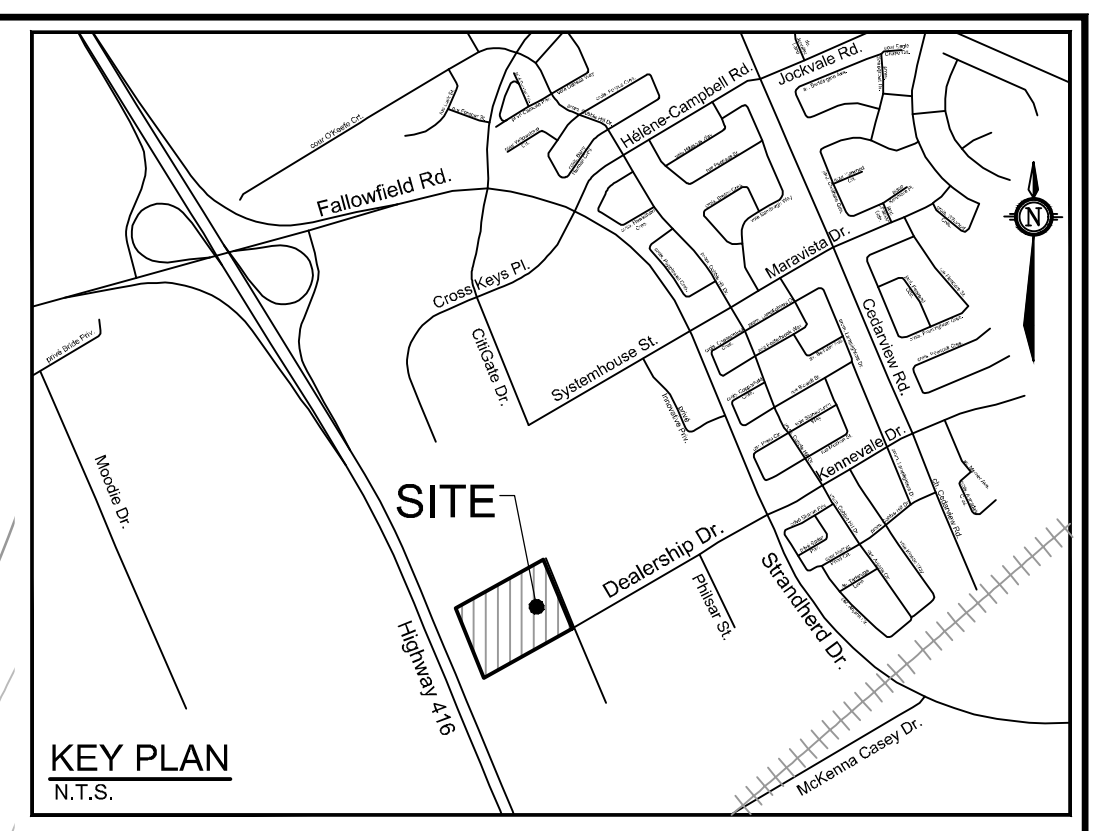
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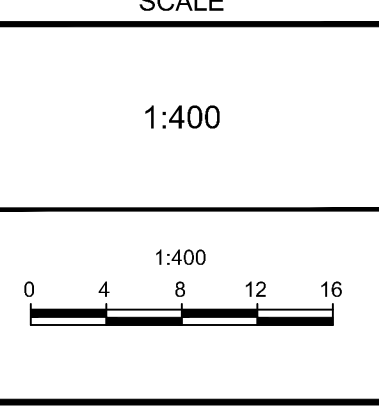
KEY PLAN
N.T.S.



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| 1:400 | SM | BM / DDB | DDB |



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

| | |
|--|---------------------------|
| LOCATION CITY OF OTTAWA 575 DEALERSHIP DRIVE - PROPOSED WAREHOUSES | PROJECT NO. 119123 |
| DRAWING NAME GRADING PLAN | REV REV #1 |
| | DRAWING NO. 119123-GR2 |

| BUILDING 'A' ROOF DRAIN TABLE: AREA R-1 (ROOF DRAINS A1 to A24) | | | | | | |
|---|------------------------------|----------------------------|-----------------------|----------------------------|-------------------------|------------------------------|
| AREA ID | ROOF DRAIN NO. (WATTS MODEL) | ROOF DRAIN OPENING SETTING | 1.5 YEAR RELEASE RATE | APPROX. 5-YR PONDING DEPTH | 1-100 YEAR RELEASE RATE | APPROX. 100-YR PONDING DEPTH |
| R-1 | RD 1 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.26 L/s | 11 cm | 1.34 L/s | 13 cm |
| R-1 | RD 2 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
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| R-1 | RD 11 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-1 | RD 12 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-1 | RD 13 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
| R-1 | RD 14 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 15 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 16 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 17 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 18 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-1 | RD 19 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-1 | RD 20 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 21 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 22 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 23 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-1 | RD 24 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |

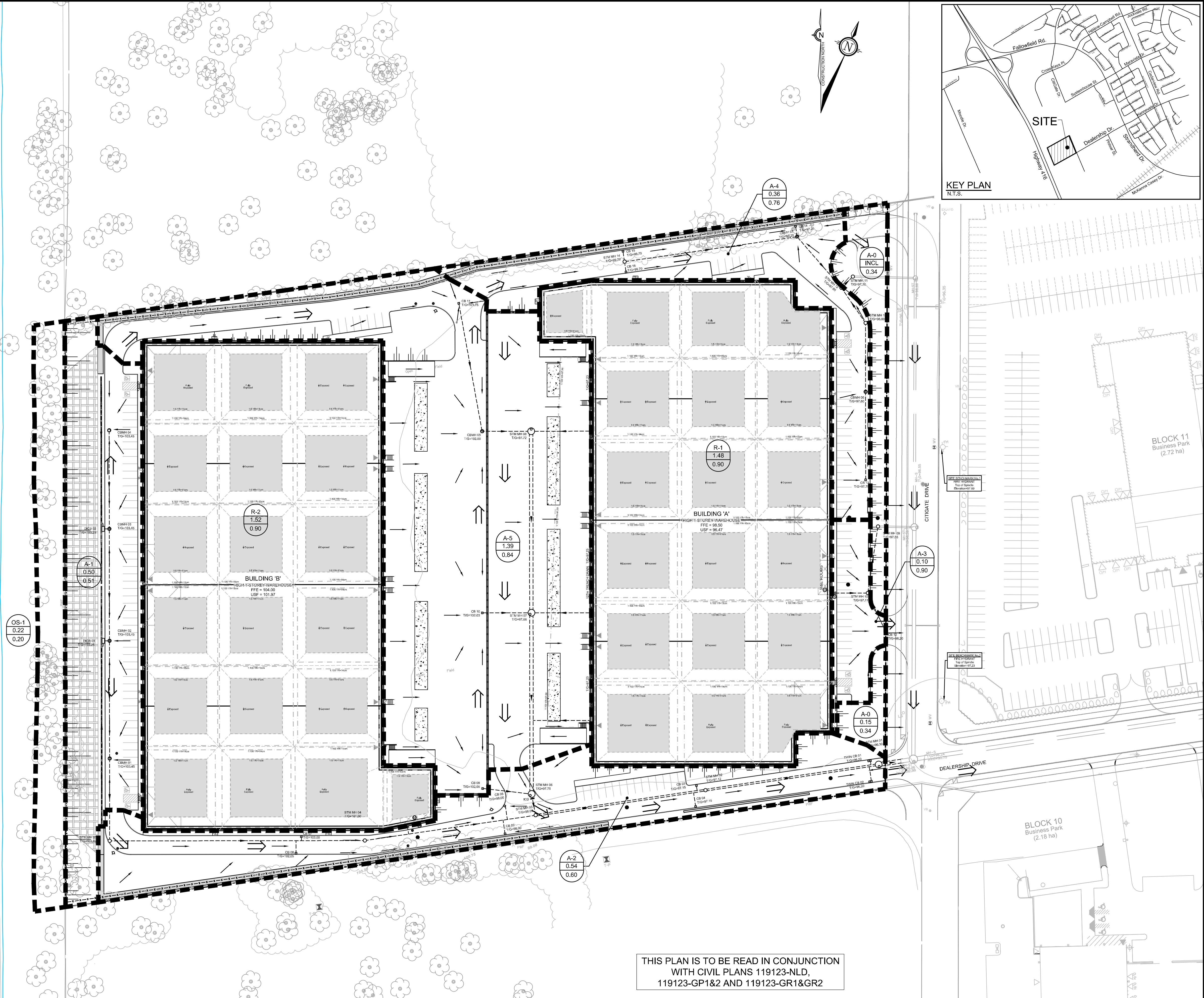
| BUILDING 'B' ROOF DRAIN TABLE: AREA R-2 (ROOF DRAINS B1 to B24) | | | | | | |
|---|------------------------------|----------------------------|-----------------------|----------------------------|-------------------------|------------------------------|
| AREA ID | ROOF DRAIN NO. (WATTS MODEL) | ROOF DRAIN OPENING SETTING | 1.5 YEAR RELEASE RATE | APPROX. 5-YR PONDING DEPTH | 1-100 YEAR RELEASE RATE | APPROX. 100-YR PONDING DEPTH |
| R-2 | RD 1 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 2 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 3 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 4 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 5 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 6 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 7 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 8 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 9 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 10 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 11 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 15 cm |
| R-2 | RD 12 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 14 cm |
| R-2 | RD 13 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 14 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 15 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 16 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 17 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 18 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 19 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 20 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 21 (RD-100-A-ADJ) | 3/4 EXPOSED | 1.10 L/s | 11 cm | 1.58 L/s | 14 cm |
| R-2 | RD 22 (RD-100-A-ADJ) | 3/4 EXPOSED | 0.87 L/s | 11 cm | 1.34 L/s | 14 cm |
| R-2 | RD 23 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.89 L/s | 15 cm |
| R-2 | RD 24 (RD-100-A-ADJ) | FULLY EXPOSED | 1.34 L/s | 11 cm | 1.58 L/s | 13 cm |

* REFER TO THE 'DEVELOPMENT SERVICING STUDY AND STORMWATER MANAGEMENT REPORT' (R-2023-069) PREPARED BY NOVATECH FOR DRAINAGE AREA IDENTIFIERS AND STORMWATER MANAGEMENT DETAILS.

** ALL CONTROLLED FLOW ROOF DRAINS FOR THE PROPOSED BUILDINGS TO BE WATTS 'ADJUSTABLE ACCUTROL' ROOF DRAINS.

| INLET CONTROL DEVICE DATA TABLE: AREA A-5 (OUTLET PIPE OF STM MH 06) | | | | | | | | |
|--|----------------------|------------------------------|------------------------|----------------------------|-----------------|---------------------|--------------------------|------------------------|
| DESIGN EVENT | ICD TYPE (PLUG TYPE) | DIAMETER OF OUTLET PIPE (mm) | PEAK DESIGN FLOW (L/s) | 1/2 PEAK DESIGN FLOW (L/s) | DESIGN HEAD (m) | WATER ELEVATION (m) | VOLUME (m ³) | AVAILABLE STORAGE |
| 1-2 YR | CIRCULAR | 375mmØ | 122.0 | 61.0 | 1.14 | 96.11 | 129 | > 1,375 m ³ |
| 1.5 YR | ORIFICE PLUG | 230mmØ | 165.4 | 82.7 | 2.10 | 97.07 | 174 | |
| 1-100 YR | ORIFICE PLUG | PVC DR35 | 181.6 | 90.8 | 2.53 | 97.50 | 436 | |

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



THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 119123-NLD, 119123-GP1&2 AND 119123-GR1&GR2

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|--|--|--|---------------------|--|
| 1 ISSUED FOR CITY OF OTTAWA REVIEW No. REVISION DATE BY | SCALE 1:750 0 10 20 30 | DESIGN SM / BM / DDB CHECKED DDB DRAWN SM CHECKED BM / DDB APPROVED DDB | FOR REVIEW ONLY | LOCATION CITY OF OTTAWA 575 DEALERSHIP DRIVE - PROPOSED WAREHOUSES DRAWING NAME POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN PROJECT No. 119123 REV # 1 DRAWING No. 119123-SWM |
| | 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 | | | |