PROPOSED OFFICE AND WAREHOUSE

100 BILL LEATHEM DRIVE
OTTAWA, ONTARIO

SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared By:

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NOVATECH
Engineers, Planners & Landscape Architects

August 22, 2024

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

Attention: **Mr. Tyler Cassidy**

Reference: **Servicing and Stormwater Management Report**
Proposed Office and Warehouse
100 Bill Leathem Drive, Ottawa, Ontario
Novatech File No.: 124011

Enclosed is a copy of the revised 'Servicing and Stormwater Management Report' for the proposed office and warehouse located at 100 Bil Leathem Drive, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of the Site Plan Control application.

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

Yours truly,

NOVATECH

MSavic

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

cc: Brandon Lawrence (S.J. Lawrence Architect Inc.)

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICIES

LIST OF DRAWINGS

General Plan of Services	(124011- GP)
Grading and Erosion & Sediment Control Plan	(124011- GR)
Stormwater Management Plan	(122021-SWM)

1.0 INTRODUCTION

Novatech has been retained to complete the site servicing and stormwater management design for the proposed office and warehouse located at 100 Bill Leathem Drive, in the City of Ottawa. This report addresses the approach to servicing and stormwater management and is being submitted in support of the Site Plan Control application.

1.1 Site Description and Location

The subject site is part of the South Merivale Business Park (SMBP) and is located on the south side of Bill Leathe Drive. The site is bordered by undeveloped parcels of land to the east end west and the existing stormwater management pond to the south.

The site is relatively flat, and it is covered by natural green features including grass, bushes, and trees. The legal description of the subject site is designated as Part of Lots 17 and 18, Concession 1 (Rideau Front), Geographic Township of Nepean, City of Ottawa.

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

1.2 Pre-Consultation Information

A pre-consultation meeting was held with the City of Ottawa on April 20, 2024, at which time the client was advised of the general submission requirements. Further consultation has been held with the City of Ottawa with respect to the stormwater management criteria for the site. Refer to **Appendix A** for a summary of the correspondence related to the proposed development.

Based on a review of **O. Reg. 525/98: Approval Exemptions**, a Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) is anticipated to be required because the industrial (warehouse) use on the site.

1.3 Proposed Development

The proposed development is a 2-storey office + warehouse building, having an area of approximately 1,554 m^2 (16,727 ft^2), including Phase II building expansion. The development will include staff parking, loading area, and garbage & storage area. The site will have two access driveways off Bill Leathem Drive. Refer to **Appendix B** for the proposed Site Plan.

The proposed development will be serviced by connecting to the existing municipal watermain, sanitary and storm sewers in Bill Leathem Drive.

1.4 Background Documents

The following documents were reviewed in preparation of the report:

- Geotechnical Investigation - Proposed Commercial Development, 100 Bill Leathem Drive, prepared by EXP (May 29, 2024).
- City of Nepean, South Merivale Business Park Phase II and III Services Design Report, prepared by Novatech, dated June 23,1992.
- City of Nepean, South Merivale Business Park, Stormwater Management Report, prepared by Novatech, revised dated December 3, 1991.
- City of Ottawa Sewer Design Guidelines (October 2012)
- Ottawa Design Guidelines – Water Distribution (July 2010)

1.5 Site Servicing

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. The servicing criteria, the expected sewage flows, and the water demands are to conform to the City of Ottawa municipal design guidelines for sewer and water distribution systems. Refer to the subsequent sections of the report for further details.

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is deemed complete and ready for review by City of Ottawa Infrastructure Approvals. A completed checklist is enclosed in **Appendix G** of the report.

2.0 WATER SERVICING

2.1 Existing Water Servicing

There is a 305mm diameter PVC watermain within the Bill Leathem drive ROW in front of the site.

2.2 Proposed Water Servicing

The proposed development will be serviced by connecting the proposed 150mm diameter water service to the existing 305mm diameter watermain in Bill Leathem Drive. An on-site private fire hydrant will be provided within 45m unobstructed path from the building fire department connection location.

2.2.1 Proposed Development Domestic Water Demands

The domestic water demands for the proposed development were calculated based on the following criteria from Section 8 of the Ontario Building Code and the peaking factors as per the City of Ottawa Water Distribution Design Guidelines:

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

The calculated water demands are summarized in **Table 2.1** below. Detailed calculations are included in **Appendix C**.

Table 2.1: Domestic Water Demand Summary

Proposed Development	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)
Office + Warehouse	0.08	0.12	0.21

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

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

Preliminary domestic water demands, and fire flow requirements were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions at the service connection point. **Table 2.2** and **Table 2.3** summarize the watermain boundary conditions provided by the City.

Table 2.2: Existing Boundary Conditions (Pre-SUC Pressure Zone Reconfiguration)

Boundary Condition	Water Demand (L/s)	Head (m)	Pressure (psi)*
Maximum HGL	0.08	132.8	61.5
Minimum HGL	0.21	125.0	50.4
Max Day + Fire Flow HGL	116.67+0.12	126.0	51.8

* Based on an average ground elevation of 89.6m. Pressure = (HGL – watermain elevation) x 1.42197 PSI/m

Table 2.2: Future Boundary Conditions (Post-SUC Pressure Zone Reconfiguration)

Boundary Condition	Water Demand (L/s)	Head (m)	Pressure (psi)*
Maximum HGL	0.08	146.9	81.5
Minimum HGL	0.21	144.1	77.5
Max Day + Fire Flow HGL	116.67+0.12	142.3	74.9

* Based on an average ground elevation of 89.6m. Pressure = (HGL – watermain elevation) x 1.42197 PSI/m

As indicated above, the existing municipal watermain will provide adequate system pressures to the proposed development. Due to high pressure (>80 psi) under the Post-SUC Pressure Zone Reconfiguration, a pressure reducing valve will be required to be installed in the building as per the Ontario Building Code (OBC).

2.2.2 Proposed Development Fire Protection System

The proposed building will not be sprinklered. Fire protection to the building will be provided from the existing municipal fire hydrants in Bill Leathem Drive. The closest municipal fire hydrant to the building is located in the north boulevard of Bill Latham Drive in front of the site. The hydrant is located within 90m unobstructed path of travel to the building principal entrance, meeting the Ontario Building Code (OBC) requirement.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed building. The fire flow calculations have been based on the information provided by the architect. The proposed building will have 2-storeys and will be constructed using non-combustible materials. The calculated fire flow demand is 7,000 L/min (117 L/s). Refer to **Appendix C** for the detailed FUS fire flow calculations.

A multi-hydrant approach to fire-fighting is anticipated to be required. There are three Class AA, blue bonnet municipal hydrants within 150m of the proposed development. All municipal hydrants are in the north boulevard of Bill Leathem Drive (one approximately 62m from the northeast corner of the proposed building, one approximately 82 from the north east corner of the building, and one approximately 92m form the northwest corner of the building) Based on *Table 1 Maximum flow to be considered from a given hydrant* in *Appendix I* of *Technical Bulletin ISTB-2018-02*, the combined flows from the three hydrants are summarized below in **Table 2.3**.

Table 2.3: Combined Hydrant Flow Summary

Municipal Fire Hydrants < 75m from Building	Municipal Fire Hydrants > 75m and < 150m from Building	Combined Fire Flow
1 x 5,700 L/min	2 x 3,800 L/min	13,400 L/min

The combined maximum flow from these hydrants will exceed the Fire Flow requirements (7,000 L/min) for the proposed development. The existing municipal watermain network should therefore have adequate fire water supply for the proposed development.

3.0 SANITARY SERVICING

3.1 Existing Sanitary Sewer

There is a 250mm diameter PVC sanitary sewer within the Bill Leathem Drive ROW in front of the site.

3.2 Proposed Sanitary Services

The proposed development will be serviced by a 150mm diameter sanitary service connected to the existing 250mm sanitary sewer in Bill Leathem Drive. A monitoring manhole will be provided near the property line as per the City of Ottawa standards.

3.2.1 Peak Sanitary Flows

The theoretical peak sanitary flow for the proposed warehouse was calculated based on the following criteria from Section 8 of the Ontario Building Code and the 0.33 L/s/ha infiltration rate as per the City of Ottawa Sewer Design Guidelines.:

- Warehouse Sanitary Flow
  - per each water closet = 950L/day
  - per each loading bay = 150L/day (each)
- Office Sanitary Flow
  - per each 9.3m² floor space = 75L/day
- Industrial Peak Peaking Factor = 3.5
- Infiltration Rate = 0.28 L/s/ha

The peak sanitary flow calculations are summarized below in **Table 3.1**. Detailed calculations are included in **Appendix D**.

Table 3.1: Peak Sanitary Flow Summary

Proposed Development	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
Office + Warehouse	0.57	0.16	0.72

The proposed 150mm diameter sanitary service at minimum slope of 1.0% has a capacity of 15.9 L/s.

3.2.2 SMBP Sanitary Flow Allotment

The SMBP Phase II and III Services Design Report provides design criteria which was used to calculate the sanitary flow allotment for the proposed development. The sanitary flow allotment to each sanitary sewer outlet was calculated based on the following design criteria provided SMBP Services Report:

- Population Equivalent = 100 persons/ha
- Design Sanitary Flow = 450 L/person/day (Commercial/Institutional Flow Rate)
- Light Industrial Peaking Factor =2.8
- Infiltration Rate = 0.11 L/s/ha

The sanitary flow allotment for the proposed development is calculated to be 0.75 L/s.

A copy of the sanitary drainage area plan and sanitary sewer design sheet from the SMBP Phase I and II Servicing Design Report are provided in **Appendix D** for reference.

Based on the preceding analysis, there is adequate capacity within the existing sanitary infrastructure to service the proposed development.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Existing Conditions

There is a 1200mm diameter concrete storm sewer within the Bill Leathem Drive ROW in front of the site. The storms sewer outlets into the existing SWM facility south of the subject site.

Under existing conditions, storm runoff from a front portion of the site drains to the north towards Bill Leathem Drive ROW. The storm runoff from the majority of the site drains to the south towards the existing SWM facility.

4.2 Stormwater Management Criteria

4.2.1 Stormwater Quality Control

An *Enhanced* level of water quality control corresponding to 80% long-term removal of total suspended solids (TSS) is required.

Stormwater quality control for the site is provided by the existing SWM facility that has been designed to provide an *Enhanced* level of protection.

4.2.2 Stormwater Quantity Control

The SMBP is currently serviced by an existing SWM facility. The subject property was included in the service area of the existing SWM facility. Coordination with the City has resulted in revised criteria for the stormwater management design for the site development. Correspondence with the City is provided in **Appendix A**.

The stormwater management criteria for the subject property is as follows:

- Stormwater is to be controlled to a 5-year release rate using a runoff coefficient of 0.65 and a time of concentration of 15 minutes. Stormwater is to be controlled up to and including the 100-year storm event.

Based on the above criteria, the allowable release rate is calculated using Rational Method as follows:

$$Q_{allow} = 2.78\ CIA = 2.78 \times 0.65 \times 83.56 \times 0.477 = 72.0\ L/s$$

4.3 Proposed Conditions

The proposed development will be serviced by an on-site storm sewer system connected to the existing 1200mm dia. concrete storm sewer in Bill Leathem Drive. The on-site storm sewer system will include storm sewers ranging in size from 200mm to 600mm in diameter.

The proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report.

4.3.1 Area A-1 Uncontrolled Direct Runoff

Stormwater runoff from this sub-catchment area will sheet drain to Bill Leathem Drive. The post-development flow from area was calculated using the Rational Method to be 1.7 L/s during the 2-year design event, 2.3 L/s during the 2-year design event, and 4.7 L/s during the 100-year design event.

4.3.2 Area A-2 Uncontrolled Flow

Stormwater runoff from this sub-catchment area will drain to the proposed CB 1 and will flow uncontrolled to the Bill Leathem Drive storm sewer. The post-development flow from this area was calculated using the Rational Method to be 6.9 L/s during the 2-year design event, 9.4 L/s during the 5-year design event, and 18.1 L/s during the 100-year design event.

4.3.3 Area A-3 Controlled Site Flows

Stormwater runoff from this sub-catchment area will be captured by the proposed CBMH 4 and will be attenuated by an ICD installed in the catchbasin manhole outlet pipe. Adequate storage for all storms up-to and including the 100-year storm event will be provided in the catchbasin manhole and on the parking lot surface. There will be no surface ponding during the 2-year storm event.

Table 4.1 summarizes the post-development design flow from this sub-catchment area as well as the type of ICD, the anticipated water storage elevations in the system, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 4.1: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-2					
	ICD Type	Peak Flow	Water Storage Elevation	Average Flow (50% Qpeak)	Storage Volume Required	Max Storage Provided
2-Year	Tempest Vortex LMF ICD Model 75	6.5 L/s	0cm ponding (89.00 m)	3.3 L/s	3.4 m^3	21.4 m^3
5-Year		7.3 L/s	0cm ponding (89.29 m)	3.7 L/s	5.3 m^3	
100-Year		7.6 L/s	21cm ponding (89.51 m)	3.8 L/s	14.2 m^3	

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for ICD information.

4.3.4 Area A-4 Controlled Site Flows

Stormwater runoff from this sub-catchment area will be captured by the proposed CB 2, CB 3, and CBMH 5 , and will be attenuated by an ICD installed in the outlet pipe of STMMH 3. Adequate storage for all storms up-to and including the 100-year storm event will be provided underground in the oversized storm pipes, and on the parking lot surface. There will be no surface ponding during the 2-year storm event.

Table 4.2 summarizes the post-development design flow from this sub-catchment area as well as the type of ICD, the anticipated water storage elevations in the system, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 4.2: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-2					
	ICD Type	Peak Flow	Water Storage Elevation	Average Flow (50% Qpeak)	Storage Volume Required	Max Storage Provided
2-Year	Tempest Vortex LMF ICD Model 105	7.0 L/s	0cm ponding (87.36 m)	3.5 L/s	12.3 m³	33.9 m³
5-Year		8.3 L/s	0cm ponding (87.56 m)	4.2 L/s	17.6 m³	
100-Year		16.1 L/s	13cm ponding (89.48 m)	8.1 L/s	33.4 m³	

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for ICD information.

4.3.5 Area A-5 Controlled Site Flows

Stormwater runoff from this sub-catchment area, including the proposed building roof, will drain to the proposed swale and will be captured by the proposed CBMH 1, CBMH 2, and CBMH 3. The flow will be attenuated by an ICD installed in the outlet pipe of CBMH 3.

The building roof will have a continuous slope from front to back and it will shed water to the landscaped area at the back of the building towards the proposed drainage swale. A roof gutter with a downspout will be provided above the doors at the back that will direct drainage towards the proposed swale. Adequate storage for all storms up-to and including the 100-year storm event will be provided underground in the oversized storm pipes, and in the proposed grassed swale.

Table 4.3 summarizes the post-development design flow from this sub-catchment area as well as the type of ICD, the anticipated water storage elevations in the system, storage volumes required and storage volume provided for the 2-year, 5-year and the 100-year design events.

Table 4.3: Stormwater Flows, ICD & Surface Storage

Design Event	Controlled Site Flows from Area A-2					
	ICD Type	Peak Flow	Water Storage Elevation	Average Flow (50% Qpeak)	Storage Volume Required	Max Storage Provided
2-Year	Circular Plug Type 84mm dia. Orifice	14.1 L/s	0cm ponding 87.63 m	7.1 L/s	16.9 m³	58.5 m³
5-Year		21.3 L/s	0cm ponding 88.7 m3	10.7 L/s	21.4 m³	
100-Year		25.1 L/s	28cm ponding	12.6 L/s	52.8 m³	

Design Event	Controlled Site Flows from Area A-2					
	ICD Type	Peak Flow	Water Storage Elevation	Average Flow (50% Qpeak)	Storage Volume Required	Max Storage Provided
			89.48 m			

Refer to **Appendix E** for detailed SWM calculations and to **Appendix F** for ICD information.

4.3.6 Stormwater Flow Summary

Table 4.4 provides a summary of the total post-development flows from the site to be developed and compares them to the allowable release rate the site

Table 4.4: Stormwater Flows Summary

Design Event	Post-Development Conditions							
	Allow. Release Rate (L/s)	A-1 Flow (L/s)	A-2 Flow (L/s)	A-3 Flow (L/s)	A-4 Flow (L/s)	A-4 Flow (L/s)	A-5 Flow (L/s)	Total Flow (L/s)
2-Yr	72.0	1.7	6.9	6.5	7.0	7.0	14.1	36.3
5-Yr		2.3	9.4	7.3	8.3	8.3	21.3	48.6
100-Yr		4.7	18.1	7.6	16.1	16.1	25.1	71.6

As indicated in **Table 4.4** the total post-development flow from the site will be released from the proposed development at a combined maximum rate of 71.6 L/s during the 1:100 year design event, 48.6 L/s under the 1:5 year event, and 36.3 L/s during the 1:2 year design event; all of which are less than or equal to the allowable flow for the site.

5.0 GEOTECHNICAL INVESTIGATIONS

A geotechnical Investigation report has been prepared by EXP for the proposed development. Refer to the Geotechnical Investigation - Proposed Commercial Development, 100 Bill Leathem Drive, (May 29, 2024).

Clay seals will be provided in service trenches at selected spacing as per the geotechnical report recommendations.

6.0 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 (catch basin inserts) will be placed in existing and proposed catch basins and catch basin 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 mat will be installed at the site entrance,
- 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.
- Existing storm pond slope will not be disturbed in any way during construction
- No fill will be placed near the crest of slope

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair, or replacement requirements. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This report has been prepared in support of the Site Plan Control applications for the proposed development. The conclusions are as follows:

Watermain

- The proposed development will be serviced by connecting to the 200mm diameter watermain in Bill Leathem Drive.
- The water supply for fire protection will be provided from the existing municipal hydrants in Bill Leathem Drive.
- The existing municipal watermain will provide adequate water supply and system pressures to the proposed development.

Sanitary Servicing

- The proposed development will be serviced by connecting to the 250mm diameter watermain in Bill Leathem Drive.
- There is adequate capacity within the proposed sanitary service and existing sanitary infrastructure to service the proposed development.

Stormwater Management

The following provides a summary of the storm sewer and stormwater management system:

- The proposed storm sewer system for the site will outlet to an existing SWM facility providing an *Enhanced* (80% long-term TSS removal) level of water quality control.
- The proposed development will control the 100-year peak flows from the site to 5-year release rate using a runoff coefficient of 0.65 and a time of concentration of 15 minutes.
- There will be no surface ponding on the parking lot for the 2-year storm event.
- Parking lot is graded to ensure that ponding depths for storms greater than the 100-year event do not exceed 0.30m.
- Major overland flow routes are provided to Bill Leathem Drive and the existing SWM pond.

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

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Reviewed by:

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APPENDIX A

Correspondence

File No.: PC2024-0094

March 22, 2024

Jordan Jackson
Novatech Engineering Consultants
Via email: j.jackson@novatech-eng.com

Subject: **Pre-Application Consultation: Meeting Feedback**
Proposed Site Plan Control Application – 100 Bill Leathem Drive

Please find below the consolidated comments from the above-noted pre-application consultation meeting held on March 20, 2024.

Pre-Application Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☐	**5** ☒

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

Next Steps

Staff undertook a review of the proposal and materials submitted for the above-noted pre-application consultation. Please proceed to complete a Phase 3 Pre-application consultation Application Form and submit the necessary studies and/or plans to planningcirculations@ottawa.ca.

In your subsequent pre-application consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

If your development proposal changes significantly in scope, design, or density before the Phase 3 pre-application consultation, you may be required to complete or repeat the Phase 2 process.

Supporting Information and Material Requirements

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

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

Consultation with Technical Agencies

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

Planning Comments

1. The Offical Plan designates the property Mixed Industrial in the Suburban Transect. As per Section 5.4.4 Policy 1 of the Official Plan, explore landscaping opportunities to screen the surface parking lot from the public realm.

2. The property is north of the Clarke Bellinger Environmental Facility, which is identified as a significant natural heritage feature. The property is subject to the associated Natural Heritage Features Overlay as shown on Schedule C11. Section 5.6.4 Policy 4 requires an environmental impact study (EIS) in support of development in or adjacent to natural heritage features. Refer to the Environmental Planning comments below for more information.

3. The site falls within in the Airport Operating Influence Zone and the 25 Line (Composite of the 25 NEF/NEP). The City's Environmental Noise Control Guidelines only require a detailed noise study for *new noise sensitive land uses* in these areas. As the proposed development does not constitute a "noise sensitive land use", staff note that a noise study is not required.

4. The property is zoned Light Industrial, Subzone 9 (IL9) and is subject to Urban Exception 2382. The IL9 zone permits offices and light industrial uses and only permits warehouses *associated with a permitted use*.

5. Provide the gross floor area for the building and include a breakdown based on use (i.e., office, warehouse, and sales area). Please note that the Zoning By-law limits accessory display and sales areas to a maximum of 25% of the gross floor area.

6. Parking requirements will be determined based on the proportion of the building occupied by each use. Below are the applicable parking rates for office and warehouse uses:

Vehicle Parking	
Office	2.4 per 100 m^2 of gross floor area
Warehouse	0.8 per 100 m^2 for the first 5000 m^2 of gross floor area and 0.4 per 100 m^2 above 5000 m^2 of gross floor area

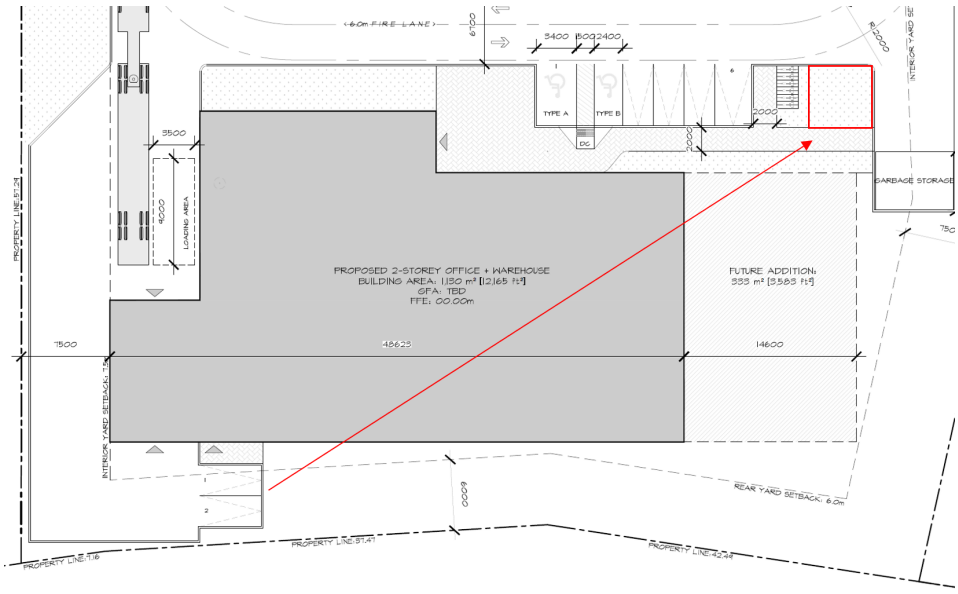
Bicycle Parking	
Office	1 per 250 m2 of gross floor area
Warehouse	1 per 2000 m2 of gross floor area

7. As per Section 106(3) of the Zoning By-law, ensure that the compact parking spaces are visibly identified as being for a compact car on the site plan.

8. Show the garbage storage structure(s) on the site plan and landscape plan to confirm compliance with Section 110(3) of the Zoning By-law.

9. Preliminary Site Plan Comments:

   a. Consider moving the 2 parking spaces in the rear of the building to the front and explore opportunities to create outdoor recreation/patio spaces for staff.



   b. Show the snow storage area(s) on the site plan. If any parking spaces are used for snow storage, be aware that those spaces cannot contribute towards the required parking count.

   c. Provide the gross floor area (GFA) as per the definition in the Zoning By-law.

   d. Ensure both required and provided setbacks are measured accurately – i.e., shortest distance between the lot line and any part of the building.

   e. Include dimentions for parking spaces, drive aisles, private approaches and walkways.

f. Add a bar scale, written ratio, and legend to the site plan showing all graphic symbols used on the plan

g. Ensure all measurements on the site plan are the same units

h. Include a statement on the site plan confirming where property boundary information was derived.

If you have any questions regarding the above comments, please contact Siobhan Kelly, Planner I, at Siobhan.kelly@ottawa.ca.

Urban Design Comments

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

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

12. The following additional drawings and studies are required as shown on the Study and Plans Identification List (SPIL). Please follow the terms of references to the prepare these drawings and studies.

    - Design Brief
    - Site Plan
    - Landscape Plan
    - Elevations

13. Find as many opportunities to plant trees on the property as possible.

14. There is a bus stop along Bill Leathem Drive near the east driveway, please include a pedestrian linkage that would allow any pedestrians a clear and safe walkway to the front entrance.

15. The pathway along the rear of the building connecting to adjacent parks and open space is accessible by the public. Please treat the rear of the building with an architectural treatment that has interest, plantings could also be utilized for a screening effect.

If you have any regarding the above comments, please contact Molly Smith, Planner II Urban Design, at molly.smith@ottawa.ca

Engineering Comments

16. The Stormwater Management Criteria, for the subject site, is to be based on the **South Merivale Business Park Stormwater Management Report** prepared by Novatech Engineering Consultants Ltd., dated November 1991.:

    a. The site's allowable release rate is based on a pre-development runoff coefficient of C=0.24 being controlled to the 5-year design storm with a 15 minute time of concentration. See the report listed above for more details.

    b. The 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.

    c. A calculated time of concentration for post-development flows (Cannot be less than 10 minutes).

    d. Flows to the storm sewer in excess of the 5-year storm release rate, up to and including the 100-year storm event, must be detained on site. No surface ponding is permitted for events up to and including the 5-year event.

    e. Ensure no overland flow for all storms up to and including the 5-year event. Any uncontrolled drainage or overflow should be directed to the Bill Leathem right-of-way.

    f. Quality control requirements are for "enhanced" target (80% TSS removal). Quality control is provided by the existing, downstream Clarke Bellinger SWM Facility (Previously known as the Longfields-Davidson SWM Facility). On-site pre-treatment is recommended.

    g. Best Management Practices (BMPs) are recommended for this site.

17. Deep Services (Storm, Sanitary & Water Supply)

a. **Storm**: 1200 mm dia. Conc. STM sewer in Bill Leathem Drive.

b. **Sanitary**: 250 mm dia. PVC SAN sewer in Bill Leathem Drive

c. **Water:** 305 mm dia. PVC watermain in Bill Leathem Drive

d. Connections to trunk sewers and easement sewers are typically not permitted.

e. Monitoring maintenance hole is required – should be located in an accessible location on private property near the property line (ie. Not in a parking area).

f. Watermain frontage fees do not apply for this application.

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

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

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

    iii. Std Dwg S11.2 (for rigid main sewers using bell end insert method) – for larger diameter laterals where manufactured inserts are not available; lateral must be less that 50% the diameter of the sewermain,

    iv. 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.

    v. No submerged outlet connections.

18. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

a. Location of service

b. Type of development and the amount of fire flow required (as per FUS).

c. Average daily demand: ___ l/s.

d. Maximum daily demand: ___l/s.

e. Maximum hourly daily demand: ___ l/s.

19. An MECP Environmental Compliance Approval **Industrial Sewage Works or Municipal** may be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office to arrange a pre-submission consultation:

    a. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca

20. **Slope stability:** This site is adjacent to unstable slopes, as identified in Schedule C of the Official Plan. Geotechnical/Natural Hazard setbacks will need to be established by a licensed geotechnical engineer.

21. If a designated fire route is required as per the OBC, reach out to fireroutes@ottawa.ca to inquire on the application process. Cc the project manager listed below.

If you have questions regarding the above comments, please contact Tyler Cassidy, P. Eng, Infrastructure Project Manager, at tyler.cassidy@ottawa.ca

Transportation Comments

22. Right-of-way protection.

    a. See Schedule C16 of the Official Plan.

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

23. TIA submission not required.

24. Show turning movements for Wb-20 accessing the loading dock

If you have questions regarding the above comments, please contact Mike Giampa, Transportation Project Manager, at mike.giampa@ottawa.ca.

Environmental Planning Comments

25. An Environmental Impact Statement (EIS) is required for this application. This report is triggered by the presence of the natural heritage features overlay on the site itself, and the presence of the water feature - and associated species-at-risk habitat - adjacent to the site.

26. The EIS should incorporate a species-at-risk (SAR) survey with a focus on the surface water feature and the possibility of Blanding's Turtles being present on or near the site. This is in addition to any other significant environmental features or SAR habitat that may be present.

27. Another issue that should be included in the EIS is the potential for the slope-stability setbacks to impact the developable area of the site. The required setback would be 15m from the top of stable slope. Note that this setback should also be shown in the site plan and the slope stability report.

28. The Bird Safe Design Guidelines (BSDG) apply to this development. Of particular importance is Guideline 2, dealing with glazing and other reflective or transparent features. The BSDG's can be found at this link.

29. This site is located in the Airport Bird Hazard Zone. This will limit the type of trees that can be planted on site. A list of trees species to avoid planting will be provided.

30. Additional tree plantings to help the City meet its urban forest canopy goals as well as reduce the effects of climate change and the urban heat island effect are always welcomed. Please note that the City prefers that tree plantings be of native and non-invasive species.

    If you have questions regarding the above comments, please contact Mark Elliott, Environmental Planner, at mark.elliott@ottawa.ca

Planning Forester Comments

31. The following Tree Conservation Report (TCR) requirements were adapted from the Schedule E of the Urban Tree Protection Guidelines:

    a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City. An approved TCR is a requirement of Site Plan approval.

    b. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

    c. The TCR must contain 2 separate plans:

        i. Plan/Map 1 - show existing conditions with tree cover information

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

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

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

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

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

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

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

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

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

   ii. Show the critical root zone of the retained trees

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

32. Landscape Plan (LP) tree planting requirements:

a. Please ensure all retained trees are shown on the LP

b. Minimum Setbacks

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

   ii. Maintain 2.5m from curb

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

c. 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.

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

e. Tree specifications

   i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

f. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.

g. No root barriers, dead-man anchor systems, or planters are permitted.

h. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

i. Hard surface planting

i. If there are hard surface plantings, a planting detail must be provided

ii. Curb style planter is highly recommended

iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

iv. Trees are to be planted at grade

j. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

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

It is strongly suggested that the proposed species list include a column listing the available soil volume

k. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

l. The City requests that consideration be given to planting native species where ever there is a high probability of survival to maturity.

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

If you have questions regarding the above comments, please contact Mark Richardson, Forester, at mark.richardson@ottawa.ca

Parks & Facilities Planning Comments

33. The amount of parkland dedication that is required is to be calculated as per the City of Ottawa Parkland Dedication By-law No. 2022-280

    Parkland requirement for commercial / industrial uses is calculated as 2% of the gross land area of the site being developed.

    Gross land area for industrial or commercial redevelopment is defined as the portion of property that is impacted by the proposed development, but not including any hazard lands or natural heritage features identified in the Official Plan, and approved Secondary Plan, or through an environmental impact study accepted by the City.

    Parks & Facilities Planning estimates the gross land area of the redevelopment to be 4,524 square meters.

    Therefore, the preliminary Parkland Dedication requirement is calculated to be 90 square meters, as shown below:

    4,524 m2 x 2% = 90 m2 parkland dedication required

    The actual parkland dedication requirement will be based on the exact gross land area. Please provide the City with a surveyor's area certificate/memo which specifies the gross land area of the property parcel(s) being developed.

    If the parkland dedication requirement has been satisfied for this parcel land previously, please submit documentation which provides confirmation of the amount for consideration for a reduction of the current requirement.

    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 land use changes, then the parkland dedication requirement be re-evaluated accordingly.

34. Parks & Facilities Planning will request Cash-in-Lieu of Parkland dedication as a condition of site plan control approval for the current proposal.

If you have questions regarding the above comments, please contact Jeannette Krabicka, Parks Planner II, at jeannette.krabicka@ottawa.ca

Rideau Valley Conservation Authority Comments

35. The lot in question is not regulated by the Conservation Authority and therefore, there are no permitting requirements from the Rideau Valley Conservation Authority.

36. Staff note that the slope adjacent to the on-line storm water management pond meets the criteria for slope analysis (i.e., greater than 2 m)

37. While the lot itself is setback from the top of slope, it may be appropriate to confirm the appropriate setbacks to be applied to the structure, through a slope analysis.

If you have questions regarding the above comments, please contact Eric Lalande, Senior Planner, eric.lalande@rcva.ca.

City Real Estate Office (CREO) Comments

38. Please be advised that this development proposal is adjacent to or in proximity to City land (non-right of way lands). Should this development require temporary or permanent interest in City land, CREO may require the developer to enter into an agreement to formalize such use at market value in accordance with CREO policy. This interest includes, but is not limited to, temporary or permanent access agreements across City lands, temporary staging areas, the installation of permanent infrastructure to the benefit of the development such as sewers, water, gas, pathways, Limiting Distance Agreements, the expansion of storm water management ponds to the benefit of the development. Note that several months may be required to formalize such agreements and conversations should be initiated early in the development process.

    For temporary interests, please contact Paul Kerluke, Program Manager, Leasing Unit, CREO: Paul.Kerluke@Ottawa.ca

    For permanent interests, please contact Dhaneshwar Neermul, Program Manager, Disposal Unit, CREO: Dhaneshwar.Neermul@Ottawa.ca

Other Comments

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

    At this time, the HPDS is not in effect and Council has referred the 2023 HPDS Update Report back to staff with direction to bring forward an updated report to Committee with recommendations for revised phasing timelines, resource

requirements and associated amendments to the Site Plan Control By-law by no later than Q1 2024.

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

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

Regards,

Siobhan Kelly
Planner I
Development Review, South
Planning, Real Estate and Economic Development Department

Attachments:

1. Study and Plan Identification List
2. Urban Design Brief Terms of Reference
3. Airport Bird Hazard Plant Species
4. List of Technical Agencies
5. Pre-application Consultation Supplementary Development Information
6. Accessible Design Standards (ADS) Site Plan Checklist

cc. Mélanie Gervais
Aaron Bell
Tyler Cassidy
Mike Giampa
Mark Elliott
Mark Richardson
Jeannette Krabicka

Miro Savic

From: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Sent: Monday, March 25, 2024 10:12 AM
To: Miro Savic
Cc: Lee Sheets
Subject: RE: 100 Bill Leathem Drive - SMBP SWM Quantity Control Criteria

Hi Miro,

I can confirm that this SWM criteria can be used for 100 Bill Leathem Drive. Thank you for bringing this to my attention. If you don't mind appending that email PDF to the Servicing/SWM report for reference, that would be greatly appreciated.

Regards,

Tyler Cassidy, P.Eng
Infrastructure Project Manager,
Planning, Real Estate and Economic Development Department / Direction générale de la planification, des biens immobiliers et du développement économique - South Branch
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 12977, Tyler.Cassidy@ottawa.ca

From: Miro Savic <m.savic@novatech-eng.com>
Sent: March 22, 2024 2:35 PM
To: Cassidy, Tyler <tyler.cassidy@ottawa.ca>
Cc: Lee Sheets <l.sheets@novatech-eng.com>
Subject: 100 Bill Leathem Drive - SMBP SWM Quantity Control Criteria

Hello Tyler,

On our previous project in SMBP, we received the attached opinion from Eric Tousignant with respect to the SWM quantity control criteria.
Can you please confirm if we can use it for the 100 Bill Leatham Drive project.

Regards,

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

'

From: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Sent: Thursday, October 8, 2020 9:32 AM
To: Lee Sheets <l.sheets@novatech-eng.com>
Subject: RE: South Merivale Business Park

Hi Lee,

I've confirmed with Eric Tousignant that the following SWM can be used for the South Merivale Business Park. His rational is below. I've also located the June 1992 and the link is below.

Regards,

Jeff Shillington, P.Eng.
Senior Project Manager, Development Review, South Branch
Planning, Infrastructure and Economic Development
City of Ottawa
tel: 580-2424 x 16960
email: jeff.shillington@ottawa.ca

From Eric T.:

The 1991 report was based on wrong assumptions, but to be fair, SWM was still in its infancy at the time and they did the best they could with the information at hand. I revised the analysis and came up with something more realistic. I therefore recommend that future development in this business park follow the conclusion below (I am pasting my original email below):

I looked at the 1991 Novatech report that you attached and I don't agree with the approach Novatech took to come up with the allowable release rate. I am explaining my thought process here, but you can simply jump to the conclusion if you want the recommended release rate.

First of all, the entire area is allowed a peak flow of 4.6 cms to the pond as per the pond's design report. It is also assumed that the vast majority of the flow will be contained in the areas and bled back into the minor system, therefore it can be assumed that no major system flow is spilling to the pond. Finally, is it assumed that the ultimate average runoff coefficient for the entire drainage area will be 0.75.

Novatech took the total allowable flow and divided it by the area to obtain an average release rate of 54.4 L/s/ha (assuming that all land is controlled equally and released constantly over the entire duration of the storm, which is way too conservative and unrealistic since is does not account for flow attenuation).

They then used the rational method equation and worked backwards from the peak flow to get the runoff coefficient that corresponds to the peak flow of 4.6 cms. This is where they made a mistake, They assume a 15 TC when this 84.4 ha drainage area will have a TC of somewhere between 70 and 75 minutes. Using a 70 minutes TC I get a 5 year intensity of approximately 29 mm/hr, **therefore the Average runoff coefficient is more like 0.67 to come up with a flow of 4.6 cms and not 0.24 as noted in the report**.

This means that C=0.67 of not far from the ultimate runoff coefficient of 0.75 for the entire area and means that the allowable release rate from the development sites does not have to be too restrictive.

Novatech then tried to come up with an allowable release rate for each sub-area by subtracting the ROW release rate. The problem is that they apply an ICD release rate as a constant when even ICD flow is attenuated by the time it reaches the outlet due to the fact that the storm does not keep a peak intensity throughout its duration.

Therefore this is how I would account for the ROW flow:

Based on the existing roadway areas, there are approximately 12 CB per ha each but they are releasing approximately 15 L/s due to the use of ICDs (in fact two CB are connected together releasing a total of 30 L/s using a type B ICD). This means that the peak 5 year capture in the ROW is 180 L/s per ha. To generate this flow with a 5 year event and a TC of 15 minutes, we need a C=0.78. Therefore we can assume that the ROW is being controlled to a C=0.78. There are 8.8 ha or ROW within the 84.4 ha sewershed, therefore the remaining developable lands need to be controlled to a C=0.65 so that the overall 84.4 ha is controlled to an equivalent C=0.67

The allowable release rate for each site should therefore be based on the 5 year storm, using a C=0.65 and a computed TC of 15 minutes to remain consistent with the original storm sewer design that used a TC of 15 minutes. .

Conclusion: Based on the above analysis, 4.6 cms is equivalent to a 5 year release rate for a 84.4 ha area having a C=0.67. If we remove the allowance for the ROW drainage (C=0.78), the allowable release rate for the remaining development lands should be based on a C=0.65.

I would therefore ask that they provide SWM to control the 100 year event to a release rate based on the 5 year event, with a C=0.65 and TC=15 minutes.

From: Lee Sheets <l.sheets@novatech-eng.com>
Sent: October 06, 2020 9:24 AM

To: Shillington, Jeffrey <jeff.shillington@ottawa.ca>
Subject: South Merivale Business Park

I'm trying to understand the SWM criteria for the remaining lands in the SMBP. I understand that quality control is handled in the Belanger SWM facility. The quantity control requirements are the reason for my e-mail.
Please feel free to give me a call on my cel if you have any questions.
Lee

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

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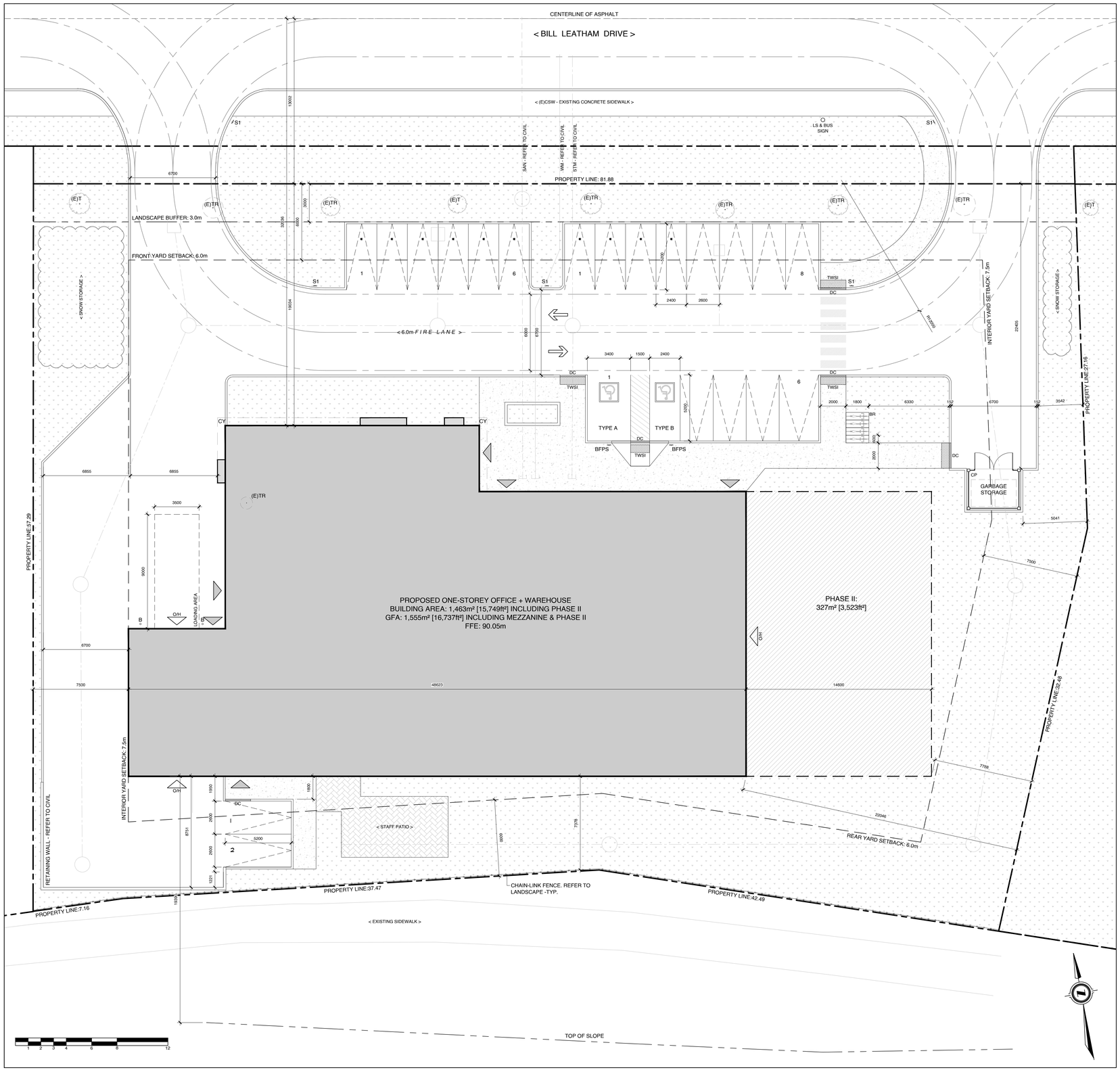
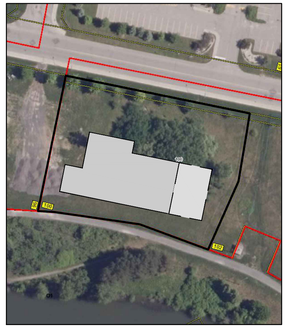
APPENDIX B

Site Plan



01 A1.0 SITE PLAN
SCALE: 1: 150



02 A1.0 KEY PLAN
SCALE: N.T.S.

PROPERTY LEGAL DESCRIPTION
PART 1 **PLAN 4R-35586** PART OF LOTS 17 & 18 CONCESSION 1 (RIDEAU FRONT) **GEOGRAPHIC TOWNSHIP OF NEPEAN** **CITY OF OTTAWA** Prepared by Stantec Geomatics Ltd. Dated July 27, 2023

BUILDING AREAS	SQ.M.	SQ.FT.
BUILDING FOOTPRINT	1,443m²	15,532ft²
GROSS FLOOR AREA:		
WAREHOUSE (PHASE I)	734m²	7,901ft²
WAREHOUSE (PHASE II)	327m²	3,523ft²
OFFICE	157m²	1,689ft²
SHOWROOM	221m² (15% OF GFA)	2,379ft²
MEZZANINE	92m²	991ft²
TOTAL	1,531m²	16,483ft²

PROJECT ZONING REVIEW/STATISTICS	
MUNICIPALITY:	CITY OF OTTAWA
MUNICIPAL ADDRESS:	100 BILL LEATHEM DRIVE
REGISTERED OWNER:	CONTINENTAL FLOORING INC.
LOT AREA:	4,530m²
ZONING ANALYSIS	
OTTAWA	
ZONE:	IL9
PROPOSED USE:	1 STOREY OFFICE + WAREHOUSE

ZONING MECHANISM (IL9)	REQUIRED	PROVIDED
MINIMUM LOT WIDTH	50m	82.2m
MINIMUM LOT AREA	3,000m²	4,530m²
MAXIMUM BUILDING HEIGHT	22m	8.1m
MINIMUM FRONT YARD SETBACK	6.0m	19.0m
MINIMUM REAR YARD SETBACK	6.0m	6.9m
MINIMUM INTERIOR YARD SETBACK	7.5m	7.5m
MAXIMUM LOT COVERAGE	60%	32%
MAXIMUM FLOOR SPACE INDEX	2	0.3
MINIMUM LANDSCAPE WIDTH ABUTTING STREET	3.0m	3.0m
PARKING & LOADING SPACE PROVISIONS		
MINIMUM REQUIRED VEHICLE PARKING SPACES	OFFICE: 2.4 PER 100m² GFA = 12 SPACES (469m²) WAREHOUSE: 0.8 PER 100m² FOR FIRST 5,000m² GFA = 9 SPACES (1,061m²)	22 SPACES
PROVIDED PARKING	REGULAR SPACES (NEW)	10 SPACES
	ACCESSIBLE SPACE (TYPE A)	1 SPACE
	ACCESSIBLE SPACE (TYPE B)	1 SPACE
	COMPACT SPACES *** (50% OF PARKING SPACES: BY-LAW 2021-218, PART 4 - SECTION 106)	10 SPACES
	TOTAL	22 SPACES
BICYCLE PARKING REQUIRED	OFFICE USE - 1 PER 250m² GFA = 2 SPACES WAREHOUSE USE - 1 PER 2,000m² GFA = 1 SPACE	4 SPACES
MINIMUM AISLE WIDTH	PARKING LOT: 6.0m	6.7m
MINIMUM PARKING SPACE DIMENSIONS	LENGTH: 5.2m WIDTH: 2.6m	LENGTH: 5.2m WIDTH: 2.6m
	UP TO 50% OF REQUIRED PARKING SPACES MAY BE 4.6m x 2.4m	50% (10 SPACES PERMITTED) = 10 SPACES PROVIDED
PROVIDED LOADING	1 SPACE PER 1000-1999m² OF OFFICE/WAREHOUSE	1
MINIMUM WIDTH OF DRIVEWAY ACCESSING LOADING SPACE	SINGLE TRAFFIC LANE - 3.5m	7.4m
MINIMUM WIDTH OF LOADING SPACE	3.5m	3.5m
MINIMUM LENGTH OF LOADING SPACE	9m	9m
MINIMUM VERTICAL CLEARANCE OF LOADING SPACE	4.2m	8.4m
MINIMUM LANDSCAPE WIDTH ABUTTING STREET	3.0m	3.0m
OUTDOOR REFUSE COLLECTION	MIN. SETBACK FROM A PUBLIC STREET: 9.0m	22.4m
	MIN. SETBACK FROM ANY LOT LINE: 3.0m	5.0m
	SCREENING MIN. HEIGHT: 2.0m	2.0m

SITE PLAN NOTES	
NOTE#	**NOTE**
(E)AS	EXISTING ASPHALT SURFACE - REFER TO SURVEY
(E)BU	EXISTING BUSHES - REFER TO SURVEY
(E)CSW	EXISTING CONCRETE CURB - REFER TO SURVEY
(E)GSW	EXISTING CONCRETE SIDEWALK - REFER TO SURVEY
(E)OHW	EXISTING OVERHEAD UTILITY WIRES - REFER TO SURVEY
(E)RW	EXISTING RETAINING WALL - REFER TO SURVEY
(E)T	EXISTING TREE - REFER TO SURVEY
(E)TR	EXISTING TREE TO BE REMOVED - REFER TO SURVEY
B	BOLLARD, 6MM X 125MM DIA. X 1050MM PAINTED GALVANIZED STEEL BOLLARD C/W WELDED CAP AND 8MM X 150MM BASE PLATE WITH 4 BOLT HOLES; SECURE TO PAVEMENT OR SIDEWALK AT LOCATIONS INDICATED WITH 16MM DIA. GALVANIZED CONCRETE OR ASPHALT ANCHORS DEPENDANT ON LOCATION.
BFPS	PROVIDE VERTICALLY-MOUNTED SIGN, MINIMUM 300MM WIDE X 600MM HIGH, MARKED WITH INTERNATIONAL SYMBOL OF ACCESSIBILITY. MOUNT NOT LESS THAN 1500MM ABOVE GRADE AND NOT MORE THAN 2000MM ABOVE GRADE. ENSURE TONAL CONTRAST BETWEEN BF PARKING SIGN AND BACKGROUND ENVIRONMENT. PROVIDE INFORMATION TEXT COMPLIANT WITH CITY OF OTTAWA BY LAW REQUIREMENTS. PROVIDE ADDITIONAL BILINGUAL SIGNAGE THAT IDENTIFIES TYPE "A" SPACES AS "VAN ACCESSIBLE/ FOURGONNETTE ACCESSIBLE".
BR	BIKE RACK - REFER TO LANDSCAPE
CC	CONCRETE CURB - REFER TO CIVIL
CP	CONCRETE PAD - REFER TO CIVIL
CSW	CONCRETE SIDEWALK - REFER TO CIVIL
CY	CANOPY C/W RECESSED POT LIGHTS - REFER TO ELECTRICAL
GM	GAS METER - REFER TO SITE SERVICING
PMT	PAD MOUNT TRANSFORMER - REFER TO CIVIL
PP	PAINTED PARKING LINES, TYP. - REFER TO CIVIL
RSL	ROOF STORM LINE - REFER TO CIVIL
RW	RETAINING WALL - REFER TO CIVIL
SL	SANITARY LINE - REFER TO CIVIL
STL	STORM LINE - REFER TO CIVIL
TWSI	TACTILE WALKING SURFACE INDICATOR (TWSI), FULL WIDTH OF CURB RAMP. RECESSED TO BE FLUSH WITH CONCRETE WALKING SURFACE. - REFER TO CIVIL
WTS	WATER SERVICE - REFER TO CIVIL
WTSL	WEEPING TILE STORM LINE - REFER TO CIVIL

SITE PLAN SYMBOLS	
O/H	NEW OVERHEAD DOOR
	NEW DOOR / ENTRANCE
	BICYCLE PARKING SPACE (1.8Mx0.6M)
	NO PARKING LINES
#	PARKING STALL COUNT PER ROW
S#	NEW SIGN, REFER TO SIGN LEGEND
S1	FIRE ROUTE SIGN
SL	STREET LIGHT
	DESIGNATED ACCESSIBLE PARKING SPACE AS PER AODA STANDARDS
V	VISITOR PARKING
	TWO WAY TRAFFIC
	DEPRESSED CURB (DC)
	TACTILE WALKING SURFACE INDICATORS (TWSI)
	PROPERTY LINE
	MINIMUM SETBACKS (ZONING)
	NEW CONSTRUCTION
	EXISTING BUILDINGS
	SOFT LANDSCAPING
	CONCRETE SIDEWALK
A	BUILDING MOUNTED LIGHTS REFER TO ELECTRICAL DWGs
*	INDICATION OF COMPACT PARKING SPACES

CLIENT NAME:

CONTINENTAL FLOORING

NOTES:

1) ALL WORK TO BE IN COMPLIANCE WITH LOCAL BUILDING CODES, REGULATIONS AND BY-LAWS.

2) ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH PLANS IN CONTRACT DOCUMENTS.

3) DO NOT SCALE DRAWINGS.

4) ALL SUB-CONTRACTORS TO TAKE THEIR OWN ON-SITE MEASUREMENTS AND BE RESPONSIBLE FOR THEIR ACCURACY.

5) NOTIFY SHAWN J. LAWRENCE ARCHITECT FOR ANY ERRORS AND/OR OMISSIONS PRIOR TO START OF WORK.

PLANNER/ CIVIL

NOVATECH ENGINEERING CONSULTING LTD.

240 MICHAELCOWPLAND DRIVE, SUITE 200.
OTTAWA, ONTARIO, K2M 1P6
(P) 613 254-9643
(F) 613 254-5867

SEAL

NORTH ARROW: N

No.	DATE	REVISION
16	2024.08.16	ISSUED FOR SPC REV
15	2024.07.09	ISSUED FOR SPC
14	2024.05.31	PHASE III - PRE-CONSULTATION
13	2024.05.21	ISSUED FOR COORDINATION
12	2024.04.26	ISSUED FOR REVIEW
11	2024.04.16	ISSUED FOR REVIEW
10	2024.04.09	ISSUED FOR COORDINATION
09	2024.03.21	ISSUED FOR COORDINATION
08	2024.03.08	ISSUED FOR REVIEW
07	2024.03.04	ISSUED FOR REVIEW
06	2024.02.29	ISSUED FOR REVIEW
05	2024.02.27	ISSUED FOR REVIEW
04	2024.02.16	ISSUED FOR REVIEW
03	2024.02.08	ISSUED FOR REVIEW
02	2024.02.02	ISSUED FOR REVIEW
01	2024.01.30	ISSUED FOR REVIEW

S.J.LAWRENCE ARCHITECT INCORPORATED

18 DEAKIN STREET
SUITE 205
OTTAWA, ONTARIO
K2E 8B7

T: (613) 739.7770
F: (613) 739.7703
sjl@sjlarchitect.com

PROJECT:

CONTINENTAL FLOORING
OFFICE + WAREHOUSE

100 BILL LEATHEM, OTTAWA, ON

SHEET TITLE:

SITE PLAN

DRAWN BY: B.L.	CHECKED BY: S.L.
PLOT DATE: 2024.08.16	PROJECT DATE: 2024.01.16
JOB NUMBER: SL-1117-24	SCALE: 1:150

SHEET NUMBER:

A1.0

PLAN #

APPLICATION #

APPENDIX C

Water Demands, FUS Calculations, Boundary Conditions

100 BILL LEATHEM DRIVE
WATER DEMAND

Dayly Demands Per OBC Table 8.2.1.3. B

Warehouse:		
Daily Volume per Water Closet, and	950	L/day
Daily Voleme per Loading Bay	150	L/day
Office:		
Daily Volume per each 9.3m of Office Floor Space	75	L/day

Warehouse & Office

Number of Water Closets	3	
Number of Loading Bays	1	
Office Floor Area	469	m^2
Total Dayly Demand	6,782	L/day

Average Day Demand	**0.08**	**L/s**
Maximum Day Demand (1.5 x avg. day)	**0.12**	**L/s**
Peak Hour Demand (1.8 x max. day)	**0.21**	**L/s**

FUS - Fire Flow Calculations

As per 2020 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124011
Project Name: 100 Bill Leathem Drive
Date: April 10, 2024
Input By: M. Savic
Reviewed By:

Legend: Input by User; No Information or Input Required

Building Description: Office & Warehouse
Type II - Non-combustible construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Area (m^2)	1554			
		Number of Floors/Storeys	2			
		Protected Openings (1 hr)				
		Area of structure considered (m^2)			**1,554**	
	F	**Base fire flow without reductions**				**7,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	0%	**7,000**
		Limited combustible		-15%		
		Combustible	Yes	0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)		-30%		**0**
		Standard Water Supply		-10%		
		Fully Supervised System		-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	>30m		0%	**0**
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**0%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**7,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**117**
				or	USGPM	1,849

Boundary Conditions
100 Bill Leathem Drive

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	5	0.08
Maximum Daily Demand	7	0.12
Peak Hour	13	0.21
Fire Flow Demand #1	7,000	116.67

Location

Results

Existing Condition (Pre- SUC Pressure Zone Reconfiguration)

Connection 1 - Bill Leathem Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.8	61.5
Peak Hour	125.0	50.4
Max Day plus Fire Flow #1	126.0	51.8
[1] Ground Elevation =	89.6	m

Future Condition (Post- SUC Pressure Zone Reconfiguration)

Connection 1 - Bill Leathem Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	146.9	81.5
Peak Hour	144.1	77.5
Max Day plus Fire Flow #1	142.3	74.9
[1] Ground Elevation =	89.6	m

Notes

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

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.

APPENDIX D

Sanitary Flow Calculation

100 BILL LEATHEM DRIVE
SANITARY FLOWS

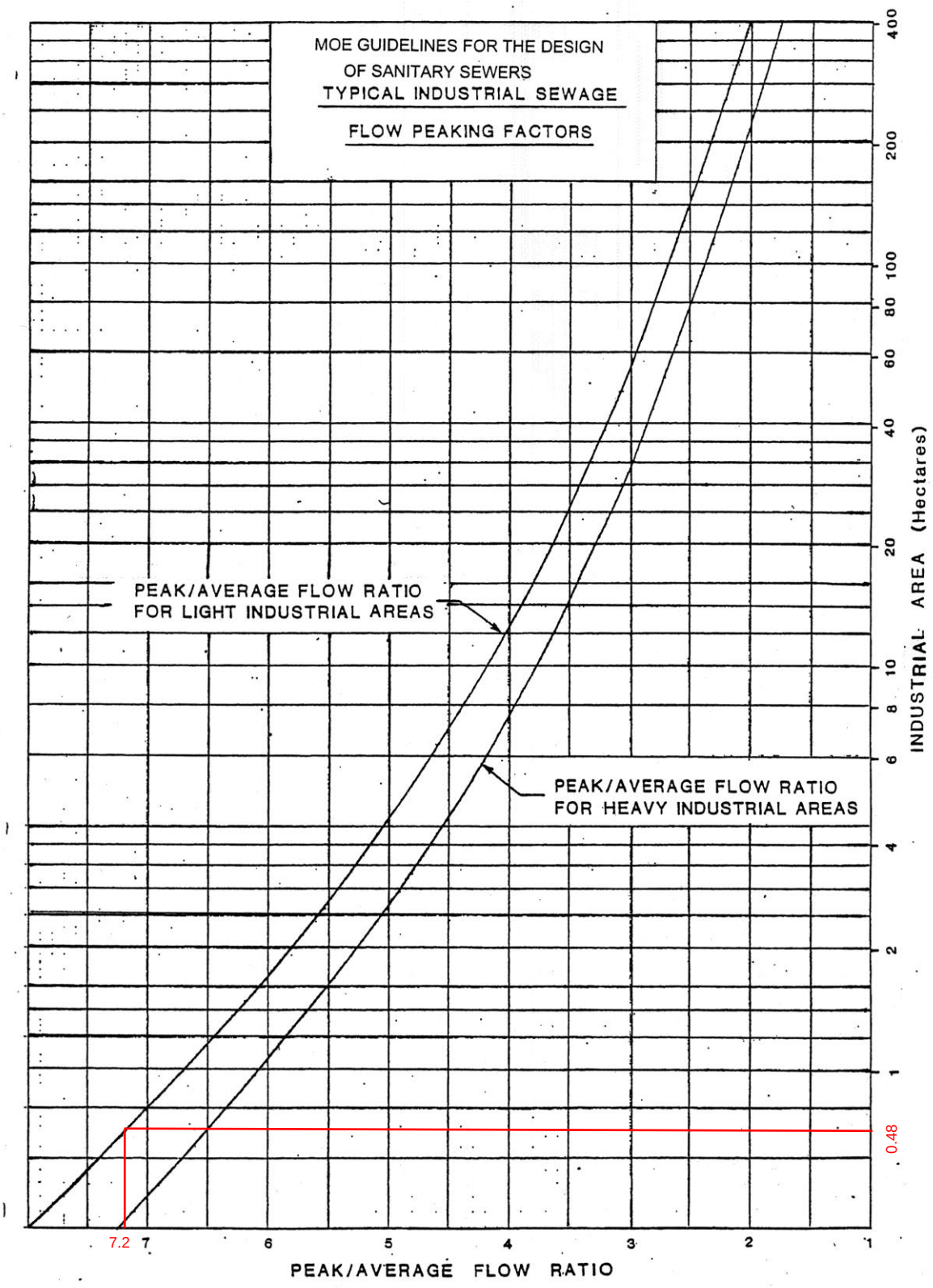
Daily Demands Per OBC Table 8.2.1.3. B

Warehouse:		
Daily Volume per Water Closet, and	950	L/day
Daily Volume per Loading Bay	150	L/day
Office:		
Daily Volume per each 9.3m of Office Floor Space	75	L/day

Warehouse & Office

Number of Water Closets	3	
Number of Loading Bays	1	
Office Floor Area	469	
Total Daily Volume	6,782	L/day
Peaking Factor	7.2	
Peak Sanitary Flow	**0.57**	**L/s**
Site Area	0.48	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flows	**0.16**	**L/s**
Total Peak Sanitary flow	**0.72**	**L/s**

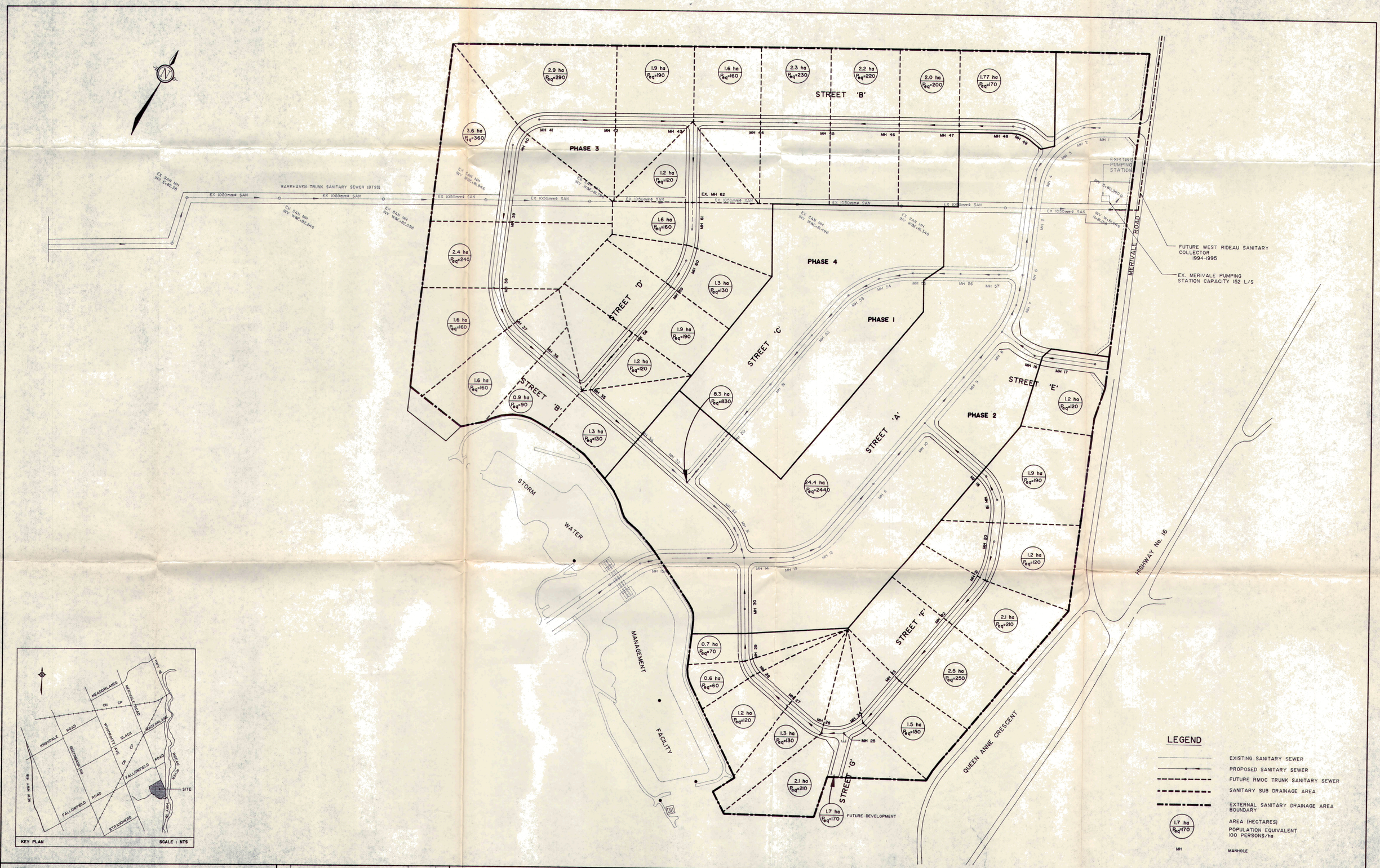
APPENDIX 4-B PEAKING FACTOR FOR INDUSTRIAL AREAS



100 BILL LEATHEM DRIVE
SANITARY FLOW ALLOTMENT

SMBP Phase II and III Servicing Design Report Criteria

Population Equivalent	100	persons/ha
Design Sanitary Flow	450	L/person/day
Light Industrial Peaking Factor	2.8	
Infiltration Rate	0.11	L/s/ha
Site Area	0.48	ha
Total Populatpn	48	
Total Dayly Volume	21,600	L/day
Peak Sanitary Flow	0.70	L/s
Peak Extraneous Flows	0.05	L/s
Total Peak Sanitary Flow	**0.75**	**L/s**



LEGEND

- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- FUTURE RMOC TRUNK SANITARY SEWER
- SANITARY SUB DRAINAGE AREA
- EXTERNAL SANITARY DRAINAGE AREA BOUNDARY
- 1.7 ha P=170 — AREA (HECTARES) / POPULATION EQUIVALENT 100 PERSONS/ha
- MH — MANHOLE

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

No.	REVISION	DATE	BY
1	REVISED PER R.M.O.C. COMMENTS	01.06.92	JFB

LICENSED PROFESSIONAL ENGINEER — UDO BOEHME — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — R.S. CEBRYK — PROVINCE OF ONTARIO

NOVATECH
ENGINEERING CONSULTANTS LTD
OTTAWA, ONTARIO

DESIGN	UB/JFB
CHECKED	UB
DRAWN	JFB
CHECKED	UB
APPROVED	RSC
SCALE	1 : 2500
	HORIZONTAL
	VERTICAL

CITY OF NEPEAN

NEPEAN

SOUTH MERIVALE BUSINESS PARK - PHASE 2 & 3

SANITARY DRAINAGE AREA PLAN

CONTRACT No.	92019
DATE	JULY 1992
DRAWING No.	92019-SAN

SANITARY SEWER DESIGN SHEET

PROJECT: SOUTH MERIVALE BUSINESS PARK Phases II and III
PAGE: 1 of 5

DESIGNED BY : LJ
DEVELOPER: CITY OF NEPEAN
DATE: June 22, 1992

CHECKED BY :
ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.
Revision:

LOCATION			INDIVIDUAL		CUMMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'F'	19	10	190	1.9	190	1.9	2.80	2.77	0.21	2.98	154.0	250	PVC	0.30	33.98	0.67
'F'	20	21	120	1.2	120	1.2	2.80	1.75	0.13	1.88	58.0	250	PVC	0.30	33.98	0.67
'F'	21	22	210	2.1	330	3.3	2.80	4.81	0.36	5.18	80.0	250	PVC	0.30	33.98	0.67
'F'	22	23	250	2.5	580	5.8	2.80	8.46	0.64	9.10	111.0	250	PVC	0.30	33.98	0.67
'F'	23	24	150	1.5	730	7.3	2.80	10.65	0.80	11.45	80.0	250	PVC	0.30	33.98	0.67
Flow From Future Development Into Manhole																
			170	1.7												
'F'	24	26	210	2.1	1110	11.1	2.80	16.19	1.22	17.41	64.0	250	PVC	0.30	33.98	0.67

q = average daily per cap. flow (450 L/cap. d)
I = unit of peak extraneous flow (0.11 L/ha/s)
M = peaking factor =2.8

Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)
Q (i) = I*A (L/s), A in hectares
Q (d) = Q (p) + Q (i) (L/s)

n = 0.013

SANITARY SEWER DESIGN SHEET

PROJECT: SOUTH MERIVALE BUSINESS PARK Phases II and III
DEVELOPER: CITY OF NEPEAN
ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DESIGNED BY : LJ
CHECKED BY :

DATE: SEPTEMBER 6, 1990
Revision:

LOCATION			INDIVIDUAL		CUMMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'F'	26	27	130	1.3	1240.0	12.4	2.80	18.08	1.36	19.45	64.0	250	PVC	0.30	33.98	0.67
'F'	27	28	120	1.2	1360	13.6	2.80	19.83	1.50	21.33	66.0	250	PVC	0.30	33.98	0.67
'F'	28	29	60	0.6	1420	14.2	2.80	20.71	1.56	22.27	24.0	250	PVC	0.30	33.98	0.67
'F'	29	14	70	0.7	1490	14.9	2.80	21.73	1.64	23.37	150.0	250	PVC	0.30	33.98	0.67
'D'	62	59	130	1.3	130	1.3	2.80	1.90	0.14	2.04	44.0	250	PVC	0.30	33.98	0.67
'D'	59	58	190	1.9	320	3.2	2.80	4.67	0.35	5.02	87.0	250	PVC	0.30	33.98	0.67
'D'	58	35	120	1.2	440	4.4	2.80	6.42	0.48	6.90	110.0	250	PVC	0.31	33.98	0.67

q = average daily per cap. flow (450 L/cap. d)
I = unit of peak extraneous flow (0.11 l/ha/s)
M = peaking factor = 2.8

Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)
Q (i) = I*A (L/s), A in hectares
Q (d) = Q (p) + Q (i) (L/s)

n = 0.013

PROJECT: SOUTH MERIVALE BUSINESS PARK Phases II and III

DESIGNED BY : SG

DEVELOPER: CITY OF NEPEAN

CHECKED BY : LJ

ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DATE: June 22, 1992

Revision:

LOCATION			INDIVIDUAL		CUMMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'B'	40	39	360	3.6	360	3.6	2.80	5.25	0.40	5.65	113.0	250	PVC	0.30	33.98	0.67
'B'	39	38	240	2.4	600	6.0	2.80	8.75	0.66	9.41	95.0	250	PVC	0.30	33.98	0.67
'B'	38	37	160	1.6	760	7.6	2.80	11.08	0.84	11.92	61.0	250	PVC	0.30	33.98	0.67
'B'	37	36	160	1.6	920	9.2	2.80	13.42	1.01	14.43	60.8	250	PVC	0.30	33.98	0.67
'B'	36	35	90	0.9	1010	10.1	2.80	14.73	1.11	15.84	75.0	250	PVC	0.30	33.98	0.67
'B'	35	34	130	1.3	1580	15.8	2.80	23.04	1.74	24.78	106.0	250	PVC	0.30	33.98	0.67
'B'	41	42	290	2.9	290	2.9	2.80	4.23	0.32	4.55	110.0	250	PVC	0.30	33.98	0.67
'B'	42	43	190	1.9	480	4.8	2.80	7.00	0.53	7.53	113.0	250	PVC	0.30	33.98	0.67

q = average daily per cap. flow (450 L/cap. d)

I = unit of peak extraneous flow (0.11 l/ha/s)

Q (p) = peak population flow (L/s)

Q (i) = peak extraneous flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)

Q (i) = I*A (L/s), A in hectares

n = 0.013

SANITARY SEWER DESIGN SHEET

PROJECT: SOUTH MERIVALE BUSINESS PARK Phases II and III
DEVELOPER: CITY OF NEPEAN
ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DESIGNED BY : LJ
CHECKED BY :

DATE: SEPTEMBER 6, 1990
Revision:

LOCATION			INDIVIDUAL		CUMMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'B'	49	47	170	1.7	170	1.7	2.80	2.48	0.19	2.67	105.0	250	PVC	0.30	33.98	0.67
'B'	47	46	200	2.0	370	3.7	2.80	5.40	0.41	5.80	86.0	250	PVC	0.30	33.98	0.67
'B'	46	45	220	2.2	590	5.9	2.80	8.60	0.65	9.25	99.0	250	PVC	0.30	33.98	0.67
'B'	45	44	230	2.3	820	8.2	2.80	11.96	0.90	12.86	101.0	250	PVC	0.30	33.98	0.67
'B'	44	43	160	1.6	980	9.8	2.80	14.29	1.08	15.37	97.0	250	PVC	0.30	33.98	0.67
'D'	43	62	120	1.2	1580	15.8	2.80	23.04	1.74	24.78	118.0	250	PVC	0.30	33.98	0.67
'D'	61	62	160	1.6	160	1.6	2.80	2.33	0.18	2.51	38.0	250	PVC	0.30	33.98	0.67

q = average daily per cap. flow (450 L/cap. d)
I = unit of peak extraneous flow (0.11 l/ha/s)
M = peaking factor = 2.8

Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)
Q (i) = I*A (L/s), A in hectares
Q (d) = Q (p) + Q (i) (L/s)

n = 0.013

SANITARY SEWER DESIGN SHEET

PROJECT: SOUTH MERIVALE BUSINESS PARK Phases II and III

PAGE: 5 of 5

DESIGNED BY : LJ

DEVELOPER: CITY OF NEPEAN

DATE: June 22, 1992

CHECKED BY :

ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

Revision:

LOCATION			INDIVIDUAL		CUMMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'E'	17	8	120	1.2	120	1.2	2.80	1.75	0.13	1.88	111.3	250	PVC	0.30	33.98	0.67

q = average daily per cap. flow (450 L/cap. d)

I = unit of peak extraneous flow (0.11 l/ha/s)

M = peaking factor = 2.8

Q (p) = peak population flow (L/s)

Q (i) = peak extraneous flow (L/s)

Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)

Q (i) = I*A (L/s), A in hectares

Q (d) = Q (p) + Q (i) (L/s)

n = 0.013

SANITARY SEWER DESIGN SHEET

DESIGNED BY : SG
CHECKED BY : LJ

PROJECT: SOUTH MERIVALE BUSINESS PARK - PHASE 1
DEVELOPER: CITY OF NEPEAN
ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DATE: NOV. 5, 1991
Revision: Dec. 31/91

LOCATION			INDIVIDUAL		CUMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (I) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
'A'	EXT.	15A	Constant Flow from Longfield-Davidson Heights = 249.45 L/s*							249.45		750	CONC	0.15	449.81	0.99
	15A	15								249.45	18.0	750	CONC	0.15	449.81	0.99
	15	14	200	2.0	200	2.0	2.80	2.92	0.22	252.59	105.0	750	CONC	0.15	449.81	0.99
Flow from Street 'B' into MH 34:			1580	15.8												
'B'	34	33	170	1.7	1750	17.5	2.80	25.52	1.93	27.45	94.0	375	CONC	0.18	77.60	0.68
Flow from Street 'C' into MH 33:			830	8.3												
'B'	33	32	110	1.1	2690	26.9	2.80	39.23	2.96	42.19	79.0	375	CONC	0.18	77.60	0.68
	32	31			2690	26.9	2.80	39.23	2.96	42.19	27.5	375	CONC	0.18	77.60	0.68
	31	14			2690	26.9	2.80	39.23	2.96	42.19	34.0	375	CONC	0.18	77.60	0.68

* Constant flow from external area = 249.45 L/s per Delcan Design Sheet dated 91.10.21

q = average daily per cap. flow (450 L/cap. d)

I = unit of peak extraneous flow (0.11 l/ha/s)

M = peaking factor = 2.8 for Light Industrial land use

Q (p) = peak population flow (L/s)

Q (I) = peak extraneous flow (L/s)

Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)

Q (I) = I*A (L/s), A in hectares

Q (d) = Q (p) + Q (I) (L/s)

n = 0.013

SANITARY SEWER DESIGN SHEET

DESIGNED BY : SG
CHECKED BY : LJ

PROJECT: SOUTH MERIVALE BUSINESS PARK - PHASE 1
DEVELOPER: CITY OF NEPEAN
ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DATE: NOV. 4, 1991
Revision: Dec. 31/91

LOCATION			INDIVIDUAL		CUMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
Flow from Street 'F' into MH 14:			1540	15.4												
'A'	14	13	120	1.2	4550	45.5	2.80	66.35	5.01	320.81	72.0	750	CONC	0.14	434.56	0.95
	13	12	120	1.2	4670	46.7	2.80	68.10	5.14	322.69	40.5	750	CONC	0.14	434.56	0.95
	12	11	220	2.2	4890	48.9	2.80	71.31	5.38	326.14	119.0	750	CONC	0.15	449.81	0.99
	11	10	260	2.6	5150	51.5	2.80	75.10	5.67	330.22	115.0	750	CONC	0.15	449.81	0.99
Flow from Street 'F' into MH 10:			190	1.9												
'A'	10	9	180	1.8	5520	55.2	2.80	80.50	6.07	336.02	86.5	750	CONC	0.15	449.81	0.99
	9	8	140	1.4	5660	56.6	2.80	82.54	6.23	338.22	86.0	750	CONC.	0.15	449.81	0.99

q = average daily per cap. flow (450 L/cap. d)
I = unit of peak extraneous flow (0.11 l/ha/s)
M = peaking factor = 2.8 for Light Industrial land use

Q (p) = peak population flow (L/s)
Q (i) = peak extraneous flow (L/s)
Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)
Q (i) = I*A (L/s), A in hectares
Q (d) = Q (p) + Q (i) (L/s)

n = 0.013

SANITARY SEWER DESIGN SHEET

DESIGNED BY : SG

CHECKED BY : LJ

PROJECT: SOUTH MERIVALE BUSINESS PARK - PHASE 1

DEVELOPER: CITY OF NEPEAN

ENGINEERS: NOVATECH ENGINEERING CONSULTANTS LTD.

DATE: NOV.4, 1991

Revision: Dec. 31/91

LOCATION			INDIVIDUAL		CUMULATIVE		PEAKING	POP FLOW	PEAK EXTRAN.	PEAK DESIGN	PROPOSED SEWER					
STREET	FROM M.H.	TO M.H.	POP	AREA (ha)	POP	AREA (ha)	FACTOR M	Q (p) (L/s)	FLOW Q (i) (L/s)	FLOW Q (d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)
Flow from Street 'E' into MH 8:			-120	1.2												
'A'	8	7	250	2.5	6030	60.3	2.80	87.94	6.63	344.02	44.0	750	CONC	0.16	464.57	1.02
	7	6			6030	60.3	2.80	87.94	6.63	344.02	44.0	750	CONC	0.16	464.57	1.02
	6	5	250	2.5	6280	62.8	2.80	91.58	6.91	347.94	96.0	750	CONC	0.16	464.57	1.02
'A'	1	2	230	2.3	230	2.3	2.80	3.35	0.25	3.61	23.5	250	PVC	0.30	33.98	0.67
	2	3			230	2.3	2.80	3.35	0.25	3.61	49.0	250	PVC	0.30	33.98	0.67
	3	4	190	1.9	420	4.2	2.80	6.13	0.46	6.59	43.0	250	PVC	0.30	33.98	0.67
	4	5			420	4.2	2.80	6.13	0.46	6.59	56.0	250	PVC	0.30	33.98	0.67
'A'	* Service Connections:															
		S9			290	2.9	2.80	4.23	0.32	4.55		250	PVC	1.00	62.04	1.22

q = average daily per cap. flow (450 L/cap. d)

I = unit of peak extraneous flow (0.11 l/ha/s)

M = peaking factor = 2.8 for Light Industrial land use

Q (p) = peak population flow (L/s)

Q (i) = peak extraneous flow (L/s)

Q (d) = peak design flow (L/s)

Q (p) = (P*q*M)/(86,400) (L/s)

Q (i) = I*A (L/s), A in hectares

Q (d) = Q (p) + Q (i) (L/s)

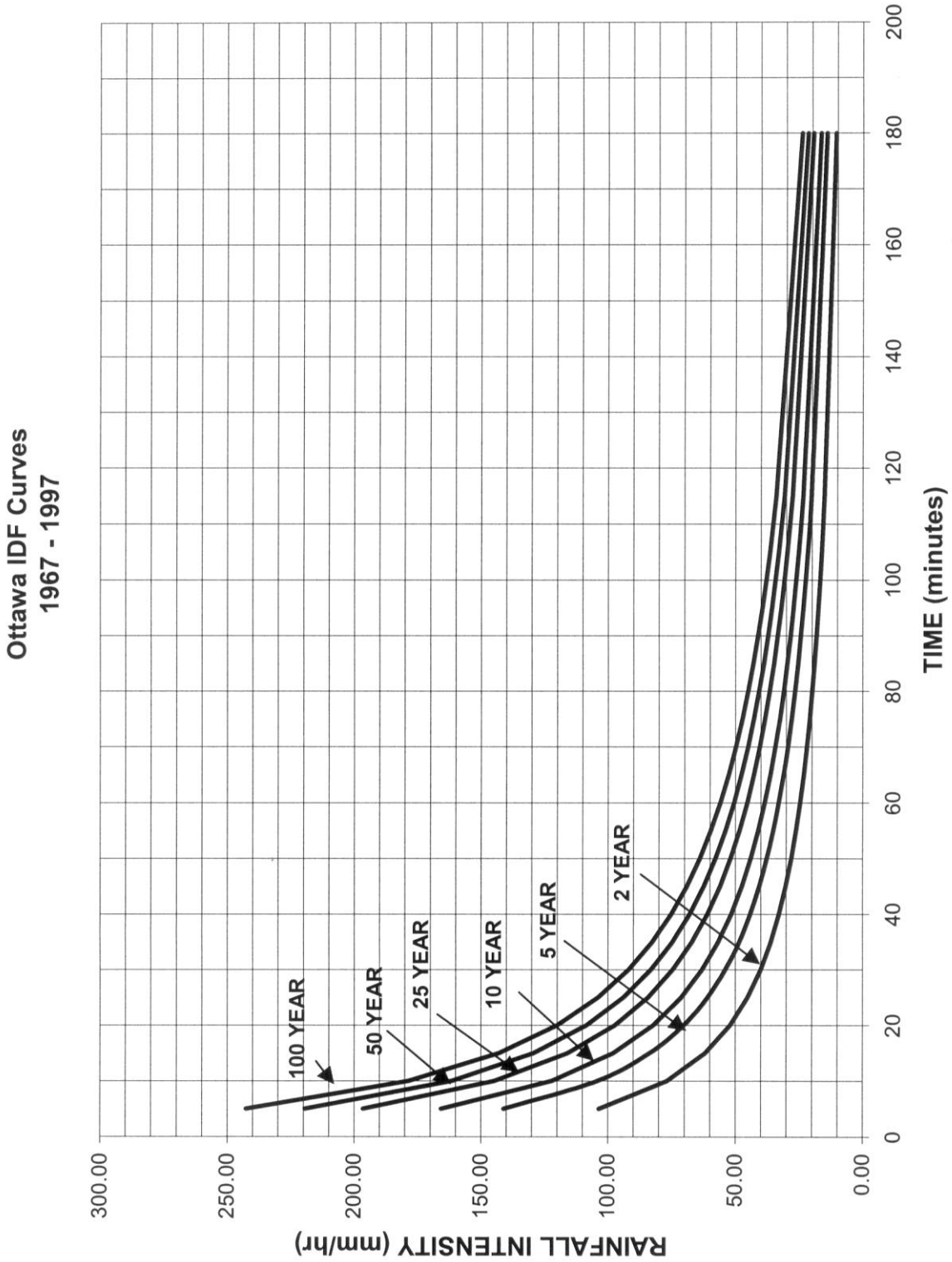
n = 0.013

* Note: 10 service connections - worst case @ manhole S9

APPENDIX E

IDF Curves and SWM Calculations

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



Proposed Residential Development
100 Bill Leathem Drive

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)
Existing Site	0.477	0.000	0.000	0.477	0.20	0.25	20.4	27.6	59.2	0.65	**72.0**

T_c = 15mins

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-1	Direct Runoff	0.026	0.004	0.022	0.31	0.37	1.7	2.3	4.7	-	-	-	-	-	-	-
A-2	Uncontrolled Flow	0.050	0.032	0.018	0.65	0.73	6.9	9.4	18.1	-	-	-	-	-	-	-
A-3	Controlled Site Flows	0.051	0.044	0.007	0.80	0.90	-	-	-	6.5	7.3	7.6	3.4	5.3	14.2	21.4
A-4	Controlled Site Flows	0.132	0.095	0.037	0.70	0.79	-	-	-	7.0	8.3	16.1	12.3	17.6	33.4	33.9
A-5	Controlled Site Flows	0.218	0.146	0.072	0.67	0.75	-	-	-	14.1	21.3	25.1	16.9	21.4	52.8	58.5
	Totals :	0.477	-	-	-	-	**8.7**	**11.7**	**22.8**	**27.6**	**36.9**	**48.8**	**32.6**	**44.3**	**100.4**	**113.8**
							Total Stormwater Flows :			**36.3**	**48.6**	**71.6**				

T_c = 10mins

Proposed Office & Warehouse
Novatech Project No. 124011
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 Direct Runoff

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	2.3	L/s
C =	0.31		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	3.14	0.82	0.25
10	104.19	2.32	0.00	0.00
15	83.56	1.86	-0.46	-0.41
20	70.25	1.56	-0.75	-0.91
25	60.90	1.35	-0.96	-1.44
30	53.93	1.20	-1.12	-2.01
35	48.52	1.08	-1.24	-2.60
40	44.18	0.98	-1.33	-3.20
45	40.63	0.90	-1.41	-3.82
50	37.65	0.84	-1.48	-4.44
55	35.12	0.78	-1.54	-5.07
60	32.94	0.73	-1.58	-5.70
65	31.04	0.69	-1.63	-6.34
70	29.37	0.65	-1.66	-6.99
75	27.89	0.62	-1.70	-7.64
80	26.56	0.59	-1.73	-8.29
85	25.37	0.56	-1.75	-8.94
90	24.29	0.54	-1.78	-9.60

Proposed Office & Warehouse
Novatech Project No. 124011
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 Direct Runoff

OTTAWA IDF CURVE

Area =	0.026	ha	Qallow =	4.7	L/s
C =	0.37		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	6.41	1.69	0.51
10	178.56	4.72	0.00	0.00
15	142.89	3.77	-0.94	-0.85
20	119.95	3.17	-1.55	-1.86
25	103.85	2.74	-1.97	-2.96
30	91.87	2.43	-2.29	-4.12
35	82.58	2.18	-2.53	-5.32
40	75.15	1.98	-2.73	-6.55
45	69.05	1.82	-2.89	-7.81
50	63.95	1.69	-3.03	-9.08
55	59.62	1.57	-3.14	-10.37
60	55.89	1.48	-3.24	-11.66
65	52.65	1.39	-3.33	-12.97
70	49.79	1.31	-3.40	-14.28
75	47.26	1.25	-3.47	-15.60
80	44.99	1.19	-3.53	-16.93
85	42.95	1.13	-3.58	-18.26
90	41.11	1.09	-3.63	-19.60

Proposed Office & Warehouse
Novatech Project No. 124011
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2 Uncontrolled Flow

OTTAWA IDF CURVE

Area =	0.050	ha	Qallow =	9.4	L/s
C =	0.65		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	141.18	12.72	3.33	1.00
10	104.19	9.38	0.00	0.00
15	83.56	7.53	-1.86	-1.67
20	70.25	6.33	-3.06	-3.67
25	60.90	5.49	-3.90	-5.85
30	53.93	4.86	-4.53	-8.15
35	48.52	4.37	-5.01	-10.53
40	44.18	3.98	-5.40	-12.97
45	40.63	3.66	-5.73	-15.46
50	37.65	3.39	-5.99	-17.98
55	35.12	3.16	-6.22	-20.53
60	32.94	2.97	-6.42	-23.10
65	31.04	2.80	-6.59	-25.69
70	29.37	2.65	-6.74	-28.30
75	27.89	2.51	-6.87	-30.93
80	26.56	2.39	-6.99	-33.56
85	25.37	2.28	-7.10	-36.21
90	24.29	2.19	-7.20	-38.86

Proposed Office & Warehouse
Novatech Project No. 124011
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2 Uncontrolled Flow

OTTAWA IDF CURVE

Area =	0.050	ha	Qallow =	18.1	L/s
C =	0.73		Vol(max) =	0.0	m^3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m^3)
5	242.70	24.63	6.50	1.95
10	178.56	18.12	0.00	0.00
15	142.89	14.50	-3.62	-3.26
20	119.95	12.17	-5.95	-7.14
25	103.85	10.54	-7.59	-11.38
30	91.87	9.32	-8.80	-15.84
35	82.58	8.38	-9.74	-20.46
40	75.15	7.62	-10.50	-25.19
45	69.05	7.01	-11.12	-30.01
50	63.95	6.49	-11.63	-34.90
55	59.62	6.05	-12.07	-39.84
60	55.89	5.67	-12.45	-44.82
65	52.65	5.34	-12.78	-49.84
70	49.79	5.05	-13.07	-54.90
75	47.26	4.80	-13.33	-59.97
80	44.99	4.57	-13.56	-65.08
85	42.95	4.36	-13.76	-70.20
90	41.11	4.17	-13.95	-75.34

Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-3 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 6.5 L/s
Area = 0.051 ha — Qavg = 3.3 L/s
C = 0.80 — Vol(max) = 3.4 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	11.81	8.56	2.57
10	76.81	8.75	5.50	3.30
15	61.77	7.04	3.79	3.41
20	52.03	5.93	2.68	3.22
25	45.17	5.15	1.90	2.85
30	40.04	4.56	1.31	2.37
35	36.06	4.11	0.86	1.81
40	32.86	3.75	0.50	1.19
45	30.24	3.45	0.20	0.53
50	28.04	3.20	-0.05	-0.16
55	26.17	2.98	-0.27	-0.88
60	24.56	2.80	-0.45	-1.62
65	23.15	2.64	-0.61	-2.38
70	21.91	2.50	-0.75	-3.16
75	20.81	2.37	-0.88	-3.95
90	18.14	2.07	-1.18	-6.38
105	16.13	1.84	-1.41	-8.89
120	14.56	1.66	-1.59	-11.45
135	13.30	1.52	-1.73	-14.05
150	12.25	1.40	-1.85	-16.68

Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 7.3 L/s
Area = 0.051 ha — Qavg = 3.7 L/s
C = 0.80 — Vol(max) = 5.3 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	16.09	12.44	3.73
10	104.19	11.88	8.23	4.94
15	83.56	9.52	5.87	5.29
20	70.25	8.01	4.36	5.23
25	60.90	6.94	3.29	4.94
30	53.93	6.15	2.50	4.49
35	48.52	5.53	1.88	3.95
40	44.18	5.04	1.39	3.33
45	40.63	4.63	0.98	2.65
50	37.65	4.29	0.64	1.93
55	35.12	4.00	0.35	1.17
60	32.94	3.75	0.10	0.38
65	31.04	3.54	-0.11	-0.44
70	29.37	3.35	-0.30	-1.27
75	27.89	3.18	-0.47	-2.12
90	24.29	2.77	-0.88	-4.76
105	21.58	2.46	-1.19	-7.50
120	19.47	2.22	-1.43	-10.30
135	17.76	2.02	-1.63	-13.16
150	16.36	1.86	-1.79	-16.07

Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 7.6 L/s
Area = 0.051 ha — Qavg = 3.8 L/s
C = 0.90 — Vol(max) = 14.2 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	30.87	27.07	8.12
10	178.56	22.71	18.91	11.35
15	142.89	18.17	14.37	12.94
20	119.95	15.26	11.46	13.75
25	103.85	13.21	9.41	14.11
30	91.87	11.68	7.88	14.19
35	82.58	10.50	6.70	14.08
40	75.15	9.56	5.76	13.82
45	69.05	8.78	4.98	13.45
50	63.95	8.13	4.33	13.00
55	59.62	7.58	3.78	12.48
60	55.89	7.11	3.31	11.91
65	52.65	6.70	2.90	11.29
70	49.79	6.33	2.53	10.64
75	47.26	6.01	2.21	9.95
90	41.11	5.23	1.43	7.71
105	36.50	4.64	0.84	5.30
120	32.89	4.18	0.38	2.76
135	30.00	3.82	0.02	0.12
150	27.61	3.51	-0.29	-2.59

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CBMH 4	1524	1.82	89.30	-	87.10

Area A-2: Storage Table

		Underground Storage	Surface Storage		**Total Storage**	
		CBMH 4		CBMH 4		
Elevation (m)	System Depth (m)	Area (m^2)	Volume (m^3)	Area (m^2)	Ponding Volume (m^3)	**Total Volume (m^3)**	Design Head
87.10	0.00	1.82	0	-	-	**0.00**	-
87.20	0.10	1.82	0.18	-	-	**0.18**	0.00
87.30	0.20	1.82	0.36	-	-	**0.36**	0.10
87.85	0.75	1.82	1.37	-	-	**1.37**	0.65
88.40	1.30	1.82	2.37	-	-	**2.37**	1.20
89.00	1.90	1.82	3.47	-	-	**3.47**	1.80
89.30	2.20	1.82	4.01	-	-	**4.01**	2.10
89.35	2.25		4.01	10.0	0.2	**4.18**	2.15
89.40	2.30		4.01	39.60	1.41	**5.42**	2.20
89.45	2.35		4.01	81.40	4.43	**8.44**	2.25
89.50	2.40		4.01	125.90	9.61	**13.63**	2.30
89.55	2.45		4.01	186.61	17.43	**21.44**	2.35

Tempest Vortex LMF ICD 75

1:100 Yr
Flow (L/s) = 7.6
Head (m) = 2.31
Elevation (m) = **89.51**
Outlet Pipe Dia.(mm) = 203
Volume (m3) = 14.2

1:5 Yr
Flow (L/s) = 7.3
Head (m) = 2.09
Elevation (m) = **89.29**
Outlet Pipe Dia.(mm) = 203
Volume (m3) = 5.3

1:2 Yr
Flow (L/s) = 6.5
Head (m) = 1.80
Elevation (m) = **89.00**
Outlet Pipe Dia.(mm) = 203
Volume (m3) = 3.4

Orifice Size - 1:100 yr Flow Check
Q=0.62xAx(2gh)^0.5

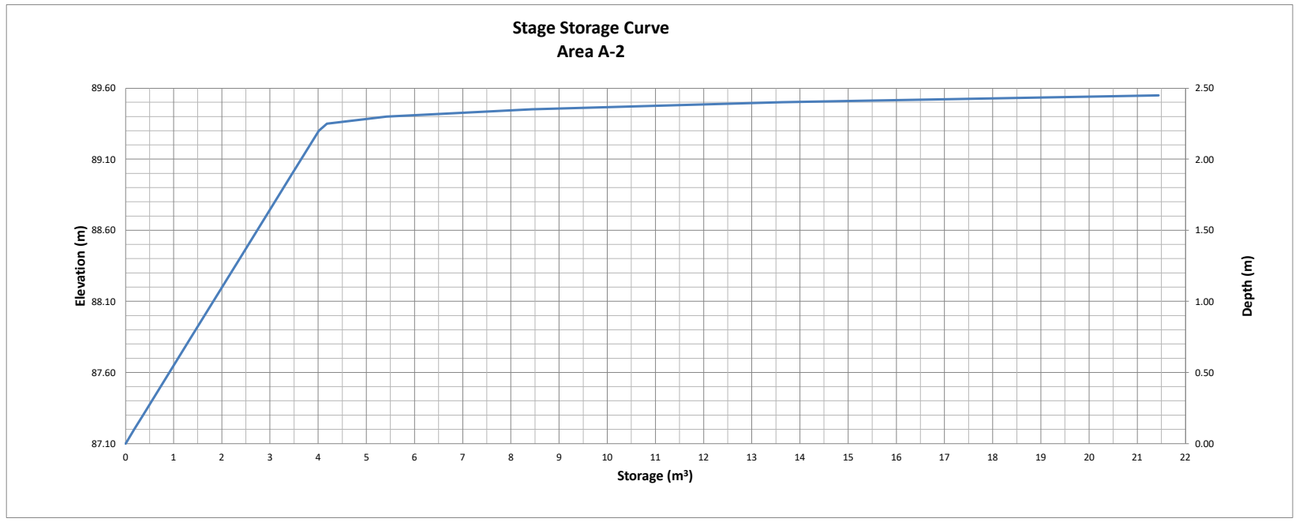
	1:100 yr	Flow Check
Q (m^3/s) =	0.0076	**0.0076**
g (m/s^2) =	9.81	9.81
h (m) =	**2.31**	2.31
A (m^2) =	**0.001821409**	**0.00181**
D (m) =	**0.04815693**	**0.04800**
D (mm) =	**48**	48.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0072
g (m/s^2) =	9.81
h (m) =	**2.09**
A (m^2) =	**0.00181**
D (m) =	**0.048**
D (mm) =	**48**

1:2 yr Flow Check

	1:2 yr
Q (m^3/s) =	0.0067
g (m/s^2) =	9.81
h (m) =	**1.80**
A (m^2) =	**0.00181**
D (m) =	**0.048**
D (mm) =	**48**



Proposed Office & Warehouse — Storage Calculations Using Average
Novatech Project No. 124011 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-4 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 7.0 L/s
Area = 0.132 ha — Qavg = 3.5 L/s
C = 0.70 — Vol(max) = 12.3 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	26.75	23.25	6.97
10	76.81	19.84	16.34	9.80
15	61.77	15.95	12.45	11.21
20	52.03	13.44	9.94	11.93
25	45.17	11.66	8.16	12.25
30	40.04	10.34	6.84	12.32
35	36.06	9.31	5.81	12.21
40	32.86	8.49	4.99	11.97
45	30.24	7.81	4.31	11.64
50	28.04	7.24	3.74	11.23
55	26.17	6.76	3.26	10.75
60	24.56	6.34	2.84	10.23
65	23.15	5.98	2.48	9.67
70	21.91	5.66	2.16	9.07
75	20.81	5.38	1.88	8.44
90	18.14	4.69	1.19	6.40
105	16.13	4.17	0.67	4.20
120	14.56	3.76	0.26	1.88
135	13.30	3.43	-0.07	-0.54
150	12.25	3.16	-0.34	-3.02

Proposed Office & Warehouse — Storage Calculations Using Average
Novatech Project No. 124011 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-4 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 8.3 L/s
Area = 0.132 ha — Qavg = 4.2 L/s
C = 0.70 — Vol(max) = 17.6 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	36.46	32.31	9.69
10	104.19	26.91	22.76	13.66
15	83.56	21.58	17.43	15.69
20	70.25	18.14	13.99	16.79
25	60.90	15.73	11.58	17.37
30	53.93	13.93	9.78	17.60
35	48.52	12.53	8.38	17.60
40	44.18	11.41	7.26	17.43
45	40.63	10.49	6.34	17.13
50	37.65	9.72	5.57	16.72
55	35.12	9.07	4.92	16.24
60	32.94	8.51	4.36	15.69
65	31.04	8.02	3.87	15.08
70	29.37	7.59	3.44	14.43
75	27.89	7.20	3.05	13.74
90	24.29	6.27	2.12	11.46
105	21.58	5.57	1.42	8.97
120	19.47	5.03	0.88	6.32
135	17.76	4.59	0.44	3.55
150	16.36	4.23	0.08	0.68

Proposed Office & Warehouse — Storage Calculations Using Average
Novatech Project No. 124011 — Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-4 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 16.1 L/s
Area = 0.132 ha — Qavg = 8.1 L/s
C = 0.79 — Vol(max) = 33.4 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	70.34	62.29	18.69
10	178.56	51.75	43.70	26.22
15	142.89	41.41	33.36	30.03
20	119.95	34.76	26.71	32.06
25	103.85	30.10	22.05	33.07
30	91.87	26.62	18.57	33.43
35	82.58	23.93	15.88	33.35
40	75.15	21.78	13.73	32.95
45	69.05	20.01	11.96	32.30
50	63.95	18.53	10.48	31.45
55	59.62	17.28	9.23	30.46
60	55.89	16.20	8.15	29.34
65	52.65	15.26	7.21	28.11
70	49.79	14.43	6.38	26.80
75	47.26	13.70	5.65	25.40
90	41.11	11.91	3.86	20.87
105	36.50	10.58	2.53	15.92
120	32.89	9.53	1.48	10.68
135	30.00	8.69	0.64	5.21
150	27.61	8.00	-0.05	-0.43

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
STM MH 3	1219	1.17	89.67	86.84	86.71
STM MH 2	1524	1.82	89.58	86.93	86.90
STM MH 1	1219	1.17	89.84	87.03	87.00
CBMH 5	1219	1.17	89.70	-	87.10

Area A-2: Storage Table

Elevation (m)	System Depth (m)	STM MH 3 Volume (m^3)	STM MH 2 Volume (m^3)	STM MH 1 Volume (m^3)	CBMH 5 Volume (m^3)	Underground Storage: Combined Volume (m^3)	Surface Storage: CB 2 Area (m^2)	CB 2 Volume (m^3)	CB 3 Area (m^2)	CB 3 Volume (m^3)	Total Storage: Ponding Volume (m^3)	**Total Volume (m^3)**	Design Head
86.71	0.00	-	-	-	-	-	-	-	-	-	-	**0**	-
86.84	0.13	0.15	-	-	-	0.15	-	-	-	-	-	**0.2**	0.00
87.16	0.45	0.53	0.47	0.19	0.07	7.12	-	-	-	-	-	**7.1**	0.32
87.43	0.72	0.84	0.97	0.50	0.39	14.42	-	-	-	-	-	**14.4**	0.59
87.70	0.99	1.16	1.46	0.82	0.70	21.73	-	-	-	-	-	**21.7**	0.86
88.05	1.34	1.56	2.10	1.23	1.11	23.59	-	-	-	-	-	**23.6**	1.21
89.35	2.64	3.08	4.47	2.74	2.63	30.51	-	-	-	-	-	**30.5**	2.51
89.40	2.69	3.14	4.56	2.80	2.68	30.78	0.00	0.00	4.70	0.08	0.1	**30.9**	2.56
89.45	2.74	3.20	4.65	2.86	2.74	31.04	8.20	0.14	18.80	0.67	0.8	**31.8**	2.61
89.48	2.77	3.23	4.71	2.89	2.78	31.20	30.50	1.10	42.40	1.58	2.7	**33.9**	2.64

Tempest Vortex LMF ICD 105

1:100 Yr
Flow (L/s) = 16.1
Head (m) = 2.64
Elevation (m) = **89.48**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 33.4

1:5 Yr
Flow (L/s) = 8.3
Head (m) = 0.72
Elevation (m) = **87.56**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 17.6

1:2 Yr
Flow (L/s) = 7.0
Head (m) = 0.52
Elevation (m) = **87.36**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 12.3

Orifice Size - 1:100 yr Flow Check
Q=0.62xAx(2gh)^0.5

	1:100 yr	Flow Check
Q (m^3/s) =	0.0161	**0.0162**
g (m/s^2) =	9.81	9.81
h (m) =	**2.64**	2.64
A (m^2) =	**0.003606086**	**0.00363**
D (m) =	**0.067759955**	**0.06800**
D (mm) =	**68**	68.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0085
g (m/s^2) =	9.81
h (m) =	**0.72**
A (m^2) =	**0.00363**
D (m) =	**0.068**
D (mm) =	**68**

1:2 yr Flow Check

	1:2 yr
Q (m^3/s) =	0.0072
g (m/s^2) =	9.81
h (m) =	**0.52**
A (m^2) =	**0.00363**
D (m) =	**0.068**
D (mm) =	**68**

PI = 3.141592654
pipe I.D.= 610 (pvc pipe)
U/G Storage Pipe Volume

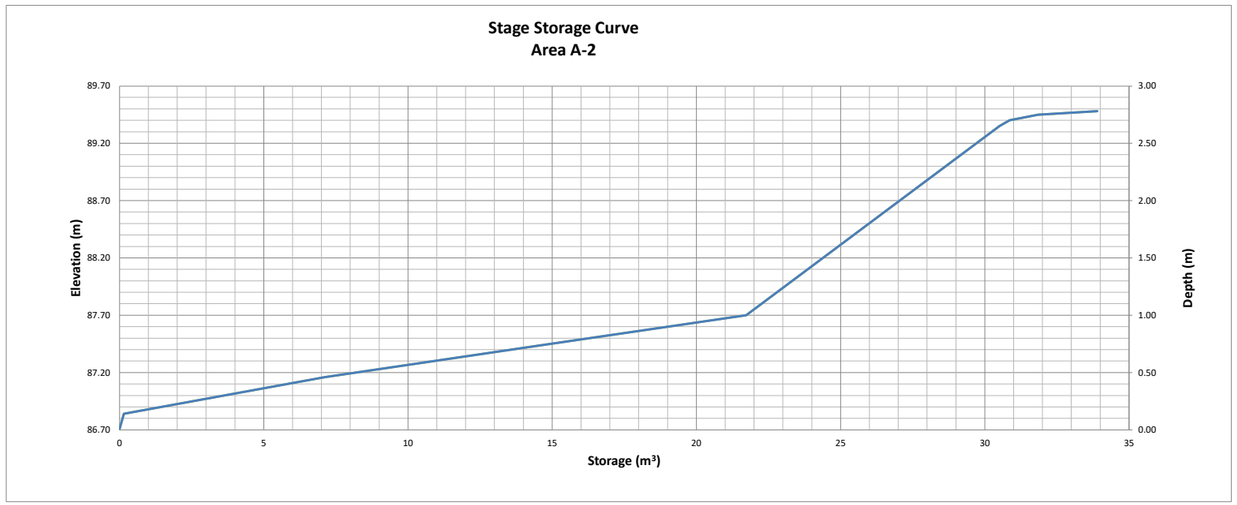
End Area	0.292	(m^2)
Total Length	18.4	(m)
Pipe Volume	5.4	(m^3)

PI = 3.14159
pipe I.D.= 610 (pvc pipe)
U/G Storage Pipe Volume

End Area	0.292	(m^2)
Total Length	20.9	(m)
Pipe Volume	6.1	(m^3)

PI = 3.141593
pipe I.D.= 610 (pvc pipe)
U/G Storage Pipe Volume

End Area	0.292	(m^2)
Total Length	20.9	(m)
Pipe Volume	6.1	(m^3)



Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-5 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 14.1 L/s
Area = 0.218 ha — Qavg = 7.1 L/s
C = 0.67 — Vol(max) = 16.9 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	41.98	34.93	10.48
10	76.81	31.13	24.08	14.45
15	61.77	25.04	17.99	16.19
20	52.03	21.09	14.04	16.85
25	45.17	18.31	11.26	16.89
30	40.04	16.23	9.18	16.52
35	36.06	14.62	7.57	15.89
40	32.86	13.32	6.27	15.05
45	30.24	12.26	5.21	14.06
50	28.04	11.37	4.32	12.95
55	26.17	10.61	3.56	11.74
60	24.56	9.95	2.90	10.45
65	23.15	9.38	2.33	9.10
70	21.91	8.88	1.83	7.69
75	20.81	8.44	1.39	6.24
90	18.14	7.35	0.30	1.64
105	16.13	6.54	-0.51	-3.22
120	14.56	5.90	-1.15	-8.26
135	13.30	5.39	-1.66	-13.45
150	12.25	4.97	-2.08	-18.76

Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-5 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 21.3 L/s
Area = 0.218 ha — Qavg = 10.7 L/s
C = 0.67 — Vol(max) = 21.4 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	57.22	46.57	13.97
10	104.19	42.23	31.58	18.95
15	83.56	33.87	23.22	20.90
20	70.25	28.47	17.82	21.39
25	60.90	24.68	14.03	21.05
30	53.93	21.86	11.21	20.17
35	48.52	19.67	9.02	18.93
40	44.18	17.91	7.26	17.42
45	40.63	16.47	5.82	15.71
50	37.65	15.26	4.61	13.84
55	35.12	14.24	3.59	11.83
60	32.94	13.35	2.70	9.73
65	31.04	12.58	1.93	7.54
70	29.37	11.91	1.26	5.27
75	27.89	11.30	0.65	2.94
90	24.29	9.84	-0.81	-4.35
105	21.58	8.75	-1.90	-11.98
120	19.47	7.89	-2.76	-19.87
135	17.76	7.20	-3.45	-27.94
150	16.36	6.63	-4.02	-36.16

Proposed Office & Warehouse Storage Calculations Using Average
Novatech Project No. 124011 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-5 Controlled Site Flows

OTTAWA IDF CURVE — Qpeak = 25.1 L/s
Area = 0.218 ha — Qavg = 12.6 L/s
C = 0.75 — Vol(max) = 52.8 m3
(Vol calculated for Qavg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	110.65	98.10	29.43
10	178.56	81.41	68.86	41.32
15	142.89	65.15	52.60	47.34
20	119.95	54.69	42.14	50.57
25	103.85	47.35	34.80	52.19
30	91.87	41.88	29.33	52.80
35	82.58	37.65	25.10	52.71
40	75.15	34.26	21.71	52.10
45	69.05	31.48	18.93	51.11
50	63.95	29.16	16.61	49.82
55	59.62	27.18	14.63	48.29
60	55.89	25.48	12.93	46.56
65	52.65	24.00	11.45	44.67
70	49.79	22.70	10.15	42.63
75	47.26	21.54	8.99	40.48
90	41.11	18.74	6.19	33.44
105	36.50	16.64	4.09	25.77
120	32.89	15.00	2.45	17.62
135	30.00	13.68	1.13	9.12
150	27.61	12.59	0.04	0.34

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CBMH 3	1219	1.17	89.20	86.77	86.64
CBMH 2	1524	1.82	89.20	86.84	86.81
CBMH 1	1219	1.17	89.20	-	86.90

PI = 3.141592654
pipe I.D.= 609 (pvc pipe)
U/G Storage Pipe Volume
End Area 0.291 (m^2)
Total Length 19.0 (m)
Pipe Volume 5.5 (m^3)

PI = 3.141592654
pipe I.D.= 609 (pvc pipe)
U/G Storage Pipe Volume
End Area 0.291 (m^2)
Total Length 27.0 (m)
Pipe Volume 7.9 (m^3)

Area A-2: Storage Table

Elevation (m)	System Depth (m)	CBMH 3 Volume (m^3)	CBMH 2 Volume (m^3)	CBMH 1 Volume (m^3)	Underground Storage Combined Volume (m^3)	Surface Storage CBMH 3 Area (m^2)	CBMH 3 Volume (m^3)	CBMH 2 Area (m^2)	CBMH 2 Volume (m^3)	CBMH 1 Area (m^2)	CBMH 1 Volume (m^3)	Total Storage Ponding Volume (m^3)	**Total Volume (m^3)**	Design Head
86.64	0.00	-	-	-	-	-	-	-	-	-	-	-	**0**	-
86.77	0.13	0.15	-	-	0.15	-	-	-	-	-	-	-	**0.2**	0.00
87.10	0.46	0.54	0.53	0.23	5.76	-	-	-	-	-	-	-	**5.8**	0.33
87.35	0.71	0.83	0.99	0.53	11.25	-	-	-	-	-	-	-	**11.3**	0.58
87.65	1.01	1.18	1.53	0.88	16.96	-	-	-	-	-	-	-	**17.0**	0.88
88.00	1.36	1.59	2.17	1.28	18.41	-	-	-	-	-	-	-	**18.4**	1.23
88.60	1.96	2.29	3.27	1.98	20.91	-	-	-	-	-	-	-	**20.9**	1.83
89.20	2.56	2.99	4.36	2.68	23.40	-	-	-	-	-	-	-	**23.4**	2.43
89.25	2.61	4.67	6.28	4.20	28.52	6.50	0.11	5.50	0.09	3.90	0.07	0.27	**28.5**	2.48
89.30	2.66	4.67	6.28	4.20	28.52	15.00	0.65	17.40	0.66	9.50	0.40	1.71	**30.2**	2.53
89.35	2.71	4.67	6.28	4.20	28.52	28.00	1.72	35.60	1.99	17.10	1.07	4.78	**33.3**	2.58
89.40	2.76	4.67	6.28	4.20	28.52	44.90	3.54	60.20	4.38	26.60	2.16	10.09	**38.6**	2.63
89.45	2.81	4.67	6.28	4.20	28.52	65.50	6.30	93.40	8.22	38.00	3.77	18.30	**46.8**	2.68
89.50	2.86	4.67	6.28	4.20	28.52	85.30	10.07	128.80	13.78	56.20	6.13	29.98	**58.5**	2.73

Circular Plug Type 84mm Orifice

1:100 Yr
Flow (L/s) = 25.1
Head (m) = 2.71
Elevation (m) = **89.48**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 52.8

1:5 Yr
Flow (L/s) = 21.3
Head (m) = 1.96
Elevation (m) = **88.73**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 21.4

1:2 Yr
Flow (L/s) = 14.1
Head (m) = 0.86
Elevation (m) = **87.63**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 16.9

Orifice Size - 1:100 yr Flow Check
Q=0.62xAx(2gh)^0.5

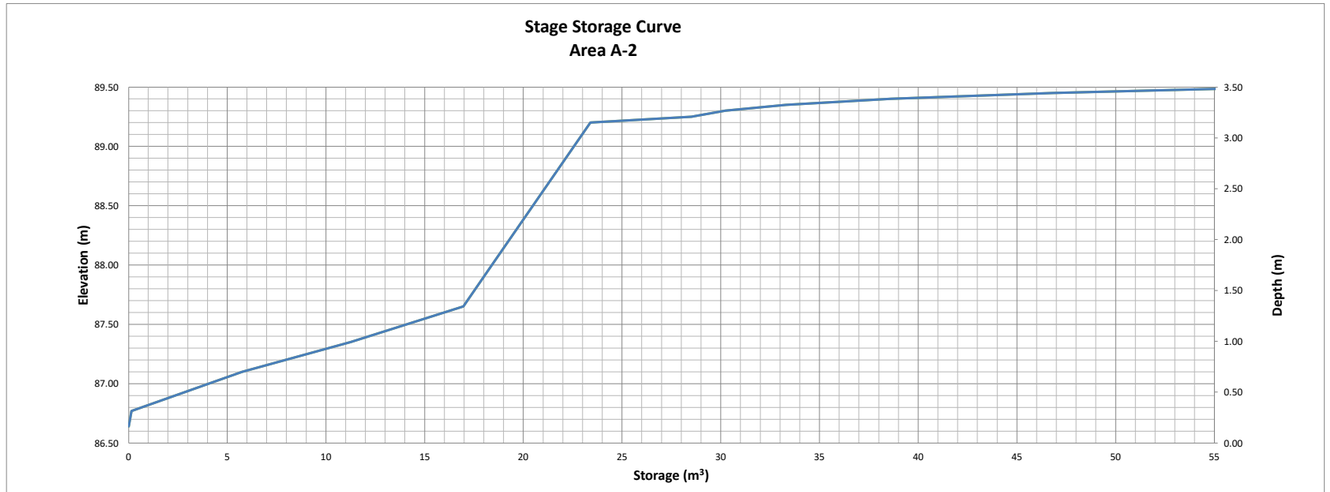
	1:100 yr	Flow Check
Q (m^3/s) =	0.0251	**0.0251**
g (m/s^2) =	9.81	9.81
h (m) =	**2.71**	2.71
A (m^2) =	**0.005548909**	**0.00554**
D (m) =	**0.084054095**	**0.08400**
D (mm) =	**84**	84.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0213
g (m/s^2) =	9.81
h (m) =	**1.96**
A (m^2) =	**0.00554**
D (m) =	**0.084**
D (mm) =	**84**

1:2 yr Flow Check

	1:2 yr
Q (m^3/s) =	0.0141
g (m/s^2) =	9.81
h (m) =	**0.86**
A (m^2) =	**0.00554**
D (m) =	**0.084**
D (mm) =	**84**



100 Bill Leathem Drive - Office & Warehouse Development
1:5 yr Storm Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT : 124011
DESIGNED BY: MS
CHECKED BY: MS
DATE: July 17, 2024

AREA	FROM MH	TO MH	AREA (ha)			INDIV 2.78 AC	ACCUM 2.78 AC	TIME OF CONC. (min)	RAINFALL INTENSITY (mm/hr)	CONTROLLED FLOW* Q (L/s)	PEAK FLOW Q (L/s)	PROPOSED SEWER								
			C= 0.20	C = 0.60	C = 0.90							TYPE OF PIPE	PIPE SIZE (mm)	PIPE ID (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	PERCENTAGE OF CAPACITY
A-4 Uncontrolled	CBMH 5	STMMH 1	0.001		0.025	0.06	0.06	10.00	104.19		6.6	CONC	600	610.0	0.30	22.1	**351.5**	1.20	0.31	2%
A-4 Uncontrolled	STMMH 1	STMMH 2					0.06	10.31	102.60		13.1	CONC	600	610.0	0.30	22.1	**351.5**	1.20	0.31	4%
A-4 Uncontrolled	CB 3	STMMH 2	0.017		0.040	0.11	0.11	10.00	104.19		11.4	PVC	200	203.0	1.00	7.4	**34.1**	1.05	0.12	33%
A-4 Uncontrolled	STMMH 2	STMMH 3					0.17	10.61	101.06		30.5	CONC	600	610.0	0.35	10.5	**379.6**	1.30	0.13	8%
A-4 Uncontrolled	CB 2	STMMH 3	0.018		0.029	0.08	0.15	10.00	104.19		15.2	PVC	200	203.0	1.00	6.7	**34.1**	1.05	0.11	44%
Controlled Flow From A-4	STMMH 3	STMMH 4	**A-4 is controlled to a maximum of 16.1 L/s by ICD in the outlet pipe of STMMH 4**							**16.1**	**16.1**	PVC	250	254.0	0.50	11.3	**43.9**	0.87	0.22	**37%**
A-5 Uncontrolled	CBMH 1	CBMH 2	0.023		0.119	0.31	0.31	10.00	104.19		32.4	CONC	600	610.0	0.20	28.6	**287.0**	0.98	0.49	11%
A-5 Uncontrolled	CBMH 2	CBMH 3	0.032			0.02	0.33	10.49	101.70		65.7	CONC	600	610.0	0.20	22.1	**287.0**	0.98	0.38	23%
Controlled Flow From A-5	CBMH 3	STMMH 5	**A-5 is controlled to a maximum of 25.1 L/s by ICD in the outlet pipe of CBMH 3**							**25.1**	**25.1**	PVC	250	254.0	0.50	20.7	**43.9**	0.87	0.40	**57%**
A-2 Uncontrolled	CB 1	STMMH 5	0.018		0.032	0.09	0.09	10.00	104.19		9.4	PVC	200	203.0	1.00	7.2	**34.1**	1.05	0.11	27%
A-5 Controled + A2 Uncontrolled	STMMH 5	STMMH 4									34.5	PVC	300	305.0	0.50	22.1	**71.5**	0.98	0.38	48%
A-5 Controlled + A4 Controled + A2 Uncontrolled	STMMH 4	City Sewer								**41.2**	**50.6**	PVC	300	305.0	1.00	21.3	**101.1**	1.38	0.26	50%

NOTES:
1) Refer to Novatech Drawing 124011-GP for storm structure designations, storm pipe details and control structure tables.
2) Refer to Novatech Drawing 124011-SWM for the on-site tributary drainage areas and Figure STM-1 for specific sewer design sheet pipe segment breakdowns.

EX 106.5–1200mmØ CONC. STM @ 0.13%

EX 93.5m–1500mmØ CONC. STM @ 0.72%

SICB T/G=89.20

SICB T/G=88.85

LS

LS

21.3m-300mmØ STM @ 1.00%

H.P.

CB 3
T/G=89.35
7.4m-200mmØ STM @ 1.00%

1:100 YR=89.48 (DEPTH=13cm)

0.058
CB 3
0.69

CB 2
T/G=89.40

6.7m-200mmØ STM @ 1.00%

1:100 YR=89.48 (DEPTH=8cm)

ICD1

CBMH 4
T/G=89.30

5.9m-200mmØ STM @ 1.00%

H.P.

CB 1
T/G=89.02

7.2m-200mmØ STM @ 1.00%

H.P.

19.6m-600mmØ STM @ 0.30%

STMMH 2
T/G=89.58

0.047
CB 2
0.63

STMMH 3
T/G=89.67

ICD2

STMMH 4
T/G=89.65

32.1m-300mmØ STM @ 0.50%

STMMH 5
T/G=89.25

20.7m-250mmØ STM @ 0.50%

H.P.

1:100 YR=89.51 (DEPTH=21cm)

0.051
CBMH 4
0.80

0.050
CB 1
0.65

10.6m-250mmØ STM @ 0.50%

22.1m-600mmØ STM @ 0.30%

8cm

12.0m-150mmØ STM @ 3.00%

EX 49.6m–1650mmØ CONC. STM @ 0.58%

0.045
CBMH 3
0.20

CBMH 3
T/G=89.20

ICD3

PROPOSED 2-STOREY OFFICE+WAREHOUSE
1,555m² (INCLUDING MEZZANINE AND PHASE II)
USF=87.92m
FFE=90.05m
TOF=90.25

PHASE II
333 m²

0.218
CBMH 1
0.67

STMMH 1
T/G=89.84

H.P.

22.1m-600mmØ STM @ 0.30%

SWALE @ 2.0%

20.6m-600mmØ STM @ 0.20%

SWALE @ 2.0%

0.032
CBMH 2
0.20

0.026
CBMH 5
0.87

CBMH 5
T/G=89.70

CBMH 1
T/G=89.20

SWALE @ 2.8%

SWALE @ 1.8%

28.6m-600mmØ STM @ 0.20%

1:100 YR=89.48 (DEPTH=28cm MAX.)

SWALE @ 1.8%

CBMH 2
T/G=89.20

AN

GP

EX 21.8m–2400mmØ CONC. STM

UP

GP

LEGEND

0.050 / CB 1 / 0.65 — DRAINAGE AREA; CATCH BASIN ID; 1:5YR WEIGHTED RUNOFF COEFFICIENT

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

100 BILL LEATHEM DRIVE

STORM DRAINAGE AREA PLAN

SCALE 1 : 300 (0, 3m, 6m, 9m, 12m)

DATE JULY 2024 | JOB 124011 | FIGURE STM-1

APPENDIX F

Inlet Control Device (ICD) Information

IPEX Tempest™ Inlet Control Devices

Municipal Technical Manual Series

Vol. I, 2nd Edition

PRODUCT INFORMATION: TEMPEST LOW, MEDIUM FLOW (LMF) ICD

Purpose

To control the amount of storm water runoff entering a sewer system by allowing a specified flow volume out of a catch basin or manhole at a specified head. This approach conserves pipe capacity so that catch basins downstream do not become uncontrollably surcharged, which can lead to basement floods, flash floods and combined sewer overflows.

Product Description

Our LMF ICD is designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter and larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 14 preset flow curves, the LMF ICD has the ability to provide flow rates: 2lps – 17lps (31gpm – 270gpm)

Product Function

The LMF ICD vortex flow action allows the LMF ICD to provide a narrower flow curve using a larger orifice than a conventional orifice plate ICD, making it less likely to clog. When comparing flows at the same head level, the LMF ICD has the ability to restrict more flow than a conventional ICD during a rain event, preserving greater sewer capacity.

Product Construction

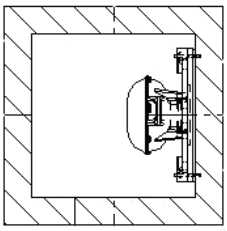
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

Product Applications

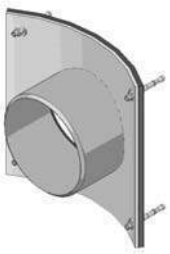
Will accommodate both square and round applications:

Square Application

Universal Mounting Plate



Round Application



+

Spigot CB Wall Plate

=

Universal Mounting Plate Hub Adapter

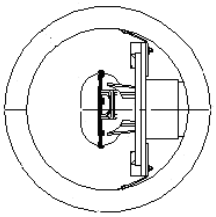


Chart 1: LMF 14 Preset Flow Curves

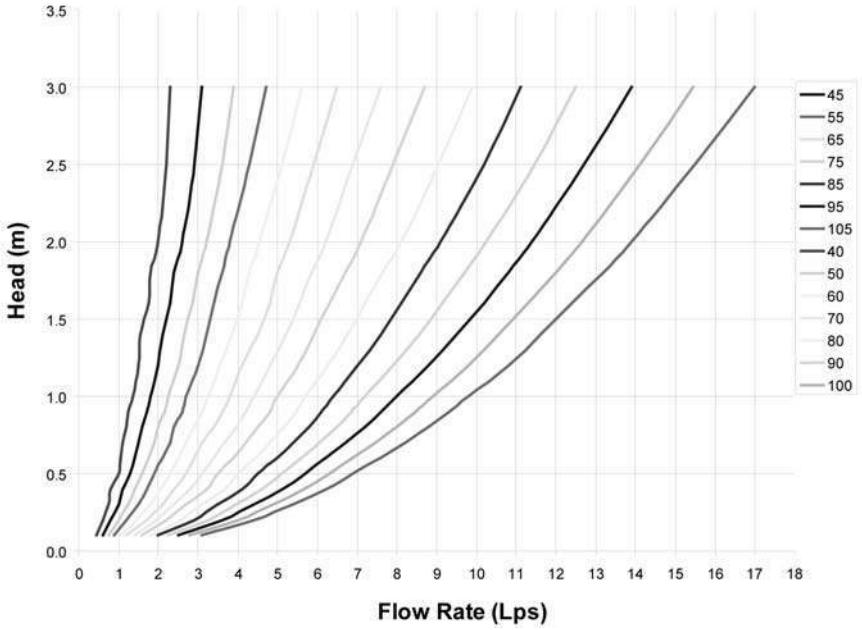
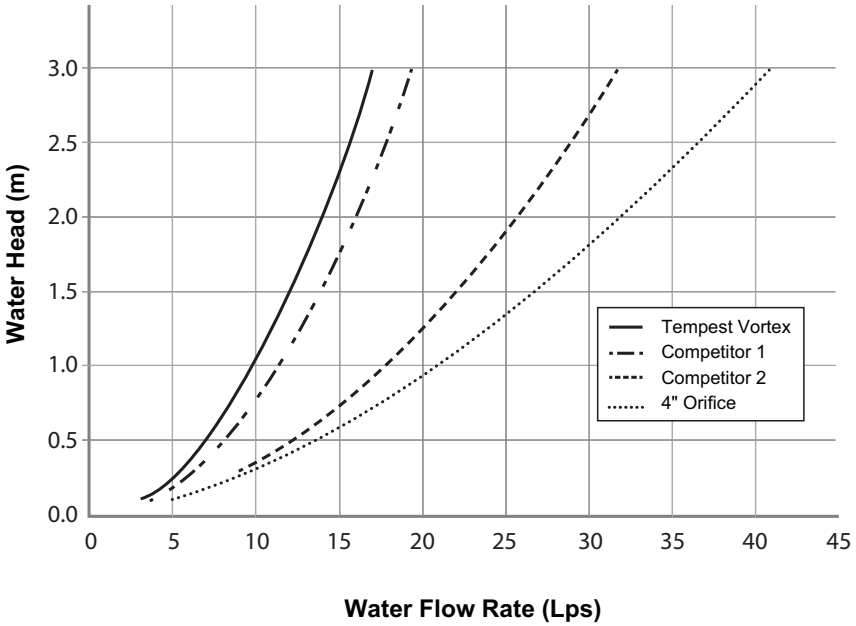


Chart 2: LMF Flow vs. ICD Alternatives



PRODUCT INSTALLATION

Instructions to assemble a TEMPEST LMF ICD into a Square Catch Basin:

STEPS:

1. Materials and tooling verification:
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level, and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers, (4) nuts, universal mounting plate, ICD device.
2. Use the mounting wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a minimum of 1-1/2" depth up to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the universal mounting plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the wall mounting plate and the catch basin wall.
6. From the ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the universal mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut down the pipe flush to the catch basin wall.
- Call your IPEX representative for more information or if you have any questions about our products.

Instructions to assemble a TEMPEST LMF ICD into a Round Catch Basin:

STEPS:

1. Materials and tooling verification.
   - Tooling: impact drill, 3/8" concrete bit, torque wrench for 9/16" nut, hand hammer, level and marker.
   - Material: (4) concrete anchor 3/8 x 3-1/2, (4) washers and (4) nuts, spigot CB wall plate, universal mounting plate hub adapter, ICD device.
2. Use the spigot catch basin wall plate to locate and mark the hole (4) pattern on the catch basin wall. You should use a level to ensure that the plate is at the horizontal.
3. Use an impact drill with a 3/8" concrete bit to make the four holes at a depth between 1-1/2" to 2-1/2". Clean the concrete dust from the holes.
4. Install the anchors (4) in the holes by using a hammer. Thread the nuts on the top of the anchors to protect the threads when you hit the anchors with the hammer. Remove the nuts from the ends of the anchors.
5. Install the CB spigot wall plate on the anchors and screw the 4 nuts in place with a maximum torque of 40 N.m (30 lbf-ft). There should be no gap between the spigot wall plate and the catch basin wall.
6. Apply solvent cement on the hub of the universal mounting plate, hub adapter and the spigot of the CB wall plate, then slide the hub over the spigot. Make sure the universal mounting plate is at the horizontal and its hub is completely inserted onto the spigot. Normally, the corners of the universal mounting plate hub adapter should touch the catch basin wall.
7. From ground above using a reach bar, lower the ICD device by hooking the end of the reach bar to the handle of the ICD device. Align the triangular plate portion into the mounting wall plate. Push down the device to be sure it has centered in to the mounting plate and has created a seal.

⚠ WARNING

- Verify that the outlet pipe doesn't protrude into the catch basin. If it does, cut back the pipe flush to the catch basin wall.
- The solvent cement which is used in this installation is to be approved for PVC.
- The solvent cement should not be used below 0°C (32°F) or in a high humidity environment. Refer to the IPEX solvent cement guide to confirm the required curing time or visit the IPEX Online Solvent Cement Training Course available at www.ipexinc.com.
- Call your IPEX representative for more information or if you have any questions about our products.

PRODUCT TECHNICAL SPECIFICATION

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

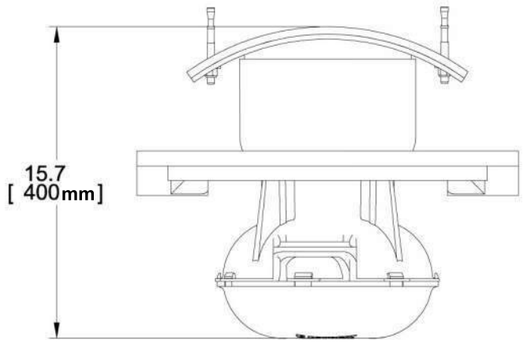
All hardware will be made from 304 stainless steel.

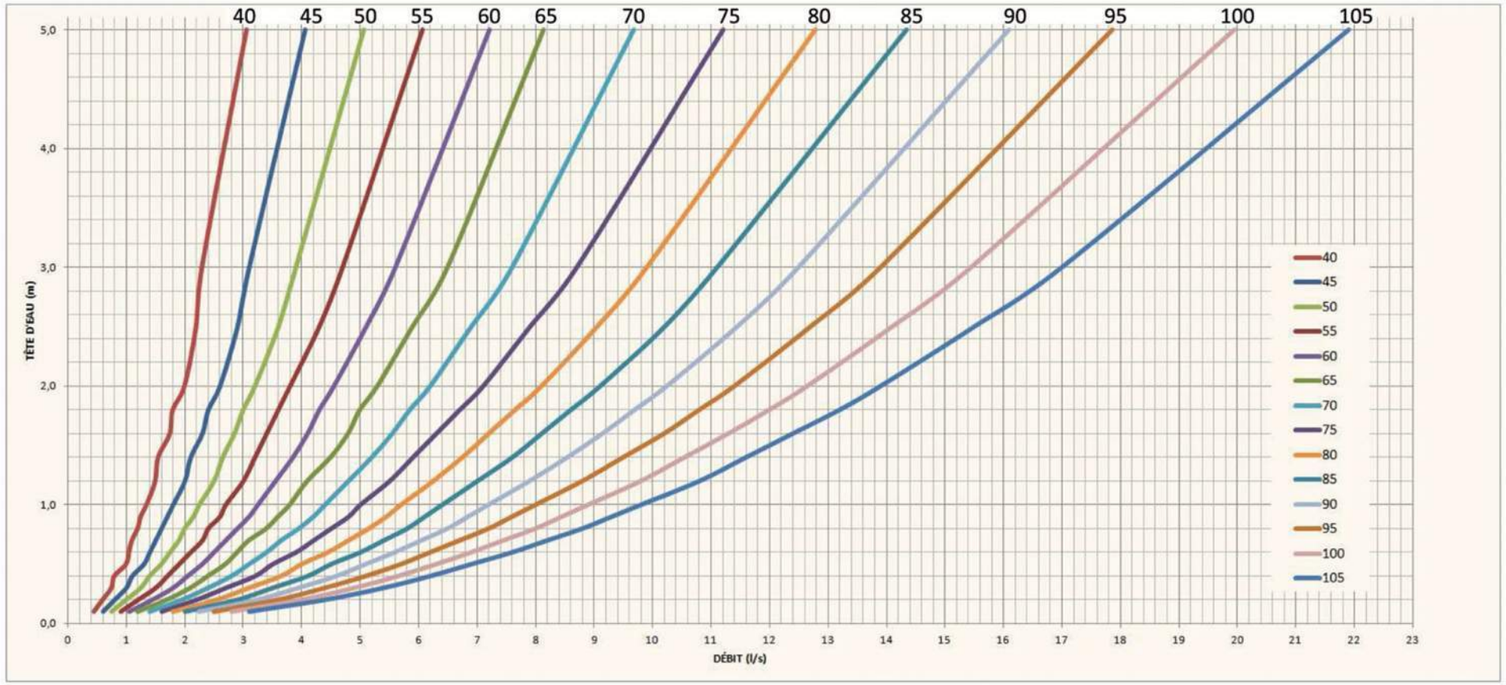
Dimensioning

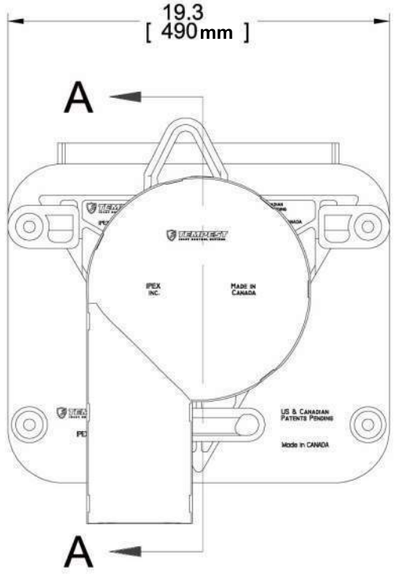
The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

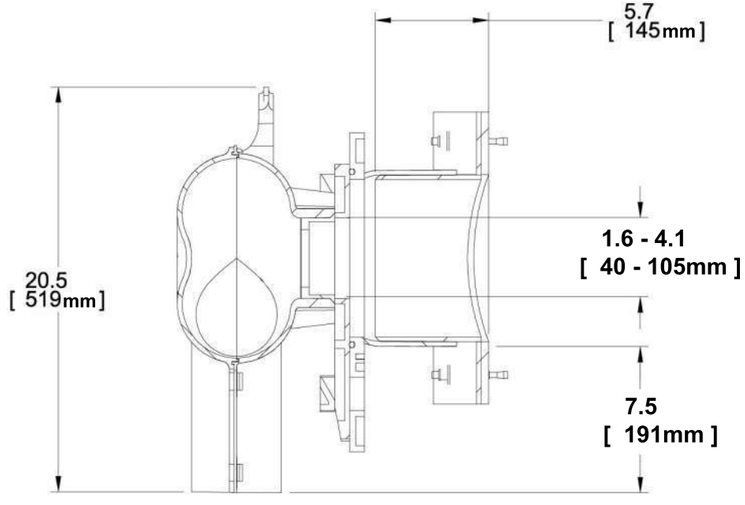
Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

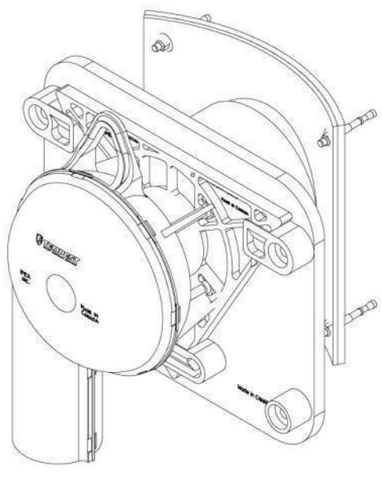








SECTION A-A



IPEX
Product development engineering
3 Place du commerce, Suite 101
Île des Soeurs, Montréal, QC, H3E 1H7
Canada Tel 514 769 2200
www.ipexna.com

PROJECTION	UNITS	TITLE			
	in [mm]	Tempest LMF round CB assembly [VORTEX]	SIZE B	SCALE(S) 1/8	1-2014

APPENDIX G

Development Servicing Study Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

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

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

4.1 General Content

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

☒ Reference to geotechnical studies and recommendations concerning servicing.

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

4.2 Development Servicing Report: Water

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

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

4.3 Development Servicing Report: Wastewater

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

4.4 Development Servicing Report: Stormwater Checklist

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

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

4.5 Approval and Permit Requirements: Checklist

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

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

4.6 Conclusion Checklist

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

APPENDIX G

Drawings

LEGEND

- PROPERTY LINE
- PROPOSED CURB
- DC — PROPOSED DEPRESSED CURB
- PROPOSED CAP
- PROPOSED SANITARY SEWER AND MANHOLE
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED CLAY SEAL
- PROPOSED WATER SERVICE
- PROPOSED HYDRANT c/w LEAD & VALVE
- V&VB — PROPOSED VALVE AND VALVE BOX
- PROPOSED BUILDING ENTRANCE
- DIRECTION OF FLOW
- PROPOSED RETAINING WALL
- M — PROPOSED WATER METER
- RM — PROPOSED REMOTE METER
- PRV — PROPOSED PRESSURE REDUCING VALVE

- EXISTING UTILITY POLE C/W GUY WIRES
- V&VC — EXISTING WATERMAIN C/W VALVE & VALVE CHAMBER
- EXISTING HYDRANT C/W VALVE & LEAD
- SAN MH — EXISTING SANITARY MANHOLE & SEWER
- STM MH — EXISTING STORM MANHOLE & SEWER
- EXISTING CATCHBASIN

VERTICAL DATUM NOTE:

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA ELEVATION=95.205.

ICD1 - INLET CONTROL DEVICE DATA TABLE - AREA A-3

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF ICD 75	1500mmØ CBMH 4	200mmØ PVC	6.5	1.80	89.00	3.4	21.4 m^3
1:5 YR				7.3	2.09	89.29	5.3	
1:100 YR				7.6	2.31	89.51	14.2	

ICD2 - INLET CONTROL DEVICE DATA TABLE - AREA A-4

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF ICD 105	1200mmØ STMMH 3	250mmØ PVC	7.0	0.52	87.36	12.3	34.6 m^3
1:5 YR				8.3	0.72	87.56	17.6	
1:100 YR				16.1	2.64	89.48	33.4	

ICD3 - INLET CONTROL DEVICE DATA TABLE - AREA A-5

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	CIRCULAR PLUG TYPE 84mm ORIFICE	1200mmØ CBMH 3	250mmØ PVC	14.1	0.86	87.63	16.9	58.5 m^3
1:5 YR				21.3	1.96	88.73	21.4	
1:100 YR				25.1	2.71	89.48	52.8	

PROPOSED 100mmØ WATER SERVICE TABLE

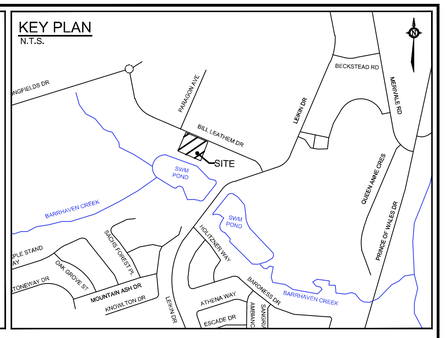
STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00.0	89.37±	87.16± ✱✱	CONNECT TO EXISTING 300mmØ WATERMAIN
0+03.2	89.45	87.07	CROSS OVER 250mmØ SAN (2.3m CLEARANCE)
0+06.3	89.37	86.99	CROSS OVER 1200mmØ STM (0.25m CLEARANCE)
0+16.4	89.70	87.30	100mmØ V&VB
0+21.6	89.69	87.29	22.5° HORIZONTAL BEND
0+26.6	89.61	87.21	22.5° HORIZONTAL BEND
0+40.0	90.03	87.63	CAP 1.0m FROM FOUNDATION WALL

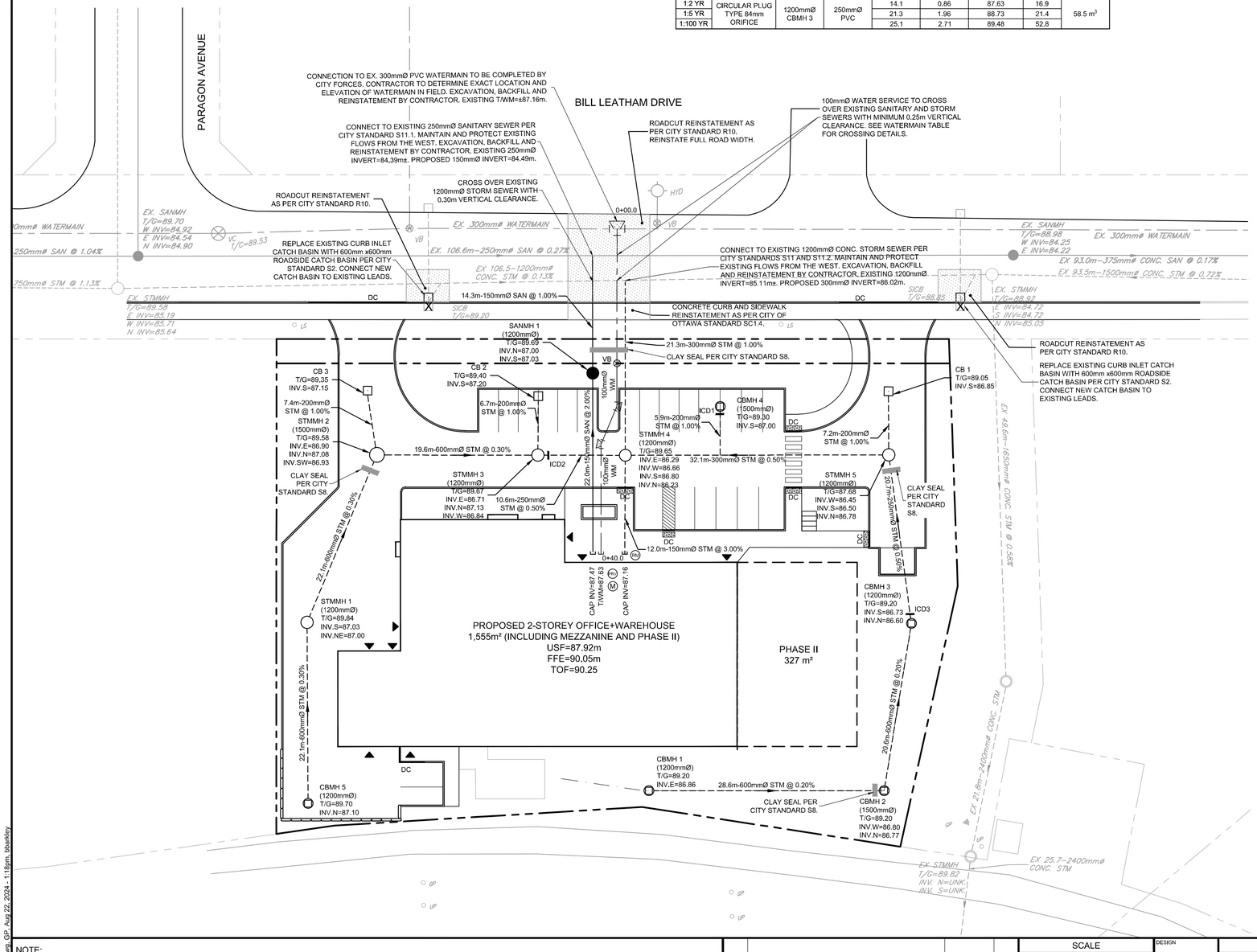
✱ CONNECT TO EXISTING 300mmØ WATERMAIN. EXACT ELEVATIONS TO BE FIELD DETERMINED.

✱✱ PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAIL W22 WHERE PIPE COVER IS LESS THAN 2.4m.

NORTH

KEY PLAN
N.T.S.





GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL REPORT OTT-24002636-A0, DATED MAY 29,2024), PREPARED BY EXP ENGINEERING, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO STORMWATER MANAGEMENT REPORT(R-2024-029) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

SEWER NOTES:

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

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200mmØ)	701.010	OPSD
STORM / SANITARY MANHOLE (1500mmØ)	701.011	OPSD
CB, FRAME & COVER	S19	CITY OF OTTAWA
STORM / SANITARY MH FRAME & COVER	401.010 -TYPE 'A'	CITY OF OTTAWA
CATCHBASIN MANHOLE FRAME & COVER	401.010-TYPE 'B'	
SEWER TRENCH	S6	CITY OF OTTAWA
DROP STRUCTURE	1003.010	OPSD
STORM SEWER	PVC DR 35 / CONC 65-D	
CATCHBASIN LEAD	PVC DR 35	

3. ALL STORM AND SANITARY SERVICE LATERALS SHALL BE EQUIPPED WITH BACKFLOW PREVENTION DEVICES AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
4. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
5. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
6. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
7. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
8. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
9. ALL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS ARE TO HAVE 600mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS TO HAVE 3.0m OF FILTER-CLOTH WRAPPED 100mm PVC PERFORATED SUBDRAIN IN AN UPGRADIENT DIRECTION PER GEOTECHNICAL RECOMMENDATIONS.
10. ALL CATCHBASINS, MANHOLES AND/OR CATCHBASIN MANHOLES THAT ARE TO HAVE ICD'S INSTALLED WITHIN THEM ARE TO HAVE 600mm SUMPS.
11. ALL WEEPING TILE CONNECTIONS TO BE MADE TO THE PROPOSED STORM SEWER SYSTEM DOWNSTREAM OF ANY INLET CONTROL DEVICES.
12. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT, UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES
.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

WATERMAIN NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION BY OPEN STRUCTURES	W23	CITY OF OTTAWA
CONCRETE THRUST BLOCKS (UNDER 400mmØ)	W25.3	CITY OF OTTAWA
THRUST BLOCK TABLE (UNDER 400mmØ)	W25.4	CITY OF OTTAWA
WATERMAIN	PVC DR 18	

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY FORCES.
3. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.
4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. WHERE DEPTH OF COVER IS LESS THAN 2.4m, WATERMAIN SHALL BE INSULATED PER CITY OF OTTAWA STANDARD DETAIL W22. WATERMAIN SHALL BE INSULATED BY OPEN STRUCTURES PER W23.
5. PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

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

No.	REVISION	DATE	BY
2	REVISED PER CITY COMMENTS	AUG 22/24	MS
1	ISSUED FOR SITE PLAN APPLICATION	MAY 31/24	MS

SCALE
1 : 300
1 : 300

DESIGN BB
CHECKED MS
DRAWN BB
CHECKED MS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — M. SAVIC — 100102651 — August 22, 2024 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
100 BILL LEATHEM DRIVE

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 124011
REV REV # 2
DRAWING No. 124011-GP

M:\2024\124011\CAD\Civil\124011-GP.dwg, GP, Aug 22, 2024 - 1:18pm, bbarkley

PLEASE PRINT - 841mm(34in)

LEGEND

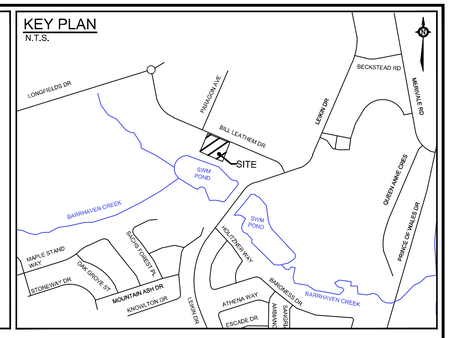
- PROPERTY LINE
- 90.00 — PROPOSED ELEVATION
- X 76.45 — EXISTING ELEVATION
- 90.00 (S) — PROPOSED SWALE ELEVATION
- PROPOSED BUILDING ENTRANCE
- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED SAN MANHOLE
- PROPOSED RETAINING WALL
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED FIRE HYDRANT
- V&VB — PROPOSED VALVE AND VALVE BOX
- H.P. — PROPOSED HIGH POINT
- PROPOSED CURB
- 1:100 YR — APPROXIMATE PONDING LIMITS
- DC — PROPOSED DEPRESSED CURB
- TACTILE WALKING SURFACE INDICATOR (TWSI) PER OPSD 310.039
- SWALE AND DIRECTION OF FLOW
- TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
- 2.0% — SLOPE AND DIRECTION
- TERRACING 3:1 SLOPE MAX
- V&VC — EXISTING VALVE & VALVE CHAMBER
- V&VB — EXISTING VALVE & VALVE BOX
- EXISTING HYDRANT
- SAN MH — EXISTING SANITARY MANHOLE
- STM MH — EXISTING STORM MANHOLE
- CB 1 — EXISTING CATCHBASIN
- LS — EXISTING LIGHT STANDARD

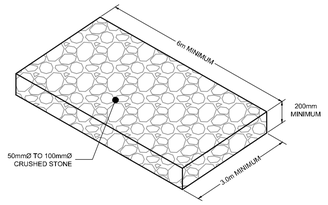
Erosion and Sediment Control Responsibilities:

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

NORTH

KEY PLAN
N.T.S.





MUD MAT DETAIL
NOT TO SCALE

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT OTT-24002636-A0, DATED MAY 29, 2024), PREPARED BY EXP ENGINEERING, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL,.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO DEVELOPMENT SERVICING STUDY & STORMWATER MANAGEMENT REPORT(R-2024-025) PREPARED BY NOVATECH.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. CONCRETE CURB AND SIDEWALK SHALL BE AS PER CITY OF OTTAWA STANDARD SC1.4.
10. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
11. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES :

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA, THEY ARE TO BE APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED DURING CONSTRUCTION IN ACCORDANCE WITH THE "GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES" (GOVERNMENT OF ONTARIO, MAY 1987). THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY AGENCY REQUIREMENTS.
4. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE).
5. TO LIMIT EROSION: MINIMIZE THE AMOUNT OF EXPOSED SOILS AT ANY GIVEN TIME, RE-VEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE AND PROTECT EXPOSED SLOPES WITH NATURAL OR SYNTHETIC MULCHES.
6. FOR MATERIAL STOCKPILING: MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME; APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.
7. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
8. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
9. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
10. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
11. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS. MONITOR DUST LEVELS DURING SITE PREPARATION/EXCAVATION, AND CONSTRUCTION ACTIVITIES, AND WHEN DUST LEVELS BECOME VISUALLY APPARENT SPRAY WATER TO MINIMIZE THE RELEASE OF DUST FROM GRAVEL, PAVED AREAS AND EXPOSED SOILS. USE CHEMICAL DUST SUPPRESSANTS ONLY WHERE NECESSARY ON PROBLEM AREAS.

PAVEMENT STRUCTURES:

LIGHT DUTY (PARKING LOTS - CARS ONLY)
65mm HL3/SP12.5mm CAT. B
150mm GRANULAR "A"
450mm GRANULAR "B" TYPE II

HEAVY DUTY (PARKING LOTS AND ACCESS ROADS)
50mm HL3/SP12.5mm CAT. B
60mm HL8/SP19.0mm CAT. B
150mm GRANULAR "A"
600mm GRANULAR "B" TYPE II

VERTICAL DATUM NOTE:

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA
ELEVATION=95.205.

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

No.	REVISION	DATE	BY
2	REVISED PER CITY COMMENTS	AUG 22/24	MS
1	ISSUED FOR SITE PLAN APPLICATION	MAY 31/24	MS

SCALE
1 : 300
1 : 300
0 3 6 9 12

DESIGN BB
CHECKED MS
DRAWN BB
CHECKED MS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
August 22, 2024
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

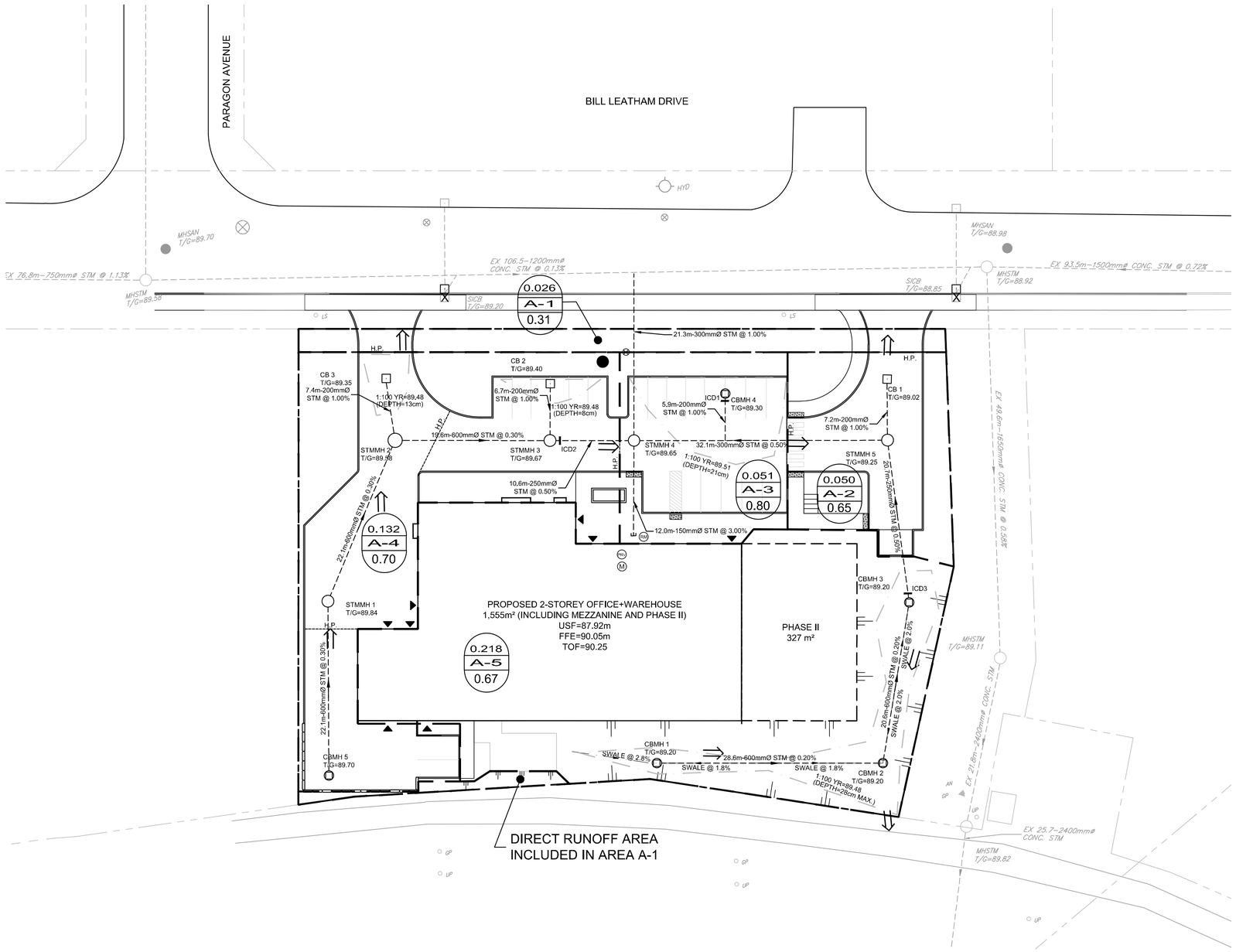
LOCATION
CITY OF OTTAWA
100 BILL LEATHEM DRIVE

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 124011
REV REV # 2
DRAWING No. 124011-GR

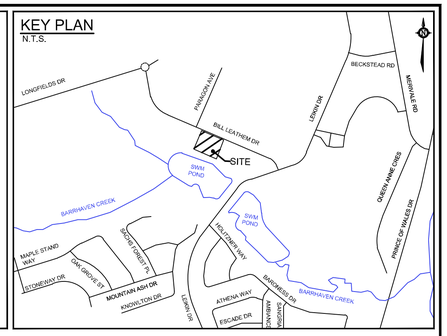
M:\2024\124011\CAD\Civil\124011-GR.dwg, GR, Aug 22, 2024 - 12:50pm, bbarkley

PLAN41.DWG - Bid Items/Sheets



NORTH

KEY PLAN
N.T.S.



LEGEND

0.000 / A-0 / 0.00	DRAINAGE AREA (Ha) / DRAINAGE AREA NUMBER / RUNOFF COEFFICIENT
	DRAINAGE AREA BOUNDARY
	PROPOSED BARRIER CURB
DC	PROPOSED DEPRESSED CURB
1:100 YR	APPROXIMATE PONDING LIMITS
	PROPOSED STORM SEWER AND FLOW DIRECTION
	EMERGENCY OVERLAND FLOW ROUTE
	PROPOSED BUILDING ENTRANCE / EXIT
STM MH	EXISTING STORM MH & SEWER
CB	EXISTING CATCHBASIN C/W CATCHBASIN LEAD
USF	UNDERSIDE OF FOOTING ELEVATION
FFE	FINISHED FLOOR ELEVATION
TOF	TOP OF FOUNDATION
	TERRACING (MAX 3:1 SLOPE)

ICD1 - INLET CONTROL DEVICE DATA TABLE - AREA A-3

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF ICD 75	1500mmØ CBMH 4	200mmØ PVC	6.5	1.80	89.00	3.4	21.4 m^3
1:5 YR				7.3	2.09	89.29	5.3	
1:100 YR				7.6	2.31	89.51	14.2	

ICD2 - INLET CONTROL DEVICE DATA TABLE - AREA A-4

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF ICD 105	1200mmØ STMMH 3	250mmØ PVC	7.0	0.52	87.36	12.3	34.6 m^3
1:5 YR				8.3	0.72	87.56	17.6	
1:100 YR				16.1	2.64	89.48	33.4	

ICD3 - INLET CONTROL DEVICE DATA TABLE - AREA A-5

DESIGN EVENT	ICD TYPE (PLUG TYPE)	OUTLET STRUCTURE	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	CIRCULAR PLUG TYPE 84mm ORIFICE	1200mmØ CBMH 3	250mmØ PVC	14.1	0.86	87.63	16.9	58.5 m^3
1:5 YR				21.3	1.96	88.73	21.4	
1:100 YR				25.1	2.71	89.48	52.8	

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

No.	REVISION	DATE	BY
2	REVISED PER CITY COMMENTS	AUG 22/24	MS
1.	ISSUED FOR SITE PLAN APPLICATION	MAY 31/24	MS

SCALE
1:300
1:300
0 3 6 9 12

DESIGN BB
CHECKED MS
DRAWN BB
CHECKED MS
APPROVED MS

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
August 22, 2024
PROVINCE OF ONTARIO

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LOCATION
CITY OF OTTAWA
100 BILL LEATHEM DRIVE

DRAWING NAME
STORMWATER MANAGEMENT PLAN

PROJECT No. 124011
REV REV # 2
DRAWING No. 124011-SWM

M:\2024\124011\CAD\Civil\124011-SWM.dwg, SWM, Aug 20, 2024 - 9:00am, bbarkley

PLAN1.DWG - 841mmx594mm