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5000 ROBERT GRANT AVENUE

Site Servicing and Stormwater Management Report

Prepared for: LEPINE

5000 ROBERT GRANT AVENUE

Ottawa, Ontario

Site Servicing and Stormwater Management Report

Prepared By:

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

October 27, 2023

Novatech File: 117151
Ref: R-2023-122

October 27, 2023

Planning and Infrastructure Approvals
City of Ottawa
110 Laurier Avenue West
Ottawa, Ontario, K1P 1J1

Attention: **Abi Dieme**

Reference: **5000 Robert Grant Avenue**
Site Servicing and Stormwater Management Report
Our File No.: 117151

Please find enclosed the 'Site Servicing and Stormwater Management Report' for the 5000 Robert Grant Avenue Residential Development. This report is submitted in support of the Site Plan Application for the proposed development.

Should you have any questions or require additional information, please contract the undersigned.

Yours truly,

NOVATECH

Drew Blair, P.Eng.
Senior Project Manager

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DRAWINGS

1.0 INTRODUCTION

Novatech has been retained to prepare a Site Servicing and Stormwater Management Report for the proposed development located at 5000 Robert Grant Avenue. This report is submitted in support of a Site Plan Application for the proposed development.

Figure 1 – Key Plan highlights the site location.

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

1.1 Existing Conditions

The total site area is approximately 2.02 hectares in size and is located within Fernbank Crossing Subdivision on Robert Grant Avenue between Bobolink Ridge and Abbot Street East. The site is currently undeveloped and covered with overgrown grasses throughout. The site is bounded by Robert Grant Avenue to the west, Livery Street to the east, an existing access path and Hydro One power lines to the north, and undeveloped land to the south. The topography of the site generally slopes down from south to north. Refer to **Figure 2** – Existing Conditions Plan for an aerial view of the site.

1.2 Proposed Development

The proposed development consists of three (3) multi-storey apartment buildings (Buildings 'A', 'B' and 'C') on a single podium structure with multiple levels of shared underground parking occupying the majority of the site. Access to the site will be provided by two (2) entrances; the first from Livery Street at the east corner of the site; and the second to Robert Grant Avenue on the south-west side of the site. The following **Table 1.1** – Residential Buildings Summary outlines the proposed residential buildings along with their respective unit counts.

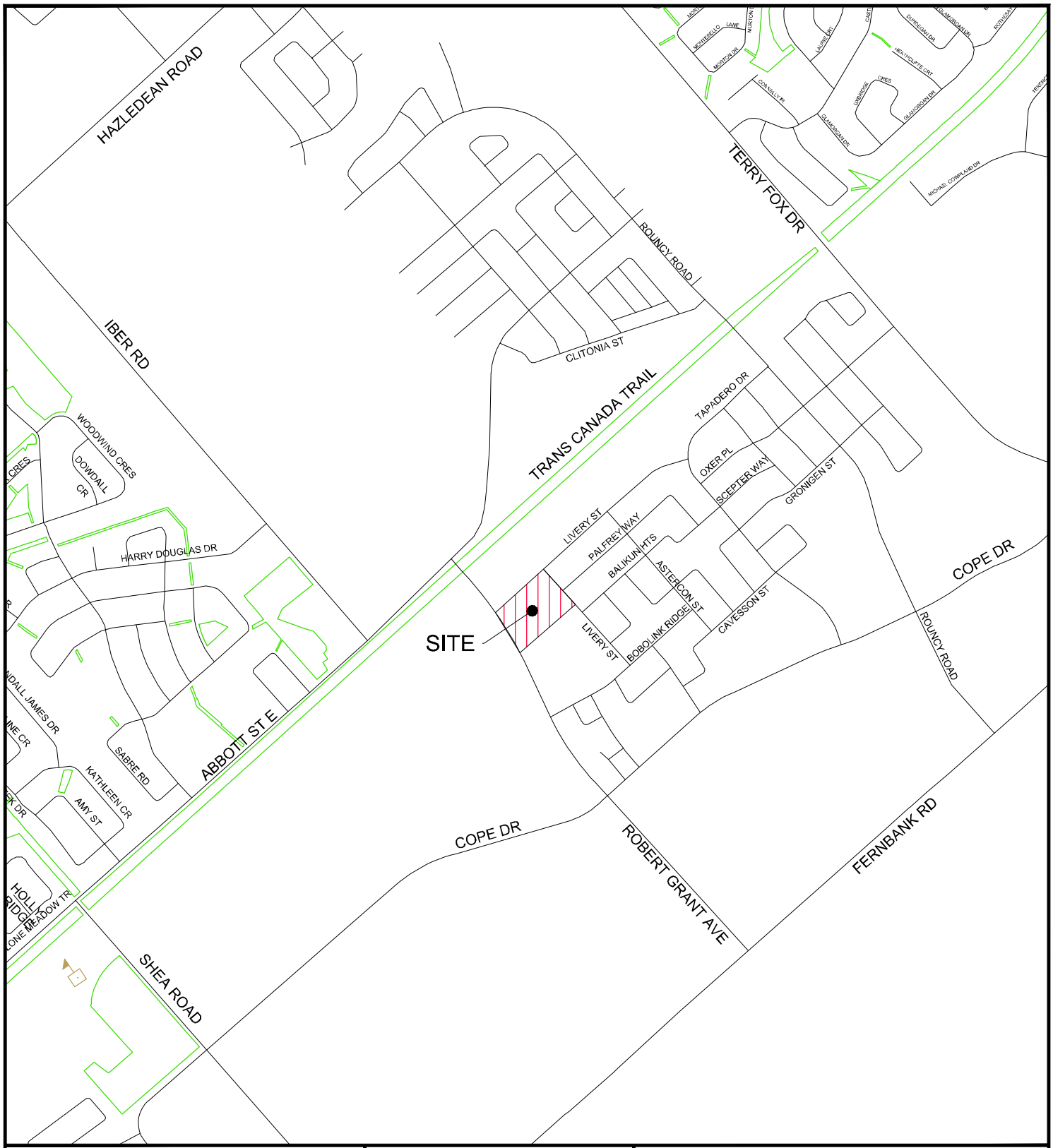
Table 1.1: Residential Buildings Summary

Building ID	Number of Storeys	Unit Count
Building 'A'	4/5	122
Building 'B'	9	163
Building 'C'	18	219

Refer to **Figure 3** – Concept Plan for additional information regarding the proposed development.

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

117151-GP	General Plan of Services
117151-GR	Grading Plan
117151-DET	Civil Details Plan
117151-ESC	Erosion and Sediment Control Plan
117151-SWM	Stormwater Management Plan



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5000 ROBERT GRANT AVE
BLOCK 203

KEY PLAN

SCALE N.T.S

DATE OCT 2023 | JOB 117151 | FIGURE FIGURE 1

SHT8X11.DWG - 216mmx279mm

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M:\2017\117151\CAD\Design\Figures\117151-EX.dwg, Figure2, Oct 10, 2023 - 11:02am, smatthews

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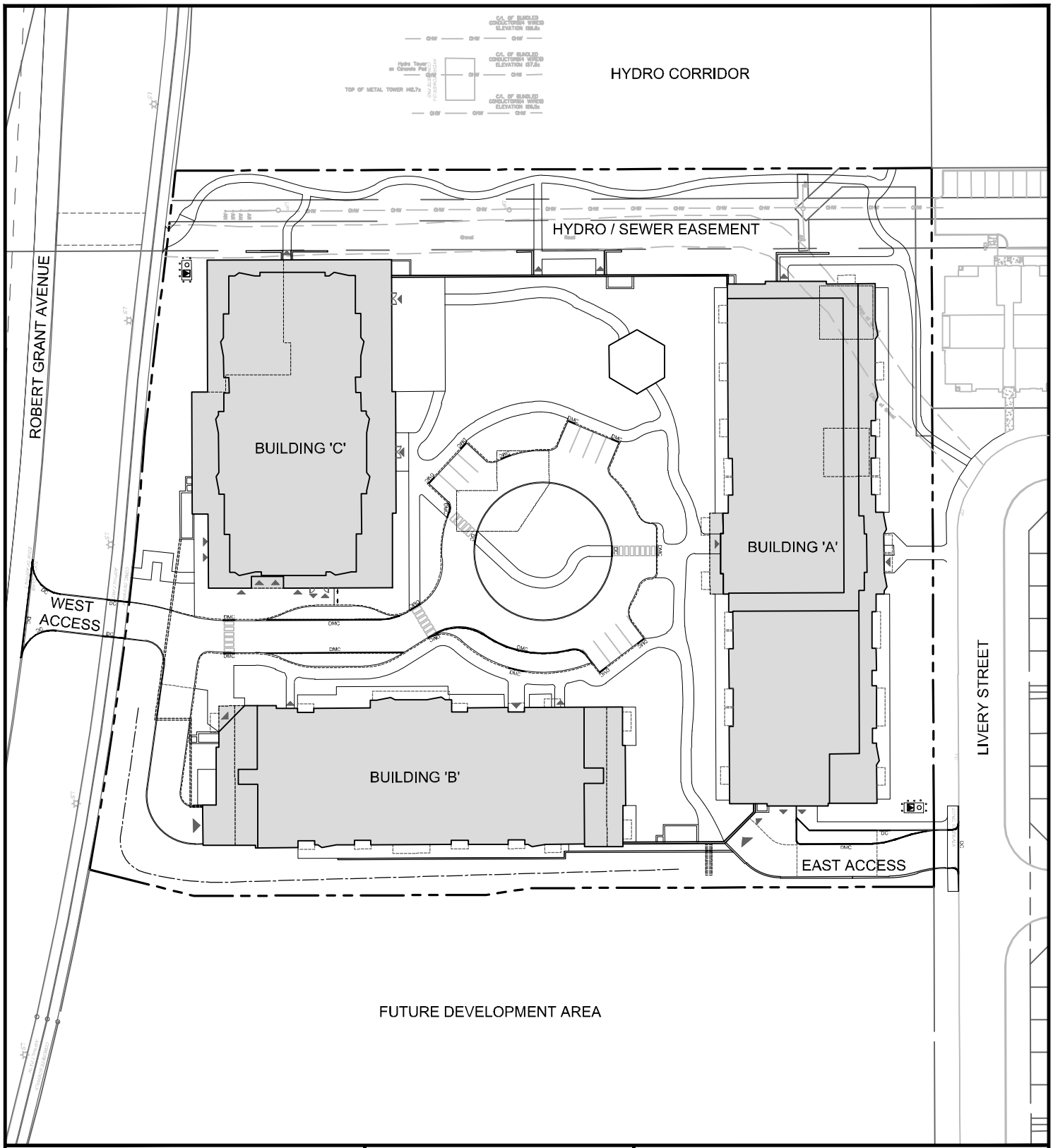
5000 ROBERT GRANT AVE
BLOCK 203

EXISTING CONDITIONS PLAN

SCALE 1 : 750 (0, 10, 20, 30)
DATE OCT 2023
JOB 117151
FIGURE FIGURE 2

SHT11X17.DWG - 279mm X 432mm



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5000 ROBERT GRANT AVE
BLOCK 203

CONCEPT PLAN

SCALE 1 : 1000 (0, 10, 20, 30, 40)

DATE OCT 2023 | JOB 117151 | FIGURE FIGURE 3

SHT8X11.DWG - 216mmx279mm

M:\2017\117151\CAD\Design\Figures\117151-CP.dwg, FIG 3-Concept, Oct 10, 2023 - 10:59am, smatthews

1.3 Geotechnical Investigation

The report titled '*Geotechnical Investigation Proposed René's Court Residential Development'* prepared by Paterson Group Rev. #3 dated May 9, 2019, provides geotechnical recommendations for the proposed development. A summary of the geotechnical investigation's findings are as follows:

- The ground surface of the site slopes down from south to north with a difference in elevation of approximately 6m.
- The site consists of topsoil and/or fill layer comprised of silty sand with gravel, occasional clay, and organics. A silty clay deposit was encountered within the norther portion of the site followed by a layer of glacial till.
- Bedrock information is based on available geological mapping of the site's location. The bedrock consists of interbedded dolostone and limestone of the Gull River formation with an overburden drift thickness ranging from ground surface to 10m depth.
- The long-term groundwater levels of the subject site can be expected at an approximate elevation of 99m, approximately, 5m to 6m below existing grade.
- A permissible grade raise restriction of 2m is recommended for the north portion of the site.

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

1.4 Report References

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

- Geotechnical Investigation, René's Court Residential Development, Block 203 – 1000 Robert Grant Avenue, Ottawa, ON, prepared by Paterson Group Rev. #3 dated May 9, 2019.
- Serviceability Report, 1000 Robert Grant Avenue – Rene's Court, Ottawa, ON, prepared by Novatech dated June 27, 2019
- Memo: Site Servicing – Multiple Service Connections, 5000 Robert Grant Avenue, Ottawa, ON, prepared by Novatech dated July 28, 2023.

2.0 WATER SERVICING

2.1 Proposed Watermain System

Water servicing for the proposed development includes both onsite and offsite watermain works. On-site, the proposed watermain will connect to the existing 200mm dia. servicing stub. Off-site, a second servicing stub will be constructed which connects to the existing 200mm dia. mainline watermain within Livery Street near the existing site servicing stubs. The two watermain services will connect and extend into Building 'A', where mechanical design shall provide internal watermain distribution to proposed Buildings 'B' and 'C'. Additionally, a 200mm dia. watermain will continue on-site to the proposed fire hydrant on the podium. Refer to **Figure 4** – Watermain Network Plan in **Appendix B** and the General Plan of Services (**117151-GP**) for more details.

As the proposed development's basic daily demand is greater than 50 m^3/day, the City of Ottawa requires the development to provide two (2) watermain connections to the existing municipal watermain as per Section 4.3.1 – 'Configuration' of the City of Ottawa Design Guidelines for Water Distribution.

There is one (1) on-site fire hydrant proposed to service the development. Additionally, there is one (1) existing hydrant on Livery Street northeast of the site. The location and details of the proposed site hydrant is illustrated on the drawing **122151-GP** in **Appendix F**. The combination of the proposed and existing hydrants will be sufficient to service the entire site based on a 150m radius from each hydrant as shown on **Figure 5** – Hydrant Coverage Plan in **Appendix B**. Each building will be provided with sprinklers and supplied with fire department (siamese) connections.

2.2 Proposed Domestic Water Demands

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

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

- Design Population
  - Multi-Unit Apartments = 1.8 persons/unit
- Residential Avg. Day Demand = 280 L/c/dap
- Residential Max. Day Demand = 2.5 x Avg. Day
- Residential Peak Hour Demand = 2.2 x Max. Day

Fireflow demands for the proposed development have been calculated using the Fire Underwriters Survey (FUS). Based on information provided by architect, maximum fireflow for the proposed residential buildings are calculated to be 167 L/s. Details of the FUS fireflow calculations can be found in **Appendix B**.

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

Table 2.1: Domestic Water Demand Summary

Building ID	Residential Design Population	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	FUS Fireflow (L/s)
Building 'A'	220	0.27	0.40	0.72	118
Building 'B'	293	0.10	0.15	0.28	105
Building 'C'	394	0.37	0.55	1.00	167
Total Domestic Demands		**0.75**	**1.12**	**2.02**	**167 (Max)**

2.3 Boundary Conditions and Hydraulic Analysis

The boundary conditions provided by the City of Ottawa are specific to two connection points. Only one connection point will be used for hydraulic analysis which is 'Connection 1' to the existing 200mm dia. watermain service stub on Livery Street. These boundary conditions are based on the proposed domestic water demands as shown in **Table 2.1**. Municipal watermain boundary conditions provided by the City of Ottawa can be found in **Appendix B**.

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

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

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

- Maximum HGL
- Peak Hour
- Maximum Day + Fireflow Demand (167 L/s)

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

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

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

Table 2.2: Hydraulic Model Summary

Operating Conditions	Demand (L/s)	Fire Flow (L/s)	Min/Max Allowable Pressure (kPa/psi)	Max/Min Pressure (kPa/psi)
High Pressure (Max HGL)	2.94	N/A	690/80 (Max)	564.1 / 81.8 (Max)
Peak Hour	16.17	N/A	276/40 (Min)	488.4 / 70.8 (Min)
Max Daily + Fire Flow Demand	7.35	167	138/20 (Min)	157.2 / 22.8 (Min)

The proposed water distribution system was checked for high pressures during average daily demand using a hydraulic boundary condition provided by the City of Ottawa. The model indicated that pressures above 550 kPa (80 psi) exist within the site, up to a maximum of 564 kPa (81.8 psi). Therefore, a pressure reducing valve will be required for the site. A note has been added to the drawings located in **Appendix F** to indicate that a pressure reducing valve is required.

The model indicates that the existing municipal watermain infrastructure on Livery Street along with the on-site watermain infrastructure will provide adequate fireflows and system pressures to service the site under each operating condition.

3.0 SANITARY SERVICING

3.1 Proposed Sanitary Servicing

Sanitary servicing for the proposed development includes both on-site and off-site works. Sanitary flows from the site will be directed to existing municipal sanitary sewer infrastructure using a series of 200mm dia. sanitary gravity sewers and maintenance holes. Multiple sanitary outlets will be utilized by the proposed development to convey sanitary flows into existing surrounding municipal sanitary infrastructure. The multiple connections to the sanitary sewer system from this site is detailed in the *MEMO: Site Servicing – Multiple Service Connections* by Novatech dated July 28, 2023. This memo has been reviewed previously by the City of Ottawa, included in **Appendix E**.

Sanitary flows generated from Building 'A' will outlet to the existing 250mm dia. sanitary servicing stub which conveys sanitary flows to Livery Street. To connect to the existing servicing stub, it is proposed to install a 200mm dia. sanitary sewer and a sanitary maintenance hole.

Sanitary flows from Buildings 'B' and 'C' will both outlet to the existing municipal sanitary maintenance hole on Robert Grant Avenue. A series of on-site and off-site 200mm dia. sanitary sewers and maintenance holes will convey sanitary flows to the existing municipal sanitary maintenance hole. Refer to the General Plan of Services (**117151-GP**) in **Appendix F** for details.

3.2 Proposed Peak Sanitary Flows

The proposed sanitary servicing for the 5000 Robert Grant Avenue Residential Development conforms to the recommendations from the *Ottawa Sewer Design Guidelines (October 2012)* and technical bulletin *ISTB-2018-01* (March 2018).

Design Criteria

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

- Site Area = 2.02 ha
- Design Population
  - Multi-Unit Apartments = 1.8 persons/unit
- Average Flow per Capita = 280 L/cap/day
- Residential Peaking Factor = Harmon Formula (max. 4.0), K = 0.8
- Infiltration Rate = 0.33 L/s/ha
- Minimum Pipe Size = 200 mm diameter
- Minimum Velocity = 0.6 m/s
- Manning's n = 0.013
-

Sanitary Flows

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

Table 3.1: Proposed Sanitary Peak Flow Summary

Flow Type	Design Population	Area (ha)	Peak Design Flow (L/s) *
Livery Street Outlet			
Residential Flows – Building 'A'	220	-	2.50
Extraneous Flows	-	0.68	0.22
Totals	220		**2.72**

Robert Grant Avenue Outlet			
Residential Flows – Building 'B'	293	-	3.30
Residential Flows – Building 'C'	394	-	4.37
Extraneous Flows	-	1.34	0.44
Totals	688		**7.84**

** Peak sanitary flow varies based on decreasing Peaking Factor*

As shown above in Table 3.1, Building 'A' will produce a peak design flow of 2.72 L/s outletting to the existing 250mm dia. sanitary servicing stub on Livery Street. Buildings 'B' and 'C' will generate a peak design flow of 7.84 L/s outletting to existing municipal sanitary maintenance hole MHSAN 72812 on Robert Grant Avenue via the sanitary sewer extension across the property frontage. The sanitary sewer design sheet for the proposed development is included in **Appendix C**.

As part of the Fernbank Crossing Subdivision, an allowable sanitary release rate of 3.3 L/s from the proposed development to the existing 250mm dia. sanitary servicing stub on Livery Street was approved. The split flows from the proposed development have been designed to be less than the allowable (2.7 L/s of the 3.3 L/s allowed) in accordance with the downstream system. A memorandum has been submitted to the City of Ottawa proposing multiple service connections from the proposed development. Refer to the *MEMO: Site Servicing – Multiple Service Connections* by Novatech which includes sanitary design sheets from the Fernbank Crossing Subdivision and is included in **Appendix E**.

The memo also includes an approximate estimate of the anticipated off-site flows and sanitary sewer capacities in the downstream system within Robert Grant Avenue. It is estimated that there will be 22.2 L/s of available flow capacity in the downstream sanitary and the proposed development will add approximately 7.8 L/s which is well within the excess capacity of the Robert Grant sewer. Refer to *MEMO: Site Servicing – Multiple Service Connections* by Novatech which includes information regarding the calculation off-site future sanitary flows to be conveyed by the existing Robert Grant Avenue sanitary sewer.

Table 3.2: Available Capacity and Proposed Peak Flow Summary

Sanitary Outlet	Service	Existing Available Capacity	Proposed Sanitary Peak Flows
Livery Street MHSAN 65150	Building 'A' Building 'B'	3.3 L/s	2.72 L/s
Robert Grant Ave MHSAN 72812	Building 'C'	22.2 L/s	7.84 L/s

As indicated in the table above, the calculated proposed sanitary peak flows are less than the indicated allowable peak flows and the downstream system has sufficient capacity to service the proposed development.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

The subject site is located within the Fernbank Crossing Subdivision. Stormwater runoff from the site is conveyed west along Livery Street and outlets to SWM Pond # 6 within the Blackstone Subdivision. Pond # 6 has been designed to provide an 'Enhanced' Level of Protection (i.e.: 80% TSS removal) before releasing stormwater to the Monahan Drain system and ultimately the Jock River. On-site quantity control, however, will be required due to the increased imperviousness of the proposed site development area.

The existing subject site has a 1200mm / 1350mm dia. concrete trunk storm sewer system located within the City of Ottawa easement along the north and a portion of the east property lines. There is a 375mm dia. PVC municipal storm sewer in Livery Street to the north-east and a 375mm / 450mm dia. concrete municipal storm sewer in Robert Grant Avenue to the south-west.

A combination of roof and podium drains will be installed to capture and convey surface stormwater to internal underground storage tanks. The SWM storage tanks will store stormwater runoff from the proposed development and outlet to two (2) existing municipal storm manholes at a controlled release rate.

4.1 Stormwater Management Criteria and Objectives

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

- Maintain existing drainage patterns.
- Provide a dual drainage system (i.e.: minor, and major system flows).
- Design storm for receiving sewer is the 5-year design storm.
- Runoff Coefficient: C= 0.5 or C=pre-development, whichever is less.
- Time of concentration (Tc): To be calculated, the minimum Tc= 10 min.
- Allowable release rate for the subject site is set at: 353 L/s.
- Ensure that no surface ponding will occur on the paved surfaces (parking stalls and drive aisles) during the 2-year storm event.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

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

There are currently no water quantity or water quality control measures being provided on site. Consequently, the uncontrolled pre-development runoff from the 2.017 ha site was calculated using the Rational Method to be 116.8 L/s during the 5-year design event and 250.4 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations. As specified by the City of Ottawa, the maximum allowable release rate from the subject site is **353 L/s**.

4.2 Post-Development Stormwater Flows

The proposed development will be serviced by a new on-site storm sewer system by extending a new 300mm dia. outlet pipe to the existing 375mm dia. PVC storm sewer in Livery Street, as well as connecting to the existing on-site 1200mm / 1350mm dia. concrete sewer system in the municipal easement. To mitigate the stormwater related impacts due to the increase in imperviousness of the site, stormwater runoff will be attenuated using an inlet control device (ICD) within the on-site storm sewer system servicing the east access off Livery Street. All building roof drains and podium drains will be controlled by mechanical pumps and stored within two internal SWM tanks. Details of the proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report.

The multiple connections to the storm sewer system from this site is detailed in the Site Servicing - Multiple Service Connections Memo by Novatech dated July 28, 2023. This memo has been reviewed previously by the City of Ottawa and is included in **Appendix E**.

Area DR-1: Direct Runoff East to Livery Street

The runoff from this sub-catchment area will flow overland towards the roadway catch basins in Livery Street. The uncontrolled post-development flows from this sub-catchment area were calculated using the Rational Method to be approximately 3.6 L/s during the 2-year design event, 4.9 L/s during the 5-year design event and 10.4 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations.

Area DR-2: Direct Runoff West to Robert Grant Avenue

The runoff from this sub-catchment area will flow overland towards the roadway catch basins in Robert Grant Avenue. The uncontrolled post-development flows from this sub-catchment area were calculated using the Rational Method to be approximately 5.7 L/s during the 2-year design event, 7.8 L/s during the 5-year design event and 15.6 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations.

Area DR-3: Direct Runoff North to Adjacent Lands

The runoff from this sub-catchment area will flow overland towards the existing stormwater system within the adjacent open space to the north. The uncontrolled post-development flows from this sub-catchment area were calculated using the Rational Method to be approximately 20.9 L/s during the 2-year design event, 28.4 L/s during the 5-year design event and 57.6 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations.

Area A-1: Uncontrolled Site Runoff to Livery Street Sewer

The runoff from this sub-catchment area will be directed to a ditch inlet catchbasin located within the drainage proposed along the east property line. Stormwater runoff will be attenuated using an inlet control device (ICD) within the outlet pipe of CBMH 01 servicing the east access road off Livery Street and the proposed storage swale The uncontrolled post-development flows from this sub-catchment area were calculated using the Rational Method to be approximately 5.9 L/s during the 2-year design event, 8.1 L/s during the 5-year design event and 15.4 L/s during the 100-year design event. Refer to **Appendix D** for detailed calculations.

Area A-2: Controlled Flow from East Drainage Swale

The post-development flow from this sub-catchment area will be attenuated using a plug type ICD (IPEX Tempest Vortex LMF – Custom sized for specific design flows & head), installed in the outlet pipe of CBMH 01. Stormwater runoff from this sub-catchment area will be temporarily stored

underground within the oversized 610mm dia. storm sewer and on the surface (within the drainage swale upstream of DICB 01) as well as the entrance of the east drive aisle prior to being discharged into the municipal storm sewer system in Livery Street. The site has been designed to ensure that no stormwater will pond on the private paved surfaces during the 2-year storm event (as a minimum).

Table 4.1: Design Flow and ICD Table

Design Event	Sub-Catchment Area A-2				
	ICD Type	Design Flow (L/s)	Water Elevation (m)	Storage Vol. Required (m^3)	Max Storage Provided (m^3)
2-Year	Ipex Tempest Vortex LMF Custom	3.4 L/s	101.23 m (u/g)	6.3 m^3	23.5 m^3
5-Year		4.1 L/s	101.55 m (u/g)	9.0 m^3	
100-Year		6.5 L/s	103.10 m	20.0 m^3	

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

Area R-1: Controlled Flow from Internal SWM Tank #1

Stormwater runoff from this sub-catchment area will be captured by approximately half of the main building roof drains, lower terrace drains and podium deck drains before being directed to internal stormwater storage Tank #1. Stormwater collected within the storage tank will be pumped up to the proposed storm service and released into the existing storm sewer in the municipal easement tributary to the Livery Street storm sewer outlet. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 82 L/s (1300 USGPM), which is significantly less than the maximum allowable flow for this catchment area. A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency power supply will also be provided and the internal SWM tank will be equipped with an emergency overflow pipe from the top of the tank outletting to the surface on the north side of the building podium (the internal plumbing is to be pressure rated piping specified by the mechanical engineer). The storm service will be equipped with a backflow prevention device to protect the building from any potential sewer back-ups.

Table 4.2: Internal Stormwater Storage Tank #1 and Pumped Flow

Design Event	Post-Development Conditions		
	Design Flow (L/s)	Volume Required (m^3)	Volume Provided (m^3)
1:2 Year	82.0 L/s	30.6 m^3	> 180 m^3
1:5 Year	82.0 L/s	59.0 m^3	
1:100 Year	82.0 L/s	178.5 m^3	

Refer to **Appendix D** for detailed calculations.

Area R-2: Controlled Flow from Internal SWM Tank #2

Stormwater runoff from this sub-catchment area will be captured by approximately half of the main building roof drains, lower terrace drains and podium deck drains before being directed to internal stormwater storage Tank #2. Stormwater collected within the storage tank will be pumped up to the proposed storm service and released into the existing storm sewer in the municipal easement

tributary to the Livery Street storm sewer outlet. A pump (designed by the mechanical consultant) is required to control flow from the tank to a maximum rate of 82 L/s (1300 USGPM), which is significantly less than the maximum allowable flow for this catchment area. A "stand-by" pump will be provided for emergency and/or maintenance purposes. An emergency power supply will also be provided and the internal SWM tank will be equipped with an emergency overflow pipe from the top of the tank outletting to the surface on the south side of the building (the internal plumbing is to be pressure rated piping specified by the mechanical engineer). The storm service will be equipped with a backflow prevention device to protect the building from any potential sewer back-ups.

Table 4.3: Internal Stormwater Storage Tank #2 and Pumped Flow

Design Event	Post-Development Conditions		
	Design Flow (L/s)	Volume Required (m^3)	Volume Provided (m^3)
1:2 Year	82.0 L/s	29.2 m^3	> 180 m^3
1:5 Year	82.0 L/s	57.2 m^3	
1:100 Year	82.0 L/s	173.7 m^3	

Refer to **Appendix D** for detailed calculations.

4.3 Stormwater Management Summary

The following Stormwater Management Tables provides a summary of the total post-development flows from the site and compares them to the uncontrolled pre-development flows and the site allowable release rate as specified by the City of Ottawa. As indicated in the tables, the 2-year, 5-year and 100-year post-development flows will be significantly less than the maximum allowable release rate for the site. Refer to **Appendix D** for detailed SWM calculations.

Project #: 117151
Project Name: 5000 Robert Grant
Location: Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

Date Prepared: 10/6/2023

Proposed Residential Development
5000 Robert Grant Avenue - Buildings 'A', 'B' and 'C'

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}	Subdivision Allowable C_w	1:2 Year Flow (L/s)	1:5 Year Flow (L/s)	1:100 Year Flow (L/s)	Pre-Development Site Flows and Allowable Flow (L/s)*
Total Site Area	2.017	0.000	0.000	2.017	0.20	0.25	0.80	86.1	116.8	250.4	467
Site Allowable											**353**

* Allowable flows as stipulated in the City of Ottawa Pre-Consultation meeting

Post - Development Site Flows																	
Area	Description	Area (ha)	A_{imp} (ha) C=0.9	A_{perv} (ha) C=0.2	C_5	C_{100}	Flow Control Device	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	
DR-1	Direct Runoff to East (Livery)	0.078	0.002	0.076	0.22	0.27	-	3.6	4.9	10.4	-	-	-	-	-	-	-
DR-2	Direct Runoff to West (Robert Grant)	0.078	0.016	0.062	0.34	0.40	-	5.7	7.8	15.6	-	-	-	-	-	-	-
DR-3	Direct Runoff to North Property	0.305	0.053	0.252	0.32	0.38	-	20.9	28.4	57.6	-	-	-	-	-	-	-
A-1	Un-Controlled Ramp / Drive Aisle	0.034	0.030	0.004	0.82	0.91	-	5.9	8.1	15.4	-	-	-	-	-	-	-
A-2	Controlled Access Road & Ditch	0.150	0.024	0.126	0.31	0.37	IPEX LMF ICD	-	-	-	3.4	4.1	6.5	6	9	20	24
R-1	Controlled Flow - Internal Tank 1	0.692	0.692	0.000	0.90	1.00	Mech. Pump	-	-	-	82.0	82.0	82.0	31	59	179	> 180
R-2	Controlled Flow - Internal Tank 2	0.680	0.680	0.000	0.90	1.00	Mech. Pump	-	-	-	82.0	82.0	82.0	29	57	174	> 180
	Totals :	2.017	-	-	-	-	-	**36.2**	**49.2**	**99.0**	**167.4**	**168.1**	**170.5**	**66**	**125**	**372**	**384**
										Total Stormwater Flows :	**203.6**	**217.3**	**269.6**	353 L/s (Total Post-Development Site Allowable)			

T_c = 10mins

4.4 Emergency Overland Flow Route

In the case of a major rainfall event exceeding the design storms provided for, the stormwater located within the subject site will overflow along the building podium towards the west access road for the site and ultimately flow towards Robert Grant Avenue. The emergency overland flow route is shown on the enclosed **Grading Plan** (**117151-GR**).

4.5 Stormwater Quality Control

As stated above, stormwater runoff from the site is tributary to SWM Pond # 6 which has been designed to provide an 'Enhanced' Level of Protection (i.e.: 80% TSS removal) before releasing stormwater to the Monahan Drain system and ultimately the Jock River.

5.0 EROSION AND SEDIMENT CONTROL MEASURES

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

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair, or replacement requirements. Sediments or granulars that enter site sewer shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (**117151-ESC**) for additional information.

6.0 CONCLUSION AND RECOMMENDATIONS

This Site Servicing and Stormwater Management Report has evaluated the servicing (water, sanitary and storm servicing) and stormwater management for the proposed high-density residential development at 5000 Robert Grant Avenue.

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

- The proposed residential development will be serviced by municipal watermain, sanitary and storm sewers located in Livery Street and Robert Grant Avenue.
- Residential Buildings 'A', 'B', and 'C' will be sprinklered and supplied with fire department (Siamese) connections. The Siamese connections will be located within 45m of a nearby fire hydrant.
- The proposed development will be serviced by two (2) 200mm dia. water main connections to the existing municipal watermain within Livery Street.
- The sanitary sewer design servicing the proposed residential development conforms to allowable release rates and existing sanitary sewer available capacities. Sanitary flows from Building 'A' will discharge to the existing sanitary servicing stub on Livery Street. Buildings 'B' and 'C' will discharge to the existing sanitary sewer system in the Robert Grant Avenue R.O.W. via a new sanitary sewer extension across the property frontage.
- The proposed development includes various methods of controlled and uncontrolled conveyance of stormwater.
    - There is sufficient capacity in the downstream storm sewer systems to accommodate the proposed development.
    - The necessary stormwater quantity control measures have been provided on-site to achieve the requirements established by the City of Ottawa.
    - Stormwater quality control will be provided in the downstream stormwater management facility (Pond #6) located within the Fernbank Crossing Subdivision.
- An emergency overland flow route has been adequately designed for the site.
- Temporary erosion and sediment control measures will be implemented on-site during construction.

7.0 CLOSURE

The preceding report is respectfully submitted for review and approval. Please contract the undersigned should you have and questions or require additional information.

NOVATECH

Prepared by:

Billy McEwen, B.A.Sc
EIT

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

Reviewed by:

Drew Blair, P.Eng.
Senior Project Manager

Appendix A
Correspondence

File Number: PC2023-0046
March 10, 2023

Pre-Application Consultation Meeting Minutes

Property Address: 5000 Robert Grant Avenue
Location: Virtual – Microsoft Teams
Meeting Date: March 2, 2023

Attendees: Pascale Lepine, Lepine Corporation
Francis Lepine, Lepine Corporation
Bria Aird, Fotenn Consultants
Bipin Dhillon, Fotenn Consultants
Cara Ruddle, Novatech Engineering Consultants
Kim Pham, Neuf Architects
Sarah Ezzio – Planning, City of Ottawa
Kieran Watson – Planning, City of Ottawa
Josiane Gervais – Transportation, City of Ottawa
Christopher Moise – Urban Design, City of Ottawa
Mark Elliott – Environmental Planning, City of Ottawa
Abi Dieme – Engineering, City of Ottawa
Daniela Gomes Tavares Correia – Parks and Facilities, City of Ottawa

Policies/Designations of the Site

- Official Plan – Suburban Transect, Neighbourhood Designation
  - Robert Grant frontage designated as Minor Corridor
  - Evolving Neighbourhood Overlay
- Fernbank Community Design Plan
  - Designated as Mixed Use, and within the Community Core area
  - The adjacent site to the south is designated as Village Green
- Zoning – Arterial Mainstreet Zone with an Urban Exception Zone 2152, a maximum Floor Space Index of 4.3, and subject to height Schedule 437, 'AM[2152] F(4.3) S437.' A portion of the site is subject to a holding symbol.

Engineering

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

Water Infrastructure**:**

- Pressure Zone: 3W
- Frontage Charges do not apply
- Accessible watermain: 200mm PVC on Livery St
  There is an existing capped 200mm watermain at the corner of Livery Street dropped to service the site.
- Submission documents must include:
  1. Boundary Conditions - civil consultant to request boundary conditions from the City's assigned Project Manager, Development Review. Water boundary conditions request must include the location of the service and the expected loads required by the proposed development. Please provide all the following information:
     - Location of service (show on a plan or map)
     - Type of development

- Average daily demand: ___ l/s.
- Maximum daily demand: ___l/s.
- Maximum hourly daily demand: ___ l/s.
- Required fire flow and completed FUS Design Declaration if applicable
- Supporting Calculations for all demands listed above and required fire flow as per Ontario Building Code or Fire Underwriter Surveys (See technical Bulletin ISTB-2021-03.

2. Watermain system analysis demonstrating adequate pressure as per section 4.2.2 of the Water Distribution Guidelines.
3. Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I table 1 – maximum flow to be considered from a given hydrant.
4. Any proposed emergency route (to be satisfactory to Fire Services).

Sanitary Sewers:

- Accessible Sanitary Sewers: 250mm PVC on Robert Grant Avenue, 250 mm PVC on Livery Street (200 mm stub dropped within the property)
- Please note that the City currently allows one sanitary sewer connection per property to protect the public sewer system. Multiple connections may be permitted on a case-by-case basis.
- A monitoring maintenance hole is required to be located on private property.
- Provide an analysis to demonstrate that there is adequate residual capacity in the receiving and downstream wastewater system to accommodate the proposed development
- Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

Storm Sewers:

- Accessible Municipal Storm Sewer: 450mm concrete on Robert Grant Avenue, 1200/1350mm concrete within a City easement through subject site, and 375mm PVC on Livery St
- Please note that the City currently allows one storm sewer connection per property to protect the public sewer system. Multiple connections may be permitted on a case-by-case basis
- Monitoring maintenance hole is not required on private property.

Storm Water Management:

- Quality Control:
  - Enhanced level water quality control provided in the downstream stormwater management facility
- Quantity Control
  - Design storm for receiving sewer: 5-year design storm
  - Runoff Coefficient: C= 0.5 or C=pre-development, whichever is less

- Time of concentration (Tc): To be calculated, min Tc= 10 mins
- Allowable release rate: 353 L/s

Additional Comments:

- Transitway Renewal is planned this year along Robert Grant Avenue – more information will be shared about this as it becomes available.
- No road moratorium that would impact the application has been identified
- Any easement identified should be shown on all plans
- Permanent structures (curbs, walls, etc) are not permitted within the City's easement.
- Trees are not permitted within the City's easement.
- Should excavation encroach within the City's easement, the City requires tie back drawings and underground structure profile to see the clearances from the sewer. The City will also require pre and post development CCTV of the sewer for review.
- For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc). Additionally, include in the submission the location of the fixtures, fixture type (make, model, part number and mounting height
- Sensitive Marine Clay (SMC) is widely found across Ottawa- geotechnical reports should include Atterberg Limits, consolidation testing and sensitivity values.

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

  - Ottawa Sewer Design Guidelines (October 2012)
  - Ottawa Design Guidelines – Water Distribution (2010)
  - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
  - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
  - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
  - City of Ottawa Park and Pathway Development Manual (2012)
  - City of Ottawa Accessibility Design Standards (2012)
  - Ottawa Standard Tender Documents (latest version)

  Should you have any questions or require additional information, please contact Abi Dieme.

Urban Design

- This proposal does not run along or does not meet the threshold in one of the City's Design Priority Areas and need not attend the City's UDRP. Staff will be responsible for evaluating the proposal and providing design direction.

- A scoped Design Brief is a required submittal for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided.
    - Phasing: As this project will be developed in phases over time, we recommend some indication for how the remaining undeveloped land will be treated while it awaits the next phase. We recommend considering sodding the lands to prevent it looking like a construction site in the interim.
    - We recommend all buildings fronting public right of ways provide a primary entrance facing that right of way.
    - We require more information to better understand site connectivity.
    - We recommend providing additional massing information of the proposal and the neighbouring properties to understand the relationship to existing built form to east and planned context to the south (see design brief TOR for details).
    - We recommend providing additional details for how the trees on the parking structure are intended to be designed.
    - We recommend review of section 6.6 of the Fernbank CDP.
    - A Type II Wind Analysis will be required. Please refer to the Terms of Reference for the wind analysis and conduct the studies to evaluate the impacts.
    - ***Note. The Design Brief submittal should have a section which addresses these pre-consultation comments.***

Please contact Christopher Moise, Urban Design for follow-up questions.

Planning

1. Thank you for following the height schedule and adhering to the general concept that was presented at the time of the zoning application.
2. This site has strong policy direction for supporting a mixed-use component: it is intended to be the community core of the Fernbank community, and the new OP directs that minor corridor designations are key to supporting the 15-minute neighbourhood concept. Please provide a commercial component to support the residents of the site and the surrounding community.
3. Please follow the Site Design and Built Form Guidelines included in Section 6.6.1 (Community Core) and 6.6.3 (Mixed Use) of the Fernbank Community Design Plan.
4. The Fernbank CDP directs the site to the south to incorporate a future Village Green, intended to be a civic gathering and passive open space for residents. Please provide pathway connections throughout the site and to the Village Green site to the south
5. Please include a walkway connection from the existing sidewalk on Robert Grant internally to the site and ensure clear pedestrian walkways provide access to building entrances.
6. This is an important site within the Fernbank community core, and the landscaped/open area central to the site will be important to provide an amenity to the residents and to realize the vision of the Community Core designation of the CDP. Please provide high

quality landscaped areas and ensure the design is welcoming and functional. You might also consider walkways with pedestrian easements or a POPs, or including the amenity building that was discussed at the rezoning stage. Pedestrian easements will likely be required.

7. With the site plan submission, it will be important to show that the areas above the parking garage have sufficient soil volumes to support trees.
8. With the site plan submission, show interim conditions between phases for all elements e.g. landscaping, traffic circulation, servicing. All phases need to function independently of eachother.
9. Please include the entirety of the public pathway block with the first phase of site development.
10. Ensure the parking requirements are met, the rezoning did not grant a reduction.
11. Please provide the following and show clearly on the site plan:
    a. Bicycle parking, including demonstration that the existing buildings on site have sufficient bicycle parking facilities if it is one lot for zoning purposes.
    b. Amenity Area, meeting the Section 137 requirements.
    c. Loading and waste facilities, including dimensions.

Process-Related Comments:

12. A lifting of a holding application will be needed prior to the third phase of development. It will not affect the construction of the underground garage with the earlier phases.
13. As the phases share many common elements, a severance application will be premature until the site plan is finalized and approved.
14. There are a few ways a phased site plan can be accomplished: either it can be approved in its entirety and securities can be phased (collected prior to the BP release for each phase), or site plan approval can be granted for the first phase and subsequent revision applications can be submitted. Either way, we will need to understand how the site will function in its final form, and please include the phasing lines on the submitted plans.
15. Please be aware that the City's High Performance Development Standards are forthcoming (expected at Council this spring) and may require additional submission requirements.
16. The City's new Community Benefits Charge will apply to this proposal and will be collected at Building Permit stage.
17. Please note that the City is currently developing an implementation strategy to respond to the Provincial Bill 109 and there may be some imminent changes to the planning process, such as requiring rezonings to be finalized prior to site plan submissions. We are happy to discuss as more details become available. Please stay tuned to the changing context

18. Please discuss the details of the proposal with the ward councillor prior to application submission.

Feel free to contact Sarah Ezzio at sarah.ezzio@ottawa.ca for follow-up questions, and we are happy to discuss any of our comments further as the proposal progresses.

Transportation

- Follow Transportation Impact Assessment Guidelines:
    - A TIA is required. Please submit the Screening Form and Scoping report to josiane.gervais@ottawa.ca at your earliest convenience. Alternatively, an update to the previous TIA can be provided to address the new submission and, unless any major changes have occurred, can be submitted as a revision to Step 4 (i.e. no need to go through individual step 2 and 3 submissions).
    - It is the City's preference that the TIA address the site at full-buildout to ensure the TIA addresses all stages.
    - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
    - An update to the *TRANS Trip Generation Manual* has been completed (October 2020). This manual is to be utilized for this TIA. A copy of this document can be provided upon request.
- Clear throat requirements for >200 residential units on an arterial is 40m. It is acknowledged that the ramp itself provides some queuing opportunity and was shown at the time of re-zoning. Ensure any gate feature for the garage access is as far down the ramp as possible to extend queueing opportunity. Any site re-design to accommodate a longer clear throat length is encouraged.
- TMP includes:
    - Transit Priority Corridor (Isolated Measures) along Robert Grant (Affordable Network)
    - BRT along Robert Grant (2031 Network Concept)
    - Widening Robert Grant to 4 lanes (Ultimate Concept)
- Construction start for the Robert Grant extension (i.e. Abbott St to Hazeldean) is anticipated to occur in 2023. The roadway is tentatively scheduled to be in service by the end of 2023.
- As the proposed site is multi-use, AODA legislation applies.
    - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
    - Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).
    - Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements. https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards
- On site plan:
    - Ensure site access meets the City's Private Approach Bylaw.

  - Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.
  - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
  - Turning movement diagrams required for internal movements (loading areas, garbage).
  - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
  - Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
  - Sidewalk is to be continuous across accesses as per City Specification 7.1 (on both Robert Grant and Livery).
  - Show slope of garage ramp on site plan. Note that underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%. Ramp grades greater than 15% can be psychological barriers to some drivers.
- Noise Impact Studies required for the following:
  - Road, as the site is within proximity to Robert Grant. Note that Robert Grant is ultimately to be widened to a 4-lane divided cross-section, and include BRT (at-grade crossings) in the median. A high-level design can be found on the West Transit Way Connections (Terry Fox Dr to Fernbank Rd) EA study. The noise study must consider the widened roadway and BRT as the 'mature state'.
  - Rail, within 100m of Carleton Place Rail Corridor (currently a non-active rail line, acquired for future rail corridor).
  - Stationary, if there will be any exposed mechanical equipment due to the proximity to neighboring noise sensitive land uses.

Please contact Josiane Gervais for follow up questions relating to the transportation comments.

Environmental Planning

- There is no trigger for an EIS
- Buildings above 4 storeys in height must include the mitigation measures in the Bird Safe Design Guidelines. The nearby hydro corridor is a likely migration route, so it is important to take measures to reduce the occurrence of bird mortality.
- While that the current design does incorporate a substantial number of trees already, any additional plantings or other features that may contribute to a cooler microclimate would be appreciated. In addition to the tree canopy goals, this also helps to combat the effects of the urban heat island effect and climate change per section 10.3 of the OP.

Please contact Mark Elliot for follow up questions relating to Environmental Planning comments.

Forestry

- There is no TCR requirement.

Planning Forester Landscape Plan tree planting requirements:

Please note that all process for reviewing and approving LP tree planting have changed at the City – in order to effectively review your submission in a timely manner the Planning Forester will need to ensure that all the bullets listed below have been addressed. Reach out to Mark.Richardson@Ottawa.ca if you have any questions.

1) Minimum Setbacks
   - Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
   - Maintain 2.5m from curb
   - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
   - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
2) Tree specifications
   - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
   - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
   - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
   - Plant native trees whenever possible
   - No root barriers, dead-man anchor systems, or planters are permitted.
   - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
3) Hard surface planting
   - Curb style planter is highly recommended
   - No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
   - Trees are to be planted at grade
4) Soil Volume
   - Please document on the LP that adequate soil volumes can be met:

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

Conifer	25	15

Sensitive Marine Clay: Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Parks

The parks comments are outstanding and will be provided once more information becomes available.

Feel free to contact Daniela Correia for follow up questions relating to these parks comments.

General Comments

A Site Plan Control (complex) application and a Lifting of a Holding application are required. The list of required plans and studies are attached to this email.

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are generally valid for one year, unless impacted by business process changes in response to Bill 109. You may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **S** indicates that the study or plan is required with application submission.
A indicates that the study or plan may be required to satisfy a condition of approval/draft approval.

For information and guidance on preparing required studies and plans refer here:

S/A	ENGINEERING		S/A
S	1. Site Servicing Plan	2. Site Servicing Study	**S**
S	3. Grade Control and Drainage Plan	4. Geotechnical Study	**S**
	5. Composite Utility Plan	6. Groundwater Impact Study	
	7. Servicing Options Report	8. Wellhead Protection Study	
S	9. Transportation Impact Assessment (TIA)	10.Erosion and Sediment Control Plan	**S**
S	11.Storm water Management Report	12.Hydro geological and Terrain Analysis	
	13.Hydraulic Water main Analysis	14.Noise / Vibration Study	S
	15.Roadway Modification Functional Design	16.Confederation Line Proximity Study	

S/A	PLANNING / DESIGN / SURVEY		S/A
	17.Draft Plan of Subdivision	18.Plan Showing Layout of Parking Garage	S
	19.Draft Plan of Condominium	20.Planning Rationale/Cover Letter	S
S	21.Site Plan	22.Minimum Distance Separation (MDS)	
	23.Concept Plan Showing Proposed Land Uses and Landscaping	24.Agrology and Soil Capability Study	
	25.Concept Plan Showing Ultimate Use of Land	26.Cultural Heritage Impact Statement	
S	27.Landscape Plan	28.Archaeological Resource Assessment Requirements: **S** (site plan) **A** (subdivision, condo)	
S	29.Survey Plan	30.Shadow Analysis	
S	31.Architectural Building Elevation Drawings (dimensioned)	32.Design Brief (includes the Design Review Panel Submission Requirements)	S
S	33.Wind Analysis		

S/A	ENVIRONMENTAL		S/A
S	34.Phase 1 Environmental Site Assessment	35.Impact Assessment of Adjacent Waste Disposal/Former Landfill Site	
A	36.Phase 2 Environmental Site Assessment (depends on the outcome of Phase 1)	37.Assessment of Landform Features	
A	38.Record of Site Condition	39.Mineral Resource Impact Assessment	
	40.Tree Conservation Report	41.Environmental Impact Statement / Impact Assessment of Endangered Species	
	42.Mine Hazard Study / Abandoned Pit or Quarry Study	43.Integrated Environmental Review (Draft, as part of Planning Rationale)	

S/A	ADDITIONAL REQUIREMENTS		S/A
S	44. Applicant's Public Consultation Strategy (may be provided as part of the Planning Rationale)	45.Site Lighting Plan	**A**
A	46. Site Lighting Certification Letter	47.	

Meeting Date: March 2, 2034 — Application Type: Site Plan (Complex) and Lifting of H

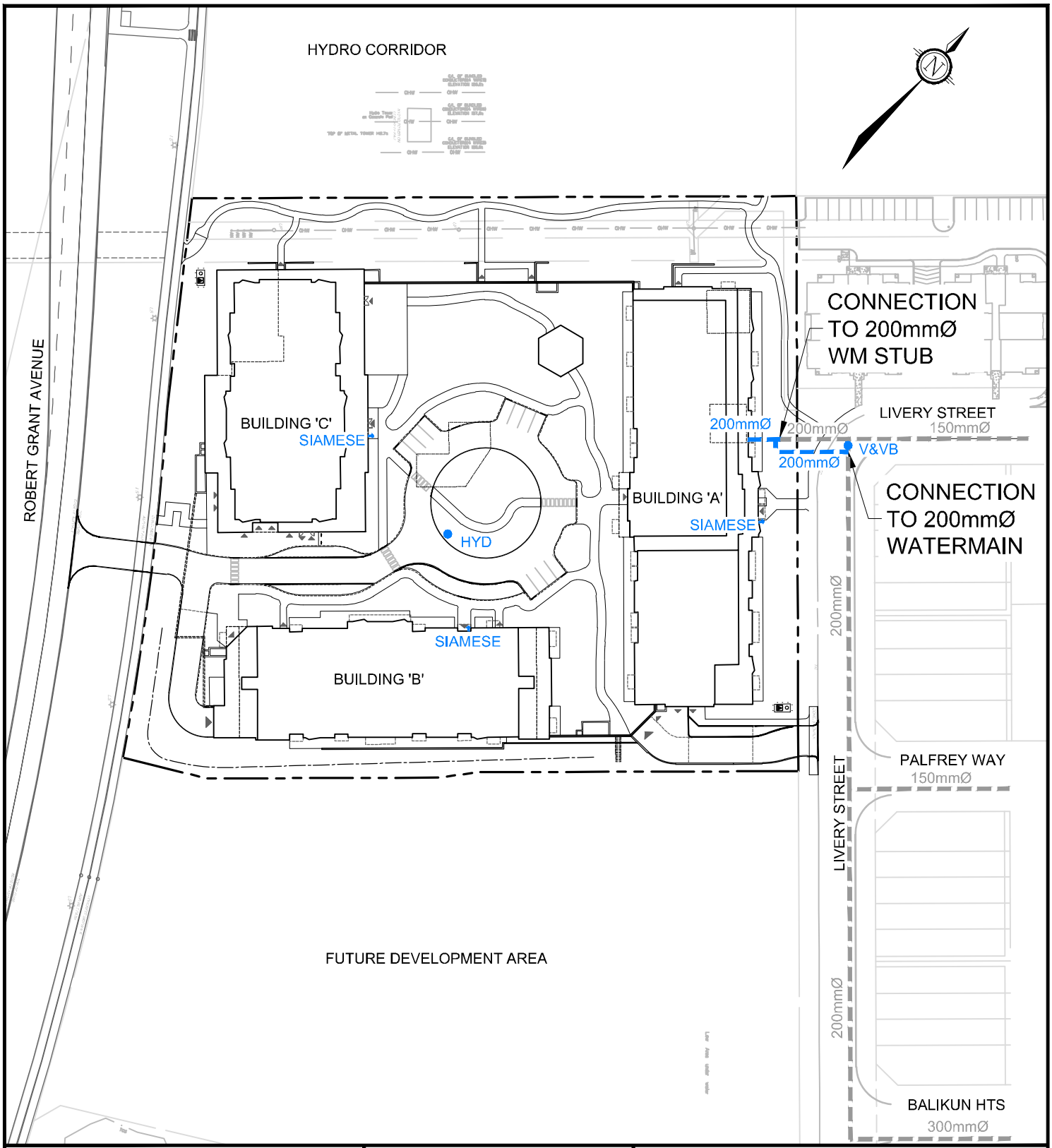
File Lead (Assigned Planner): Sarah Ezzio — Infrastructure Approvals Project Manager: Abi Dieme

Site Address (Municipal Address): 5000 Robert Grant — *Preliminary Assessment: 1☐ 2☐ 3☒ 4☐ 5

*One (1) indicates that considerable major revisions are required before a planning application is submitted, while five (5) suggests that 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.**

It is important to note that the need for additional studies and plans may result during application review. If following the submission of your application, it is determined that material that is not identified in this checklist is required to achieve complete application status, in accordance with the Planning Act and Official Plan requirements, the Planning, Real Estate and Economic Development Department will notify you of outstanding material required within the required 30 day period. Mandatory pre-application consultation will not shorten the City's standard processing timelines, or guarantee that an application will be approved. It is intended to help educate and inform the applicant about submission requirements as well as municipal processes, policies, and key issues in advance of submitting a formal development application. This list is valid for one year following the meeting date. If the application is not submitted within this timeframe the applicant must again pre-consult with the Planning, Real Estate and Economic Development Department.

Appendix B
Water Servicing Information



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

LEGEND

- SITE BOUNDARY
- 200mmØ EXISTING WM AND DIAMETER
- 200mmØ PROPOSED WM AND DIAMETER

5000 ROBERT GRANT AVE BLOCK 203

WATERMAIN NETWORK PLAN

SCALE 1 : 1250 (0, 10, 20, 30, 40, 50)

DATE OCT 2023 | JOB 117151 | FIGURE FIGURE 4

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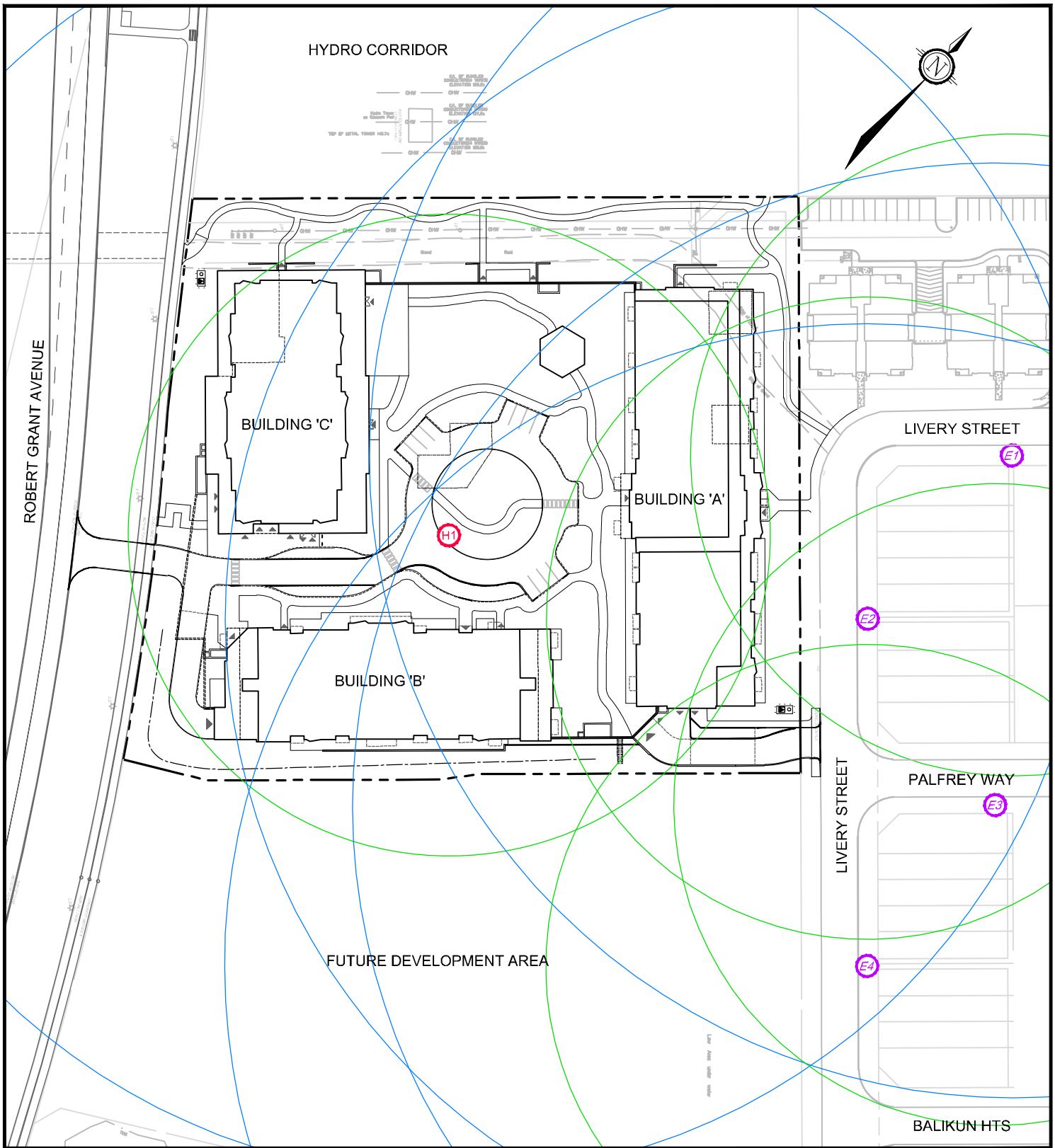

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LEGEND

- H3 PROPOSED FIRE HYDRANT
- E2 EXISTING FIRE HYDRANT
- 75m RADIUS COVERAGE
- 150m RADIUS COVERAGE

5000 ROBERT GRANT AVE BLOCK 203

HYDRANT COVERAGE PLAN

SCALE 1 : 1250 (0, 10, 20, 30, 40, 50)

DATE OCT 2023 | JOB 117151 | FIGURE FIGURE 5

SHT8X11.DWG - 216mmx279mm

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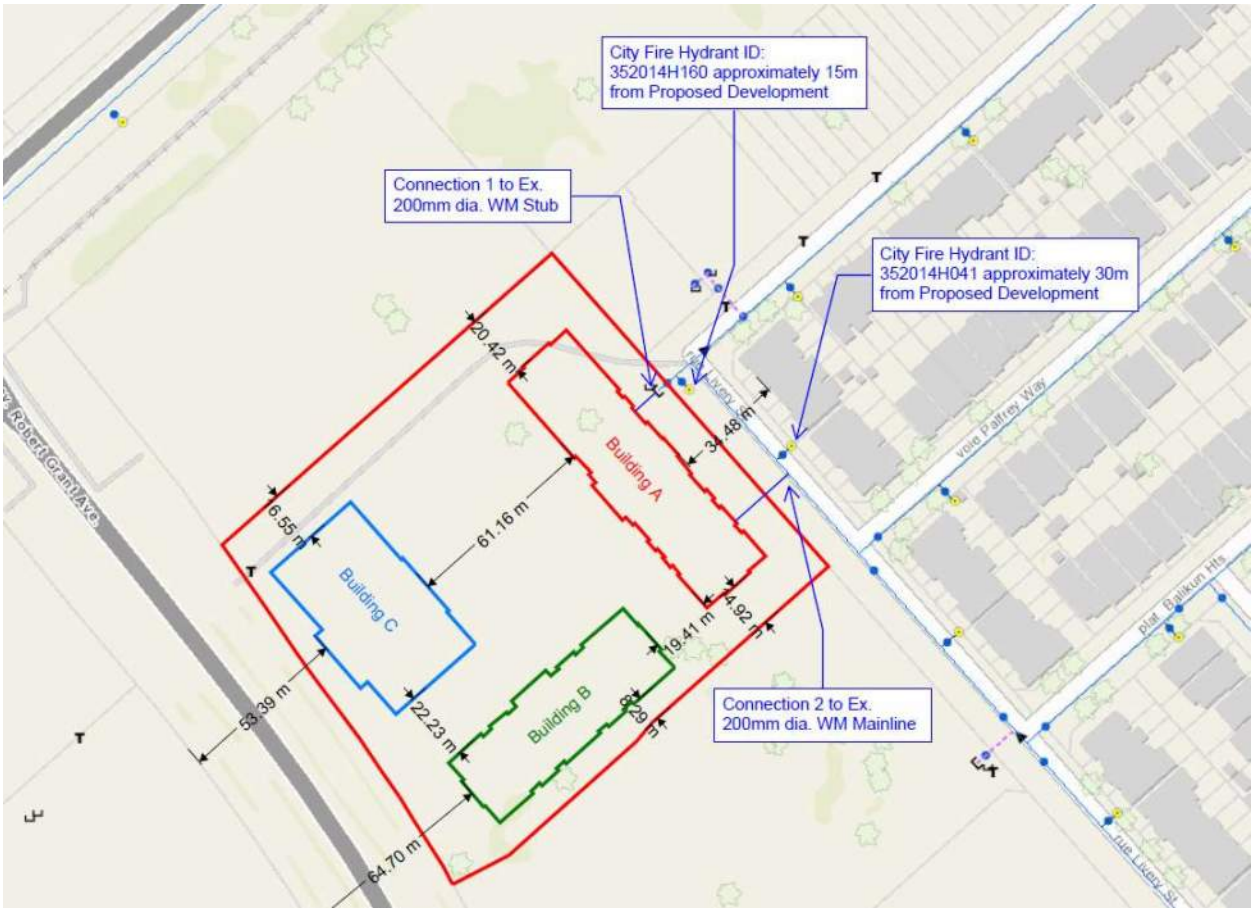
Boundary Conditions
5000 Robert Grant

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	176	2.94
Maximum Daily Demand	441	7.35
Peak Hour	970	16.17
Fire Flow Demand #1	10,020	167.00

Location



Results

Connection 1 - Livery Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.2	83.0
Peak Hour	156.3	76.0
Max Day plus Fire Flow	142.7	56.6
[1] Ground Elevation =	102.9	m

Connection 2 - Balikun Heights

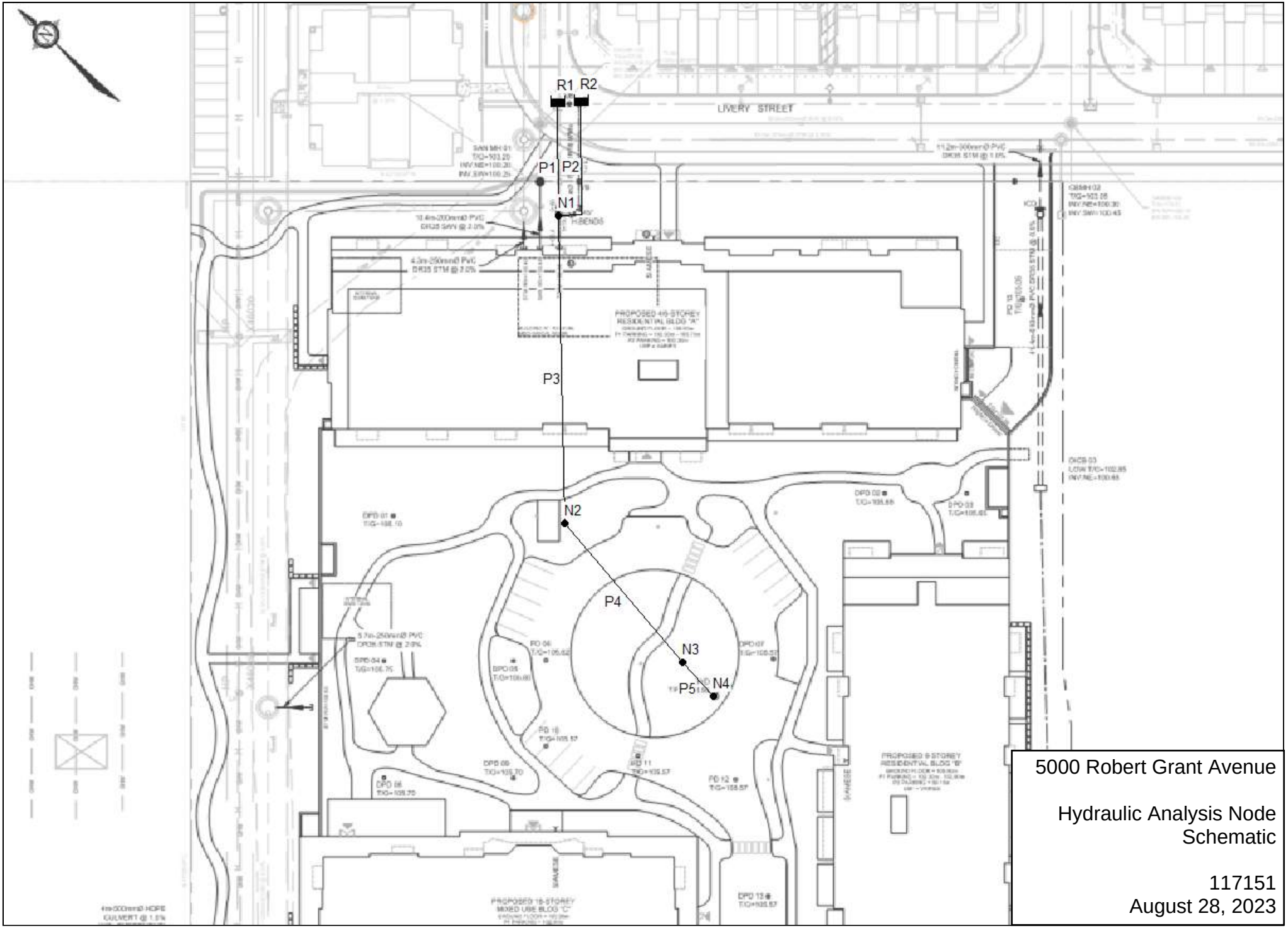
Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.2	82.2
Peak Hour	156.3	75.2
Max Day plus Fire Flow	154.2	72.1
[1] Ground Elevation =	103.5	m

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.



5000 Robert Grant Avenue

Hydraulic Analysis Node Schematic

117151
August 28, 2023

5000 ROBERT GRANT AVENUE
Water Demand

Building ID	Total No. Units	Design Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Building A	113	203	0.66	1.65	3.63
Building B	153	275	0.89	2.23	4.91
Building C	238	428	1.39	3.47	7.64
Totals	504	907	**2.94**	**7.35**	**16.17**

Water Demand Parameters

Multi-Unit Residential Apartments	1.8	persons/unit
Residential Demand	280.0	L/c/day
Residential Max Day	2.5	x Avg Day
Residential Peak Hour	2.2	x Max Day

Fireflow - Max Fire Flow (per FUS calculations) **167** L/s

Notes:
1) Residential water demand based on City of Ottawa Design Guidelines - Water Distribution 2010
2) Fireflows calculated as per 2020 Fire Underwriter's Survey Guidelines.

Legend Print Layers

City Fire Hydrant ID: 352014H160 approximately 15m from Proposed Development

Connection 1 to Ex. 200mm dia. WM Stub

City Fire Hydrant ID: 352014H041 approximately 30m from Proposed Development

20.42 m

34.48 m

6.55 m

61.16 m

Building A

Building C

14.92 m

19.41 m

53.39 m

22.23 m

Building B

8.29 m

64.70 m

Connection 2 to Ex. 200mm dia. WM Mainline

av. Robert Grant Ave.

rue Abbott St E.

Corridor ferroviaire Carleton Place rail corridor

voie Palfrey Way

plat. Balikun Hts.

rue Livery St

1:2256.99

0 20 40m

Watermain Boundary Conditions Request

5000 Robert Grant Ave.

June 2023

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 117151
Project Name: Rene's Court
Date: 6/19/2023
Input By: Billy McEwen
Reviewed By: Drew Blair

Legend: Input by User; No Information or Input Required

Building Description: 6 Storey Apartments - Building A
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	2495			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**3,743**	
	F	**Base fire flow without reductions**				**11,000**
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**9,350**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-3,740**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	**4,208**
		East Side	30.1- 45 m		5%	
		South Side	10.1 - 20 m		15%	
		West Side	10.1 - 20 m		15%	
				Cumulative Total	**45%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**10,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**167**
				or	USGPM	2,642
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1200

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 117151
Project Name: Rene's Court
Date: 6/19/2023
Input By: Billy McEwen
Reviewed By: Drew Blair

Legend: Input by User; No Information or Input Required

Building Description: 9 Storey Apartments - Building B
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1950			
		Number of Floors/Storeys	9			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,925**	
	F	**Base fire flow without reductions**				**10,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**8,500**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-3,400**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	**3,400**
		East Side	10.1 - 20 m		15%	
		South Side	10.1 - 20 m		15%	
		West Side	> 45.1m		0%	
				Cumulative Total	**40%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**9,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**150**
				or	USGPM	2,378
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	1080

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

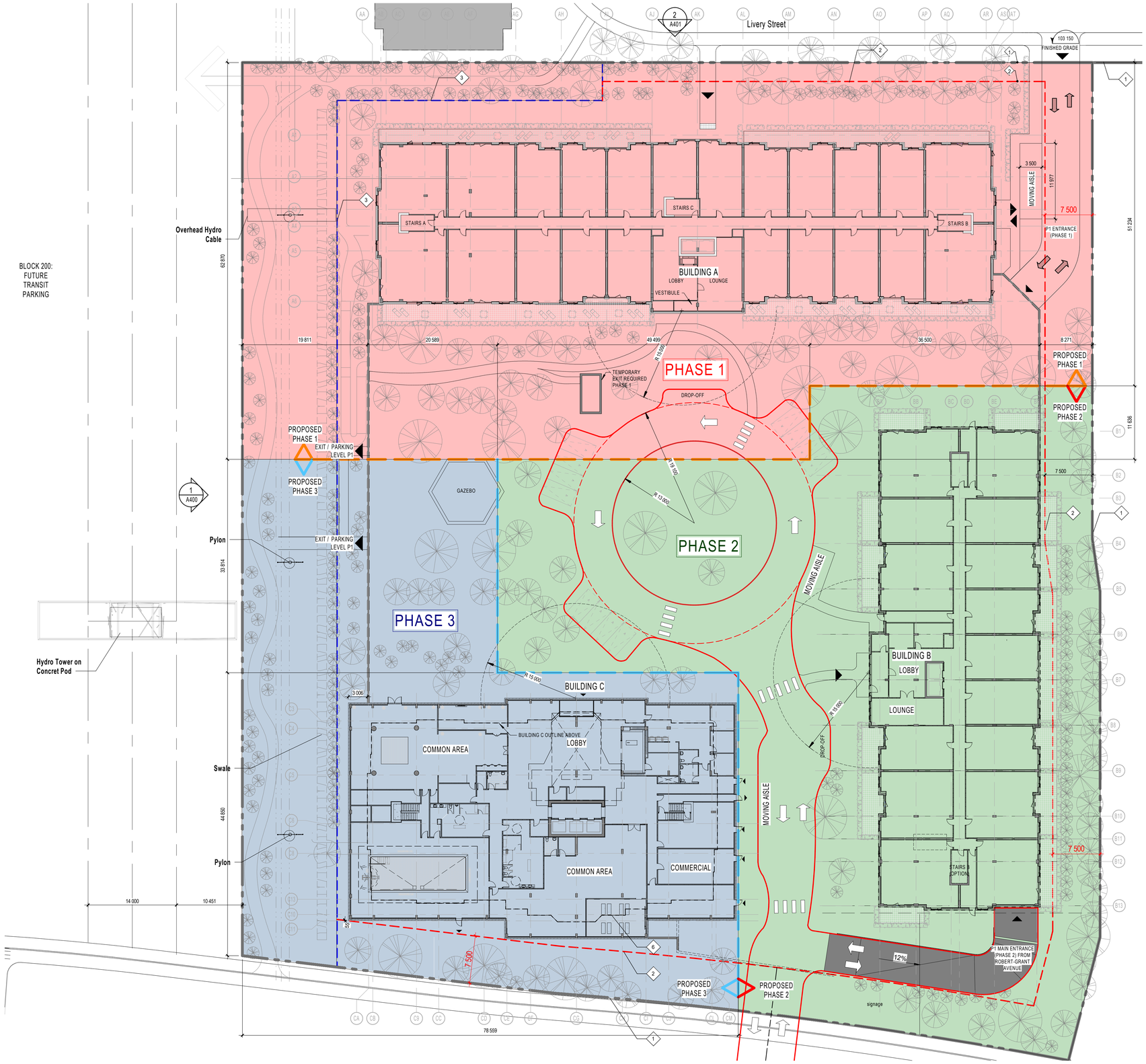
NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 117151
Project Name: Rene's Court
Date: 6/19/2023
Input By: Billy McEwen
Reviewed By: Drew Blair

Legend: Input by User; No Information or Input Required

Building Description: 18 Storey Apartments - Building C
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.8	
		Ordinary construction		1		
		Non-combustible construction	Yes	0.8		
		Modified Fire resistive construction (2 hrs)		0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	1620			
		Number of Floors/Storeys	18			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			**2,430**	
	F	**Base fire flow without reductions**				**9,000**
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**7,650**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-3,060**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	10.1 - 20 m		15%	**1,913**
		East Side	> 45.1m		0%	
		South Side	20.1 - 30 m		10%	
		West Side	> 45.1m		0%	
				Cumulative Total	**25%**	
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
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	2
		Required Volume of Fire Flow (m^3)			m^3	840



GROUND FLOOR - MASTER PLAN
1 : 300

1 A101

GENERAL NOTES	
# NOTE	DESCRIPTION
1	PROPERTY LINE
2	SETBACKS
3	EASEMENT
4	PARKING P1 - OUTLINE
5	TOWER - OUTLINE
6	FLOOR 4TH - OUTLINE
7	POOL - OUTLINE
8	GROUND FLOOR - OUTLINE
9	CANOPY FOOTPRINT
10	ENTRANCE CANOPY
11	EXISTING ROAD - OUTLINE
12	MOUNTED SIGN
13	PRIVATE TERRACE
14	PRIVATE BALCONY
15	HYDRO TRANSFORMER
17	DEPRESSED CURB
18	ROLLING CURB
19	COMMUNAL AMENITIES
20	GUARDRAIL
21	FIRE DEPARTMENT CONNECTION
22	SCUPPER, SEE DETAIL 1/A838 , 3/A835, 5/A823
23	FIRE HOSE CABINET
24	CRANE LOCATION
25	ELEVATOR PIT
26	SANITARY PIT
27	STORM PIT
28	HYDRO OTTAWA TOWER ON CONCRETE POD
29	MECHANICAL OPENING
30	MECHANICAL ROOM ACCESS SERVICE DOOR 629mm X 1467 mm
32	TACTILE WALKING SURFACE INDICATOR
33	FIRE RATED INSULATED ACCESS SERVICE DOOR 1219mm x 1219mm
34	Overhead Hydro Cable OVERHEAD HYDRO CABLE
35	PYLON

SITE PLAN LEGEND	
	EASEMENT LINE
	PROPERTY LINE
	SETBACK LINE
	SEWER TRUNK
	SWALE WITH CULVERT
	EXISTING BUILDINGS

SURFACE LEGEND	
	PAVING (ON-SLAB) LARGE PATIO TILES
	PAVING 2 (ON-GRADE) 300 x 600 FLAME GRANITE, NEWTON BROWN
	ASHPALT
	ASHPALT OVER PARKING LEVEL
	CONCRETE ON-GRADE
	CONCRETE OVER PARKING LEVEL
	LANDSCAPING
	EXISTING BUILDING
	FUTURE DEVELOPMENT

PARKING SPACES BY PHASE				
LEVELS	PHASE 1	PHASE 2	PHASE 3	TOTAL
P3	-	15	82	97
P2	95	122	90	307
P1	67	122	89	278
TOTAL / PH	162	259	261	682
TOTAL	421		261	682
REQUIRED	159	210	280*	642*
EXTERIOR PARKING				
GF	0	12	0	12
REQUIRED	-	-	-	16 PREV. REQ.
TOTAL PROVIDED				694
UNITS	113	153	238	504

* TOTAL REQUIRED 695, 642 REQUIRED WITH 53 PARKING REDUCTION ACCORDING TO ZONING BY-LAW APPLICATION 2020-09-25

GRAPHIC SCALE: 1:300

NOTES GÉNÉRALES General Notes

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COMPANY NAME
FERNBANK APARTMENTS INC.

RENÉS COURT

EMPLACEMENT Location
5000 Robert Grant Avenue
OTTAWA

NO PROJET No.
11186

NO	RELEASE	DATE (aa-mm-jj)
0.A	FOR PROPOSED SEVERANCE	2023.01.30

Preliminary
DO NOT USE FOR CONSTRUCTION

DESSINÉ PAR Drawn by
O.A. & A.W

VÉRIFIÉ PAR Checked
K.P.

DATE (aa.mm.jj)
2023 02 10

ÉCHELLE Scale
1 : 300

TITRE DU DESSIN Drawing Title
GROUND FLOOR- MASTER PLAN

PREVIOUS REVISION: 0.4
CURRENT REVISION: 0.5
RÉVISION Revision

NO. DESSIN Dwg Number
0.5 **A101**

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5000 ROBERT GRANT AVENUE
Water Demand

Building ID	Total No. Units	Design Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Building A	122	220	0.71	1.78	3.91
Building B	163	293	0.95	2.38	5.23
Building C	219	394	1.28	3.19	7.03
Totals	504	907	**2.94**	**7.35**	**16.17**

Water Demand Parameters

Multi-Unit Residential Apartments	1.8	persons/unit
Residential Demand	280.0	L/c/day
Residential Max Day	2.5	x Avg Day
Residential Peak Hour	2.2	x Max Day

Fireflow - Max Fire Flow (per FUS calculations) **167** L/s

Basic Demand (cubic meters per day) **254** m^3/day

Notes:
1) Residential water demand based on City of Ottawa Design Guidelines - Water Distribution 2010
2) Fireflows calculated as per 2020 Fire Underwriter's Survey Guidelines.

AVERAGE DAY DEMAND / HIGH PRESSURE CHECK

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	161.2	-1.53	161.20	0.00	0.00	0.00
Resvr R2	161.2	-1.41	161.20	0.00	0.00	0.00
Junc N1	103.7	2.94	161.20	57.50	564.08	81.81
Junc N2	106.5	0.00	161.20	54.70	536.61	77.83
Junc N3	105.9	0.00	161.20	55.30	542.49	78.68
Junc N4	105.7	0.00	161.20	55.50	544.46	78.97

Maximum Pressure

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	17	200	110	1.53	0.05	0.03	0.046
Pipe 2	19.4	200	110	1.41	0.04	0.02	0.047
Pipe 3	50.7	200	110	0.00	0.00	0.00	0.000
Pipe 4	24	200	110	0.00	0.00	0.00	0.000
Pipe 5	10	150	100	0.00	0.00	0.00	0.000

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	156.3	-8.40	156.30	0.00	0.00	0.00
Resvr R2	156.3	-7.77	156.30	0.00	0.00	0.00
Junc N1	103.7	16.17	156.29	52.59	515.91	74.83
Junc N2	106.5	0.00	156.29	49.79	488.44	70.84
Junc N3	105.9	0.00	156.29	50.39	494.33	71.70
Junc N4	105.7	0.00	156.29	50.59	496.29	71.98

Minimum Pressure

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	16.8	200	110	8.40	0.27	0.64	0.035
Pipe 2	19.4	200	110	7.77	0.25	0.56	0.036
Pipe 3	50.7	200	110	0.00	0.00	0.00	0.000
Pipe 4	24.0	200	110	0.00	0.00	0.00	0.000
Pipe 5	10.0	150	100	0.00	0.00	0.00	0.000

MAXIMUM DAY + FIRE FLOW DEMAND AT N4

Junction Report

Node ID	Elevation m	Demand LPS	Total Head m	Pressure m	Pressure kPa	Pressure psi
Resvr R1	142.7	-90.56	142.70	0.0	0.00	0.00
Resvr R2	142.7	-83.79	142.70	0.0	0.00	0.00
Junc N1	103.7	7.35	141.82	38.1	373.96	54.24
Junc N2	106.5	0.00	133.55	27.1	265.36	38.49
Junc N3	105.9	0.00	129.63	23.7	232.79	33.76
Junc N4	105.7	167.00	121.73	16.0	157.25	22.81

Minimum Pressure
Applied Fire Flow

Pipe Report

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Headloss m/km	Friction Factor
Pipe 1	16.8	200	110	90.56	2.88	52.52	0.025
Pipe 2	19.4	200	110	83.79	2.67	45.48	0.025
Pipe 3	50.7	200	110	167.00	5.32	163.13	0.023
Pipe 4	24.0	200	110	167.00	5.32	163.13	0.023
Pipe 5	10.0	150	100	167.00	9.45	790.24	0.026

MAXIMUM DAY + FIRE FLOW DEMAND SUMMARY

Maximum day plus fire flow demand was modeled for node N4.
The following is a summary of the minimum pressures that occurred for this operating condition.

	Demand (L/s)			Minimum Pressure			
Fire at Junction	Maximum Daily	Fire Flow	Max Day + Fire	(m)	kPa	psi	Node
N4	7.35	167.00	174.35	16.00	156.96	22.77	N4

Appendix C
Sanitary Servicing Information

SANITARY SEWER DESIGN SHEET
5000 Robert Grant Ave - Residential Development

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT # : 117151
DESIGNED BY : BM
CHECKED BY : DDB
DATE PREPARED : 25-Oct-23

LOCATION				RESIDENTIAL							INFILTRATION			FLOW	PROPOSED SEWER							
				INDIVIDUAL			CUMULATIVE															
STREET	FROM MH	TO MH	Area	Apartment Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)	PEAK FACTOR M	POPULATION FLOW Qr(p) (L/s)	Total AREA (ha.)	Accu. Total AREA (ha.)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/ D_{full}
Robert Grant Ave Outlet																						
	Building B	MH 05	0.67	163	0.293	0.67	0.293	0.67	3.5	3.30	0.67	0.67	0.22	3.52	5.8	200	203.20	DR 35	1.00	34.2	1.06	10.3%	0.19
	MH 05	MH 03		0	0.000	0.00	0.293	0.67	3.5	3.30	0.00	0.67	0.22	3.52	8.7	200	203.20	DR 35	0.35	20.2	0.62	17.4%	0.29
	Sanitary Cap	MH 03	0	0	0.000	0.17	0.000	0.17	3.8	0.00	0.17	0.17	0.06	0.06	36.0	200	203.20	DR 35	0.35	20.2	0.62	0.3%	0.00
	MH 03	MH 02		0	0.000	0.29	0.293	1.13	3.5	3.30	0.29	1.13	0.37	3.67	57.8	200	203.20	DR 35	0.35	20.2	0.62	18.1%	0.29
	Building C	MH 04	0.67	219	0.394	0.67	0.394	0.67	3.4	4.37	0.67	0.67	0.22	4.59	8.9	200	203.20	DR 35	2.20	50.8	1.56	9.0%	0.19
	MH 04	MH 02		0	0.000	0.00	0.394	0.67	3.4	4.37	0.00	0.67	0.22	4.59	9.8	200	203.20	DR 35	0.35	20.2	0.62	22.7%	0.30
	MH 02	*EX SAN MH*		0	0.000	0.16	0.688	1.96	3.3	7.40	0.16	1.96	0.65	**8.04**	30.0	200	203.20	DR 35	0.35	20.2	0.62	39.7%	0.44
Livery Street Outlet																							
	Building A	MH 01	0.68	122	0.220	0.68	0.220	0.68	3.5	2.50	0.68	0.68	0.22	2.72	9.2	200	203.20	DR 35	2.00	48.4	1.49	5.6%	0.12
	MH 01	*EX SAN MH*		0	0.000	0.00	0.220	0.68	3.5	2.50	0.00	0.68	0.22	**2.72**	36.1	250	254.00	DR 35	0.36	37.2	0.73	7.3%	0.19

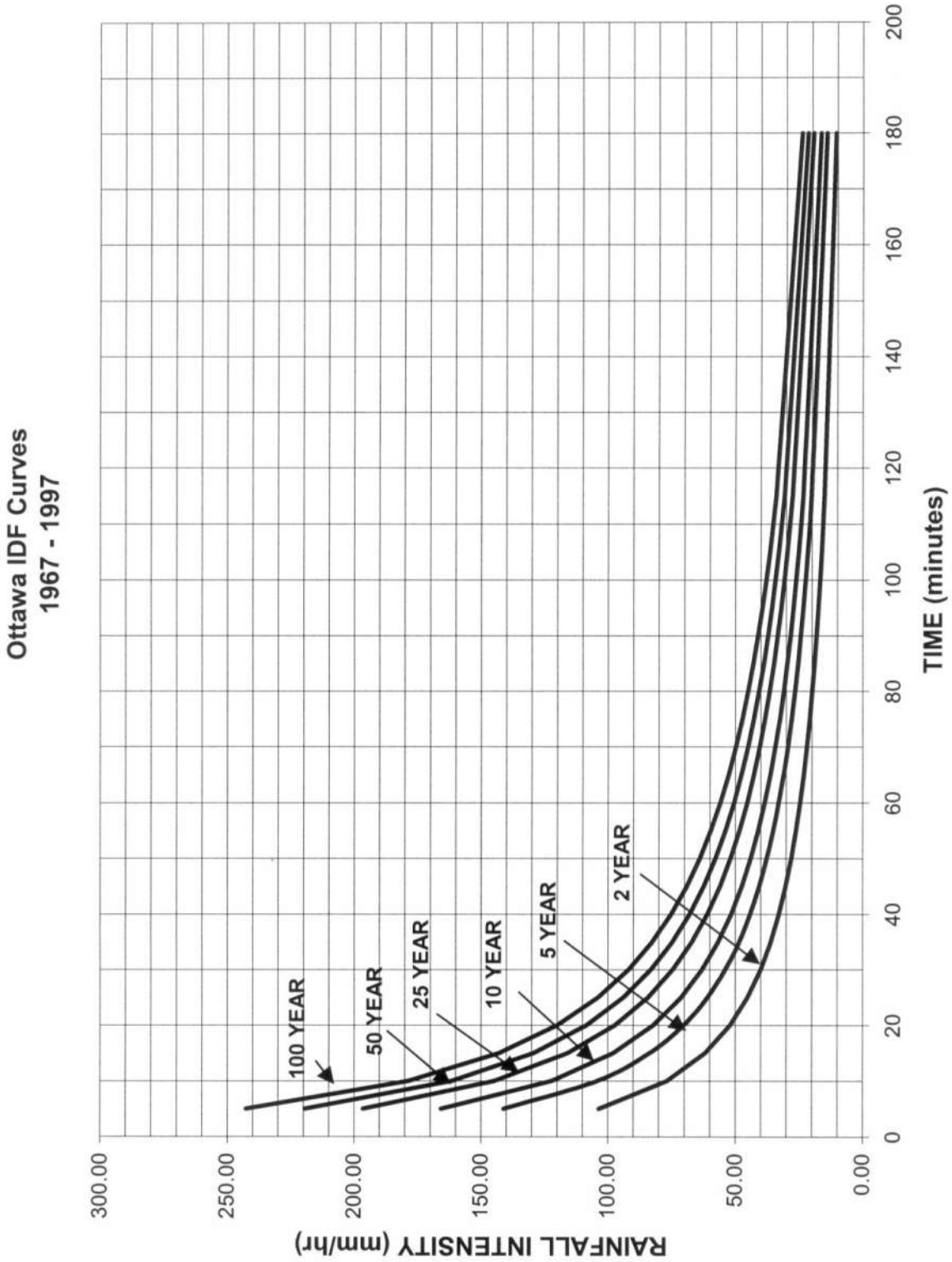
Notes:
1. Q(d) = Qr(p) + Q(i) + Qc(p)
2. Q(i) = 0.33 L/sec/ha
3. Qr(p) = (PxqxM/86,400)
3. Qc(p) = (A*q*Pf)/86,400

Definitions:
Q(d) = Design Flow (L/sec)
Qr(p) = Population Flow (L/sec), Residential
Q(i) = Extraneous Flow (L/sec)

P = Population (3.4 persons per single unit, 2.7 persons per townhouse unit, 2.1 persons per apartment unit)
q = Average per capita flow = 280 L/cap/day - Residential
M = Harmon Formula (maximum of 4.0), K = 0.8
Min pipe size 200mm @ min. slope 0.32%
Mannings n = 0.013

Appendix D
Storm Servicing and Stormwater Management Information

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



Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA DR-1 Direct Runoff to East (Livery)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	3.6	L/s
C =	0.22		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	4.89	1.26	0.38
10	76.81	3.63	0.00	0.00
15	61.77	2.92	-0.71	-0.64
20	52.03	2.46	-1.17	-1.40
25	45.17	2.13	-1.50	-2.24
30	40.04	1.89	-1.74	-3.13
35	36.06	1.70	-1.93	-4.04
40	32.86	1.55	-2.08	-4.98
45	30.24	1.43	-2.20	-5.94
50	28.04	1.33	-2.30	-6.91
55	26.17	1.24	-2.39	-7.90
60	24.56	1.16	-2.47	-8.89
75	20.81	0.98	-2.65	-11.91
90	18.14	0.86	-2.77	-14.97
120	14.56	0.69	-2.94	-21.18
150	12.25	0.58	-3.05	-27.46
180	10.63	0.50	-3.13	-33.78
210	9.42	0.44	-3.18	-40.13

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA DR-1 Direct Runoff to East (Livery)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	4.9	L/s
C =	0.22		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.67	1.75	0.52
10	104.19	4.92	0.00	0.00
15	83.56	3.95	-0.98	-0.88
20	70.25	3.32	-1.60	-1.92
25	60.90	2.88	-2.05	-3.07
30	53.93	2.55	-2.38	-4.28
35	48.52	2.29	-2.63	-5.53
40	44.18	2.09	-2.84	-6.81
45	40.63	1.92	-3.00	-8.11
50	37.65	1.78	-3.14	-9.43
55	35.12	1.66	-3.26	-10.77
60	32.94	1.56	-3.37	-12.12
75	27.89	1.32	-3.61	-16.23
90	24.29	1.15	-3.78	-20.39
120	19.47	0.92	-4.00	-28.83
150	16.36	0.77	-4.15	-37.36
180	14.18	0.67	-4.25	-45.94
210	12.56	0.59	-4.33	-54.57

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA DR-1 Direct Runoff to East (Livery)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	10.4	L/s
C =	0.27		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	14.17	3.74	1.12
10	178.56	10.42	0.00	0.00
15	142.89	8.34	-2.08	-1.87
20	119.95	7.00	-3.42	-4.11
25	103.85	6.06	-4.36	-6.54
30	91.87	5.36	-5.06	-9.11
35	82.58	4.82	-5.60	-11.77
40	75.15	4.39	-6.04	-14.49
45	69.05	4.03	-6.39	-17.26
50	63.95	3.73	-6.69	-20.07
55	59.62	3.48	-6.94	-22.91
60	55.89	3.26	-7.16	-25.78
75	47.26	2.76	-7.67	-34.49
90	41.11	2.40	-8.02	-43.33
120	32.89	1.92	-8.50	-61.23
150	27.61	1.61	-8.81	-79.31
180	23.90	1.40	-9.03	-97.51
210	21.14	1.23	-9.19	-115.79

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA DR-1 Direct Runoff to East (Livery)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	12.5	L/s
C =	0.27		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	17.00	4.49	1.35
10	214.27	12.51	0.00	0.00
15	171.47	10.01	-2.50	-2.25
20	143.94	8.40	-4.11	-4.93
25	124.62	7.28	-5.23	-7.85
30	110.24	6.44	-6.07	-10.93
35	99.09	5.79	-6.72	-14.12
40	90.17	5.26	-7.24	-17.39
45	82.86	4.84	-7.67	-20.71
50	76.74	4.48	-8.03	-24.09
55	71.55	4.18	-8.33	-27.50
60	67.07	3.92	-8.59	-30.94
75	56.71	3.31	-9.20	-41.39
90	49.33	2.88	-9.63	-52.00
120	39.47	2.30	-10.20	-73.47
150	33.13	1.93	-10.57	-95.17
180	28.68	1.67	-10.83	-117.01
210	25.37	1.48	-11.03	-138.95

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA DR-2 Direct Runoff to West (RG)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	5.7	L/s
C =	0.34		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	7.72	1.99	0.60
10	76.81	5.72	0.00	0.00
15	61.77	4.60	-1.12	-1.01
20	52.03	3.88	-1.85	-2.21
25	45.17	3.37	-2.36	-3.54
30	40.04	2.98	-2.74	-4.93
35	36.06	2.69	-3.04	-6.38
40	32.86	2.45	-3.27	-7.86
45	30.24	2.25	-3.47	-9.37
50	28.04	2.09	-3.63	-10.90
55	26.17	1.95	-3.77	-12.45
60	24.56	1.83	-3.89	-14.01
75	20.81	1.55	-4.17	-18.77
90	18.14	1.35	-4.37	-23.60
120	14.56	1.08	-4.64	-33.39
150	12.25	0.91	-4.81	-43.29
180	10.63	0.79	-4.93	-53.25
210	9.42	0.70	-5.02	-63.26

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA DR-2 Direct Runoff to West (RG)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	7.8	L/s
C =	0.34		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	10.52	2.76	0.83
10	104.19	7.76	0.00	0.00
15	83.56	6.23	-1.54	-1.38
20	70.25	5.23	-2.53	-3.03
25	60.90	4.54	-3.23	-4.84
30	53.93	4.02	-3.74	-6.74
35	48.52	3.61	-4.15	-8.71
40	44.18	3.29	-4.47	-10.73
45	40.63	3.03	-4.74	-12.79
50	37.65	2.81	-4.96	-14.87
55	35.12	2.62	-5.15	-16.98
60	32.94	2.45	-5.31	-19.11
75	27.89	2.08	-5.69	-25.58
90	24.29	1.81	-5.95	-32.15
120	19.47	1.45	-6.31	-45.45
150	16.36	1.22	-6.54	-58.89
180	14.18	1.06	-6.71	-72.43
210	12.56	0.94	-6.83	-86.02

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA DR-2 Direct Runoff to West (RG)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	15.6	L/s
C =	0.40		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	21.25	5.62	1.69
10	178.56	15.64	0.00	0.00
15	142.89	12.51	-3.12	-2.81
20	119.95	10.50	-5.13	-6.16
25	103.85	9.09	-6.54	-9.81
30	91.87	8.04	-7.59	-13.66
35	82.58	7.23	-8.41	-17.65
40	75.15	6.58	-9.06	-21.73
45	69.05	6.05	-9.59	-25.89
50	63.95	5.60	-10.04	-30.11
55	59.62	5.22	-10.42	-34.37
60	55.89	4.89	-10.74	-38.67
75	47.26	4.14	-11.50	-51.74
90	41.11	3.60	-12.04	-65.00
120	32.89	2.88	-12.76	-91.84
150	27.61	2.42	-13.22	-118.97
180	23.90	2.09	-13.54	-146.27
210	21.14	1.85	-13.78	-173.69

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA DR-2 Direct Runoff to West (RG)

OTTAWA IDF CURVE

Area =	0.078	ha	Qallow =	18.8	L/s
C =	0.40		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	25.50	6.74	2.02
10	214.27	18.76	0.00	0.00
15	171.47	15.02	-3.75	-3.37
20	143.94	12.60	-6.16	-7.39
25	124.62	10.91	-7.85	-11.78
30	110.24	9.65	-9.11	-16.40
35	99.09	8.68	-10.09	-21.18
40	90.17	7.90	-10.87	-26.08
45	82.86	7.26	-11.51	-31.07
50	76.74	6.72	-12.04	-36.13
55	71.55	6.27	-12.50	-41.24
60	67.07	5.87	-12.89	-46.40
75	56.71	4.97	-13.80	-62.09
90	49.33	4.32	-14.44	-78.00
120	39.47	3.46	-15.31	-110.21
150	33.13	2.90	-15.86	-142.76
180	28.68	2.51	-16.25	-175.52
210	25.37	2.22	-16.54	-208.43

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA DR-3 **Direct Runoff to North Property**

OTTAWA IDF CURVE

Area =	0.305	ha	Qallow =	20.9	L/s
C =	0.32		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	28.25	7.30	2.19
10	76.81	20.95	0.00	0.00
15	61.77	16.85	-4.10	-3.69
20	52.03	14.19	-6.76	-8.11
25	45.17	12.32	-8.63	-12.94
30	40.04	10.92	-10.03	-18.05
35	36.06	9.83	-11.11	-23.34
40	32.86	8.96	-11.98	-28.76
45	30.24	8.25	-12.70	-34.29
50	28.04	7.65	-13.30	-39.90
55	26.17	7.14	-13.81	-45.57
60	24.56	6.70	-14.25	-51.30
75	20.81	5.68	-15.27	-68.71
90	18.14	4.95	-16.00	-86.39
120	14.56	3.97	-16.97	-122.22
150	12.25	3.34	-17.60	-158.44
180	10.63	2.90	-18.05	-194.92
210	9.42	2.57	-18.38	-231.57

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA DR-3 **Direct Runoff to North Property**

OTTAWA IDF CURVE

Area =	0.305	ha	Qallow =	28.4	L/s
C =	0.32		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	38.50	10.09	3.03
10	104.19	28.42	0.00	0.00
15	83.56	22.79	-5.63	-5.06
20	70.25	19.16	-9.26	-11.11
25	60.90	16.61	-11.81	-17.71
30	53.93	14.71	-13.71	-24.67
35	48.52	13.23	-15.18	-31.89
40	44.18	12.05	-16.37	-39.28
45	40.63	11.08	-17.34	-46.80
50	37.65	10.27	-18.15	-54.44
55	35.12	9.58	-18.84	-62.16
60	32.94	8.98	-19.43	-69.95
75	27.89	7.61	-20.81	-93.64
90	24.29	6.62	-21.79	-117.67
120	19.47	5.31	-23.11	-166.36
150	16.36	4.46	-23.95	-215.58
180	14.18	3.87	-24.55	-265.12
210	12.56	3.42	-24.99	-314.89

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA DR-3 **Direct Runoff to North Property**

OTTAWA IDF CURVE

Area =	0.305	ha	Qallow =	57.6	L/s
C =	0.38		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	78.27	20.69	6.21
10	178.56	57.58	0.00	0.00
15	142.89	46.08	-11.50	-10.35
20	119.95	38.68	-18.90	-22.68
25	103.85	33.49	-24.09	-36.14
30	91.87	29.63	-27.96	-50.32
35	82.58	26.63	-30.95	-65.00
40	75.15	24.23	-33.35	-80.04
45	69.05	22.27	-35.31	-95.35
50	63.95	20.62	-36.96	-110.87
55	59.62	19.23	-38.35	-126.57
60	55.89	18.02	-39.56	-142.40
75	47.26	15.24	-42.34	-190.54
90	41.11	13.26	-44.32	-239.35
120	32.89	10.61	-46.97	-338.21
150	27.61	8.90	-48.68	-438.10
180	23.90	7.71	-49.87	-538.64
210	21.14	6.82	-50.76	-639.61

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA DR-3 **Direct Runoff to North Property**

OTTAWA IDF CURVE

Area =	0.305	ha	Qallow =	69.1	L/s
C =	0.38		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	93.92	24.82	7.45
10	214.27	69.10	0.00	0.00
15	171.47	55.30	-13.80	-12.42
20	143.94	46.42	-22.68	-27.22
25	124.62	40.19	-28.91	-43.37
30	110.24	35.55	-33.55	-60.39
35	99.09	31.96	-37.14	-78.00
40	90.17	29.08	-40.02	-96.04
45	82.86	26.72	-42.38	-114.42
50	76.74	24.75	-44.35	-133.05
55	71.55	23.07	-46.03	-151.88
60	67.07	21.63	-47.47	-170.89
75	56.71	18.29	-50.81	-228.65
90	49.33	15.91	-53.19	-287.22
120	39.47	12.73	-56.37	-405.85
150	33.13	10.68	-58.41	-525.72
180	28.68	9.25	-59.85	-646.36
210	25.37	8.18	-60.92	-767.54

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-1 **Uncontrolled Site Access**

OTTAWA IDF CURVE

Area =	0.034	ha	Qallow =	5.9	L/s
C =	0.82		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	8.00	2.07	0.62
10	76.81	5.94	0.00	0.00
15	61.77	4.77	-1.16	-1.05
20	52.03	4.02	-1.91	-2.30
25	45.17	3.49	-2.45	-3.67
30	40.04	3.09	-2.84	-5.11
35	36.06	2.79	-3.15	-6.61
40	32.86	2.54	-3.40	-8.15
45	30.24	2.34	-3.60	-9.72
50	28.04	2.17	-3.77	-11.31
55	26.17	2.02	-3.91	-12.91
60	24.56	1.90	-4.04	-14.54
75	20.81	1.61	-4.33	-19.47
90	18.14	1.40	-4.53	-24.48
120	14.56	1.13	-4.81	-34.63
150	12.25	0.95	-4.99	-44.90
180	10.63	0.82	-5.11	-55.24
210	9.42	0.73	-5.21	-65.62

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-1 **Uncontrolled Site Access**

OTTAWA IDF CURVE

Area =	0.034	ha	Qallow =	8.1	L/s
C =	0.82		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	10.91	2.86	0.86
10	104.19	8.05	0.00	0.00
15	83.56	6.46	-1.59	-1.44
20	70.25	5.43	-2.62	-3.15
25	60.90	4.71	-3.35	-5.02
30	53.93	4.17	-3.88	-6.99
35	48.52	3.75	-4.30	-9.04
40	44.18	3.41	-4.64	-11.13
45	40.63	3.14	-4.91	-13.26
50	37.65	2.91	-5.14	-15.43
55	35.12	2.71	-5.34	-17.62
60	32.94	2.55	-5.51	-19.82
75	27.89	2.16	-5.90	-26.54
90	24.29	1.88	-6.18	-33.35
120	19.47	1.50	-6.55	-47.15
150	16.36	1.26	-6.79	-61.09
180	14.18	1.10	-6.96	-75.13
210	12.56	0.97	-7.08	-89.23

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-1 **Uncontrolled Site Access**

OTTAWA IDF CURVE

Area =	0.034	ha	Qallow =	15.4	L/s
C =	0.91		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	20.92	5.53	1.66
10	178.56	15.39	0.00	0.00
15	142.89	12.31	-3.07	-2.77
20	119.95	10.34	-5.05	-6.06
25	103.85	8.95	-6.44	-9.66
30	91.87	7.92	-7.47	-13.45
35	82.58	7.12	-8.27	-17.37
40	75.15	6.48	-8.91	-21.39
45	69.05	5.95	-9.44	-25.48
50	63.95	5.51	-9.88	-29.63
55	59.62	5.14	-10.25	-33.82
60	55.89	4.82	-10.57	-38.06
75	47.26	4.07	-11.32	-50.92
90	41.11	3.54	-11.85	-63.96
120	32.89	2.83	-12.55	-90.38
150	27.61	2.38	-13.01	-117.08
180	23.90	2.06	-13.33	-143.95
210	21.14	1.82	-13.57	-170.93

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR + 20%
AREA A-1 **Uncontrolled Site Access**

OTTAWA IDF CURVE

Area =	0.034	ha	Qallow =	18.5	L/s
C =	0.91		Vol(max) =	0.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	25.10	6.63	1.99
10	214.27	18.47	0.00	0.00
15	171.47	14.78	-3.69	-3.32
20	143.94	12.40	-6.06	-7.27
25	124.62	10.74	-7.73	-11.59
30	110.24	9.50	-8.97	-16.14
35	99.09	8.54	-9.93	-20.84
40	90.17	7.77	-10.69	-25.67
45	82.86	7.14	-11.32	-30.58
50	76.74	6.61	-11.85	-35.56
55	71.55	6.17	-12.30	-40.59
60	67.07	5.78	-12.69	-45.67
75	56.71	4.89	-13.58	-61.10
90	49.33	4.25	-14.21	-76.76
120	39.47	3.40	-15.06	-108.46
150	33.13	2.86	-15.61	-140.49
180	28.68	2.47	-15.99	-172.73
210	25.37	2.19	-16.28	-205.12

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 117151 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA A-2 Controlled Access Road & Ditch

OTTAWA IDF CURVE — Qpeak = 3.4 L/s
Area = 0.150 ha — Qavg = 1.7 L/s
C = 0.31 — Vol(max) = 6.3 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	13.48	11.78	3.53
10	76.81	9.99	8.29	4.98
15	61.77	8.04	6.34	5.70
20	52.03	6.77	5.07	6.08
25	45.17	5.88	4.18	6.26
30	40.04	5.21	3.51	6.32
35	36.06	4.69	2.99	6.28
40	32.86	4.28	2.58	6.18
45	30.24	3.93	2.23	6.03
50	28.04	3.65	1.95	5.84
55	26.17	3.40	1.70	5.63
60	24.56	3.20	1.50	5.38
65	23.15	3.01	1.31	5.12
70	21.91	2.85	1.15	4.83
75	20.81	2.71	1.01	4.54
90	18.14	2.36	0.66	3.57
105	16.13	2.10	0.40	2.51
120	14.56	1.89	0.19	1.40
135	13.30	1.73	0.03	0.24
150	12.25	1.59	-0.11	-0.95

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 117151 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-2 Controlled Access Road & Ditch

OTTAWA IDF CURVE — Qpeak = 4.1 L/s
Area = 0.150 ha — Qavg = 2.1 L/s
C = 0.31 — Vol(max) = 9.0 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	18.37	16.32	4.90
10	104.19	13.56	11.51	6.90
15	83.56	10.87	8.82	7.94
20	70.25	9.14	7.09	8.51
25	60.90	7.92	5.87	8.81
30	53.93	7.02	4.97	8.94
35	48.52	6.31	4.26	8.95
40	44.18	5.75	3.70	8.88
45	40.63	5.29	3.24	8.74
50	37.65	4.90	2.85	8.55
55	35.12	4.57	2.52	8.31
60	32.94	4.29	2.24	8.05
65	31.04	4.04	1.99	7.76
70	29.37	3.82	1.77	7.44
75	27.89	3.63	1.58	7.10
90	24.29	3.16	1.11	5.99
105	21.58	2.81	0.76	4.78
120	19.47	2.53	0.48	3.48
135	17.76	2.31	0.26	2.12
150	16.36	2.13	0.08	0.71

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 117151 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-2 Controlled Access Road & Ditch

OTTAWA IDF CURVE — Qpeak = 6.5 L/s
Area = 0.150 ha — Qavg = 3.3 L/s
C = 0.37 — Vol(max) = 20.0 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	37.45	34.20	10.26
10	178.56	27.55	24.30	14.58
15	142.89	22.05	18.80	16.92
20	119.95	18.51	15.26	18.31
25	103.85	16.02	12.77	19.16
30	91.87	14.17	10.92	19.66
35	82.58	12.74	9.49	19.93
40	75.15	11.59	8.34	20.03
45	69.05	10.65	7.40	19.99
50	63.95	9.87	6.62	19.85
55	59.62	9.20	5.95	19.63
60	55.89	8.62	5.37	19.35
65	52.65	8.12	4.87	19.00
70	49.79	7.68	4.43	18.61
75	47.26	7.29	4.04	18.18
90	41.11	6.34	3.09	16.70
105	36.50	5.63	2.38	15.00
120	32.89	5.08	1.83	13.14
135	30.00	4.63	1.38	11.16
150	27.61	4.26	1.01	9.09

Proposed Residential Development Storage Calculations Using Average
Novatech Project No. 117151 Release Rate Equal to 50% of the Qpeak
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA A-2 Controlled Access Road & Ditch

OTTAWA IDF CURVE — Qpeak = 6.6 L/s
Area = 0.150 ha — Qavg = 3.3 L/s
C = 0.37 — Vol(max) = 25.6 m3
(Vol calculated for Qallow-avg)

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	44.94	41.64	12.49
10	214.27	33.06	29.76	17.86
15	171.47	26.46	23.16	20.84
20	143.94	22.21	18.91	22.69
25	124.62	19.23	15.93	23.89
30	110.24	17.01	13.71	24.68
35	99.09	15.29	11.99	25.18
40	90.17	13.91	10.61	25.47
45	82.86	12.78	9.48	25.61
50	76.74	11.84	8.54	25.62
55	71.55	11.04	7.74	25.54
60	67.07	10.35	7.05	25.38
65	63.18	9.75	6.45	25.14
70	59.75	9.22	5.92	24.86
75	56.71	8.75	5.45	24.52
90	49.33	7.61	4.31	23.28
105	43.80	6.76	3.46	21.78
120	39.47	6.09	2.79	20.09
135	36.00	5.55	2.25	18.26
150	33.13	5.11	1.81	16.31

Structures	Size (mm)	Area (m^2)	T/G	Inv IN	Inv OUT
CBMH 01	1219	1.17	103.05	100.50	100.36
DICB 01	1200x600	0.74	102.85	-	100.70

Area A-2: Storage Table

Elevation (m)	System Depth (m)	CBMH 01 Volume (m^3)	DICB 01 Volume (m^3)	Underground Storage Combined Volume (m^3)	Surface Storage CBMH 01 Area (m^2)	Surface Storage CBMH 01 Volume (m^3)	Surface Storage DICB 01 Area (m^2)	Surface Storage DICB 01 Volume (m^3)	Total Storage Ponding Volume (m^3)	Total Storage **Total Volume (m^3)**	Design Head
100.36	0.00	-	-	-	-	-	-	-	-	**0**	-
100.50	0.14	0.16	-	0.16	-	-	-	-	-	**0.2**	0.01
101.10	0.74	0.86	-	4.89	-	-	-	-	-	**4.9**	0.61
101.61	1.25	1.46	-	9.51	-	-	-	-	-	**9.5**	1.12
102.50	2.14	2.50	1.34	15.92	-	-	-	-	-	**15.9**	2.01
102.85	2.49	2.91	1.60	16.59	-	-	0.0	0.0	-	**16.6**	2.36
102.90	2.54	2.96	1.64	16.68	-	-	1.24	0.03	0.0	**16.7**	2.41
102.95	2.59	3.02	1.67	16.78	-	-	4.47	0.17	0.2	**17.0**	2.46
103.00	2.64	3.08		16.84	0.0	0.0	9.71	0.53	0.5	**17.4**	2.51
103.05	2.69	3.14		16.89	11.60	0.29	17.01	1.20	1.5	**18.4**	2.56
103.15	2.79	-		16.89	46.38	3.19	27.61	3.43	6.6	**23.5**	2.66

Tempest Vortex LMF Custom ICD

1:100 Yr
Flow (L/s) = 6.5
Head (m) = 2.61
Elevation (m) = **103.10**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 20.0

1:5 Yr
Flow (L/s) = 4.1
Head (m) = 1.06
Elevation (m) = **101.55**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 9.0

1:2 Yr
Flow (L/s) = 3.4
Head (m) = 0.74
Elevation (m) = **101.23**
Outlet Pipe Dia.(mm) = 254
Volume (m3) = 6.3

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

	1:100 yr	Flow Check
Q (m^3/s) =	0.0065	**0.0064**
g (m/s^2) =	9.81	9.81
h (m) =	**2.61**	2.61
A (m^2) =	**0.001464207**	**0.00145**
D (m) =	**0.04317738**	**0.04300**
D (mm) =	**43**	43.0

1:5 yr Flow Check

	1:5 yr
Q (m^3/s) =	0.0041
g (m/s^2) =	9.81
h (m) =	**1.06**
A (m^2) =	**0.00145**
D (m) =	**0.043**
D (mm) =	**43**

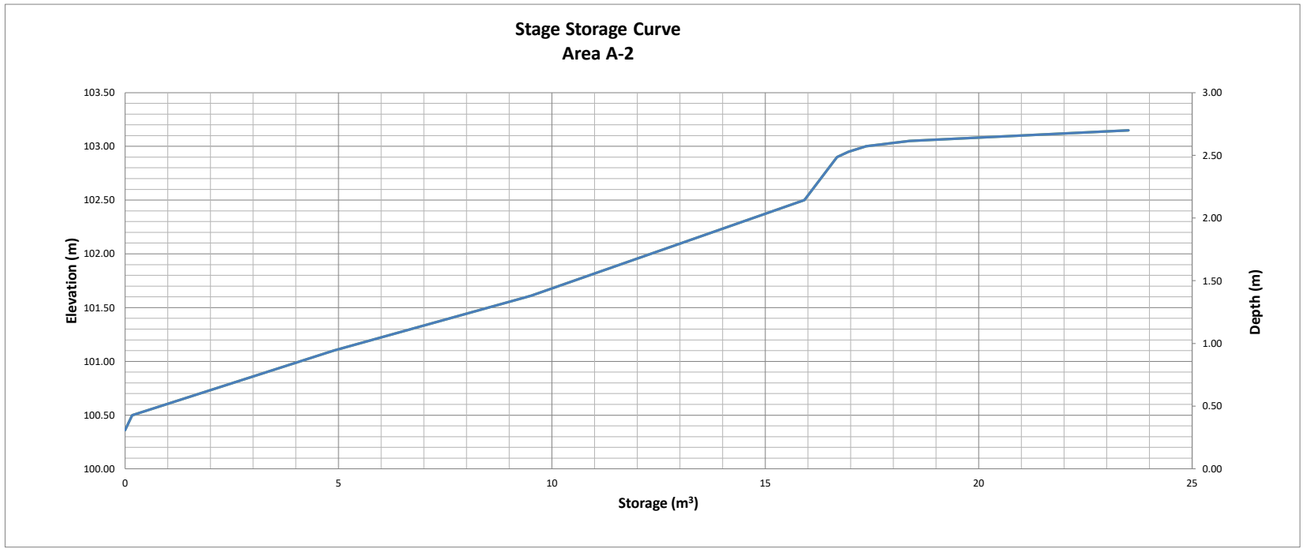
1:2 yr Flow Check

	1:2 yr
Q (m^3/s) =	0.0034
g (m/s^2) =	9.81
h (m) =	**0.74**
A (m^2) =	**0.00145**
D (m) =	**0.043**
D (mm) =	**43**

PI = 3.141592654
pipe I.D.= 610 (pvc pipe)
U/G Storage Pipe Volume
End Area 0.292 (m^2)
Total Length 41.3 (m)
Pipe Volume 12.1 (m^3)

U/G Pipe Size	610mm dia.
Pipe Segment	CBMH 01 - DICB 01
Centre-Centre Length	42.3
Inside Structure	0.9
U/G Storage Length	41.3

Maximum Ponding Depths	(cm)
1:100 Yr	**25**
1:5 Yr	**-130**
1:2 Yr	**-162**



Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-1 Controlled Internal SWM Tank 1

OTTAWA IDF CURVE

Area = 0.692 ha Qallow = 82.0 L/s
C = 0.90 Vol(max) = 30.6 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	179.32	97.32	29.20
10	76.81	132.98	50.98	30.59
15	61.77	106.94	24.94	22.45
20	52.03	90.09	8.09	9.70
25	45.17	78.20	-3.80	-5.70
30	40.04	69.33	-12.67	-22.81
35	36.06	62.43	-19.57	-41.09
40	32.86	56.90	-25.10	-60.24
45	30.24	52.36	-29.64	-80.04
50	28.04	48.55	-33.45	-100.35
55	26.17	45.31	-36.69	-121.07
60	24.56	42.52	-39.48	-142.13
65	23.15	40.08	-41.92	-163.47
70	21.91	37.94	-44.06	-185.05
75	20.81	36.04	-45.96	-206.84
90	18.14	31.41	-50.59	-273.17
105	16.13	27.93	-54.07	-340.62
120	14.56	25.21	-56.79	-408.87
135	13.30	23.02	-58.98	-477.74
150	12.25	21.21	-60.79	-547.09

Proposed Mixed-Use Development
Novatech Project No. 119210
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-1 Controlled Internal SWM Tank 1

OTTAWA IDF CURVE

Area = 0.692 ha Qallow = 82.0 L/s
C = 0.90 Vol(max) = 59.0 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	244.43	162.43	48.73
10	104.19	180.40	98.40	59.04
15	83.56	144.67	62.67	56.40
20	70.25	121.63	39.63	47.56
25	60.90	105.43	23.43	35.15
30	53.93	93.37	11.37	20.46
35	48.52	84.00	2.00	4.21
40	44.18	76.50	-5.50	-13.20
45	40.63	70.34	-11.66	-31.47
50	37.65	65.19	-16.81	-50.42
55	35.12	60.81	-21.19	-69.92
60	32.94	57.04	-24.96	-89.86
65	31.04	53.75	-28.25	-110.18
70	29.37	50.85	-31.15	-130.81
75	27.89	48.29	-33.71	-151.72
90	24.29	42.05	-39.95	-215.72
105	21.58	37.37	-44.63	-281.19
120	19.47	33.71	-48.29	-347.72
135	17.76	30.76	-51.24	-415.06
150	16.36	28.33	-53.67	-483.04

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-1 Controlled Internal SWM Tank 1

OTTAWA IDF CURVE

Area = 0.692 ha Qallow = 82.0 L/s
C = 1.00 Vol(max) = 178.5 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	466.90	384.90	115.47
10	178.56	343.50	261.50	156.90
15	142.89	274.89	192.89	173.60
20	119.95	230.76	148.76	178.51
25	103.85	199.78	117.78	176.67
30	91.87	176.73	94.73	170.52
35	82.58	158.86	76.86	161.41
40	75.15	144.56	62.56	150.15
45	69.05	132.84	50.84	137.26
50	63.95	123.03	41.03	123.10
55	59.62	114.70	32.70	107.92
60	55.89	107.53	25.53	91.90
65	52.65	101.28	19.28	75.19
70	49.79	95.78	13.78	57.89
75	47.26	90.91	8.91	40.09
90	41.11	79.09	-2.91	-15.73
105	36.50	70.21	-11.79	-74.26
120	32.89	63.28	-18.72	-134.77
135	30.00	57.71	-24.29	-196.77
150	27.61	53.12	-28.88	-259.95

Proposed Mixed-Use Development
Novatech Project No. 119210
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA R-1 Controlled Internal SWM Tank 1

OTTAWA IDF CURVE

Area = 0.692 ha Qallow = 82.0 L/s
C = 1.00 Vol(max) = 236.6 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	560.28	478.28	143.49
10	214.27	412.21	330.21	198.12
15	171.47	329.87	247.87	223.09
20	143.94	276.91	194.91	233.89
25	124.62	239.73	157.73	236.60
30	110.24	212.08	130.08	234.14
35	99.09	190.63	108.63	228.13
40	90.17	173.47	91.47	219.54
45	82.86	159.40	77.40	208.99
50	76.74	147.64	65.64	196.92
55	71.55	137.64	55.64	183.62
60	67.07	129.03	47.03	169.32
65	63.18	121.54	39.54	154.19
70	59.75	114.94	32.94	138.35
75	56.71	109.09	27.09	121.90
90	49.33	94.91	12.91	69.69
105	43.80	84.25	2.25	14.20
120	39.47	75.94	-6.06	-43.64
135	36.00	69.25	-12.75	-103.29
150	33.13	63.74	-18.26	-164.34

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:2 YEAR EVENT
AREA R-2 Controlled Internal SWM Tank 2

OTTAWA IDF CURVE

Area = 0.680 ha Qallow = 82.0 L/s
C = 0.90 Vol(max) = 29.2 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	103.57	176.21	94.21	28.26
10	76.81	130.67	48.67	29.20
15	61.77	105.09	23.09	20.78
20	52.03	88.52	6.52	7.83
25	45.17	76.85	-5.15	-7.73
30	40.04	68.13	-13.87	-24.97
35	36.06	61.35	-20.65	-43.37
40	32.86	55.91	-26.09	-62.61
45	30.24	51.45	-30.55	-82.49
50	28.04	47.71	-34.29	-102.88
55	26.17	44.53	-37.47	-123.67
60	24.56	41.78	-40.22	-144.79
65	23.15	39.39	-42.61	-166.19
70	21.91	37.28	-44.72	-187.82
75	20.81	35.41	-46.59	-209.65
90	18.14	30.87	-51.13	-276.11
105	16.13	27.45	-54.55	-343.67
120	14.56	24.78	-57.22	-412.02
135	13.30	22.62	-59.38	-480.97
150	12.25	20.84	-61.16	-550.40

Proposed Mixed-Use Development
Novatech Project No. 119210
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA R-1 Controlled Internal SWM Tank 2

OTTAWA IDF CURVE

Area = 0.680 ha Qallow = 82.0 L/s
C = 0.90 Vol(max) = 57.2 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	240.20	158.20	47.46
10	104.19	177.27	95.27	57.16
15	83.56	142.16	60.16	54.14
20	70.25	119.52	37.52	45.03
25	60.90	103.61	21.61	32.41
30	53.93	91.75	9.75	17.55
35	48.52	82.55	0.55	1.15
40	44.18	75.17	-6.83	-16.38
45	40.63	69.12	-12.88	-34.77
50	37.65	64.06	-17.94	-53.82
55	35.12	59.76	-22.24	-73.40
60	32.94	56.05	-25.95	-93.42
65	31.04	52.82	-29.18	-113.82
70	29.37	49.97	-32.03	-134.52
75	27.89	47.45	-34.55	-155.48
90	24.29	41.32	-40.68	-219.65
105	21.58	36.72	-45.28	-285.27
120	19.47	33.12	-48.88	-351.93
135	17.76	30.22	-51.78	-419.38
150	16.36	27.84	-54.16	-487.46

Proposed Residential Development
Novatech Project No. 117151
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA R-2 Controlled Internal SWM Tank 2

OTTAWA IDF CURVE

Area = 0.680 ha Qallow = 82.0 L/s
C = 1.00 Vol(max) = 173.7 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	458.81	376.81	113.04
10	178.56	337.55	255.55	153.33
15	142.89	270.13	188.13	169.31
20	119.95	226.75	144.75	173.71
25	103.85	196.31	114.31	171.47
30	91.87	173.67	91.67	165.00
35	82.58	156.11	74.11	155.62
40	75.15	142.05	60.05	144.13
45	69.05	130.53	48.53	131.04
50	63.95	120.90	38.90	116.70
55	59.62	112.71	30.71	101.35
60	55.89	105.66	23.66	85.19
65	52.65	99.52	17.52	68.34
70	49.79	94.12	12.12	50.91
75	47.26	89.33	7.33	32.99
90	41.11	77.72	-4.28	-23.13
105	36.50	68.99	-13.01	-81.93
120	32.89	62.18	-19.82	-142.67
135	30.00	56.71	-25.29	-204.88
150	27.61	52.20	-29.80	-268.24

Proposed Mixed-Use Development
Novatech Project No. 119210
REQUIRED STORAGE - 1:100 YR + 20% IDF Increase
AREA R-1 Controlled Internal SWM Tank 2

OTTAWA IDF CURVE

Area = 0.680 ha Qallow = 82.0 L/s
C = 1.00 Vol(max) = 230.4 m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	291.24	550.57	468.57	140.57
10	214.27	405.06	323.06	193.83
15	171.47	324.15	242.15	217.94
20	143.94	272.11	190.11	228.13
25	124.62	235.58	153.58	230.36
30	110.24	208.40	126.40	227.52
35	99.09	187.33	105.33	221.19
40	90.17	170.47	88.47	212.32
45	82.86	156.64	74.64	201.53
50	76.74	145.08	63.08	189.24
55	71.55	135.26	53.26	175.74
60	67.07	126.80	44.80	161.27
65	63.18	119.43	37.43	145.97
70	59.75	112.95	30.95	129.98
75	56.71	107.20	25.20	113.39
90	49.33	93.26	11.26	60.80
105	43.80	82.79	0.79	5.00
120	39.47	74.62	-7.38	-53.13
135	36.00	68.05	-13.95	-113.02
150	33.13	62.63	-19.37	-174.29

5000 Robert Grant Avenue

Project No.: 117151

STORM SEWER DESIGN SHEET
5000 Robert Grant Avenue
FLOW RATES BASED ON RATIONAL METHOD

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			AREA (ha)			FLOW								TOTAL FLOW	SEWER DATA								
Catchment ID	From Manhole	To Manhole	Area (ha)	C	AC (ha)	Indiv 2.78 AC	Accum 2.78 AC	Time of Concentration	Rainfall Intensity 2 Year (mm/hr)	Rainfall Intensity 5 Year (mm/hr)	Rainfall Intensity 10 Year (mm/hr)	Rainfall Intensity 100 Year (mm/hr)	Peak Flow (L/s)	Total Peak Flow, Q (L/s)	Dia. (m) Actual	Dia. (mm)	Type	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Flow Time (min)	Ratio Q/Q full
EAST ACCESS ROAD TO SUBJECT SITE OFF LIVERY STREET																							
					0.00	0.000	0.000	10.00															
AREA A-2.1	DICB 01	CBMH 01	0.137	0.26	0.04	0.099	0.099	10.00		104.19			10	10.3	0.610	600	PVC	0.50	41.4	452.7	1.55	0.44	2%
					0.00	0.000	0.000	10.00															
					0.00	0.000	0.000	10.00															
					0.00	0.000	0.000	10.44															
AREA A-2.2	CBMH 01	STM MH 01	0.000	0.90	0.00	0.000	0.099	10.44		101.90			10.1	10.1	0.254	250	PVC	1.00	4.7	62.0	1.22	0.06	16%
					0.00	0.000	0.000	10.44															
					0.00	0.000	0.000	10.44															
								10.51															
					0.00	0.000	0.000	10.51															
**** AREA A-2.2 ** Controlled**	CBMH 01	STM MH 01	0.00	0.00	0.00	0.000	0.099	10.51		101.58			10	4.1	0.254	250	PVC	1.00	4.7	62.0	1.22	0.06	7%
					0.00	0.000	0.000	10.51															
					0.00	0.000	0.000	10.51															
					0.00	0.000	0.000	10.00															
AREA A-1.1	STM MH 02	STM MH 01	0.034	0.82	0.03	0.078	0.078	10.00		104.19			8.1	8.1	0.254	250	PVC	1.00	24.4	62.0	1.22	0.33	13%
					0.00	0.000	0.000	10.00															
					0.00	0.000	0.000	10.00															
					0.00	0.000	0.000	10.51															
AREA A-2.2	STM MH 01	OUTLET TEE	0.013	0.81	0.01	0.029	0.107	10.51		101.58			10.8	12.2	0.305	300	PVC	1.00	8.0	100.8	1.38	0.10	12%
					0.00	0.000	0.000	10.51															
					0.00	0.000	0.000	10.51															
								10.61															

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

Consultant:	**Novatech**	
Issued Date:	October 13, 2023	
Review Date:		
Design By:	SM	
Client:	**Dwg. Reference:**	**Checked By:**
LEPINE	117151-SWM	DDB

Legend:

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

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

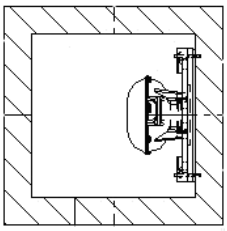
Constructed from durable PVC, the LMF ICD is light weight 8.9 Kg (19.7 lbs).

Product Applications

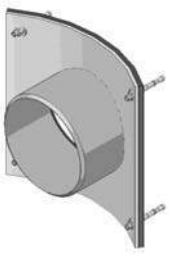
Will accommodate both square and round applications:

Square Application

Universal Mounting Plate



Round Application



+

Spigot CB Wall Plate

=

Universal Mounting Plate Hub Adapter

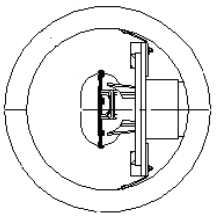


Chart 1: LMF 14 Preset Flow Curves

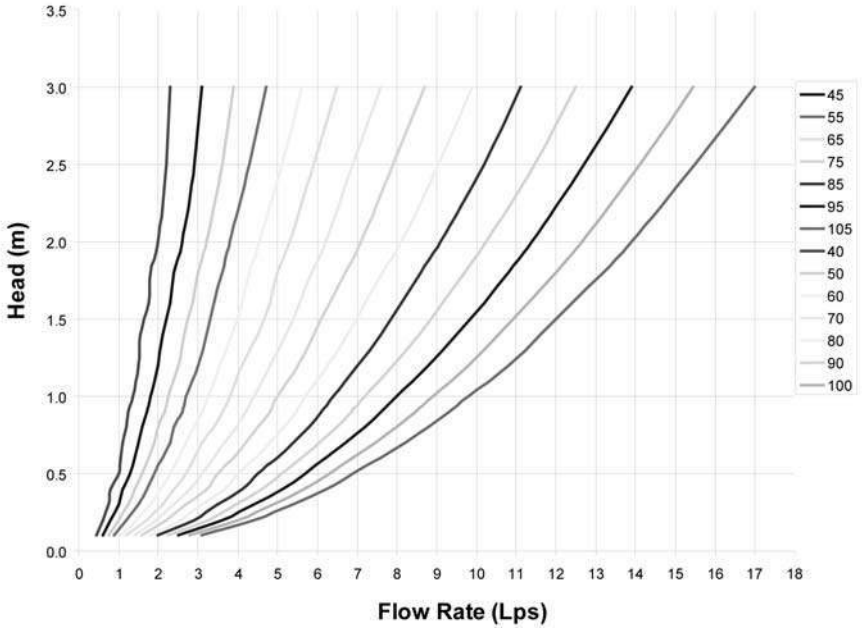
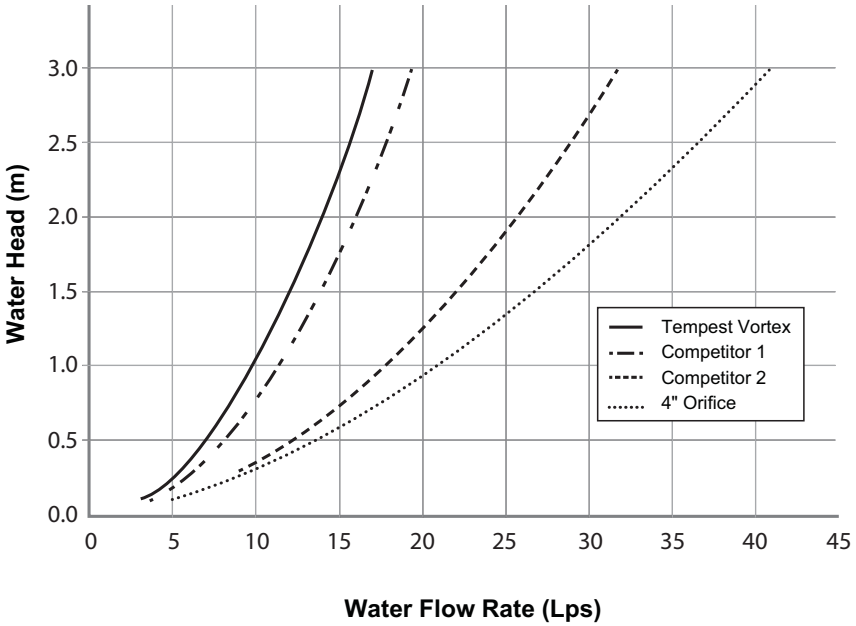


Chart 2: LMF Flow vs. ICD Alternatives



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.

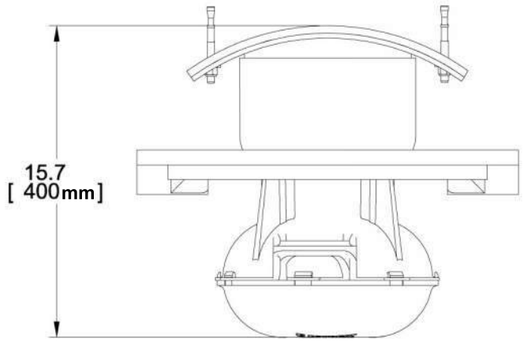
All hardware will be made from 304 stainless steel.

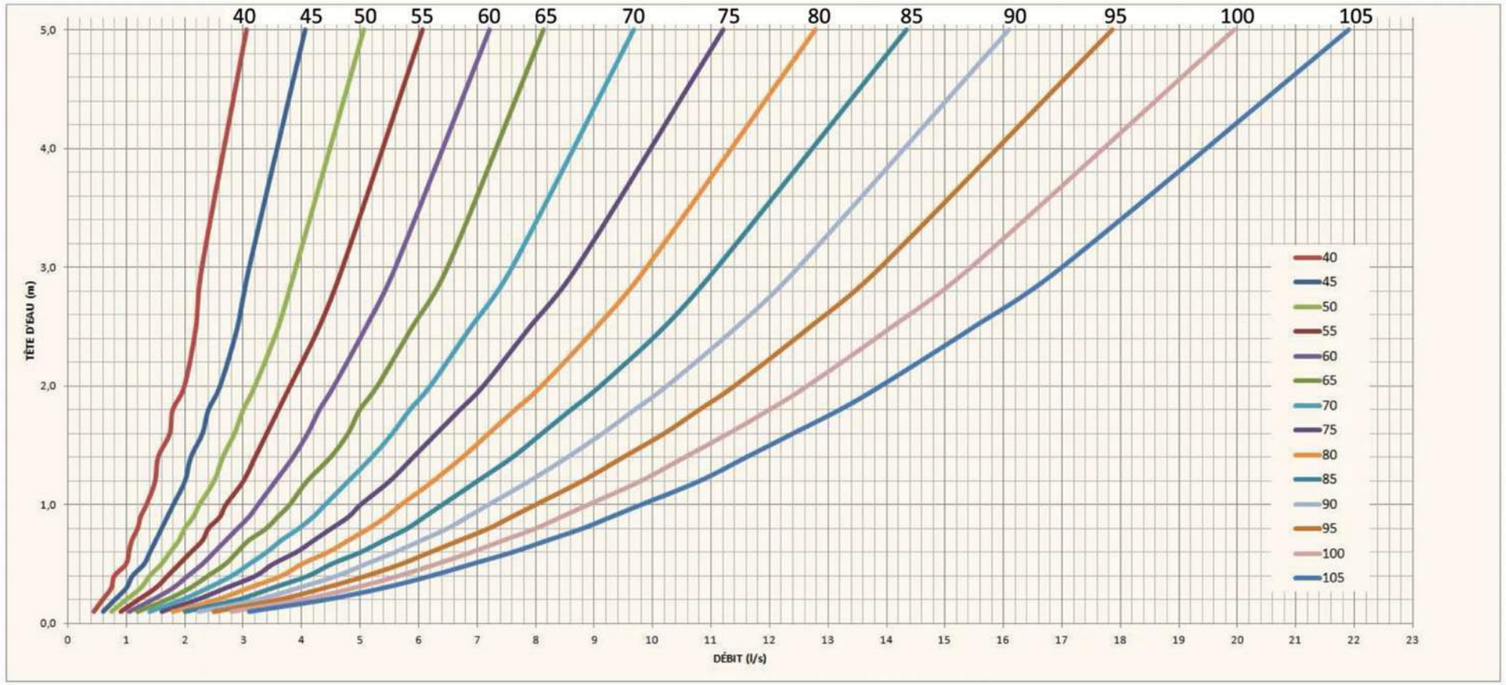
Dimensioning

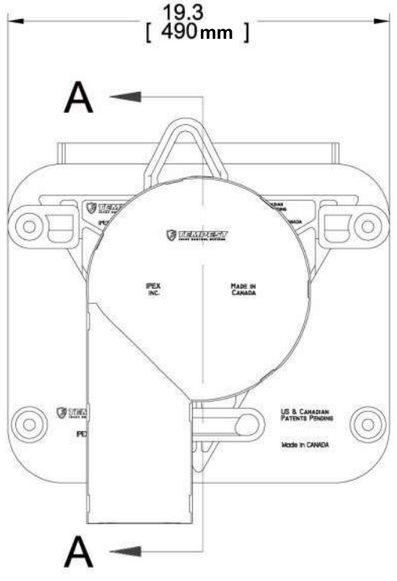
The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

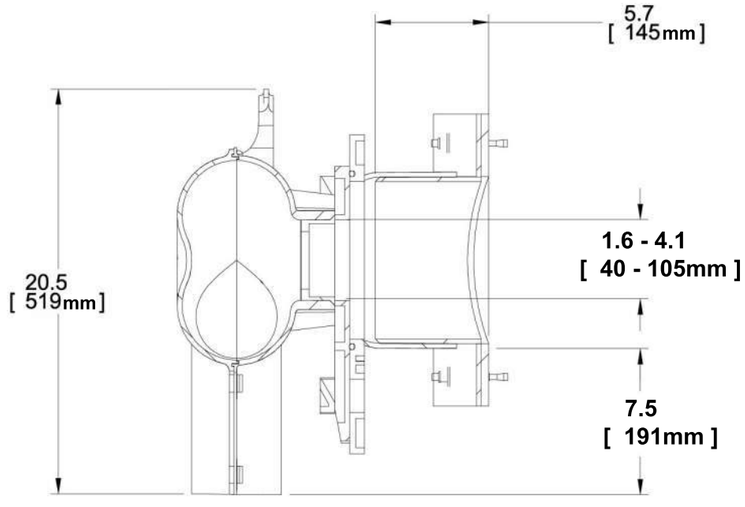
Installation

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.

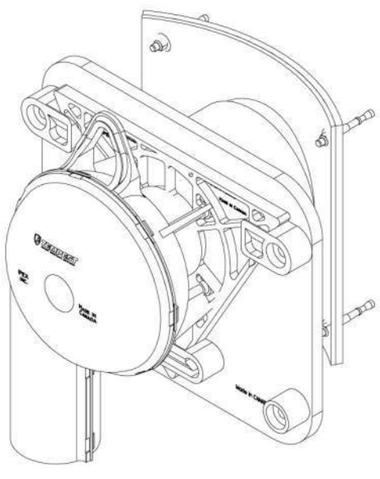








SECTION A-A



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 E
Multiple Service Connections Memo

NOVATECH
ENGINEERING
CONSULTANTS LTD.

M E M O R A N D U M

DATE: JULY 28, 2023

TO: ABI DIEME (CITY OF OTTAWA)

FROM: DREW BLAIR

RE: 5000 ROBERT GRANT AVENUE
SITE SERVICING – MULTIPLE SERVICE CONNECTIONS
PRECON #: PC2023-0046
NOVATECH #: 117151
CC: F. LEPINE, A. LALONDE (LEPINE), A. WENDZICH (NEUF), S. EZZIO (CITY)

Novatech has been retained to prepare a site servicing and stormwater management report to support the site plan application for the property located at 5000 Robert Grant Avenue within the City of Ottawa. The subject site is a vacant lot with a total site area of approximately 2.02 hectares. The site plan application proposes three new residential mid to high-rise towers (ranging between 4 and 18-storeys) to be built on top of a single common podium structure for the on-site underground parking. The proposed site entrance off Robert Grant Avenue will provide access to all buildings at the ground level as well as access to the underground parking structure via. a ramp near the south-west corner of the site. The Livery Street site entrance will provide access to the underground parking garage only and is to be located near the south-east corner of the subject site.

This technical memorandum is being submitted in support of the site plan application process for the justification of multiple service connections to the adjacent municipal infrastructure. The City of Ottawa previously identified that multiple sanitary and storm outlet sewers are available for connecting the proposed site servicing. While the City typically allows one sanitary and one storm sewer connection per property, it was stated in the pre-consultation meeting that multiple servicing connections may be permitted on a case-by-case basis.

Multiple Sanitary Service Outlets

As part of the Fernbank Crossing Subdivision, the original concept for the subject site was to develop the lands as a commercial/mixed use residential area. A 250mm diameter sanitary service stub connected to Livery Street was installed as part of the Fernbank Crossing Subdivision works near the north-east corner of the site. The approved design flow from the subject site to the existing Livery Street sanitary sewer was approximately 3.3 L/s via. the existing 250mm service stub. Refer to the sanitary sewer design sheet and drainage area plan in **Appendix A** for details of the approved sanitary site flows and sewer pipe capacities in the downstream system along Livery Street in Fernbank Crossing. The site was Block 203 (labelled as Area A4-3) in the Fernbank Crossing drainage area plan and design sheet.

The current site development proposal contains high density residential buildings with anticipated sanitary flows greater than originally accounted for in the downstream Livery Street sanitary sewer

system. Peak sanitary flows for the entire site will be in the order of 10.8 L/s and are summarized in **Table 1** below:

Table 1: Proposed Sanitary Peak Flow Summary

Proposed Use	Unit Count / Area	Peaking Factor (1)	Peak Design Flow (L/s)
Building A			
Residential Tower	113	3.52	2.32
Extraneous Infiltration (ha)	0.68	-	0.22
Building A	-	-	**2.5**
Building B			
Residential Tower	153	3.47	3.11
Extraneous Infiltration (ha)	0.67	-	0.22
Building B	-	-	**3.3**
Building C			
Residential Tower	238	3.41	4.74
Commercial/Retail Space (m^2)	157	1.5	0.01
Extraneous Infiltration (ha)	0.67	-	0.22
Building C	-	-	**5.0**
Site Totals	504 / 157	-	**10.8**

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

Refer to the sanitary design sheets in **Appendix A** for details of the theoretical site flows generated by the full site development.

Upon review of the downstream sanitary sewers, it is noted that there is one section of sewer within the Westpark Phase 1 sanitary sewer system that is near capacity. The sanitary sewer design sheet for the Westpark Phase 1 development, prepared by IBI, indicates that the existing 375mm diameter sewer on Oxford Place (between MH 103A and MH 202A) is currently operating at 92% with 6.57 L/s of available capacity. This sewer is downstream of Livery Street in Fernbank Crossing and is shown on the IBI West Park General Plan of Services provided in **Appendix A**.

The proposed site will generate sanitary flows greater than the original design flows (10.8 L/s versus 3.3 L/s), and as noted above, there are capacity limitations in the downstream sanitary sewer within the Westpark Phase 1 development, so it would be beneficial to split post-development sanitary flows between two separate sanitary service outlets.

As indicated in the pre-consultation meeting with the City, there is an existing 250mm diameter PVC sanitary sewer accessible in the Robert Grant Avenue right-of-way (ROW). The existing 250mm diameter PVC sanitary sewer in the Robert Grant Avenue ROW outlets directly to the municipal 750mm diameter Stittsville sanitary trunk sewer on the north side of the hydro corridor. This segment of the 250mm diameter sewer was constructed at a slope of 0.35% and has an approximate capacity of 36.7 L/s. The theoretical sanitary flow from the upstream tributary area (including the future residential build-out area) is approximately 14.5 L/s, leaving approximately 22.2 L/s of available flow capacity in the pipe segment downstream of the subject site. Refer to **Appendix A** for details of the anticipated off-site flows and sewer pipe capacities in the downstream system along Robert Grant Avenue.

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

In the post-development condition, the subject site may be serviced by the 250mm diameter sanitary sewer in the Robert Grant Avenue ROW with the anticipated peak sanitary flow of 8.3 L/s from Towers 'B' and 'C'. The remaining 2.5 L/s of sanitary flow from Tower 'A' will outlet to the existing sanitary servicing stub on Livery Street. The sanitary flow to Livery Street will be less than the approved allowable release rate and the available capacity in the municipal system.

The internal mechanical plumbing will benefit from splitting flows to reduce the lengths and sizes of the internal runs and still be able to service all of the residential units through the use of gravity sewers. Reducing or avoiding pumping sanitary flows will increase the reliability and the safety of the system for the long-term maintenance of the system.

It is proposed to split flows and utilize the available downstream sewer capacities of both the Livery Street and Robert Grant Avenue municipal sanitary sewer systems with the additional sanitary connection (i.e.: two (2) sanitary connections in total for this site).

Multiple Storm Service Outlets

The Fernbank Crossing Subdivision design proposed a storm service from the subject site to outlet to the existing 1200mm/1350mm diameter concrete storm trunk sewer within the on-site City easement along the north side of the site. The approved design included approximately 440 L/s from the subject site outletting to the 1200mm/1350mm diameter storm sewer segments which drains to Pond 6 providing quality control of stormwater for a portion of the Fernbank Crossing Subdivision. The site's allowable release rate, as defined in the pre-consultation notes from the City, is significantly less than the modelled system capacity and has been calculated to be 353 L/s.

Under post-development conditions, it is proposed that stormwater from the majority of the site will be controlled using two (2) internal storage tanks. One internal tank will outlet to the existing maintenance hole on the 1350mm storm trunk sewer next to the north-east corner of Building A. The second internal tank will outlet to the existing maintenance hole on the 1200mm storm trunk sewer located midway within the easement along the northern edge of the site.

The proposed development will require some direct runoff towards the municipal ROW's and the hydro corridor in order to match the existing elevations surrounding the site. The actual flows directed to the municipal storm sewer system will be significantly less than the allowable (approximately 165 L/s outlet from the internal storage tanks to the 1200mm/1350mm storm trunk sewer system).

To protect the south building façade from off-site drainage that currently slopes towards the subject site and self-contain stormwater within the site area, a diversion berm is proposed to direct off-site stormwater runoff to the existing catchbasin near the south-east property corner (as intended in the approved Fernbank Crossing design for stormwater flowing from the adjacent site). The on-site diversion berm and swale will protect the building from flooding and provide storage for the controlled stormwater flows prior to outletting to the proposed additional storm connection to the local 375mm diameter storm sewer on Livery Street. These external storm flows and a portion of the access ramp to the underground parking garage would need to be taken internally into the building (which is not desirable or encouraged) to outlet on the east side of the site on Livery Street. The existing 375mm diameter storm sewer in Livery Street is currently operating at 65% with approximately 35 L/s of available capacity. Therefore, it is proposed to have a small portion of the post-development storm flows outlet separately from the main building services to the additional Livery Street storm sewer connection. Refer to **Appendix B** for details of the sewer pipe capacities in the downstream storm sewer system along Livery Street.

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The internal mechanical plumbing will benefit from splitting flows and having three (3) storm service connections to the municipal system to reduce the lengths and sizes of the internal runs as intake of exterior storm flow to be conveyed and stored is reduced. Reducing the pumping of stormwater will increase the reliability and the safety of the system for the long-term maintenance of the system.

It is proposed to split flows and utilize the available downstream sewer capacities of both the 1200mm/1350mm storm trunk sewer along the north side of the site and the Livery Street municipal storm sewer system with the additional storm service connections (i.e.: three (3) storm service connections in total for this site).

Conclusion

In order to meet the allowable release rates and available downstream capacities in the municipal sanitary and storm sewer systems, it is proposed to service the subject site with more than one each for the sanitary and storm service connections. Multiple sanitary and storm service outlets for the proposed development at 5000 Robert Grant Avenue will provide a beneficial design in the follow aspects:

- Splitting sanitary flows to meet existing downstream sewer capacities in the municipal systems.
- Reduction of the length and sizes of internal sanitary and storm plumbing to increase reliability and safety of the internal systems.
- Allows the internal sanitary and storm plumbing systems to maximize gravity servicing of the large podium and multiple towers while minimizing the amount of pumping required.

We trust this justifies the site requirements for multiple sanitary and storm connections to service the proposed development. Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH

Drew Blair, P. Eng.
Senior Project Manager

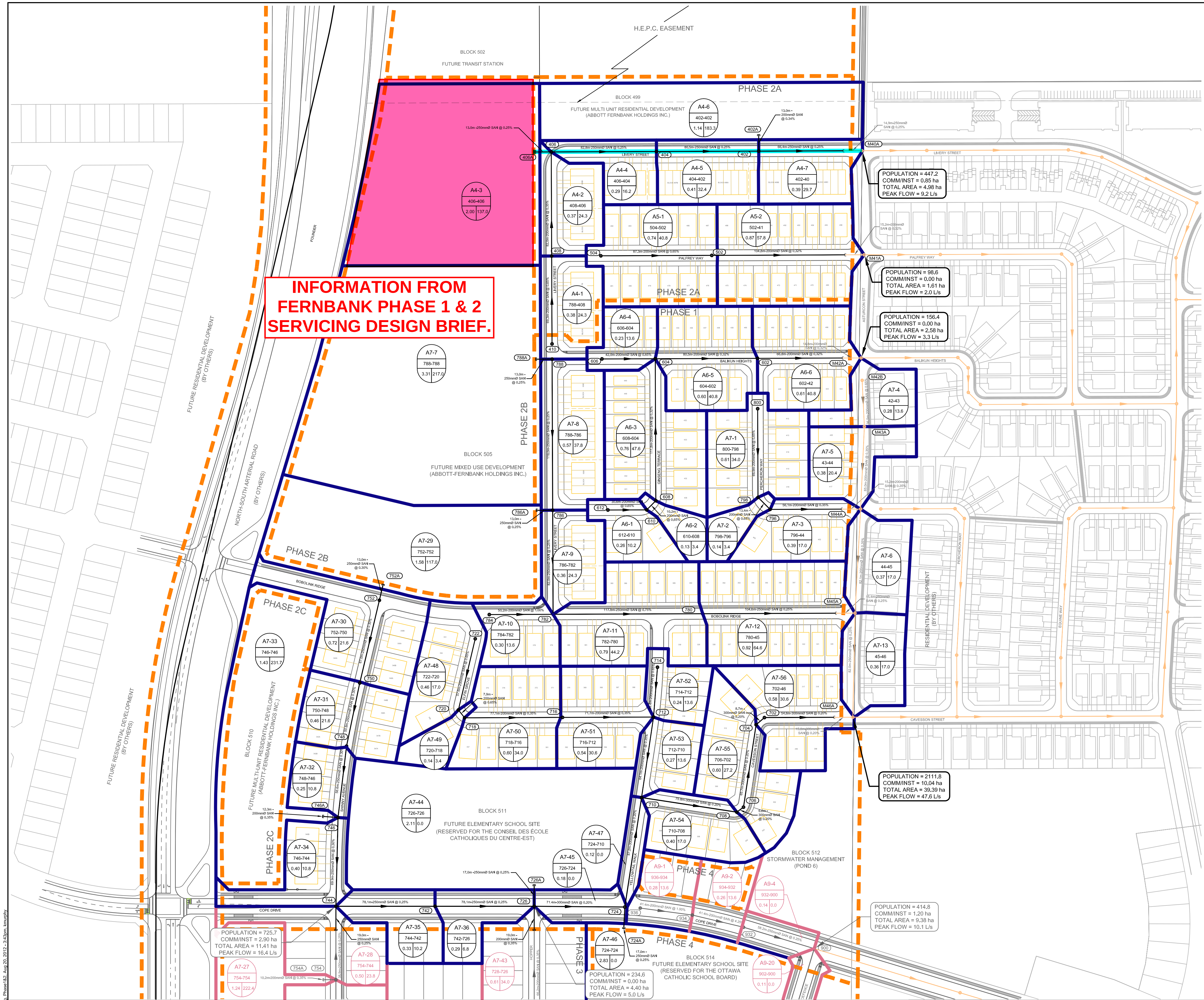
List of Appendices:

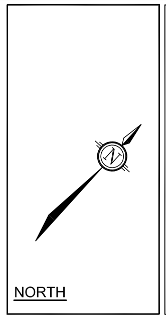
Appendix A:	Sanitary Flow Calculations and Sewer Capacities
Appendix B:	Storm Drainage Areas and Sewer Capacities
Appendix C:	Proposed Servicing Sketch

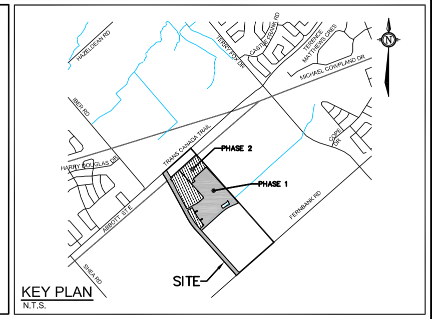
Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

APPENDIX A

Sanitary Flow Calculations and Sewer Capacities







LEGEND

- AREA ID
- MANHOLE TO MANHOLE
- POPULATION EQUIVALENT
- AREA IN HECTARES
- SANITARY DRAINAGE AREA BOUNDARY
- PHASE BOUNDARY LINE
- DIRECTION OF FLOW
- PROPOSED SANITARY SEWER AND MANHOLE
- FUTURE AREA ID
- FUTURE MANHOLE TO MANHOLE
- FUTURE POPULATION EQUIVALENT
- FUTURE AREA IN HECTARES
- FUTURE SANITARY DRAINAGE AREA BOUNDARY
- FUTURE DIRECTION OF FLOW
- FUTURE PROPOSED SANITARY SEWER AND 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.

ABBOTT-FERNBANK HOLDINGS INC.

No.	REVISION	DATE	BY
3.	ISSUED FOR APPROVAL (PHASE 1&2)	AUG 17/12	KJM
2.	ISSUED FOR APPROVAL (PHASE 1&2)	JUN 21/12	KJM
1.	ISSUED FOR APPROVAL	MAR 9/12	KJM

SCALE 1:1250

DESIGN KJM · CHECKED MAB · DRAWN RCH · CHECKED KJM · APPROVED MAB

FOR REVIEW ONLY

K. J. MURPHY 100123021 · M.A. BISSETT — LICENSED PROFESSIONAL ENGINEER, PROVINCE OF ONTARIO

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
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CITY OF OTTAWA
FERNBANK CROSSING

SANITARY DRAINAGE AREA PLAN PHASE 1 & 2

PROJECT No. 108180-10
REV # 3
DRAWING No. 108180-SAN1

Fernbank Crossing - Sanitary Sewer Design Sheet

FLOW ALLOTED FROM BLOCK 203

AREA			RESIDENTIAL												ICI				INFILTRATION				PIPE					
			SINGLES		TOWNS				MIXED USE		TOTAL																	
ID	From	To	Units	Pop.	Units	Pop.	Area	Pop.	Net Area (ha)	Pop.	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)	Commercial Area (ha)	Institutional Area (ha)	Accum. Area (ha)	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	**Total Flow (l/s)**	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
Outlet 400																												
4-1	410	408	0	0.0	9	24.3	0.0	0.0	0.00	0.0	24.3	24.3	4.0	0.4	0.00	0.00	0.00	0.0	0.38	0.38	0.1	0.5	200	0.65	69.3	27.6	0.85	1.8%
4-2	408	**406**	0	0.0	9	24.3	0.0	0.0	0.00	0.0	24.3	48.6	4.0	0.8	0.00	0.00	0.00	0.0	0.37	0.75	0.2	1.0	200	0.35	82.0	20.2	0.62	4.9%
4-3	406A	**406**	0	0.0	0	0.0	0.0	0.0	1.70	137.0	137.0	137.0	4.0	2.2	0.85	0.00	0.85	0.5	2.00	2.00	0.6	3.3	250	0.25	11.0	31.0	0.61	10.6%
4-4	**406**	404	0	0.0	6	16.2	0.0	0.0	0.00	0.0	16.2	201.8	4.0	3.3	0.00	0.00	0.85	0.5	0.29	3.04	0.9	4.6	250	0.25	82.8	31.0	0.61	14.9%
4-5	404	**402**	0	0.0	12	32.4	0.0	0.0	0.00	0.0	32.4	234.2	4.0	3.8	0.00	0.00	0.85	0.5	0.41	3.45	1.0	5.3	250	0.25	80.5	31.0	0.61	17.0%
4-6	402A	**402**	0	0.0	0	0.0	1.1	183.3	0.00	0.0	183.3	183.3	4.0	3.0	0.00	0.00	0.00	0.0	1.14	1.14	0.3	3.3	200	0.35	11.0	20.2	0.62	16.3%
4-7	**402**	**40A**	0	0.0	11	29.7	0.0	0.0	0.00	0.0	29.7	447.2	4.0	7.2	0.00	0.00	0.85	0.5	0.39	4.98	1.4	9.2	250	0.25	81.3	31.0	0.61	29.5%
Outlet 500																												
5-1	504	502	12	40.8	0	0.0	0.0	0.0	0.00	0.0	40.8	40.8	4.0	0.7	0.00	0.00	0.00	0.0	0.74	0.74	0.2	0.9	200	0.65	87.3	27.6	0.85	3.2%
5-2	502	**41A**	17	57.8	0	0.0	0.0	0.0	0.00	0.0	57.8	98.6	4.0	1.6	0.00	0.00	0.00	0.0	0.87	1.61	0.5	2.0	200	0.32	120.0	19.4	0.60	10.6%
Outlet 600																												
6-1	612	610	3	10.2	0	0.0	0.0	0.0	0.00	0.0	10.2	10.2	4.0	0.2	0.00	0.00	0.00	0.0	0.26	0.26	0.1	0.2	200	0.65	30.6	27.6	0.85	0.9%
6-2	610	608	1	3.4	0	0.0	0.0	0.0	0.00	0.0	3.4	13.6	4.0	0.2	0.00	0.00	0.00	0.0	0.13	0.39	0.1	0.3	200	0.65	10.2	27.6	0.85	1.2%
6-3	608	**604**	14	47.6	0	0.0	0.0	0.0	0.00	0.0	47.6	61.2	4.0	1.0	0.00	0.00	0.00	0.0	0.76	1.14	0.3	1.3	200	0.32	111.8	19.4	0.60	6.8%
6-4	606	**604**	4	13.6	0	0.0	0.0	0.0	0.00	0.0	13.6	13.6	4.0	0.2	0.00	0.00	0.00	0.0	0.23	0.23	0.1	0.3	200	0.65	42.0	27.6	0.85	1.0%
6-5	**604**	602	12	40.8	0	0.0	0.0	0.0	0.00	0.0	40.8	115.6	4.0	1.9	0.00	0.00	0.00	0.0	0.60	1.97	0.6	2.4	200	0.32	80.5	19.4	0.60	12.5%
6-6	602	**42A**	12	40.8	0	0.0	0.0	0.0	0.00	0.0	40.8	156.4	4.0	2.5	0.00	0.00	0.00	0.0	0.61	2.58	0.7	3.3	200	0.32	81.6	19.4	0.60	16.8%
Outlet 700																												
7-1	800	798	10	34.0	0	0.0	0.0	0.0	0.00	0.0	34.0	34.0	4.0	0.6	0.00	0.00	0.00	0.0	0.61	0.61	0.2	0.7	200	0.65	69.9	27.6	0.85	2.6%
7-2	798	796	1	3.4	0	0.0	0.0	0.0	0.00	0.0	3.4	37.4	4.0	0.6	0.00	0.00	0.00	0.0	0.14	0.75	0.2	0.8	200	0.65	13.4	27.6	0.85	3.0%
7-3	796	**44A**	5	17.0	0	0.0	0.0	0.0	0.00	0.0	17.0	54.4	4.0	0.9	0.00	0.00	0.00	0.0	0.39	1.14	0.3	1.2	200	0.35	71.3	20.2	0.62	5.9%
7-4	42B	43A	4	13.6	0	0.0	0.0	0.0	0.00	0.0	13.6	13.6	4.0	0.2	0.00	0.00	0.00	0.0	0.28	0.28	0.1	0.3	200	0.65	36.5	27.6	0.85	1.1%
7-5	43A	**44A**	6	20.4	0	0.0	0.0	0.0	0.00	0.0	20.4	34.0	4.0	0.6	0.00	0.00	0.00	0.0	0.38	0.66	0.2	0.7	200	0.35	65.0	20.2	0.62	3.6%
7-6	**44A**	**45A**	5	17.0	0	0.0	0.0	0.0	0.00	0.0	17.0	105.4	4.0	1.7	0.00	0.00	0.00	0.0	0.37	2.17	0.6	2.3	200	0.35	82.1	20.2	0.62	11.4%
7-7	788A	788	0	0.0	0	0.0	0.0	0.0	2.68	217.0	217.0	217.0	4.0	3.5	1.34	0.00	1.34	0.8	3.31	3.31	0.9	5.3	250	0.25	11.0	31.0	0.61	17.0%
7-8	788	786	0	0.0	14	37.8	0.0	0.0	0.00	0.0	37.8	254.8	4.0	4.1	0.00	0.00	1.34	0.8	0.57	3.89	1.1	6.0	250	0.25	119.0	31.0	0.61	19.4%
7-9	786	**782**	0	0.0	9	24.3	0.0	0.0	0.00	0.0	24.3	279.1	4.0	4.5	0.00	0.00	1.34	0.8	0.36	4.25	1.2	6.5	250	0.25	82.0	31.0	0.61	21.0%
7-10	784	**782**	4	13.6	0	0.0	0.0	0.0	0.00	0.0	13.6	13.6	4.0	0.2	0.00	0.00	0.00	0.0	0.30	0.30	0.1	0.3	200	1.00	50.2	34.2	1.06	0.9%
7-11	**782**	780	13	44.2	0	0.0	0.0	0.0	0.00	0.0	44.2	336.9	4.0	5.5	0.00	0.00	1.34	0.8	0.80	5.35	1.5	7.8	250	0.75	117.8	53.7	1.06	14.5%
7-12	780	**45A**	19	64.6	0	0.0	0.0	0.0	0.00	0.0	64.6	401.5	4.0	6.5	0.00	0.00	1.34	0.8	0.93	6.28	1.8	9.1	250	0.25	120.0	31.0	0.61	29.3%
7-13	**45A**	**46A**	5	17.0	0	0.0	0.0	0.0	0.00	0.0	17.0	523.9	4.0	8.4	0.00	0.00	1.34	0.8	0.36	8.81	2.5	11.7	250	0.25	82.0	31.0	0.61	37.7%

INFORMATION FROM FERNBANK PHASE 1 & 2 SERVICING DESIGN BRIEF.

NOVATECH ENGINEERING CONSULTANTS LTD.

Fernbank Crossing - Sanitary Sewer Design Sheet

AREA			RESIDENTIAL												ICI				INFILTRATION				PIPE					
			SINGLES		TOWNS				MIXED USE		TOTAL																	
ID	From	To	Units	Pop.	Units	Pop.	Area	Pop.	Net Area (ha)	Pop.	Pop.	Accum. Pop.	Peak Factor	Peak Flow (l/s)	Commercial Area (ha)	Institutional Area (ha)	Accum. Area (ha)	Peak Flow (l/s)	Total Area (ha)	Accum. Area (ha)	Infilt. Flow (l/s)	**Total Flow (l/s)**	Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
Future		**744**	101	343.4	0	0.0	2.4	382.3	0.00	0.0	725.7	725.7	3.9	11.4	0.00	2.90	2.90	1.8	11.41	11.41	3.2	16.4						
7-29	752A	752	0	0.0	0	0.0	0.0	0.0	1.45	117.0	117.0	117.0	4.0	1.9	0.73	0.00	0.73	0.4	1.58	1.58	0.4	2.8	250	0.30	11.0	34.0	0.67	8.2%
7-30	752	750	0	0.0	8	21.6	0.0	0.0	0.00	0.0	21.6	138.6	4.0	2.2	0.00	0.00	0.73	0.4	0.72	2.30	0.6	3.3	250	0.30	67.0	34.0	0.67	9.8%
7-31	750	748	0	0.0	8	21.6	0.0	0.0	0.00	0.0	21.6	160.2	4.0	2.6	0.00	0.00	0.73	0.4	0.44	2.74	0.8	3.8	250	0.30	51.6	34.0	0.67	11.2%
7-32	748	**746**	0	0.0	4	10.8	0.0	0.0	0.00	0.0	10.8	171.0	4.0	2.8	0.00	0.00	0.73	0.4	0.23	2.97	0.8	4.0	250	0.30	55.9	34.0	0.67	11.9%
7-33	746A	**746**	0	0.0	0	0.0	1.4	231.7	0.00	0.0	231.7	231.7	4.0	3.8	0.00	0.00	0.00	0.0	1.43	1.43	0.4	4.2	200	0.35	10.2	20.2	0.62	20.5%
7-34	**746**	**744**	0	0.0	4	10.8	0.0	0.0	0.00	0.0	10.8	413.5	4.0	6.7	0.00	0.00	0.73	0.4	0.40	4.80	1.3	8.5	250	0.30	69.9	34.0	0.67	25.0%
7-35	**744**	742	3	10.2	0	0.0	0.0	0.0	0.00	0.0	10.2	1149.3	3.8	17.5	0.00	0.00	3.76	2.3	0.33	16.54	4.6	24.4	250	0.25	78.1	31.0	0.61	78.7%
7-36	742	**726**	2	6.8	0	0.0	0.0	0.0	0.00	0.0	6.8	1156.1	3.8	17.6	0.00	0.00	3.76	2.3	0.29	16.83	4.7	24.6	250	0.25	78.1	31.0	0.61	79.3%
Future		**726**	69	234.6	0	0.0	0.0	0.0	0.00	0.0	234.6	234.6	4.0	3.8	0.00	0.00	0.00	0.0	4.40	4.40	1.2	5.0						
7-44	726A	**726**	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	4.0	0.0	0.00	2.12	2.12	1.3	2.12	2.12	0.6	1.9	250	0.25	15.0	31.0	0.61	6.1%
7-45	**726**	**724**	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	1390.7	3.7	20.9	0.00	0.00	5.87	3.6	0.18	23.53	6.6	31.0	300	0.20	71.4	45.1	0.62	68.7%
7-46	**724A**	**724**	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	4.0	0.0	0.00	2.83	2.83	1.7	2.83	2.83	0.8	2.5	250	0.25	15.0	31.0	0.61	8.1%
7-47	**724**	**710**	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	1390.7	3.7	20.9	0.00	0.00	8.70	5.3	0.11	26.47	7.4	33.6	300	0.20	87.2	45.1	0.62	74.4%
7-48	722	720	5	17.0	0	0.0	0.0	0.0	0.00	0.0	17.0	17.0	4.0	0.3	0.00	0.00	0.00	0.0	0.46	0.46	0.1	0.4	200	0.65	57.6	27.6	0.85	1.5%
7-49	720	718	1	3.4	0	0.0	0.0	0.0	0.00	0.0	3.4	20.4	4.0	0.3	0.00	0.00	0.00	0.0	0.14	0.60	0.2	0.5	200	0.65	7.9	27.6	0.85	1.8%
7-50	718	716	10	34.0	0	0.0	0.0	0.0	0.00	0.0	34.0	54.4	4.0	0.9	0.00	0.00	0.00	0.0	0.60	1.20	0.3	1.2	200	0.35	75.7	20.2	0.62	6.0%
7-51	716	**712**	9	30.6	0	0.0	0.0	0.0	0.00	0.0	30.6	85.0	4.0	1.4	0.00	0.00	0.00	0.0	0.54	1.74	0.5	1.9	200	0.35	73.1	20.2	0.62	9.2%
7-52	714	**712**	4	13.6	0	0.0	0.0	0.0	0.00	0.0	13.6	13.6	4.0	0.2	0.00	0.00	0.00	0.0	0.23	0.23	0.1	0.3	200	0.65	39.4	27.6	0.85	1.0%
7-53	**712**	**710**	4	13.6	0	0.0	0.0	0.0	0.00	0.0	13.6	112.2	4.0	1.8	0.00	0.00	0.00	0.0	0.28	2.25	0.6	2.4	200	0.35	64.1	20.2	0.62	12.1%
7-54	**710**	708	5	17.0	0	0.0	0.0	0.0	0.00	0.0	17.0	1519.9	3.7	22.6	0.00	0.00	8.70	5.3	0.40	29.11	8.2	36.1	300	0.20	75.8	45.1	0.62	79.9%
	708	706	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	1519.9	3.7	22.6	0.00	0.00	8.70	5.3	0.00	29.11	8.2	36.1	300	0.20	6.6	45.1	0.62	79.9%
7-55	706	704	8	27.2	0	0.0	0.0	0.0	0.00	0.0	27.2	1547.1	3.7	23.0	0.00	0.00	8.70	5.3	0.60	29.71	8.3	36.6	300	0.20	65.7	45.1	0.62	81.1%
	704	702	0	0.0	0	0.0	0.0	0.0	0.00	0.0	0.0	1547.1	3.7	23.0	0.00	0.00	8.70	5.3	0.00	29.71	8.3	36.6	300	0.20	8.7	45.1	0.62	81.1%
7-56	702	**46A**	9	30.6	0	0.0	0.0	0.0	0.00	0.0	30.6	1577.7	3.7	23.4	0.00	0.00	8.70	5.3	0.58	30.29	8.5	37.2	300	0.20	69.6	45.1	0.62	82.4%
	46A	**31A**	3	10.2	0	0.0	0.0	0.0	0.00	0.0	10.2	2111.8	3.6	30.5	0.00	0.00	10.04	6.1	0.29	39.39	11.0	47.6	300	0.65	82.0	81.3	1.11	58.6%

Design Parameters:

Avg Flow/Person =	350	l/day
Comm./Inst. Flow =	35000	l/ha/day
Infiltration =	0.28	l/s/ha
Pipe Friction n =	0.013	

Residential Peaking Factor = Harmon Equation (max 4, min 2)

Peaking Factor Comm./Inst. 1.5

Population Density:

	ppl/unit	units/net ha
Mixed Use	1.80	90
Singles	3.40	
Towns	2.70	60

Project: Abbott-Fernbank (108180)

Designed: KJM

Checked: MAB

Date: August 17, 2012

INFORMATION FROM FERNBANK CROSSING PHASE 1 & 2 DEVELOPMENT

NOVATECH ENGINEERING CONSULTANTS LTD.

5000 Robert Grant - Tower 'A' and Podium
POST-DEVELOPMENT SANITARY FLOWS

Residential Flows	**Post-Development**	
Total Number of Units	113	
Average Number of Persons per Unit	1.8	
Design Population	204	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.52	
Peak Residential Flow	**2.32**	**L/s**
Commercial Flows		
Ground Floor Area	0	m^2
Average Commercial Daily Demand	2.8	$L/m^2/day$
Peaking Factor	1.5	
Peak Commercial Flows	**0.00**	**L/s**
Extraneous Flow		
Site Area	0.68	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**0.22**	**L/s**
Total Peak Sanitary Flow	**2.5**	**L/s**

5000 Robert Grant - Tower 'B' and Podium
POST-DEVELOPMENT SANITARY FLOWS

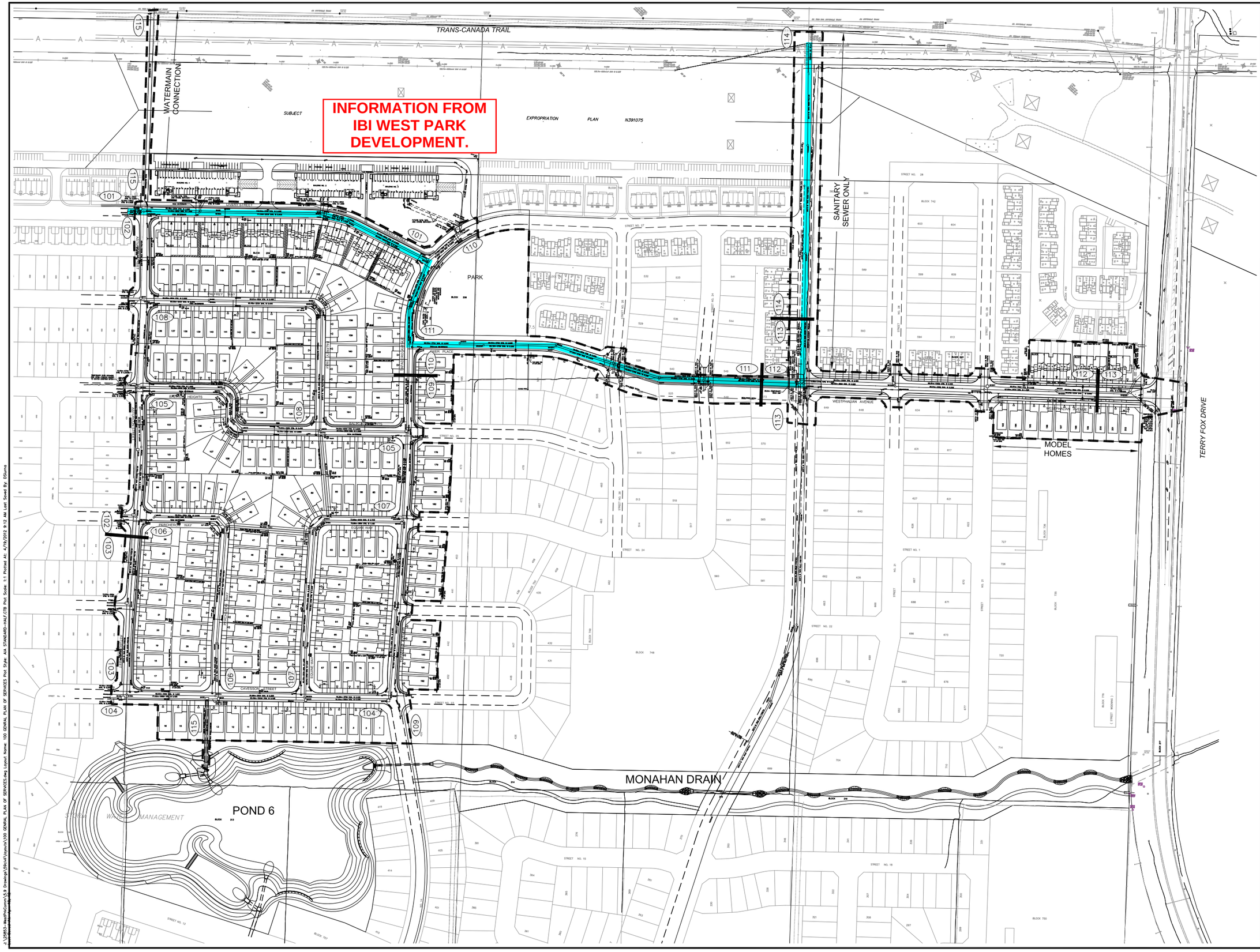
Residential Flows	**Post-Development**	
Total Number of Units	153	
Average Number of Persons per Unit	1.8	
Design Population	276	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.47	
Peak Residential Flow	**3.11**	**L/s**
Commercial Flows		
Ground Floor Area	0	m^2
Average Commercial Daily Demand	2.8	$L/m^2/day$
Peaking Factor	1.5	
Peak Commercial Flows	**0.00**	**L/s**
Extraneous Flow		
Site Area	0.67	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**0.22**	**L/s**
Total Peak Sanitary Flow	**3.3**	**L/s**

5000 Robert Grant - Tower 'C' and Podium
POST-DEVELOPMENT SANITARY FLOWS

Residential Flows	**Post-Development**	
Total Number of Units	238	
Average Number of Persons per Unit	1.8	
Design Population	429	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.41	
Peak Residential Flow	**4.74**	**L/s**
Commercial Flows		
Ground Floor Area	157	m^2
Average Commercial Daily Demand	2.8	$L/m^2/day$
Peaking Factor	1.5	
Peak Commercial Flows	**0.01**	**L/s**
Extraneous Flow		
Site Area	0.67	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**0.22**	**L/s**
Total Peak Sanitary Flow	**5.0**	**L/s**

5000 Robert Grant - Towers A + B + C and Podium
SUBJECT SITE: SANITARY FLOW SUMMARY TABLE

Area	**Allowable (to Livery)** Peak Flow (L/s)	**Available Capacity RGA 250 Sewer** (L/s)	**Post-Development** Peak Flow (L/s)
Overall Site	3.3	22.2	-
Tower A	-	-	2.5
Tower B	-	-	3.3
Tower C	-	-	5.0
Totals	**3.3**	**22.2**	**10.8**



LEGEND:

- SINGLE SERVICE LOCATION
- DOUBLE SERVICE LOCATION
- STACKED TOWNHOUSE DOUBLE SERVICE
- DRIVEWAY LOCATION
- CB — STANDARD STREET CATCHBASIN *
- RYCB — REARYARD CB C/W TOP OF GRATE *
- ETCB — ELBOW OR TEE REARYARD CB C/W TOP OF GRATE
- SC — SINGLE CONNECTION BETWEEN PAIRS OF STREET CATCHBASINS
- BARRIER CURB
- MOUNTABLE CURB
- PHASE 1 LIMITS
- DEPRESSED CURB
- * REFER TO CATCHBASIN DATA TABLE ON DRAWING 25853-DETAILS 1 FOR TOP OF GRATE, LEAD INVERT, PIPE SIZE AND INLET CONTROL DEVICE INFORMATION
- 101 — DRAWING NUMBER
- MAIL BOX C/W 2.0m DEPRESSED CURB

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
7			
6			
5			
4	ISSUED FOR MOE APPROVAL	LME	12:04:19
3	ISSUED FOR SUBMISSION #3	LME	12:03:29
2	ISSUED FOR SUBMISSION #2	LME	12:01:27
1	ISSUED FOR SUBMISSION #1	LME	11:09:22

IBI GROUP
333 Preston Street
Tower 1, Suite 400
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Project Title

WEST PARK
MONARCH - CARDEL
PHASE 1

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
PROVINCE OF ONTARIO

N

Drawing Title

GENERAL PLAN
OF SERVICES

Scale: 1 : 1500

Design	Date
LME	SEPT 2011
Drawn	Checked
D.D.	RWW
Project No.	Drawing No.
25853	100

INFORMATION FROM IBI WEST PARK DEVELOPMENT

IBI Group
333 Preston Street - Suite 400
Ottawa, Ontario
K1S 5N4

SANITARY SEWER DESIGN SHEET

PROJECT: WEST PARK IN FERNBANK - PHASE 1
DEVELOPER: MONARCH CORPORATION

JOB #: 25853-5.7
DATE PRINTED: 01-May-12
DESIGN: LE

FLOW FROM FERNBANK CROSSING LIVERY STREET

LOCATION			INDIVIDUAL				CUM. RES. FLOW			ICI				INFILTRATION			TOTAL	PROPOSED SEWER							FLOW DEPTH	
STREET	FROM MH	TO MH	RESID. UNITS Sngls	Towns Semis	Multi Res	POP.	POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM. AREA (Ha)	INSTIT. AREA (Ha)	CUM. AREA (Ha)	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (l/s)	AVAIL. CAP. (%)	Flow qa/Qa	Depth da/Df
Private Site	211 A	100 A			45	103.5	104	4.00	1.70					0.72	0.72	0.20	**1.90**	**26.49**	200	8.5	0.60	0.82	24.60	93%		
Tapadero Avenue	100 A	101 A				0.0	104	4.00	1.70					0.09	0.81	0.23	**1.92**	**26.49**	200	41.0	0.60	0.82	24.57	93%		
External	Stub	40 A				468.1	468	3.99	7.66					5.05	5.05	1.41	**9.07**	**31.01**	250	15.0	0.25	0.61	21.94	71%	0.29	0.37
Livery Street	40 A	90 A		6		16.2	484	3.98	7.91					0.22	5.27	1.48	**9.38**	**70.74**	250	51.1	1.30	1.40	61.36	87%	0.13	0.25
Private Site	240 A	90 A			56	128.8	129	4.00	2.11					0.49	0.49	0.14	**2.25**	**34.21**	200	9.5	1.00	1.06	31.96	93%		
Livery Street	90 A	91 A		16		43.2	656	3.91	10.52					0.55	6.31	1.77	**12.29**	**39.22**	250	111.5	0.40	0.77	26.93	69%	0.31	0.39
Private Site	241 A	91 A			45	103.5	104	4.00	1.70					0.43	0.43	0.12	**1.82**	**34.21**	200	9.5	1.00	1.06	32.40	95%		
Livery Street	91 A	92 A		3		8.1	768	3.87	12.19					0.11	6.85	1.92	**14.11**	**62.02**	250	27.0	1.00	1.22	47.92	77%	0.23	0.33
	92 A	101 A		10		27.0	795	3.86	12.59					0.39	7.24	2.03	**14.61**	**53.71**	250	83.0	0.75	1.06	39.10	73%	0.27	0.35
Tapadero Avenue	101 A	102 A				0.0	898	3.83	14.11					0.07	8.12	2.27	**16.38**	**34.00**	250	46.2	0.30	0.67	17.62	52%	0.48	0.49
	102 A	103 A	3			10.2	909	3.83	14.25					0.22	8.34	2.34	**16.59**	**34.00**	250	33.0	0.30	0.67	17.41	51%	0.49	0.49
Asturcon Street	42 B	43 A	4			13.6	14	4.00	0.22					0.28	0.28	0.08	**0.30**	**27.60**	200	36.5	0.65	0.85	27.30	99%		
Asturcon Street	43 A	44 A	7			23.8	37	4.00	0.61					0.38	0.66	0.18	**0.80**	**20.24**	200	65.0	0.35	0.62	19.44	96%		
External	Stub	44 A				52.8	53	4.00	0.87					1.14	1.14	0.32	**1.19**	**20.24**	200	15.0	0.35	0.62	19.05	94%		
Asturcon Street	44 A	45 A	5			17.0	107	4.00	1.76					0.36	2.16	0.60	**2.36**	**20.24**	200	82.2	0.35	0.62	17.87	88%		
External	Stub	45 A				412.1	412	4.00	6.76	1.40		1.40	0.85	6.39	6.39	1.79	**9.40**	**31.01**	250	15.0	0.25	0.61	21.61	70%	0.30	0.38
Asturcon Street	45 A	46 A	5			17.0	536	3.96	8.70			1.40	0.85	0.37	8.92	2.50	**12.05**	**31.01**	250	82.0	0.25	0.61	18.96	61%	0.39	0.43
External	Stub	46 A				1586.4	1586	3.66	23.82	0.73	5.15	5.88	3.57	28.97	28.97	8.11	**35.50**	**45.09**	300	15.0	0.20	0.62	9.59	21%	0.79	0.67
Cavesson Street	46 A	31 A	3			10.2	2133	3.56	31.17			7.28	4.42	0.29	38.18	10.69	**46.28**	**127.18**	300	82.0	1.59	1.74	80.90	64%	0.36	0.41
Percheron Way	50 A	51 A	6			20.4	20	4.00	0.33					0.38	0.38	0.11	**0.44**	**28.64**	200	74.4	0.70	0.88	28.19	98%		
	51 A	52 A	2			6.8	27	4.00	0.45					0.21	0.59	0.17	**0.61**	**61.68**	200	10.7	3.25	1.90	61.07	99%		
	52 A	53 A	15			51.0	78	4.00	1.28					0.83	1.42	0.40	**1.68**	**22.96**	200	107.8	0.45	0.71	21.28	93%		
	53 A	31 A	6			20.4	99	4.00	1.62					0.37	1.79	0.50	**2.12**	**42.61**	200	48.6	1.55	1.31	40.49	95%		
Cavesson Street	31 A	30 A	6			20.4	2252	3.55	32.73			7.28	4.42	0.39	40.36	11.30	**48.46**	**59.69**	300	82.0	0.35	0.82	11.23	19%	0.81	0.68

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Residential Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousa
Q(p) = Peak population flow (l/s)
Q(i) = peak extraneous flow (l/s)
Commercial, Office Space and School - Average flow 35,000 l/day/ha (0.405 l/s/ha) with Peaking Factor = 1.5

Population Density

Singles	**3.4**
Towns/Semis	**2.7**
Multi Residential	

IBI Group
333 Preston Street - Suite 400
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SANITARY SEWER DESIGN SHEET

PROJECT: WEST PARK IN FERNBANK - PHASE 1
DEVELOPER: MONARCH CORPORATION

JOB #: 25853-5.7
DATE PRINTED: 01-May-12
DESIGN: LE

LOCATION			INDIVIDUAL				CUM. RES. FLOW			ICI				INFILTRATION			TOTAL	PROPOSED SEWER							FLOW DEPTH	
STREET	FROM MH	TO MH	RESID. UNITS Sngls	Towns Semis	Multi Res	POP.	POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM. AREA (Ha)	INSTIT. AREA (Ha)	CUM. AREA (Ha)	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (l/s)	AVAIL. CAP. (%)	Flow qa/Qa	Depth da/Df
Equine Way	60 A	61 A	3			10.2	10	4.00	0.17					0.23	0.23	0.06	**0.23**	**34.21**	200	12.0	1.00	1.06	33.98	99%		
	61 A	62 A	15			51.0	61	4.00	1.00					0.77	1.00	0.28	**1.28**	**21.63**	200	109.8	0.40	0.67	20.35	94%		
	62 A	30 A	4			13.6	75	4.00	1.23					0.24	1.24	0.35	**1.57**	**37.49**	200	45.4	1.20	1.16	35.91	96%		
Cavesson Street	30 A	107 A	12			40.8	2368	3.53	34.24			7.28	4.42	0.62	42.22	11.82	**50.49**	**63.77**	300	79.4	0.40	0.87	13.29	21%	0.79	0.66
Tapadero Avenue	107 A	106 A	9			30.6	2398	3.52	34.64			7.28	4.42	0.50	42.72	11.96	**51.02**	**70.80**	375	82.2	0.15	0.62	19.77	28%	0.72	0.62
	106 B	105 A	8			27.2	2425	3.52	34.99			7.28	4.42	0.45	43.17	12.09	**51.50**	**70.80**	375	82.2	0.15	0.62	19.30	27%	0.73	0.63
Equine Way	60 A	105 A	10			34.0	34	4.00	0.56					0.55	0.55	0.15	**0.71**	**56.23**	200	73.9	2.70	1.73	55.52	99%		
Tapadero Avenue	105 A	104 A	5			17.0	2476	3.51	35.66			7.28	4.42	0.34	44.06	12.34	**52.41**	**70.80**	375	82.1	0.15	0.62	18.39	26%	0.74	0.63
External	Stub	42 A				151.8	152	4.00	2.49					2.59	2.59	0.73	**3.21**	**20.24**	200	15.0	0.35	0.62	17.02	84%		
Balikun Heights	42 A	70 A	6			20.4	172	4.00	2.82					0.37	2.96	0.83	**3.65**	**21.63**	200	76.2	0.40	0.67	17.98	83%		
	70 A	71 A	2			6.8	179	4.00	2.94					0.18	3.14	0.88	**3.81**	**21.63**	200	11.5	0.40	0.67	17.82	82%		
	71 A	72 A	3			10.2	189	4.00	3.10					0.18	3.32	0.93	**4.03**	**21.63**	200	19.4	0.40	0.67	17.60	81%		
	72 A	73 A	3			10.2	199	4.00	3.27					0.27	3.59	1.01	**4.28**	**21.63**	200	13.5	0.40	0.67	17.35	80%		
	73 A	74 A	5			17.0	216	4.00	3.55					0.35	3.94	1.10	**4.65**	**28.64**	200	72.5	0.70	0.88	23.98	84%		
External	Stub	41 A				95.7	96	4.00	1.57					1.61	1.61	0.45	**2.02**	**20.24**	200	15.0	0.35	0.62	18.22	90%		
Palfrey Way	41 A	80 A	7			23.8	120	4.00	1.96					0.39	2.00	0.56	**2.52**	**30.61**	200	60.0	0.80	0.94	28.09	92%		
	80 A	81 A	13			44.2	164	4.00	2.68					0.76	2.76	0.77	**3.46**	**21.63**	200	95.5	0.40	0.67	18.17	84%		
	81 B	82 A	1			3.4	167	4.00	2.74					0.09	2.85	0.80	**3.54**	**54.09**	200	11.5	2.50	1.67	50.55	93%		
	82 A	74 A	15			51.0	218	4.00	3.58					0.91	3.76	1.05	**4.63**	**21.63**	200	110.2	0.40	0.67	17.00	79%		
Balikun Heights	74 A	104 A	5			17.0	452	4.00	7.40					0.36	8.06	2.26	**9.66**	**39.01**	200	82.0	1.30	1.20	29.36	75%		
Tapadero Avenue	104 A	103 A	10			34.0	2962	3.45	41.86			7.28	4.42	0.58	52.70	14.76	**61.04**	**70.80**	375	82.0	0.15	0.62	9.76	14%	0.86	0.72
Oxer Place	103 A	200 A	3			10.2	3881	3.35	53.22			7.28	4.42	0.20	61.24	17.15	**74.79**	**81.86**	375	68.5	0.20	0.72	7.07	9%	0.91	0.75
	200 A	201 A	4			13.6	3894	3.34	53.39			7.28	4.42	0.30	61.54	17.23	**75.04**	**81.86**	375	66.7	0.20	0.72	6.82	8%	0.92	0.75
	201 A	202 A	4			13.6	3908	3.34	53.55			7.28	4.42	0.28	61.82	17.31	**75.28**	**81.86**	375	57.2	0.20	0.72	6.57	8%	0.92	0.76
Street No. 26	Stub North	202 A	7	19		75.1	75	4.00	1.23					1.00	1.00	0.28	**1.51**	**41.90**	200	11.0	1.50	1.29	40.39	96%		
Street No. 26	Stub South	202 A	31			105.4	105	4.00	1.73					1.80	1.80	0.50	**2.23**	**48.38**	200	6.5	2.00	1.49	46.15	95%		
Block 205	202 A	203 A				0.0	4088	3.32	55.73			7.28	4.42		64.62	18.09	**78.25**	**91.44**	375	42.7	0.25	0.80	13.19	14%	0.86	0.72
	203 A	204 A				0.0	4088	3.32	55.73			7.28	4.42		64.62	18.09	**78.25**	**163.60**	375	40.9	0.80	1.44	85.36	52%	0.48	0.48

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Residential Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousa
Q(p) = Peak population flow (l/s)
Q(i) = peak extraneous flow (l/s)
Commercial, Office Space and School - Average flow 35,000 l/day/ha (0.405 l/s/ha) with Peaking Factor = 1.5

Population Density

Singles	**3.4**
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Multi Residential	

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SANITARY SEWER DESIGN SHEET

PROJECT: WEST PARK IN FERNBANK - PHASE 1
DEVELOPER: MONARCH CORPORATION

JOB #: 25853-5.7
DATE PRINTED: 01-May-12
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LOCATION			INDIVIDUAL				CUM. RES. FLOW			ICI				INFILTRATION			TOTAL	PROPOSED SEWER							FLOW DEPTH	
STREET	FROM MH	TO MH	RESID. UNITS Sngls	Towns Semis	Multi Res	POP.	POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM. AREA (Ha)	INSTIT. AREA (Ha)	CUM. AREA (Ha)	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (l/s)	AVAIL. CAP. (%)	Flow qa/Qa	Depth da/Df
Street No. 24	Stub North	204 A	15	29	46	235.1	235	4.00	3.86					3.53	3.53	0.99	**4.84**	**37.49**	200	12.0	1.20	1.16	32.64	87%		
Street No. 24	Stub South	204 A	82			278.8	279	4.00	4.57					5.09	5.09	1.43	**6.00**	**21.63**	200	10.0	0.40	0.67	15.63	72%	0.28	0.36
Block 204	204 A	205 B				0.0	4602	3.28	61.86			7.28	4.42		73.24	20.51	**86.79**	**129.29**	375	89.7	0.50	1.13	42.50	33%	0.67	0.62
Westphalian Avenue	Stub North	209 A		42		113.4	113	4.00	1.86					1.42	1.42	0.40	**2.26**	**21.63**	200	13.8	0.40	0.67	19.37	90%		
	209 A	208 A	6	9		44.7	158	4.00	2.59					0.67	2.09	0.59	**3.18**	**27.60**	200	64.9	0.65	0.85	24.42	88%		
	208 A	207 A	4	4		24.4	183	4.00	2.99					0.41	2.50	0.70	**3.69**	**45.27**	200	67.5	1.75	1.40	41.58	92%		
Street No. 28	Stub North	207 A	12	35		135.3	135	4.00	2.22					1.48	1.48	0.41	**2.63**	**34.21**	200	19.0	1.00	1.06	31.58	92%		
Street No. 21	Stub South	207 A	97			329.8	330	4.00	5.41					6.02	6.02	1.69	**7.09**	**31.01**	250	19.0	0.25	0.61	23.92	77%	0.23	0.33
Westphalian Avenue	207 A	206 A		9		24.3	672	3.90	10.76					0.38	10.38	2.91	**13.66**	**45.09**	300	82.0	0.20	0.62	31.43	70%	0.30	0.38
Street No. 28	Stub North	206 A	20			68.0	68	4.00	1.12					1.16	1.16	0.32	**1.44**	**38.27**	200	20.0	1.25	1.18	36.83	96%		
Westphalian Avenue	206 A	205 A		9		24.3	764	3.87	12.13					0.40	11.94	3.34	**15.48**	**45.09**	300	85.0	0.20	0.62	29.62	66%	0.34	0.40
Street No. 1	Stub South	205 B	27			91.8	92	4.00	1.51					0.90	0.90	0.25	**1.76**	**21.63**	200	20.0	0.40	0.67	19.87	92%		
Street No. 1	Stub North	205 B	10	15		74.5	75	4.00	1.22					1.40	1.40	0.39	**1.61**	**40.47**	200	18.0	1.40	1.25	38.86	96%		
Street No. 1	205 B	205 A				0.0	4769	3.26	63.81			7.28	4.42		75.54	21.15	**89.39**	**129.29**	375	2.5	0.50	1.13	39.90	31%	0.69	0.63
Street No. 1	Stub South	205 A	506	260	86	2620.2	2620	3.49	37.51		2.90	2.90	1.76	57.88	57.88	16.21	**55.48**	**132.98**	450	20.0	0.20	0.81	77.50	58%	0.42	0.47
Street No. 1	205 A	222 A				0.0	8153	3.04	101.69			10.18	6.18	0.30	145.66	40.78	**148.66**	**221.82**	600	120.0	0.12	0.76	73.16	33%	0.67	0.62
Street No. 1	222 A	221 A				0.0	8153	3.04	101.69			10.18	6.18	0.26	145.92	40.86	**148.73**	**221.82**	600	100.0	0.12	0.76	73.08	33%	0.67	0.62
Street No. 1	221 A	FT06				0.0	8153	3.04	101.69			10.18	6.18	0.19	146.11	40.91	**148.79**	**221.82**	600	94.0	0.12	0.76	73.03	33%	0.67	0.62

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Residential Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousa
Q(p) = Peak population flow (l/s)
Q(i) = peak extraneous flow (l/s)
Commercial, Office Space and School - Average flow 35,000 l/day/ha (0.405 l/s/ha) with Peaking Factor = 1.5

Population Density

Singles	**3.4**
Towns/Semis	**2.7**
Multi Residential	**2.3**

Off-Site Sanitary Drainage Areas

5000 Robert Grant: Off-Site Townhome Development
THEORETICAL SANITARY FLOWS

Residential Flows	**Post-Development**	
Total Number of Townhomes	137	
Average Number of Persons per Townhome	2.7	
Design Population	370	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.43	
Peak Residential Flow	**4.11**	**L/s**
Commercial Flows		
Ground Floor Area	0	m^2
Average Commercial Daily Demand	2.8	$L/m^2/day$
Peaking Factor	1.5	
Peak Commercial Flows	**0.00**	**L/s**
Extraneous Flow		
Site Area	4.47	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**1.48**	**L/s**
Total Peak Sanitary Flow	**5.6**	**L/s**

5000 Robert Grant: Off-Site Future Residential Development
THEORETICAL SANITARY FLOWS

Residential Flows	**Post-Development**	
Total Number of Units	433	
Average Number of Persons per Unit	1.8	
Design Population	780	
Average Daily Flow per Resident	280	L/c/day
Peak Factor (Harmon Formula)	3.29	
Peak Residential Flow	**8.33**	**L/s**
Commercial Flows		
Ground Floor Area	150	m^2
Average Commercial Daily Demand	2.8	$L/m^2/day$
Peaking Factor	1.5	
Peak Commercial Flows	**0.01**	**L/s**
Extraneous Flow		
Site Area	1.7	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**0.56**	**L/s**
Total Peak Sanitary Flow	**8.9**	**L/s**

PROJECT #: 117151
PROJECT NAME: 5000 Robert Grant
LOCATION: Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

DATE: 7/13/2023
PREPARED BY: SM
REVIEWED BY: DDB

Post-Development Sanitary Flow Calculations

Location			Residential		Commercial / Institutional		Residential Cumulative		Peak Factor		Commercial / Institutional		Residential	Infiltration		Foundation		PEAK DESIGN FLOW (l/s)	Pipe Data					
Street / Area	From	To	Population	Area (ha)	Area (ha)	Accu. Area (ha)	Pop.	Area (ha)	Res Peak Factor	Comm Peak Factor	Peak Flow (l/s)	Accu. Peak Flow	Acc. Peak Flow (l/s)	Infilt. Flow (l/s)	Accu Infil. Flow	Found. Flow (l/s)	Accu Found. Flow		Size (mm)	Slope (%)	Length (m)	Capacity (l/s)	Full Flow Vel. (m/s)	Q/Q_{full} (%)
Robert Grant Avenue	MHSA72812	MHSA72813	1198	6.17	0.02	0.02	1198	6.17	3.2	1.5	0.01	0.01	12.42	2.04	2.04	0.00	0.00	**14.5**	254	0.35	90.5	36.7	0.72	39.5%

Population includes both existing off-site townhome development area (4.47 ha) + future residential medium/high-density development parcel (1.7 ha) with average apartment units
The number of units allotted to the 1.7 ha future parcel development has been approximated based on a pro-rated area comparisson to the proposed subject site at 5000 Robert Grant Avenue

36.7 - 14.5 = **22.2 L/s** available capacity in outlet sewer

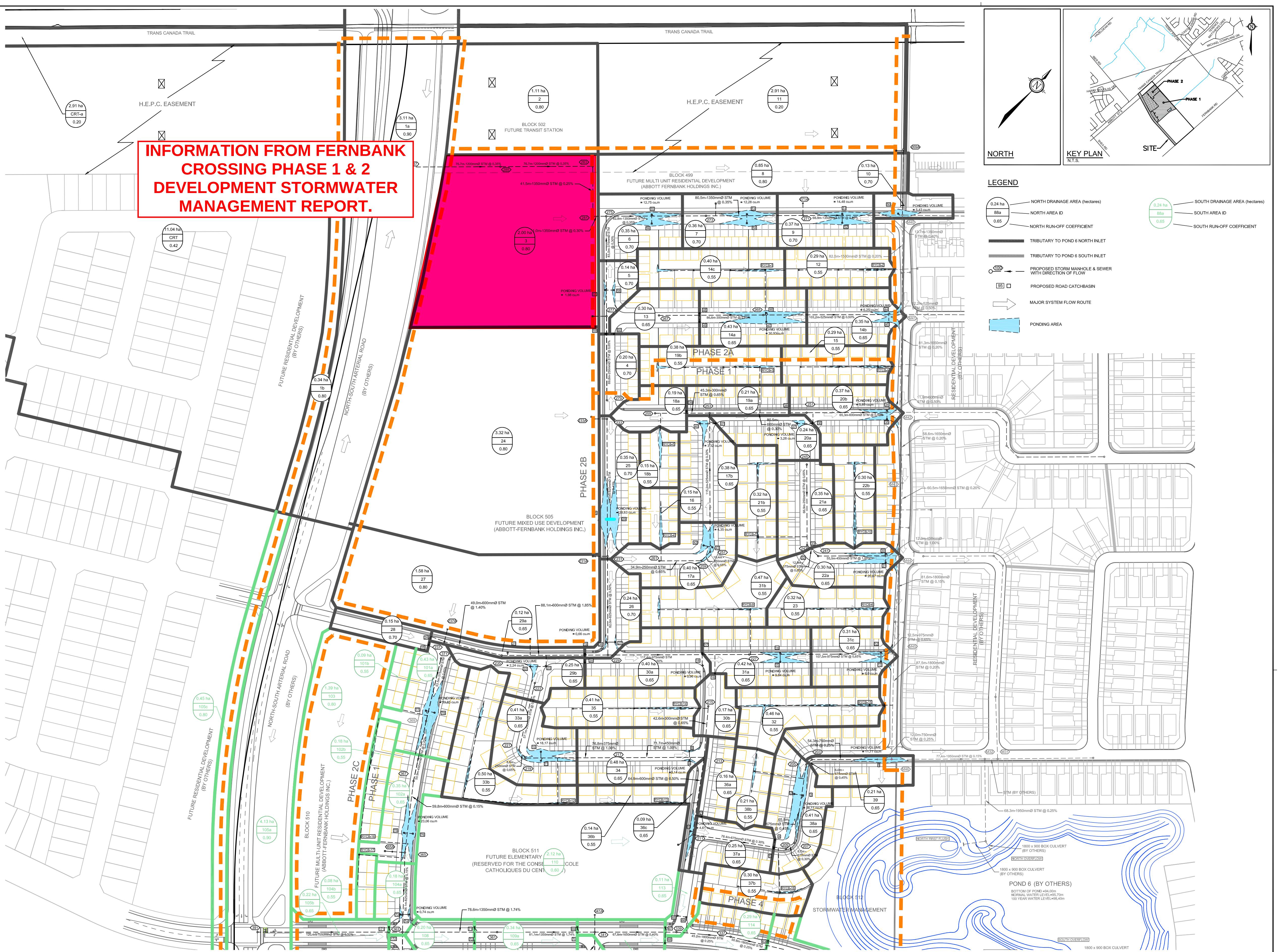
City of Ottawa Sewer Design Guidelines

Studio / 1-Bedroom Apartment Unit	1.4	persons/unit	
2-Bedroom Apartment Unit	2.1	persons/unit	
3-Bedroom Apartment Unit	3.1	persons/unit	
Average Medium / High-Density Apartment Unit	1.8	persons/unit	
Townhomes	2.7	persons/unit	
Average Domestic Flow	280	L/person/day	
Institutional / Commercial Flow	28,000	L/ha/day	
Extraneous Flows	0.33	L/s/ha	
Foundation Drain Allowance	5.0	L/s/ha	(use 5.0 L/s/ha for tributary areas < 10 ha; 3.0 L/s/ha for tributary areas >10 ha and < 100 ha; 2.0 L/s/ha for tributary areas >100 ha)
Residential Peaking Factor	Harmon Equation, Correction Factor = 0.8		
Institutional / Commercial Peaking Factor	1.5		

Notes:
The number of units has been counted from geoOttawa imagery of the recently constructed townhouse development upstream of MHSA72812.
Existing pipe information has been taken from the City of Ottawa geoOttawa website.
A foundation drain allowance would only be accounted for along those existing streets that do not have a separated storm sewer as indicated on the geoOttawa website.

APPENDIX B

Storm Drainage Areas and Sewer Capacities



STM MANHOLE TABLE

MANHOLE ID	OBVERT
203	S=98.33 NE=98.33
205	SE=98.38 N=98.35
207	S=98.72 NW=98.68
209	SW=98.78 N=98.74
211	NW=99.01 NE=99.01
213	SW=99.33 NW=99.33 SE=99.33
215	SE=99.61
217	SW=100.05 NE=100.05
219	W=100.82 NE=100.82
221	NW=100.90 E=100.87
223	SE=101.27
227	SW=99.12 NE=99.12
229	SW=99.70 NE=99.70 NW=99.70
231	SE=100.11 SW=100.18 NW=100.11
233	SE=100.63 SW=100.68
235	SW=101.33 NE=101.33
237	NE=102.02
241	W=99.13 NE=99.13
243	NW=99.21 E=99.21
245	SE=99.65
251	SW=99.09 NE=99.09
253	SE=99.34 SW=99.34 NE=99.34
255	NE=99.63
257	S=99.68 NW=99.68
259	SW=99.78 N=99.75
261	NE=100.01
265	SW=99.45 NE=99.45
267	NE=100.01
269A	SE=99.19
271	SW=99.37 NW=99.37 NE=99.37
273	SW=99.65 NE=99.65
275	SW=99.94 SE=99.94 NE=99.94
277	SE=100.19 NW=100.19
279	NW=100.64
281	NW=100.03 NE=99.97
283	SW=100.13 SE=100.13
285	SW=100.40 NE=100.40
287	NE=100.67
301	SW=98.59 SE=98.59 NE=98.59
335	SW=98.76 SE=98.76 NE=98.76
337	SW=98.89 NE=98.89
339	SW=99.00 NE=99.00
341	SW=99.27 NW=99.27 SE=99.27 NE=99.27
361	SW=100.68 NE=100.68
363	NW=102.05 SW=102.05 SE=102.11 NE=102.05
365	NW=102.15 SW=102.15 SE=102.15
367	NW=102.24 SE=102.24
369	NW=102.34 SE=102.34
371	SE=102.69
391	NE=102.65

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.

FERNBANK CROSSING
the Heart of the Community

ABBOTT-FERNBANK HOLDINGS INC.

REGIONAL
THE REGIONAL GROUP

No.	REVISION	DATE	BY
3.	ISSUED FOR APPROVAL (PHASE 1&2)	AUG 17/12	KJM
2.	ISSUED FOR APPROVAL (PHASE 1&2)	JUN 21/12	KJM
1.	ISSUED FOR APPROVAL	MAR 9/12	KJM

SCALE
1:1250

1:1250
0 10 20 30 40 50

DESIGN KJM
CHECKED MAB
DRAWN RCH
CHECKED KJM
APPROVED MAB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
K. J. MURPHY
100123021
AUG. 17/12
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
M.A. BISSETT
AUG. 17/12
PROVINCE OF ONTARIO

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CITY OF OTTAWA
FERNBANK CROSSING

STORM DRAINAGE AREA PLAN PHASE 1 & 2

PROJECT No. 108180-10
REV: REV # 3
DRAWING No. 108180-STM1

PLANB1.DWG - 1000mmx707mm

Fernbank Crossing - Storm Sewer Design Sheet (Rational Method)

LOCATION			AREA											FLOW							Total Peak Flow (Q)	PROPOSED SEWER							
Location	From node	To node	Mixed Use	Park N' Ride Paramedic Post Medium Block	Arterial Road ROW	Schools	Parks	Hydro Corridor	Singles Front Yards	Singles Rear Yard	Towns Front Yard	Towns Rear Yard	Total Area	Weighted Runoff Coefficient	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration	Rain Intensity (mm/hr) 5yr	Rain Intensity (mm/hr) 10yr	Peak Flow		Pipe	Size	Grade	Length	Capacity	Full Flow Velocity	Time of Flow	Q/Qfull
			0.80	0.80	0.90	0.60	0.40	0.20	0.65	0.55	0.70	0.60	(ha)							(L/s)	(L/s)	Type	(mm)	(%)	(m)	(l/s)	(m/s)	(min.)	(%)
POND 6 North Inlet																													
CRT	CRT	287						2.91					13.95	0.38	14.54	14.54	15.00	83.6		1215.2	**1215.2**								
													0.00		0.00	0.00	15.00			0.0									
1	287	285											0.00		0.00	14.54	15.00	83.6		1215.2	**2257.9**	CONC	1200	0.35	76.7	2406.2	2.06	0.62	93.8%
				0.34	3.11								3.45	0.89	8.54	8.54	10.00		122.1	1042.8									
	285	283											0.00		0.00	14.54	15.62	81.6		1186.8	**2002.6**	CONC	1200	0.35	76.7	2406.2	2.06	0.62	83.2%
													0.00		0.00	8.54	15.62		95.6	815.8									
2	283	281		1.11									1.11	0.80	2.47	17.01	16.24	79.8		1356.7	**2153.9**	CONC	1350	0.25	41.5	2784.1	1.88	0.37	77.4%
													0.00		0.00	8.54	16.24		93.4	797.2									
3	281	275	2.00										2.00	0.80	4.45	21.46	16.61	78.7		1688.9	**2475.5**	CONC	1350	0.30	11.0	3049.8	2.06	0.09	81.2%
													0.00		0.00	8.54	16.61		92.1	786.6									
4	279	277									0.20		0.20	0.70	0.39	0.39	10.00	104.2		40.6	**40.6**	PVC	250	0.65	69.8	50.0	0.99	1.18	81.1%
													0.00		0.00	0.00	10.00			0.0									
5	277	275									0.14		0.14	0.70	0.27	0.66	11.18	98.4		65.1	**65.1**	PVC	375	0.30	83.0	100.2	0.88	1.57	65.0%
													0.00		0.00	0.00	11.18			0.0									
6	275	273									0.35		0.35	0.70	0.68	22.80	16.70	78.4		1788.8	**2572.9**	CONC	1350	0.35	82.8	3294.2	2.23	0.62	78.1%
													0.00		0.00	8.54	16.70		91.8	784.1									
7	273	271									0.36		0.36	0.70	0.70	23.50	17.32	76.8		1803.9	**2571.0**	CONC	1350	0.35	80.5	3294.2	2.23	0.60	78.0%
													0.00		0.00	8.54	17.32		89.9	767.1									
8	271A	271		0.85									0.85	0.80	1.89	1.89	10.00	104.2		197.0	**197.0**	CONC	525	0.25	8.5	224.3	1.00	0.14	87.8%
													0.00		0.00	0.00	10.00			0.0									
9,10	271	**M40**									0.50		0.50	0.70	0.97	26.37	17.92	75.2		1982.2	**2733.6**	CONC	1350	0.40	82.6	3521.6	2.38	0.58	77.6%
													0.00		0.00	8.54	17.92		88.0	751.3									
11	269A	**M40**						2.91					2.91	0.20	1.62	1.62	15.00	83.6		135.2	**135.2**	CONC	450	0.25	54.5	148.7	0.91	1.00	90.9%
													0.00		0.00	0.00	15.00			0.0									
13	267	265							0.30				0.30	0.65	0.54	0.54	10.00	104.2		56.5	**56.5**	PVC	300	0.65	86.6	81.3	1.11	1.29	69.4%
													0.00		0.00	0.00	10.00			0.0									
14	265	**M41**							0.78	0.40			1.18	0.62	2.02	2.56	15.00	83.6		214.2	**214.2**	CONC	525	0.50	115.4	317.2	1.42	1.35	67.5%
													0.00		0.00	0.00	15.00			0.0									
16	261	259								0.15			0.15	0.55	0.23	0.23	15.00	83.6		19.2	**19.2**	PVC	250	0.65	34.9	50.0	0.99	0.59	38.3%
													0.00		0.00	0.00	15.00			0.0									
	259	257											0.00		0.00	0.23	15.59	81.7		18.7	**18.7**	PVC	250	0.65	10.4	50.0	0.99	0.18	37.5%
													0.00		0.00	0.00	15.59			0.0									
17	257	253							0.79				0.79	0.65	1.43	1.66	15.76	81.2		134.5	**134.5**	CONC	525	0.30	115.2	245.7	1.10	1.75	54.7%
													0.00		0.00	0.00	15.76			0.0									
18	255	253							0.19	0.15			0.34	0.61	0.57	0.57	15.00	83.6		47.9	**47.9**	PVC	300	0.65	45.3	81.3	1.11	0.68	58.8%
													0.00		0.00	0.00	15.00			0.0									
19	253	251							0.21	0.38			0.59	0.59	0.96	3.19	17.51	76.2		243.2	**243.2**	CONC	600	0.30	80.5	350.8	1.20	1.12	69.3%
													0.00		0.00	0.00	17.51			0.0									
20	251	**M42**							0.61				0.61	0.65	1.10	4.29	18.63	73.4		315.1	**315.1**	CONC	600	0.50	77.2	452.9	1.55	0.83	69.6%
													0.00		0.00	0.00	18.63			0.0									

INFORMATION FROM FERNBANK CROSSING PHASE 1 & 2 DEVELOPMENT STORMWATER MANAGEMENT REPORT.

NOVATECH ENGINEERING CONSULTANTS LTD.

Fernbank Crossing - Storm Sewer Design Sheet (Rational Method)

LOCATION			AREA											FLOW							PROPOSED SEWER								
Location	From node	To node	Mixed Use	Park N' Ride Paramedic Post Medium Block	Arterial Road ROW	Schools	Parks	Hydro Corridor	Singles Front Yards	Singles Rear Yard	Towns Front Yard	Towns Rear Yard	Total Area	Weighted Runoff Coefficient	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration	Rain Intensity (mm/hr) 5yr	Rain Intensity (mm/hr) 10yr	Peak Flow	Total Peak Flow (Q) (L/s)	Pipe	Size	Grade	Length	Capacity	Full Flow Velocity	Time of Flow	Q/Qfull
			0.80	0.80	0.90	0.60	0.40	0.20	0.65	0.55	0.70	0.60	(ha)							(L/s)		Type	(mm)	(%)	(m)	(l/s)	(m/s)	(min.)	(%)
21	245	243								0.32			0.32	0.55	0.49	0.49	15.00	83.6		40.9	**40.9**	PVC	250	0.65	66.9	50.0	0.99	1.13	81.7%
													0.00		0.00	0.00	15.00			0.0									
	243	241							0.35				0.35	0.65	0.63	1.12	16.13	80.1		89.8	**89.8**	PVC	375	0.65	12.9	147.5	1.29	0.17	60.9%
													0.00		0.00	0.00	16.13			0.0									
22	241	**M44**							0.30	0.30			0.60	0.60	1.00	2.12	16.30	79.6		168.9	**168.9**	CONC	450	1.00	67.3	297.4	1.81	0.62	56.8%
													0.00		0.00	0.00	16.30			0.0									
24	233A	233	3.32										3.32	0.80	7.38	7.38	10.00	104.2		769.3	**769.3**	CONC	825	0.45	8.5	1004.6	1.82	0.08	76.6%
													0.00		0.00	0.00	10.00			0.0									
25	233	231									0.35		0.35	0.70	0.68	8.06	10.08	103.8		837.0	**837.0**	CONC	825	0.45	114.0	1004.6	1.82	1.04	83.3%
													0.00		0.00	0.00	10.08			0.0									
26	231	229									0.24		0.24	0.70	0.47	8.53	11.12	98.6		841.4	**841.4**	CONC	825	0.50	82.0	1058.9	1.92	0.71	79.5%
													0.00		0.00	0.00	11.12			0.0									
27	237A	237	1.58										1.58	0.80	3.51	3.51	10.00	104.2		366.1	**366.1**	CONC	600	0.50	9.0	452.9	1.55	0.10	80.8%
													0.00		0.00	0.00	10.00			0.0									
28	237	235									0.15		0.15	0.70	0.29	3.81	10.10	103.7		394.6	**394.6**	CONC	600	1.40	49.0	757.9	2.60	0.31	52.1%
													0.00		0.00	0.00	10.10			0.0									
29	235	229							0.37				0.37	0.65	0.67	4.47	10.41	102.1		456.7	**456.7**	CONC	600	1.85	88.1	871.3	2.99	0.49	52.4%
													0.00		0.00	0.00	10.41			0.0									
30	229	227							0.57				0.57	0.65	1.03	14.04	11.83	95.4		1339.2	**1339.2**	CONC	975	0.50	117.4	1653.2	2.15	0.91	81.0%
													0.00		0.00	0.00	11.83			0.0									
31	227	**M45**							0.73	0.47			1.20	0.61	2.04	16.07	15.00	83.6		1343.1	**1343.1**	CONC	975	0.65	120.0	1884.9	2.45	0.82	71.3%
													0.00		0.00	0.00	15.00			0.0									
	223	221											0.00		0.00	0.00	10.00			0.0	**0.0**	PVC	250	0.65	57.1	50.0	0.99	0.96	0.0%
													0.00		0.00	0.00	10.00			0.0									
	221	219											0.00		0.00	0.00	10.96			0.0	**0.0**	PVC	250	0.65	8.6	50.0	0.99	0.15	0.0%
													0.00		0.00	0.00	10.96			0.0									
33	219	217							0.41	0.50			0.91	0.60	1.51	1.51	15.00	83.6		125.8	**125.8**	PVC	375	1.00	76.8	182.9	1.60	0.80	68.8%
													0.00		0.00	0.00	15.00			0.0									
34	217	213							0.48				0.48	0.65	0.87	2.37	15.80	81.1		192.3	**192.3**	CONC	450	1.00	71.7	297.4	1.81	0.66	64.7%
													0.00		0.00	0.00	15.80			0.0									
35	215	213								0.41			0.41	0.55	0.63	0.63	15.00	83.6		52.4	**52.4**	PVC	300	0.65	42.6	81.3	1.11	0.64	64.4%
													0.00		0.00	0.00	15.00			0.0									
36	213	211							0.25	0.14			0.39	0.61	0.67	3.67	16.46	79.1		290.0	**290.0**	CONC	600	0.50	64.9	452.9	1.55	0.70	64.0%
													0.00		0.00	0.00	16.46			0.0									
37	211	209							0.25	0.30			0.55	0.60	0.91	4.58	17.15	77.2		353.2	**353.2**	CONC	675	0.30	78.4	480.3	1.30	1.00	73.5%
													0.00		0.00	0.00	17.15			0.0									
	209	207											0.00		0.00	4.58	18.16	74.6		341.2	**341.2**	CONC	675	0.30	8.7	480.3	1.30	0.11	71.0%
													0.00		0.00	0.00	18.16			0.0									
38	207	205							0.41	0.21			0.62	0.62	1.06	5.64	18.27	74.3		418.8	**418.8**	CONC	675	0.45	65.8	588.3	1.59	0.69	71.2%
													0.00		0.00	0.00	18.27			0.0									
	205	203											0.00		0.00	5.64	18.96	72.6		409.4	**409.4**	CONC	675	0.45	6.0	588.3	1.59	0.06	69.6%
													0.00		0.00	0.00	18.96			0.0									
	203	**M46**							0.21				0.21	0.65	0.38	6.02	19.02	72.5		436.1	**436.1**	CONC	750	0.25	66.3	580.7	1.27	0.87	75.1%
													0.00		0.00	0.00	19.02			0.0									

NOVATECH ENGINEERING CONSULTANTS LTD.

Fernbank Crossing - Storm Sewer Design Sheet (Rational Method)

LOCATION			AREA											FLOW						Total Peak Flow (Q)	PROPOSED SEWER							
Location	From node	To node	Mixed Use	Park N' Ride Paramedic Post Medium Block	Arterial Road ROW	Schools	Parks	Hydro Corridor	Singles Front Yards	Singles Rear Yard	Towns Front Yard	Towns Rear Yard	Total Area	Weighted Runoff Coefficient	Indivi 2.78 AR	Accum 2.78 AR	Time of Concentration	Rain Intensity (mm/hr) 5yr	Rain Intensity (mm/hr) 10yr	Peak Flow		Pipe	Size	Grade	Length	Capacity	Full Flow Velocity	Time of Flow	Q/Qfull
			0.80	0.80	0.90	0.60	0.40	0.20	0.65	0.55	0.70	0.60	(ha)							(L/s)	(L/s)	Type	(mm)	(%)	(m)	(l/s)	(m/s)	(min.)	(%)
South Outlet																													
107	FUT	363		5.15					3.90	1.36			10.41	0.71	20.58	20.58	20.48	69.2		1424.5	**1424.5**	CONC	1350	0.20	58.8	2490.2	1.69	0.58	57.2%
													0.00		0.00	0.00	20.48			0.0									
105	391	363							0.22				0.22	0.65	0.40	0.40	15.00	83.6		33.2	**1469.2**	CONC	1050	0.50	120.4	2014.4	2.25	0.89	72.9%
				0.64	4.13								4.13	1.02	11.76	11.76	10.00		122.1	1436.0									
101	371	369							0.42	0.09			0.51	0.63	0.90	0.90	15.00	83.6		74.9	**74.9**	PVC	375	0.65	53.5	147.5	1.29	0.69	50.8%
													0.00		0.00	0.00	15.00			0.0									
	369	367											0.00	0.00	0.00	0.90	15.69	81.4		73.0	**73.0**	CONC	450	0.20	50.9	133.0	0.81	1.05	54.9%
													0.00		0.00	0.00	15.69			0.0									
102	367	365							0.35	0.18			0.53	0.62	0.91	1.80	16.74	78.3		141.3	**141.3**	CONC	600	0.15	59.8	248.1	0.85	1.17	57.0%
													0.00		0.00	0.00	16.74			0.0									
103	365A	365		1.39									1.39	0.80	3.09	3.09	10.00	104.2		322.1	**322.1**	CONC	600	0.30	8.7	350.8	1.20	0.12	91.8%
													0.00		0.00	0.00	10.00			0.0									
104	365	363							0.18	0.08			0.26	0.62	0.45	5.34	17.91	75.2		401.8	**401.8**	CONC	825	0.15	66.1	580.0	1.05	1.05	69.3%
													0.00		0.00	0.00	17.91			0.0									
108	363	361							0.20				0.20	0.65	0.36	6.10	20.48	69.2		422.4	**1374.6**	CONC	1350	1.74	78.6	7344.9	4.97	0.26	18.7%
													0.00		0.00	11.76	20.48		81.0	952.2									
109	361	341							0.34	0.36			0.70	0.60	1.16	7.27	20.74	68.7		499.0	**1443.6**	CONC	1350	1.74	81.1	7344.9	4.97	0.27	19.7%
													0.00		0.00	11.76	20.74		80.3	944.6									
111	FUT	341							3.23	1.67			4.90	0.62	8.39	8.39	19.28	71.9		603.1	**603.1**	CONC	825	1.88	86.2	2053.3	3.72	0.39	29.4%
													0.00		0.00	0.00	19.28			0.0									
110	341A	341				2.12							2.12	0.60	3.54	3.54	10.00	104.2		368.4	**368.4**	CONC	675	0.25	12.5	438.5	1.19	0.18	84.0%
													0.00		0.00	0.00	10.00			0.0									
112	341	339							0.18				0.18	0.65	0.33	19.52	21.01	68.1		1329.2	**2266.1**	CONC	1650	0.40	67.8	6013.7	2.72	0.41	37.7%
													0.00		0.00	11.76	21.01		79.7	936.8									
113	339	337							0.11				0.11	0.65	0.20	19.72	21.43	67.3		1326.2	**2251.5**	CONC	1800	0.25	45.2	5995.9	2.28	0.33	37.6%
													0.00		0.00	11.76	21.43		78.7	925.3									
114	337	335							0.29				0.29	0.65	0.52	20.24	21.76	66.6		1348.3	**2264.6**	CONC	1800	0.25	50.8	5995.9	2.28	0.37	37.8%
													0.00		0.00	11.76	21.76		77.9	916.3									
115	335A	335				2.83							2.83	0.60	4.72	4.72	10.00	104.2		491.8	**491.8**	CONC	750	0.25	17.9	580.7	1.27	0.23	84.7%
													0.00		0.00	0.00	10.00			0.0									
116	335	301							0.21				0.21	0.65	0.38	25.34	22.13	65.9		1669.9	**2576.4**	CONC	1800	0.30	57.7	6568.2	2.50	0.38	39.2%
													0.00		0.00	11.76	22.13		77.1	906.4									
117	FUT	301					1.20		5.13	1.57			7.90	0.59	11.67	11.67	23.33	63.7		743.4	**743.4**	CONC	975	0.61	54.7	1826.0	2.37	0.38	40.7%
													0.00		0.00	0.00	23.33			0.0									
118	301	**M97**									0.30		0.30	0.70	0.58	37.60	23.76	63.0		2366.8	**3232.6**	CONC	1950	0.30	78.3	8131.0	2.64	0.49	39.8%
													0.00		0.00	11.76	23.76		73.6	865.8									
119	M97	M98								0.94	0.40		1.34	0.59	2.22	39.81	24.25	62.1		2473.0	**3327.2**	CONC	2100	0.20	78.3	8089.5	2.26	0.58	41.1%
													0.00		0.00	11.76	24.25		72.7	854.2									
119	M98	**M99**											0.00	0.00	0.00	39.81	24.83	61.2		2435.3	**3276.4**	CONC	2400	0.15	29.6	10002.3	2.14	0.23	32.8%
													0.00		0.00	11.76	24.83		71.5	841.2									

Q = 2.78 AIR

WHERE : Q = PEAK FLOW IN LITRES PER SECOND (L/s)
A = AREA IN HECTARES (ha)
I = RAINFALL INTENSITY IN MILLIMETERS PER HOUR (mm/hr)
R = WEIGHTED RUNOFF COEFFICIENT

Q = (1/n) A R(2/3)So(1/2)

WHERE : Q = CAPACITY (L/s)
n = MANNING COEFFICIENT OF ROUGHNESS (0.013)
A = FLOW AREA (m2)

Project: Fernbank Crossing (108180-10)
Designed: KJM
Checked: MAB
Date: August 17 2012

NOVATECH ENGINEERING CONSULTANTS LTD.

APPENDIX C

Proposed Servicing Sketch

PROPOSED SERVICING SKETCH

LIVERY STREET

SAN MH 01
T/G=103.30
INV.NE=100.20
INV.SW=100.25

VB
PVC DR18 WMs
VB
45°
H.BENDS

9.2m-200mmØ PVC
DR35 SAN @ 2.0%

4.3m-250mmØ PVC
DR35 STM @ 2.0%

INTERNAL SWM TANK
> 176m³ ACTIVE STORAGE

WATER ENTRY ROOM
STM INV=100.40
SAN INV=100.45
TWM=100.85

SIAMESE

PROPOSED 4/5-STOREY
RESIDENTIAL BLDG "A"
GROUND FLOOR = 105.90m
P1 PARKING = 102.90m - 103.70m
P2 PARKING = 100.30m
USF = VARIES

8.0m-300mmØ PVC
DR35 STM @ 1.0%

STM MH 01
T/G=103.10
INV.NE=100.26
INV.S=100.31
INV.SW=100.31
BACKWATER VALVE
4.7m-250mmØ PVC
DR35 STM @ 1.0%

CBMH 01
T/G=103.05
INV.N=100.36
INV.SW=100.50

24.4m-250mmØ PVC
DR35 STM @ 1.0%

CB 01
T/G=103.05
INV=101.05

0.6m-200mmØ PVC DR35 CB
LEAD & TEE @ 1.0% (MIN.)

7.0m / 9.3m-200mmØ PVC DR35
TRENCH OUTLETS @ 1.0%

TRENCH DRAIN

41.4m-610mmØ PVC DR35 STM @ 0.5%

STM MH 02
T/G=103.12
INV.NE=100.55
INV.NW=100.85
INV.SW=100.85

DICB 01
LOW T/G=102.85
INV.NE=100.70

PD 01
T/G=106.10

PD 02
T/G=105.65

PD 03
T/G=105.65

200mmØ SWM TANK OVERFLOW
FROM TOP OF BOTH INTERNAL
TANKS. REFER TO MECHANICAL.

INTERNAL SWM TANK
> 176m³ ACTIVE STORAGE

5.7m-250mmØ PVC
DR35 STM @ 2.0%

PD 04
T/G=105.75

PD 05
T/G=105.60

CIPD 06
T/G=105.62

CIPD 07
T/G=105.57

HYD
T/FL=105.95

PD 10
T/G=105.57

PD 09
T/G=105.70

PD 08
T/G=105.70

CIPD 11
T/G=105.57

PD 12
T/G=105.57

PROPOSED 9-STOREY
RESIDENTIAL BLDG "B"
GROUND FLOOR = 105.90m
P1 PARKING = 102.90m - 102.90m
P2 PARKING = 99.10m
USF = VARIES

PROPOSED 18-STOREY
MIXED USE BLDG "C"
GROUND FLOOR = 105.90m
P1 PARKING = 102.30m
P2 PARKING = 99.10m
P3 PARKING = 95.90m
USF = VARIES

BUILDING 'C' - P1 LEVEL
MECHANICAL ROOM

PD 13
T/G=105.57

PD 14
T/G=105.57

TRENCH DRAIN
T/G=102.28

RAMP TO U/G PARKING

4m-500mmØ HDPE
CULVERT @ 1.0%
(10% EMBEDMENT)
INV.N=102.12
INV.S=102.16

SAN INV=101.50

SAN MH 03
T/G=104.60
INV.NE=101.30
INV.SE=101.30
INV.SW=101.25

250x200 REDUCER

9.6m-200mmØ PVC
DR35 SAN @ 2.0%

55.6m-200mmØ PVC DR35 SAN @ 0.35%

SAN INV=101.57

3.0m-200mmØ PVC
DR35 SAN @ 1.0%

EX. 250mmØ PVC SAN @ 0.35%

INV=101.07

34.0m-200mmØ PVC DR35 SAN @ 0.35%

8.4m-200mmØ PVC
DR35 SAN @ 0.35%

SAN MH 02
T/G=104.15
INV.NE=101.22
INV.NW=101.17

SAN MH 04
T/G=105.33
INV.NE=101.54
INV.NW=101.49

ROBERT GRANT AVENUE

Steve Matthews

From: Drew Blair
Sent: Monday, September 25, 2023 9:15 AM
To: Steve Matthews; Billy McEwen
Subject: FW: 5000 Robert Grant - new application process
Attachments: Study and Plan Identification List - 5000 Robert Grant.pdf; 5000 Robert Grant Meeting Minutes - Updated Sept 2023.pdf; Deviation Request - 5000 Robert Grant Avenue - Servicing.pdf

FYI on deviation memo.

Drew Blair, 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 Ext: 236

From: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Sent: Monday, September 18, 2023 2:03 PM
To: Jillian Simpson <simpson@fotenn.com>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>; Dieme, Abi <Abibatou.Dieme@ottawa.ca>; Cara Ruddle <c.ruddle@novatech-eng.com>; Gervais, Josiane <josiane.gervais@ottawa.ca>; Drew Blair <D.Blair@novatech-eng.com>
Subject: RE: 5000 Robert Grant - new application process

Hi Jillian,

I hope you had a good weekend. I've attached the updated plans and study list for 5000 Robert Grant, and our updated terms of reference for each plan and study can be found here.

We also have completed our review of the deviation request, and I've attached the response memo as well as updated pre-consult notes (only the engineering section has been updated).

Let me know if you have any questions on the process or requirements.

Best,

Sarah Ezzio, MCIP RPP
Planner II, Development Review (West Services)
Urbaniste II, Examen des projets d'aménagement (services ouest)

City of Ottawa | Ville d'Ottawa
613.580.2424 ext. | poste 23493
ottawa.ca/planning / ottawa.ca/urbanisme

From: Jillian Simpson <simpson@fotenn.com>
Sent: September 14, 2023 2:34 PM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>; Dieme, Abi <Abibatou.Dieme@ottawa.ca>
Subject: RE: 5000 Robert Grant - new application process

Hi Sarah,

Thanks so much – we'll await your confirmation.

Have a great afternoon,

Jillian Simpson, M. PL (*she/her*)
Planner
T 613.730.5709 x241

From: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Sent: Thursday, September 14, 2023 11:42 AM
To: Jillian Simpson <simpson@fotenn.com>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>; Dieme, Abi <Abibatou.Dieme@ottawa.ca>
Subject: RE: 5000 Robert Grant - new application process

Hi Jillian,

Thanks for the update, and yes, we are happy to provide the updated plans and studies list. It will include a lot of the same requirements as the old one, but the format is changed to correspond with our new Terms of Reference and there is also now the requirement for a Zoning Confirmation Report.

I'm just confirming some details with the team before sending the list over, but I will provide it shortly. We would just need those few components I had mentioned to you before we could proceed with the Phase 3 pre-consult (as well as the Phase 3 requirements).

For the wind study, it is just the Type II needed. I'll clarify that on the list.

Be in touch shortly, and let me know if you have any questions.

Best,

Sarah Ezzio, MCIP RPP
Planner II, Development Review (West Services)
Urbaniste II, Examen des projets d'aménagement (services ouest)

City of Ottawa | Ville d'Ottawa
613.580.2424 ext. | poste 23493
ottawa.ca/planning / ottawa.ca/urbanisme

From: Jillian Simpson <simpson@fotenn.com>
Sent: September 12, 2023 2:03 PM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>; Dieme, Abi <Abibatou.Dieme@ottawa.ca>
Subject: RE: 5000 Robert Grant - new application process

Good afternoon Sarah,

Providing you with a quick update on 5000 Robert Grant as we're close to submitting under Phase 2, however we're waiting on some internal decisions to be confirmed before we're in a position to submit.

After discussing with Bria, I'm wondering if the City could issue the plans and studies list so we can begin work on any outstanding items? This would provide us with clarity on the requirements – i.e. in the original list provided, a wind study was required however the updated TOR indicates it as a two-step process.

Let me know if you wish to discuss further and thanks in advance!

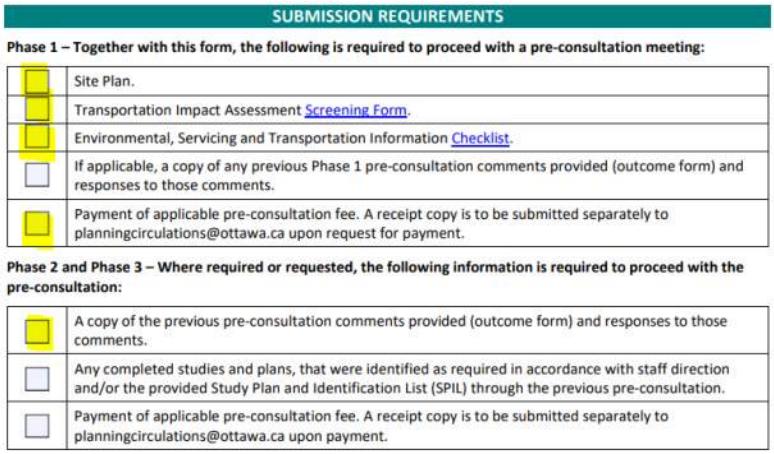
Jillian Simpson, M. PL ***(she/her)***
Planner
T 613.730.5709 x241

From: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Sent: Friday, August 18, 2023 11:12 AM
To: Jillian Simpson <simpson@fotenn.com>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>; Dieme, Abi <Abibatou.Dieme@ottawa.ca>
Subject: RE: 5000 Robert Grant - new application process

Hi Jill,

Happy Friday, and once again, thank you very much for your patience with my response. I appreciate you reaching out to confirm the requirements.

There are a few additional items required, I've highlighted below a screenshot from the pre-consult form to show what we would need in this case:



SUBMISSION REQUIREMENTS

Phase 1 – Together with this form, the following is required to proceed with a pre-consultation meeting:

☐	Site Plan.
☐	Transportation Impact Assessment Screening Form.
☐	Environmental, Servicing and Transportation Information Checklist.
☐	If applicable, a copy of any previous Phase 1 pre-consultation comments provided (outcome form) and responses to those comments.
☐	Payment of applicable pre-consultation fee. A receipt copy is to be submitted separately to planningcirculations@ottawa.ca upon request for payment.

Phase 2 and Phase 3 – Where required or requested, the following information is required to proceed with the pre-consultation:

☐	A copy of the previous pre-consultation comments provided (outcome form) and responses to those comments.
☐	Any completed studies and plans, that were identified as required in accordance with staff direction and/or the provided Study Plan and Identification List (SPIL) through the previous pre-consultation.
☐	Payment of applicable pre-consultation fee. A receipt copy is to be submitted separately to planningcirculations@ottawa.ca upon payment.

The link to the pre-consult form and templates is here. I know some of the pre-con follow up comments are on technical aspects that aren't fully ironed out at this stage, but please respond as best as possible .

We've also received the servicing memo from Cara, and Abi is working on its circulation and review.

Another question just from a brief look at the site plan, is the plan still to phase the development?

Best,

Sarah Ezzio, MCIP RPP
Planner II, Development Review (West Services)
Urbaniste II, Examen des projets d'aménagement (services ouest)

City of Ottawa | Ville d'Ottawa
613.580.2424 ext. | poste 23493
ottawa.ca/planning / ottawa.ca/urbanisme

From: Jillian Simpson <simpson@fotenn.com>
Sent: August 11, 2023 2:37 PM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Cc: Bria Aird <aird@fotenn.com>; Pascale Lepine <Pascale@lepinecorp.com>
Subject: RE: 5000 Robert Grant - new application process

Good afternoon Sarah,

I hope you're having a great August!

I've attached the updated zoning review, site plan and site servicing memorandum to waive the Phase 1 Pre-consultation requirements for the Site Plan Control application for 5000 Robert Grant. Please review and let me know if there's anything else required to schedule a Phase 2 pre-app, or if you wish to discuss further over a call/Teams.

Have a great weekend and talk soon,

Jillian Simpson, M. PL ***(she/her)***

Planner
T 613.730.5709 x241

From: Bria Aird <aird@fotenn.com>
Sent: Tuesday, July 25, 2023 9:33 AM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Cc: Jillian Simpson <simpson@fotenn.com>
Subject: RE: 5000 Robert Grant - new application process

Hi Sarah,

I hope you had a good long weekend!

Jillian Simpson will be replacing Bipin on this file – would you be able to update your records accordingly?

Also, we are targeting a full Phase 2 preapp submission for the end of August – so if we could connect to confirm requirements and process, that would be fantastic.

Thanks!

Bria Aird, RPP MCIP ***(she/her)***
Senior Planner
T: 613.730.5709 x224
M: 613.408.6286

From: Bria Aird
Sent: Wednesday, July 19, 2023 4:18 PM
To: Ezzio, Sarah <sarah.ezzio@ottawa.ca>
Subject: 5000 Robert Grant - new application process

Hi Sarah,

I hope your summer is going well. Lepine's consultant team for this project has turned their attention to preparing the Site Plan Control materials for this file, so I wanted to confirm a few aspects of the new process as it applies to this project:

1) Should we schedule a new Step 1 Preconsult, or will the preconsult held this spring, including the attached Plans and Studies Identification List?
2) Cara Ruddle at Novatech has already been in touch with Abi about some servicing questions. Cara's preferred approach would be to submit a memo with some design assumptions for City review and comment, before finalizing the full site plan materials. Can we just go ahead and do this, or is there a preferred approach for this?
3) Do you anticipate requiring a Step 2 preconsult for this project?

I'd be happy to have a quick chat over phone or teams if it's easier to discuss live.

Thank you!

Bria Aird, RPP MCIP ***(she/her)***
Senior Planner

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File Number: PC2023-0046
March 10, 2023
September 18, 2023 Update with Engineering Comments

Pre-Application Consultation Meeting Minutes

Property Address: 5000 Robert Grant Avenue
Location: Virtual – Microsoft Teams
Meeting Date: March 2, 2023

Attendees: Pascale Lepine, Lepine Corporation
Francis Lepine, Lepine Corporation
Bria Aird, Fotenn Consultants
Bipin Dhillon, Fotenn Consultants
Cara Ruddle, Novatech Engineering Consultants
Kim Pham, Neuf Architects
Sarah Ezzio – Planning, City of Ottawa
Kieran Watson – Planning, City of Ottawa
Josiane Gervais – Transportation, City of Ottawa
Christopher Moise – Urban Design, City of Ottawa
Mark Elliott – Environmental Planning, City of Ottawa
Abi Dieme – Engineering, City of Ottawa
Daniela Gomes Tavares Correia – Parks and Facilities, City of Ottawa

Policies/Designations of the Site

- Official Plan – Suburban Transect, Neighbourhood Designation
  - Robert Grant frontage designated as Minor Corridor
  - Evolving Neighbourhood Overlay
- Fernbank Community Design Plan
  - Designated as Mixed Use, and within the Community Core area
  - The adjacent site to the south is designated as Village Green
- Zoning – Arterial Mainstreet Zone with an Urban Exception Zone 2152, a maximum Floor Space Index of 4.3, and subject to height Schedule 437, 'AM[2152] F(4.3) S437.' A portion of the site is subject to a holding symbol.

Engineering

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

Water Infrastructure**:**

- Pressure Zone: 3W
- Frontage Charges do not apply
- Accessible watermain: 200mm PVC on Livery St
  There is an existing capped 200mm watermain at the corner of Livery Street installed to service the site. A second watermain connection is required as the proposed development will have more than 50 units (refer to technical bulletin ISTB-2021-03)
- Submission documents must include:
  1. Boundary Conditions - civil consultant to request boundary conditions from the City's assigned Project Manager, Development Review. Water boundary conditions request must include the location of the service and the expected loads required by the proposed development. Please provide all the following information:
     - Location of service (show on a plan or map)

- Type of development
- Average daily demand: ___ l/s.
- Maximum daily demand: ___l/s.
- Maximum hourly daily demand: ___ l/s.
- Required fire flow and completed FUS Design Declaration if applicable
- Supporting Calculations for all demands listed above and required fire flow as per Ontario Building Code or Fire Underwriter Surveys (See technical Bulletin ISTB-2021-03.

2. Watermain system analysis demonstrating adequate pressure as per section 4.2.2 of the Water Distribution Guidelines.
3. Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I table 1 – maximum flow to be considered from a given hydrant.
4. Any proposed emergency route. A fire route above an underground parking would require a special design and approval from Fire Services. Please contact Fire Services (Allan.Evans@ottawa.ca) prior to the phase 3 pre-consultation.

Sanitary Sewers:

- Accessible Sanitary Sewers: 250mm PVC on Robert Grant Avenue, 250 mm PVC on Livery Street (200 mm stub dropped within the property)
- Please note that the City currently allows one sanitary sewer connection per property to protect the public sewer system. Multiple connections may be permitted on a case-by-case basis.
- A monitoring maintenance hole is required to be located on private property.
- Provide an analysis to demonstrate that there is adequate residual capacity in the receiving and downstream wastewater system to accommodate the proposed development. Note that the maximum allowable release rate to Livery St sanitary system is 3.3 L/s.
- Please apply the wastewater design flow parameters in Technical Bulletin PIEDTB-2018-01.

Storm Sewers:

- Accessible Municipal Storm Sewer: 450mm concrete on Robert Grant Avenue, 1200/1350mm concrete within a City easement through subject site, and 375mm PVC on Livery St
- Please note that the City currently allows one storm sewer connection per property to protect the public sewer system. Multiple connections may be permitted on a case-by-case basis
- Monitoring maintenance hole is not required on private property.

Storm Water Management:

- Quality Control:
  - Enhanced level water quality control provided in the downstream stormwater management facility.
- Quantity Control
  - Design storm for receiving sewer: 5-year design storm.
  - Runoff Coefficient: C as per Fernbank Crossing Stormwater Management Report
  - Time of concentration (Tc): To be calculated, min Tc= 10 mins
  - Allowable release rate: 353 L/s

Additional Comments:

- No road moratorium that would impact the application has been identified.
- Any easement identified should be shown on all plans.
- Permanent structures (curbs, walls, etc) are not permitted within the City's easement.
- Trees are not permitted within the City's easement.
- Should excavation encroach within the City's easement, the City requires tie back drawings and underground structure profile to see the clearances from the sewer. The City will also require pre and post development CCTV of the sewer for review.
- For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc). Additionally, include in the submission the location of the fixtures, fixture type (make, model, part number and mounting height.
- Sensitive Marine Clay (SMC) is widely found across Ottawa- geotechnical reports should include Atterberg Limits, consolidation testing and sensitivity values.

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

  - Ottawa Sewer Design Guidelines (October 2012)
  - Ottawa Design Guidelines – Water Distribution (2010)
  - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
  - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
  - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
  - City of Ottawa Park and Pathway Development Manual (2012)
  - City of Ottawa Accessibility Design Standards (2012)
  - Ottawa Standard Tender Documents (latest version)

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

Should you have any questions or require additional information on the Engineering comments, please contact Abi Dieme.

Urban Design

- This proposal does not run along or does not meet the threshold in one of the City's Design Priority Areas and need not attend the City's UDRP. Staff will be responsible for evaluating the proposal and providing design direction.
- A scoped Design Brief is a required submittal for all Site Plan/Re-zoning applications and can be combined with the Planning Rationale. Please see the Design Brief Terms of Reference provided.
    - Phasing: As this project will be developed in phases over time, we recommend some indication for how the remaining undeveloped land will be treated while it awaits the next phase. We recommend considering sodding the lands to prevent it looking like a construction site in the interim.
    - We recommend all buildings fronting public right of ways provide a primary entrance facing that right of way.
    - We require more information to better understand site connectivity.
    - We recommend providing additional massing information of the proposal and the neighbouring properties to understand the relationship to existing built form to east and planned context to the south (see design brief TOR for details).
    - We recommend providing additional details for how the trees on the parking structure are intended to be designed.
    - We recommend review of section 6.6 of the Fernbank CDP.
    - A Type II Wind Analysis will be required. Please refer to the Terms of Reference for the wind analysis and conduct the studies to evaluate the impacts.
    - ***Note. The Design Brief submittal should have a section which addresses these pre-consultation comments.***

Please contact Christopher Moise, Urban Design for follow-up questions.

Planning

1. Thank you for following the height schedule and adhering to the general concept that was presented at the time of the zoning application.
2. This site has strong policy direction for supporting a mixed-use component: it is intended to be the community core of the Fernbank community, and the new OP directs that minor corridor designations are key to supporting the 15-minute neighbourhood concept.

Please provide a commercial component to support the residents of the site and the surrounding community.

3. Please follow the Site Design and Built Form Guidelines included in Section 6.6.1 (Community Core) and 6.6.3 (Mixed Use) of the Fernbank Community Design Plan.
4. The Fernbank CDP directs the site to the south to incorporate a future Village Green, intended to be a civic gathering and passive open space for residents. Please provide pathway connections throughout the site and to the Village Green site to the south
5. Please include a walkway connection from the existing sidewalk on Robert Grant internally to the site and ensure clear pedestrian walkways provide access to building entrances.
6. This is an important site within the Fernbank community core, and the landscaped/open area central to the site will be important to provide an amenity to the residents and to realize the vision of the Community Core designation of the CDP. Please provide high quality landscaped areas and ensure the design is welcoming and functional. You might also consider walkways with pedestrian easements or a POPs, or including the amenity building that was discussed at the rezoning stage. Pedestrian easements will likely be required.
7. With the site plan submission, it will be important to show that the areas above the parking garage have sufficient soil volumes to support trees.
8. With the site plan submission, show interim conditions between phases for all elements e.g. landscaping, traffic circulation, servicing. All phases need to function independently of eachother.
9. Please include the entirety of the public pathway block with the first phase of site development.
10. Ensure the parking requirements are met, the rezoning did not grant a reduction.
11. Please provide the following and show clearly on the site plan:
    a. Bicycle parking, including demonstration that the existing buildings on site have sufficient bicycle parking facilities if it is one lot for zoning purposes.
    b. Amenity Area, meeting the Section 137 requirements.
    c. Loading and waste facilities, including dimensions.

Process-Related Comments:

12. A lifting of a holding application will be needed prior to the third phase of development. It will not affect the construction of the underground garage with the earlier phases.
13. As the phases share many common elements, a severance application will be premature until the site plan is finalized and approved.
14. There are a few ways a phased site plan can be accomplished: either it can be approved in its entirety and securities can be phased (collected prior to the BP release for each

phase), or site plan approval can be granted for the first phase and subsequent revision applications can be submitted. Either way, we will need to understand how the site will function in its final form, and please include the phasing lines on the submitted plans.

15. Please be aware that the City's High Performance Development Standards are forthcoming (expected at Council this spring) and may require additional submission requirements.
16. The City's new Community Benefits Charge will apply to this proposal and will be collected at Building Permit stage.
17. Please note that the City is currently developing an implementation strategy to respond to the Provincial Bill 109 and there may be some imminent changes to the planning process, such as requiring rezonings to be finalized prior to site plan submissions. We are happy to discuss as more details become available. Please stay tuned to the changing context
18. Please discuss the details of the proposal with the ward councillor prior to application submission.

Feel free to contact Sarah Ezzio at sarah.ezzio@ottawa.ca for follow-up questions, and we are happy to discuss any of our comments further as the proposal progresses.

Transportation

- Follow Transportation Impact Assessment Guidelines:
  - A TIA is required. Please submit the Screening Form and Scoping report to josiane.gervais@ottawa.ca at your earliest convenience. Alternatively, an update to the previous TIA can be provided to address the new submission and, unless any major changes have occurred, can be submitted as a revision to Step 4 (i.e. no need to go through individual step 2 and 3 submissions).
  - It is the City's preference that the TIA address the site at full-buildout to ensure the TIA addresses all stages.
  - Start this process asap. The application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
  - An update to the *TRANS Trip Generation Manual* has been completed (October 2020). This manual is to be utilized for this TIA. A copy of this document can be provided upon request.
- Clear throat requirements for >200 residential units on an arterial is 40m. It is acknowledged that the ramp itself provides some queuing opportunity and was shown at the time of re-zoning. Ensure any gate feature for the garage access is as far down the ramp as possible to extend queueing opportunity. Any site re-design to accommodate a longer clear throat length is encouraged.
- TMP includes:
  - Transit Priority Corridor (Isolated Measures) along Robert Grant (Affordable Network)
  - BRT along Robert Grant (2031 Network Concept)
  - Widening Robert Grant to 4 lanes (Ultimate Concept)

- Construction start for the Robert Grant extension (i.e. Abbott St to Hazeldean) is anticipated to occur in 2023. The roadway is tentatively scheduled to be in service by the end of 2023.
- As the proposed site is multi-use, AODA legislation applies.
    - Ensure all crosswalks located internally on the site provide a TWSI at the depressed curb, per requirements of the Integrated Accessibility Standards Regulation under the AODA.
    - Clearly define accessible parking stalls and ensure they meet AODA standards (include an access aisle next to the parking stall and a pedestrian curb ramp at the end of the access aisle, as required).
    - Please consider using the City's Accessibility Design Standards, which provide a summary of AODA requirements. https://ottawa.ca/en/city-hall/creating-equal-inclusive-and-diverse-city/accessibility-services/accessibility-design-standards-features#accessibility-design-standards
- On site plan:
    - Ensure site access meets the City's Private Approach Bylaw.
    - Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.
    - Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
    - Turning movement diagrams required for internal movements (loading areas, garbage).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
    - Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
    - Sidewalk is to be continuous across accesses as per City Specification 7.1 (on both Robert Grant and Livery).
    - Show slope of garage ramp on site plan. Note that underground ramps should be limited to a 12% grade and must contain a subsurface melting device when exceeding 6%. Ramp grades greater than 15% can be psychological barriers to some drivers.
- Noise Impact Studies required for the following:
    - Road, as the site is within proximity to Robert Grant. Note that Robert Grant is ultimately to be widened to a 4-lane divided cross-section, and include BRT (at-grade crossings) in the median. A high-level design can be found on the West Transit Way Connections (Terry Fox Dr to Fernbank Rd) EA study. The noise study must consider the widened roadway and BRT as the 'mature state'.
    - Rail, within 100m of Carleton Place Rail Corridor (currently a non-active rail line, acquired for future rail corridor).
    - Stationary, if there will be any exposed mechanical equipment due to the proximity to neighboring noise sensitive land uses.

Please contact Josiane Gervais for follow up questions relating to the transportation comments.

Environmental Planning

- There is no trigger for an EIS

- Buildings above 4 storeys in height must include the mitigation measures in the Bird Safe Design Guidelines. The nearby hydro corridor is a likely migration route, so it is important to take measures to reduce the occurrence of bird mortality.
- While that the current design does incorporate a substantial number of trees already, any additional plantings or other features that may contribute to a cooler microclimate would be appreciated. In addition to the tree canopy goals, this also helps to combat the effects of the urban heat island effect and climate change per section 10.3 of the OP.

Please contact Mark Elliot for follow up questions relating to Environmental Planning comments.

Forestry

- There is no TCR requirement.

Planning Forester Landscape Plan tree planting requirements:

Please note that all process for reviewing and approving LP tree planting have changed at the City – in order to effectively review your submission in a timely manner the Planning Forester will need to ensure that all the bullets listed below have been addressed. Reach out to Mark.Richardson@Ottawa.ca if you have any questions.

1) Minimum Setbacks
    - Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.
    - Maintain 2.5m from curb
    - Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
    - Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
2) Tree specifications
    - Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
    - Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
    - Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
    - Plant native trees whenever possible
    - No root barriers, dead-man anchor systems, or planters are permitted.
    - No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)
3) Hard surface planting
    - Curb style planter is highly recommended

- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

4) Soil Volume
   - Please document on the LP that adequate soil volumes can be met:

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

Sensitive Marine Clay: Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Parks

The parks comments are outstanding and will be provided once more information becomes available.

Feel free to contact Daniela Correia for follow up questions relating to these parks comments.

General Comments

A Site Plan Control (complex) application and a Lifting of a Holding application are required. The list of required plans and studies are attached to this email.

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are generally valid for one year, unless impacted by business process changes in response to Bill 109. You may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

MEMO

Application No. PC2023-0046
Date: September 15, 2023

To / Destinataire: Cara Ruddle

From / Expéditeur: Abibatou Dieme
Project Manager
Development Review, West Branch

Subject / Objet: Sewer connection deviation request – 5000 Robert Grant Avenue
Ward 6 – Stittsville – Councillor glen Gower

The City has reviewed the servicing memorandum #117151 prepared by Novatech dated July 28, 2023, submitted August 10, 2023. Please consider the following comments for your final servicing design:

1. A sanitary sewer extension (250mm) will be required within the public ROW along Robert Grant Avenue. The sewer should be extended across the site's entire Robert Grant frontage. A detailed review of the proposed system will be conducted at submission.
2. Municipal Consent circulation and MECP ECA will be required for the proposed sanitary sewer extension along Robert Grant Avenue.
3. There seems to be an opportunity to connect the 250mm storm sewer along the south side property line to the existing storm maintenance hole at the front of building A. Please proceed with a connection to the existing manhole.

Please feel free to contact me at 613-580-2424, extension x 16596 or via email abibatou.dieme@ottawa.ca if you have any questions.

Sincerely,

Abibatou Dieme, EIT
Project Manager
Development Review, West Branch

Cc: Justin Armstrong, Project Manager
Sarah Ezzio, File lead

APPLICANT'S STUDY AND PLAN IDENTIFICATION LIST

Legend: **R** = Required, the study or plan is required with application submission
A = Advised, the study or plan is advised to evaluate the application or satisfy a condition of approval/draft approval
1 - OPA, **2** - ZBA, **3** - Plan of Subdivision, **4** - Plan of Condominium, **5** - SPC

Core studies required for certain applications all the time (Remaining studies are site specific)

For information and guidance on preparing required studies and plans refer here:

ENGINEERING										
R	**A**	**Study/ Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☒	☐	1. Environmental Site Assessment (Phase 1 & Phase 2)	Ensures development only takes place on sites where the environmental conditions are suitable for the proposed use	☒	☒	☒	☒	☒	Record of Site Condition required where warranted by the findings of Phases 1 and 2.
				Study Trigger Details: All cases					
☒	☐	2. Geotechnical Study	Geotechnical design requirements for the subsurface conditions	☒	☒	☒	☒	☒	
				Study Trigger Details: All cases					
☒	☐	3. Grading and Drainage Plan	Grading relationships between connecting (or abutting) properties and surface runoff control	☐	☐	☒	☐	☒	
				Study Trigger Details: All cases					
☐	☐	4. Hydrogeological and Terrain Analysis	A scientific study or evaluation that includes a description of the ground and surface hydrology, geology, terrain, affected landform and its susceptibility	☐	☐	☒	☒	☒	Reasonable Use Study Yes ☐ No ☐ Groundwater Impact Study Yes ☐ No ☐
				Study Trigger Details: When developing on private services or when urban development is in close proximity to existing private serviced development					
☒	☐	5. Noise Control Study	Potential impacts of noise on a development	☒	☒	☒	☒	☒	Vibration Study Yes ☐ No ☐
				Study Trigger Details: See Terms of Reference for full details.					

☐	☐	6. Rail Proximity Study	Development on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan, to follow rail safety and risk mitigation best practices	☐	☒	☒	☒	☒	Rail Safety Report Yes ☐ No ☐ O-Train Network Proximity Study Yes ☐ No ☐
				Study Trigger Details: Within the Development Zone of Influence for existing and future rapid transit stations and corridors, as shown on Annex 2 of the OP OR on land adjacent to all Protected Transportation Corridors and facilities shown on Schedule C2 of the Official Plan					
☒	☐	7. Site Servicing Study	Provides servicing details based on proposed scale of development with an engineering overview taking into consideration surrounding developments and connections.	☐	☒	☒	☒	☒	Fluvial Geomorphological Report Yes ☐ No ☐ Assessment of Adequacy of Public Services Yes ☒ No ☐ Servicing Options Report Yes ☐ No ☐ Erosion and Sediment Control Plan / Brief Yes ☒ No ☐ Hydraulic Water Main Analysis Yes ☒ No ☐ Stormwater Management Report and Detailed Design Brief Yes ☒ No ☐
				Study Trigger Details: All cases					
☐	☐	8. Slope Stability Study	Assessment of slope stability and measures to provide safe set-back.	☐	☒	☒	☒	☒	Retrogressive Landslide Analysis Yes ☐ No ☐
				Study Trigger Details: Where the potential for Hazard Lands exists on a site.					
☒	☐	9. Transportation Impact Assessment	Identify on and off-site measures to align a development with City transportation objectives.	☐	☒	☒	☒	☒	Roadway Modification Functional Design Yes ☐ No ☐
				Study Trigger Details: If the development generates 60 person-trips or more; or if the development is located in a Location Trigger; or if the development has a Safety Trigger.					

☐	☐	10. Water Budget Assessment	Identify impact of land use changes on the hydrologic cycle and post-development mitigation targets.	☐	☒	☒	☒	☒	
				Study Trigger Details: May be required for site plan control applications for sites with private servicing and / or proximity to hydrogeologically-sensitive areas. Draft plans of subdivision are required to integrate water budget assessments into supporting stormwater management plans and analysis for the study area.					
☐	☐	11. Wellhead Protection Study	Delineate a Wellhead Protection Area (WHPA) and characterize vulnerability for new communal residential drinking water well systems, in accordance with Technical Rules under *Clean Water Act.*	☐	☒	☒	☒	☒	
				Study Trigger Details: Required for all new communal residential drinking water well systems; including new municipal wells, new private communal wells (small water works) that require a Municipal Responsibility Agreement (MRA), expansions or increased water takings from an existing municipal well or existing private communal well and new private communal wells.					

PLANNING									
R	**A**	**Study/Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☐	☐	12. Agrology and Soil Capability Study	Confirm or recommend alterations to mapping of agricultural lands in the City.	☒	☐	☐	☐	☐	
				Study Trigger Details: For the expansion of a settlement area or identification of a new settlement area through a comprehensive review; or where it is demonstrated that the land does not meet the requirements for an Agricultural Resource Area.					
☐	☐	13. Archaeological Assessment	Discover any archaeological resources on site, evaluate cultural heritage value and conservation strategies	☒	☒	☒	☒	☒	
				Study Trigger Details: When the land has either: a known archaeological site; or the potential to have archaeological sites; or where the City's Archaeological Resource Potential Mapping Study indicates archaeological potential, outside of the historic core; or upon discovery of any archaeological resource during construction in the City's historic core area.					
☒	☐	14. Building Elevations	Visual of proposed development to understand facing of building including direction of sunlight, height, doors, and windows.	☒	☒	☐	☐	☒	
				Study Trigger Details: Site Plan: for residential buildings with 25 or more residential units; or for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area. Official Plan or Zoning By-law: if staff deem it necessary to determine compliance with OP policies, the Zoning By-law or City of Ottawa Urban Design Guidelines.					

☐	☐	15. Heritage Impact Assessment	Determine impacts of proposed development on cultural heritage resources.	☒	☒	☒	☒	☒	Study Trigger Details: Where development or an application under the Ontario Heritage Act is proposed on, adjacent to, across the street from or within 30 metres of a protected heritage property; or for any development adjacent to the Rideau Canal UNESCO World Heritage Site and its landscaped buffer.	Conservation Plan Yes ☐ No ☐
☐	☐	16. Heritage Act Acknowledgement Report	A submission requirement to demonstrate that the *Ontario Heritage Act* requirements have been satisfied, to ensure that multiple applications are considered currently.	☐	☒	☒	☒	☒	Study Trigger Details: Where the subject property is listed on the Heritage Register and the applicant must submit a Heritage Permit Application (designated heritage property listed on the Heritage Register) or provide notice of intent to demolish or remove a building (non-designated property listed on the Heritage Register).	Heritage Permit Application Yes ☐ No ☐ Notice of Intent to Demolish Yes ☐ No ☐
☐	☐	17. Impact Assessment Study – Mineral Aggregate	Mineral aggregate extraction activities; and to protect known high quality mineral aggregate resources from development and activities that would preclude or hinder their existence (ability to be extracted) or expansion.	☒	☒	☒	☒	☒	Study Trigger Details: New Development within 500 metres of lands within the Bedrock Overlay , or within 300 metres of lands within the Sand and Gravel Resource Area Overlay.	
☐	☐	18. Impact Assessment Study – Mining Hazards	To identify or confirm known mineral deposits or petroleum resources and significant areas of mineral potential. To protect mineral and petroleum resources from development and activities which would preclude or hinder the establishment of new operations or access to the resources.	☒	☒	☒	☒	☒	Study Trigger Details: For all applications in proximity to mining operations.	

☐	☐	19. Impact Assessment Study – Waste Disposal Sites / Former Landfill Sites	To identify or confirm known proximity of existing or former waste disposal sites. To ensure issues of public health, public safety and environmental impact are addressed.	☒	☒	☒	☒	☒	
				Study Trigger Details: For the establishment of any new Solid Waste Disposal Site or for a footprint expansion of an operating Solid Waste Disposal Site; or development within three kilometers of an operating or non-operating Waste Disposal Site.					
☒	☐	20. Landscape Plan	A plan to demonstrate how the canopy cover, urban design, health, and climate change objectives of Official Plan will be met through tree planting and other site design elements.	☒	☒	☒	☒	☒	Please include phasing lines on the Landscape Plan if the development is to be phased.
				Study Trigger Details: Site Plan, Plan of Subdivision, and Plan of Condominium: always required, except where it is demonstrated that the landscape component of a project is not relevant to the review of the application. A high-level conceptual Landscape Plan may be required to support Zoning By-law and Official Plan Amendment applications.					
☐	☐	21. Mature Neighbourhood Streetscape Character Analysis	In the Mature Neighbourhoods a Streetscape Character Analysis is required to determine the applicable zoning requirements.	☐	☒	☐	☐	☐	
				Study Trigger Details: Zoning By-law amendment application in areas covered by the Mature Neighbourhoods zoning overlay for applications of residential development of four storeys or less located in a R1, R2, R3, or R4 zone.					
☐	☐	22. Minimum Distance Separation	Provincial land use planning tool that determines setback distances between livestock barns, manure storages or anaerobic digesters and surrounding land uses, with the objective of minimizing land use conflicts and nuisance complaints related to odour.	☒	☒	☒	☒	☒	
				Study Trigger Details: Applications in the Rural Area, outside of a village.					

☐	☐	23. Parking Plan	A tool to assess the sufficiency of on-street parking in plans of subdivision.	☐	☐	☒	☒	☐	Study Trigger Details: For new or revised plans of subdivision with public streets.	
☒	☐	24. Plan of Survey	A Plan of Survey depicts legal boundaries and is a specialized map of a parcel of land and it delineates boundary locations, building locations, physical features and other items of spatial importance.	☒	☒	☒	☒	☒	Study Trigger Details: Required for all *Planning Act* applications.	
☐	☐	25. Plan of Subdivision	Proposed subdivision layout to be used for application approval	☐	☒	☒	☐	☐	Study Trigger Details: Always required with the submission of plan of subdivision application. Only required with a Zoning By-law Amendment application, where such ZBLA is in response to enable a subdivision.	
☐	☐	26. Plan of Condominium	Proposed condominium layout to be used for application approval	☐	☐	☐	☒	☐	Study Trigger Details: With the submission of plan of condominium application.	
☐	☐	27. Planning Rationale	Provides the planning justification in support of the *Planning Act* application and to assist staff and the public in the review of the proposal.	☒	☒	☒	☐	☐	Study Trigger Details: For all Official Plan amendment, Zoning By-law amendment, or plan of subdivision applications.	Integrated Environmental Review Summary Yes ☐ No ☐
☐	☒	28. Preliminary Construction Management Plan	A checklist that shows a development proposal's anticipated impacts to all modes of transportation and all elements in the right of way during construction.	☐	☐	☒	☐	☒	Study Trigger Details: When development is going to impact the City's transportation network (sidewalks, multi-use pathways, bus stops, transit lanes, cycle lanes, general purpose traffic lanes).	Please provide if the site's construction is planned to use components of the City's transportation network.

☒	☐	29. Public Consultation Strategy	Proposal to reach and collect public input as part of development application.	☒	☒	☒	☒	☒	Study Trigger Details: Official Plan Amendment, Zoning By-law Amendment and Subdivision: Always required. Condominium: Vacant Land only Site Plan: At the discretion of the City's file lead in consultation with the Business and Technical Support Services Manager.	Please provide a brief description of what public consultation has been carried out (e.g. discussion with the ward Councillor, neighbours, community groups, etc.)
☐	☐	30. Shadow Analysis	A visual model of how the proposed development will cast its shadow.	☐	☒	☐	☐	☐	Study Trigger Details: When there is an increase in height or massing proposed for a residential, commercial or office use. Two triggers: 1. Downtown, Inner Urban, Outer Urban Transects over 5 storeys, 2. less than 5 storeys but near a shadow sensitive area.	
☒	☐	31. Site Plan	A Site Plan is a visual drawing that illustrates the proposed development of a site in two dimensions.	☒	☒	☒	☒	☒	Study Trigger Details: Site Plan: All Other applications: where a layout of the public realm, building massing, heights, densities or massing of the proposal provides changes to the planned context; sites proposing multiple land uses; sites with multiple landowners; sites with two or more buildings, on-site park dedication, and/or a new public or private street(s); sites with proposed changes to connectivity (such as active transportation networks, vehicular circulation or access to transit); sites where the development potential on	Site Plan – Please show phasing lines if development is to be phased. Yes ☒ No ☐ Concept Plan Yes ☐ No ☒ Facility Fit Plan Yes ☐ No ☒

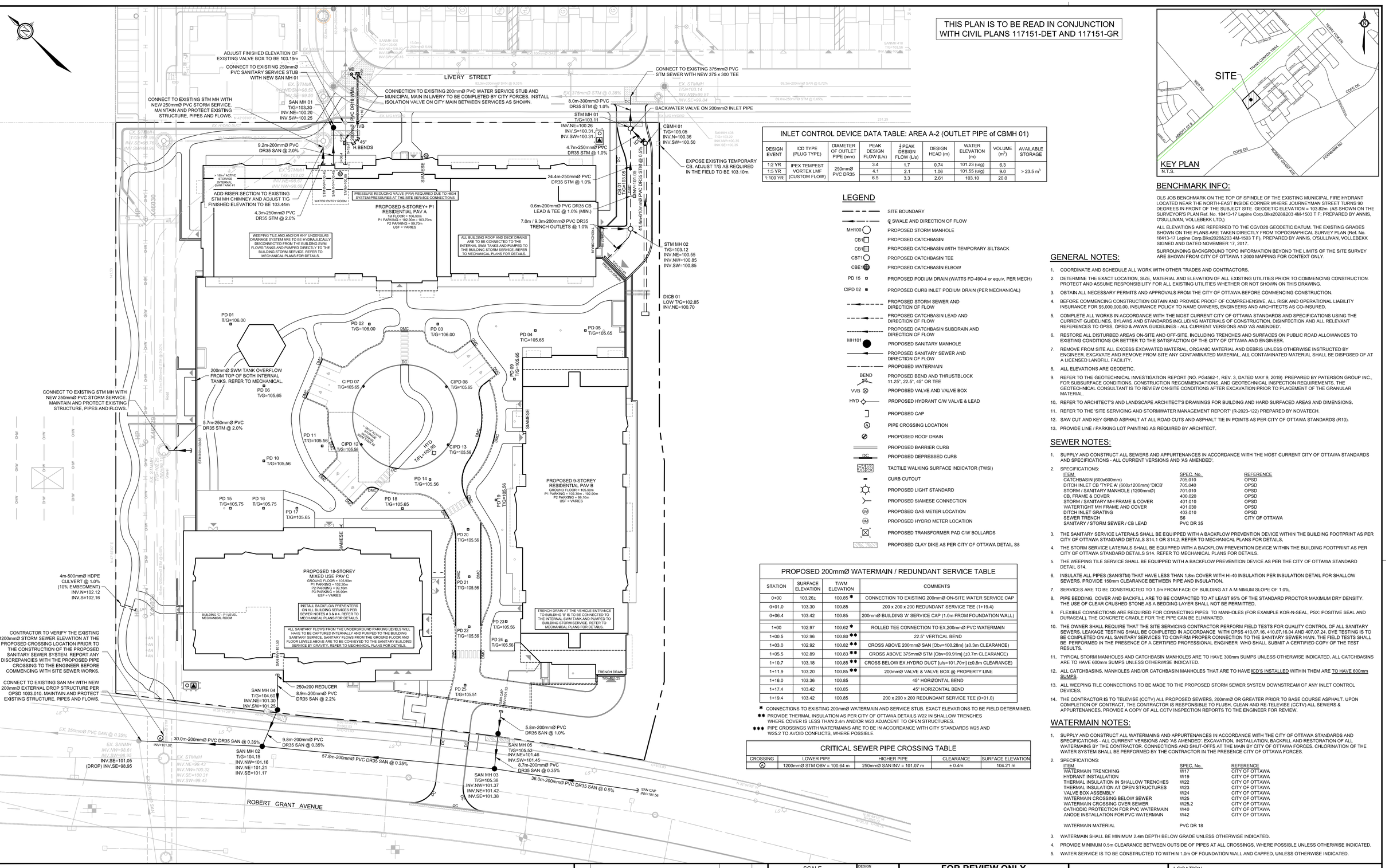
				adjacent properties may be impacted by or could be integrated into the proposed site.					
☒	☐	32. Urban Design Brief	Illustrate how a development proposal represents high-quality and context sensitive design that implements policies of the Official Plan, relevant secondary plans, and Council approved plans and guidelines.	☒	☒	☒	☐	☒	Please include discussion of how the proposal is in meeting with the Fernbank CDP, including the Community Core designation.
				Study Trigger Details: For all Official Plan amendment, Zoning By-law amendment, and plan of subdivision applications. For SPC applications: proposals for residential buildings with 25 or more residential units, or for proposals for residential buildings with less than 25 residential units, if the units are within the Urban area or the High-performance Development Standard threshold in the rural area where OP Policy 11.3 (3) is relevant; for non-residential and mixed-use proposals.					
☐	☐	33. Urban Design Review Panel Report	Demonstrates that a development proposal has attended an Urban Design Review Panel formal review meeting, received, and responded to the associated recommendations, if applicable	☒	☒	☒	☒	☒	
				Study Trigger Details: Required for all planning act applications subject to UDRP review, in accordance with the UDRP Panel Terms of Reference.					
☒	☐	34. Wind Analysis	A visual model and a written evaluation of how a proposed development will impact pedestrian-level wind conditions.	☐	☒	☐	☐	☒	A Type II Wind Analysis only is required.
				Study Trigger Details: Applications seeking an increase in height and/or massing which is either: a tall building(s), 10 storeys or more or a proposed building that is more than twice the height of adjacent existing buildings and is greater than five storeys in height and is adjacent to existing or planned low rise development, open spaces, water bodies and large public amenity areas.					
☒	☐	35. Zoning Confirmation Report	The purpose of the Zoning Confirmation Report (ZCR) is	☐	☒	☐	☐	☒	

			to identify all zoning compliance issues, if any, at the outset of a planning application.	Study Trigger Details: Required for all SPC and ZBLA applications.	

ENVIRONMENTAL										
R	**A**	**Study / Plan Name**	**Description**	**When Required**					**Applicable Study Components & Other Comments**
				1	**2**	**3**	**4**	**5**	
☐	☐	36. Community Energy Plan	Includes a community energy analysis, alongside mitigation measures, and other associated information. The community energy analysis refers to the overall assessment process to identify on and off-site measures to align the design of the development with City climate objectives.	☐	☐	☐	☐	☐	
				NOT IMPLEMENTED & NOT REQUIRED					
☐	☐	37. Energy Modelling Report	The Energy Modeling Report is a Site Plan Control application submission requirement to show how climate change mitigation, and energy objectives will be met through exterior building design elements.	☐	☐	☐	☐	☐	
				NOT IMPLEMENTED & NOT REQUIRED					
☐	☐	38. Environmental Impact Study	Assessment of environmental impacts of a project and documents the existing natural features, identifies the potential environmental impacts, recommends ways to avoid and reduce the negative impacts, and proposes ways to enhance natural features and functions.	☒	☒	☒	☐	☒	Assessment of Landform Features Yes ☐ No ☐ Integrated Environmental Review Yes ☐ No ☐ Protocol for Wildlife Protection during Construction Yes ☐ No ☐
				Study Trigger Details: Is required when development or site alteration is proposed in or within a specified distance of environmentally designated lands, natural heritage features, the City's Natural Heritage System, or hazardous forest types for wildland fire. The EIS Decision Tool (Appendix 2 of the Environmental Impact Study Guidelines) provides a checklist of the natural heritage features and adjacent areas within which an					

				EIS is required to support development applications under the *Planning Act.*					Significant Woodlands Guidelines for Identification, Evaluation, and Impact Assessment Yes ☐ No ☐
☐	☐	39. Environmental Management Plan	A comprehensive environmental planning document that identifies, evaluates, and mitigates the potential impacts of proposed development on the natural environment and its ecological functions at local planning stage.	☒	☐	☐	☐	☐	
				Study Trigger Details: Official Plan amendments for local plans (area-specific policy or secondary plan, where: there is significant change in the conditions upon which the original study was based; there are proposed changes to planned infrastructure needed to service a subdivision that would have a significant impact on the infrastructure needs of another subdivision within the EMP study area, or the applicable Class Environmental Assessment approval has expired.					
☐	☐	40. High-performance Development Standard	A collection of voluntary and required standards that raise performance of new building projects to achieve sustainable and resilient design	☐	☐	☐	☐	☐	
				NOT IMPLEMENTED & NOT REQUIRED					
☐	☐	41. Tree Conservation Report	Demonstrates how tree cover will be retained and protected on the site, including mature trees, stands of trees, and hedgerows.	☐	☐	☒	☒	☒	
				Study Trigger Details: Where there is a tree of 10 centimeters in diameter or greater on the site and/or if there is a tree on an adjacent site that has a Critical Root Zone (CRZ) extending onto the development site.					

Appendix F
Drawings



THIS PLAN IS TO BE READ IN CONJUNCTION
WITH CIVIL PLANS 117151-DET AND 117151-GR

KEY PLAN
N.T.S.

INLET CONTROL DEVICE DATA TABLE: AREA A-2 (OUTLET PIPE of CBMH 01)								
DESIGN EVENT	ICD TYPE (PLUG TYPE)	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	½ PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF (CUSTOM FLOW)	250mmØ PVC DR35	3.4	1.7	0.74	101.23 (u/g)	6.3	> 23.5 m^3
1:5 YR			4.1	2.1	1.06	101.55 (u/g)	9.0	
1:100 YR			6.5	3.3	2.61	103.10	20.0	

LEGEND

━ ━ ━	SITE BOUNDARY
◄ ─ · ─	℄ SWALE AND DIRECTION OF FLOW
MH100 ○	PROPOSED STORM MANHOLE
CB1 ☐	PROPOSED CATCHBASIN
CB1 ▨	PROPOSED CATCHBASIN WITH TEMPORARY SILTSACK
CBT1 ○	PROPOSED CATCHBASIN TEE
CBE1 ⊞	PROPOSED CATCHBASIN ELBOW
PD 15 ▫	PROPOSED PODIUM DRAIN (WATTS FD-490-4 or equiv, PER MECH)
CIPD 02 ▪	PROPOSED CURB INLET PODIUM DRAIN (PER MECHANICAL)
─ ◄ ─ ─	PROPOSED STORM SEWER AND DIRECTION OF FLOW
─ ─ ◄ ─	PROPOSED CATCHBASIN LEAD AND DIRECTION OF FLOW
---◄---	PROPOSED CATCHBASIN SUBDRAIN AND DIRECTION OF FLOW
MH101 ●	PROPOSED SANITARY MANHOLE
──◄──	PROPOSED SANITARY SEWER AND DIRECTION OF FLOW
─ · ─	PROPOSED WATERMAIN
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° OR TEE
VVB ⊗	PROPOSED VALVE AND VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
]	PROPOSED CAP
Ⓐ	PIPE CROSSING LOCATION
⊘	PROPOSED ROOF DRAIN
═	PROPOSED BARRIER CURB
DC	PROPOSED DEPRESSED CURB
▨	TACTILE WALKING SURFACE INDICATOR (TWSI)
▬	CURB CUTOUT
☼	PROPOSED LIGHT STANDARD
≻	PROPOSED SIAMESE CONNECTION
GM	PROPOSED GAS METER LOCATION
HM	PROPOSED HYDRO METER LOCATION
☒	PROPOSED TRANSFORMER PAD C/W BOLLARDS
▨	PROPOSED CLAY DIKE AS PER CITY OF OTTAWA DETAIL S8

PROPOSED 200mmØ WATERMAIN / REDUNDANT SERVICE TABLE			
STATION	SURFACE ELEVATION	T/WM ELEVATION	COMMENTS
0+00	103.26±	100.85 *	CONNECTION TO EXISTING 200mmØ ON-SITE WATER SERVICE CAP
0+01.0	103.30	100.85	200 x 200 x 200 REDUNDANT SERVICE TEE (1+19.4)
0+06.4	103.42	100.85	200mmØ BUILDING 'A' SERVICE CAP (1.0m FROM FOUNDATION WALL)
1+00	102.97	100.62 *	ROLLED TEE CONNECTION TO EX.200mmØ PVC WATERMAIN
1+00.5	102.96	100.80 **	22.5° VERTICAL BEND
1+03.0	102.92	100.82 **	CROSS ABOVE 200mmØ SAN [Obv=100.28m] (±0.3m CLEARANCE)
1+05.5	102.89	100.83 **	CROSS ABOVE 375mmØ STM [Obv=99.91m] (±0.7m CLEARANCE)
1+10.7	103.18	100.85 **	CROSS BELOW EX.HYDRO DUCT [u/s=101.70m] (±0.8m CLEARANCE)
1+11.9	103.20	100.85 **	200mmØ VALVE & VALVE BOX @ PROPERTY LINE
1+16.0	103.36	100.85	45° HORIZONTAL BEND
1+17.4	103.42	100.85	45° HORIZONTAL BEND
1+19.4	103.42	100.85	200 x 200 x 200 REDUNDANT SERVICE TEE (0+01.0)

* CONNECTIONS TO EXISTING 200mmØ WATERMAIN AND SERVICE STUB. EXACT ELEVATIONS TO BE FIELD DETERMINED.

** PROVIDE THERMAL INSULATION AS PER CITY OF OTTAWA DETAILS W22 IN SHALLOW TRENCHES WHERE COVER IS LESS THAN 2.4m AND/OR W23 ADJACENT TO OPEN STRUCTURES.

*** PIPE CROSSINGS WITH WATERMAINS ARE TO BE IN ACCORDANCE WITH CITY STANDARDS W25 AND W25.2 TO AVOID CONFLICTS, WHERE POSSIBLE.

CRITICAL SEWER PIPE CROSSING TABLE				
CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE	SURFACE ELEVATION
Ⓐ	1200mmØ STM OBV = 100.64 m	250mmØ SAN INV = 101.07 m	± 0.4m	104.21 m

BENCHMARK INFO:

OLS JOB BENCHMARK ON THE TOP OF SPINDLE OF THE EXISTING MUNICIPAL FIRE HYDRANT LOCATED NEAR THE NORTH-EAST INSIDE CORNER WHERE JOURNEYMAN STREET TURNS 90 DEGREES IN FRONT OF THE SUBJECT SITE. GEODETIC ELEVATION = 103.82m. (AS SHOWN ON THE SURVEYOR'S PLAN Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F; PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.)

ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM. THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM TOPOGRAPHICAL SURVEY PLAN (Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F), PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK SIGNED AND DATED NOVEMBER 17, 2017.

SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:2000 MAPPING FOR CONTEXT ONLY.

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. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
6. 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.
7. 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.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO THE GEOTECHNICAL INVESTIGATION REPORT (NO. PG4562-1, REV. 3, DATED MAY 9, 2019) PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
11. REFER TO THE 'SITE SERVICING AND STORMWATER MANAGEMENT REPORT' (R-2023-122) PREPARED BY NOVATECH.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE / PARKING LOT PAINTING AS REQUIRED BY ARCHITECT.

SEWER NOTES:

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

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
DITCH INLET CB 'TYPE A' (600x1200mm) 'DICB'	705.040	OPSD
STORM / SANITARY MANHOLE (1200mmØ)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
WATERTIGHT MH FRAME AND COVER	401.030	OPSD
DITCH INLET GRATING	403.010	OPSD
SEWER TRENCH	S6	CITY OF OTTAWA
SANITARY / STORM SEWER / CB LEAD	PVC DR 35	

3. THE SANITARY SERVICE LATERALS SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION DEVICE WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14.1 OR S14.2. REFER TO MECHANICAL PLANS FOR DETAILS.
4. THE STORM SERVICE LATERALS SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION DEVICE WITHIN THE BUILDING FOOTPRINT AS PER CITY OF OTTAWA STANDARD DETAILS S14. REFER TO MECHANICAL PLANS FOR DETAILS.
5. THE WEEPING TILE SERVICE SHALL BE EQUIPPED WITH A BACKFLOW PREVENTION DEVICE AS PER THE CITY OF OTTAWA STANDARD DETAIL S14.
6. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.8m COVER WITH HI-40 INSULATION PER INSULATION DETAIL FOR SHALLOW SEWERS. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
7. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
8. 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.
9. 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.
10. 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.
11. TYPICAL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS ARE TO HAVE 600mm SUMPS UNLESS OTHERWISE INDICATED.
12. ALL CATCHBASINS, MANHOLES AND/OR CATCHBASIN MANHOLES THAT ARE TO HAVE ICD'S INSTALLED WITHIN THEM ARE TO HAVE 600mm SUMPS.
13. ALL WEEPING TILE CONNECTIONS TO BE MADE TO THE PROPOSED STORM SEWER SYSTEM DOWNSTREAM OF ANY INLET CONTROL DEVICES.
14. THE CONTRACTOR IS TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH, CLEAN AND RE-TELEVISE (CCTV) ALL SEWERS & APPURTENANCES. PROVIDE A COPY OF ALL CCTV INSPECTION REPORTS TO THE ENGINEER FOR REVIEW.

WATERMAIN NOTES:

1. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS - ALL CURRENT VERSIONS AND 'AS AMENDED'. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN BY CITY OF OTTAWA FORCES. CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE CITY OF OTTAWA FORCES.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
HYDRANT INSTALLATION	W19	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
THERMAL INSULATION AT OPEN STRUCTURES	W23	CITY OF OTTAWA
VALVE BOX ASSEMBLY	W24	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING OVER SEWER	W25.2	CITY OF OTTAWA
CATHODIC PROTECTION FOR PVC WATERMAIN	W40	CITY OF OTTAWA
ANODE INSTALLATION FOR PVC WATERMAIN	W42	CITY OF OTTAWA
WATERMAIN MATERIAL	PVC DR 18	

3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.5m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS, WHERE POSSIBLE UNLESS OTHERWISE INDICATED.
5. 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
1.B	ISSUED FOR PHASE 3 PRE-CONSULTATION	OCT 27/23	DDB

SCALE
1:400

1:400
0 4 8 12 16

DESIGN	SM / BM / DDB
CHECKED	DDB / CR
DRAWN	SM
CHECKED	CR / DDB
APPROVED	DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
Drew Blair
D. D. BLAIR
100122737
Oct. 27 2023
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
5000 ROBERT GRANT - RESIDENTIAL DEVELOPMENT

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 117151
REV REV # 1.B
DRAWING No. 117151-GP

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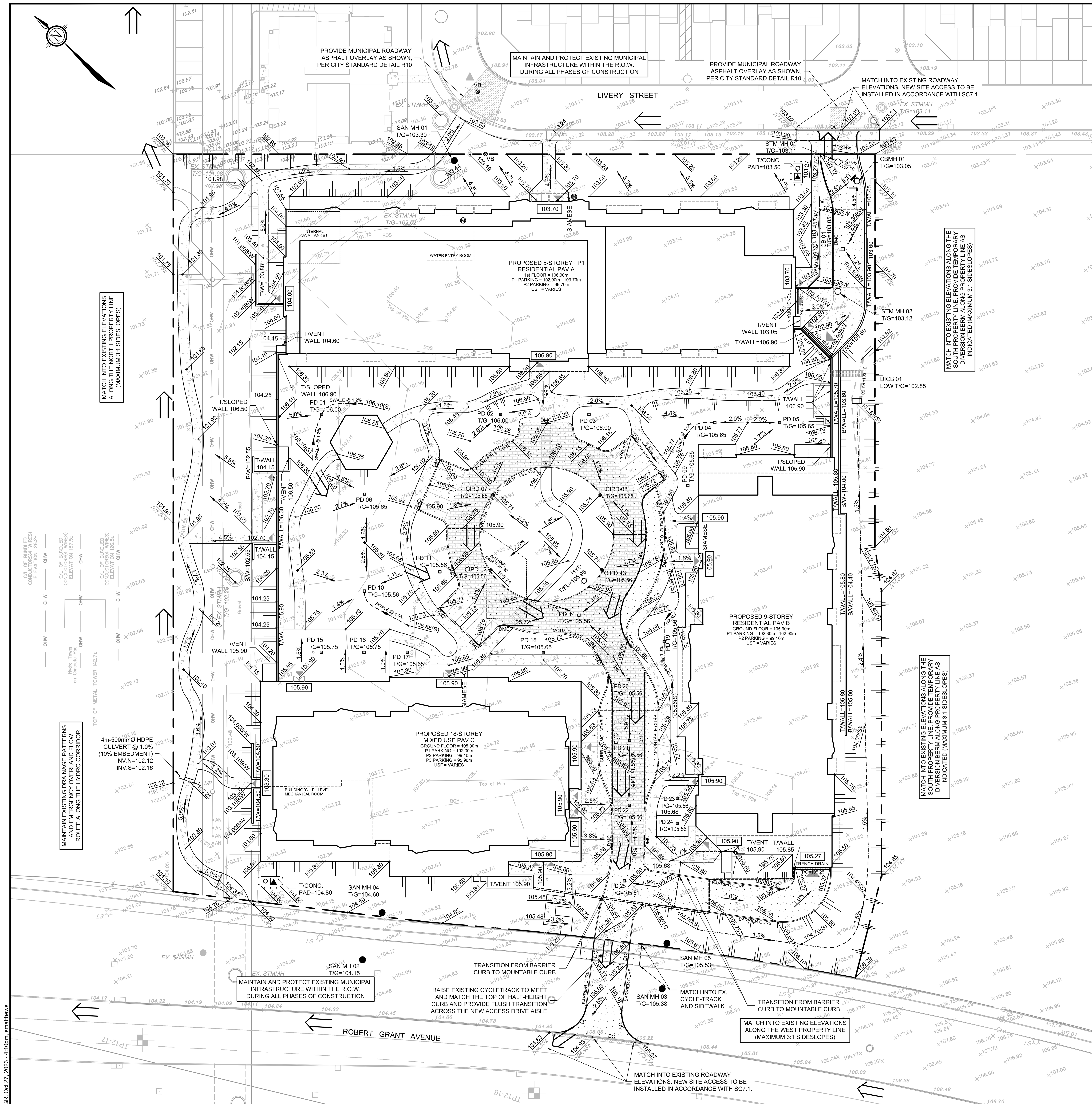
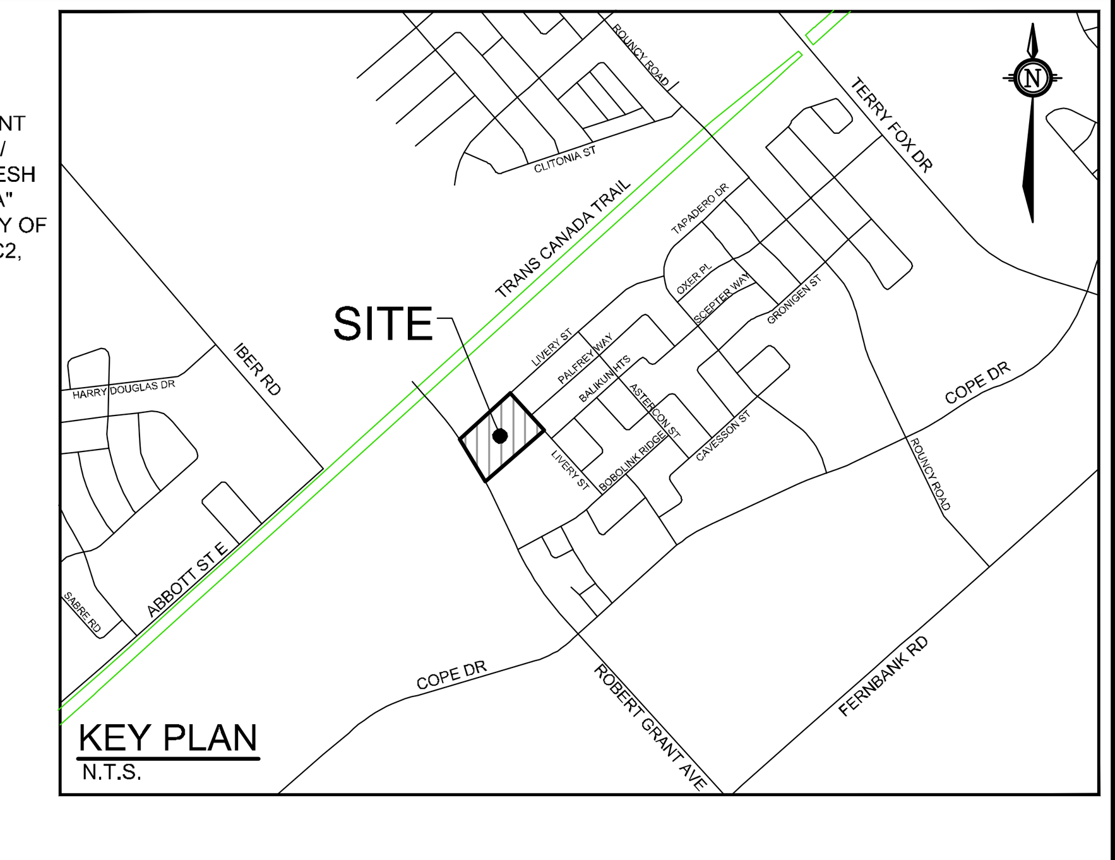
PLAN24x36.DWG - 914.4mmx609.6mm





PAVEMENT STRUCTURES:

LIGHT DUTY ASPHALT PAVEMENT
50mm HL-3 or SUPERPAVE 12.5
150mm GRANULAR "A"
300mm GRANULAR "B" TYPE II
ASPHALT GRADE PG 58-34 - TRAFFIC LEVEL 'B'
*INSTALLED PER GEOTECHNICAL REPORT

CONCRETE PAVEMENT
150mm CONCRETE w/ REINFORCEMENT MESH
150mm GRANULAR "A"
*INSTALLED PER CITY OF OTTAWA DETAILS SC2, SC4 AND / OR SC7.1

HEAVY DUTY ASPHALT PAVEMENT
40mm HL-3 or SUPERPAVE 12.5
50mm HL-8 or SUPERPAVE 19.0
150mm GRANULAR "A"
400mm GRANULAR "B" TYPE II
ASPHALT GRADE PG 58-34 - TRAFFIC LEVEL 'B'
*INSTALLED PER GEOTECHNICAL REPORT

INTERLOCK ROADWAY ON BUILDING PODIUM
POLYMERIC SAND & SEALER
100mm HEAVY DUTY PAVING STONE
15mm LEVELING SAND
150mm GRANULAR "A"
GRANULAR "B" AS REQUIRED TO DECKING MEMBRANE
*ABOVE BRIDGE-RATED CONCRETE DECKING

HEAVY DUTY PAVEMENT - ROADWAY RE-INSTATEMENT
MATCH EXISTING GRANULAR STRUCTURE OF ROADWAY IN TRENCHES
MATCH EXISTING ASPHALT THICKNESSES IN TRENCHES
NEW ASPHALT GRADE: PG 58-34
PROVIDE MUNICIPAL ROADWAY ASPHALT OVERLAY AS SHOWN, PER CITY STANDARD DETAIL R10. REFER TO AMENDED ROAD ACTIVITY BY-LAW 2003-445.

LEGEND

Symbol	Description
	SITE BOUNDARY
	℄ SWALE AND DIRECTION OF FLOW
104.67 / 104.67±	PROPOSED ELEVATION / *EXISTING ELEVATION*
104.50(S)	PROPOSED SWALE ELEVATION
105.90	PROPOSED TERRACE ELEVATION
	MAJOR OVERLAND FLOW ROUTE
	MAXIMUM 3: 1 SIDESLOPE
2.0%	PARKING GRADE AND DIRECTION
FFE	PROPOSED FINISHED FLOOR ELEVATION
USF	PROPOSED UNDER SIDE OF FOOTING ELEVATION
	PROPOSED BUILDING ENTRANCE
	PROPOSED LIMIT OF BUILDING OVERHANG
T/G=	TOP OF GRATE ELEVATION
MH 01	PROPOSED SANITARY MANHOLE
MH 02	PROPOSED STORM MANHOLE
CB1	PROPOSED CATCHBASIN
CB1	PROPOSED CATCHBASIN WITH TEMPORARY SILTSACK
CBT1	PROPOSED CATCHBASIN TEE
CBE1	PROPOSED CATCHBASIN ELBOW
PD 15	PROPOSED PODIUM DRAIN (WATTS FD-490-4 or equiv, PER MECH)
CIPD 02	PROPOSED CURB INLET PODIUM DRAIN (PER MECHANICAL)

BENCHMARK INFO:

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9. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
10. 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.

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 98% 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. PROPOSED CURBS ON TOP OF THE BUILDING PODIUM SHALL BE MOUNTABLE CURB (75mm) CONSTRUCTED PER CITY OF OTTAWA STANDARDS (SC1.3) WITH THE EXCEPTION OF THE CIRCULAR INNER CURBED ISLAND WHICH SHALL BE BARRIER CURB (SC1.1) TO ACCOMMODATE THE CURB INLET CATCHBASIN STRUCTURES OVER MECHANICAL DRAINS.
9. ALL CURBS OFF THE BUILDING STRUCTURE SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
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 THIS PLAN.

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 117151-DET AND 117151-GP

NOTE:
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1.B	ISSUED FOR PHASE 3 PRE-CONSULTATION	OCT 27/23	DDB

SCALE 1:400

DESIGN: SM / BM / DDB
CHECKED: DDB / CR
DRAWN: SM
CHECKED: CR / DDB
APPROVED: DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — D. D. BLAIR 100122737 — Oct. 27 2023 — 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
5000 ROBERT GRANT - RESIDENTIAL DEVELOPMENT

DRAWING NAME
GRADING PLAN

PROJECT No. 117151
REV: REV # 1.B
DRAWING No. 117151-GR

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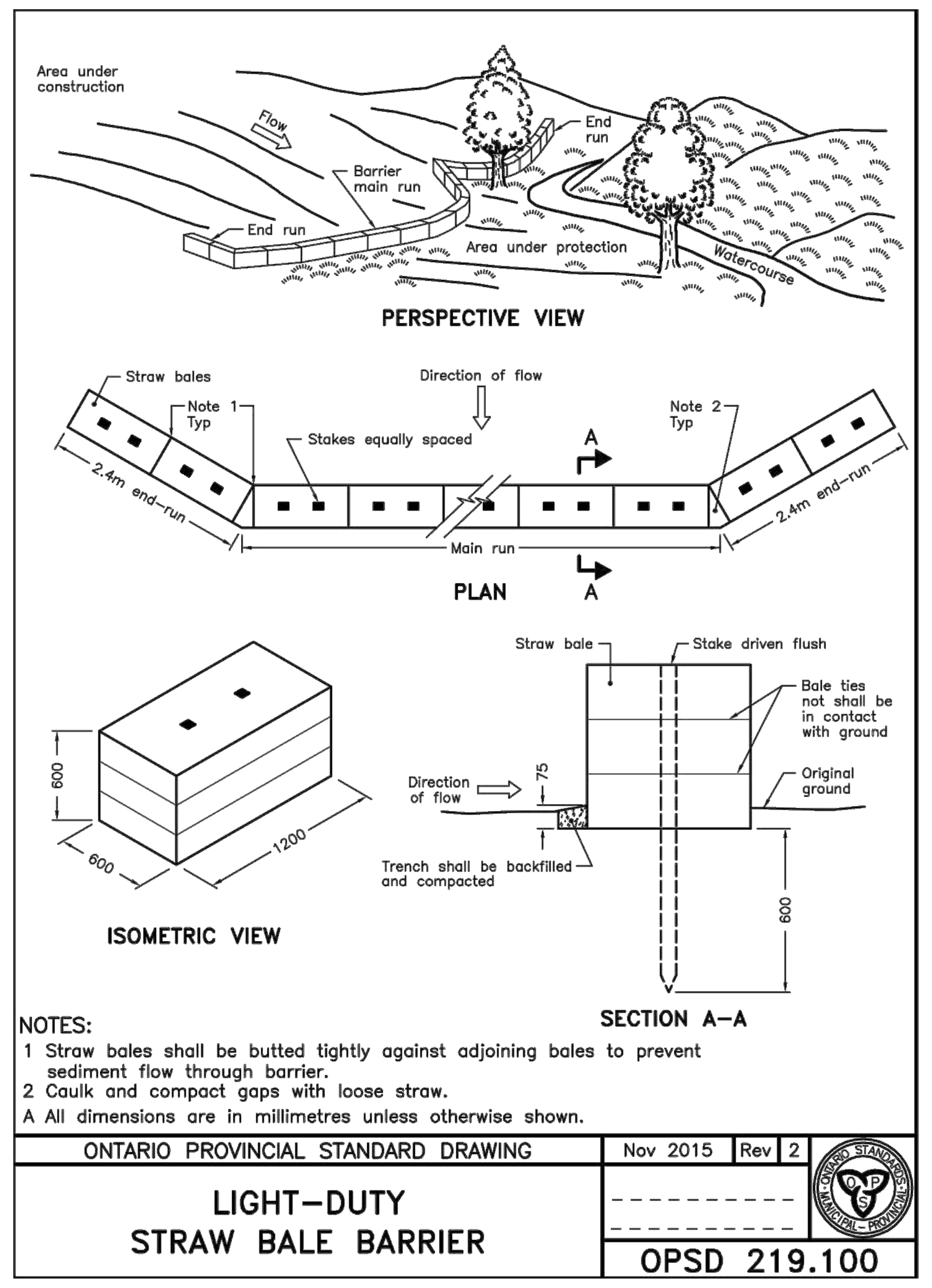
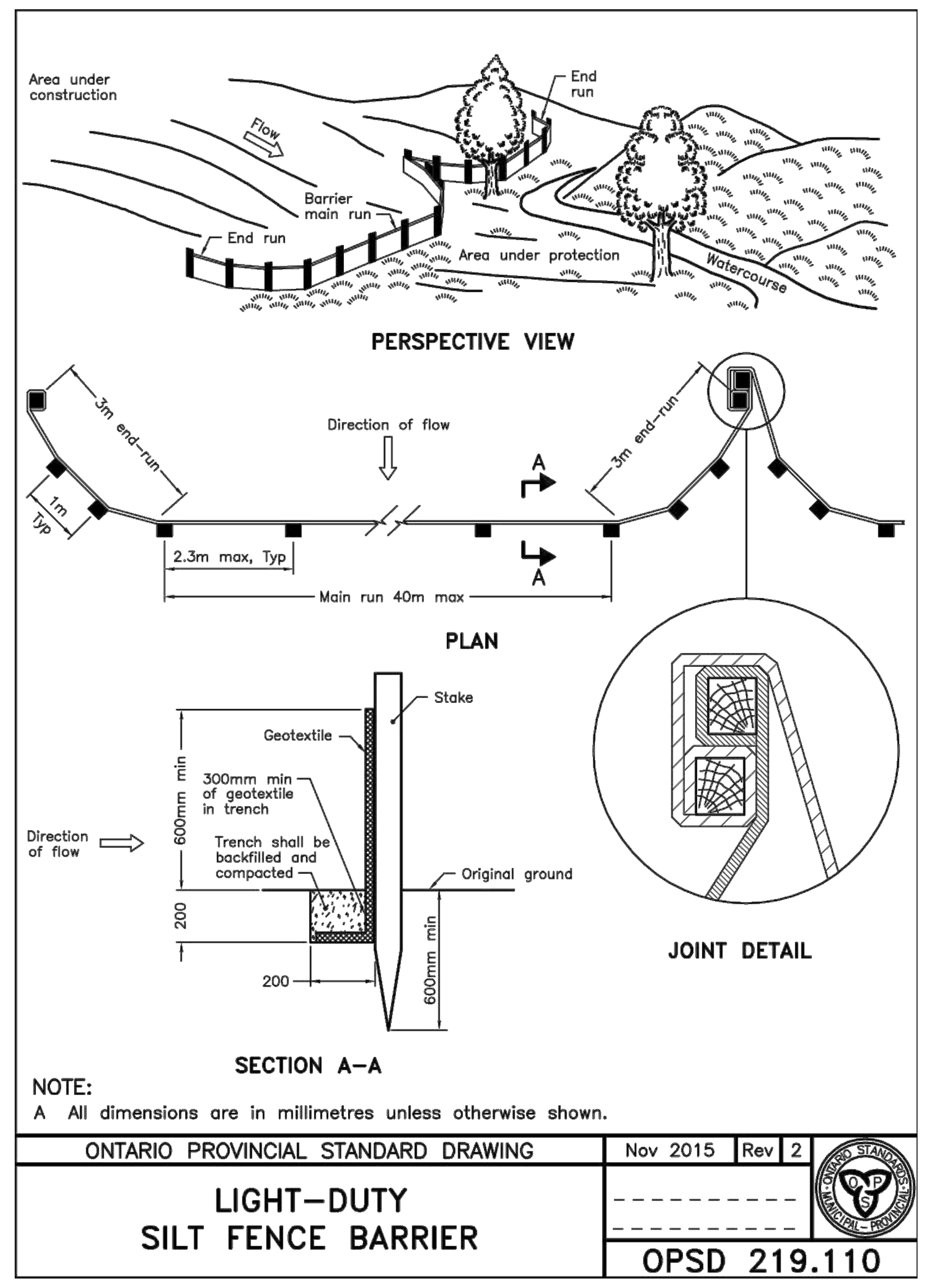
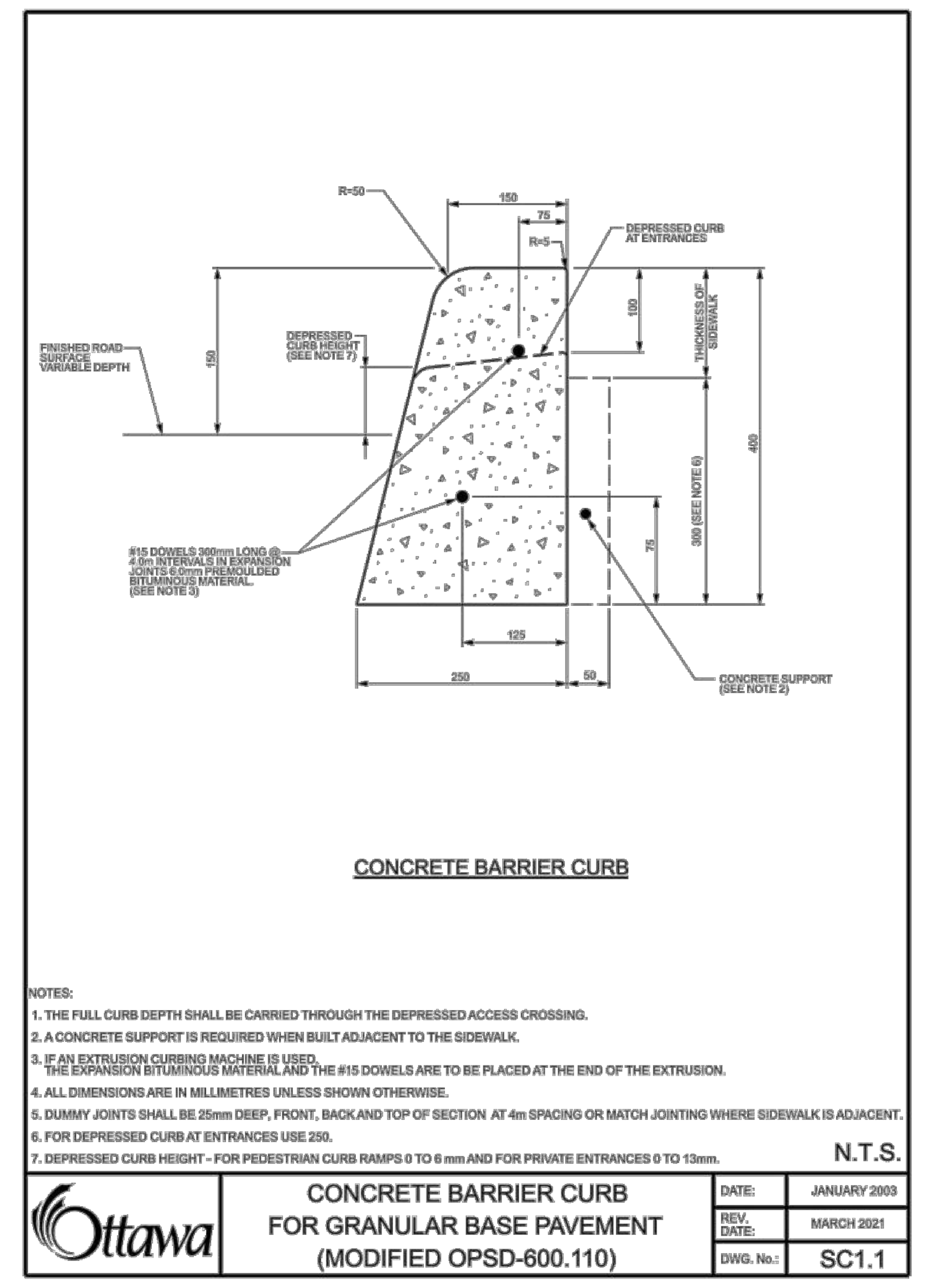
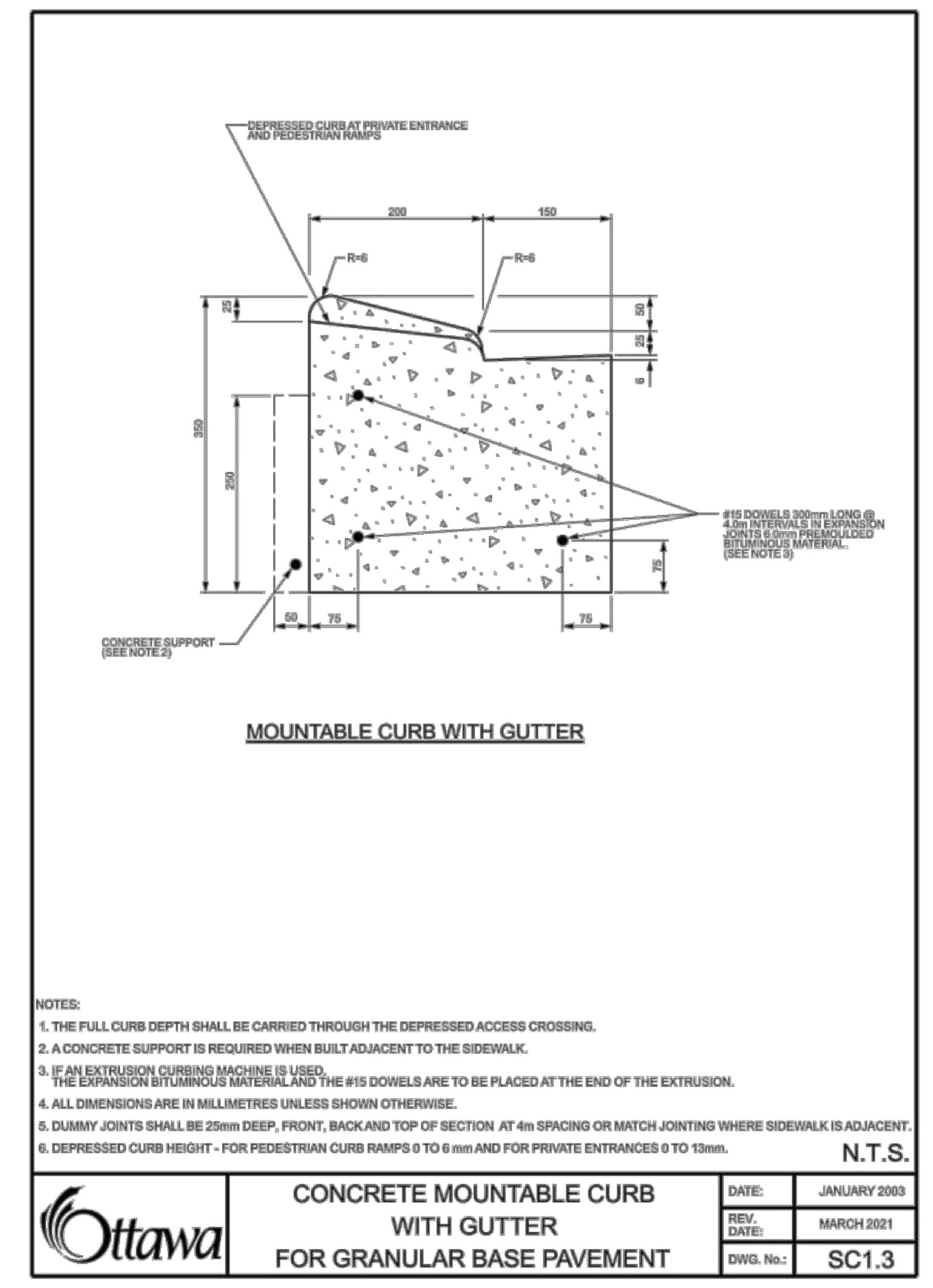
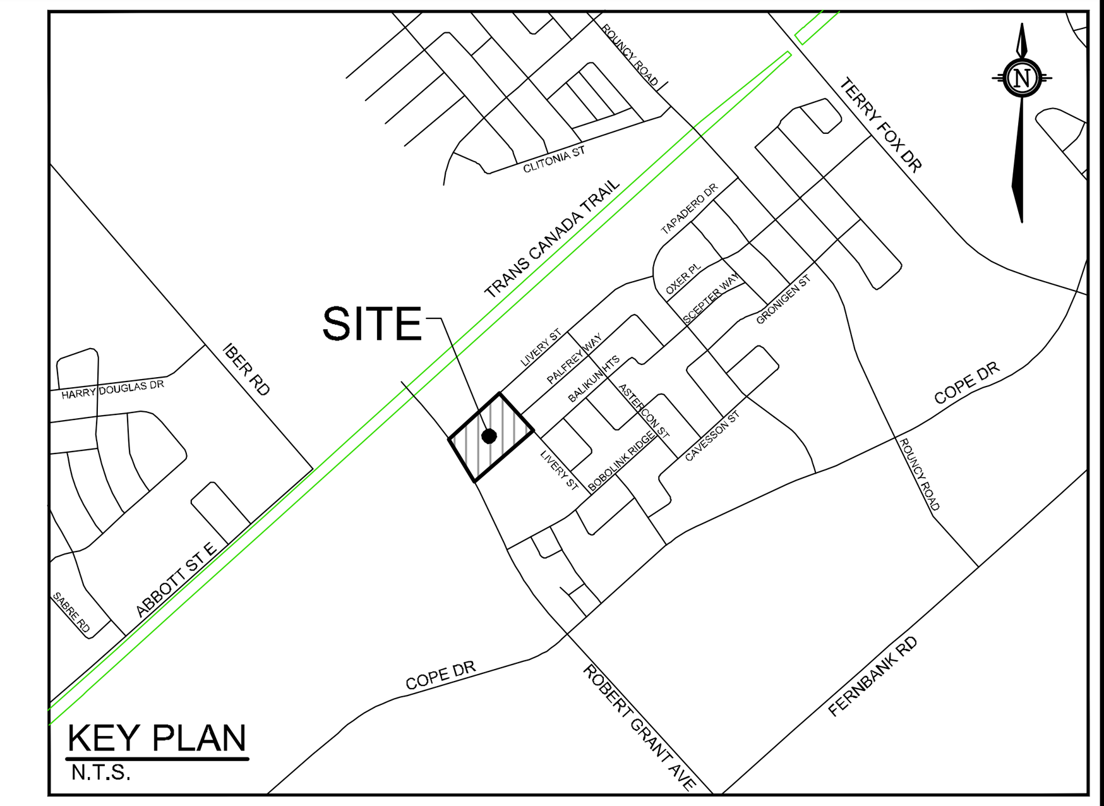








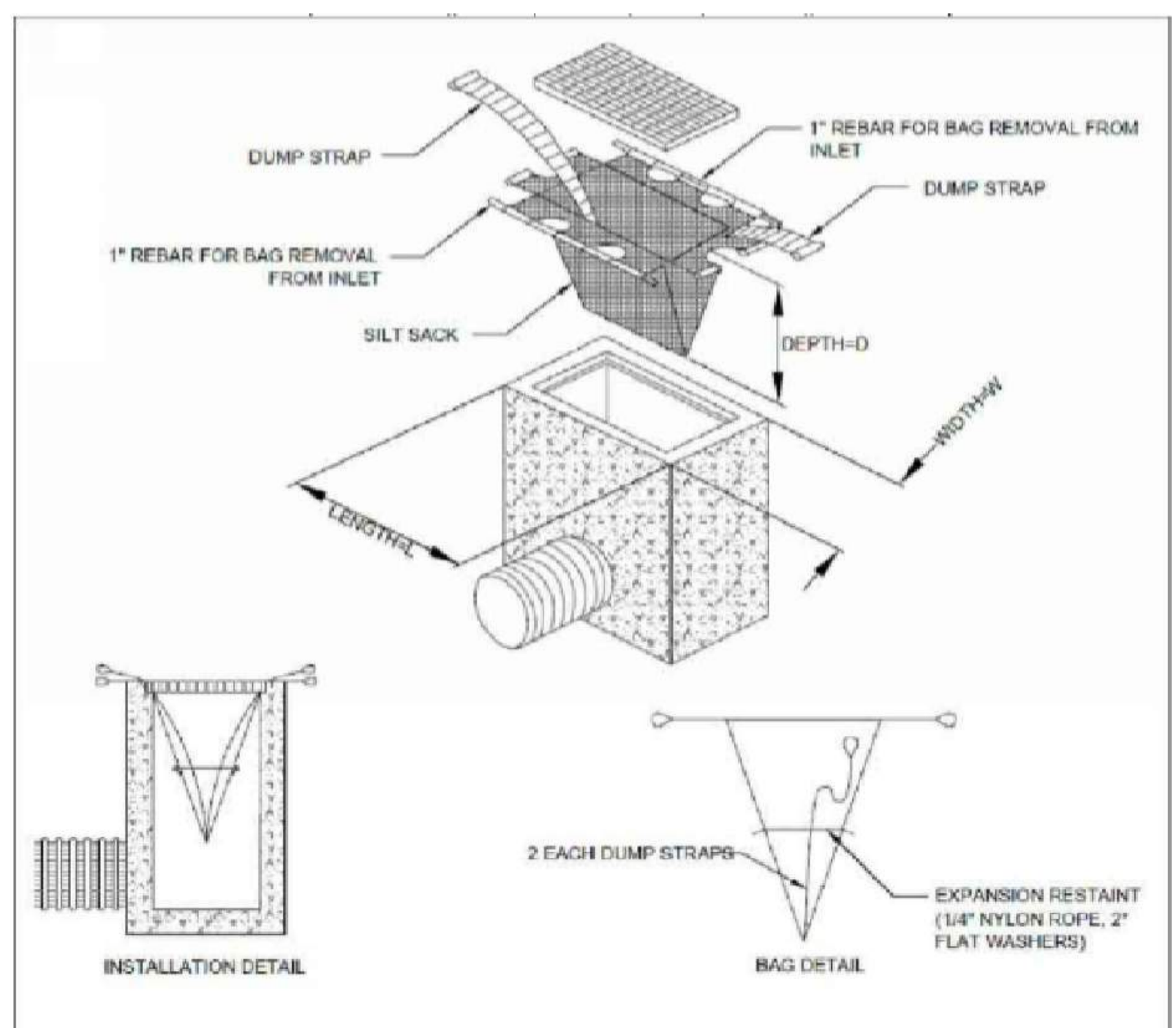


BENCHMARK INFO:

OLS JOB BENCHMARK ON THE TOP OF SPINDLE OF THE EXISTING MUNICIPAL FIRE HYDRANT LOCATED NEAR THE NORTH-EAST INSIDE CORNER WHERE JOURNEYMAN STREET TURNS 90 DEGREES IN FRONT OF THE SUBJECT SITE. GEODETIC ELEVATION = 103.82m. (AS SHOWN ON THE SURVEYOR'S PLAN Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F; PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.)

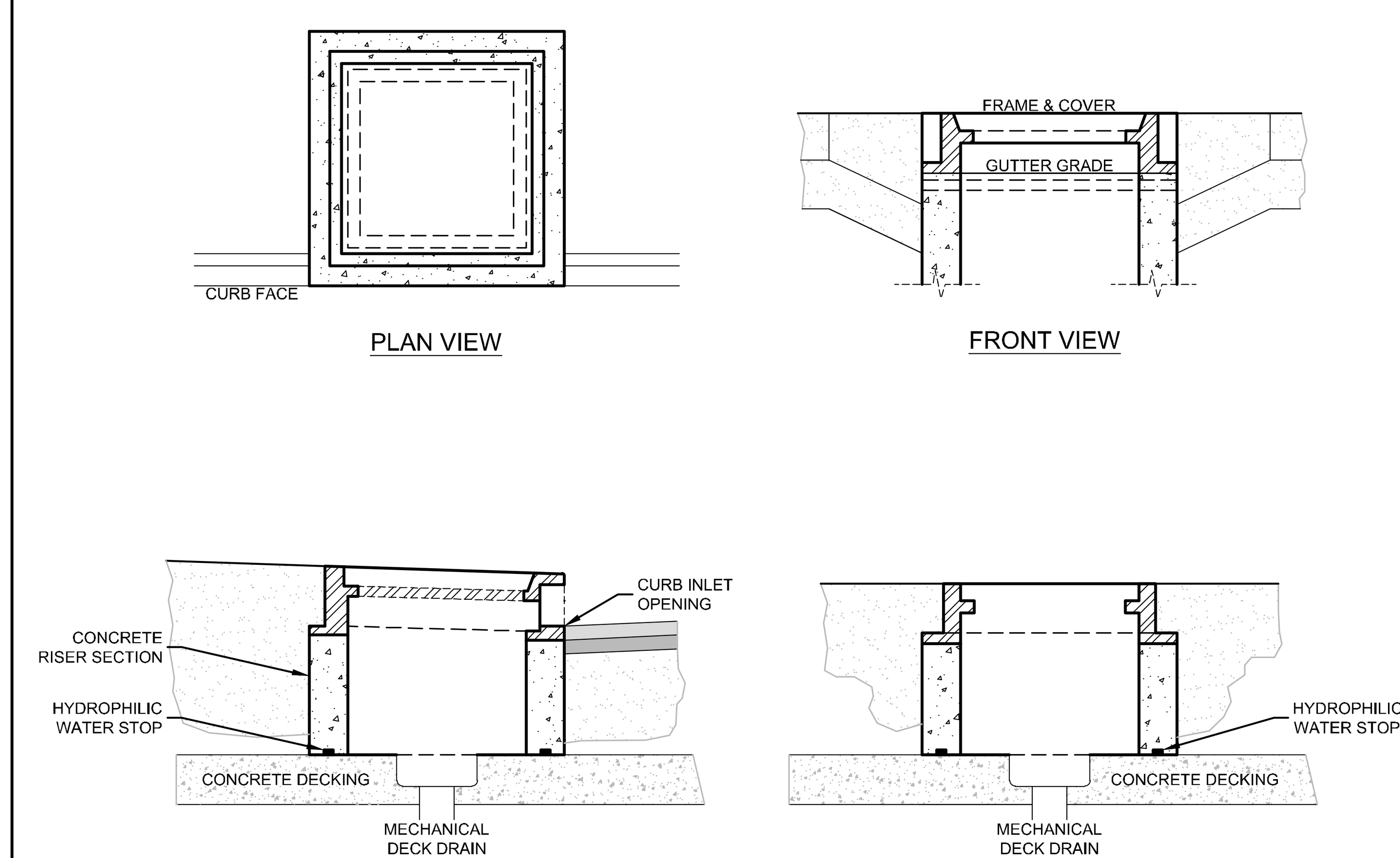
ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM. THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM TOPOGRAPHICAL SURVEY PLAN (Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F), PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK SIGNED AND DATED NOVEMBER 17, 2017.

SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:2000 MAPPING FOR CONTEXT ONLY.



INLET SEDIMENT CONTROL DEVICE

N.T.S



NOTES:

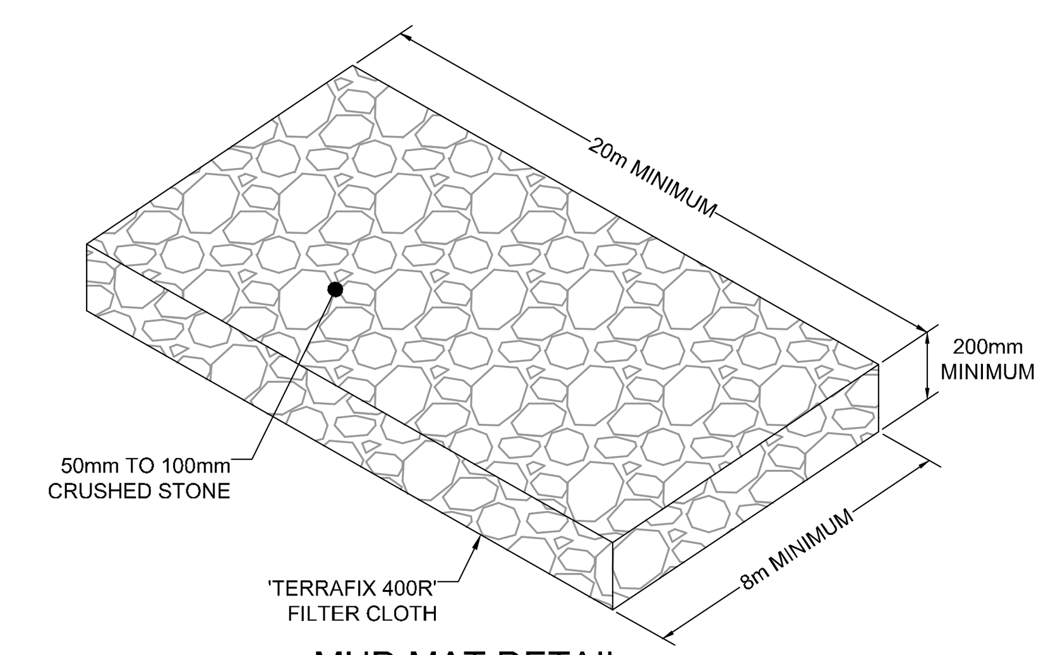
1. CURB INLET CATCHBASINS ON THE BUILDING PODIUM ARE TO BE IN ACCORDANCE WITH OPSD 400.082. THEY ARE TO BE CENTERED BETWEEN EXPANSION JOINTS WHERE THE CURB FACE HEIGHT IS 152mm MINIMUM.
2. ADJUSTMENTS ARE TO BE MADE WITH PRECAST CONCRETE RISERS TO MEET THE REQUIRED HEIGHT.
3. FRAME AND COVER TO MATCH THE PROPOSED FINISHED GRADE ELEVATIONS.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
5. AREA DRAIN TO BE INSTALLED AT THE BOTTOM OF THE SUMP, DRAIN TYPE AND OUTLET PIPE SIZE TO BE DETERMINED MY MECHANICAL. REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR DETAILS.

CURB INLET CATCHBASIN DETAILS (ON PODIUM ISLAND)

NTS

INLET CONTROL DEVICE DATA TABLE: AREA A-2 (OUTLET PIPE of CBMH 01)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	½ PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF (CUSTOM FLOW)	250mmØ PVC DR35	3.4	1.7	0.74	101.23 (u/g)	6.3	> 23.5 m^3
1:5 YR			4.1	2.1	1.06	101.55 (u/g)	9.0	
1:100 YR			6.5	3.3	2.61	103.10	20.0	



MUD MAT DETAIL

NTS

Erosion and Sediment Control Responsibilities:

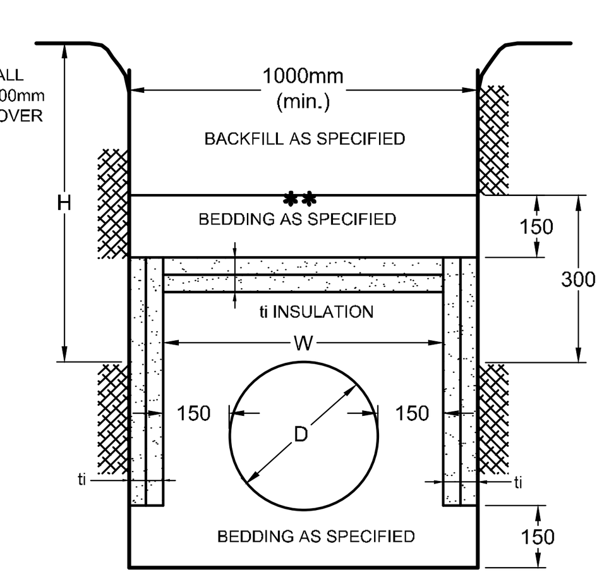
	ESC Measure	Symbol	Specification	During Construction: Installation Responsibility	During Construction: Inspection/Maintenance Responsibility	During Construction: Inspection Frequency	After Construction Prior to Final Acceptance: Approval to Remove	After Construction Prior to Final Acceptance: Removal Responsibility	After Final Acceptance: Inspection/Maintenance Responsibility
Temporary Measures	Straw Bale Barrier (Light Duty)		OPSD 219.100	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Silt Fence (Light Duty)		OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Filter Bags	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	MM	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

INSULATION NOTES:

1. THE THICKNESS OF SEWER INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER LESS THAN 1800mm (SEE TABLE BELOW)

ti = THICKNESS OF INSULATION (mm)
h = DEPTH OF COVER
W = D + 300 (1000 min.)
W = WIDTH OF INSULATION (mm)
D = O.D OF PIPE (mm)

COVER (mm)	INSULATION THICKNESS (mm)
1800-1500	50
1500-1200	75
1200-900	100
900-600	125



INSULATION DETAIL FOR SHALLOW SEWERS

NOT TO SCALE

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LICENSED PROFESSIONAL ENGINEER · D. D. BLAIR · 100122737 · Oct. 27 2023 · PROVINCE OF ONTARIO

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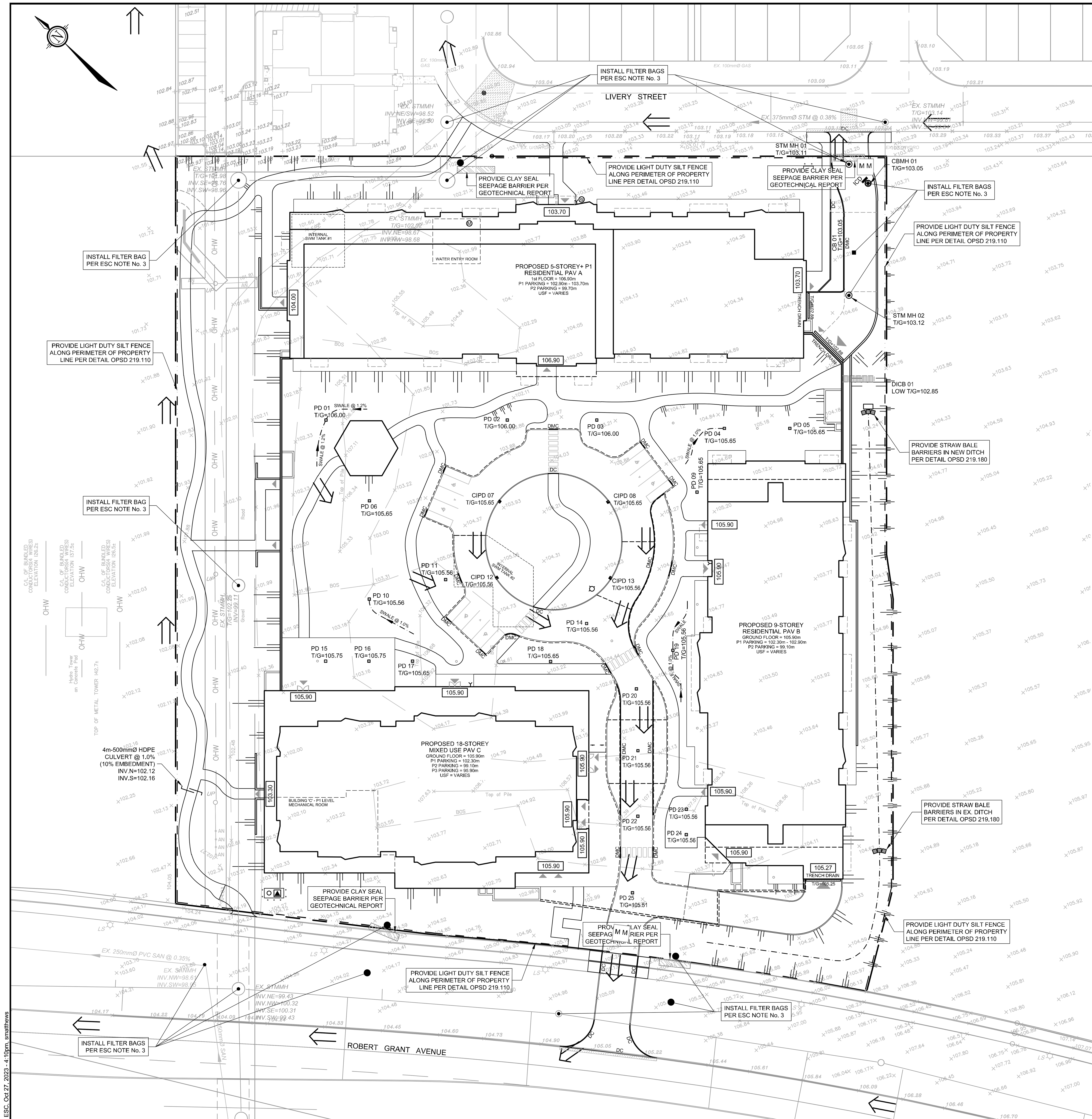
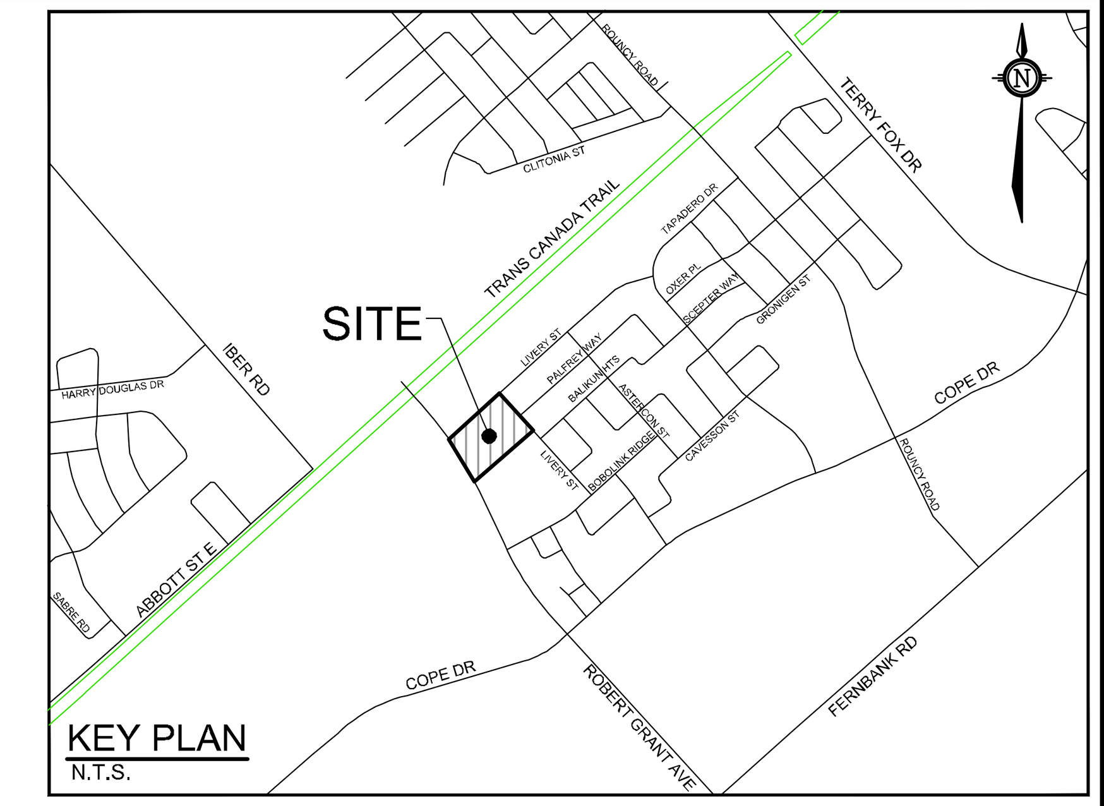
LOCATION
CITY of OTTAWA
5000 ROBERT GRANT - RESIDENTIAL DEVELOPMENT

DRAWING NAME
CIVIL DETAILS

PROJECT No. 117151
REV # 1.B
DRAWING No. 117151-DET





KEY PLAN

N.T.S.

LEGEND

(thick line)	SITE BOUNDARY
(arrow line)	℄ SWALE AND DIRECTION OF FLOW
MH100	PROPOSED STORM MANHOLE
CB1	PROPOSED CATCHBASIN
CB1	PROPOSED CATCHBASIN WITH TEMPORARY SILTSACK
CBT1	PROPOSED CATCHBASIN TEE
CBE1	PROPOSED CATCHBASIN ELBOW
PD 15	PROPOSED PODIUM DRAIN (WATTS FD-490-4 or equiv, PER MECH)
CIPD 02	PROPOSED CURB INLET PODIUM DRAIN (PER MECHANICAL)
(line)	SILT FENCE AS PER OPSD 219.110
(arrow)	MAJOR OVERLAND FLOW ROUTE
(bales)	STRAW BALES AS PER OPSD 219.100
M M	CONSTRUCTION ACCESS MUD MAT

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6. 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.
7. 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.
8. 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.
9. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
10. 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.

Erosion and Sediment Control Responsibilities:

				During Construction			After Construction Prior to Final Acceptance		After Final Acceptance
	ESC Measure	Symbol	Specification	Installation Responsibility	Inspection/Maintenance Responsibility	Inspection Frequency	Approval to Remove	Removal Responsibility	Inspection/Maintenance Responsibility
Temporary Measures	Straw Bale Barrier (Light Duty)	(straw bales)	OPSD 219.100	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Silt Fence (Light Duty)	(line)	OPSD 219.110	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Filter Bags	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	M M	Drawing Details	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Dust Control	Location as Required Around Site	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Consultant	Developer's Contractor	N/A
	Stabilized Material Stockpiling	Location as Required by Contractor	Erosion and Sediment Control Notes	Developer's Contractor	Developer's Contractor	Weekly (as a minimum)	Developer's Contractor	Developer's Contractor	N/A
	Sediment Basin (for flows being pumped out of excavations)	Location as Required by Contractor	- - -	Developer's Contractor	Developer's Contractor	After Every Rainstorm	Developer's Contractor	Developer's Contractor	N/A

BENCHMARK INFO:

OLS JOB BENCHMARK ON THE TOP OF SPINDLE OF THE EXISTING MUNICIPAL FIRE HYDRANT LOCATED NEAR THE NORTH-EAST INSIDE CORNER WHERE JOURNEYMAN STREET TURNS 90 DEGREES IN FRONT OF THE SUBJECT SITE. GEODETIC ELEVATION = 103.82m. (AS SHOWN ON THE SURVEYOR'S PLAN Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F; PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.)

ALL ELEVATIONS ARE REFERRED TO THE CGVD28 GEODETIC DATUM. THE EXISTING GRADES SHOWN ON THE PLANS ARE TAKEN DIRECTLY FROM TOPOGRAPHICAL SURVEY PLAN (Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F), PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK SIGNED AND DATED NOVEMBER 17, 2017.

SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:2000 MAPPING FOR CONTEXT ONLY.

ALL PROJECT NOTES, DETAILS AND SPECIFICATIONS ARE TO MEET THE MOST CURRENT AND AMENDED VERSIONS OF THE CITY OF OTTAWA AND PROVINCIAL STANDARDS

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CIVIL PLANS 117151-GP AND 117151-GR

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.B	ISSUED FOR PHASE 3 PRE-CONSULTATION	OCT 27/23	DDB

SCALE 1:400

DESIGN SM / BM / DDB — CHECKED DDB / CR — DRAWN SM — CHECKED CR / DDB — APPROVED DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — D. D. BLAIR — 100122737 — Oct. 27 2023 — PROVINCE OF ONTARIO

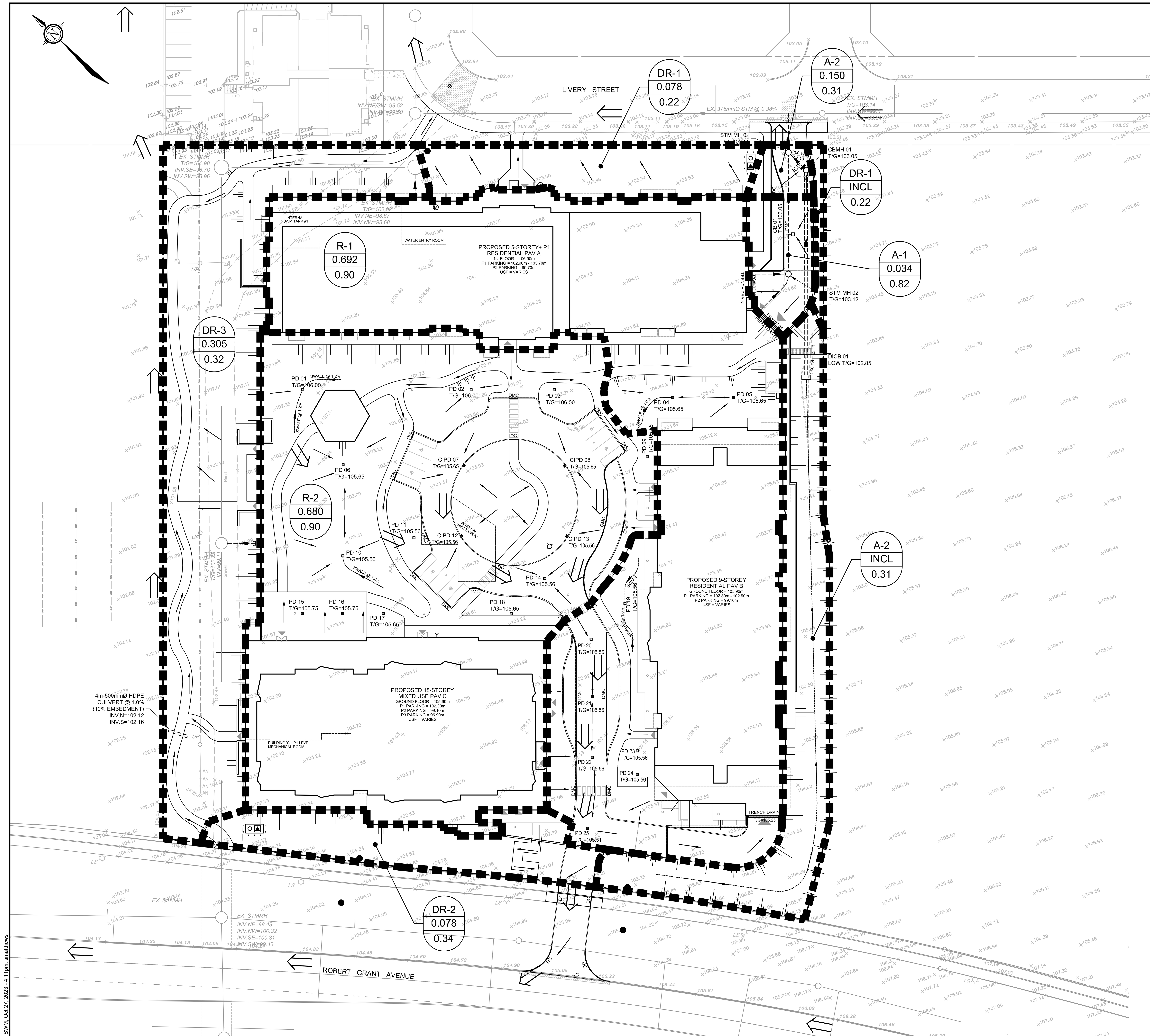
NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
5000 ROBERT GRANT - RESIDENTIAL DEVELOPMENT

DRAWING NAME
EROSION AND SEDIMENT CONTROL PLAN

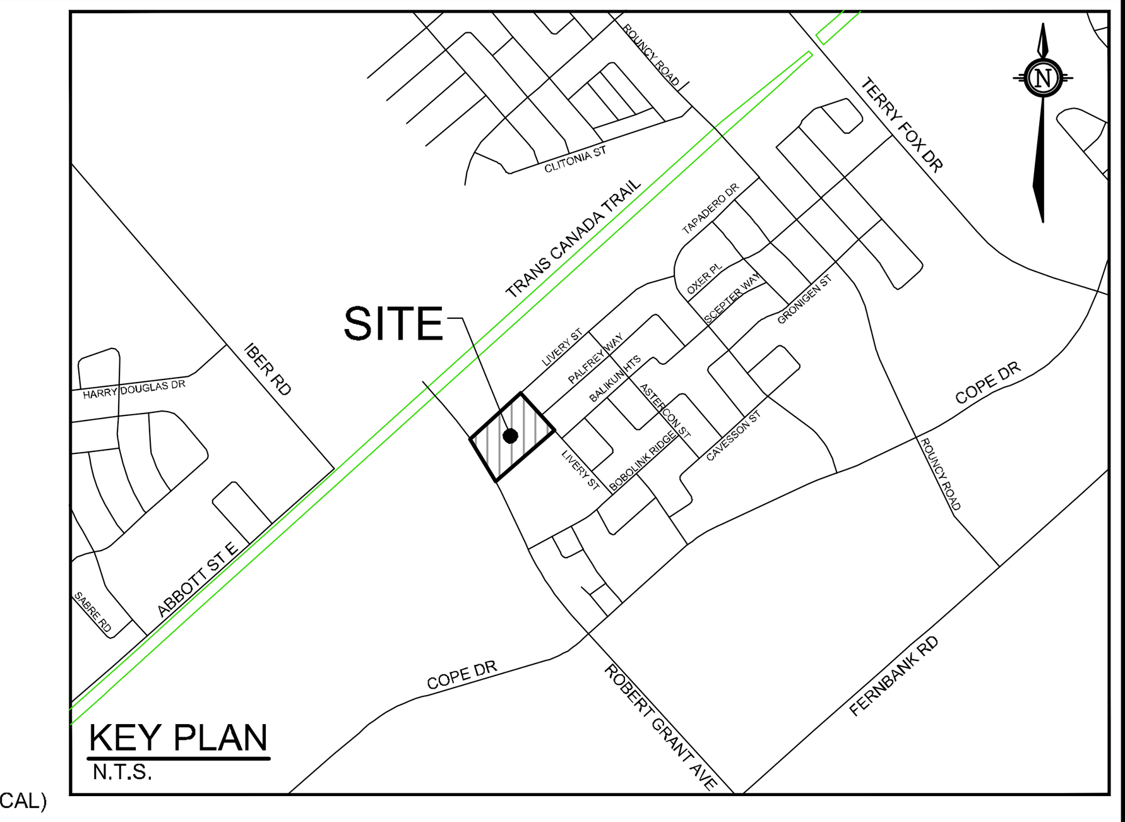
PROJECT No. 117151
REV # 1.B
DRAWING No. 117151-ESC

PLAN24x36.DWG - 914.4mmx609.6mm



LEGEND

- SITE BOUNDARY
- ℄ SWALE AND DIRECTION OF FLOW
- MAXIMUM 3: 1 SIDESLOPE
- SURFACE FLOW DIRECTION
- FFE — PROPOSED FINISHED FLOOR ELEVATION
- USF — PROPOSED UNDER SIDE OF FOOTING ELEVATION
- PROPOSED BUILDING ENTRANCE
- PROPOSED LIMIT OF BUILDING OVERHANG
- MH100 — PROPOSED STORM MANHOLE
- CB1 — PROPOSED CATCHBASIN
- CB1 — PROPOSED CATCHBASIN WITH TEMPORARY SILTSACK
- CBT1 — PROPOSED CATCHBASIN TEE
- CBE1 — PROPOSED CATCHBASIN ELBOW
- PD 15 — PROPOSED PODIUM DRAIN (PER MECHANICAL)
- CIPD 02 — PROPOSED CURB INLET PODIUM DRAIN (PER MECHANICAL)
- ICD — PROPOSED INLET CONTROL DEVICE
- 1:5 YR / 1:100 YR — APPROXIMATE PONDING LIMITS
- STORM DRAINAGE BOUNDARY
- A-1 / 0.034 / 0.82 — SUB-CATCHMENT AREA ID / TRIBUTARY AREA (ha) / 1:5 YR POST-DEV. RUNOFF COEFFICIENT



KEY PLAN
N.T.S.

BENCHMARK INFO:

OLS JOB BENCHMARK ON THE TOP OF SPINDLE OF THE EXISTING MUNICIPAL FIRE HYDRANT LOCATED NEAR THE NORTH-EAST INSIDE CORNER WHERE JOURNEYMAN STREET TURNS 90 DEGREES IN FRONT OF THE SUBJECT SITE. GEODETIC ELEVATION = 103.82m. (AS SHOWN ON THE SURVEYOR'S PLAN Ref. No. 18413-17 Lepine Corp.Blks2028&203 4M-1503 T F; PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.)

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SURROUNDING BACKGROUND TOPO INFORMATION BEYOND THE LIMITS OF THE SITE SURVEY ARE SHOWN FROM CITY OF OTTAWA 1:2000 MAPPING FOR CONTEXT ONLY.

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. COMPLETE ALL WORKS IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS USING THE CURRENT GUIDELINES, BYLAWS AND STANDARDS INCLUDING MATERIALS OF CONSTRUCTION, DISINFECTION AND ALL RELEVANT REFERENCES TO OPSS, OPSD & AWWA GUIDELINES - ALL CURRENT VERSIONS AND 'AS AMENDED'.
6. 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.
7. 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.
8. ALL ELEVATIONS ARE GEODETIC.
9. REFER TO THE GEOTECHNICAL INVESTIGATION REPORT (NO. PG4562-1, REV. 3, DATED MAY 9, 2019) PREPARED BY PATERSON GROUP INC., FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACED AREAS AND DIMENSIONS.
11. REFER TO THE 'SITE SERVICING AND STORMWATER MANAGEMENT REPORT' (R-2023-122) PREPARED BY NOVATECH.
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE / PARKING LOT PAINTING AS REQUIRED BY ARCHITECT.

INLET CONTROL DEVICE DATA TABLE: AREA A-2 (OUTLET PIPE of CBMH 01)

DESIGN EVENT	ICD TYPE (PLUG TYPE)	DIAMETER OF OUTLET PIPE (mm)	PEAK DESIGN FLOW (L/s)	½ PEAK DESIGN FLOW (L/s)	DESIGN HEAD (m)	WATER ELEVATION (m)	VOLUME (m^3)	AVAILABLE STORAGE
1:2 YR	IPEX TEMPEST VORTEX LMF (CUSTOM FLOW)	250mmØ PVC DR35	3.4	1.7	0.74	101.23 (u/g)	6.3	> 23.5 m^3
1:5 YR			4.1	2.1	1.06	101.55 (u/g)	9.0	
1:100 YR			6.5	3.3	2.61	103.10	20.0	

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1.B	ISSUED FOR PHASE 3 PRE-CONSULTATION	OCT 27/23	DDB

SCALE: 1:400

DESIGN: SM / BM / DDB
CHECKED: DDB / CR
DRAWN: SM
CHECKED: CR / DDB
APPROVED: DDB

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
D. D. BLAIR
100122737
Oct. 27 2023
PROVINCE OF ONTARIO

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

LOCATION
CITY of OTTAWA
5000 ROBERT GRANT - RESIDENTIAL DEVELOPMENT

DRAWING NAME
POST-DEVELOPMENT STORMWATER MANAGEMENT PLAN

PROJECT No. 117151
REV: REV # 1.B
DRAWING No. 117151-SWM

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