January 8, 2025

Halifax Regional Water Commission
450 Cowie Hill Road,
Halifax, NS B3K 5M1
Attention: Sarah Howlett

RE: Lake Loon Development – Servicing Review Summary
DesignPoint Project #: 24-021

Introduction

The proposed development consists of 1581 multi-unit dwellings, 18 townhouse units, and 2690 m² of commercial space. The project is located in Cole Harbour, Nova Scotia, as shown in Figure 1, and is situated within the following PIDs: 00261925, 00261933, 40173395, 00602474, 40396152, 41053299, and 40433518.

Figure 1: Project Location

Water System

There is an existing 1050 mm transmission main along Golf View Drive as well as a PRV at its intersection with Main Street. However, Halifax Water indicated that the new development cannot be serviced from this source and connecting the new system to the existing 600 mm water main along Mt. Edward Road would be the viable option. Therefore, the new water system is proposed to be connected to the existing 600 mm water main through a new 400 mm water main along Ridgecrest Drive, replacing the existing 200 mm water main. We obtained the existing water pipe sizes and configuration from Halifax Water GIS data.

Water Model

A hydraulic water model was developed using Bentley Systems WaterCAD in accordance with Halifax Water requirements and was prepared based on existing record information provided by Halifax Water. See Appendix A – Water Network Schematic.

A pump and reservoir were added to the model at the intersection of Mt. Edward Road and Ridgecrest Drive to simulate the hydrant flow test, which took place on July 2, 2024 and was conducted by Aqua Data Atlantic. The flow hydrant and the residual hydrant are located in Landgdon Drive. The limits of the model were determined based on the extents of the network which was covered in this hydrant flow test. A schematic of the water model and the hydrant flow test results are included as attachments to this letter.

The following criteria were used to calculate the projected water demands for the proposed development. These criteria were obtained from the current editions of the Halifax Water Design Specifications.

- Average Water Demand of 375 L/day/capita.
- 3.35 people per Single Family unit, Townhouse, and Semi-Detached unit.
- 2.25 people per Multi-Unit Residential unit.
- Peaking Factors of 0.70 for Minimum Hour, 1.65 for Maximum Day, and 2.50 for Peak Hour for Low Density Residential.

The water model was used to determine the existing water system characteristics, as well as the potential for supplying adequate flow to the project area for the proposed development. Both domestic and fire flow servicing were reviewed, based on the proposed unit count of the development. The results of the water analysis are summarized on Appendix B – Water Model Results.

Minimum Hourly Scenario – Domestic

The model was run using minimum hourly demands and the results of the analysis, including the junction input data, are attached to this letter. The pressure at the junctions within the development are above the required 40 psi and below the maximum of 90 psi under standard conditions. One junction outside the development, located at the intersection of Ridgecrest Drive and Mt. Edward Road (J-1 on the attached water schematic), results in a pressure of 33.3 psi. This represents a negligible change in existing pressure conditions.

Peak Hourly Scenario – Domestic

The model was run using peak hourly demands and the results of the analysis, including the junction input data, are attached to this letter. The pressure at the junctions within the development are above the required 40 psi and below the maximum of 90 psi under standard conditions. One junction outside the development, located at the intersection of Ridgecrest Drive and Mt. Edward Road (J-1 on the attached water schematic), results in a pressure of 32.8 psi. This represents a negligible change in existing pressure conditions.

Maximum Daily Demand + Fire Flow Analysis

A scenario was run in the model which applied a fire flow demand to each junction during the maximum day demand scenario. The fire flow analysis applies the fire demand to a junction, checks all the remaining junctions for available pressure, and then repeats this process for each junction until all the junctions have been analyzed. The requirements for fire flow analysis for this type of development are as follows in Table 1.

Table 1: Maximum Daily + Fire Flow Requirements

Development Type	Multi-Unit Buildings
Required Fire Flow	13,620 L/min
Minimum Allowable Pressure	150 kPa (22 psi)
Maximum Allowable Velocity	2.4 m/s

Following the water system sizing and upgrades shown in the attached water schematic, our results indicate that all calculated zone pressures and residual pressures remain above the minimum of 22 psi, and no pipe velocities exceed the maximum of 2.4 m/s to service this new development.

Table 2: Water Model Flow Criteria

Criteria	Townhouse Flow per Unit	Multi-Unit Flow per Unit	Commercial Flow per m²	*Total Flow from Development
Minimum Hourly	879.38 L/unit/day	708.75 L/unit/day	15.12 L/m²/day	817 L/min
Maximum Daily	2072.81 L/unit/day	1096.88 L/unit/day	19.87 L/m²/day	1267 L/min
Peak Hourly	3140.63 L/unit/day	2109.38 L/unit/day	21.60 L/m²/day	2396 L/min
*Based on 18 tonwhouse units with 3.35 people/townhouse, 1581 multi-units with 2.25 people/multi-unit, and 2690 m² of commercial areas.				
Minimum allowable pressure = 175 kPa (40 psi), maximum allowable pressure = 620 kPa (90 psi)				

The new water system can adequately supply these domestic demands and pressure. Appendix A includes schematic WA-01 which illustrates the proposed water system size and layout. Appendix B contains detailed calculations for the fire flow analysis.

Wastewater System

The new buildings are proposed to be serviced by a new sanitary network of 300 mm concrete pipes within the project area, which will discharge by gravity to the existing Main Street pumping station (PS-103) located at the intersection of Main Street and Golf View Drive. The station discharges to the existing 300 – 600 mm gravity sewer along Wildwood Boulevard, Gregory Drive, Roslyn Drive, Glenalva Court, Circassion Drive, Forest Hills Parkway, and Cole Harbour Road. An upgrade to this pumping station will be needed in order to have enough capacity to accommodate the additional demand. Pipe sizing has been preliminarily determined based on the assumption of minimum pipe grades. Final pipe sizes and slopes as well as final grading will be subject to

detailed design. The Appendix D – Concept Servicing Schematic and Plan & Profile Views includes a preliminary profile view of the proposed grade along the public right of ways and the proposed sanitary pipes.

DesignPoint has previously completed a downstream wastewater capacity assessment, which is attached as an appendix to this report. It was determined that the existing gravity system downstream of the development had adequate capacity to support the proposed development (ranging between 24-95%). In addition, the future design peak wet weather flow for the Main Street pumping station PS-103 will be 144.8 L/s. Localized upgrades to this existing pumping station were not included as part of that assessment and will be subject to detailed design.

Stormwater System

A high-level stormwater management study was completed for the project area in accordance with the requirements of Halifax Regional Municipality, Halifax Water, and Nova Scotia Environment and Climate Change (NSECC). A preliminary hydrologic/hydraulic stormwater model was created using HydroCAD, which was used to determine approximate required storage volumes for stormwater management to balance pre-development and post-development flows for the 5, 10, 25, 50, and 100-year Halifax Water Rainfall event. The existing stormwater infrastructure data was obtained from Halifax Water GIS data, and the existing surface elevations from the Nova Scotia Provincial LiDAR (CGVD2013).

A preliminary stormwater pond sizing has been completed as part of this study. It has been assumed that individual lots will balance their own runoff, and this pond will primarily balance flows from the public right of way and the proposed urban park. New 450 – 750 mm concrete stormwater mains are proposed along the new public right of way to direct runoff from these lots towards the stormwater retention pond. These pipes were sized assuming a slope of 0.5% and can be found on the Stormwater Management Plan on Appendix F. The stormwater model indicated that a total of 951 m^3 of storage will be required to balance up to the 100-year Halifax Water Rainfall event. The estimated area of a pond capable to store that volume is approximately 2345 m^2.

Detailed design of individual lots within the proposed development has not been completed and may not occur for several years for certain lots in later phases. Therefore, the storm water master plan presents post-development runoff targets in the format of allowable runoff values per hectare to match pre-development flow conditions. The proposed lots were divided into seven separate groups for the 2 existing downstream outfalls.

As shown in Appendix F – Stormwater Management Plan, the first outfall is through the existing watercourse that drains to Loon Lake, and the second through the existing ditch along PID 41053877 that directs runoff towards Topsail Lake. Runoff coming from outside the project area is proposed to be drained directly to the existing watercourse (in which the Loon Lake is located downstream) through proposed ditches that border the property boundary. Those ditches' designs are going to be determined on the detailed design stage of this project.

Low Impact Development/Best Management Practices

The HRM Storm Water Management By-law, enacted in 2021, requires that all sites must retain the first 10mm of rain on site, and that storm water quality objectives must be met (i.e., 80% removal of total suspended solids (TSS)). Bio-retention ponds (Rain Gardens), bio-swales, and hydrodynamic separators are all common systems used on site to treat storm water runoff before entering the city's system.

The proposed lot configuration and more specifically, the available land for each individual building lot as shown on the Fathom concept plans dated January 10, 2024, will make adhering to these storm water regulations achievable. This will be done on an individual lot basis rather than one large pond at the end of the pipe network, as this is what the regulations promote. Low Impact Development/Best Management Practice systems will be subject to detailed design of each individual lot.

Overall Servicing Summary

Water System

The new 400 mm water network will need to be connected to the existing 600 mm water main located in Mt. Edward Road in order to meet both domestic servicing and fire flow requirements. The proposed water system is shown in Appendix A.

Wastewater System

It is proposed in this study to direct wastewater towards the Main Street pumping station through a new 300 mm gravity sewer along the public right of ways. It was determined that existing infrastructure downstream the project area has adequate capacity to accommodate the new demand. Find attached on Appendix D the Concept Servicing Schematic as well as the Plan & Profile Views for more details.

Storm Water System

A high-level stormwater management study was completed for the project area, and a preliminary stormwater pond sizing as part of this study. A total of 951 m^3 of storage will be required to balance up to the 100-year Halifax Water Rainfall event. Individual lots will balance their own runoff, and this pond will primarily balance flows from the public right of way and the proposed urban park. New 450 – 750 mm concrete stormwater mains are proposed along the new public right of way to direct runoff from these lots towards the retention pond. These pipes were sized assuming a slope of 0.5% and can be found on the Stormwater Management Plan on Appendix F.

Closing

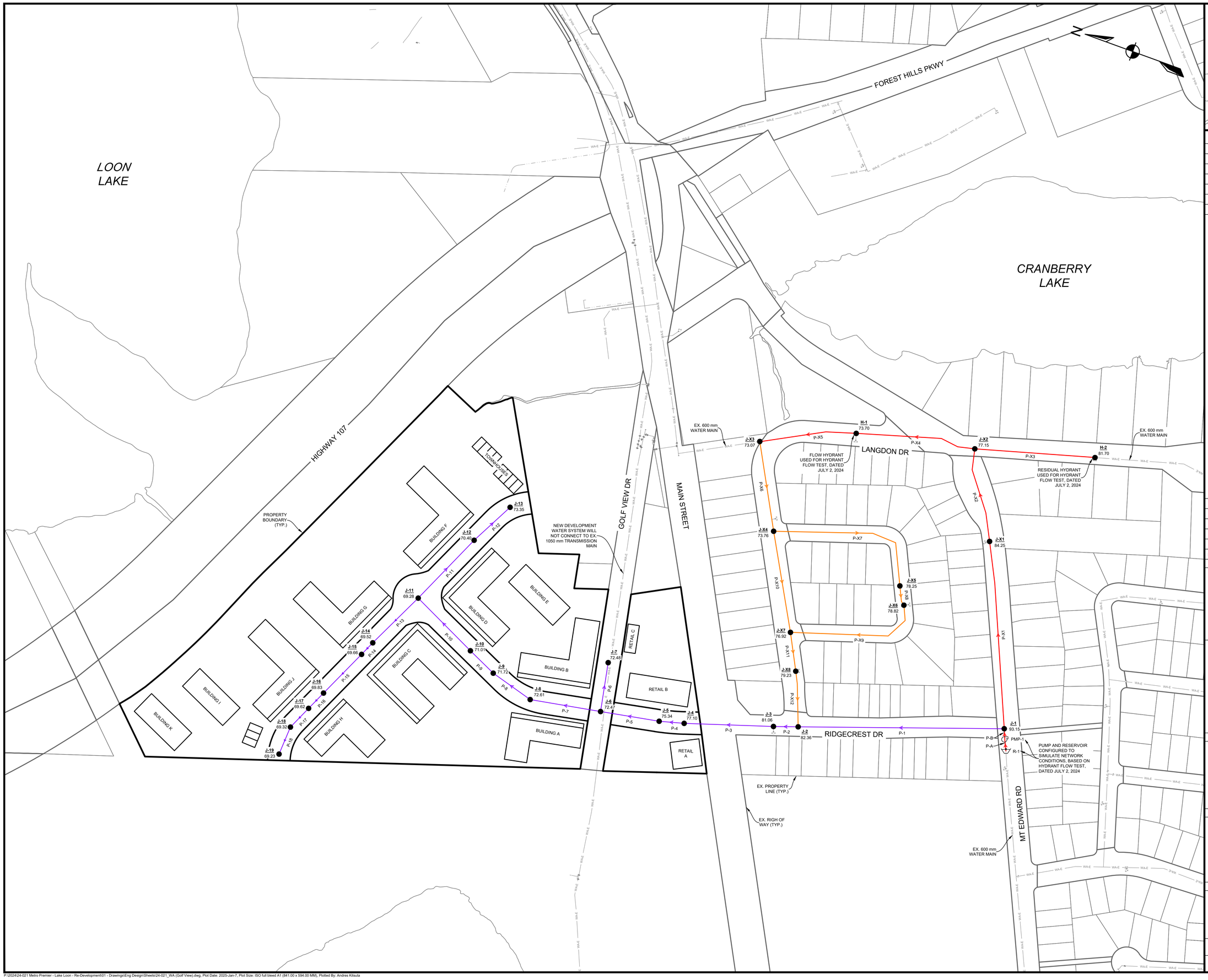
Please reach out should you have any questions or should you require any additional information.

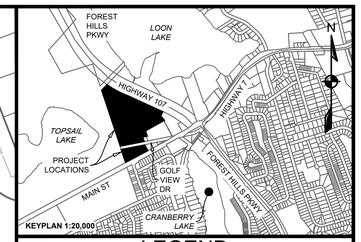
Thank you,
DesignPoint Engineering & Surveying Ltd.

Neil Fougere, P.Eng.
Senior Civil Engineer & Principal

Enclosures:
Appendix A – Water Network Schematic
Appendix B – Water Model Results
Appendix C – Hydrant Flow Test Results
Appendix D – Concept Servicing Schematic and Plan & Profile Views
Appendix E – Downstream Wastewater Capacity Analysis
Appendix F – Stormwater Schematic & Calculations

APPENDIX A – WATER NETWORK SCHEMATIC





KEYPLAN 1:20,000

LEGEND

EXISTING		PROPOSED
WA-E	WATER PIPE	WA WA
	WATER VALVE	
	HYDRANT	
EX. 150 mm WATER PIPE		
EX. 400 mm WATER PIPE		
EX. 600 mm WATER PIPE		

NOTE:

J - # REPRESENTS A JUNCTION LABEL AND ELEVATION USED IN REFERENCE WITH THE CALCULATION SUMMARY TABLES.

H - # REPRESENTS THE HALIFAX WATER ID NUMBER FOR THE FIRE HYDRANTS USED IN THE HYDRANT FLOW TEST.

P - # REPRESENTS A PIPE LABEL AND DIAMETER USED IN REFERENCE WITH THE CALCULATION SUMMARY TABLES.

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1:1500

ISSUE	DATE	DESCRIPTION	INT.
A	JAN. 08, 2025	ISSUED FOR REVIEW	AK

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PRELIMINARY
JAN. 08, 2025

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

WATER NETWORK SCHEMATIC

Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	WA-01
Scale	Filename		1 of 1
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APPENDIX B – WATER MODEL CALCULATIONS

Average Daily: Proposed Development

Junction	Elevation (m)	Demand (L/min)	Hydraulic Grade (m)	Pressure (psi)
J-1	93.15	0.0	116.6	33.3
J-2	82.36	0.0	116.6	48.6
J-3	81.06	0.0	116.6	50.4
J-4	77.1	7.5	116.6	56.0
J-5	75.34	14.4	116.6	58.5
J-6	72.47	0.0	116.6	62.6
J-7	72.48	4.3	116.6	62.6
J-8	72.61	84.4	116.6	62.4
J-9	71.72	119.3	116.6	63.7
J-10	70.01	150.0	116.6	66.1
J-11	69.28	0.0	116.6	67.1
J-12	70.4	85.6	116.6	65.5
J-13	73.35	15.7	116.6	61.3
J-14	69.52	85.6	116.6	66.8
J-15	69.66	154.8	116.6	66.6
J-16	69.83	85.6	116.6	66.3
J-17	69.62	85.6	116.6	66.6
J-18	69.32	0.0	116.6	67.1
J-19	69.23	83.2	116.6	67.2

Minimum Hourly: Proposed Development

Junction	Elevation (m)	Demand (L/min)	Hydraulic Grade (m)	Pressure (psi)
J-1	93.15	0.0	116.6	33.3
J-2	82.36	0.0	116.6	48.7
J-3	81.06	0.0	116.6	50.5
J-4	77.1	6.3	116.6	56.1
J-5	75.34	12.1	116.6	58.6
J-6	72.47	0.0	116.6	62.7
J-7	72.48	3.6	116.6	62.7
J-8	72.61	70.9	116.6	62.5
J-9	71.72	100.2	116.6	63.7
J-10	70.01	126.0	116.6	66.2
J-11	69.28	0.0	116.6	67.2
J-12	70.4	71.9	116.6	65.6
J-13	73.35	11.0	116.6	61.4
J-14	69.52	71.9	116.6	66.9
J-15	69.66	130.1	116.6	66.7
J-16	69.83	71.9	116.6	66.4
J-17	69.62	71.9	116.6	66.7
J-18	69.32	0.0	116.6	67.1
J-19	69.23	69.9	116.6	67.3

Peak Hourly: Proposed Development

Junction	Elevation (m)	Demand (L/min)	Hydraulic Grade (m)	Pressure (psi)
J-1	93.15	0.0	116.2	32.8
J-2	82.36	0.0	116.2	48.0
J-3	81.06	0.0	116.2	49.8
J-4	77.1	9.0	116.1	55.4
J-5	75.34	17.3	116.1	57.9
J-6	72.47	0.0	116.1	62.0
J-7	72.48	5.1	116.1	61.9
J-8	72.61	210.9	116.1	61.7
J-9	71.72	291.7	116.1	63.0
J-10	70.01	375.0	116.1	65.4
J-11	69.28	0.0	116.1	66.4
J-12	70.4	213.9	116.1	64.8
J-13	73.35	39.3	116.1	60.6
J-14	69.52	213.9	116.1	66.1
J-15	69.66	383.9	116.1	65.9
J-16	69.83	213.9	116.1	65.6
J-17	69.62	213.9	116.1	65.9
J-18	69.32	0.0	116.1	66.3
J-19	69.23	208.0	116.1	66.5

Fire Flow - Proposed Demands Applied to Proposed Water System

Junction	Fire Flow (Needed) (L/min)	Fire Flow (Available) (L/min)	Pressure (Calculated Residual) (psi)	Junction with Minimum Pressure	Maximum Pipe Velocity (m/s)	Pipe w/ Maximum Velocity
J-1	13,620	13,620	29.7	J-X1	0.87	P-B
J-2	13,620	13,620	42.7	J-1	1.84	P-1
J-3	13,620	13,620	44.3	J-1	1.95	P-2
J-4	13,620	13,620	48.8	J-1	1.95	P-2
J-5	13,620	13,620	51.0	J-1	1.95	P-2
J-6	13,620	13,620	54.4	J-1	1.95	P-2
J-7	13,620	13,620	53.8	J-1	1.95	P-2
J-8	13,620	13,620	53.3	J-1	1.95	P-2
J-9	13,620	13,620	54.0	J-1	1.95	P-2
J-10	13,620	13,620	56.1	J-1	1.95	P-2
J-11	13,620	13,620	56.3	J-1	1.95	P-2
J-12	13,620	13,620	53.8	J-1	1.95	P-2
J-13	13,620	13,620	49.1	J-1	1.95	P-2
J-14	13,620	13,620	55.2	J-1	1.95	P-2
J-15	13,620	13,620	54.8	J-1	1.95	P-2
J-16	13,620	13,620	54.0	J-1	1.95	P-2
J-17	13,620	13,620	54.0	J-1	1.95	P-2
J-18	13,620	13,620	54.2	J-1	1.95	P-2
J-19	13,620	13,620	54.0	J-1	1.95	P-2

APPENDIX C – HYDRANT FLOW TEST RESULTS

WATER FLOW TEST SUMMARY

Type of Area:	Residential	Test No:	Test # 1 - DesignPoint
Location:	Langton Drive, Dartmouth	Test By:	Tom Cameron
Municipality:	HRM	Date:	July 2, 2024

- **SYSTEM DATA**

Size of Main: | Dead End: | Two Ways: | Loop:

Source Reliable: | If not, explain:

Comments: Results are in US GPM and PSI. Hyd coefficient is 0.09

- **TEST DATA**

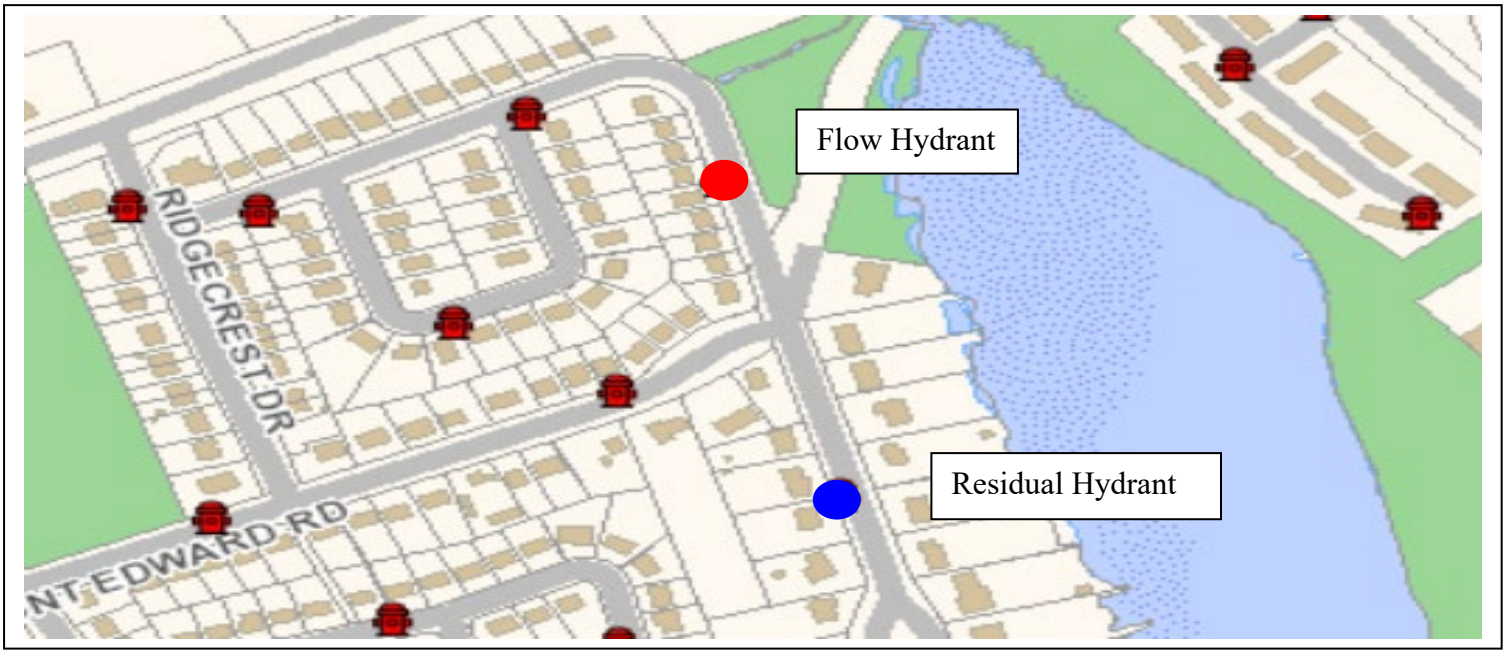
Location of Test Hydrants: Residual: See sketch below for location

Flow: See sketch below for location

Normal Pressure: 50 Time: 11:05 A.M. P.M. X

Test No.	No. of Outlets	Orifice Size (IN)	Pilotless Nozzle Reading (PSI)	Equivalent Flow (US GPM)	Total Flow (US GPM)	Residual Pressure (PSI)	Comments
1	1	2.5"	25	836	836	50	
2	2	2.5"	19 / 20	729 / 748	1477	48	
3							

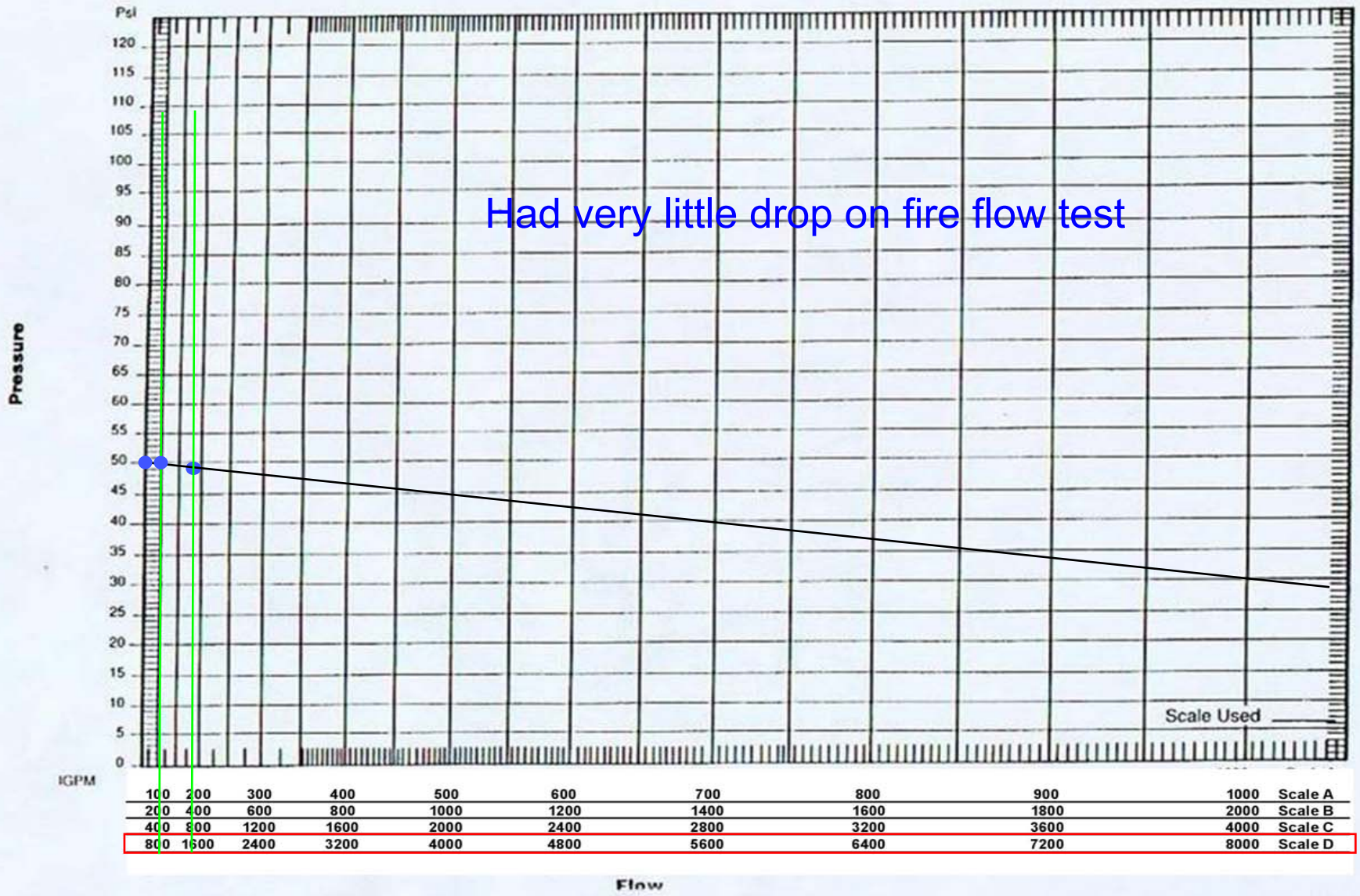
Hydrant flow information from the files of the Aqua Data Atlantic, regardless of their original source, are maintained for internal use only. Although such information is often shared with others, people or firms who make use of this data do so at their own risk.



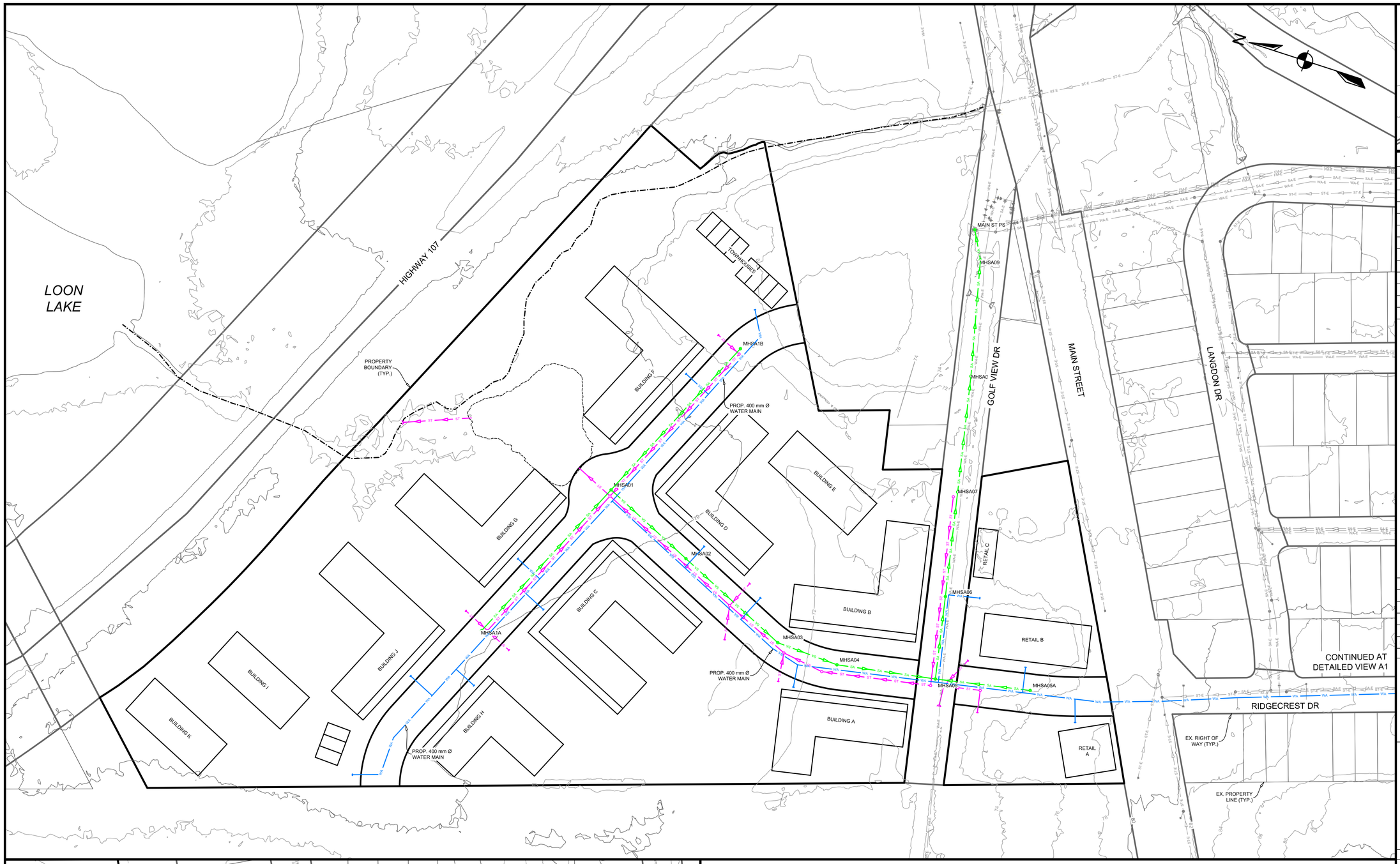
AQUA DATA Atlantic

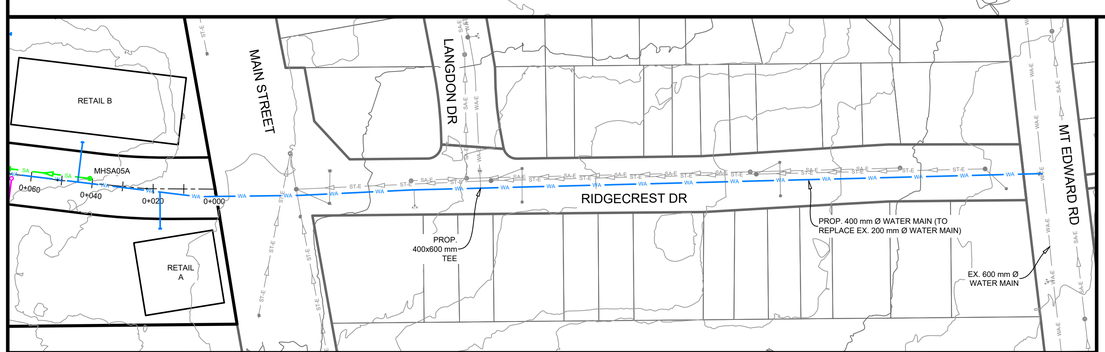
Water Flow Test Summary

Location: Langdon Drive | Municipality: Dartmouth, NS | Date: July 2, 2024



APPENDIX D – CONCEPT SERVICING SCHEMATIC AND PLAN & PROFILE VIEWS





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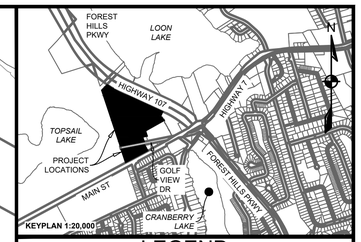

LEGEND

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		

30 0 30 60 METRES
1:1000

ISSUE	DATE	DESCRIPTION	INT.
A	JAN. 08, 2025	ISSUED FOR REVIEW	AK

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PRELIMINARY
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PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

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Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	CP-01
Scale 1:1000	Filename 24-021_CP (Golf View).dwg		1 of 4

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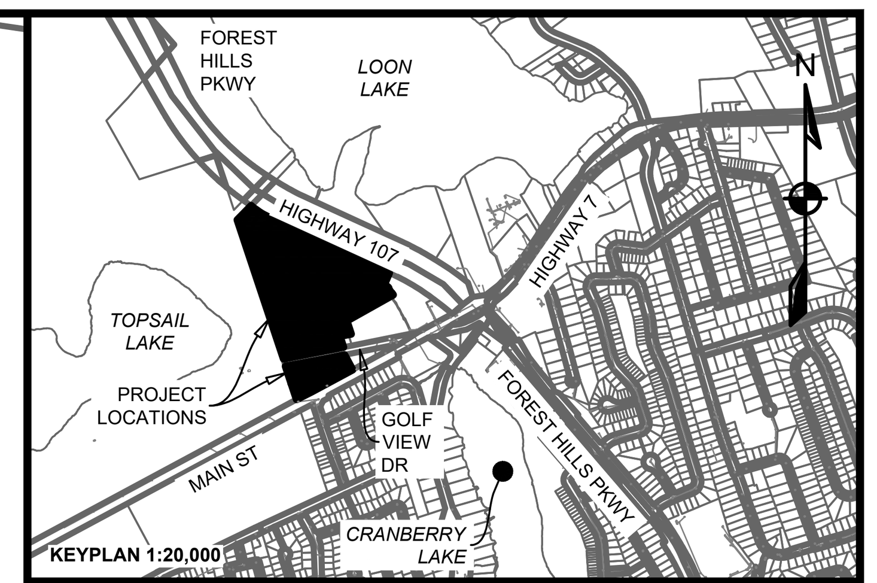
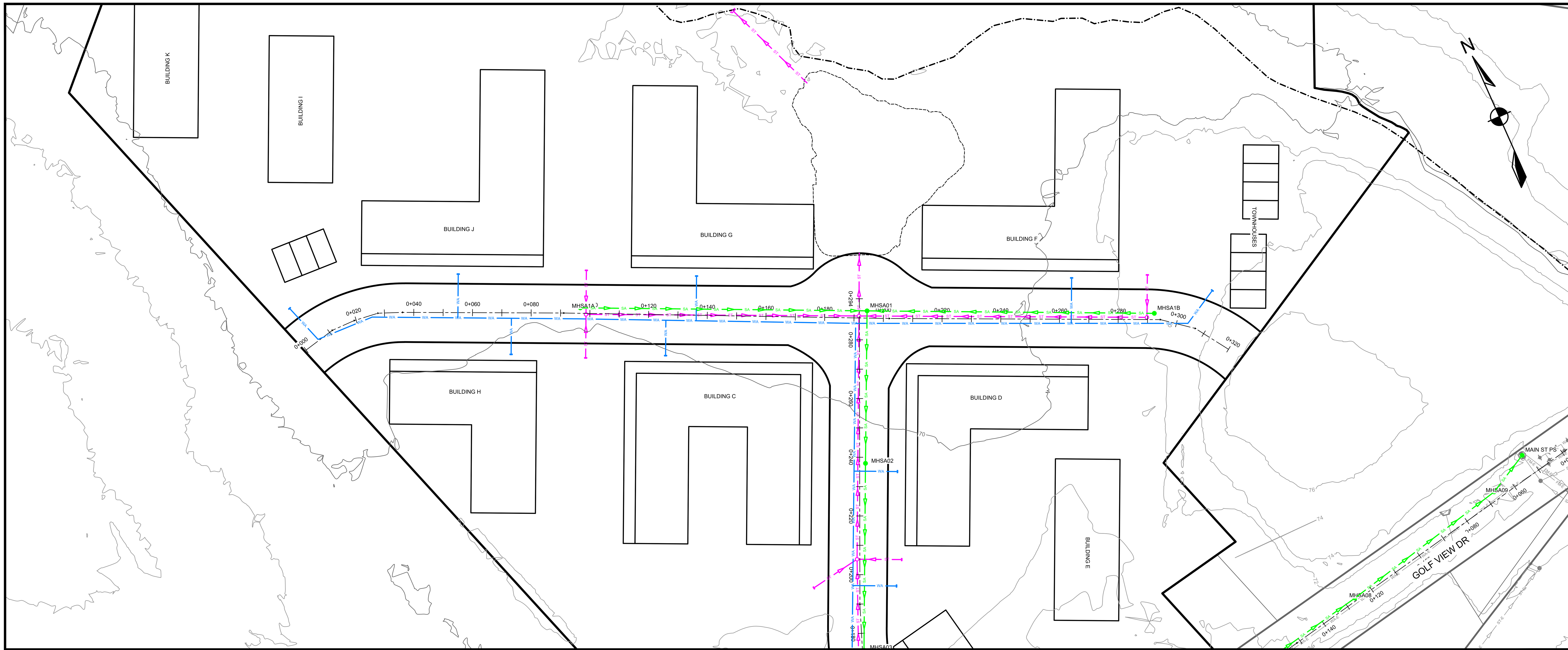


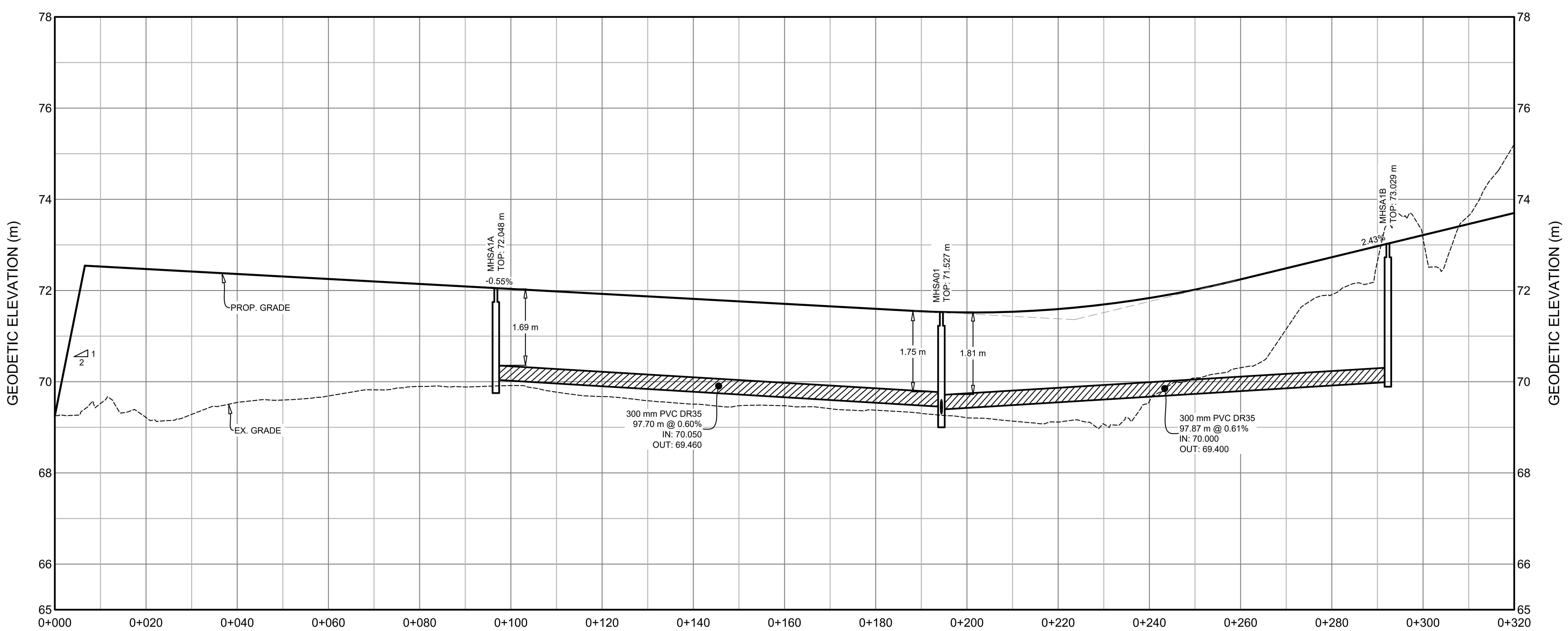


LEGEND

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		

METRES
15 0 30 45
1:750



ISSUE	DATE	DESCRIPTION	INT.
A	JAN. 08, 2025	ISSUED FOR REVIEW	AK

CONSULTANT

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PRELIMINARY
JAN. 08, 2025

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

SANITARY SEWER
PLAN & PROFILE
ALIGNMENT 1

Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	PP-01
Scale 1:750	Filename 24-021_CP (Golf View).dwg		2 of 4

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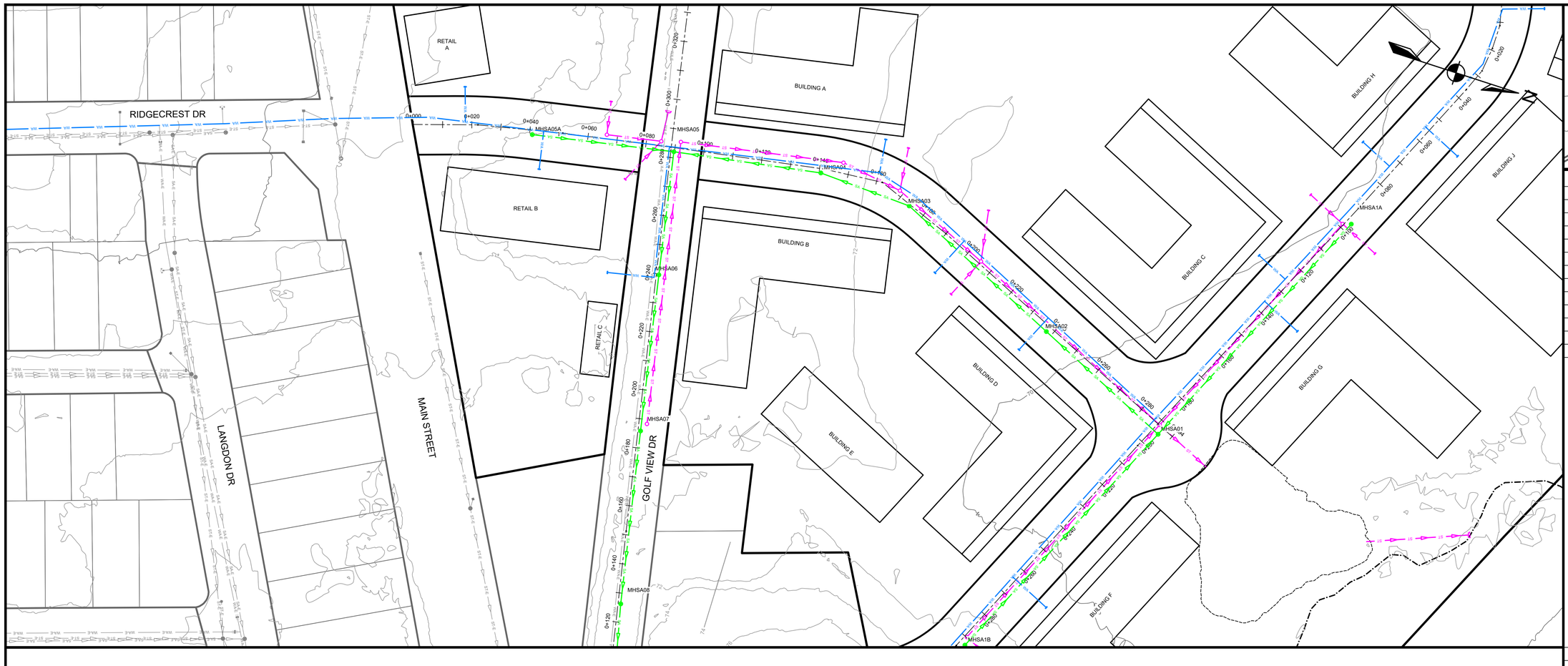

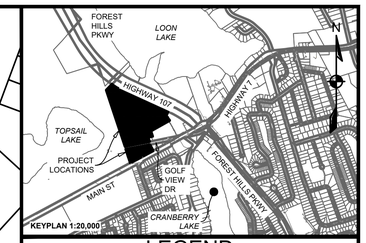

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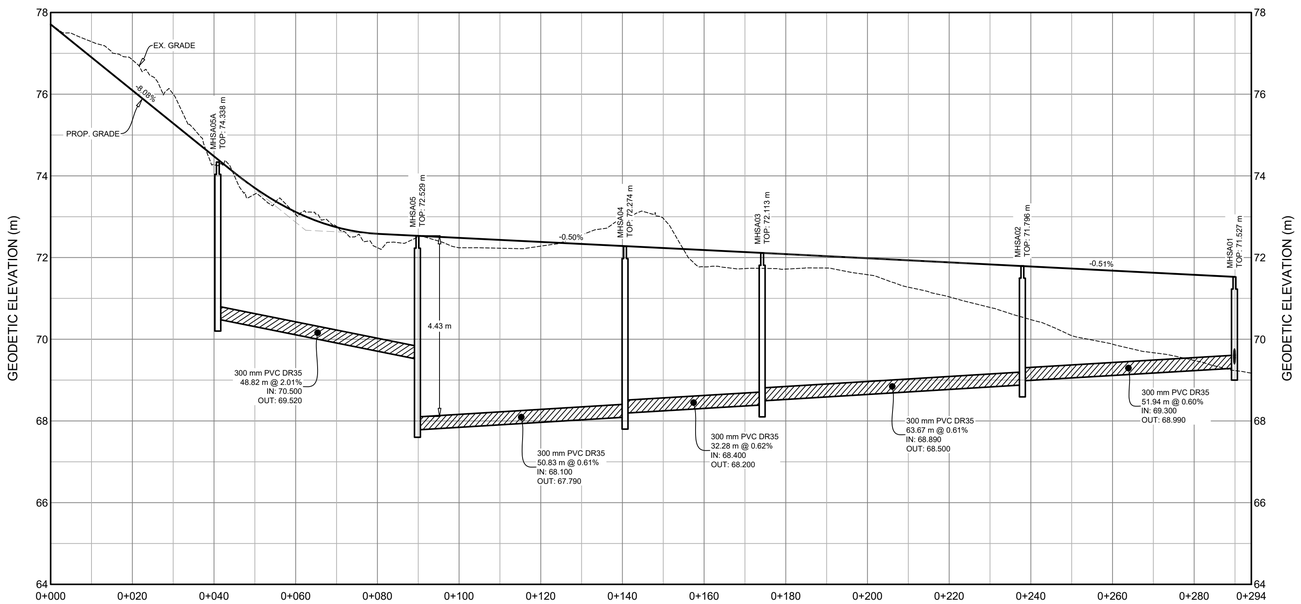
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		

15 0 METRES 30 45

1:750



ISSUE	DATE	DESCRIPTION	INT.
A	JAN. 08, 2025	ISSUED FOR REVIEW	AK

CONSULTANT

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PRELIMINARY
JAN. 08, 2025

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

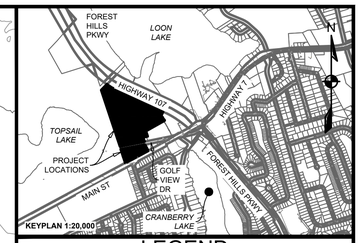
DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

SANITARY SEWER
PLAN & PROFILE
ALIGNMENT 2

Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	PP-02
Scale	Filename		3 of 4
1:750	24-021_CP (Golf View).dwg		

P:\2024\24-021 Metro Premier - Lake Loon - Re-Development\01 - Drawings\Eng Design\Sheets\24-021_CP (Golf View).dwg, Plot Date: 2025-Jan-8, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Andres Kitsuta

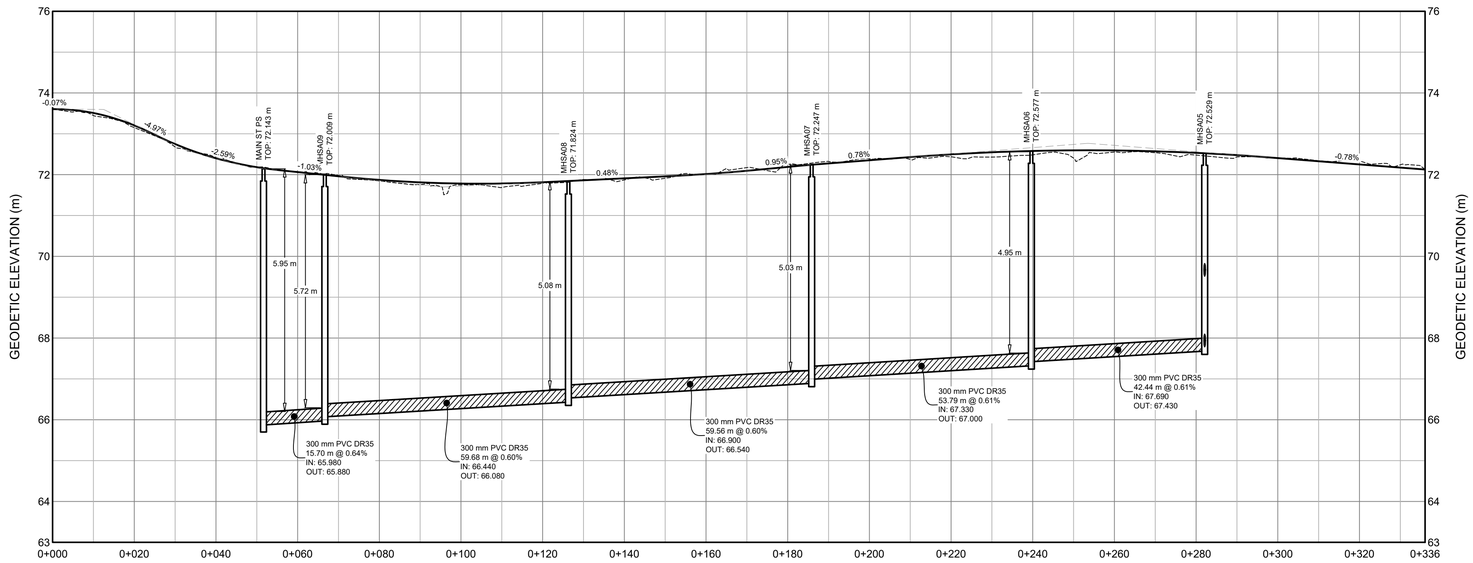


LEGEND

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	
WA-E	WATER PIPE	WA
SA-E	SANITARY PIPE	SA
ST-E	STORM PIPE	ST

	EXISTING	PROPOSED		EXISTING	PROPOSED
CURBSTOP			WATER VALVE		
REDUCER			HYDRANT		
PRECAST HEADWALL			CATCHBASIN		

METRES
15 0 30 45
1:750



ISSUE	DATE	DESCRIPTION	INT.
A	JAN. 08, 2025	ISSUED FOR REVIEW	AK

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PRELIMINARY
JAN. 08, 2025

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

SANITARY SEWER
PLAN & PROFILE
ALIGNMENT 3

Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	PP-03
Scale	Filename		4 of 4
1:750	24-021_CP (Golf View).dwg		

P:\2024\24-021 Metro Premier - Lake Loon - Re-Development\01 - Drawings\Eng Design\Sheets\24-021_CP (Golf View).dwg, Plot Date: 2025-Jan-8, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Andres Kitsuta

APPENDIX E – DOWNSTREAM WASTEWATER CAPACITY ANALYSIS

Date: January 7, 2025

Halifax Water
450 Cowie Hill Road,
Halifax, NS B3K 5M1
Attention: Sarah Howlett

RE: Lake Loon Development – Downstream Wastewater Capacity Analysis
DesignPoint Project #: 24-021

Introduction

The proposed development consists of 1581 multi-unit dwellings, 18 townhouse units, and 2690 m² of commercial space. The project is located in Cole Harbour, Nova Scotia, as shown in Figure 1, and is situated within the following PIDs: 00261925, 00261933, 40173395, 00602474, 40396152, 41053299, and 40433518.

Figure 1: Project Location

As part of the servicing review for the proposed development, DesignPoint has completed a downstream wastewater capacity analysis to determine the hydraulic capacity of the existing municipal wastewater system in the project area and its ability to service the proposed development.

This letter summarizes the review DesignPoint has completed for this project.

Wastewater Servicing

The new buildings are proposed to be serviced by the existing downstream wastewater system, firstly discharging directly to the Main Street pumping station (PS-103) located at the intersection of Main Street and Golf View Drive. The station discharges to the existing 300 – 600 mm gravity sewer along Wildwood Boulevard, Gregory Drive, Roslyn Drive, Glenalva Court, Circassion Drive, Forest Hills Parkway, and Cole Harbour Road. Halifax Water Regional Water Commission (HRWC) determined the termination point of the study to be at HRWC manhole ID: MH27830, which is upstream of the existing Cole Harbour Road pumping station (PS-116). The extents of the existing system which were analyzed are illustrated in the attached drawing SA-01.

Downstream Capacity Analysis

GIS information and record drawings from Halifax Water were used to compile information for the existing wastewater infrastructure, as well as to determine sewersheds and tributary areas to the pipes in the study area. Detailed tabulated calculations are included as an attachment to this letter.

The attached calculation table uses the following criteria to determine a peak design flow for each pipe in the study area, according to the Design Specifications & Supplementary Standard Specifications for Water, Wastewater & Stormwater Systems by Halifax Water (current edition).

- Wastewater generation rate of 300 L/day/person for residential dwellings;
- 3.35 people per Single-Family/Townhouse Unit;
- 2.25 people per Multi-Unit Residential Unit;
- Inflow and Infiltration allowance of 24 L/s/ha;
- Commercial and institutional flows as well as Industrial wastewater flows were estimated in accordance with Section 3.3.4.3, 3.3.4.4, and 3.3.5 in the Atlantic Canada Wastewater System Guidelines (current edition).

The Memorial Drive pumping station PS-137 discharges flows to the existing HRWC manhole ID: MH28793, which is within the limits of this study. Existing pump models were established from HRWC GIS, and pump curves were then provided by the Manufacturer for the corresponding pump models. A system curve was creating using the force main information within the provided GIS and plotted with the pump curve to determine the theoretical operating points of the pumps. For the purposes of this analysis, we have calculated a theoretical operating point for the pumps of 74 L/s.

Using the criteria previously outlined, the Peak Wet Weather Flow (PWWF) for the existing/proposed development was calculated for each pipe within the study area. This PWWF was then compared to the pipe capacity to identify any pipes that have exceeded capacity. See the attached detailed wastewater calculation table.

Results

As shown in the attached table, the downstream wastewater gravity sewer included in this analysis has adequate capacity to support the proposed development, ranging in capacity between 24-95% full following full buildout.

The future design peak wet weather flow to existing pumping station PS-103 was determined to be 144.8 L/s. Localized upgrades to this existing station were not included as part of this review.

Recommendations

The downstream wastewater capacity analysis indicated that the existing sanitary sewer within the study area has adequate capacity, and no upgrades are required to support the proposed development.

Information on some pipes within the study area were not available through HRWC Record Drawings or GIS. As such, a minimum slope of 0.60% was assumed for this analysis (see attached Wastewater System Review). A topographic survey could be completed in this area to determine the actual slopes of those pipes, and the analysis can be updated accordingly.

Further to this, localized upgrades to existing PS-103 were not included in this review. Further analysis is required to determine the extents of the station upgrades required to support the proposed development.

Closing

Please reach out should you have any questions or should you require any additional information.

Thank you,
DesignPoint Engineering & Surveying Ltd.

[redacted]

Jeremy Wyatt, P.Eng.
Civil/ Water Resource Engineer

Attachments: Wastewater System Review
SA-01 – Downstream Wastewater Capacity Analysis

Wastewater System Review
Project Name: Golf View Development
Project Number: 24-021
Date: April 19, 2024

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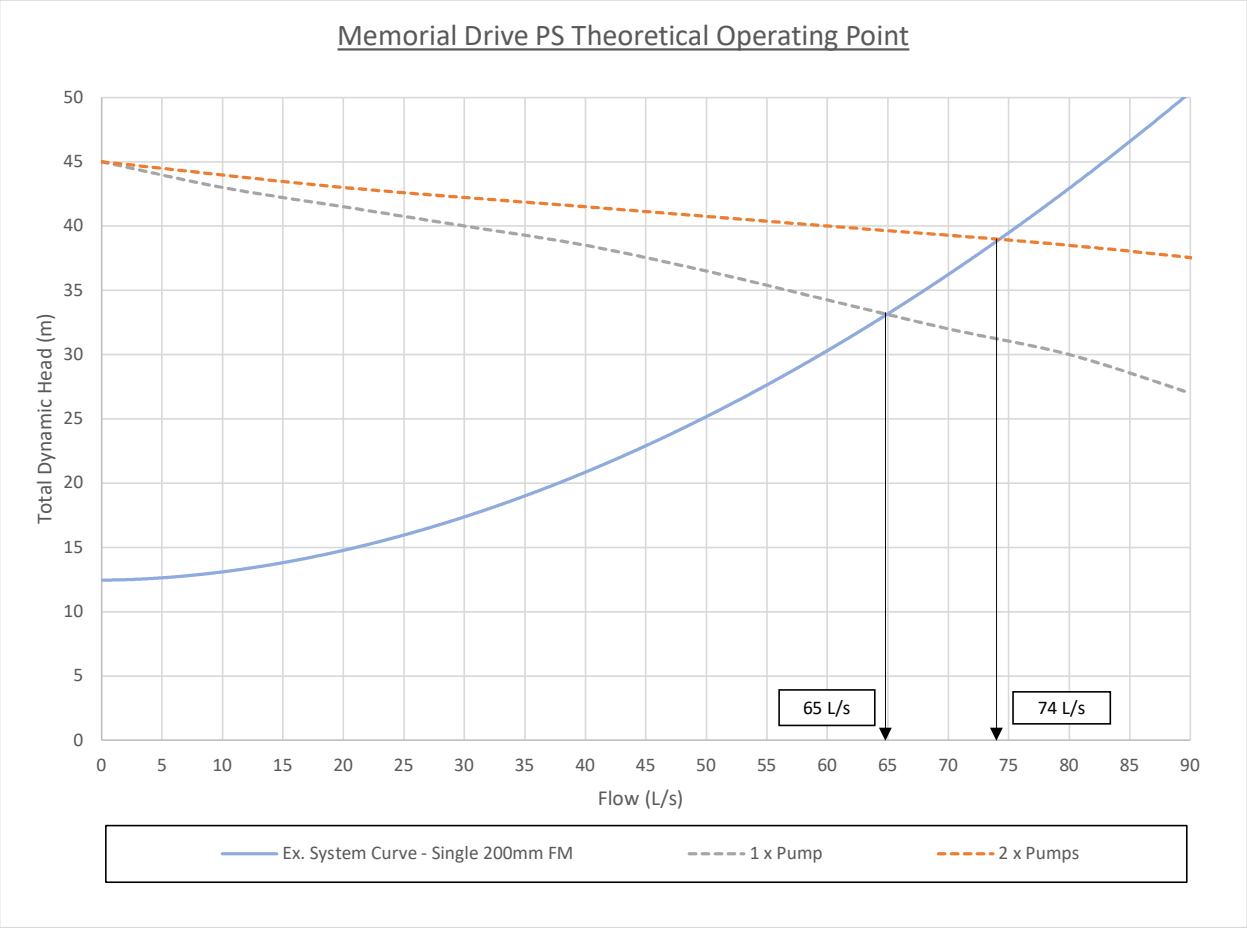

Wastewater System Review

Project Name: Gold View Development

Project Number: 24-021

Date: January 7, 2025

Tributary Area	Area ID	Total Area (m²)	Total Area (ha)	Res Units @ 3.35 ppu	Res Units @ 2.25 ppu	Population	Peak Commercial and Institutional (L/s)
A	**A**	101,651	10.17	18	1581	3618	0.84
X0	**X0**	280,106	28.01	123	0	413	0.67
X1	**X1**	7,283	0.73	4	0	14	0.00
X2	**X2**	13,912	1.39	6	0	21	0.00
X3	**X3**	16,148	1.61	8	0	27	0.00
X4	**X4**	11,121	1.11	6	0	21	0.00
X5	**X5**	356,142	35.61	434	0	1454	0.08
X6	**X6**	25,723	2.57	7	0	24	0.00
X7	**X7**	10,549	1.05	4	0	14	0.00
X8	**X8**	31,302	3.13	25	0	84	0.00
X9	**X9**	2,318	0.23	2	0	7	0.00
X10	**X10**	21,833	2.18	13	0	44	0.00
X11	**X11**	11,895	1.19	10	0	34	0.00
X12	**X12**	13,495	1.35	12	0	41	0.00
X13	**X13**	12,767	1.28	2	0	7	0.00
X14	**X14**	9,230	0.92	6	0	21	0.00
X15	**X15**	10,577	1.06	10	0	34	0.00
X16	**X16**	9,828	0.98	7	0	24	0.00
X17	**X17**	337,938	33.79	437	0	1464	1.02
X18	**X18**	62,628	6.26	81	0	272	0.00
X19	**X19**	11,070	1.11	16	0	54	0.00
X20	**X20**	38,329	3.83	28	0	94	0.00
X21	**X21**	32,872	3.29	0	66	149	0.00
X22	**X22**	5,389	0.54	0	0	0	0.00
X23	**X23**	19,951	2.00	0	0	0	0.27
X24	**X24**	3,183	0.32	0	0	0	0.00
X25	**X25**	1,357	0.14	0	0	0	0.00
X26	**X26**	57,743	5.77	0	0	0	3.60
X27	**X27**	2,578	0.26	0	0	0	0.00
X28	**X28**	12,528	1.25	0	32	72	0.33
X29	**X29**	4,185	0.42	0	35	79	0.00
X30	**X30**	4,963	0.50	0	0	0	0.00
X31	**X31**	4,499	0.45	0	0	0	0.10
X32	**X32**	1,125,169	112.52	857	135	3175	21.64
X33	**X33**	1,185,151	118.52	1194	44	4099	15.38
X34	**X34**	13,146	1.31	3	0	11	0.62
X35	**X35**	23,639	2.36	0	142	320	0.21
X36	**X36**	4,558	0.46	0	0	0	0.70
X37	**X37**	13,202	1.32	0	0	0	0.59
X38	**X38**	4,140	0.41	0	0	0	0.06

Wastewater System Review
Project Name: Gold View Development
Project Number: 24-021
Date: January 7, 2025

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		TRIBUTARY AREAS	Total Area	Pump Station Flow	Tot. Pop. "P"	Domestic Load	Average Dry Weather	Average Dry Weather	Harmon Peaking	Peak Commercial Load	Peak Commercial Load	Peak Dry Weather	Peak Dry Weather	Safety Factor	Peak Dry Weather incl SF	I/I Allowance	I/I Loading	Peak Wet Weather	Pipe Size	Pipe Slope	Pipe Manning's	Pipe Capacity	Percent Full	NOTES
U/S MH	D/S MH		(Ha)	(L/s)	People	(L/day)	(L/day)	(L/s)	Factor	(L/day)	(L/s)	(L/day)	(L/s)		(L/s)	(L/s/Ha)	(L/s)	(L/s)	(mm)	(%)	"n"	(L/s)	(%)	
-	PS-103	A, X0	38.18	74.00	4031	300	1209300	14.00	3.33	130410	1.51	4157777	48.1	1.25	60.2	0.28	10.7	144.8						Future peak wet weather design flow to PS-103 = 144.8 L/s.
MH21448	MH21449	X1	0.73	150.00	14	300	4200	0.05	4.40	0	0.00	18478	0.2	1.25	0.3	0.28	0.2	150.5	350	1.94%	0.010	264.5	57	Estimated PS-103 outflow post-development = 150 L/s
MH21449	MH21450	X1, X2	2.12	150.00	35	300	10500	0.12	4.34	0	0.00	45608	0.5	1.25	0.7	0.28	0.6	151.3	350	1.60%	0.010	240.1	63	
MH21450	MH21451	X1, X2, X3	3.73	150.00	62	300	18600	0.22	4.29	0	0.00	79885	0.9	1.25	1.2	0.28	1.0	152.2	400	0.87%	0.010	252.6	60	
MH21451	MH21413	X1, X2, X3, X4	4.85	150.00	83	300	24900	0.29	4.26	0	0.00	106195	1.2	1.25	1.5	0.28	1.4	152.9	400	0.74%	0.010	232.7	66	
MH21413	MH21420	X1, X2, X3, X4, X5	40.46	150.00	1537	300	461100	5.34	3.67	6777	0.08	1699880	19.7	1.25	24.6	0.28	11.3	185.9	450	0.75%	0.010	320.8	58	
MH21420	MH21421	X1, X2, X3, X4, X5, X6	43.03	150.00	1561	300	468300	5.42	3.67	6777	0.08	1724020	20.0	1.25	24.9	0.28	12.0	187.0	500	0.29%	0.010	263.8	71	
MH21421	MH21566	X1, X2, X3, X4, X5, X6, X7	44.09	150.00	1575	300	472500	5.47	3.66	6777	0.08	1738081	20.1	1.25	25.1	0.28	12.3	187.5	500	0.29%	0.010	262.5	71	
MH21566	MH21567	X1, X2, X3, X4, X5, X6, X7, X8	47.22	150.00	1659	300	497700	5.76	3.65	6777	0.08	1822134	21.1	1.25	26.4	0.28	13.2	189.6	500	0.38%	0.010	302.7	63	
MH21567	MH21568	X1, X2, X3, X4, X5, X6, X7, X8, X9	47.45	150.00	1666	300	499800	5.78	3.65	6777	0.08	1829115	21.2	1.25	26.5	0.28	13.3	189.7	500	0.63%	0.010	390.6	49	
MH21568	MH21569	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10	49.63	150.00	1710	300	513000	5.94	3.64	6777	0.08	1872913	21.7	1.25	27.1	0.28	13.9	191.0	500	0.19%	0.010	216.1	88	
MH21569	MH21570	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11	50.82	150.00	1744	300	523200	6.06	3.63	6777	0.08	1906662	22.1	1.25	27.6	0.28	14.2	191.8	500	0.38%	0.010	302.5	63	
MH21570	MH21571	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12	52.17	150.00	1785	300	535500	6.20	3.62	6777	0.08	1947252	22.5	1.25	28.2	0.28	14.6	192.8	500	0.52%	0.010	355.6	54	
MH21571	MH21572	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13	53.45	150.00	1792	300	537600	6.22	3.62	6777	0.08	1954170	22.6	1.25	28.3	0.28	15.0	193.2	450	1.00%	0.010	371.9	52	
MH21572	MH21573	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14	54.37	150.00	1813	300	543900	6.30	3.62	6777	0.08	1974905	22.9	1.25	28.6	0.28	15.2	193.8	400	3.61%	0.010	514.9	38	
MH21573	MH25681	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15	55.43	150.00	1847	300	554100	6.41	3.61	6777	0.08	2008411	23.2	1.25	29.1	0.28	15.5	194.6	400	3.65%	0.010	517.9	38	
MH25681	MH27959	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16	56.41	150.00	1871	300	561300	6.50	3.61	6777	0.08	2032016	23.5	1.25	29.4	0.28	15.8	195.2	400	2.22%	0.010	403.9	48	
MH27959	MH27960	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17	90.21	150.00	3335	300	1000500	11.58	3.40	95270	1.10	3499910	40.5	1.25	50.6	0.28	25.3	225.9	400	2.15%	0.010	397.6	57	
MH27960	MH27961	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18	96.47	150.00	3607	300	1082100	12.52	3.37	95270	1.10	3745408	43.3	1.25	54.2	0.28	27.0	231.2	400	2.11%	0.010	393.7	59	
MH27961	MH25771	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19	97.58	150.00	3661	300	1098300	12.71	3.37	95270	1.10	3793811	43.9	1.25	54.9	0.28	27.3	232.2	400	2.19%	0.010	401.4	58	
MH25771	MH25772	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20	101.41	150.00	3755	300	1126500	13.04	3.36	95270	1.10	3877812	44.9	1.25	56.1	0.28	28.4	234.5	400	1.59%	0.010	342.1	69	
MH25772	MH30488	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21	104.70	150.00	3904	300	1171200	13.56	3.34	95270	1.10	4010312	46.4	1.25	58.0	0.28	29.3	237.3	450	0.99%	0.010	369.7	64	
MH30488	MH27863	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22	105.23	150.00	3904	300	1171200	13.56	3.34	95270	1.10	4010312	46.4	1.25	58.0	0.28	29.5	237.5	450	1.84%	0.010	503.3	47	
MH27863	MH30489	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23	107.23	150.00	3904	300	1171200	13.56	3.34	118382	1.37	4033424	46.7	1.25	58.4	0.28	30.0	238.4	450	2.72%	0.010	612.3	39	
MH30489	MH27864	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24	107.55	150.00	3904	300	1171200	13.56	3.34	118382	1.37	4033424	46.7	1.25	58.4	0.28	30.1	238.5	500	1.15%	0.010	527.9	45	
MH27864	MH27865	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25	107.68	150.00	3904	300	1171200	13.56	3.34	118382	1.37	4033424	46.7	1.25	58.4	0.28	30.2	238.5	600	0.60%	0.010	618.9	39	Pipe information missing from HRWC Records. Minimum slope assumed.

Wastewater System Review
Project Name: Gold View Development
Project Number: 24-021
Date: January 7, 2025

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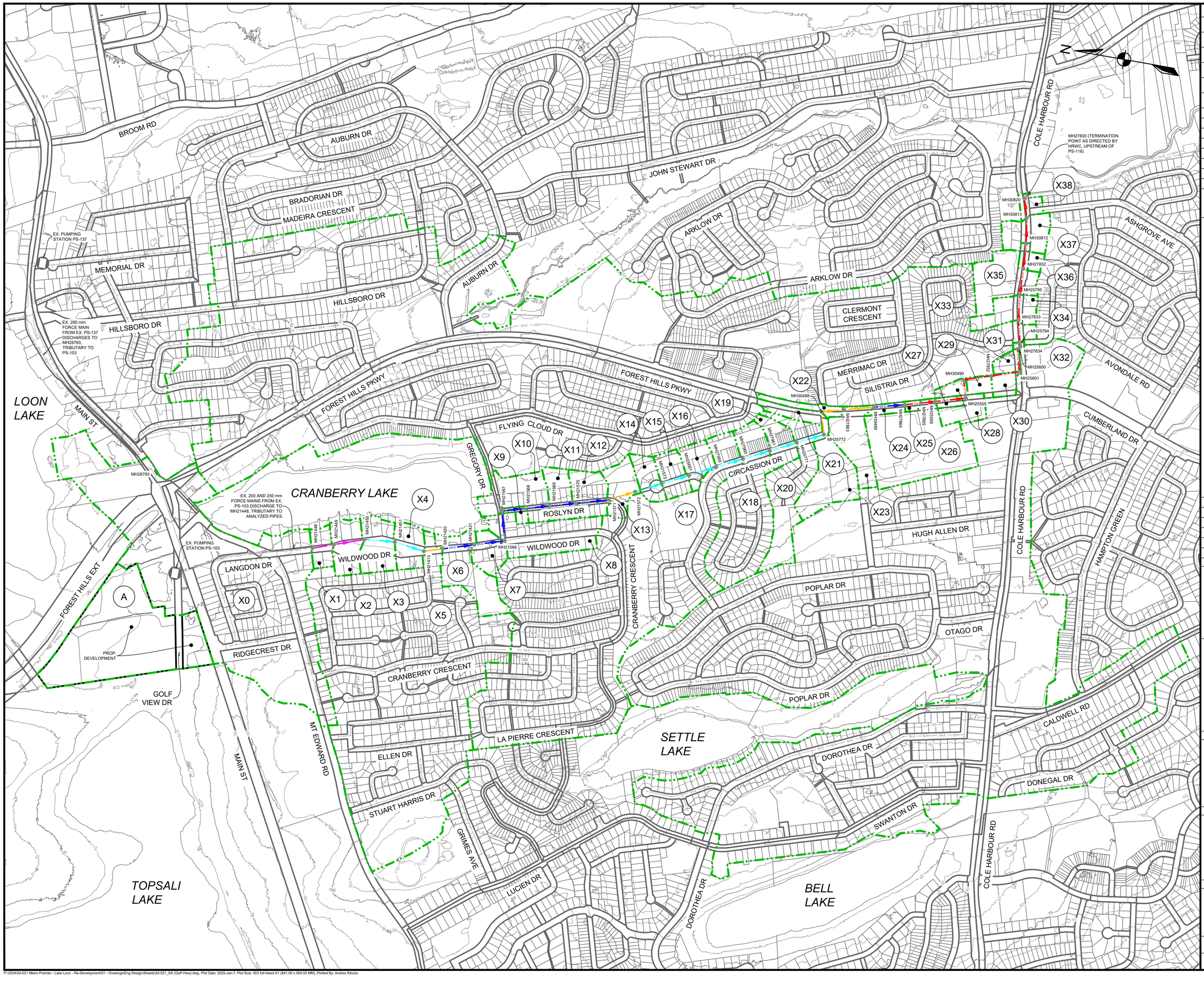
		TRIBUTARY AREAS	Total Area	Pump Station Flow	Tot. Pop. "P"	Domestic Load	Average Dry Weather	Average Dry Weather	Harmon Peaking	Peak Commercial Load	Peak Commercial Load	Peak Dry Weather	Peak Dry Weather	Safety Factor	Peak Dry Weather incl SF	I/I Allowance	I/I Loading	Peak Wet Weather	Pipe Size	Pipe Slope	Pipe Manning's	Pipe Capacity	Percent Full	NOTES
U/S MH	D/S MH		(Ha)	(L/s)	People	(L/day)	(L/day)	(L/s)	Factor	(L/day)	(L/s)	(L/day)	(L/s)		(L/s)	(L/s/Ha)	(L/s)	(L/s)	(mm)	(%)	"n"	(L/s)	(%)	
MH27865	MH25556	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26	113.46	150.00	3904	300	1171200	13.56	3.34	429503	4.97	4344545	50.3	1.25	62.9	0.28	31.8	244.6	600	0.60%	0.010	618.9	40	Pipe information missing from HRWC Records. Minimum slope assumed.
MH25556	MH25555	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27	113.72	150.00	3904	300	1171200	13.56	3.34	429503	4.97	4344545	50.3	1.25	62.9	0.28	31.8	244.7	600	0.59%	0.010	613.3	40	
MH25555	MH30490	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28	114.97	150.00	3976	300	1192800	13.81	3.34	457880	5.30	4436670	51.4	1.25	64.2	0.28	32.2	246.4	600	0.49%	0.010	560.5	44	
MH30490	MH27952	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29	115.39	150.00	4055	300	1216500	14.08	3.33	457880	5.30	4506412	52.2	1.25	65.2	0.28	32.3	247.5	600	0.45%	0.010	533.2	46	
MH27952	MH25601	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30	115.88	150.00	4055	300	1216500	14.08	3.33	457880	5.30	4506412	52.2	1.25	65.2	0.28	32.4	247.6	600	0.53%	0.010	583.0	42	
MH25601	MH25600	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31	116.33	150.00	4055	300	1216500	14.08	3.33	466358	5.40	4514890	52.3	1.25	65.3	0.28	32.6	247.9	600	1.67%	0.010	1031.4	24	
MH25600	MH27834	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32	228.85	150.00	7230	300	2169000	25.10	3.09	2336364	27.04	9045147	104.7	1.25	130.9	0.28	64.1	344.9	600	3.25%	0.010	1440.6	24	
MH27834	HM25794	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32	228.85	150.00	7230	300	2169000	25.10	3.09	2336364	27.04	9045147	104.7	1.25	130.9	0.28	64.1	344.9	600	1.18%	0.010	866.7	40	
HM25794	MH27833	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33	347.37	150.00	11329	300	3398700	39.34	2.90	3664879	42.42	13523356	156.5	1.25	195.7	0.28	97.3	442.9	600	0.98%	0.013	607.4	73	
MH27833	MH25795	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34	348.68	150.00	11340	300	3402000	39.38	2.90	3718285	43.04	13584900	157.2	1.25	196.5	0.28	97.6	444.2	600	1.23%	0.013	682.0	65	
MH25795	MH27832	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35	351.04	150.00	11660	300	3498000	40.49	2.89	3736591	43.25	13839331	160.2	1.25	200.2	0.28	98.3	448.5	600	1.22%	0.013	680.2	66	
MH27832	MH30812	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36	351.50	150.00	11660	300	3498000	40.49	2.89	3797233	43.95	13899973	160.9	1.25	201.1	0.28	98.4	449.5	600	3.92%	0.013	1217.1	37	
MH30812	MH30813	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37	352.82	150.00	11660	300	3498000	40.49	2.89	3848101	44.54	13950841	161.5	1.25	201.8	0.28	98.8	450.6	600	6.60%	0.013	1579.0	29	
MH30813	MH30820	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38	353.23	150.00	11660	300	3498000	40.49	2.89	3853690	44.60	13956430	161.5	1.25	201.9	0.28	98.9	450.8	600	0.60%	0.013	476.1	95	Pipe information missing from HRWC Records. Minimum slope assumed.
MH30820	MH27830	X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, X24, X25, X26, X27, X28, X29, X30, X31, X32, X33, X34, X35, X36, X37, X38	353.23	150.00	11660	300	3498000	40.49	2.89	3853690	44.60	13956430	161.5	1.25	201.9	0.28	98.9	450.8	600	9.17%	0.013	1861.4	24	



LEGEND

EX. 350 mm PIPE	SA-E SA-E SA-E SA-E
EX. 400 mm PIPE	SA-E SA-E SA-E SA-E
EX. 450 mm PIPE	SA-E SA-E SA-E SA-E
EX. 500 mm PIPE	SA-E SA-E SA-E SA-E
EX. 600 mm PIPE	SA-E SA-E SA-E SA-E
SEWERSHED AREA	

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	
SA-E	SANITARY PIPE	
FM-E	FORCE MAIN	

SUBCATCHMENT ID — A1

NOTES:

1. CONTOUR INTERVAL IS 5 METRES. CONTOUR DATA OBTAINED FROM PROVINCIAL LiDAR.
2. EX. SANITARY PIPES COLOUR CODED FOR PIPES INCLUDED IN DOWNSTREAM ANALYSIS ONLY.

150 0 METRES 150 300

1:5000

ISSUE	DATE	DESCRIPTION	INT.
1	APR. 19, 2024	ISSUED FOR REVIEW	NF

CONSULTANT

DESIGNPOINT
engineering • surveying • solutions
902.832.5597 designpoint.ca

PRELIMINARY
APR. 19, 2024

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

GOLF VIEW DEVELOPMENT

DARTMOUTH, NOVA SCOTIA

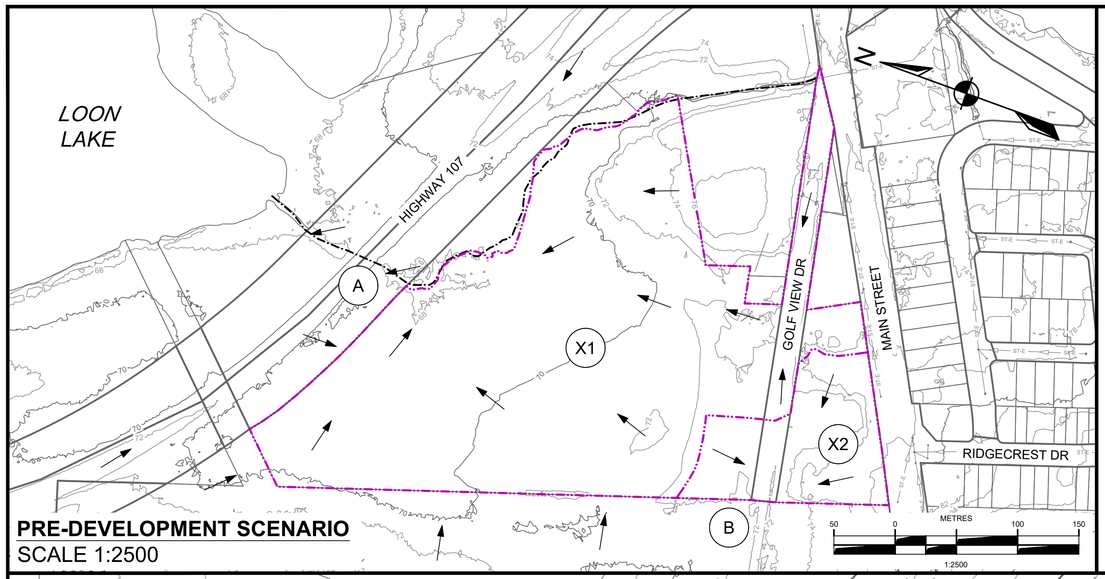
SHEET DESCRIPTION

DOWNSTREAM WASTEWATER CAPACITY ANALYSIS

Drawn: A. KITSUTA	Engineer: N. FOUGERE	Project No.: 24-021	Drawing No.: SA-01
Scale: 1:5000	Filename: 24-021_SA (Golf View).dwg		1 of 1

P:\2024\24-021 Metro Premier - Lake Loon - Re-Development\01 - Drawings\Eng Design\Sheets\24-021_SA (Golf View).dwg, Plot Date: 2025-Jan-7, Plot Size: ISO full bleed A1 (841.00 x 594.00 MM), Plotted By: Andres Kitsuta

APPENDIX F – STORMWATER SCHEMATIC AND CALCULATIONS



PRE-DEVELOPMENT SCENARIO
SCALE 1:2500

DESIGN FLOW BASED ON SCS WATERSHED RUNOFF MODEL WITH SYNTHETIC DESIGN STORM AS PER HALIFAX SPECIFICATIONS (2023). 24 HR RAINFALL DEPTHS AS FOLLOWS:

- 5 YEAR RETURN: 124 mm
- 10 YEAR RETURN: 145 mm
- 25 YEAR RETURN: 169 mm
- 50 YEAR RETURN: 188 mm
- 100 YEAR RETURN: 204 mm

ANTECEDENT MOISTURE CONDITION (AMC) = 2

LOT GRADING FOR EACH LOT MUST ULTIMATELY DIRECT RUNOFF TOWARDS STORM WATER SYSTEM WHICH DRAINS TO CORRESPONDING DOWNSTREAM BALANCE POINT.

FLOW ALLOWANCES FOR EACH LOT GROUP WERE CALCULATED ASSUMING THE FLOW FROM THE RIGHT OF WAY WILL BE UNCONTROLLED. ALL STORM WATER MANAGEMENT INFRASTRUCTURE IS ASSUMED TO BE ON INDIVIDUAL LOTS, SUBJECT TO INDIVIDUAL DETAILED DESIGN.

LOW-IMPACT DEVELOPMENT (LID) / BEST MANAGEMENT PRACTICE (BMP) SUBJECT TO INDIVIDUAL DETAILED LOT DESIGN, REQUIRED ON EACH INDIVIDUAL LOT AS PER CURRENT EDITION HALIFAX REGIONAL MUNICIPALITY STORM WATER GUIDELINES. RUNOFF RESULTING FROM 10 mm 10-MINUTE DESIGN STORM FOLLOWING 5-YEAR DISTRIBUTION TO BE CONTAINED ON EACH INDIVIDUAL SITE.

SURFACE COVERAGE - X1	
DESCRIPTION	AREA (Ha)
BUILDING	0.02
PAVED	0.34
GRASS	7.09
WOODS	1.24

SURFACE COVERAGE - X2	
DESCRIPTION	AREA (Ha)
BUILDING	0.10
PAVED	0.74
GRASS	0.47
WOODS	0.08

PRE-DEVELOPMENT CATCHMENT SCS PARAMETERS			
ID	AREA (Ha)	CN	Tc (min)
X1	8.69	75	32.3
X2	1.38	89	5.0

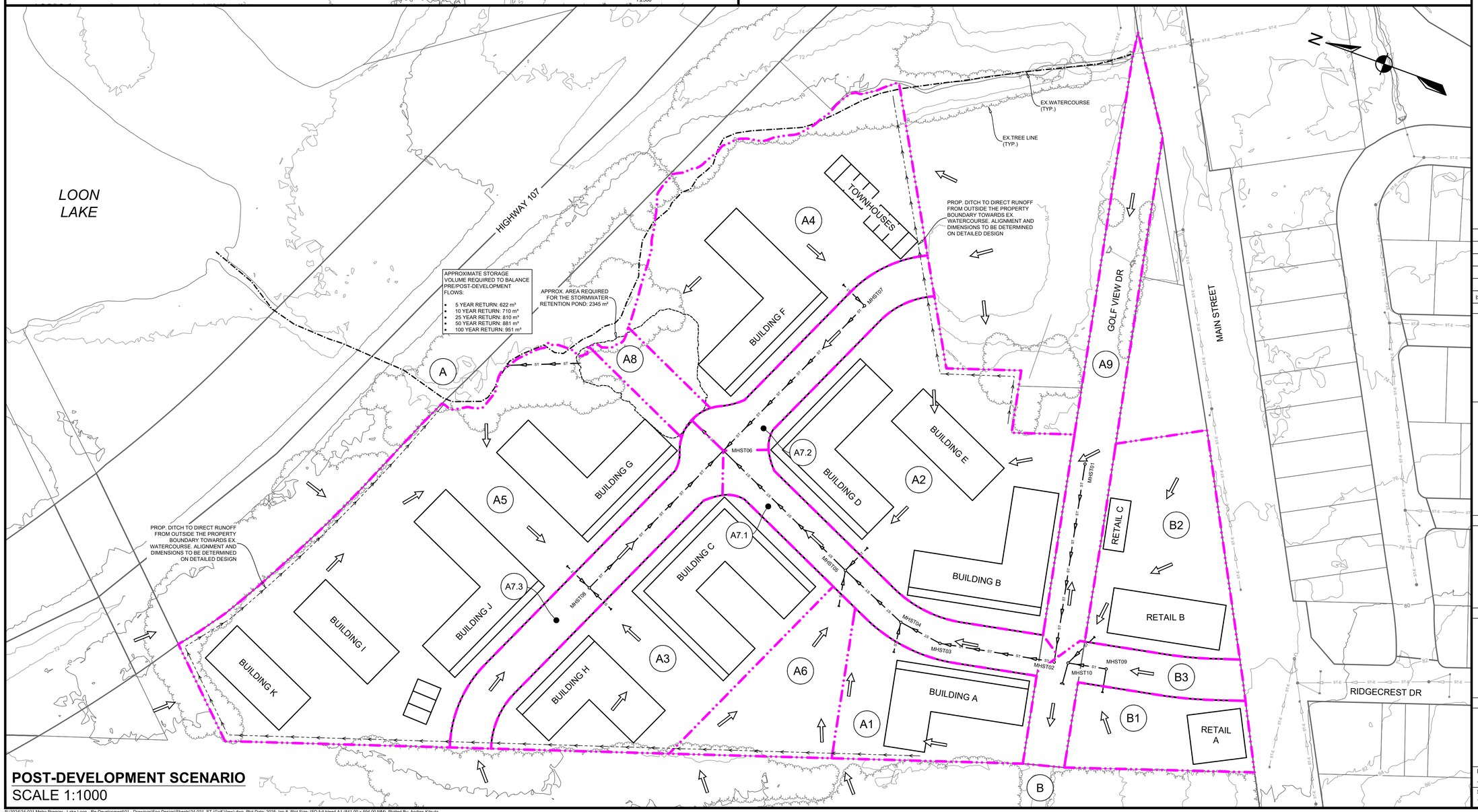
RETURN PERIOD	PRE-DEVELOPMENT RUNOFF (m^3/s)	
	X1	X2
5-YR	0.5617	0.2816
10-YR	0.7140	0.3383
25-YR	0.9025	0.4080
50-YR	1.0422	0.4558
100-YR	1.1814	0.5075

RETURN PERIOD	ALLOWABLE POST-DEVELOPMENT RUNOFF (m^3/s/Ha)	
	LOT GROUP A	LOT GROUP B
5-YR	0.07	0.24
10-YR	0.09	0.29
25-YR	0.11	0.35
50-YR	0.13	0.39
100-YR	0.15	0.43

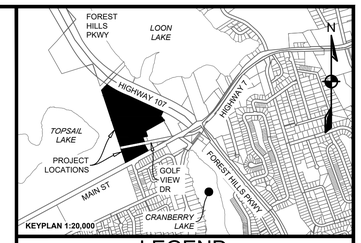
LOT GROUP A1: BUILDING A
LOT GROUP A2: BUILDINGS B, D, AND E
LOT GROUP A3: BUILDINGS C AND H
LOT GROUP A4: BUILDINGS4 AND TOWNHOUSES
LOT GROUP A5: BUILDINGS G, I, J, AND K
LOT GROUP B1: RETAIL A
LOT GROUP B2: RETAILS B AND C

POST-DEVELOPMENT LOT GROUP AREAS	
LOT GROUP	AREA (Ha)
A1	0.48
A2	1.45
A3	1.07
A4	1.33
A5	2.42
B1	0.32
B2	0.62

UPSTREAM DEVICE	DOWNSTREAM DEVICE	TRIBUTARY AREAS	DESIGN EVENT	FLOW TO PIPE	FLOW TO PIPE	PIPE SIZE	PIPE SLOPE	MANNING'S COEFFICIENT	PIPE CAPACITY	PERCENT FULL
				(m^3/s)	(L/s)	(mm)	(%)	"n"	(L/s)	(%)
MHST01	MHST02	A9	1 IN 5 YR	0.1149	114.9	450	0.50	0.013	201.8	56.9
MHST02	MHST06	A1, A2, A6, A7.1	1 IN 5 YR	0.2614	261.4	600	0.50	0.013	434.6	60.1
MHST07	MHST06	A4, A7.2	1 IN 5 YR	0.1404	140.4	450	0.50	0.013	201.8	69.6
MHST08	MHST06	A3, A5, A7.3	1 IN 5 YR	0.3387	338.7	600	0.50	0.013	434.6	77.9
MHST06	POND	A1-A9	1 IN 5 YR	0.8365	836.5	900	0.50	0.013	1281.4	65.3
POND	EX. WATERCOURSE	A1-A9 (BALANCED)	1 IN 5 YR	0.5617	561.7	750	0.50	0.013	788.0	71.3
MHST09	MHST10	B1-B3	1 IN 5 YR	0.2816	281.6	600	0.50	0.013	434.6	64.8



POST-DEVELOPMENT SCENARIO
SCALE 1:1000



LEGEND

EXISTING		PROPOSED
10	MAJOR CONTOUR	10
10	MINOR CONTOUR	10
	EASEMENT	
	RIGHT OF WAY	
	LOT LINE	
ST-E	STORM PIPE	ST ST
	SUBCATCHMENT AREA	

	EXISTING	PROPOSED		EXISTING	PROPOSED
PRECAST HEADWALL			CATCHBASIN		
CATCHMENT ID		A	SUBCATCHMENT ID		A1

ELEVATIONS ARE REFERENCED TO NOVA SCOTIA PROVINCIAL LIDAR (CGVD2013). CONTOUR INTERVAL IS 2 m.

A	JAN. 08, 2025	ISSUED FOR REVIEW	AK
ISSUE	DATE	DESCRIPTION	INT.

CONSULTANT

DESIGNPOINT
engineering • surveying • solutions
902.832.5597
designpoint.ca

PRELIMINARY
JAN. 08, 2025

CLIENT

METRO PREMIER PROPERTIES

PROJECT DESCRIPTION

LAKE LOON DEVELOPMENT

DARTMOUTH, NOVA SCOTIA

SHEET DESCRIPTION

STORMWATER MANAGEMENT PLAN

Drawn	Engineer	Project No.	Drawing No.
A. KITSUTA	N. FOUGERE	24-021	ST-01
Scale	Filename		1 of 6
1:1000	24-021_ST (Golf View).dwg		