

FUNCTIONAL SERVICING REPORT

PROJECT:

WEST MEADOW PH.2 BLOCK 44 APARTMENTS

LOCATED IN PICTON,

THE CORPORATION OF THE COUNTY OF PRINCE EDWARD

DATED: January 2024

PREPARED FOR:

1083953 Canada Ltd.

141 Main Street, Unit 203

Picton, ON K0K2T0

TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 OVERALL DEVELOPMENT PHASING	1
1.2 BACKGROUND STUDIES.....	2
2.0 DESIGN GUIDELINES	2
3.0 EXISTING SERVICES	2
4.0 WATER SUPPLY.....	3
4.1 SYSTEM PRESSURE REQUIREMENTS	3
4.2 FIRE FLOW REQUIREMENTS.....	3
4.3 DOMESTIC WATER DEMAND	4
4.4 HYDRAULIC MODELING RESULTS	4
5.0 WASTEWATER.....	4
5.1 DESIGN CRITERIA	4
5.2 SEWAGE FLOW RATES AND DOWNSTREAM CAPACITY ASSESSMENT	5
6.0 STORM SEWERS	5
7.0 PUBLIC UTILITIES.....	5
8.0 CONCLUSIONS	6

DRAWINGS

C-SVC-1: Servicing Plan

C-GR-1: Grading Plan

APPENDICES

APPENDIX A: Required Fire Flow (RFF) and water modeling results by Jewell Engineering

APPENDIX B: Sanitary Design Sheets and sanitary modeling results by JF Sabourin and Associates

1.0 INTRODUCTION

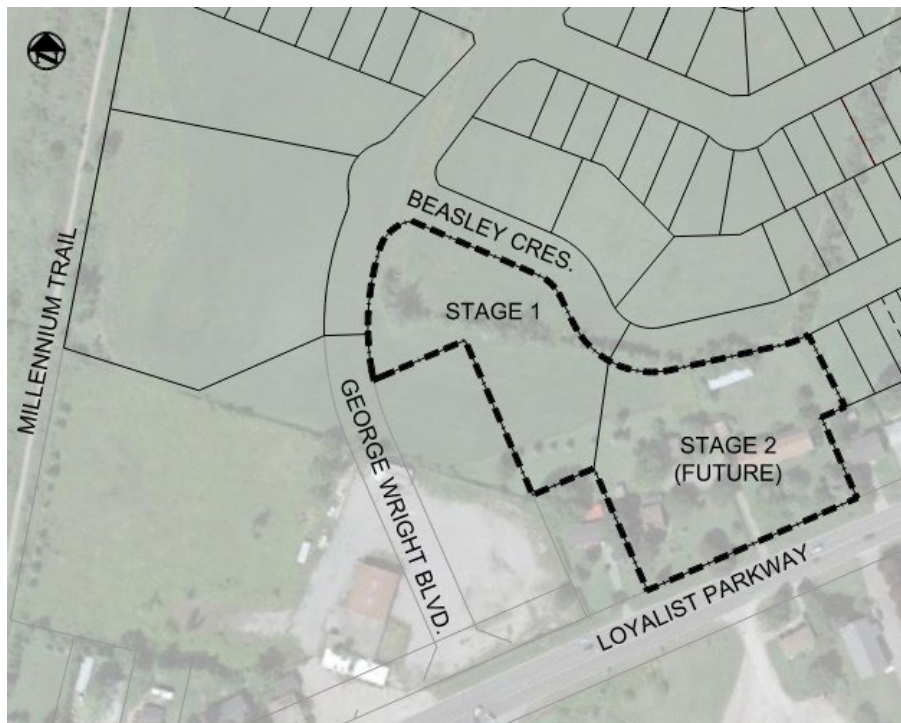
This Report has been prepared to support zoning amendment and site plan approval to construct two apartment buildings in Picton within the Corporation of the County of Prince Edward. The site to be developed is within Block 44 of the West Meadow Phase 2 Subdivision. The proposed development includes a parking lot, and each proposed apartment building will be 5-storeys with seventy-eight units.

The site area is 0.79 hectares and is generally located to the northeast of Loyalist Parkway and George Wright Boulevard. Road access will be provided from Beasley Crescent to the north of the site. There are no significant features to be removed from the site for construction, including buildings, trees, or natura/heritage features.

1.1 Overall Development Phasing

The West Meadow Subdivision development is intended to include two high density developments. This Report is for the purpose of approvals related to Stage 1 of the two high density blocks. The engineering design has been prepared in consideration to both stages of development, as they will be serviced by the same infrastructure. The first stage (the first two apartment buildings forming part of the current application for approval) is anticipated to commence construction in 2024, while the future stage is intended to be completed in 2027.

Property Location Map



The purpose of this Report is to demonstrate how the proposed development will be serviced, including water, sanitary and storm, connections to existing municipal infrastructure, and availability of capacity in the municipal system to accommodate additional capacity of the proposed development. The Report will also address all impacts on downstream infrastructure that could require system upgrades.

It should be noted that changes may materialize during the detailed design process with the building permit application.

1.2 Background Studies

This Report considers the following Studies previously completed in support of Subdivision Registration of the West Meadow Subdivision development:

- Stormwater Management Report for West Meadow Subdivision, dated December 2021 prepared by Ainley Group.
- Geotechnical Investigations Report for West Meadow Phase 2, dated November 8, 2023, prepared by Cambium. Report recommendations include servicing excavation methods and proposed pavement structure for the detailed design of the parking lot.

Based on the borehole investigation completed, depth to groundwater is anticipated to be approximately 2.5m to 4.5m below existing ground and bedrock was encountered approximately 4.0m to 5.5m below existing ground.

2.0 DESIGN GUIDELINES

Water and sanitary servicing for the proposed development has considered the following Guidelines:

- Prince Edward County Engineering Design Guidelines and Technical Standards (currently in draft version)
- Ontario Building Code

3.0 EXISTING SERVICES

Based on the approved West Meadow Subdivision Phase 2 engineering drawings and the topographic survey completed in 2023, municipal services and public utility services will be readily available at the boundary to service the proposed buildings and parking lot drainage. The existing services are illustrated on the attached Servicing Plan.

4.0 WATER SUPPLY

The proposed design conforms with the MECP Design Guidelines for Drinking-Water Systems and the Municipality's Design Manual. Layout of the proposed water services is illustrated on the attached Servicing Plan.

Each apartment will be serviced with a 200mm dia. water service. The proposed building fronting George Wright Boulevard will connect to the existing 200mm dia PVC watermain. The development will include a new 300mm dia watermain to loop the existing 300mm watermain on Beasley Crescent to the existing 250mm watermain on Loyalist Parkway. The easterly building will connect to the new 300mm watermain.

The proposed watermain system will include mechanical restraints at all hydrants and fittings (if pipe length is less than 6.1m) to prevent pipe movement and subsequent joint failure. Thrust blocks will be positioned at all plugs, tees and bends deflecting 22.5 deg or more. The watermain system is designed to meet the following Guidelines:

- Minimum depth of cover of 1.8m (measured from centreline of road)
- Pipe material specification PVC DR18 for pipes 300mm dia and smaller)
- Minimum separations between watermain and sewer; 2.5m horizontal and 0.5m vertical

Watermain chlorination and testing procedures will be completed in accordance with the municipal guidelines.

4.1 System Pressure Requirements

In accordance with MECP and municipal Guidelines, the system should be designed to maintain a minimum pressure of 140 kPa (20 psi) under maximum day demand plus fire flow conditions. The normal operating pressure in the distribution system should be 350 to 480 kPa (50 to 70 psi) and not less than 275 kPa (40 psi).

4.2 Fire Flow Requirements

In accordance with MECP and municipal Guidelines, fire flow requirement calculations shall be based on the Fire Underwriters Survey (FUS) document Water Supply for Public Protection 2000. The estimated amount of water required for fire protection in a building has been calculated using the Fire Underwriters Survey Formula for Required Fire Flow (RFF), and is provided in *Appendix A*.

$RFF (l/s) = 220 C \sqrt{A}$, where:

C = Construction Coefficient

A (sqm)= total effective floor area

Based on the FUS formula, the Required Fire Flow (RFF) for each 5-storey building is 117 L/s (7000 L/min).

4.3 Domestic Water Demand

The domestic water demand has been calculated in accordance with MECP Design Guidelines for Drinking-Water Systems Peaking Factors Table 3-1, based on the population of Prince Edward County of 25,000.

- Maximum Day Factor: 1.90
- Peak Hour Factor 2.85

The proposed development density for the two 5-storey building has been assumed as a High-Density development, including 80% 2-bdrm 2.1 persons/unit and 20% 1-bedrm 1.4 persons/unit.

The domestic water demand calculations are provided in *Appendix A*.

4.4 Hydraulic Modeling Results

A hydraulic water model has been completed by Jewell Engineering to confirm adequacy of the existing and proposed municipal watermain system (see Appendix A). Based on the modeling results, the availability of capacity in the municipal watermain will be adequate to meet the pressure and flow requirements of the proposed development.

It should be noted that the calculations are based on the building design parameters provided by the project architect (Alexander Wilson Architects) including the construction type and sprinkler protection, which should be reconfirmed at the time of building permit applications.

5.0 WASTEWATER

The proposed development will be serviced by the existing municipal wastewater system. Individual 150mm dia service connections will discharge to the existing 200mm dia PVC sanitary sewers on George Wright Boulevard and Beasley Crescent fronting the property. Layout of the proposed sanitary services is illustrated on the attached Servicing Plan.

5.1 Design Criteria

The Rational Method calculation was used to design the proposed sewage flow rates with the following municipal parameters:

- Residential (q) : average daily per capita flow (L/day/person) = 350
- Extraneous (i) : Unit of peak extraneous flow (L/s/ha) = 0.28
- Population density: Person per unit:
High Density: one bdrm PPU : 1.4, two bedrm: 2.1 PPU

The sanitary system is designed to meet the following Guidelines:

- Minimum depth of cover of 2.5m (measured from centreline of road)
- Minimum pipe Slope: 2% for service laterals
- Pipe material specification PVC DR35 for mainline and PVC DR28 for service laterals

5.2 Sewage Flow Rates and Downstream Capacity Assessment

The proposed flows are provided on the sanitary sewer design sheet in *Appendix B*. The sanitary sewer design sheet includes the comparison of flows assumed with the West Meadow Ph.2 Subdivision design and illustrates that the proposed connections of the future stage 2 buildings to Loyalist Parkway will reduce the flows on George Wright Boulevard so that its capacity will be reduced to a maximum 80%.

As requested by County staff during pre-consultation, the municipal sanitary model has been updated to include the proposed sanitary flows. The modeling results were prepared by JF Sabourin and Associates and are included in Appendix B.

Based on the modeling results, the existing downstream system is adequately sized to accommodate the proposed development, concluding there is no known impact due to the proposed development and no need for expansions or upgrades. Appendix Ba includes the graphed maximum HGL under the ultimate condition along Loyalist Parkway, from the site connection to the intersection with Lake Street. From this figure, it can be shown that no pipes are surcharged.

6.0 STORM SEWERS

The site development will necessitate the addition of a catchbasin manhole in the boulevard of Beasley Crescent to capture parking lot runoff, which will connect to the existing storm sewer. The project Stormwater Management Report prepared by INSITE details how the stormwater drainage conforms with the available capacity of offsite stormwater management controls.

7.0 PUBLIC UTILITIES

The proposed apartments will be serviced with public utilities including Canada Post, underground electrical power by Hydro One Networks, natural gas by Enbridge and telecommunications by Tenacity. Providers will design the proposed infrastructure.

8.0 CONCLUSIONS

- The proposed High Density residential Site Plan is 0.79 hectares and generally located to the northeast of Loyalist Parkway and George Wright Boulevard. The development will consist of two apartments building each 5-storeys and seventy-eight units, with a parking lot.
- The apartments will be serviced with 200mm dia water connections; one will connect to the existing 200mm watermain on George Wright Boulevard and the other to a proposed 300mm watermain along the east side of the site, which will loop the West Meadow Subdivision distribution watermains to Loyalist Parkway.
- Based on the water modeling results, the municipal system will be adequate to meet the proposed development's flow demands and pressure requirements.
- The apartments will be serviced with individual 150mm dia laterals and connect to the existing 200mm dia sanitary sewer system fronting the property on George Wright Boulevard and Beasley Crescent.
- Based on the sanitary modeling results, the existing downstream system is adequately sized to accommodate the proposed development, concluding there is no known impact due to the proposed development and no need for expansions or upgrades.
- The site development will necessitate the addition of a catchbasin manhole in the boulevard of Beasley Crescent to capture parking lot runoff which will connect to the existing storm sewer. The project Stormwater Management Report prepared by INSITE details how the proposed site stormwater drainage conforms with the available capacity of offsite stormwater management controls.
- Public utility providers will design subdivision servicing for Canada Post, underground electrical power by Hydro One Networks, natural gas by Union Gas and telecommunications.

9.0 REPORT LIMITATIONS

General content, findings and results included in this report are based on information made available by the client, municipality, and external parties at the time of its writing. It has been assumed that the information provided is accurate and reliable, unless expressly noted otherwise. INSITE will not be held responsible or accountable for any errors, omissions or misleading information provided by others. Any changes in material following the provision of services and submission of the Report that may result in outdated and incorrect information is not collected by INSITE for the purpose of maintaining the Report current, unless expressly requested by the client.

The Report is based on INSITE's knowledge of application legislation, regulations, engineering standards and industry guidelines stated in the Report.

Reliance on this report is reserved for the purpose stated and may be relied on by the client. Any other party that uses its work for reliance without INSITE's express written consent shall do so at their own risk. INSITE shall not be held liable for loss or damages incurred by any person or company relying on the contents of this Report. Use of this Report subject to intellectual property rights.

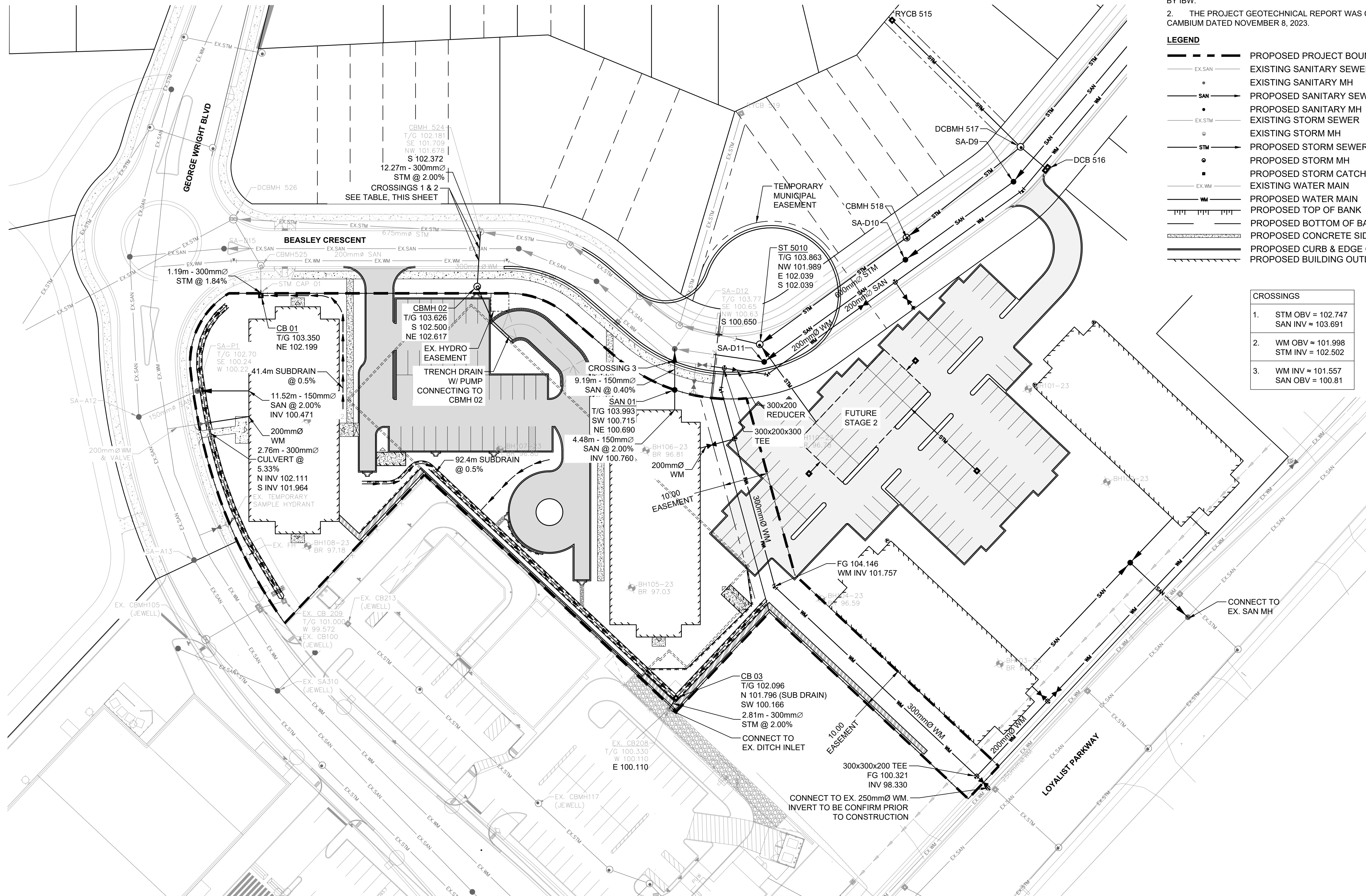
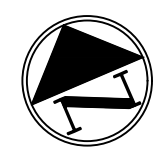
The user should be aware of the possibility of digital manipulation of the Report contents by parties external to INSITE. It is expected that INSITE be promptly notified of such occurrences.

This Report has been prepared by:



Nancy Dionne, P. Eng,
nancy.dionne@insiteconsulting.ca

DRAWINGS



PROJECT BENCHMARK:

- PROJECT BENCHMARK ELEVATION 106.917: TOP NUT OF FIRE HYDRANT LOCATED WITHIN TALBOT STREET RIGHT-OF-WAY TO THE EAST OF THE SITE APPROXIMATELY 260M EAST OF WHERE THE MILLENNIUM TRAIL CROSSES TALBOT STREET.
- PROJECT BENCHMARK ELEVATION 103.67: THE CORNER OF CONCRETE VAULT AT THE END OF THE CUL DE SAC.

PROJECT NOTES:

- THE TOPOGRAPHIC SURVEY WAS COMPLETED BY IBW IN 2023, AND THE PROPERTY BOUNDARY SURVEY WAS COMPLETED BY IBW.
- THE PROJECT GEOTECHNICAL REPORT WAS COMPLETED BY CAMBIUM DATED NOVEMBER 8, 2023.

- LEGEND**
- PROPOSED PROJECT BOUNDARY
 - EX.SAN --- EXISTING SANITARY SEWER
 - EXISTING SANITARY MH
 - SAN --- PROPOSED SANITARY SEWER
 - PROPOSED SANITARY MH
 - EX.STM --- EXISTING STORM SEWER
 - EXISTING STORM MH
 - STM --- PROPOSED STORM SEWER
 - PROPOSED STORM MH
 - PROPOSED STORM CATCH BASIN
 - EX.WM --- EXISTING WATER MAIN
 - WM --- PROPOSED WATER MAIN
 - TOP --- PROPOSED TOP OF BANK
 - BOT --- PROPOSED BOTTOM OF BANK
 - CON --- PROPOSED CONCRETE SIDEWALK
 - CURB --- PROPOSED CURB & EDGE OF PAVEMENT
 - BLDG --- PROPOSED BUILDING OUTLINE

CROSSINGS

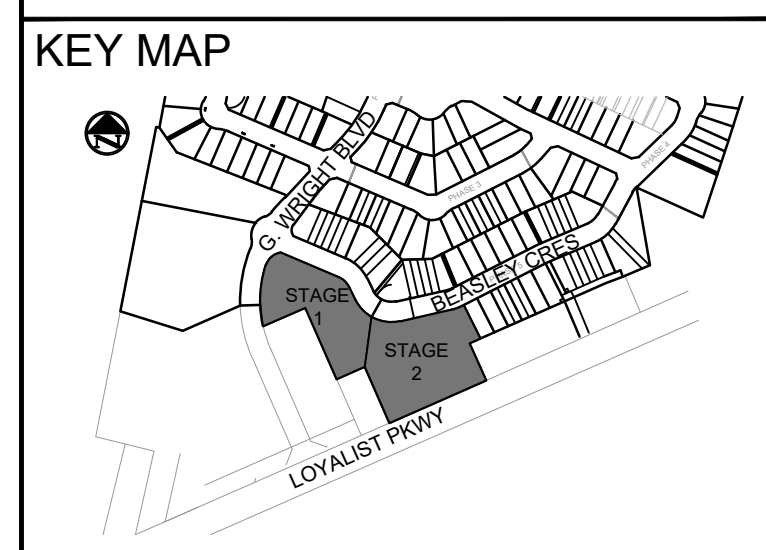
1.	STM OBV = 102.747 SAN INV = 103.691
2.	WM OBV = 101.998 STM INV = 102.502
3.	WM INV = 101.557 SAN OBV = 100.81



CLIENT

PROJECT 22-104

WEST MEADOW APARTMENTS SITE PLAN



LEGEND
SEE C-GEN-3

INSITE

PROJECT CONSULTING INC.

DRAWN BY: D.YIN
DESIGNED BY: N.DIONNE, P.ENG

REVISIONS

#	M/D/Y	BY	ISSUED FOR
1	01/08/24	N.D	REZONING

DRAWING TITLE

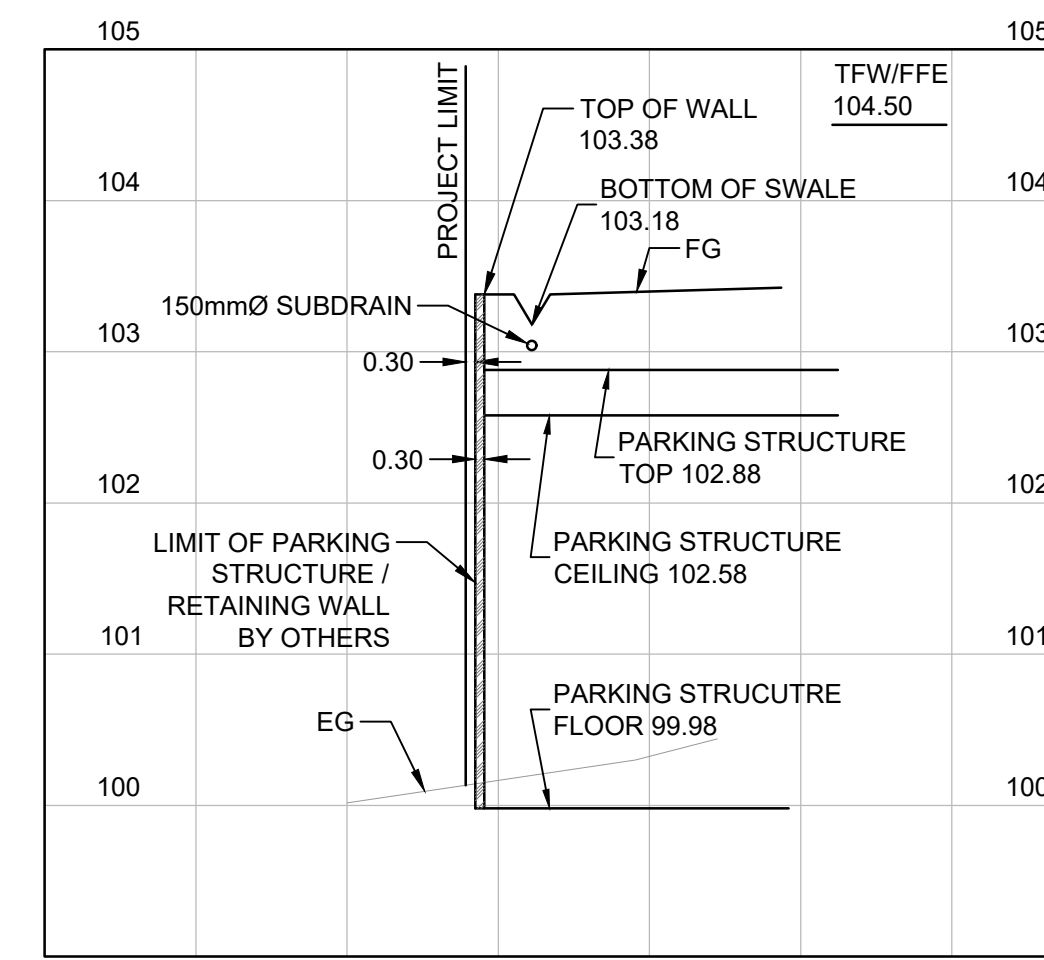
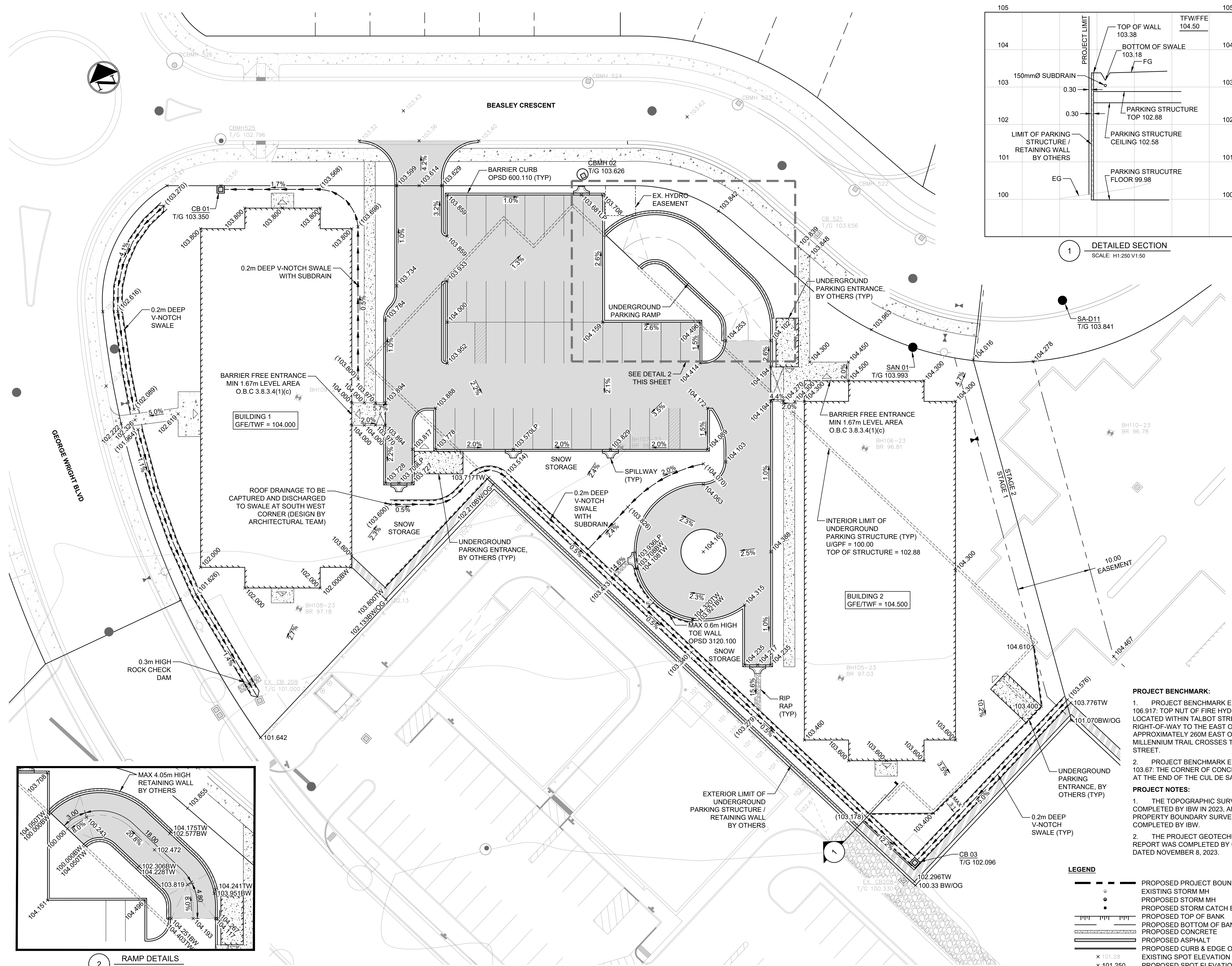
SERVICING PLAN - STAGE 1

SCALE **1:500** DWG. NO. **C-SVC-1**

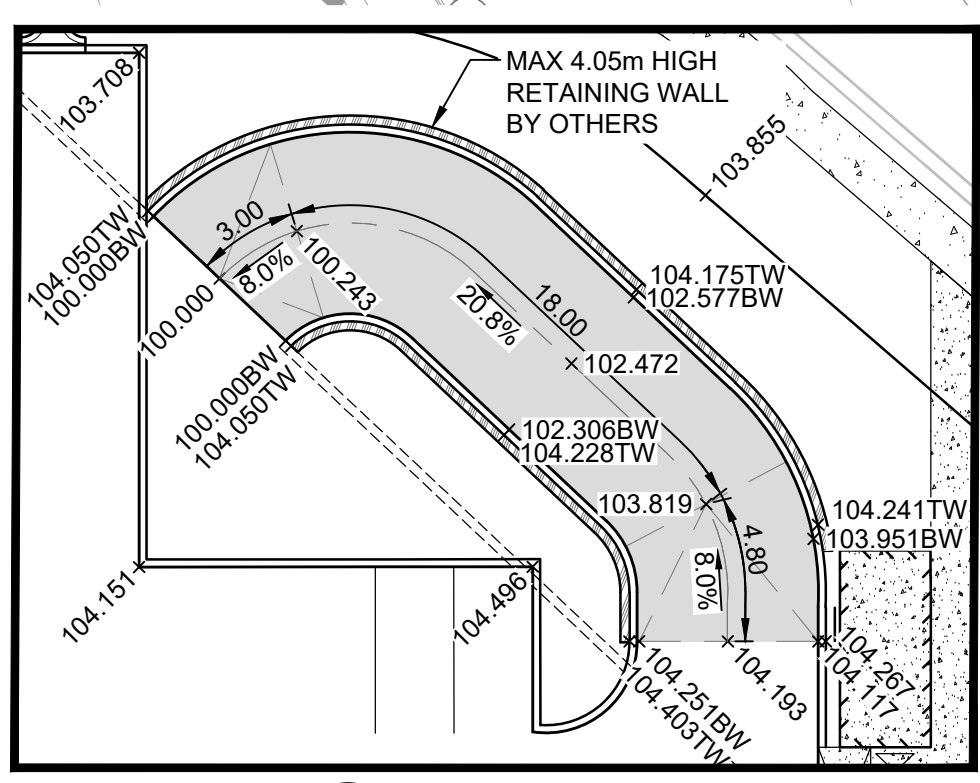
SIZE ANSI D (22"X34")

C:\USERS\15279\ONEHDRIIVE - INSITE PROJECT CONSULTING INC\PROJECTS\22-104 WEST MEADOW PH2 SITE PLANNING\02 LAYOUTS\22-104 -SERVICING PLAN.DWG

C:\USERS\1527\ONE\DRIVE - INSITE PROJECT CONSULTING INC\PROJECTS\22-104 WEST MEADOW PH2 SITE PLANNING\02 LAYOUTS\22-104 - GRADING PLANNING



1 DETAILED SECTION
SCALE: H1:250 V1:50



2 RAMP DETAILS
SCALE: 1:250

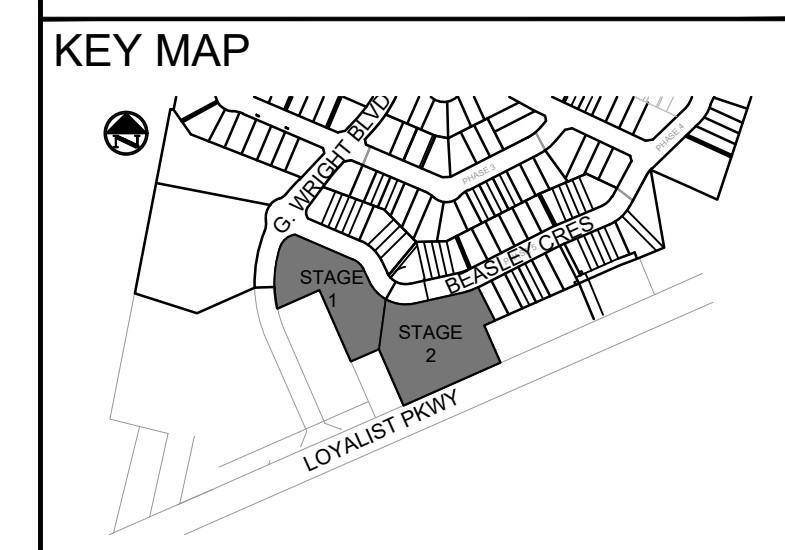
- PROJECT BENCHMARK:**
- PROJECT BENCHMARK ELEVATION 106.917: TOP NUT OF FIRE HYDRANT LOCATED WITHIN TALBOT STREET RIGHT-OF-WAY TO THE EAST OF THE SITE APPROXIMATELY 260M EAST OF WHERE THE MILLENNIUM TRAIL CROSSES TALBOT STREET.
 - PROJECT BENCHMARK ELEVATION 103.67: THE CORNER OF CONCRETE VAULT AT THE END OF THE CUL DE SAC.
- PROJECT NOTES:**
- THE TOPOGRAPHIC SURVEY WAS COMPLETED BY IBW IN 2023, AND THE PROPERTY BOUNDARY SURVEY WAS COMPLETED BY IBW.
 - THE PROJECT GEOTECHNICAL REPORT WAS COMPLETED BY CAMBIUM DATED NOVEMBER 8, 2023.

LEGEND

---	PROPOSED PROJECT BOUNDARY
○	EXISTING STORM MH
●	PROPOSED STORM MH
○	PROPOSED STORM CATCH BASIN
	PROPOSED TOP OF BANK
	PROPOSED BOTTOM OF BANK
---	PROPOSED CONCRETE
---	PROPOSED ASPHALT
---	PROPOSED CURB & EDGE OF PAVEMENT
x 101.28	EXISTING SPOT ELEVATION
x 101.250	PROPOSED SPOT ELEVATION
2.0%	PROPOSED SLOPE



CLIENT
**Port Picton
HOMES**
PROJECT 22-104
**WEST MEADOW
APARTMENTS
SITE PLAN**



LEGEND
SEE C-GEN-3

INSITE
PROJECT CONSULTING INC.

DRAWN BY: D.YIN
DESIGNED BY: N.DIONNE, P.ENG

REVISIONS

#	M/D/Y	BY	ISSUED FOR
1	01/08/24	N.D	REZONING

DRAWING TITLE
**GRADING PLAN
- STAGE 1**

SCALE **1:250** DWG. NO.
SIZE ANSI D **C-GR-1**
(22"X34")

APPENDIX A

Required Fire Flow Calculations and Water Modeling results by
Jewell Engineering



10839353 Ontario Ltd.
141 Main Street, Unit 203
Picton, ON, K0K 2T0

November 13, 2023

Attn: Nancy Dionne, P.Eng.
Insite Project Consulting Inc.

Re: **West Meadow Subdivision – Phase 2 Apartments
Water Modeling Results
Jewell Engineering File Number: 230-5392**

BELLEVILLE
(HEAD OFFICE)
1–71 Millennium Pkwy.
Belleville ON K8N 4Z5
Tel: 613-969-1111
info@jewelleng.ca

TOLL FREE
1-800-966-4338

KINGSTON
208–4 Cataraqui St.
Kingston ON K7K 1Z7
Tel: 613-389-7250
kingston@jewelleng.ca

OAKVILLE
214–231 Oak Park Blvd.
Oakville, ON L6H 7S8
Tel: 905-257-2880
oakville@jewelleng.ca

www.jewelleng.ca

Dear Ms. Dionne,

Port Picton Homes is looking to construct Phase 2 Apartments of the West Meadow subdivision. Jewell was requested to review water servicing that would be required to ensure adequate flow and pressure for this phase. It is known that there is low pressure in the location and that future looping is anticipated to improve water pressures.

Two scenarios were modeled and tested against the minimum tolerable pressures:

1. Peak Hour Minimum 40 psi
2. Max Day + Fire Flow Minimum 20 psi

Domestic demands were provided by Insite for two buildings of 78 units each using 320 L/person/day and 1.4 persons per 1-bedroom units and 2.1 persons per 2-bedroom units. A summary of the domestic demands is in Table 1. The Insite demand calculations are attached.

Table 1: Domestic Demand Summary

Domestic Demands	Flow per Building (L/s)
Average Day Demand	0.6
Peak Hour Demand (Factor = 2.85)	1.7
Max Day Demand (Factor = 1.9)	1.1



Professional Engineers
Ontario

Authorized by the Association of Professional Engineers
of Ontario to offer professional engineering services.



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES
ONTARIO

Analysis

Scenario 1 – Peak Hour

Peak hour demand of 1.7 L/s per building (for a total demand of 3.4 L/s) was applied at Nodes J2280 and J2284. The model indicates system pressures would be more than 48 psi under the design conditions supplied by Insite. This is greater than the 40 psi minimum requirement; therefore, there is no concern with meeting the domestic demands for peak hour (see Table 2).

Scenario 2 – Max Day + Fire Flow

Fire flow for the two buildings was calculated by Insite using the 2020 Fire Underwriters Survey. The required fire flow is calculated to be 117 L/s for Phase 2.

A 300mm watermain is needed to create a loop from Loyalist Parkway to the 300mm watermain in front of the new apartments to supply the fire demand. The watermain modification is illustrated in Figure 1.

A fire flow of 117 L/s and a max day demand of 1.1 L/s was applied to Node J2284, and a max day demand of 1.1 L/s was applied to Node J2280. The resulting residual pressures with the looped watermain were greater than 20 psi (see Table 2).

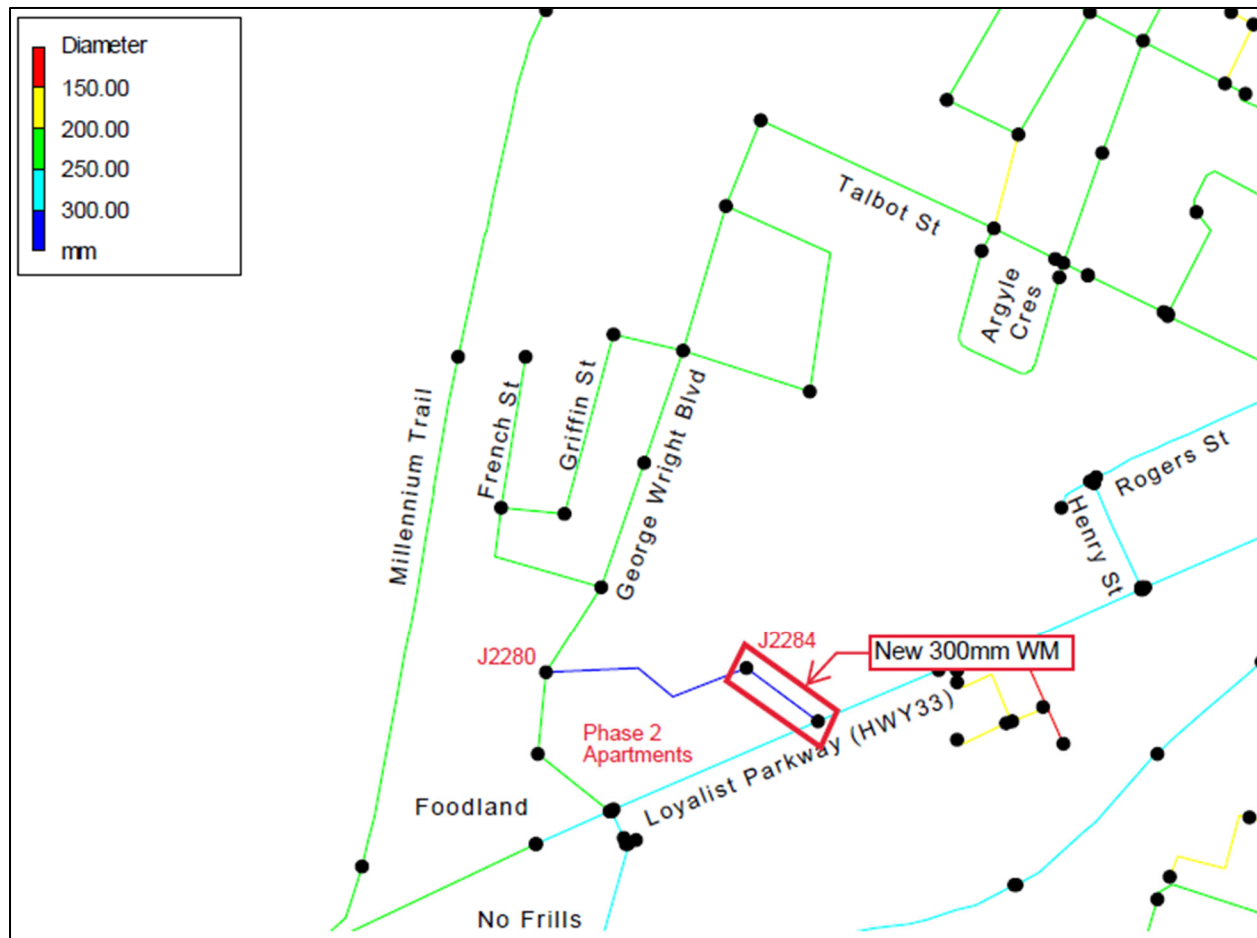



Figure 1: Water Model Map

Table 2: Water Model Results

Water Model Results							
Building	Juntion ID	Elevation (m)	Base Demand (L/s)	1 - Peak Hour		2 - Max Day + Fire Flow	
				Demand (L/s)	Pressure (psi)	Demand (L/s)	Pressure (psi)
1	J2280	103.50	0.6	1.7	50.3	1.1	30.3
2	J2284	104.50	0.6	1.7	48.9	118.1	28.4
	Designed: Julie Humphries, C.E.T. Checked: Bryon Keene, P.Eng.			Note: Fire flow event at J2284	Project: West Meadows Phase 2 Apartments		

Summary

Jewell found the existing dead-end watermain is not adequate to provide the required fire flow. A 300 mm watermain (approximately 85 metres in length) is required to loop the dead-end watermain to the existing 250 mm watermain on Loyalist Parkway. With the 300 mm watermain loop, the Picton water system is adequate to meet peak flow demands for all of Phase 2 while maintaining a minimum pressure of 48.9 psi, which exceeds the minimum allowable of 40 psi. Furthermore, we found that fire flow demands can be met during maximum day usage while maintaining a minimum pressure more than 20 psi in the system.

If you have any questions, please feel free to contact the undersigned.

Sincerely,

Julie Humphries

Julie Humphries, C.E.T.
Jewell Engineering Inc.



Bryon Keene, P.Eng.
Jewell Engineering Inc.

1. FIRE FLOW REQUIREMENT CALCULATIONS
West Meadow Subdivision - Phase 2 Apartments
Municipal Criteria: The Corporation of the County of Prince Edward



Prepared by: Nancy Dionne, P.Eng
 Date: November 2023

Fire flow requirements per Fire Underwriters Survey Water Supply for Public Fire Protection, 2020

RFF (l/s) = 220 C √A, to the nearest 1,000 LPM, where:

C = Construction Coefficient

A (sqm)= total effective floor area

PARAMETERS	Building 1	Building 2
A. Determine Construction Coefficient '<C)		
1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)		
0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)		
0.6 for fire resistive construction (fully protected frame, floors, roof)	0.8	0.8
B. Determine Total Effective Floor Area (A)		
Construction Type of Exposed Building Face (per Architect)	protected openings	protected openings
For C < 1.0:		
a) two largest adjoining floors plus 50% of each of any floors immediately above them up to eight, when the vertical openings of enclosure walls are inadequately protected (less than one hour rating).		
OR b) only the area of the largest floor plus 25% of each of the two immediately adjoining floors, when the vertical openings are properly protected (per NBC Div B, Sec 3.5 Vertical Transportation).	1537.5	1537.5
C. Calculate Required Fire Flow (LPM)		
Fire Flow Equation:	6901	6901
C1 - Fire Flow (Rounded to nearest 1,000 LPM)	7000	7000
D. Determine Occupancy Content Adjustment Factor:		
D1 - Residential (Limited Combustible)	-15%	-15%
E. Determine Automatic Sprinkler Protection:		
E1 - % Reduction for Sprinkler Credit (per Architect)	-30%	-30%
F. Determine Total Exposure Adjustment Charge (max 75%):		
a) Exposure distance: Interior distance between Bldgs 1 and 2	2	2.0
Table 6 Max. Exposure Adjustment Charge	25%	25%
b) Exposure distance: Distance to north THs	30	30.0
Table 6 Max. Exposure Adjustment Charge	5%	5%
c) Exposure distance: Distance to south buildings	20.0	6.5
Table 6 Max. Exposure Adjustment Charge	10%	20%
F1 - Total Max. Exposure Charge = a + b + c	40%	50%
G. Final Required Fire Flow (nearest 1000 LPM):		

PARAMETERS	Building 1	Building 2
Adjusted Fire Flow (L/min) = $C1+C1*(D1+E1+F1)$	6650	7350
Adjusted Fire Flow, rounded to nearest 1000 (L/min)	7000	7000
Required Fire Flow (L/s)	117	117
Max Available (L/s)	125	125

Notes:

1. Nov 2023 AWA advised that : "and yes the vertical openings are to be protected as for the sprinkler system, the system should be designed in accordance with nfpa 13 and it should be a fully supervised system but we can't speak to the water supply. "

2. DOMESTIC WATER DEMAND CALCULATIONS



West Meadow Subdivision - Phase 2 Apartments

Municipal Criteria: The Corporation of the County of Prince Edward

Prepared by: Nancy Dionne, P.Eng

Date: October 2023

DESIGN DENSITIES (POP)		
Low Density: Singles, semis / duplex PPU :	3.0	
Med Density: Triplex, Fourplex, THs PPU :	2.5	
High Density: Apartments (54 to 300 units/Ha) PPU :		
	1 bdrm: 1.4	3 bdrm: 2.4
	2 bdrm: 2.1	4 bdrm: 3.0

BUILDING 1

Average day per capita (L per person/day)	320	A
Number of Units (Apartments)	78	B
PPU Density (Number of Person /unit) 80% 2-bdrm unit / 20% 1-bedrm	1.96	C
* Maximum Day Factor:	1.9	D
* Peak Hour Factor	2.85	E
Required Fire Flow (RFF) L/s	117	F

* Peaking Factors shall be based on MECP Design Guidelines for Drinking Water Systems Tables 3.1 and 3.3 in consultation with the Development Services Department.

FLOW REQUIREMENTS	L/day	L/min	L/sec
Average Day Demand ADD $Q_{ave} = A \times B \times C$	48,921.6	34.0	0.6
Max Day Demand MDD $Q_{mdd} = Q_{ave} \times D$	92,951.0	64.5	1.1
Peak Hour Demand PHD $Q_{phd} = Q_{ave} \times E$	139,426.6	96.8	1.6
Total Demand TD $Q_{td} = Q_{mdd} + RFF$		7,064.5	117.7

BUILDING 2

Average day per capita (L per person/day)	320	A
Number of Units (Apartments)	78	B
PPU Density (Number of Person /unit) 80% 2-bdrm unit / 20% 1-bedrm	1.96	C
Maximum Day Factor:	1.9	D
Peak Hour Factor	2.85	E
Required Fire Flow (RFF) L/s	117	F

FLOW REQUIREMENTS	L/day	L/min	L/sec
Average Day Demand ADD $Q_{ave} = A \times B \times C$	48,921.6	34.0	0.6
Max Day Demand MDD $Q_{mdd} = Q_{ave} \times D$	92,951.0	64.5	1.1
Peak Hour Demand PHD $Q_{phd} = Q_{ave} \times E$	139,426.6	96.8	1.6
Total Demand TD $Q_{td} = Q_{mdd} + RFF$		7,064.5	117.7

APPENDIX B

Sanitary Design Sheet and Sanitary Modeling Results prepared
by JF Sabourin and Associates

Pipe Name	Inlet Node	Outlet Node	Dia (m)	Length	Upstream Invert	Downstream Invert	Upstream HGL	Downstream HGL	Upstream Freeboard	Downstream Freeboard
C128	PROP-SA-206	PROP-SA-205	0.3	55.1	98.38	98.25	98.5	98.41	0.18	0.14
C129_1	PROP-SA-205	PROP-SA-204	0.3	221.391	98.25	98.05	98.41	98.2	0.14	0.15
C129_2	PROP-SA-204	PROP-SA-203	0.3	89.8	98.05	97.85	98.2	98.01	0.15	0.14
C87	PROP-SA-203	PROP-SA-202	0.3	92.8	97.85	97.64	98.01	97.76	0.14	0.18
C82	PROP-SA-202	PROP-SA-201	0.3	34.5	97.64	97.47	97.76	97.55	0.18	0.22
C83	PROP-SA-201	519	0.3	12.1	97.47	97.17	97.55	97.31	0.22	0.16
109	519	518	0.3	64.27	97.17	96.918	97.31	97.07	0.16	0.15
110	518	517	0.3	80.84	96.918	96.685	97.07	96.89	0.15	0.09
111	517	j400	0.3	56.52	96.685	96.63	96.89	96.79	0.09	0.14
C70	j400	516	0.3	21.44	96.63	96.581	96.79	96.74	0.14	0.14
112	516	515	0.3	90.84	96.581	96.39	96.74	96.59	0.14	0.10
113	515	514	0.3	89.4	96.39	96.234	96.59	96.33	0.10	0.20
114	514	513	0.3	95.05	96.234	93.881	96.33	93.95	0.20	0.23
C89	513	MH522	0.25	17.1	93.881	92.62	93.95	93.05	0.18	-0.18
C149	MH522	520	0.25	64.2	92.62	92.38	93.05	92.66	-0.18	-0.03
352	520	521	0.25	46.9	92.38	92.19	92.66	92.08	-0.03	0.36
C35	521	872	0.6	45.7	91.95	91.5	92.08	91.59	0.47	0.51
156	872	837	0.6	75.5	91.48	90.11	91.59	89.92	0.49	0.79
157	837	834	0.6	90.7	89.75	89.3	89.92	89.41	0.43	0.49
C25	834	893	0.6	65.4	89.25	88.84	89.41	88.95	0.44	0.49
C26	893	1015	0.6	21.1	88.79	88.65	88.95	88.76	0.44	0.49
207	1015	SAN_MH8	0.6	81.3	88.6	88.11	88.76	88.23	0.44	0.48
208_1	SAN_MH8	SAN_MH9	0.6	64.6	88.06	87.68	88.23	87.8	0.43	0.48
208_2	SAN_MH9	791	0.6	18.8	87.62	87.52	87.8	87.8	0.42	0.32
209_1	791	J18.	0.6	6	87.702	87.318	87.8	87.43	0.50	0.49
209_2	J18.	961	0.375	72.152	87.318	82.809	87.43	82.99	0.26	0.19

Ultimate Conditions - Sanitary - Loyalist Parkway

Peak values

HGL

