Enhancing our communities

116 Bond Street

FUNCTIONAL SERVICING REPORT

Sullnet Holdings Inc.

File 323899 | September 11, 2025

Document Control

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Issue	Date	Description
3	December 20, 2024	Revised Site Plan
4	July 2, 2025	City Review Comments
5	September 11, 2025	Final – Issued for ZBA

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1 Introduction

Tatham Engineering Limited has been retained by Sullnet Holdings Inc. to prepare a Functional Servicing Report (FSR) in support of a proposed residential townhome development located in the City of Orillia (City). A Stormwater Management Report and Traffic Impact Brief have been completed under separate cover.

1.1 SITE DESCRIPTION

The overall development site is approximately 0.22 ha in size and is located at 116 Bond Street within the City of Orillia. The property is bound by Bond Street to the south, existing single family residential properties to the east and west and an existing townhome development to the north. The adjacent 120 Bond Street parcel, approximately 0.15 ha in size, is also owned by the applicant and may be subject to future applications, however, is not proposed for development at this time.

The location of this property is shown on the Site Location Plan (Figure 1) enclosed.

1.2 PROPOSED DEVELOPMENT

The proposed development includes eighteen residential townhome units accessed via a new private roadway, coinciding with the existing driveway on the east side of the parcel, extended from Bond Street. The proposed units will reside on the west side of the existing parcel with parking provided along the front of the units and additional snow storage areas provided at the northern limit of the parcel. Private water and sewer infrastructure will be extended to the site from existing municipal infrastructure on Bond Street. Additional details of the proposed development site are illustrated on the Site Plan prepared by API Development Consultants Inc. and Fabiani Architects Ltd. submitted under separate cover. This report provides background support for Zoning approvals.

1.3 BACKGROUND INFORMATION

A number of guidelines, background reports and studies relating to municipal services development in the area were utilized in preparation of this report as follows:

- City of Orillia, Wastewater System Master Plan Update (Ainley Group, 2022);
- City of Orillia, Water System Master Plan (Tatham Engineering, 2022);
- City of Orillia, Watermain Replacement and Asphalt Resurfacing Drawing P4 & P5 (2008);
- City of Orillia, Engineering Design Criteria (2012)

- Design Guidelines for Drinking Water Systems (MECP, 2008);
- Design Guidelines for Sewage Works, Storm Sewers and Forcemains for Alteration Authorized Under Environmental Compliance Approvals (MECP, 2022);
- Water Supply for Public Fire Protection (Fire Underwriters Survey, 2020); and
- Fire Hydrants: Installation, Field Testing, and Maintenance, 5th edition, AWWA.

2 Water Supply & Distribution

2.1 EXISTING WATER SYSTEM

The City maintains an existing 150 mm diameter PVC watermain along Bond Street located within pressure Zone 1. Hydrants numbered 12 & 13 are located along Bond Street with Hydrant 12 located in front of 110 Bond Street, southwest of the development. Hydrant flow testing was completed on May 14, 2025, by Simcoe Sewer & water Ltd. and was utilized to assess the water servicing capacity as summarized in Table 1. Supporting calculations and copies of the flow testing reports are provided in Appendix A.

Table 1: Fire Hydrant Flow Data Summary

HYD. NO.	LOCATION	STATIC PRESSURE		PITOT PRESSURE		FLOW RATE			
						Measured		Estimated at 20psi	
		(kPa)	(psi)	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)
12	No. 110 Bond St.	544	80	462	68	87.4	1,384	208	3,301
13	No. 430 Gill St.	558	82	394	58	80.8	1,280	135	2,137

An average available fire flow of 172 L/s is calculated for the Bond Street watermain across the frontage of the development when a residual pressure of 138 kPa (20 psi) is applied. Calculations are provided in Appendix A.

2.2 PROPOSED WATER SYSTEM

The proposed development will be serviced with a 50 mm diameter private watermain connected to the existing watermain on Bond Street. Each unit will be serviced with individual 25 mm water services connected to the new private watermain. A 50 mm riser with blowoff at the terminal end of the common watermain is provided for flushing and sampling.

A future 50 mm watermain complete with isolation valve and cap near the property line is conceptually shown along the property frontage to allow future servicing of the 120 Bond Street property, pending combination of the two properties through separate application. Should development of 120 Bond Street proceed, this configuration will minimize disruption to the proposed site, its residents and the municipal roadway. Additional details are provided on the Site Servicing Plan (Drawing SS.1).

The existing fire hydrant located adjacent to the property will provide sufficient fire protection to the development with all dwellings located within a 90 m radius of the hydrant, therefore no on-site hydrant is proposed.

2.3 PROPOSED DESIGN FLOWS

Water demands for the site have been estimated by applying an average daily consumption rate of 300 L/person/day and a density of 2.95 people/unit per City criteria. Maximum daily demand and peak hour demand were considered for both the City criteria and MECP guidelines. To ensure the proposed watermain is suitable to service development of 120 Bond Street in the future, an additional 16 units were also considered in the design calculations. The flows are summarized in Table 2 with supporting calculations provided in Appendix A.

Table 2: Water Servicing Demands

SCENARIO	AVERAGE DAILY FLOW (L/day)	CITY CRITERIA		MECP GUIDELINES	
		Max. Day (L/day)	Peak Hour (L/day)	Max. Day (L/day)	Peak Hour (L/day)
Proposed	16,200	25,920	72,900	139,320	210,600
Future	30,600	48,960	137,700	208,080	312,120

Applying the minimum peaking factors per City Criteria, pressure losses to the ceiling space of a 3-storey home were calculated to be 119.0 kPa (17.3 psi). The existing static pressure at Hydrant 12 is 551.6 kPa (80 psi) resulting in a supply pressure of 432.6 kPa (62.7 psi) to the ceiling space. There is minimal change to the supply pressure when accounting for future development when applying the City criteria.

Applying the peaking factors per the MECP Guidelines, pressure losses to the ceiling space of a 3-storey home were calculated to be 158.2 kPa (22.9 psi), resulting in a supply pressure of 393.4 kPa (57.1 psi) for the proposed development. Including allowances for future development, the pressure losses are calculated between 151.3 kPa and 154.5 kPa (21.9 psi to 22.4 psi), resulting in service pressures between 397.1 kPa and 400.3 kPa (57.6 psi to 58.1 psi). It is expected existing pressure in the main will be sufficient to service the proposed buildings recognizing the MECP peaking factors applied are very conservative.

2.4 FIRE PROTECTION

The fire flow demands of the site were calculated using Fire Underwriters Survey (2020). Assuming ordinary construction and no firewalls between units the fire flow demands for Blocks A and B-1 are 133 L/s and 100 L/s, respectively. The available flow from existing fire hydrant No. 12 is 208 L/s while the average available fire flow between hydrant No. 12 and hydrant No. 13 on Gill Street is 172 L/s. The average flow is suitable for protection of both Block A and Block B-1 with no further protection measures provided actual construction materials meet the definition of ordinary construction in the FUS.

Supporting fire protection calculations are included in Appendix A.

3 Sanitary Sewer Collection

3.1 EXISTING SANITARY SYSTEM

The proposed development is located within drainage area 12 and conveys sewage flows to the James Street trunk sanitary main. Bond Street is serviced by a 250 mm diameter sanitary sewer with existing peak flows between MH 167 and MH 166 reaching 2.92 L/s, representing 9.6% of the full flow capacity of 30.32 L/s. Existing flows are estimated based on City standards for occupancy and available mapping of sewer service areas.

3.2 PROPOSED SANITARY SYSTEM

A new 200 mm diameter communal sanitary sewer is proposed to service the site. Each pair of stacked units will discharge to the communal sewer via 125 mm diameter service laterals for a total of nine service connections to the proposed sewer. Connection to the existing Bond Street sewer is proposed via a new maintenance hole at the proposed connection and with a maintenance hole at the property line for access. Additional details are provided on the Site Servicing Plan (Drawing SS.1).

The calculated average daily flow from the development is 0.18 L/s. Applying the Harmon peaking factor and infiltration rate results in a peak sewage flow of 0.82 L/s. The development increases the flows between MH 167 and MH 166 to 3.61 L/s representing 11.9% of the full flow capacity.

A 200 mm service stub including a temporary cap and cleanout near the property line are also proposed for future servicing of 120 Bond Street. The proposed service stub will minimize disruption to both the proposed infrastructure and municipal roadway should the future development proceed. Accounting for the future development, average daily flows from the site increase to 0.35 L/s. Applying the Harmon peaking factor and infiltration rate results in a peak sewage flow of 1.51 L/s. Accounting for the future development, flows between MH 167 and MH 166 increase to 4.23 L/s representing 13.9% of the full flow capacity.

Sanitary sewer calculations are provided in Appendix B.

4 Erosion Control & Grading

Siltation and erosion controls should be implemented for all construction activities, including tree clearing, earthwork operations, service construction, building construction and grading works. Substantial volumes of fill will be required to raise the site to provide sufficient cover over the proposed services and to ensure emergency overflow drainage is conveyed to the Bond Street Road allowance and away from adjacent properties. A combination of retaining walls, 3:1 slopes and the proposed townhomes, as illustrated on the Site Grading Plan (Drawing SG.1), will be utilized to match existing elevations at the property limits. A temporary fill slope is also proposed on the 120 Bond Street property in lieu of retaining walls to accommodate the future development.

Details of the siltation and erosion control plan will be provided at detailed design however, controls are shown on the Removals and Erosion & Sediment Control Plan (Drawing ESC.1). A number of standard practices which will be implemented are summarized as follows:

- The disturbance area and disturbance activities will be minimized where possible;
- The smallest possible land area will be exposed for the shortest amount of time;
- Heavy duty silt control fences will be erected coincident with the property boundary prior to commencement of grading operations to control sediment movement;
- A stone mud mat will be implemented at a construction entrance in support of rough grading work and service installations;
- Straw bale check dams will be installed in ditches and swales downstream of the site and at key locations associated with proposed drainage works during rough grading work and service installations;
- Silt traps will be installed in ditch inlet catch basins adjacent to the development site;
- Regular inspection of control measures shall be instituted and repairs made as necessary; and,
- Promptly re-vegetating disturbed areas following completion of construction works within the site.

5 Utilities

All utilities (electrical, gas, telecommunications) are available within Bond Street and can be utilized to service the proposed development. Detailed design for servicing will be complete in conjunction with service providers during detailed design stage.

6 Summary

6.1 WATER SUPPLY & DISTRIBUTION

Each unit will be serviced by a 25 mm diameter domestic water service lateral connected to the new 50 mm diameter watermain extended into the property. Fire protection will be provided by the existing fire hydrant adjacent to the property.

Future servicing of 120 Bond Street can be accommodated through the proposed 50 mm service.

6.2 SANITARY SEWER COLLECTION

The site will be serviced by a 200 mm diameter sanitary sewer and 125 mm diameter service laterals to each pair of stacked townhouse units. A maintenance hole will be provided at property line to serve as a maintenance access.

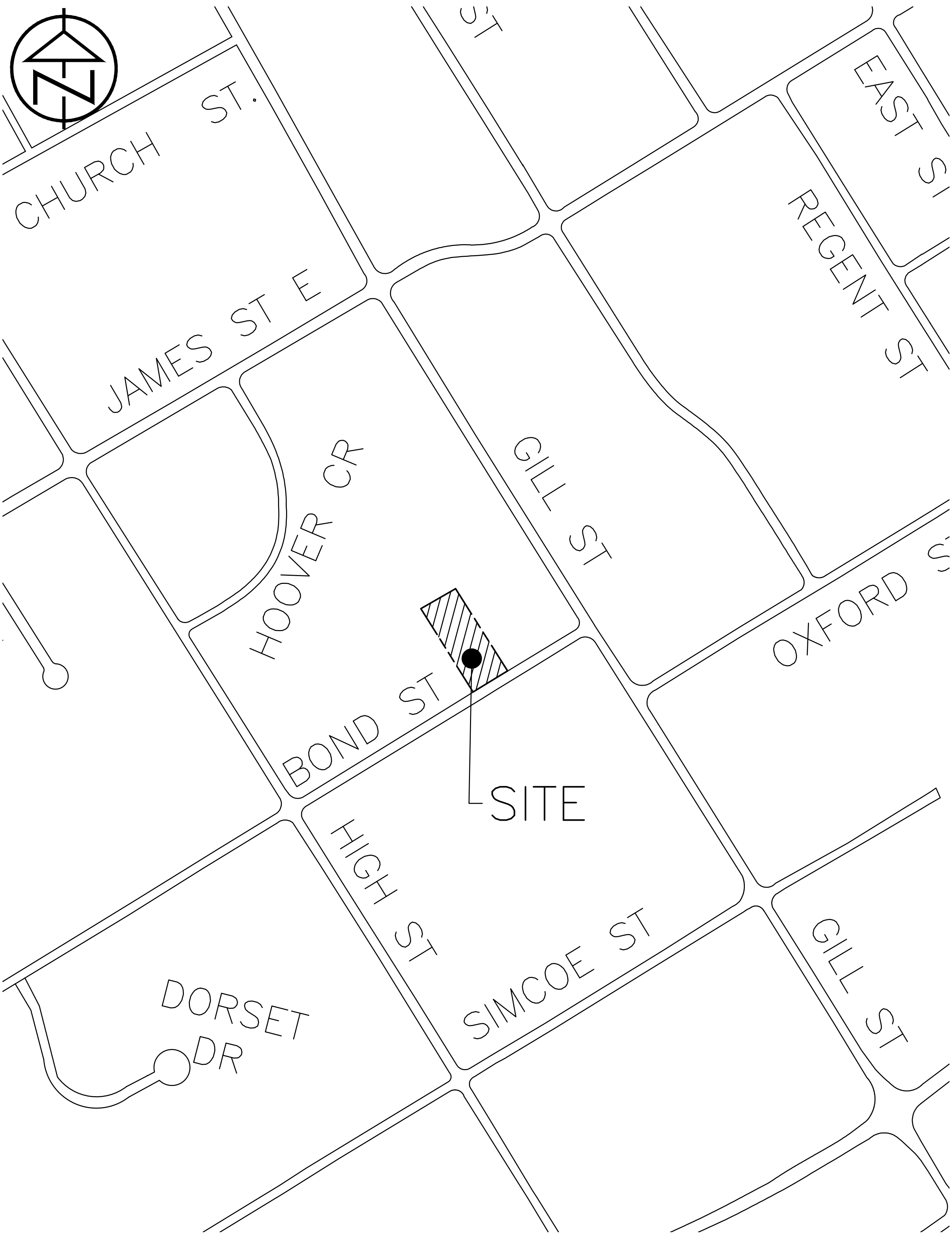
Future servicing of 120 Bond Street can be accommodated through the proposed 200 mm sewer.

6.3 EROSION CONTROL & GRADING

Erosion control devices will be installed around the perimeter of the site, inspected, and maintained regularly during construction. Proposed grading will match existing grades along the perimeter of the development.

6.4 UTILITIES

Utilities will be coordinated to service the development during the detailed design phase.



TATHAM ENGINEERING

116 BOND STREET
CITY OF ORILLIA

SCALE: NTS	DATE: MAR. 2024	DWG. No. **FIG. 1**
		JOB NO. 323899

Drawing Name: 323899 – FIG–1.dwg, Plotted: Dec 20, 2024

Appendix A:
Water Demand Calculations

ORILLIA

Hydrant Inspection & Test Report

NOTE: Hydrant Use Permit required prior to conducting inspection. Copy of both Use Permit and Inspection Report required for submission. Please submit the completed permit and test report to the City of Orillia at enviroservices@orillia.ca. Sullnetholdings@icloud.com

CUSTOMER NAME: Sullnet Holdings Inc PHONE & FAX NO: 289-680-3644

ADDRESS: 16 Hopkins Street HYDRANT LOCATION: 116 Bond Street

Thorold L2V 0E9 HYDRANT #: 12

CONTACT PERSON: Michael Sullivan MAKE/MODEL: Darling (2008)

1. Secondary Valve	O/L ☐	O/R ☐	Closed ☐	Not Visible ☐	OK ☑	Inoperable ☐
2. Ground Flange	Solid ☐	Safety ☐	Buried ☐	Damaged ☐	OK ☑	
3. Barrel	Water Level:	Self-Draining ☑	Plugged ☐			
4. Caps and Gaskets	Replaced ☐	Lubricated ☐	OK ☑			
5. Nozzles and Threads	Loose ☐	Damaged ☐	Leaking ☐	Repaired ☐	Lead ☐	OK ☑
6. Nozzle Orientation	OK ☑	Improper ☐				
7. Lubricate Hydrant	OK ☑	Replaced ☐	Missing ☐			
8. Lube Screw	OK ☑	Replaced ☐	Missing ☐			
9. Hydrant Painted	Yes ☐	No ☑	Colour ☐			
10. Pumper Nozzle	Yes ☑	No ☐	Type ☐	standard		
11. Traffic Bollards	OK ☐	Damaged ☐	Too Close ☐	N/A ☑		

☐ **Please check box if conducting visual inspection ONLY (no water flow & calculation required)**

1. Hydrostatic Testing

Prior to Opening:	underground leak	Yes ☐	No ☑
	above ground leak	Yes ☐	No ☑
Fully Open:	underground leak	Yes ☐	No ☑
Fully Closed:	underground leak	Yes ☐	No ☑

2. Fire Flow Testing

All flow tests require flow calculations to be completed as indicated below. Failure to fully complete this section will cause this form to be rejected by the Orillia Fire Department.

Pitot reading: 68 psi	462.4 kPa	minutes flowed: 1	
Pressure Test: 80 psi	544 kPa	Fire flow rating: 5242	L/min
Water Used: (L/min. x Minutes Flowed) = 5242	Litres	L/min ÷ 1000 = 5.24	m3 of water used

COMMENTS:
pull from # 11, pull rate 75 kPa
static 82

Hydrant Operation Satisfactory ☑
Hydrant Operation Unsatisfactory ☐

INSPECTION CONDUCTED BY: Brett Sanderson COMPANY NAME: Simcoe Sewer & Water Ltd

ADDRESS: 5-525 West Street South, Orillia

PHONE NO.: 705-325-8138 FAX: N/A.

SIGNATURE: Brett Sanderson DATE: May 14th 2025
Inspector

SIGNATURE: [signature] DATE: May 14, 2025
Owner

ORILLIA

Hydrant Inspection & Test Report

NOTE: Hydrant Use Permit required prior to conducting inspection. Copy of both Use Permit and Inspection Report required for submission. Please submit the completed permit and test report to the City of Orillia at enviroservices@orillia.ca. Sullnetholdings@icloud.com

CUSTOMER NAME: Sullnet Holdings Inc PHONE & FAX NO: 289-680-3644

ADDRESS: 16 Hopkins Street HYDRANT LOCATION: 430 Gill Street

Thorold L2V 0E9 HYDRANT #: 13

CONTACT PERSON: Michael Sullivan MAKE/MODEL: Darling

1. Secondary Valve	O/L ☐	O/R ☐	Closed ☐	Not Visible ☐	OK ☑	Inoperable ☐
2. Ground Flange	Solid ☐	Safety ☐	Buried ☐	Damaged ☐	OK ☑	
3. Barrel	Water Level:	Self-Draining ☐	Plugged ☑			
4. Caps and Gaskets	Replaced ☐	Lubricated ☐	OK ☑			
5. Nozzles and Threads	Loose ☐	Damaged ☐	Leaking ☐	Repaired ☐	Lead ☐	OK ☑
6. Nozzle Orientation	OK ☑	Improper ☐				
7. Lubricate Hydrant	OK ☑	Replaced ☐	Missing ☐			
8. Lube Screw	OK ☑	Replaced ☐	Missing ☐			
9. Hydrant Painted	Yes ☐	No ☑	Colour ☐			
10. Pumper Nozzle	Yes ☐	No ☑	Type ☐			
11. Traffic Bollards	OK ☐	Damaged ☐	Too Close ☐	N/A ☑		

☐ **Please check box if conducting visual inspection ONLY (no water flow & calculation required)**

1. Hydrostatic Testing

Prior to Opening:	underground leak	Yes ☐	No ☑
	above ground leak	Yes ☐	No ☑
Fully Open:	underground leak	Yes ☐	No ☑
Fully Closed:	underground leak	Yes ☐	No ☑

2. Fire Flow Testing

All flow tests require flow calculations to be completed as indicated below. Failure to fully complete this section will cause this form to be rejected by the Orillia Fire Department.

Pitot reading: 58psi	394.4 kPa	minutes flowed: 1	
Pressure Test: 82 Psi	557.6 kPa	Fire flow rating: 4845	L/min
Water Used: (L/min. x Minutes Flowed) =	4845 Litres	L/min ÷ 1000 = 4.85	m3 of water used

COMMENTS: pull from 39, pull rate 80 psi
static 85 psi

Hydrant Operation Satisfactory ☑
Hydrant Operation Unsatisfactory ☐

INSPECTION CONDUCTED BY: Brett Sanderson COMPANY NAME: Simcoe Sewer & Water Ltd

ADDRESS: 5-525 West Street South, Orillia

PHONE NO.: 705-325-8138 FAX: N/A.

SIGNATURE: Brett Sanderson DATE: May 14th 2025
Inspector

SIGNATURE: [signature] DATE: May 14, 2025
Owner

PROJECT	116 Bond Street	FILE	323899		
		DATE	6/11/2025		
SUBJECT	Available Fire Flow from Hydrant Test	NAME	JH	CHKD	JN
		PAGE	1	OF	1

DESIGN EQUATION

The following equation provided by the *AWWA M17 Fire Hydrants: Installation, Field Testing, and Maintenance* calculates the available fire flow at a desired residual pressure, given observed hydrant test results of static pressure, hydrant flow and residual pressure.

$$Q_r = Q_f \left(\frac{h_r}{h_f}\right)^{0.54}$$

Where: Q_r is the flow at a desired residual pressure (U.S. GPM)

Q_f is the observed flow (U.S. GPM)

h_r is the difference between the static pressure and the desired residual pressure (psi)

h_f is the observed drop in pressure from static pressure to residual pressure (psi)

CALCULATION *Enter values in the cells highlighted in blue*

Hydrant Test Description	Observed			Calculated		Target		
	Static Pressure (psi)	Residual Pressure (psi)	Hydrant Flow (U.S. GPM) Q_f	h_r	h_f	Residual Pressure (psi)	Hydrant Flow Q_r (GPM)	(L/s)
Hyd 13	82	58	1,280	62	24	20	2,137	135
Hyd 12	80	68	1,384	60	12	20	3,301	208
							Average AFF at 20 psi	**172**

TATHAM ENGINEERING

PROJECT	116 Bond Street	FILE	323899		
		DATE	11-Jun-2025		
SUBJECT	Water Supply Calculations Typical City Criteria	NAME	JN	CHECK	
		PAGE	1	OF	6

SITE DESCRIPTION

Proposed 18 unit stacked townhouse development with allowance for future 16 unit stacked townhouse development.

DAILY DEMAND DESIGN PARAMATERS

	Prop.	Fut.	
No. of Units	18	16	
Pop. Density	2.95	2.95	p/unit
Demand	300	300	L/p/d
Population	54	48	people
Units per Service	1	1	

Max Day Factor 1.6

Peak Hour Factor 4.5

Q = PxDxPF, where:

P = Population

D = Per Capita Demand

PF = Peaking Factor

Proposed Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	885	0.01	16,200	0.19
Maximum Day	1,416	0.02	25,920	0.30
Peak Hour	3,983	0.05	72,900	0.84
Future Demand	L/day	L/s	L/day	L/s
Average Daily	885	0.01	14,400	0.17
Maximum Day	1,416	0.02	23,040	0.27
Peak Hour	3,983	0.05	64,800	0.75

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service Type	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	Friction Loss psi	Friction Loss kPa
Service (M. Day)	25	0.02	0.0005	0.04	100	2.5	0.000	0.001	0.01
Service (Peak)	25	0.05	0.0005	0.10	100	2.5	0.003	0.005	0.04
Proposed W/M	50	0.84	0.0020	0.43	100	60.0	0.560	0.797	5.50
Future W/M	50	0.75	0.0020	0.38	100	65.0	0.488	0.694	4.79
Connection	50	1.59	0.0020	0.80	100	15.0	0.455	0.647	4.47

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:
- Peak flow utilized for dedicated domestic watermain while maximum day and fire flow are applied for combined watermains.
- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}}\right)^{1/0.54}$; where Q is converted to m^3/s.

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)	Building Height (m)	Total Head Loss		
					(m)	(psi)	(kPa)
Static Head Loss	222.50	1.80	223.12	8.70	11.12	15.813	109.03

TOTAL LOSSES

Service Type	Static Pressure		Static Loss	W/M Loss	Service Loss	Total Loss	Service Pressure	
	(psi)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(psi)
Proposed W/M	80	551.59	109.03	9.97	0.04	119.04	432.55	62.74
Future W/M	80	551.59	109.03	9.26	0.04	118.33	433.26	62.84

SUMMARY

Under typical residential peak demand, there will be sufficient pressure to service the highest floor of the development with residual pressure of 62.74 psi in the ceiling space of the uppermost floor of the proposed building.

SITE DESCRIPTION

Proposed 18 unit stacked townhouse development with allowance for future 16 unit stacked townhouse development.

DAILY DEMAND DESIGN PARAMATERS

	Prop.	Fut.	
No. of Units	18		
Pop. Density	2.95		p/unit
Demand	300		L/p/d
Population	54	0	people
Units per Service	1		

Max Day Factor	8.6
Peak Hour Factor	13

Q = PxDxPF, where:
P = Population
D = Per Capita Demand
PF = Peaking Factor

Proposed Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	885	0.01	16,200	0.19
Maximum Day	7,611	0.09	139,320	1.61
Peak Hour	11,505	0.13	210,600	2.44
Future Demand	L/day	L/s	L/day	L/s
Average Daily	0	0.00	0	0.00
Maximum Day	0	0.00	0	0.00
Peak Hour	0	0.00	0	0.00

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service Type	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	Friction Loss psi	Friction Loss kPa
Service (M. Day)	25	0.09	0.0005	0.18	100	2.5	0.010	0.015	0.11
Service (Peak)	25	0.13	0.0005	0.27	100	2.5	0.022	0.032	0.23
Proposed W/M	50	2.44	0.0020	1.22	100	60.0	3.995	5.681	39.17
Future W/M									
Connection	50	2.44	0.0020	1.22	100	15.0	0.999	1.421	9.80

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:
- Peak flow utilized for dedicated domestic watermain while maximum day and fire flow are applied for combined watermains.
- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m^3/s.

TATHAM ENGINEERING

PROJECT	116 Bond Street	FILE	323899		
		DATE	11-Jun-2025		
SUBJECT	Water Supply Calculations MECP Criteria - Proposed	NAME	JN	CHECK	
		PAGE	4	OF	6

STATIC HEAD LOSS

	Road C/L Elev	Depth to W/M	Finished Floor	Building Height	Total Head Loss		
	(m)	(m)	(m)	(m)	(m)	(psi)	(kPa)
Static Head Loss	222.50	1.80	223.12	8.70	11.12	15.813	109.03

TOTAL LOSSES

Service Type	Static Pressure		Static Loss	W/M Loss	Service Loss	Total Loss	Service Pressure	
	(psi)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(psi)
Proposed W/M	80	551.59	109.03	48.97	0.23	158.23	393.36	57.06
Future W/M								

SUMMARY

Under typical residential peak demand, there will be sufficient pressure to service the highest floor of the development with residual pressure of 57.06 psi in the ceiling space of the uppermost floor of the proposed building.

TATHAM ENGINEERING

PROJECT	116 Bond Street	FILE	323899		
		DATE	11-Jun-2025		
SUBJECT	Water Supply Calculations MECP Criteria - Future	NAME	JN	CHECK	
		PAGE	5	OF	6

SITE DESCRIPTION

Proposed 18 unit stacked townhouse development with allowance for future 16 unit stacked townhouse development.

DAILY DEMAND DESIGN PARAMATERS

	Prop.	Fut.	
No. of Units	18	16	
Pop. Density	2.95	2.95	p/unit
Demand	300	300	L/p/d
Population	54	48	people
Units per Service	1	1	

Max Day Factor	6.8
Peak Hour Factor	10.2

Q = PxDxPF, where:
P = Population
D = Per Capita Demand
PF = Peaking Factor

Proposed Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	885	0.01	16,200	0.19
Maximum Day	6,018	0.07	110,160	1.28
Peak Hour	9,027	0.10	165,240	1.91
Future Demand	L/day	L/s	L/day	L/s
Average Daily	885	0.01	14,400	0.17
Maximum Day	6,018	0.07	97,920	1.13
Peak Hour	9,027	0.10	146,880	1.70

WATERMAIN SERVICE SIZING AND FRICTION LOSS

Service Type	D (mm)	Q (L/s)	A (m^2)	V (m/s)	C	L (m)	Friction Loss (m)	Friction Loss psi	Friction Loss kPa
Service (M. Day)	25	0.07	0.0005	0.14	100	2.5	0.007	0.010	0.07
Service (Peak)	25	0.10	0.0005	0.21	100	2.5	0.014	0.021	0.15
Proposed W/M	50	1.91	0.0020	0.96	100	60.0	2.549	3.626	25.01
Future W/M	50	1.70	0.0020	0.85	100	65.0	2.221	3.158	21.78
Connection	50	3.61	0.0020	1.81	100	15.0	2.069	2.943	20.30

D - Pipe Diameter
Q - Demand Flow
A - Pipe Flow Area
V - Flow Velocity
C - Pipe Coefficient
L - Pipe Length

Notes:
- Peak flow utilized for dedicated domestic watermain while maximum day and fire flow are applied for combined watermains.
- $A = (\pi D^2)/4$; where D is converted to m.
- $V = Q/A$; where Q is converted to m^3/s.
- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}}\right)^{1/0.54}$; where Q is converted to m^3/s.

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Floor (m)	Building Height (m)	Total Head Loss (m)	(psi)	(kPa)
Static Head Loss	222.50	1.80	223.12	8.70	11.12	15.813	109.03

TOTAL LOSSES

Service Type	Static Pressure		Static Loss	W/M Loss	Service Loss	Total Loss	Service Pressure	
	(psi)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(psi)
Proposed W/M	80	551.59	109.03	45.31	0.15	154.49	397.10	57.6
Future W/M	80	551.59	109.03	42.08	0.15	151.26	400.33	58.07

SUMMARY

Under typical residential peak demand, there will be sufficient pressure to service the highest floor of the development with residual pressure of 57.6 psi in the ceiling space of the uppermost floor of the proposed building.

TATHAM ENGINEERING	Project: 116 Bond Street	Date: June 11, 2025	
	File No.: 323899	Designed: JN	
	Subject: Fire Flow Demand - Block A - Ten Units No Fire Separations	Checked	
	Revisions:		

Fire Underwriters Survey Fire Flow Calculations

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**291**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**454**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
					Total Effective Area	**745**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						6,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(900)	5,100
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	5,100
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	10.1 to 20.0 m	0.15	0.55	%	2,805	7,905
			East Side	20.1 to 30.0 m	0.10				
			South Side	3.1 to 10.0 m	0.20				
			West Side	20.1 to 30.0 m	0.10				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	7,905
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
	Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							8,000	
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						133	
		Required Duration of Fire Flow of 8,000 L/min (hrs):						2	
		Required volume for Fire Flow of 8,000 L/min (m^3):						960	

TATHAM ENGINEERING

Project: 116 Bond Street		Date:	June 11, 2025
File No.: 323899		Designed:	JN
Subject: Fire Flow Demand - Block B-1 - Eight Units No Fire Separations		Checked	
Revisions:			

Fire Underwriters Survey Fire Flow Calculations

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**216**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**337**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**553**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						5,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(750)	4,250
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	4,250
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	3.1 to 10.0 m	0.20	0.5	%	2,125	6,375
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	3.1 to 10.0 m	0.20				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	6,375
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
	Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							6,000	
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						100	
		Required Duration of Fire Flow of 6,000 L/min (hrs):						2	
		Required volume for Fire Flow of 6,000 L/min (m^3):						720	

Appendix B:
Sanitary Flow Calculations

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Date:	December 16, 2024
Version Number:	2

Project Information

116 Bond Street - Existing Condition	323899

Drawing Reference

Prepared By

JN	December 16/24

Reviewed By

Municipality

City of Orillia

Population Density

Capita per Unit	Low	Medium	High
	2.95	2.95	2.95

Infiltration

Infiltration (L/s/ha)	0.1

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	300	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	28,000	1.6
Commercial	28,000	1.6
Industrial (High)	-	-
Industrial (Low)	36,000	-

Notes

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s) Development	Average Flow (L/s) Infiltration	Average Flow (L/s) Total	Peak Flow (L/s) Development	Peak Flow (L/s) Infiltration	Peak Flow (L/s) Total	Proposed Sanitary Sewer Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
EXISTING - Populations inferred from City Design Standards and sewer mapping.																									
Bond Street		EX 168	EX 167	Residential	Medium	54	159.3	159.3	4.18	1.44	1.44	0.55	0.14	0.70	2.31	0.14	2.46	69.8	0.4%	250	0.80	39.45	0.44	88	6.2%
		EX 167	EX 166	Residential	Low	9	26.6	185.9	4.16	0.88	2.32	0.65	0.23	0.88	2.68	0.23	2.92	61.0	0.3%	250	0.62	30.32	0.38	104	9.6%
		EX 166	EX 108	Residential	Low	4	11.8	197.7	4.15	0.56	2.88	0.69	0.29	0.97	2.85	0.29	3.14	71.0	1.4%	250	1.44	70.86	0.72	78	4.4%
Hoover Court		EX 128	EX 127	Residential	Low	5	14.8	14.8	4.40	0.68	0.68	0.05	0.07	0.12	0.23	0.07	0.29	45.1	1.0%	200	1.04	32.80	0.34	34	0.9%
		EX 127	EX 126	Residential	Low	6	17.7	32.5	4.35	0.73	1.41	0.11	0.14	0.25	0.49	0.14	0.63	64.9	1.0%	200	1.04	32.80	0.41	45	1.9%
		EX 126	EX 107	Residential	Low	2	5.9	38.4	4.34	0.19	1.60	0.13	0.16	0.29	0.58	0.16	0.74	69.2	1.0%	200	1.04	32.80	0.43	48	2.2%
High Street		EX 111	EX 110	Residential	Low	2	5.9	5.9	4.43	0.27	0.27	0.02	0.03	0.05	0.09	0.03	0.12	57.0	0.3%	200	0.57	17.96	0.17	30	0.7%
		EX 110	EX 1767	Residential	Medium	9	26.6	32.5	4.35	1.23	1.50	0.11	0.15	0.26	0.49	0.15	0.64	73.5	0.3%	200	0.57	17.96	0.27	57	3.6%
		EX 1767	EX 109	Residential	High	26	76.7	109.2	4.23	0.78	2.28	0.38	0.23	0.61	1.60	0.23	1.83	19.5	0.3%	200	0.57	17.96	0.36	85	10.2%
		EX 109	EX 108	Residential	Low	8	23.6	132.8	4.21	0.60	2.88	0.46	0.29	0.75	1.94	0.29	2.23	89.9	0.3%	200	0.57	17.96	0.37	91	12.4%
		EX 108	EX 107	Residential	Low	16	47.2	377.6	4.03	1.33	7.09	1.31	0.71	2.02	5.29	0.71	6.00	157.9	0.3%	300	0.75	52.97	0.48	132	11.3%
		EX 107	EX 75	Residential	Low	12	35.4	451.4	4.00	1.02	9.71	1.57	0.97	2.54	6.26	0.97	7.23	147.8	0.3%	300	0.75	52.97	0.50	142	13.7%

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Date:	December 16, 2024
Version Number:	2

Project Information

116 Bond Street - Proposed Condition	323899

Drawing Reference

Prepared By

JN	December 16/24

Reviewed By

Municipality

City of Orillia

Population Density

Capita per Unit	Low	Medium	High
	2.95	2.95	2.95

Infiltration

Infiltration (L/s/ha)	0.1

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	300	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	28,000	1.6
Commercial	28,000	1.6
Industrial (High)	-	-
Industrial (Low)	36,000	-

Notes

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s) Development	Average Flow (L/s) Infiltration	Average Flow (L/s) Total	Peak Flow (L/s) Development	Peak Flow (L/s) Infiltration	Peak Flow (L/s) Total	Proposed Sanitary Sewer Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
PROPOSED - Populations inferred from City Design Standards and sewer mapping.																									
Bond Street	116	P SAN MH 1	P SAN MH 2	Residential	Medium	6	17.7	17.7	4.39	0.08	0.08	0.06	0.01	0.07	0.27	0.01	0.28	14.8	1.0%	200	1.04	32.80	0.33	33	0.8%
		P SAN MH 2	P SAN MH 3	Residential	Medium	12	35.4	53.1	4.31	0.14	0.22	0.18	0.02	0.21	0.79	0.02	0.82	50.0	0.5%	200	0.74	23.19	0.34	57	3.5%
		P SAN MH 3	P SAN MH 4	Residential	Medium	0	0.0	53.1	4.31	0.00	0.22	0.18	0.02	0.21	0.79	0.02	0.82	10.1	0.5%	200	0.74	23.19	0.34	57	3.5%
Bond Street		P 168	P SAN MH 4	Residential	Medium	27	79.7	79.7	4.27	0.53	0.53	0.28	0.05	0.33	1.18	0.05	1.23	14.4	0.4%	250	0.80	39.45	0.36	68	3.1%
		P SAN MH 4	P 167	Residential	Medium	26	76.7	209.5	4.14	0.69	1.44	0.73	0.14	0.87	3.01	0.14	3.16	55.4	0.4%	250	0.77	37.61	0.45	99	8.4%
		P 167	P 166	Residential	Low	9	26.6	236.0	4.12	0.88	2.32	0.82	0.23	1.05	3.38	0.23	3.61	61.0	0.3%	250	0.62	30.32	0.40	112	11.9%
		P 166	P 108	Residential	Low	4	11.8	247.8	4.11	0.56	2.88	0.86	0.29	1.15	3.54	0.29	3.83	71.0	1.4%	250	1.44	70.86	0.75	84	5.4%
Hoover Court		P 128	P 127	Residential	Low	5	14.8	14.8	4.40	0.68	0.68	0.05	0.07	0.12	0.23	0.07	0.29	45.1	1.0%	200	1.04	32.80	0.34	34	0.9%
		P 127	P 126	Residential	Low	6	17.7	32.5	4.35	0.73	1.41	0.11	0.14	0.25	0.49	0.14	0.63	64.9	1.0%	200	1.04	32.80	0.41	45	1.9%
		P 126	P 107	Residential	Low	2	5.9	38.4	4.34	0.19	1.60	0.13	0.16	0.29	0.58	0.16	0.74	69.2	1.0%	200	1.04	32.80	0.43	48	2.2%
High Street		P 111	P 110	Residential	Low	2	5.9	5.9	4.43	0.27	0.27	0.02	0.03	0.05	0.09	0.03	0.12	57.0	0.3%	200	0.57	17.96	0.17	30	0.7%
		P 110	P 1767	Residential	Medium	9	26.6	32.5	4.35	1.23	1.50	0.11	0.15	0.26	0.49	0.15	0.64	73.5	0.3%	200	0.57	17.96	0.27	57	3.6%
		P 1767	P 109	Residential	High	26	76.7	109.2	4.23	0.78	2.28	0.38	0.23	0.61	1.60	0.23	1.83	19.5	0.3%	200	0.57	17.96	0.36	85	10.2%
		P 109	P 108	Residential	Low	8	23.6	132.8	4.21	0.60	2.88	0.46	0.29	0.75	1.94	0.29	2.23	89.9	0.3%	200	0.57	17.96	0.37	91	12.4%
		P 108	P 107	Residential	Low	16	47.2	427.8	4.01	1.33	7.09	1.49	0.71	2.19	5.95	0.71	6.66	157.9	0.3%	300	0.75	52.97	0.49	138	12.6%
		P 107	P 75	Residential	Low	12	35.4	501.5	3.97	1.02	9.71	1.74	0.97	2.71	6.92	0.97	7.89	147.8	0.3%	300	0.75	52.97	0.52	147	14.9%

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Date: December 16, 2024
Version Number: 2

Project Information

116 & 120 Bond Street - Future Condition	323899

Drawing Reference

Prepared By

JN	December 16/24

Reviewed By

Municipality

City of Orillia

Population Density

Capita per Unit	Low	Medium	High
	2.95	2.95	2.95

Infiltration

Infiltration (L/s/ha)	0.1

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	300	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	28,000	1.6
Commercial	28,000	1.6
Industrial (High)	-	-
Industrial (Low)	36,000	-

Notes

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s) Development	Average Flow (L/s) Infiltration	Average Flow (L/s) Total	Peak Flow (L/s) Development	Peak Flow (L/s) Infiltration	Peak Flow (L/s) Total	Proposed Sanitary Sewer Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
FUTURE - Populations inferred from City Design Standards and sewer mapping.																									
Bond Street	116	P SAN MH 1	P SAN MH 2	Residential	Medium	6	17.7	17.7	4.39	0.08	0.08	0.06	0.01	0.07	0.27	0.01	0.28	14.8	1.0%	200	1.04	32.80	0.33	33	0.8%
		P SAN MH 2	P SAN MH 3	Residential	Medium	12	35.4	53.1	4.31	0.14	0.22	0.18	0.02	0.21	0.79	0.02	0.82	50.0	0.5%	200	0.74	23.19	0.34	57	3.5%
	120	F SAN MH 1	F SAN MH 2	Residential	Medium	6	17.7	17.7	4.39	0.06	0.06	0.06	0.01	0.07	0.27	0.01	0.28	17.5	1.0%	200	1.04	32.80	0.33	33	0.8%
		F SAN MH 2	F SAN MH 3	Residential	Medium	10	29.5	47.2	4.32	0.09	0.15	0.16	0.02	0.18	0.71	0.02	0.72	25.5	0.5%	200	0.74	23.19	0.33	54	3.1%
		F SAN MH 3	P SAN MH 3	Residential	Medium	0	0.0	47.2	4.32	0.00	0.15	0.16	0.02	0.18	0.71	0.02	0.72	14.0	0.5%	200	0.74	23.19	0.33	54	3.1%
		P SAN MH 3	P SAN MH 4	Residential	Medium	0	0.0	100.3	4.24	0.00	0.37	0.35	0.04	0.39	1.48	0.04	1.51	10.1	0.8%	200	0.93	29.34	0.48	66	5.2%
Bond Street		P 168	P SAN MH 4	Residential	Medium	27	79.7	79.7	4.27	0.53	0.53	0.28	0.05	0.33	1.18	0.05	1.23	14.4	0.4%	250	0.80	39.45	0.36	68	3.1%
		P SAN MH 4	P 167	Residential	Medium	25	73.8	253.7	4.11	0.69	1.59	0.88	0.16	1.04	3.62	0.16	3.78	55.4	0.4%	250	0.77	37.61	0.47	106	10.0%
		P 167	P 166	Residential	Low	9	26.6	280.3	4.09	0.88	2.47	0.97	0.25	1.22	3.98	0.25	4.23	61.0	0.3%	250	0.62	30.32	0.42	119	13.9%
		P 166	P 108	Residential	Low	4	11.8	292.1	4.08	0.56	3.03	1.01	0.30	1.32	4.14	0.30	4.44	71.0	1.4%	250	1.44	70.86	0.79	88	6.3%
Hoover Court		P 128	P 127	Residential	Low	5	14.8	14.8	4.40	0.68	0.68	0.05	0.07	0.12	0.23	0.07	0.29	45.1	1.0%	200	1.04	32.80	0.34	34	0.9%
		P 127	P 126	Residential	Low	6	17.7	32.5	4.35	0.73	1.41	0.11	0.14	0.25	0.49	0.14	0.63	64.9	1.0%	200	1.04	32.80	0.41	45	1.9%
		P 126	P 107	Residential	Low	2	5.9	38.4	4.34	0.19	1.60	0.13	0.16	0.29	0.58	0.16	0.74	69.2	1.0%	200	1.04	32.80	0.43	48	2.2%

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Date: December 16, 2024

Version Number: 2

Project Information

116 & 120 Bond Street - Future Condition	323899

Drawing Reference

Prepared By

JN	December 16/24

Reviewed By

Municipality

City of Orillia

Population Density

Capita per Unit	Low	Medium	High
	2.95	2.95	2.95

Infiltration

Infiltration (L/s/ha)	0.1

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

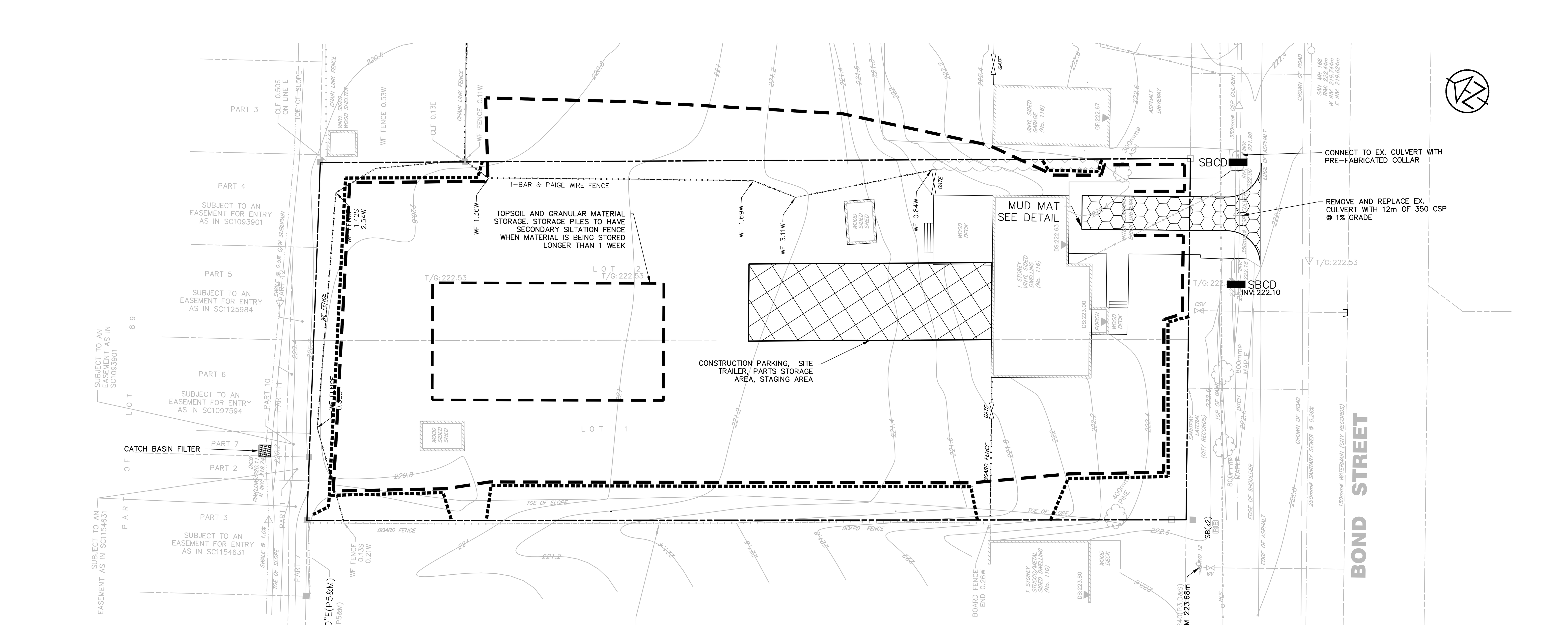
Development Type	Average (L/cap/day)	Peaking Factor
Residential	300	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	28,000	1.6
Commercial	28,000	1.6
Industrial (High)	-	-
Industrial (Low)	36,000	-

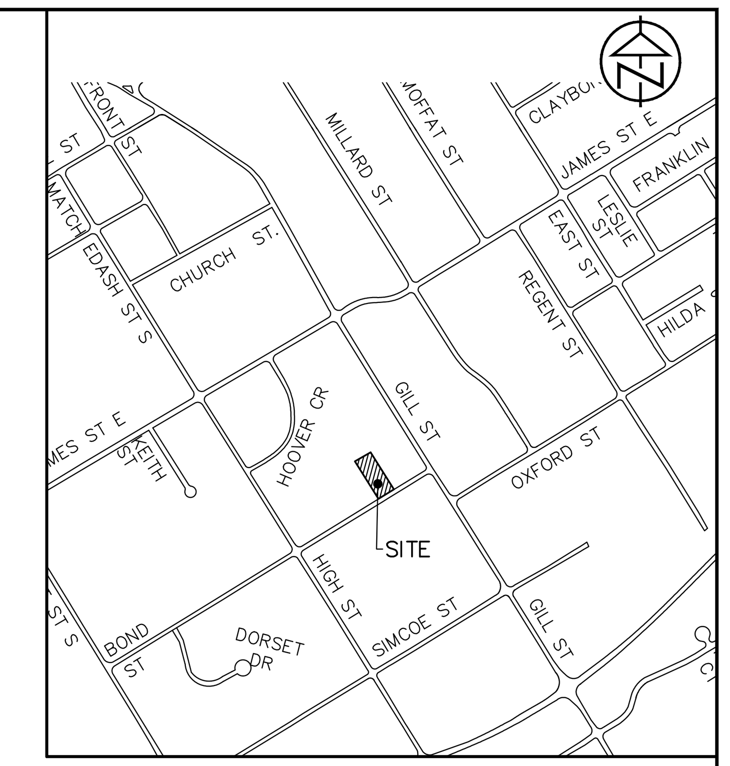
Notes

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s) Development	Average Flow (L/s) Infiltration	Average Flow (L/s) Total	Peak Flow (L/s) Development	Peak Flow (L/s) Infiltration	Peak Flow (L/s) Total	Proposed Sanitary Sewer Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
High Street		P 111	P 110	Residential	Low	2	5.9	5.9	4.43	0.27	0.27	0.02	0.03	0.05	0.09	0.03	0.12	57.0	0.3%	200	0.57	17.96	0.17	30	0.7%
		P 110	P 1767	Residential	Medium	9	26.6	32.5	4.35	1.23	1.50	0.11	0.15	0.26	0.49	0.15	0.64	73.5	0.3%	200	0.57	17.96	0.27	57	3.6%
		P 1767	P 109	Residential	High	26	76.7	109.2	4.23	0.78	2.28	0.38	0.23	0.61	1.60	0.23	1.83	19.5	0.3%	200	0.57	17.96	0.36	85	10.2%
		P 109	P 108	Residential	Low	8	23.6	132.8	4.21	0.60	2.88	0.46	0.29	0.75	1.94	0.29	2.23	89.9	0.3%	200	0.57	17.96	0.37	91	12.4%
		P 108	P 107	Residential	Low	16	47.2	472.0	3.99	1.33	7.24	1.64	0.72	2.36	6.53	0.72	7.26	157.9	0.3%	300	0.75	52.97	0.50	142	13.7%
		P 107	P 75	Residential	Low	12	35.4	545.8	3.95	1.02	9.86	1.89	0.99	2.88	7.49	0.99	8.48	147.8	0.3%	300	0.75	52.97	0.53	151	16.0%

Appendix C:
Design Drawings

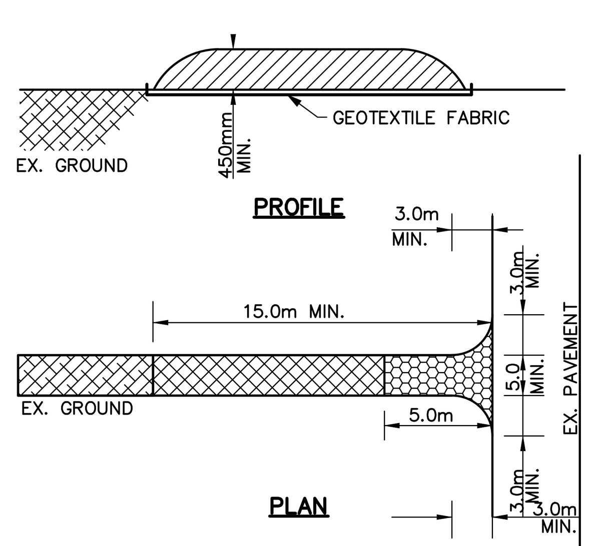




KEY PLAN
N.T.S.

LEGEND

- SBCD — STRAW BALE CHECK DAM PER OPSD 219.180
- SILT FENCE PER OPSD 219.131
- TREE PROTECTION FENCE
- PROPERTY LINE
- EXISTING DITCH
- EXISTING BELL LINE
- EXISTING HYDRO LINE
- EXISTING GAS LINE
- EXISTING HYDRO POLE/LIGHT STANDARD
- EXISTING HYDRO POLE
- EXISTING BENCH MARK
- STONE MUD MAT
- CATCH BASIN FILTER



STONE SIZE – THE STONE PAD SHALL BE A MIN. 450mm THICK. USE 50mmø STONE OR RECLAIMED CONCRETE EQUIVALENT FOR FIRST 5m FROM ADJACENT ROAD & 150mmø STONE FOR REMAINDER OF STONE PAD.

LENGTH – AS REQUIRED BUT NOT LESS THAN 15m.

WIDTH – 5m MIN. BUT NOT LESS THAN THE WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.

GEOTEXTILE FABRIC (TERRAFIX 270R OR EQUAL) WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.

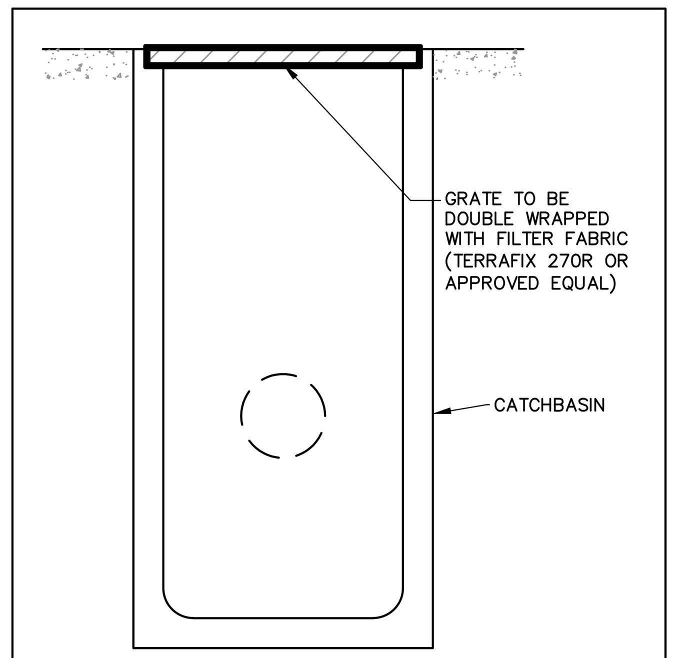
SURFACE WATER – ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE.

MAINTENANCE – THE CONTRACTOR SHALL MAINTAIN THE ENTRANCE AT ALL TIME, IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR. UPON OBSERVATION OF CONTINUOUS MUD TRACKING ONTO ADJACENT STREETS, THE STONE MAT IS TO BE FULLY REPLACED.

WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

INSPECTION AND REQUIRED MAINTENANCE AFTER EACH RAIN SHALL BE PROVIDED BY THE CONTRACTOR.

STONE MUD MAT DETAIL
SCALE: NTS



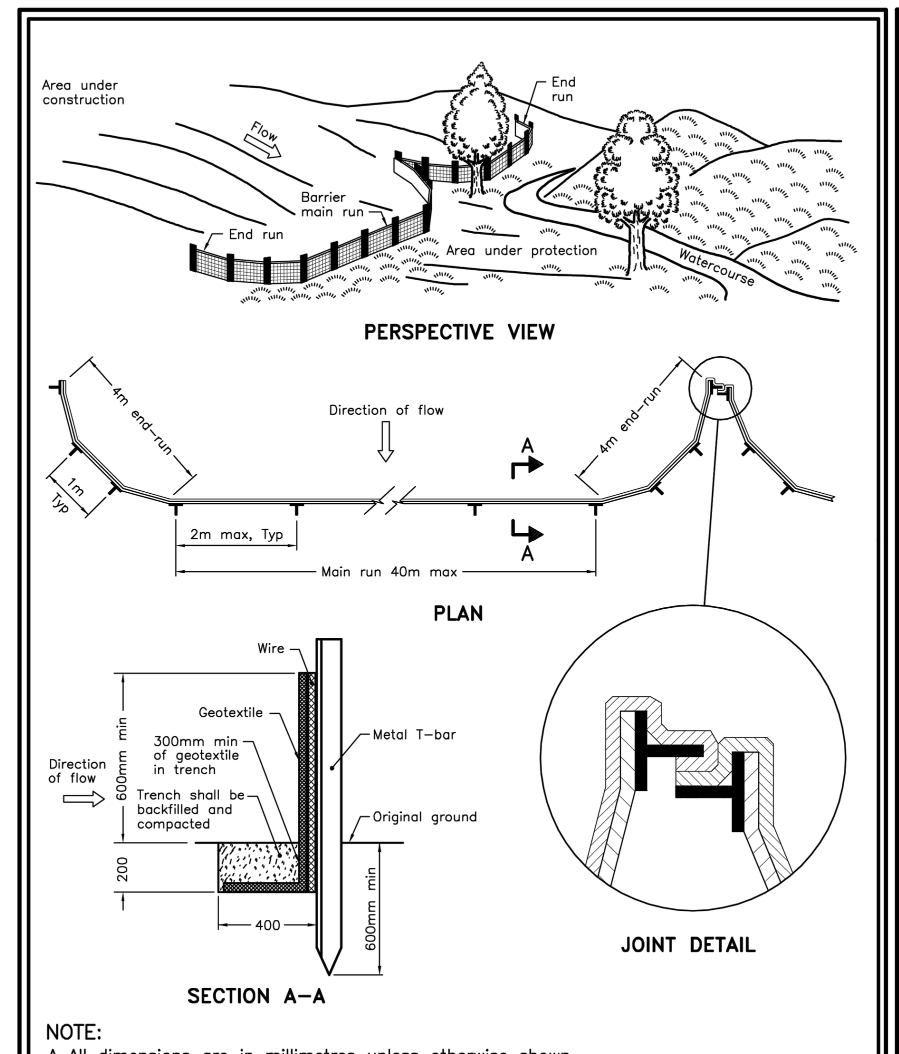
CATCHBASIN FILTRATION DETAIL
SCALE: N.T.S.

SILTATION AND EROSION CONTROL NOTES

1. ALL SILTATION AND EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO INSTALL AND MAINTAIN SILTATION CONTROL DEVICES AT LOCATIONS SHOWN, OR AS DIRECTED BY THE ENGINEER IF ADDITIONAL CONTROLS ARE DEEMED NECESSARY.
3. CONTRACTOR TO ARRANGE PRE-CONSTRUCTION MEETING WITH ENGINEER IMMEDIATELY AFTER PLACING ALL SILTATION CONTROL DEVICES.
4. SILTATION CONTROL DEVICES TO BE INSPECTED BY CONTRACTOR WEEKLY AND AFTER EACH RAINFALL. REPAIRS TO SILTATION CONTROL DEVICES TO BE COMPLETED PROMPTLY WHEN REQUIRED.
5. THE ENGINEER WILL INSPECT THE SEDIMENT AND EROSION CONTROL MEASURES PERIODICALLY, AND AFTER EACH MAJOR STORM EVENT. THE ENGINEER WILL NOTIFY THE CONTRACTOR OF CORRECTIVE ACTIONS REQUIRED AS SOON AS DEFICIENCIES ARE NOTED. THE CONTRACTOR MAINTAINS ULTIMATE RESPONSIBILITY TO ENSURE PROPER SEDIMENT AND EROSION CONTROL MEASURES ARE IMPLEMENTED AND MAINTAINED. ALL DEFICIENCIES AND CORRECTIVE MEASURES WILL BE DOCUMENTED BY THE CONTRACTOR IN A WEEKLY INSPECTION REPORT. A COPY OF THE WEEKLY INSPECTION REPORT WILL BE PROVIDED TO THE ENGINEER.
6. INSTALL SILT SACK IN ALL NEW CATCHBASINS/CATCHBASIN MAINTENANCE HOLES AND EXISTING CATCHBASINS/CATCHBASIN MAINTENANCE HOLES WITHIN THE CONSTRUCTION LIMITS AND/OR AREAS EXPOSED TO SILTATION. SILT SACK – REGULAR FLOW BY TERRAFIX OR APPROVED EQUAL.
7. CONTRACTOR TO REMOVE SILTATION CONTROL DEVICES ONLY AFTER ALL PAVING IS COMPLETED AND VEGETATION HAS STABILIZED.
8. ALL SILT FENCE PER OPSD 219.131 (SEE DETAIL DWG DET-3) .

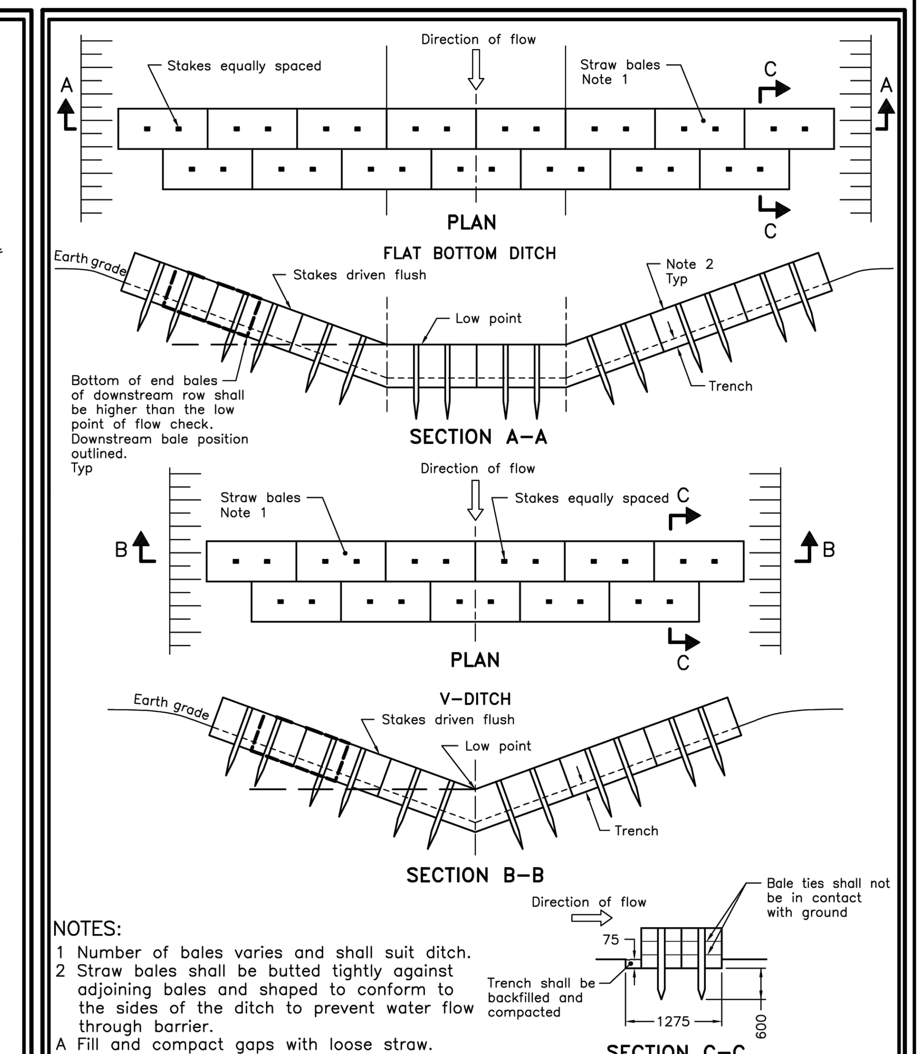
CONSTRUCTION ENTRANCE NOTES

1. CONSTRUCT AND MAINTAIN CONSTRUCTION ENTRANCE AS SHOWN AND IN ACCORDANCE WITH O.P.S.D. 301.020.
2. ALL CONSTRUCTION VEHICLES TO ACCESS THE SITE USING THE DESIGNATED CONSTRUCTION ENTRANCE.
3. CONTRACTOR TO INSTALL AND MAINTAIN STONE MUD MAT AS DETAILED.
4. REMOVE TOPSOIL (WHERE APPLICABLE) BEFORE INSTALLING CONSTRUCTION ENTRANCE.
5. PROMPTLY REMOVE ANY MUD OR DUST WHICH IS TRANSPORTED BEYOND THE STONE MUD MAT TO MAINTAIN EXISTING ROAD DRIVING CONDITION.
6. ENTRANCE RADII TO BE MINIMUM 8.0m.



NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 0
HEAVY-DUTY WIRE-BACKED SILT FENCE BARRIER		OPSD 219.131



NOTES:
1 Number of bales varies and shall suit ditch.
2 Straw bales shall be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A Fill and compact gaps with loose straw.
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev 3
STRAW BALE FLOW CHECK DAM		OPSD 219.180

DISCLAIMER AND COPYRIGHT

BENCHMARKS

TBM #1 – TOP OF RAISED ARROWHEAD SITUATED ATOP OF FIRE HYRDRANT #12 LOCATED ON THE NORTH SIDE OF BOND STREET, APPROXIMATELY 4m SOUTH WEST OF THE SOUTH WEST CORNER OF LOT 1, REGISTERED PLAN 992, ELEVATION OF 223.68m.

NOTES

LEGAL AND TOPOGRAPHIC INFORMATION ARE TAKEN FROM PLAN OF SURVEY SHOWING TOPOGRAPHIC FEATURES OF No. 116 & 120 BOND STREET, LOTS 1, 2 & 3, REGISTERED PLAN 992, CITY OF ORILLIA, COUNTY OF SIMCOE (PREPARED FOR: 1000444419 ONTARIO INC.) BY DEARDEN AND STANTON LTD. O.L.S. DATED 16/08/23 AND 17/04/24.

SITE PLAN INFORMATION OBTAINED FROM SITE PLAN PREPARED BY API DEVELOPMENT CONSULTANTS INC. AND FABIANI ARCHITECTS LTD. RECEIVED 20/11/2024.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	OCT. 2023
2.	2nd SUBMISSION	JUL. 2025
3.	FINAL – ISSUED FOR ZBA	SEPT. 2025

ENGINEER

LICENSED PROFESSIONAL ENGINEER
J. A. NEMISZ
100181826
Sept. 11, 2025
323899
PROVINCE OF ONTARIO

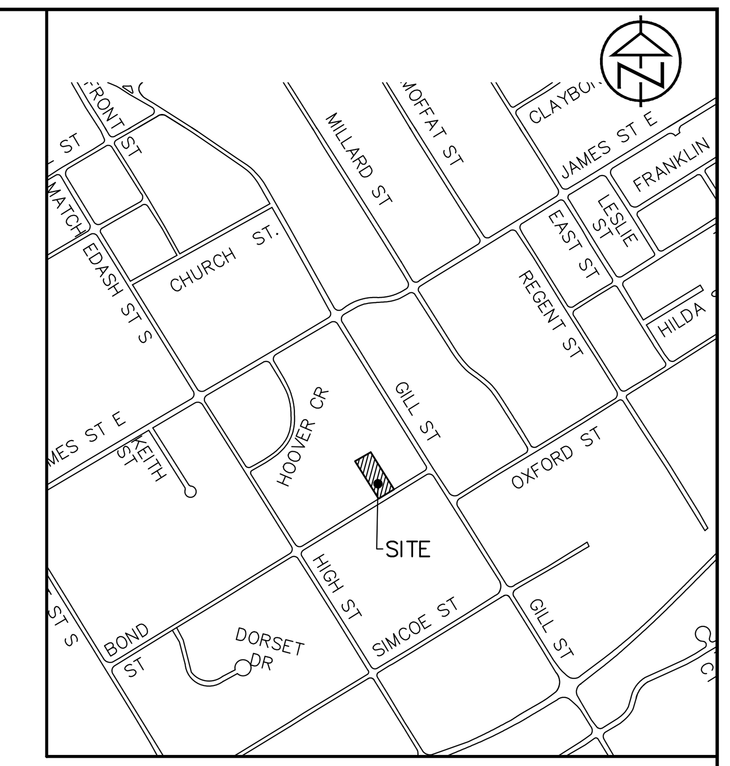
116 BOND STREET
CITY OF ORILLIA

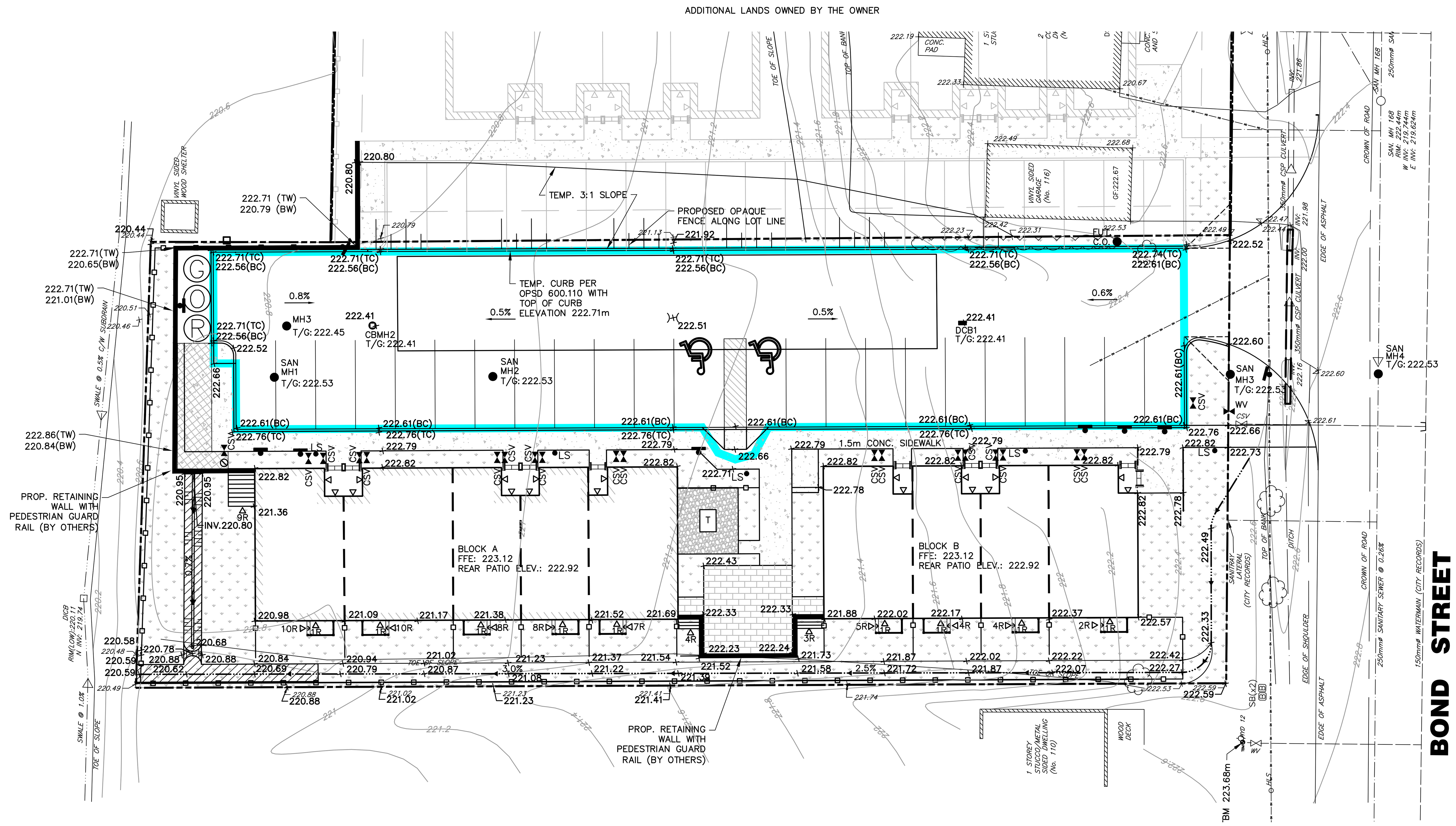
REMOVALS AND EROSION & SILTATION CONTROL PLAN

TATHAM ENGINEERING

DESIGN: JN	FILE: 323899	DWG:
DRAWN: JH	DATE: MAR. 2024	ESC.1
CHECK: RS	SCALE: 1:200	

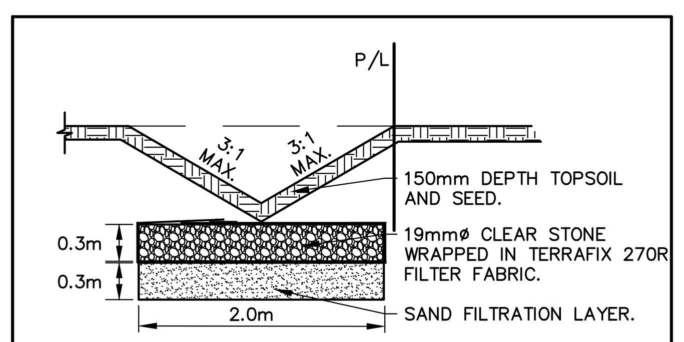
Drawing Name: 323899 – ESC01.dwg, Plotted: Sep 11, 2025





LEGEND

+221.50	PROPOSED GROUND ELEVATION
+221.50	EXISTING GROUND ELEVATION
	PROPERTY LINE
	EXISTING DITCH
	FUTURE STORM SEWER
STM MH	FUTURE STORM MH
CB	FUTURE STORM CB
1.9%	PROPOSED OVERLAND FLOW DIRECTION
STM MH	PROPOSED MH
CB	PROPOSED CB
DCB	ENTRANCE/EXIT – VEHICULAR
CBMH	ENTRANCE/EXIT – PEDESTRIAN
	PROPOSED FENCE
WV	PROPOSED WATER VALVE
HYD	PROPOSED HYDRANT & VALVE
	PROPOSED STREET SIGNS
HYD	EXISTING HYDRANT
	PROPOSED CULVERT
	PROPOSED STORM SEWER INSULATION
	PROPOSED INFILTRATION GALLERY
	PROPOSED SIDEWALKS
	PROPOSED GRASSED AREAS
	PROPOSED GRAVEL AREAS
	LIMIT OF PONDING DURING EMERGENCY OVERFLOW CONVEYANCE



INFILTRATION GALLERY DETAIL

SCALE: NTS

BENCHMARKS

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ENGINEER

LICENSED PROFESSIONAL ENGINEER
J. A. NEMISZ
100181826
Sept. 11, 2025
PROVINCE OF ONTARIO

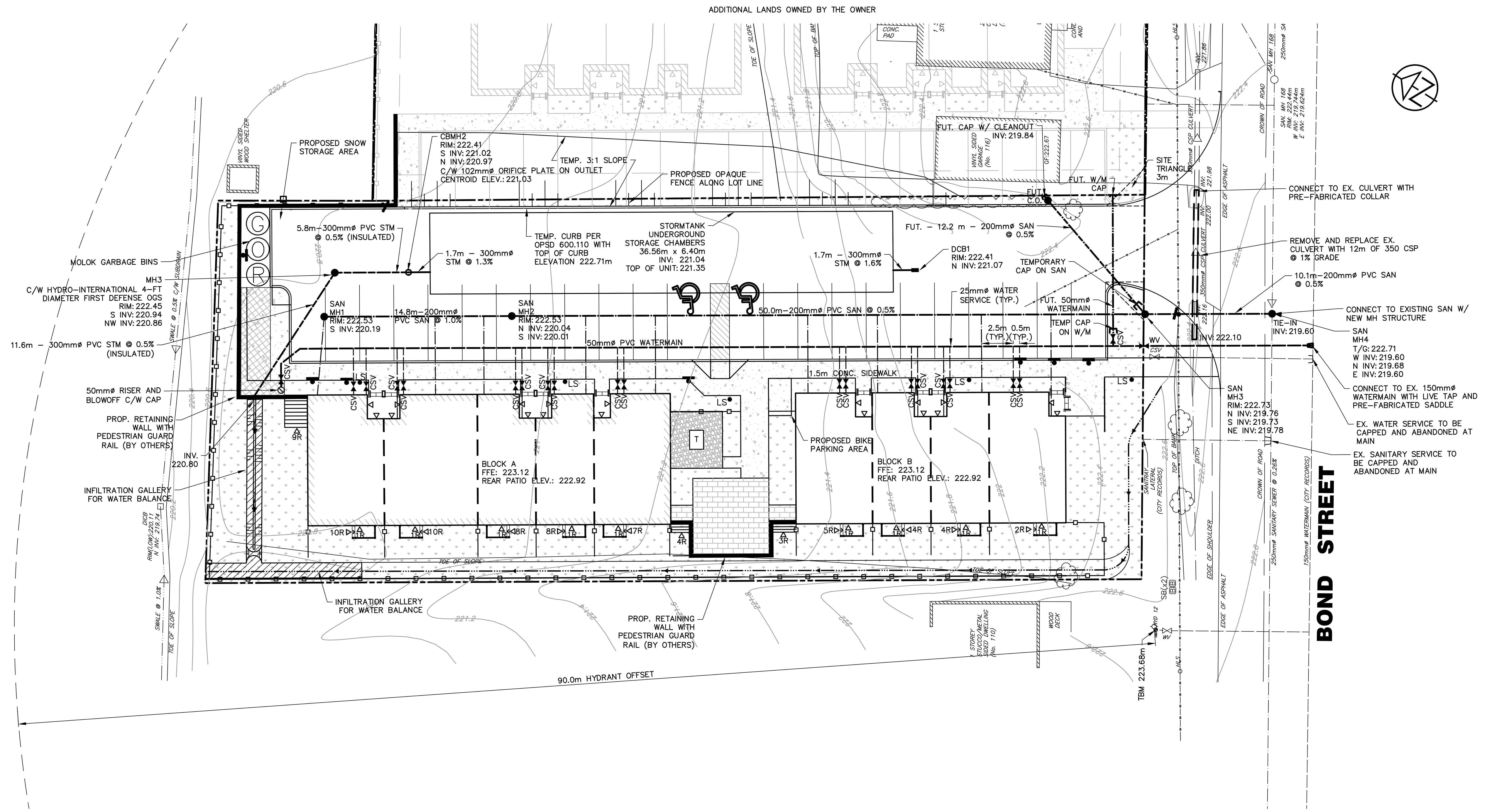
116 BOND STREET
CITY OF ORILLIA

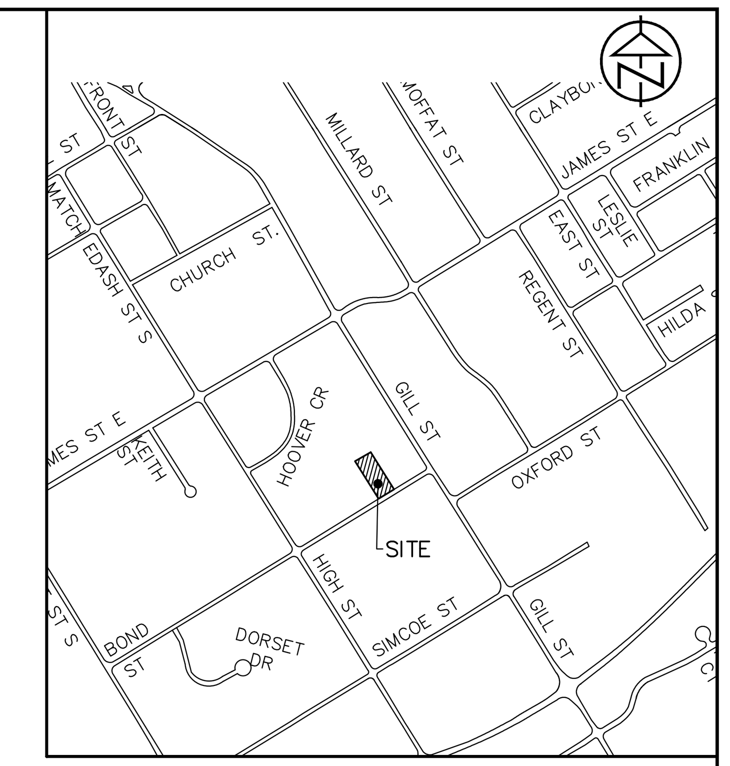
SITE GRADING PLAN

TATHAM ENGINEERING

DESIGN: JN	FILE: 323899	DWG: SG.1
DRAWN: JH	DATE: MAR. 2024	
CHECK: RS	SCALE: 1:200	

Drawing Name: 323899 – LG01.dwg, Plotted: Sep 11, 2025





KEY PLAN
N.T.S.

LEGEND

- PROPERTY LINE
- EXISTING DITCH
- FUTURE STORM SEWER
- FUTURE STORM MH
- FUTURE STORM CB
- 200ø SAN — PROPOSED SANITARY SEWER/ SIZE/ DIRECTION OF FLOW
- 450ø STM — PROPOSED STORM SEWER/ SIZE/ DIRECTION OF FLOW
- 150ø WATERMAIN — WATERMAIN/SIZE
- 50ø WATERMAIN — FUTURE WATERMAIN/SIZE
- 200ø SAN — FUTURE SANITARY SEWER/ SIZE/ DIRECTION OF FLOW
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- PROPOSED DITCH
- C.O. — PROPOSED CLEAN OUT
- SAN MH2 — PROPOSED SANITARY MANHOLE/ NUMBER
- STM MH2 — PROPOSED STORM MANHOLE/ NUMBER
- CBMH — PROPOSED CATCH BASIN MANHOLE
- CB — PROPOSED CATCHBASIN
- DCB — PROPOSED DOUBLE CATCHBASIN
- HYD & WV — PROPOSED HYDRANT & WATER VALVE
- WV — PROPOSED WATER VALVE
- CSV — PROPOSED WATER CURB STOP
- PROPOSED STREET SIGNS
- ENTRANCE/EXIT – VEHICULAR
- ENTRANCE/EXIT – PEDESTRIAN
- PROPOSED FENCE
- HYD — EXISTING HYDRANT
- PROPOSED CULVERT
- C2 C3 — ELECTRIC CAR CHARGERS
- PROPOSED TACTILE PLATE
- PROPOSED PRECAST CURB
- PROPOSED STORM SEWER INSULATION
- PROPOSED INFILTRATION GALLERY
- PROPOSED SIDEWALKS
- PROPOSED GRASSED AREAS
- PROPOSED GRAVEL AREAS

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

BENCHMARKS

TBM #1 – TOP OF RAISED ARROWHEAD SITUATED ATOP OF FIRE HYRDRANT #12 LOCATED ON THE NORTH SIDE OF BOND STREET, APPROXIMATELY 4m SOUTH WEST OF THE SOUTH WEST CORNER OF LOT 1, REGISTERED PLAN 992, ELEVATION OF 223.68m.

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ENGINEER

LICENSED PROFESSIONAL ENGINEER
J. A. NEMISZ
100181826
Sept. 11, 2025
323899
PROVINCE OF ONTARIO

116 BOND STREET
CITY OF ORILLIA

SITE SERVICING PLAN

TATHAM ENGINEERING

DESIGN: JN	FILE: 323899	DWG: SS.1
DRAWN: JH	DATE: MAR. 2024	
CHECK: RS	SCALE: 1:200	

Drawing Name: 323899 – GS01.dwg, Plotted: Sep 11, 2025