Water Distribution & Supply Analysis Report

Simcoe County Housing Corporation

20 Rose Street
City of Barrie
County of Simcoe

PEARSON ENGINEERING

PEARSONENG.COM

City of Barrie File Number
D28-032-2024

(Revised September 2024)

May 2024

20118

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Water Distribution & Supply Analysis Report

20 Rose Street, Barrie

1. Introduction

PEARSON Engineering Ltd. (PEARSON) has been retained by Simcoe County Housing Corporation (SCHC) (Client) to prepare a Water Distribution and Supply Analysis Report (Report) in support of the proposed affordable housing development located at 20 Rose Street (Project) in the City of Barrie (City), County of Simcoe (County). The Project site is approximately 1.87 hectares in size and is zoned as Institutional. The Project site fronts onto Rose Street to the south, the Highway 400 Northbound ramp to the west, Highway 400 Corridor to the north and existing residential homes to the east. The subject lands can be seen on Figure 1.

The Project consists of a 215-unit apartment building with 9 and 11-storey buildings and community agency spaces on Level 1 and 2, a parking structure with additional community agency spaces, surface parking, two driveway connections to Rose Street, and an amenity area. The buildings are proposed to be connected by both an underground tunnel and an above-ground enclosed bridge.

2. Water Supply and Distribution

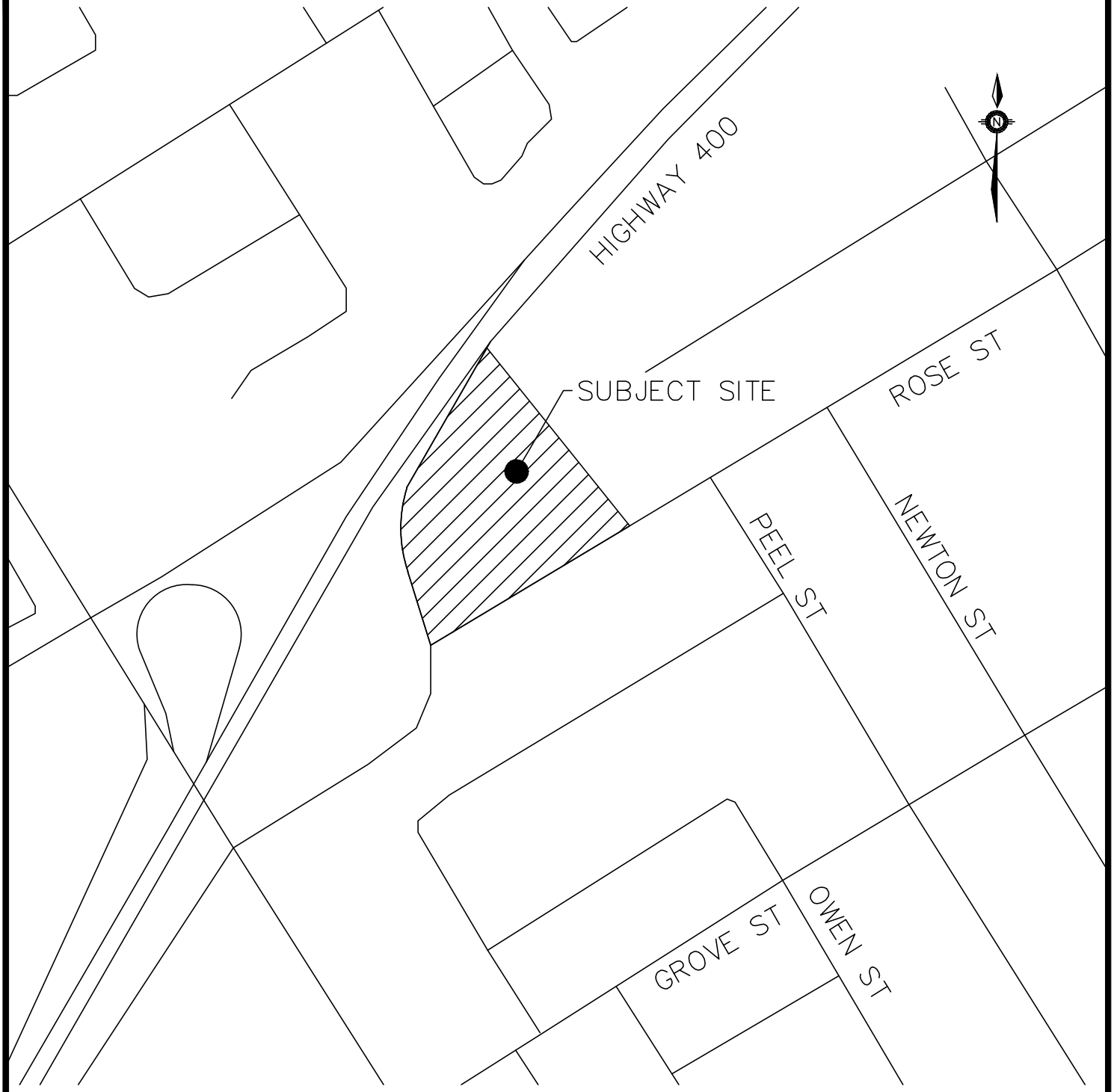
Currently there is an existing municipal 200 mm diameter cast iron watermain fronting the site and an existing 300 mm diameter watermain installed in the early 1990's that extends from the east to the intersection of Peel Street and Rose Street. Both existing watermains will be decommissioned as part of the Rose Street works scheduled for spring 2024. Under existing conditions, the closest hydrant is located at the intersection of Peel Street and Rose Street which is connected to the 300 mm diameter watermain and can be used to service the site during construction if needed.

The Rose Street works include a watermain extension of the 300 mm diameter Rose Street watermain and the works are scheduled to take place in parallel to the construction of the proposed development. These design works are still ongoing and the SCHC team is coordinating with the City team. The Rose Street watermain works requires three scenarios and therefore three separate watermain analysis are required, including:

- **Scenario #1 – Existing Conditions**: 200 mm diameter watermain is in place and being used to service the development.
- **Scenario #2 – Interim Condition:** 300 mm diameter watermain on Rose Street terminates at the existing Hwy 400 on-ramp with existing 200 mm diameter watermain on the on-ramp remaining place complete with a 200 mm diameter watermain crossing across the Bayfield Street highway crossing.
- **Scenario #3 – Ultimate Condition:** 300 mm diameter watermain on Rose Street and is terminated at the Bayfield Street highway crossing.

3. Design Criteria

Proposed developments within the City of Barrie are required to follow the City of Barrie Water Transmission and Distribution Policies and Design Standards, dated January 2024. As per the City Guidelines, new developments are to provide Fire Protection as per the City of Barrie fire flow requirements or the flow required by the latest version of the Fire Underwriters Survey (FUS) document, in this case "Water Supply for Fire Protection, A Guide to Recommended Practice" 2020, whichever is higher.



COUNTY OF SIMCOE AFFORDABLE HOUSING – 20 ROSE ST. CITY OF BARRIE

SITE LOCATION PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AMC/TWC	HORIZ SCALE	NTS	PROJECT #	20118
DRAWN BY	TWC	VERT SCALE		DRAWING #	FIG–1
CHECKED BY	MWD	DATE	OCTOBER 2023	REVISION #	0

The Project proposes 215 residential units and approximately 7,755 m^2 of commercial space. The domestic water demand of the proposed site has been developed based on the following demands and design criteria set out by the City of Barrie Water Design Standards and MECP Guidelines:

- Residential population density of 1.67 people/unit for Apartments
- Commercial Design flow of 28,000 L/ha/day
- Demand per Person (Q) = 250 L/person/day

Based on a population density of 1.67 people/unit (ppu) as per City of Barrie guidelines, the 215 units of residential result in a design population of 359 persons. Utilizing the City of Barrie Engineering Design Criteria for residential water demand of 250 L/cap/day for the apartments and 28,000 L/ha/d for the commercial space, an Average Day Demand (ADD) of 0.94 L/s for residential and a commercial flow of 0.25 L/s was calculated. A Max Day Factor of 3.00 was used in calculating a Max Day Flow of 3.56 L/s. A Peak Rate factor of 4.50 was used in calculating a Peak Hour Demand of 5.34 L/s for the proposed development. Calculations for the domestic water requirements for the site can be found in Appendix A.

4. Domestic and Fire Water Distribution System

The Project will be serviced by the City municipal water system for with a 200 mm diameter fire service and 150 mm diameter domestic service connected to the proposed 300 mm diameter watermain located within Rose Street. The 200 mm diameter fire service will decrease after the proposed hydrant to a 150 mm diameter watermain to connect to the proposed buildings. The water will extend to the mechanical/meter room in the proposed parking garage and fire services will split and connect to the parking garage and apartment building accordingly. From the meter room, domestic water services will be extended to the residential building as per Drawing SS-1 in Appendix C.

Hydrant flow tests were completed by Vipond Inc. in October 2022 indicating that a static pressure of 66 psi was available at the existing hydrant adjacent to 20 Rose Street. These flow tests resulted in a flow that can be supplied on Rose Street of approximately 117 L/s (1,848 GPM) at a residual pressure of 68 psi from the existing hydrant. With the use of the NFPA Equation 4.10.1.2, the flow extrapolated at a minimum residual pressure of 20 psi was 589 L/s for the hydrant on Rose Street. Water hydrant test results are attached in Appendix A.

In order to analyze the domestic availability with the existing and proposed infrastructure, the site information was inputted into WaterCAD, a hydraulic modelling program. The water model uses the following peak domestic demand flows for each proposed building:

Table 1: Peak Domestic Demand Flows

Building	Peak Domestic Demand Flow per Building (L/s)
Residential High-Rise	4.21
Commercial / Parking	1.13

This results in a minimum pressure of 70.2 psi occurring at Junction J-5 at the domestic water service for the Proposed Residential Building. WaterCAD modelling details can be found in Appendix B at the back of this report. Refer to Drawing WC-1 for the WaterCAD modelling layout in Appendix C.

4.1. Fire Flow Requirements

Proposed developments are required to follow the City's Water Transmission and Distribution Policies and Design Standards which outlines new developments are to provide Fire Protection based on the higher of City of Barrie fire flow requirements or the flow required by the latest version of the Fire Underwriters Survey (FUS) document.

The required fire flow was calculated as per the 2020 Edition of the FUS assessment. Using City of Barrie Standards and residential requirements, residential high-rise and mixed-use building descriptions have been assumed which dictates typically a minimum required fire flow is subject to calculations provided by the Engineer. As per discussions with City of Barrie staff, a required fire flow of 200 L/s is to be used for the residential buildings while a fire flow of 283 L/s is to be used for the commercial portion. The required fire flow for the proposed buildings was determined to range from approximately 83 L/s to 100 L/s. The building constructions consists of a sprinklered water system, and a structure consisting of all structural elements, walls, arches, floors, and roof to be constructed with a minimum 1-hour fire resistance rating (FRR). Vipond has prepared a letter confirming that the proposed automatic sprinkler system is a fully supervised system in accordance with the 2020 FUS document and can be found in Appendix A. The required fire flows and footprint areas can be seen summarized below in Table 2 with the detailed FUS calculations attached in Appendix A. Calculations included in Appendix A were completed based on the FUS guide for the determination of required fire flow.

Table 2: 2020 FUS Calculation Results Summary

Building	Building Footprint Area (m^2)	City of Barrie Required Fire Flow (L/s)**	FUS Required Fire Flow (L/s)
Residential High-Rise	3,282	200	100
Commercial / Parking	2,361	283	83

** Denotes that typically applicant provides their own calculations as per the City of Barrie Water Design Standards for Mixed-Use Buildings. However, as per discussion with City of Barrie staff, alternate required fire flows have been provided.

In order to understand the required fire flows along with the available fire flows available for each water servicing scenario below, the following analysis was completed for each scenario and the information provided can be seen below:

4.1.1. Scenario 1 - Existing Conditions

A water pressure test was performed by Vipond Inc. on October 4, 2022, on the existing municipal fire hydrant located at the intersection of Peel Street and Rose Street indicating a static pressure of 66 psi. This flow test also demonstrated that a flow of approximately 117 L/s (1,848 GPM) can be supplied at a residual pressure of 68 psi from the existing hydrant. Due to the results of the hydrant flow test showing no loss in residual pressure, a conservative pressure drop of 2 psi was assumed and NFPA Equation 4.10.1.2 was used to extrapolate the hydrant test results, resulting in an available 589 L/s at 20 psi at the existing onsite hydrant. In addition, the WaterCAD modelling results utilizing the existing watermain on Rose Street can be found in Table 3 below:

Table 3: Available Fire Flow Summary

Building	Available Fire Flow at Building (L/s)	Available Fire Flow at Nearest Hydrant (L/s)
Residential (J-9)	174	310
Commercial / Parking (J-8)	212	310

Therefore, in the existing conditions, there is adequate flow to service the proposed development.

4.1.2. Scenario 2 - Interim Conditions

Under the interim scenario, the proposed 300 mm diameter watermain will extend west down Rose Street towards the existing Highway 400 northbound exit ramp reducing to a 200 mm diameter watermain at the existing ramp. Under these conditions, the existing 200 mm diameter watermain at the Bayfield Street overpass will also remain in place.

Based on the existing available flow and the ultimate anticipated fire flows provided by the City of Barrie it is assumed the available fire flow will be greater than 390 L/s in the interim phase. However, this needs to be confirmed with hydrant flow tests once the new hydrants and watermains on Rose Street are commissioned. Based on discussions with City of Barrie staff, reconstruction of Rose Street is scheduled to begin in late summer of 2024. Therefore, in the interim scenario, it is anticipated there is adequate available flow to service the proposed development.

4.1.3. Scenario 3 - Ultimate Conditions

After the completion of the Bayfield overpass construction is completed, the 300 mm diameter watermain on Rose Street will be terminated at the Bayfield Street overpass and it will no longer connect to the watermain within Bayfield Street.

Based on the information provided by the city staff, the anticipated fire flow is 418 L/s in the ultimate condition which is greater than the required fire flow for the proposed development. Hydrant tests must be completed to confirm the modelled fire flow once the new infrastructure has been constructed. Therefore, in the ultimate scenario, it is anticipated there is adequate available flow to service the proposed development.

4.1.4. Fire Flow Requirement Conclusion

As under each scenario, the available fire flow ranges from 212 L/s to 418 L/s, the proposed development is to have adequate fire flow to service the proposed buildings with required fire flows of 200 L/s to 283 L/s at a minimum residual pressure of 20 psi. Provided fire flow information from the water model can be found in Appendix A.

5. Conclusions

The proposed development will require the connection of municipal watermain to the existing municipal watermain on Rose Street. The WaterCAD analysis demonstrates that sufficient pressure and flow is available throughout the project site.

All of which is respectfully submitted,

Pearson Engineering Ltd.

Taylor Arkell, P.Eng.
Senior Project Engineer/Manager

Mike Dejean, P.Eng.
Partner, Manager of Engineering Services

Appendix A

Water Servicing and Fire Flow Calculations

20 Rose Street, Barrie
Water Flow Calculations

Design Criteria

Demand per capita (Q):	300	L/cap/d
Peak Rate Factor (Max. Hour)	4.50	(Table 3-3: Peaking Factors for Drinking-Water Systems Serving Fewer than 500 People,
Max. Day Factor	3.00	MECP Design Guidelines for Drinking-Water Systems)

Site Data

Description	Density		Units		Flow Rate		Peaking Factors	
Apartments	1.67	people/unit	215	units	300	L/cap/d	MAX DAY FACTOR*	3.00
Commercial	7,755	m^2			28,000	L/ha/d	PEAK RATE FACTOR*	4.50
							*From MECP Manual based on Population of fewer than 500 People	

Calculate Population

Pop. Apartments	=	1.67	x	215
Pop. Total	=	359	people	

Calculate Commercial Flows

Proposed $Q_{Commercial}$	=	0.78	x	28,000
	=	21,714	L/day	
	=	0.25	L/s	

Calculate Average Day Demand (ADD)

ADD - Apartments	=	300	x	359
ADD - Apartments	=	107,715	L/day	
ADD - Apartments	=	1.25	L/s	
ADF Total	=	1.25	+	0.25
ADF Total	=	129,429	L/day	
ADF Total	=	1.50	L/s	

Calculate Max Day Flow

MDF	=	1.50	x	3.00
MDF	=	4.49	L/s	

Calculate Peak Hour Demand

PHD	=	1.50	x	4.50
PHD	=	6.74	L/s	

FLOW TEST RESULTS

FIRST FOR FIRE, LIFE SAFETY & SECURITY
VIPOND INC
est. 1945

DATE : OCTOBER 4, 2022

TIME VALVE OPENED : 11:00 AM

TIME LAST VALVE CLOSED : 11:30 AM

LOCATION : 20 ROSE STREET

BARRIE

ONTARIO

TEST BY : LEN.K

NAME OF CITY OPERATOR : CAM NEWITT

STATIC PRESSURE : 66 PSI

SIZE OF UNDERGROUND MAIN :

TEST NO.	NO. OF NOZZLES	NOZZLE DIAMETER (INCHES)	DISCHARGE CO-EFFICIENT	RESIDUAL PRESSURE (PSI)	PITOT PRESSURE (PSI)	DISCHARGE (U.S.GPM)
1	1	1-3/4	0.995	68	63	707
2	1	2-1/2	0.90	68	37	1026
3	2	2-1/2	0.90	68	30	1848

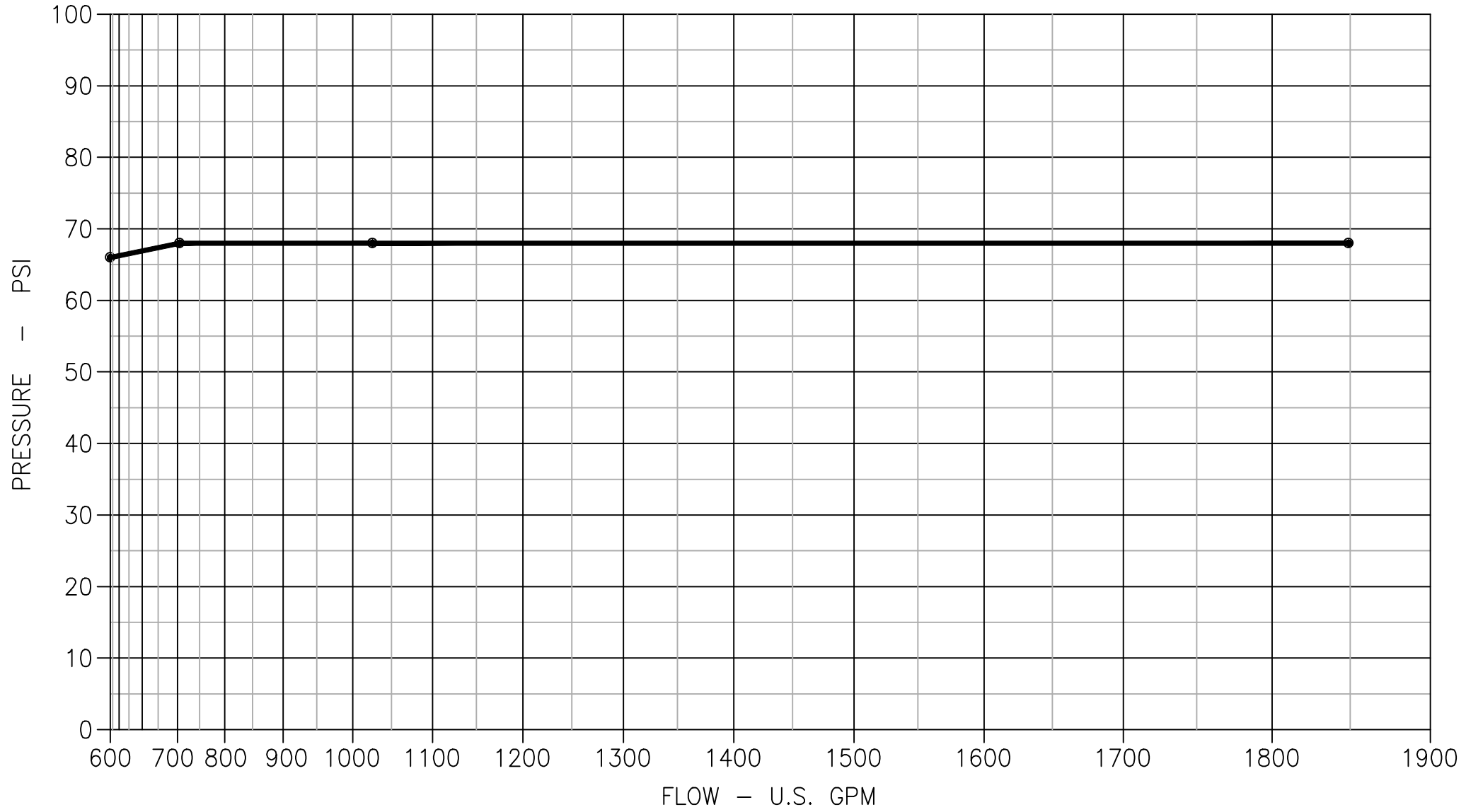
FIRST FOR FIRE, LIFE SAFETY & SECURITY

VIPOND INC

est. 1945

20 ROSE STREET	BY : LEN.K/ETHAN.B
BARRIE	OFFICE : BARRIE
ONTARIO	TEST BY : VIPOND & PUC
	DATE : OCTOBER 4, 2022

STATIC:		RESIDUAL:		FLOW:
66 PSI	TEST#1	68 PSI	@	707 GPM
	TEST#2	68 PSI	@	1026 GPM
	TEST#3	68 PSI	@	1848 GPM



FIRST FOR FIRE, LIFE SAFETY & SECURITY

VIPOND INC est. 1945

BUILD SAFE AND SECURE COMMUNITIES

January 17, 2024

COUNTY OF SIMCOE
Social Housing Department
1110 Highway 26, Midhurst, ON L9X 1N6

Our Project Ref. # 350773

Attention: Mr. Jason Allan, *Construction Projects Supervisor*

Re; **FIRE PROTECTION SPRINKLER & STANDPIPE SYSTEMS**
20 ROSE ST. AFFORDABLE HOUSING BUILDING & PARKING GARAGE
Barrie, Ontario

We offer this letter as confirmation that the proposed sprinkler system for the subject property will meet the "fully supervised system" requirements of FUS 2020.

Below Table and paragraph is from:

WATER SUPPLY FOR PUBLIC FIRE PROTECTION
"A Guide to recommended Practice in Canada" 2020

Table 4 Sprinkler Credits

Automatic Sprinkler System Design	Credit	
	With complete building coverage	With partial building coverage of X%
Automatic sprinkler protection designed and installed in accordance with NFPA 13	30%	30% × Percentage of Total Floor Area Serviced by Sprinkler System
Water supply is standard for both the system and Fire Department hose lines	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System
Fully supervised system	10%	10% × Percentage of Total Floor Area Serviced by Sprinkler System

Fully Supervised System (10%)

To qualify to apply an additional 10% reduction, an automatic sprinkler system should be fully supervised. The purpose of the supervisory signal is to ensure that malfunctions of the automatic sprinkler system will be discovered and corrected promptly, while the water flow alarm serves to notify emergency services of the fire as soon as the automatic sprinkler system activates.

- a distinctive supervisory signal to indicate conditions that could impair the satisfactory operation of the sprinkler system (a fault alarm), which is to sound and be displayed, either at a location within the building that is constantly attended by qualified personnel (such as a security room), or at an approved remotely located receiving facility (such as a monitoring facility of the sprinkler system manufacturer); and
- a water flow alarm to indicate that the sprinkler system has been activated, which is to be transmitted to an approved, proprietary alarm-receiving facility, a remote station, a central station or the fire department.

Yours truly,

VIPOND FIRE PROTECTION
DIVISION OF VIPOND INC.

Russ Kerr, *GSC*
General Manager - Barrie

VIPOND INC. 110 Saunders Road, Unit 1, Barrie, ON L4N 9A8 Telephone: (705) 726-3535 Fax: (705) 726-1515 **www.vipond.ca**

PEARSON ENGINEERING

20 Rose Street, Barrie
Fire Flow Calculations - Proposed Residential Building

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Location:	20 Rose Street, Barrie
OBC Occupancy:	Residential Occupancies - Class C
Building Foot Print:	3,282 m²
# of Stories:	11 (Note: Only stories at least 50% above ground)

Date: 2024-05-23
Project: 20 Rose Street, Barrie
Project Number: 20118

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 — Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 sprinkler standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Limited Combustible **Charge:** -15%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Ex. Highway Corridor	>100	> 30.1	0%
East Prop. Commercial/Parking	> 100	9.9	4%
South Ex. Residential	> 100	> 30.1	0%
West Ex. Highway Corridor	> 100	> 30.1	0%
		Total:	**4%**

Separation Distance	Charge
0.0 - 3.0 m	0%-5%
3.1 - 10.0 m	0%-4%
10.1 - 20.0 m	0%-3%
20.1 - 30.0 m	0%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? Yes

Calculations: *C* = 0.80 Non-Combustible

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of constructior
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor Area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A =	Single Largest Floor	+	25% of Two Immediately Adjoining Floors
A =	3,282	+	1,641
	A =	4,923	m²

RFF = 12,349 L/min
Round to Nearest 1000 L/min RFF = 12,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		-1,800	L/min	
RFF Adjusted for Contents	**E =**	10,200	L/min	*As per "Water Supply for Public Fire Protection" pg.20 note H:*
Reduction For Sprinkler	**F =**	5,100	L/min	***RFF*** = **E - F + G**
RFF w/ Sprinkler Reduction		5,100	L/min	
Exposure Charge	**G =**	408	L/min	RFF = 10200 L/min - 5100 L/min + 408 L/min
RFF w/ Exposure Charge		5,508	L/min	RFF = 5508 L/min

Required Fire Flow: **RFF =** 5,508 L/min

Round to Nearest 1,000 L/min

RFF =	**6,000**	**L/min**
RFF=	**1,584**	**GPM**
RFF =	**100**	**L/s**

PEARSON ENGINEERING

20 Rose Street, Barrie
Fire Flow Calculations - Proposed Commercial & Parking Structure

Required fire flow calculations as per the Fire Underwriters Survey's Water Supply for Public Fire Protection - 2020:

Location:	20 Rose Street, Barrie
OBC Occupancy:	Business and Personal Services Occupancies - Class D
Building Foot Print:	2,361 m²
# of Stories:	4 (Note: Only stories at least 50% above ground)

Date: 2024-05-23
Project: 20 Rose Street, Barrie
Project Number: 20118

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 2 — Non-Combustible

Automated Sprinkler Protection:

		Credit	Total
NFPA 13 sprinkler standard	Yes	30%	50%
Standard Water Supply	Yes	10%	
Fully Supervised System	Yes	10%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Limited Combustible — **Charge:** -15%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Ex. Highway Corridor	> 100	> 30.1	0%
East Ex. Residential	> 100	23.1	0%
South Ex. Residential	> 100	> 30.1	0%
West Prop. Residential	> 100	9.9	4%
		Total:	**4%**

Separation Distance	Charge
0.0 - 3.0 m	0%-5%
3.1 - 10.0 m	0%-4%
10.1 - 20.0 m	0%-3%
20.1 - 30.0 m	0%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type I-II[2] were used for Non-Combustible Class

Are Buildings Contigious? Yes

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? Yes

Calculations: *C* = 0.80 — Non-Combustible

Required Fire Flow: $RFF = 220 \times C \times \sqrt{A}$

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of constructior
A = the total effective area in square meters for Construction Coefficient below 1.0 (excluding basements in building considered).
Note: Single largest floor area plus 25% of each of the two immediately adjoining floors was considered to determine the effective area.

Total Effective Area:

A =	Single Largest Floor	+	25% of Two Immediately Adjoining Floors
A =	2,361	+	1,181
	A =	3,542	m²

RFF = 10,474 L/min
Round to Nearest 1,000 L/min — RFF = 10,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		-1,500	L/min
RFF Adjusted for Contents	**E =**	8,500	L/min
Reduction For Sprinkler	**F =**	4,250	L/min
RFF w/ Sprinkler Reduction		4,250	L/min
Exposure Charge	**G =**	340	L/min
RFF w/ Exposure Charge		4,590	L/min

As per "Water Supply for Public Fire Protection" pg.20 note H:
RFF = **E - F + G**

RFF = 8500 L/min - 4250 L/min + 340 L/min
RFF = 4590 L/min

Required Fire Flow: **RFF =** 4,590 L/min

Round to Nearest 1,000 L/min

RFF =	**5,000**	**L/min**
RFF=	**1,320**	**GPM**
RFF =	**83**	**L/s**

Appendix B

WaterCAD Modelling Results

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20 Rose Street, Barrie
WaterCAD FlexTable: Junction Table - Domestic Peak Hour

Label	Description	Elevation (m)	Head (m)	Demand (L/s)	Pressure (psi)
HYD-1	Proposed Hydrant	266.40	50.62	0.00	71.9
J-1	Rose Street	265.20	51.86	0.00	73.6
J-2	Rose Street	265.20	51.86	0.00	73.6
J-3	Rose Street	265.10	51.92	0.00	73.7
J-4	Parking Garage - Dom	266.90	50.11	1.03	71.1
J-5	Residential Bld - Dom	267.50	49.38	5.74	70.1
J-6		266.50	50.61	0.00	71.8
J-7		266.90	50.20	0.00	71.3
J-8	Parking Garage - Fire	266.90	50.14	0.00	71.2
J-9	Residential Bld - Fire	267.00	50.07	0.00	71.1

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20 Rose Street, Barrie
WaterCAD FlexTable: Pipe Table - Domestic Report

Label	Diameter (mm)	Hazen-Williams C	Velocity (m/s)	Headloss (m)	Headloss Gradient (m/m)	Start Node	Pressure (Start) (psi)	Stop Node	Pressure (Stop) (psi)
P-0A	1,200	130	0.01	0.00	0.000	7279: R-1	0.0	7276: PMP-1	2.6
P-0B	1,200	130	0.01	0.00	0.000	7276: PMP-1	73.6	7263: J-1	73.6
P-1	200	110	0.22	0.00	0.000	7263: J-1	73.6	7266: J-2	73.6
P-2	200	110	0.22	0.00	0.000	7266: J-2	73.6	7290: J-3	73.7
P-3	150	100	0.38	0.10	0.002	7290: J-3	73.7	7292: J-4	71.1
P-4	150	100	0.32	0.04	0.002	7292: J-4	71.1	7294: J-5	70.1
P-5	200	110	0.00	0.00	0.000	7266: J-2	73.6	7268: J-6	71.8
P-6	200	110	0.00	0.00	0.000	7268: J-6	71.8	7286: HYD-1	71.9
P-7	150	100	0.00	0.00	0.000	7268: J-6	71.8	7270: J-7	71.3
P-8	150	100	0.00	0.00	0.000	7270: J-7	71.3	7288: J-9	71.1
P-9	150	100	0.00	0.00	0.000	7274: J-8	71.2	7270: J-7	71.3

*Material is PVC unless otherwise noted
*Water Age (Hours) is n/a unless otherwise noted

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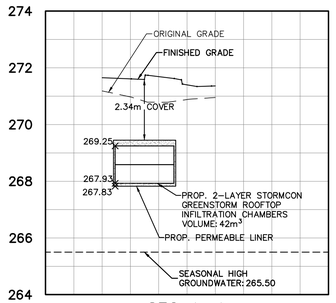
20 Rose Street, Barrie
WaterCAD FlexTable: Fire Flow Report

Label	Description	Satisfies Fire Flow Constraints?	Fire Flow (Required) (L/s)	Pressure Required (Residual Lower Limit) (psi)	Fire Flow (Available)* (Upper Limit) (L/s)	Pressure (Calculated Residual @ Total Flow Needed) (psi)
HYD-1	Proposed Hydrant	TRUE	100	20.0	200	63.6
J-8	Parking Garage - Fire	TRUE	83	20.0	200	57.1
J-9	Residential Bld - Fire	TRUE	100	20.0	173	51.6

Appendix C

Pearson Engineering Drawings

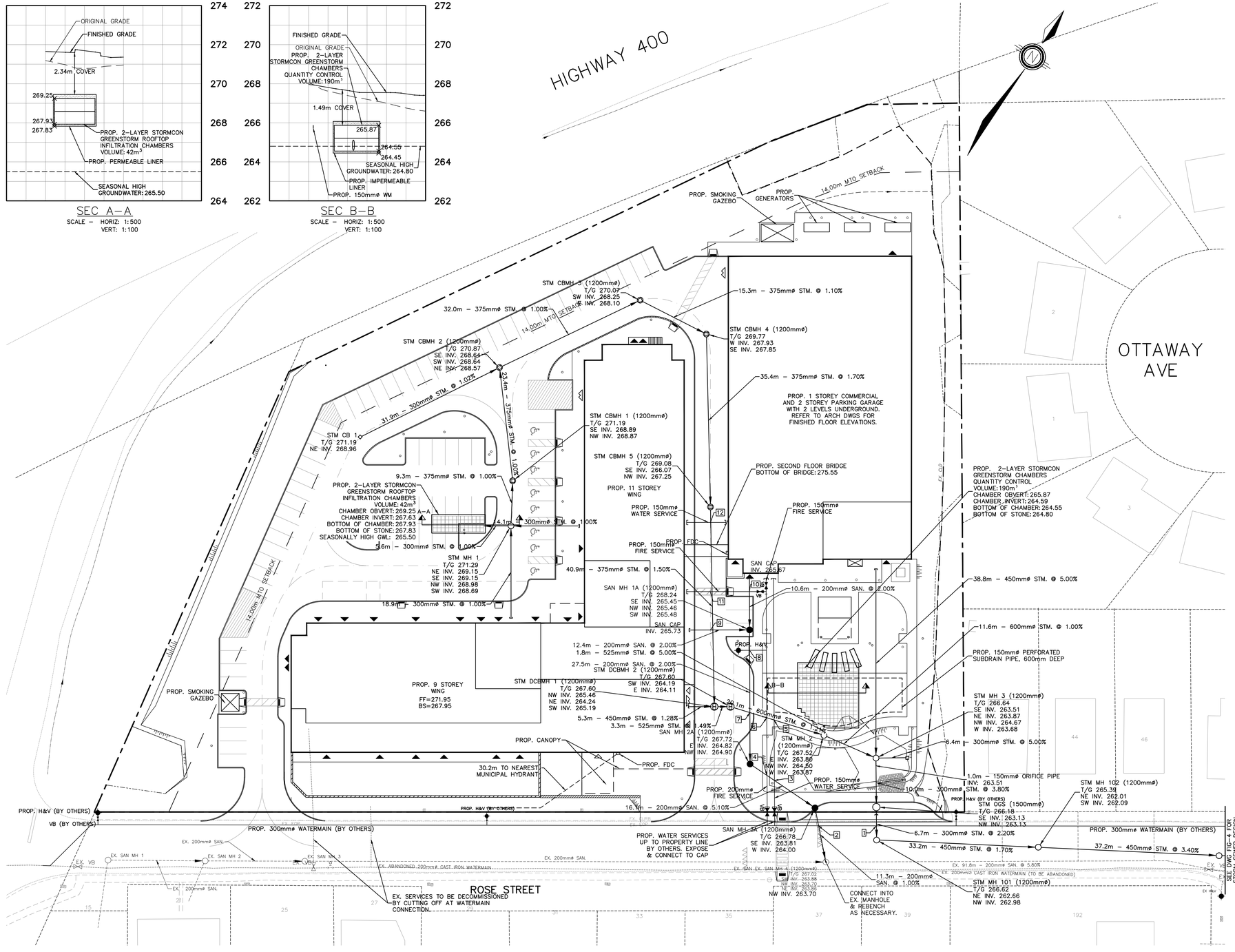


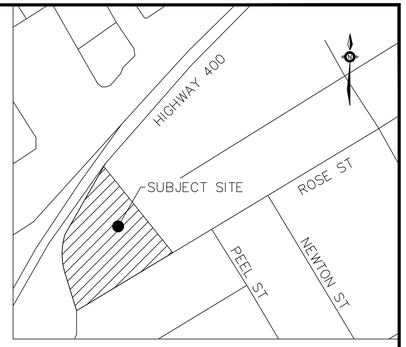
SEC A–A

SCALE – HORIZ: 1:500
VERT: 1:100

SEC B–B

SCALE – HORIZ: 1:500
VERT: 1:100

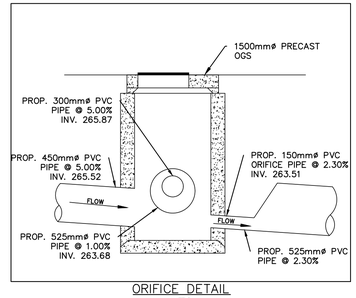




KEYMAP
NTS

LEGEND

- SITE BOUNDARY
- WATER VALVE
- EX STM MANHOLE
- PROP. STM MANHOLE
- EX. STM PIPE
- PROP. STM PIPE
- EX SAN MANHOLE
- PROP. SAN MANHOLE
- EX. SAN PIPE
- PROP. SAN PIPE
- SERVICING CAP
- TRANSFORMER
- ACCESSIBLE FF ENTRANCE
- MAIN FLOOR (FF) ENTRANCE
- BASEMENT (BS) ENTRANCE
- VEHICLE ENTRANCE
- TREE PRESERVATION FENCE



ORIFICE DETAIL
NTS

PIPE CROSSINGS								
CROSSING LOCATION	ELEVATION	SEPARATION (m)	SAN INV	SAN OBV	STM INV	STM OBV	WM INV	WM OBV
1	266.04	0.50				263.43	263.93	
2	266.50	0.50		263.98			264.48	
3	267.29	0.54		264.71			265.25	
4	267.52	0.54		264.81			265.35	
5	267.87	1.04				264.53	265.57	
6	267.91	1.10				264.55	265.65	
7	267.86	0.52	265.10			264.58		
8	268.16			265.57			266.07	
9	268.08	1.05		264.65	265.70			
10	268.65	0.72		265.72			266.44	
11	268.51	0.50				266.19	266.69	
12	269.04	0.77			267.27			266.50

SCALE BAR 1:400
0 10 25

CITY OF BARRIE D30–006–2024

I HAVE REVIEWED THE PLANS FOR THE CONSTRUCTION OF SITE PLAN LOCATED AT 20 ROSE STREET IN THE CITY OF BARRIE AND HAVE PREPARED THIS PLAN TO INDICATE THE COMPATIBILITY OF THE PROPOSAL TO EXISTING ADJACENT PROPERTIES AND MUNICIPAL SERVICES. IT IS MY BELIEF THAT ADHERENCE TO THE PROPOSED GRADE AS SHOWN WILL PRODUCE ADEQUATE SURFACE DRAINAGE AND PROPER FACILITY OF MUNICIPAL SERVICES WITHOUT ANY DETRIMENTAL EFFECT TO THE EXISTING DRAINAGE PATTERNS OR ADJACENT PROPERTIES.

NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER CITY OF BARRIE COMMENTS	09/13/24	TWC

BENCHMARK

ELEVATIONS ARE GEODETIC REFERED TO VERTICAL CONTROL MONUMENT No. 010198654 74 AND RELATED TO THE CGVD28:78 DATUM, HAVING AN ELEVATION OF 272.0897 METRES.

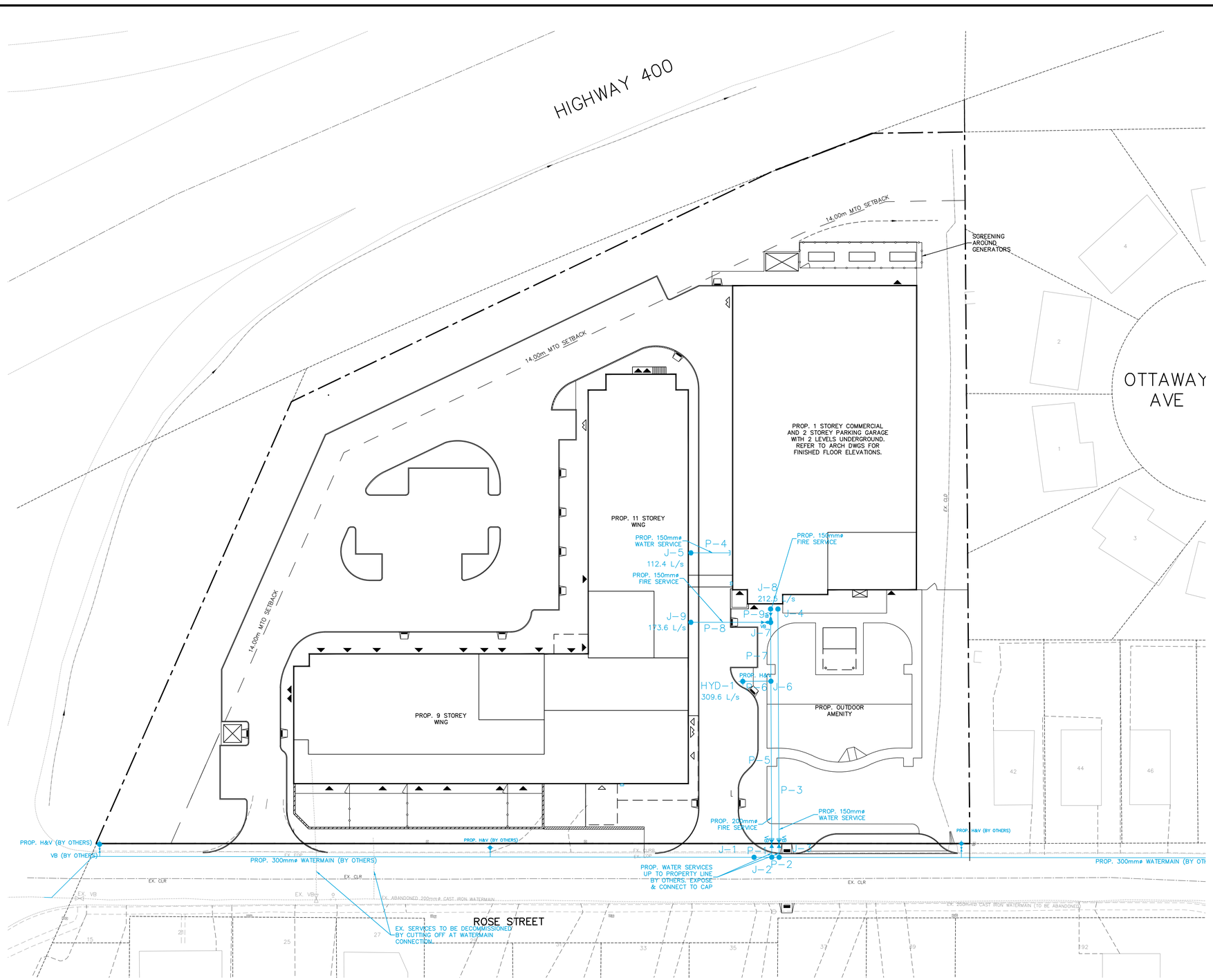
LICENSED PROFESSIONAL ENGINEER M.W. DEJEAN Sept 13, 2024 PROVINCE OF ONTARIO

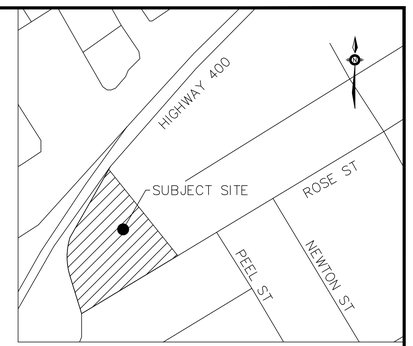
COUNTY OF SIMCOE AFFORDABLE HOUSING – 20 ROSE ST. CITY OF BARRIE

SITE SERVICING PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AMC/TWC	HORIZ SCALE	1:400
DRAWN BY	TWC	VERT SCALE	N/A
CHECKED BY	MWD	DATE	OCTOBER 2023
PROJECT #	20118		
DRAWING #	SS–1		
REVISION #	1		





LEGEND

- SITE BOUNDARY
- H&V FIRE HYDRANT
- WATER VALVE
- WATERMAIN
- JUNCTION

SCALE BAR 1:400

0 10 25

CITY OF BARRIE D30-006-2024

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NO.	REVISION NOTE	DATE	BY
1.	REVISED AS PER CITY OF BARRIE COMMENTS	09/13/24	TWC

BENCHMARK

ELEVATIONS ARE GEODETIC REFERED TO VERTICAL CONTROL MONUMENT No. 01019865474 AND RELATED TO THE CGVD28:78 DATUM, HAVING AN ELEVATION OF 272.0897 METRES.

COUNTY OF SIMCOE AFFORDABLE HOUSING – 20 ROSE ST.
CITY OF BARRIE

WATER SERVICING PLAN

PEARSON ENGINEERING
PEARSONENG.COM PH. 705.719.4785

DESIGNED BY	AMC/TWC	HORIZ SCALE	1:400
DRAWN BY	TWC	VERT SCALE	N/A
CHECKED BY	MWD	DATE	OCTOBER 2023

PROJECT # 20118
DRAWING # WC-1
REVISION # 1