

May 2, 2023

Project No. 17003-57

Sherborne Lodge Developments Limited
C/O Trinison Management Corp.,
8600 Dufferin St.,
Vaughan, ON L4K 5P5
Attn: Sang Kim

ENO Investments Limited
C/O Remington Group Limited
7501 Keele Street, Suite 100
Vaughan, ON L4K 1Y2
Attn: Jason Sheldon

**Subject: Sherborne Lodge & Eno Investments
Water Distribution Modeling
Town of Oakville, Region of Halton**

Dear Mr. Kim, Mr. Sheldon,

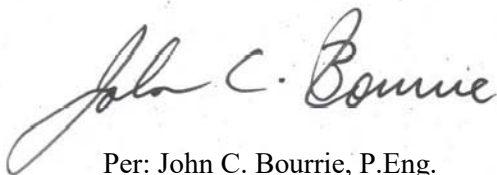
We are pleased to submit our report entitled “Sherborne Lodge & Eno Investments Development Watermain Analysis” outlining the results of our water distribution analysis for the proposed residential development in the Town of Oakville, Region of Halton.

This development layout was incorporated into the Region of Halton’s existing Infowater water models dated August 2022 and modeled utilizing the design information provided to Municipal Engineering Solutions. The findings of our analysis are summarized in the following report.

We trust you will find this report satisfactory. Should you have any questions or require further clarification, please call.

Yours truly,

Municipal Engineering Solutions



Per: John C. Bourrie, P.Eng.

/LMC

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SHERBORNE LODGE & ENO INVESTMENTS DEVELOPMENTS

WATER ANALYSIS

PREPARED BY:

MUNICIPAL ENGINEERING SOLUTIONS



FOR:

TRINISON MANAGEMENT/REMINGTON GROUP
May 2023

Project Number: 17003-57

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Section 1 – INTRODUCTION

Municipal Engineering Solutions (“MES”) was retained by Sherborne Lodge Investments Ltd. and ENO Investments Ltd. to conduct a hydraulic water analysis for the proposed Sherborne Lodge and ENO developments located in the Town of Oakville in the Region of Halton. As part of this hydraulic assessment MES was requested to undertake the following:

1. Calculate/verify water demands for the proposed development using Region of Halton, provincial and industry design standards;
2. Add the subject watermain/development to the Region’s existing water model;
3. Run the model to size the subject mains to achieve service criteria during Average Day, Peak Hour, and fire flow during Maximum Day demand; and
4. Prepare a Report summarizing the modeling results for agency review and design purposes.

1.1 Development Background

The Sherborne Lodge and ENO developments are located south of William Halton Parkway (Burnhamthorpe Road West), east of Neyagawa Boulevard in the Town of Oakville. Sherborne Lodge will consist of 84 single family homes, 125 townhomes, a commercial block, an apartment block and a school block, while ENO will consist of 292 single family homes, 309 street townhomes, two high density blocks, and a future development block. The proposed developments are shown below on **Figure 1**.

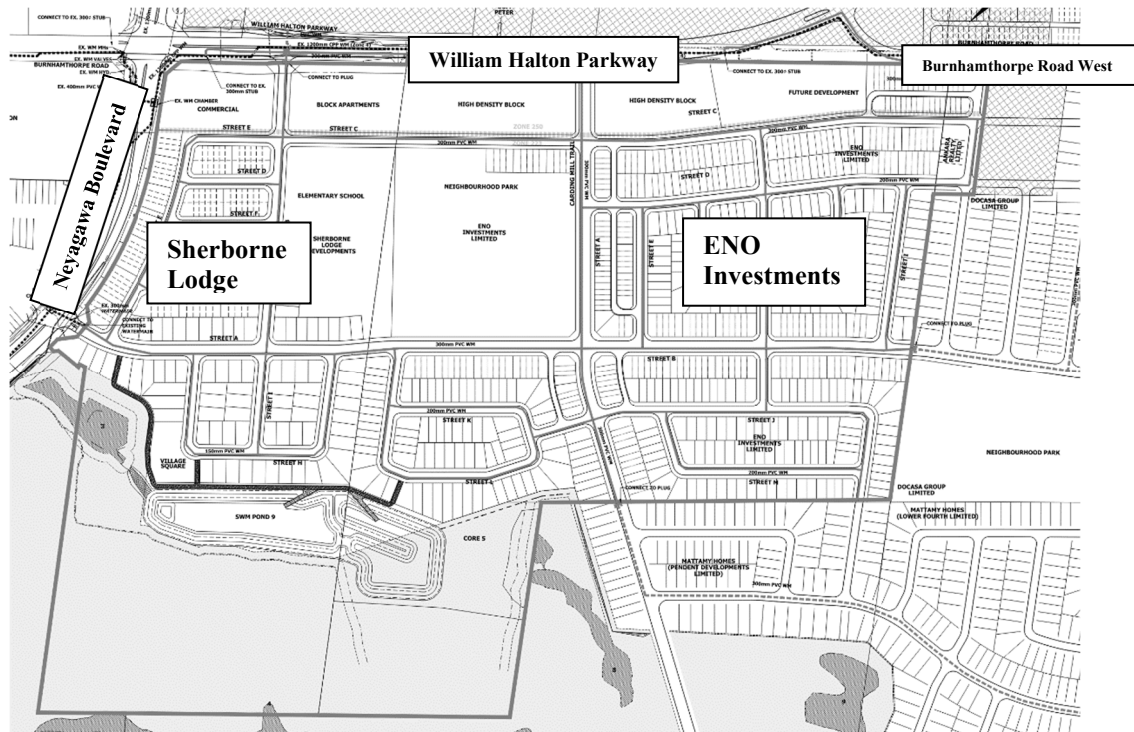


Figure 1 - Proposed Sherborne Lodge & ENO Developments

Section 2 – WATERMAIN DESIGN CRITERIA

The design criteria utilized to estimate the water demands for the hydraulic water model follows general industry standards and is calculated using the design criteria and guidelines outlined in the Region of Halton’s October 2019 Water and

Wastewater Linear Design Manual, the Ministry of the Environment, Conservation and Parks (MECP) Watermain Design Criteria, and the Fire Underwriters Survey.

The following sections summarize the specific design criteria used to carry out the hydraulic watermain assessment for this development.

2.1 Equivalent Population Densities & Water Design Factors

To calculate the equivalent population and water design factors for this development MES used Region of Halton criteria as noted in the “*Region of Halton Water and Wastewater Linear Design Manual, October 2019*”. **Table 1** summarizes the population densities and **Table 2** summarizes the average daily demand and peaking factors used for this analysis.

Table 1 – Equivalent Population Density

Type of Development	Equivalent Population (Persons/Ha)	Equivalent Population (Persons/Unit)
Single Family	55	3.772
Semi-Detached	100	3.772
Townhouse	135	2.851
Apartment	285	1.655
Light Commercial/Schools	90	
Community Services	40	

Source: Region of Halton Water and Wastewater Linear Design Manual, October 2019, 2022 Development Charges Update December 2021 (Table A-3)

Table 2 - Water Design Factors

Type of Development	Average Daily Demand (m ³ per capita)	Maximum Daily Demand Peaking Factor	Peak Hourly Demand Peaking Factor
Residential	0.275	2.25	4.00
Industrial	0.275	2.25	2.25
Commercial	0.275	2.25	2.25
Community Services	0.275	2.25	2.25

Source: Region of Halton Water and Wastewater Linear Design Manual, October 2019

Section 3 –FLOW DEMANDS

Utilizing the equivalent population data and the corresponding Average Day, Maximum Day, and Peak Hour data from **Table 1** the water demands for this development were calculated.

3.1 Equivalent Population Flow Demands

The calculated demands for the development are summarized in **Table 3**. For additional details on the development water demands and assigned demand nodes used in the water model see **Appendix A**.

Table 3 – Water Demand for Sherborne Lodge/ENO Developments

Development	Average Day Demand (L/S)	Maximum Day Demand (L/S)	Peak Hour Demand (L/S)
Sherborne Lodge	4.35	9.78	16.26
ENO	16.17	36.38	63.99
Total	20.52	46.16	80.25

3.2 Fire Flow Demands

The fire demands for this development were based on typical flows calculated using the Fire Underwriters Survey (“FUS”) formula outlined in the ‘*Water Supply For Public Fire Protection Guideline*’, dated 2020. Since the detailed design data (specifics) for the proposed units/buildings are not known at this time, fire flows that have been used by MES for other similar developments previously submitted in Halton were utilized. Once the building designs/configurations are known for the proposed development the fire flows for each unit/building must be confirmed using the FUS criteria to determine the actual fire flow required. Building construction and sprinkler systems may need to be designed to suit the available flow and pressure. The fire flows used are shown in **Table 4**.

Table 4 - Fire Flow Requirements

Building	Fire Flow (L/S)
Singles/Semidetached	167
Street Towns	250
B2B Towns	283
Apartments	273

Source: Fire Underwriters Survey,

3.3 External Demands

The Region of Halton InfoWater model that was provided by the Region to MES included water demands for existing and known future developments within the Region.

Section 4 – OTHER SYSTEM REQUIREMENTS

4.1 System Pressure Requirements

In addition to meeting the various flow requirements, the system must also satisfy minimum and maximum pressure requirements as outlined by the Region of Halton. The Region’s pressure requirements are outlined in the Water and Wastewater Linear Design Manual and stipulate the following:

1. The water system shall be designed to maintain as close as possible to a maximum working pressure of 690 kPa (100 psi) as a best management practice.
2. The minimum system pressure shall not be less than 140 kPa (20 psi) at any point in the water system under fire flow conditions.
3. Under normal operating conditions, the water system shall have a target minimum static pressure of 345 kPa (50 psi). Under no operating conditions shall the static pressure within a distribution main fall below 275 kPa (40 psi).
4. The normal method of reduction of pressures to comply with the Ontario Building Code (reduction of pressures to 550 kPa, 80 psi) is by pressure reducing valves to be installed on individual services.

4.2 Watermain Sizing

The Region of Halton also stipulates minimum pipe sizes and requires that all watermains are adequately sized to maintain demand flows at the required pressures without causing excessive energy loss or result in water quality decay. The watermain system must therefore be designed to accommodate the greater of the following:

- Maximum day plus fire demand
- Peak hour demand

The minimum pipe size for commercial and industrial areas shall be 300 mm diameter and for residential areas the minimum pipe size shall be 150 mm diameter. For distribution systems providing fire protection the minimum pipe size

shall be 150 mm diameter in accordance with Ministry of the Environment, Conservation and Parks (MECP) and NFPA requirements.

To provide appropriate fire protection, reliable supply and pressures the water distribution system should be looped wherever possible to improve supply security and water quality.

4.3 Watermain C-Factor

In designing and modeling of the pipes the Coefficient of Roughness (C-Factor) factors from the Region’s design manual were utilized. The Coefficient of Roughness assigned to each pipe size in summarized in **Table 5** below.

Table 5 - Hazen-Williams Coefficient of Roughness (C-Factors)

Size of Pipe (Diameter in mm)	Pipe Material	Coefficient of Roughness (C)
50 mm	Copper	120
100 mm to 400 mm	PVC/HDPE	130
Greater Than 400 mm	Concrete Lined	110

Source: Region of Halton Water and Wastewater Linear Design Manual, October 2019

Section 5 – ANALYSIS & MODELING RESULTS

To conduct the hydraulic water analysis for the proposed development the water demands were estimated by MES using the design criteria previously discussed and incorporated the demands into the existing Region of Halton InfoWater model which was provided by the Region and confirmed as most recent. The following sections discusses the model setup and results.

5.1 Model Setup

The Sherborne Lodge and ENO developments are located within the Region’s Zone O4 which is part of the area to be changed through the Region’s zone realignment. The developments are located near the boundary between the future Zones 223 and 250 which is approximated to run along William Halton Parkway/Burnhamthorpe Road on the Region’s plans shown below. The model considers the zone realignment to be in place in all planning scenarios.

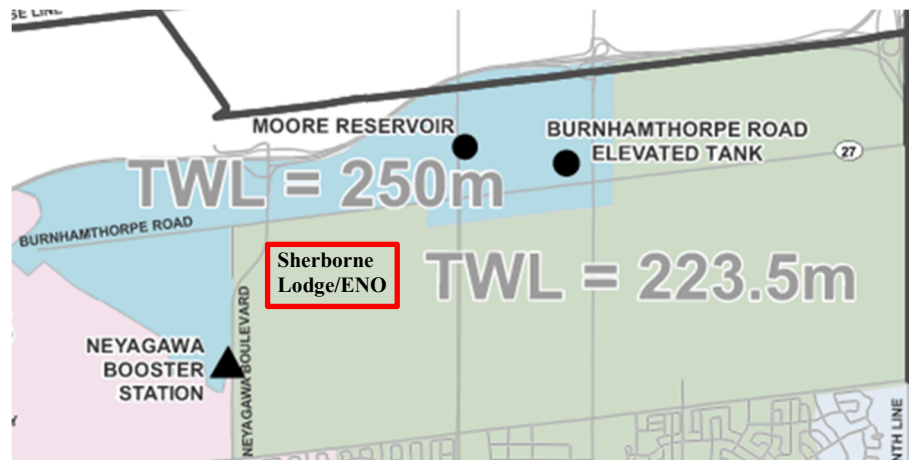


Figure 2 – Region’s Future Pressure 250 & 223 Zones

The development was modeled under 2026 and 2031 conditions in the Region's water model. Based on the current understanding of the area development buildout, the developments were considered to be constructed in 2026 with supply provided by Zone 250. In 2031, when external Zone 223 watermains become available, all but the higher density blocks along William Halton Parkway/Burnhamthorpe Road will be moved to the lower zone.

New nodes were created to add the flow demands and service elevation information from the developments to the Region of Halton's existing Infowater hydraulic water distribution model system and the system analysis was carried out. Friction factor for the pipes were assigned according to **Table 5**.

5.2 Watermain Sizing and System Pressures

The analysis was conducted under 2026 and 2031 servicing conditions for Average Day, Maximum Day, Peak Hour and Maximum day plus Fire demands to size the watermains and meet the pressure requirements. The pipe size and layout are shown in **Appendix B**.

As noted in Section 5.1, the Sherborne Lodge and Eno developments are anticipated to be completed before other neighbouring developments. Without the external development watermains to the south and east, only a Zone 250 supply will be available from the existing stubs on the William Halton Parkway/Burnhamthorpe Road 1,200 mm Zone 250 feedermain. The developments will initially have connections to those existing stubs at Neyagawa Boulevard, near Street 'A' and the existing 300 mm stub on William Halton Parkway, west of Street 'B'.

According to the model output, the developments will experience pressures above the OBC limit of 80 psi (550 kPa) and over 100 psi (700 kPa) when supplied from Zone 250. It should be noted that the Region does not examine minimum hour conditions so pressures could be higher than modelled.

A pressure contour schematic of the 2026 average day conditions is within Appendix B. Most of the development, under average day conditions, will have pressures above the Region's criteria 100 psi (700 kPa). This interim supply situation must be discussed with the Region to confirm that the Region is comfortable with the higher pressures until the lower zone supply becomes available. The units will require pressure reducing valves to meet the OBC limit while being supplied by Zone 250 and the higher density blocks building mechanical systems must be designed with consideration for the high pressures. Pressures must be confirmed in the field.

When the Zone 223 supply becomes available from the other external developments south and east, the connections to the Zone 250 watermains supplying the development units south of William Halton Parkway/Burnhamthorpe Road should be decommissioned. The pressures will be lower with the Zone 223 supply and the pressure reduction no longer needed within those units. The higher density blocks fronting William Halton Parkway/Burnhamthorpe Road will remain on Zone 250.

If the Zone realignment is not in place at the time of construction, the supply will be from Zone O4. The top water level of Zone O4 is 236 m while the top water levels of Zone 250 and Zone 223 are 250 m and 223.5 m respectively. The pressure supplied by Zone 250 will be approximately 14 m or 19.9 psi (138 kPa) higher than Zone O4 while the pressure under Zone 223 will be approximately 13 m or 18.5 psi (127.5 kPa) lower than Zone O4. Pressure reduction would still be required in some areas of the developments to meet the OBC pressure limit until the zone realignment is completed and Zone 223 supply available. Also, the higher density block building mechanical designers should be aware that pressures will be higher under Zone 250 conditions.

The watermains were sized at 150 mm to 300 mm according to the results of average day, maximum day, maximum day plus fire, and peak hour scenarios.

Modeled service pressures for the development are summarized in **Table 6**. All pressures lie within the required operating range under average day, maximum day, and peak hour demands in 2031. Fire flows can be met at all nodes except for a slight shortfall at Node J-2032. Future external connections will increase the fire flow to the area.

Detailed pipe and node tables for the various scenarios modelled are attached to this report in **Appendix B**.

Table 6 - Modeled Service Pressures

Scenario	Average Day	Maximum Day	Peak Hour	Max. Day + Fire
2026	95.4 – 110.6 psi (658 to 762 kPa)	94.2 – 109.6 psi (650 to 756 kPa)	78.6 to 93.9 psi (542 to 648 kPa)	363 to 1,520 L/s @ 20 psi
2031				
Zone 223	57.2 – 68.1 psi (394 to 469 kPa)	46.8 – 57.8 psi (323 to 398 kPa)	46.2 – 57.1 psi (319 to 394 kPa)	208 to 371 L/s @ 20 psi
Zone 250	94.7 – 99.6 psi (653 to 687 kPa)	95.6 – 101.0 psi (659 to 696 kPa)	79.3 – 84.7 psi (547 to 584 kPa)	468 to 1,197 L/s @ 20 psi

Section 6 – CONCLUSIONS

The results are summarized below.

- The service pressures are expected to range between 78.7 psi to 110.6 psi (542 kPa to 762 kPa) in 2026 with a Zone 250 supply and in 2031 between 46.2 psi to 68.1 psi (319 kPa to 469 kPa) for areas in Zone 223 and between 79.3 psi to 101.0 psi (547 kPa to 696 kPa) for areas remaining in Zone 250 .
- The available fire flow meets the preliminary fire flow demands at the minimum pressure of 20 psi (140 kPa) except for a slight shortfall at Node J-2032. Future external connections will increase the fire flow to the area.
- The developments will experience pressures above the OBC limit of 80 psi (550 kPa) and most areas will experience pressures above 100 psi (700 kPa) in 2026 when supplied from Zone 250. The units will require individual pressure reducing valves until the Zone 223 supply becomes available. Pressures must be confirmed in the field. Higher density building mechanical designs should consider the higher pressures.
- Given the high operating pressures expected, the Zone 223/250 boundary location and the temporary supply from Zone 250 must be discussed with the Region.
- The available fire flow meets or exceeds the preliminary fire flow demands utilized for this assessment at the minimum pressure of 140 kPa based on the proposed watermain supply and assumptions made within this report but must be confirmed when additional information becomes available. Once building designs/configurations are known, the fire flows must be confirmed using the FUS formula. Building construction may need to be designed to suit the available flow and pressure.
- This report, including all modeling assumptions used, is to be submitted to and reviewed by the water operating authority (municipality) to confirm that the modeling parameters used are acceptable to the operating authority and/or confirm if modified domestic or fire flow requirements are required or should be implemented for this particular development.

Appendix A

Demands

Halton Design Criteria

Water & Wastewater Linear Design Manual, October 2019

Equivalent Population by Unit

(2022 Development Charges Update, Table A-3)

Type of Development	Equivalent Population Density
	(Person/Unit)
Single Family or Semi-Detached	3.772
Townhouse	2.851
Apartment	1.655

Equivalent Population by Area

Type of Development	Equivalent Population Density	Average Day Demands
	(Person/Hectare)	(m3/ha/day)
Single Family	55	15.13
Semi-detached duplex and 4-plex	100	27.50
Townhouse, Maisonette (<6 stories)	135	37.13
Apartments (>6 stories)	285	78.38
Light Commercial Areas	90	24.75
Community Services	40	11.00
Light Industrial Areas	125	34.38
Hospitals (persons/bed)	4	

Water Design Factors

Average Daily Demand (m3/capita)	0.275
Maximum Daily Demand P.F.	2.25
Maximum Hourly Demand P.F.	
<i>Residential</i>	4
<i>I/C/I</i>	2.25

Coefficient of Roughness

Size of Pipe (mm Dia.)	Material	Coefficient of Roughness (C)
50	Copper	120
100-400	PVC/HDPE	130
Over 400	Concrete Lined	110

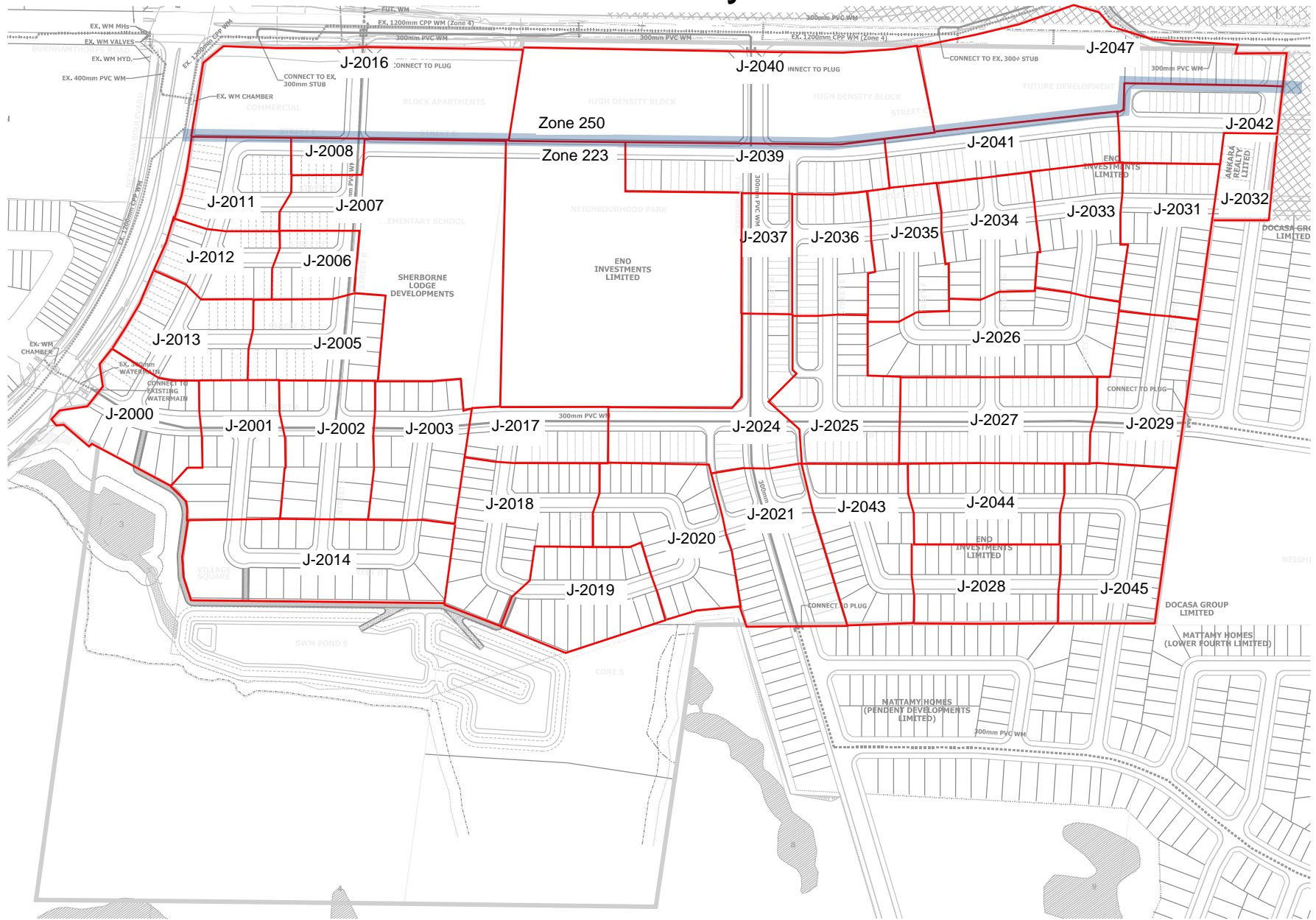
Minimum Pipe Size

Type of Development	Size of Pipe (mm Dia.)
Residential	150
Commercial/Industrial/Community	300

Working Pressures

Parameter	Pressure
Normal Condition	
Minimum Pressure	275 kPa (40 psi)
Target Pressure	350 kPa (50 psi)
Maximum (Building Code)	550 kPa (80 psi)
Maximum (Halton)	690 kPa (100 psi)
Fire Flow Conditions	
Minimum Pressure	140 kPa (20 psi)

Demand Layout



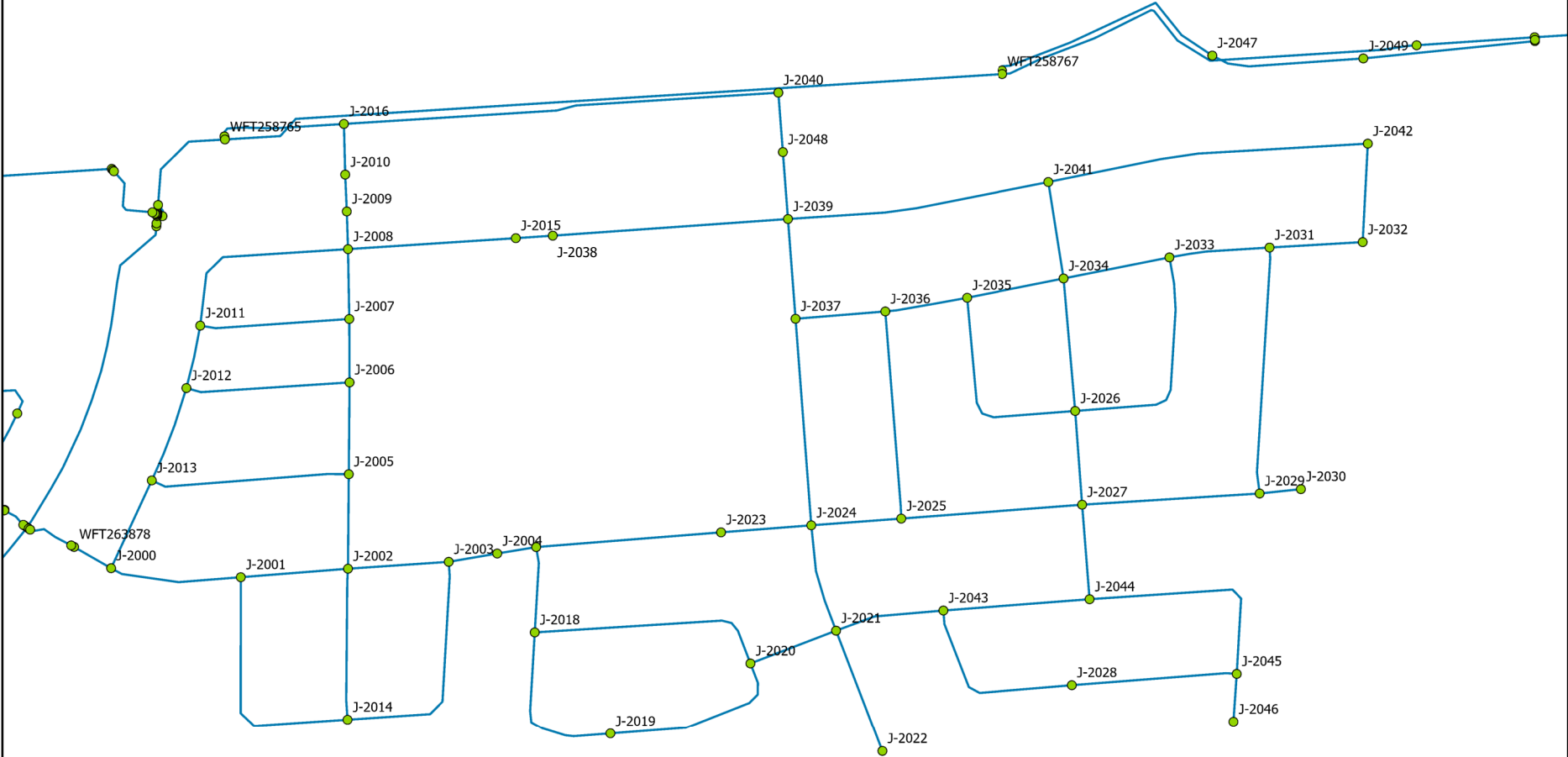
Water Demand
 Sherborne Lodge/Eno, Oakville ON
 May 1, 2023

Node	Site	Exist. Zone	Interim Zone	Fut. Zone	Elevation (m)	Type of Development						Equivalent Population		Demands			Fire Flow Demands	
						Single Family	Semi-Detached	Townhouse	Apartment	Commercial	Community	Industrial	Total Population	Total Population	ADD	MDD		PHD
						(units)	(units)	(units)	(units)	(ha)	(ha)	(ha)	(Residential)	(ICI)	(L/s)	(L/s)		(L/s)
J-2000	Sherborne	O4	250	223	175.07	11		4					53	0	0.17	0.38	0.67	250
J-2001	Sherborne	O4	250	223	176.49	15							57	0	0.18	0.41	0.72	167
J-2002	Sherborne	O4	250	223	176.10	15							57	0	0.18	0.41	0.72	167
J-2003	Sherborne	O4	250	223	176.30	16							60	0	0.19	0.43	0.77	167
J-2004	Sherborne	O4	250	223	176.53								0	0	0.00	0.00	0.00	167
J-2005	Sherborne	O4	250	223	176.43	6		16					68	0	0.22	0.49	0.87	250
J-2006	Sherborne	O4	250	223	177.27			13					37	0	0.12	0.27	0.47	283
J-2007	Sherborne	O4	250	223	178.41			13			2.8		37	112	0.47	1.07	1.27	283
J-2008	Sherborne	O4	250	223	179.63			6					17	0	0.05	0.12	0.22	283
J-2009	Sherborne	O4	250		180.27								0	0	0.00	0.00	0.00	
J-2010	Sherborne	O4	250		180.99								0	0	0.00	0.00	0.00	
J-2011	Sherborne	O4	250	223	179.62			29					83	0	0.26	0.59	1.05	283
J-2012	Sherborne	O4	250	223	178.35			18					51	0	0.16	0.37	0.65	283
J-2013	Sherborne	O4	250	223	176.32			26					74	0	0.24	0.53	0.94	250
J-2014	Sherborne	O4	250	223	175.51	21							79	0	0.25	0.57	1.01	167
J-2015	Sherborne	O4	250	223	181.00								0	0	0.00	0.00	0.00	
J-2016	Sherborne	O4	250	250	182.11				296	1.007			490	91	1.85	4.16	6.89	273
J-2017	Eno	O4	250	223	176.19	2		10					36	0	0.11	0.26	0.46	250
J-2018	Eno	O4	250	223	175.70	32							121	0	0.38	0.86	1.54	167
J-2019	Eno	O4	250	223	175.53	20							75	0	0.24	0.54	0.96	167
J-2020	Eno	O4	250	223	177.83	23							87	0	0.28	0.62	1.10	167
J-2021	Eno	O4	250	223	178.91	8		21					90	0	0.29	0.64	1.15	250
J-2022	Eno	O4	250	223	179.57								0	0	0.00	0.00	0.00	250
J-2023	Eno	O4	250	223	177.77								0	0	0.00	0.00	0.00	250
J-2024	Eno	O4	250	223	178.33			28					80	0	0.25	0.57	1.02	250
J-2025	Eno	O4	250	223	178.38	6		27					100	0	0.32	0.71	1.27	250
J-2026	Eno	O4	250	223	179.30	27							102	0	0.32	0.73	1.30	167
J-2027	Eno	O4	250	223	179.17			39					111	0	0.35	0.80	1.42	250
J-2028	Eno	O4	250	223	179.80	23							87	0	0.28	0.62	1.10	167
J-2029	Eno	O4	250	223	180.12	13		14					89	0	0.28	0.64	1.13	250
J-2030	Eno	O4	250	223	180.59								0	0	0.00	0.00	0.00	
J-2031	Eno	O4	250	223	180.01	17		11					95	0	0.30	0.68	1.22	250
J-2032	Eno	O4	250	223	181.15			6					17	0	0.05	0.12	0.22	250
J-2033	Eno	O4	250	223	180.69	12		10					74	0	0.23	0.53	0.94	250
J-2034	Eno	O4	250	223	180.27	12		8					68	0	0.22	0.49	0.87	250
J-2035	Eno	O4	250	223	179.70	12		8					68	0	0.22	0.49	0.87	250
J-2036	Eno	O4	250	223	179.98	6		17					71	0	0.23	0.51	0.91	250
J-2037	Eno	O4	250	223	179.03			13					37	0	0.12	0.27	0.47	250
J-2038	Eno	O4	250	223	180.90								0	0	0.00	0.00	0.00	
J-2039	Eno	O4	250	223	179.83			27					77	0	0.25	0.55	0.98	250
J-2040	Eno	O4	250	250	182.88			116	1200	1.376			2317	124	7.77	17.48	30.38	273
J-2041	Eno	O4	250	223	180.58			24					68	0	0.22	0.49	0.87	250
J-2042	Eno	O4	250	223	182.76			28					80	0	0.25	0.57	1.02	250
J-2043	Eno	O4	250	223	179.07	25							94	0	0.30	0.68	1.20	167
J-2044	Eno	O4	250	223	179.59	24							91	0	0.29	0.65	1.15	167
J-2045	Eno	O4	250	223	180.53	30							113	0	0.36	0.81	1.44	167
J-2046	Eno	O4	250	223	180.80								0	0	0.00	0.00	0.00	
J-2047	Eno	O4	250	250	185.29			86	280				709	0	2.26	5.07	9.02	273
J-2048	Eno	O4	250		180.83								0	0	0.00	0.00	0.00	
J-2049	Eno	O5	250	250	181.83								0	0	0.00	0.00	0.00	250
Total						376	0	618	1776	2.383	2.800	0.000	6119	326	20.52	46.16	80.25	
Sherborne						84	0	125	296	1.007	2.800	0.000	1163	203	4.35	9.78	16.26	
Eno						292	0	493	1480	1.376	0.000	0.000	4956	124	16.17	36.38	63.99	
2031 Zone 223						376	0	416	0	0.000	2.800	0.000	2604	112	8.65	19.45	33.96	
2031 Zone 250						0	0	202	1776	2.383	0.000	0.000	3515	214	11.87	26.71	46.29	

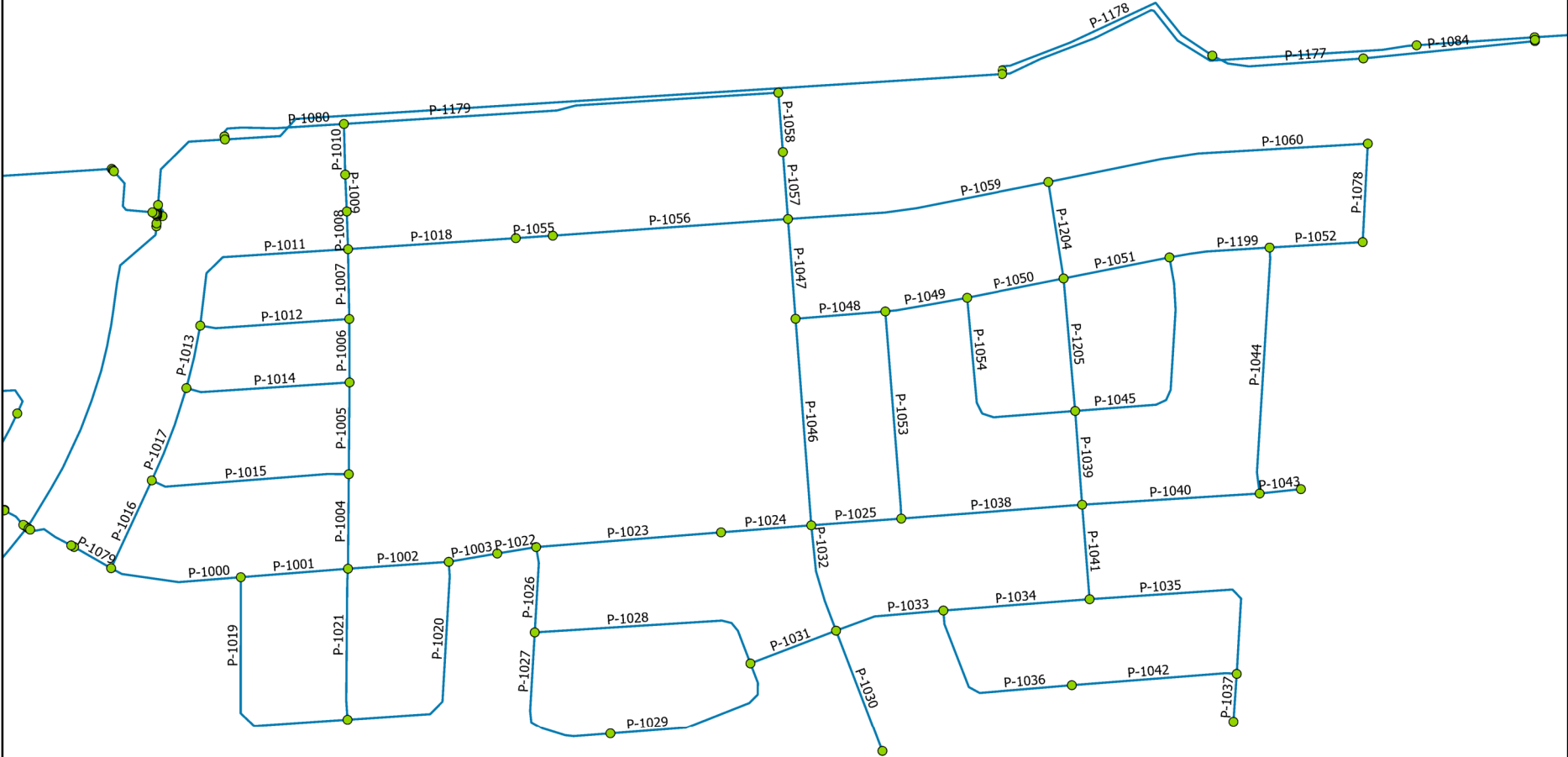
Appendix B

Model Results

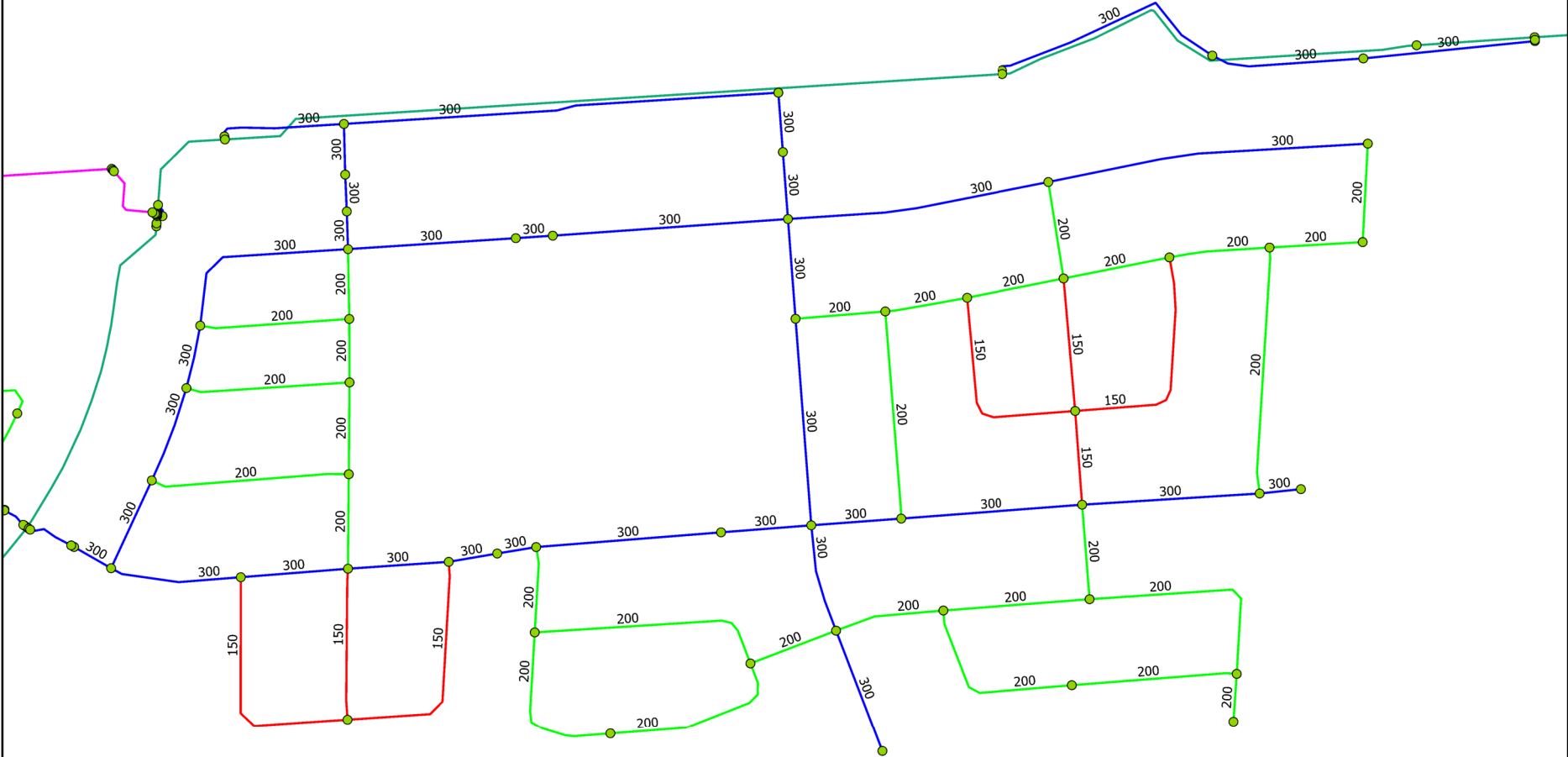
Node Names



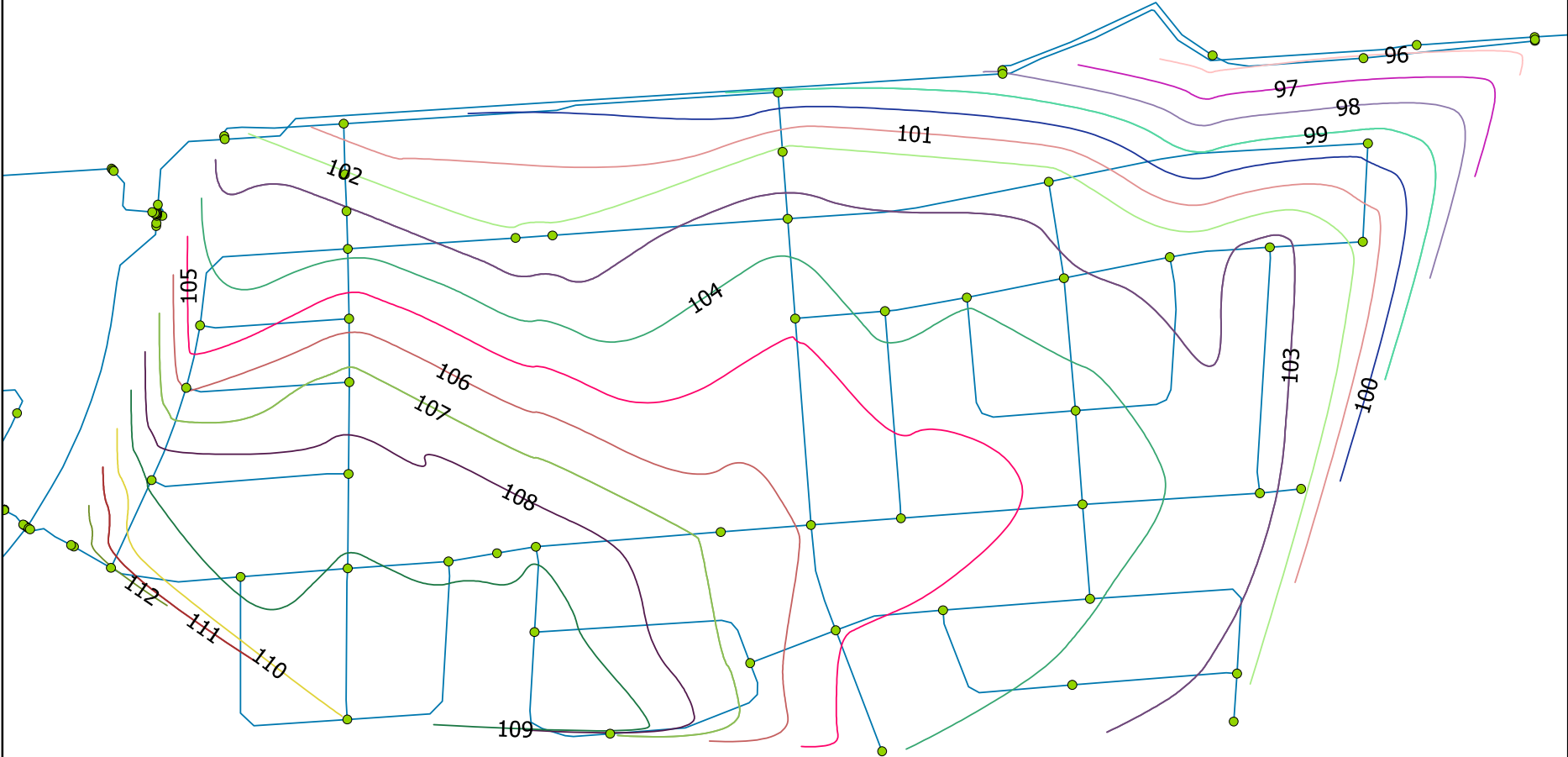
Pipe Names



Pipe Diameter



2026 Average Day Pressures Zone 250 Supply

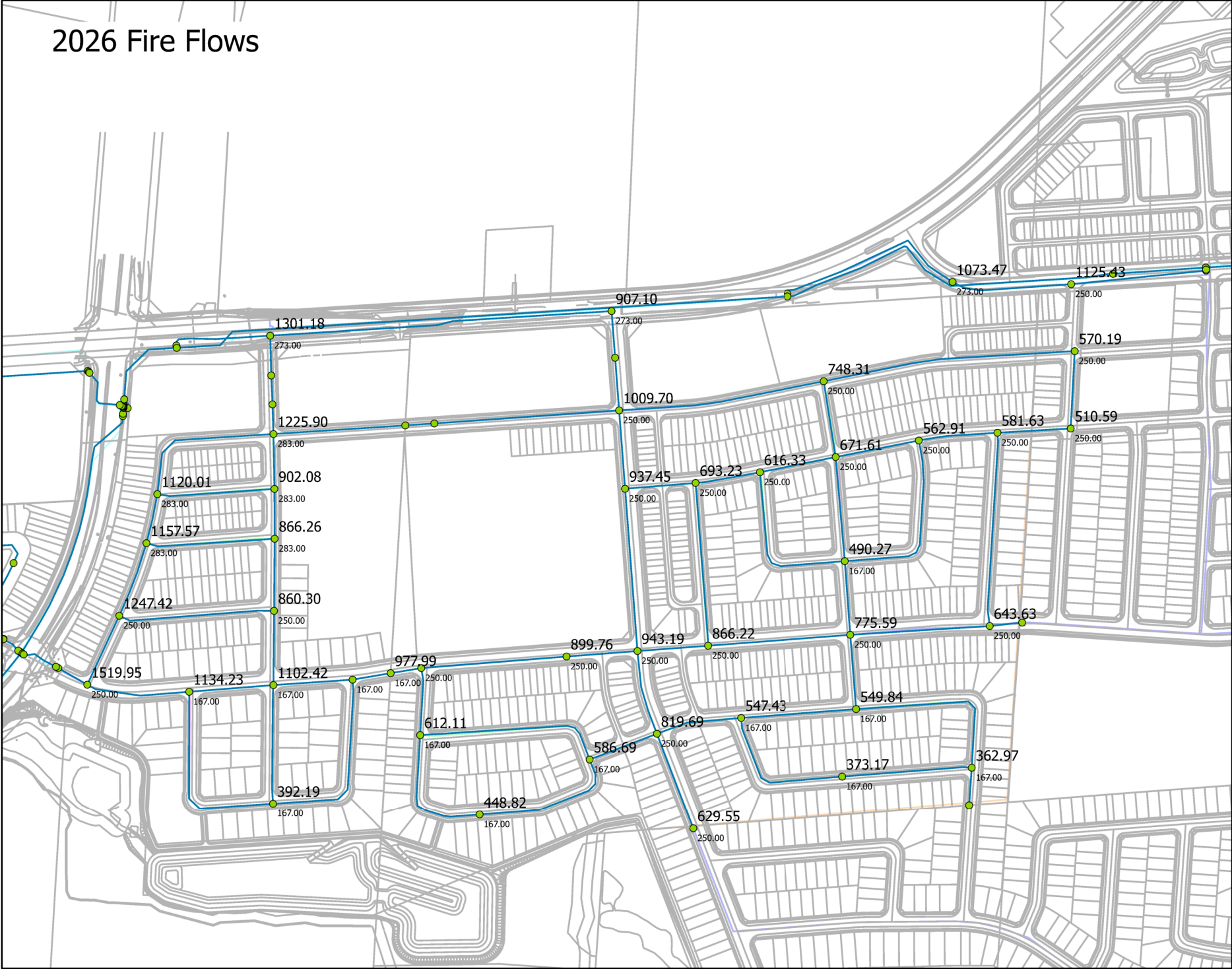


2026 Conditions
 Sherborne & Eno Developments, Oakville On
 May 3, 2023

Fire Flow Table			
ID	Total Demand	Available Flow	Fire Flow Met?
	(L/s)	(L/s)	
J-2000	250.38	1519.95	TRUE
J-2001	167.41	1134.23	TRUE
J-2002	167.41	1102.42	TRUE
J-2003	167.43	1010.27	TRUE
J-2004	167.00	977.99	TRUE
J-2005	250.49	860.30	TRUE
J-2006	283.27	866.26	TRUE
J-2007	284.07	902.08	TRUE
J-2008	283.12	1225.90	TRUE
J-2011	283.59	1120.01	TRUE
J-2012	283.37	1157.57	TRUE
J-2013	250.53	1247.42	TRUE
J-2014	167.57	392.19	TRUE
J-2016	277.16	1301.18	TRUE
J-2017	250.26	966.31	TRUE
J-2018	167.86	612.11	TRUE
J-2019	167.54	448.82	TRUE
J-2020	167.62	586.69	TRUE
J-2021	250.64	819.69	TRUE
J-2022	250.00	629.55	TRUE
J-2023	250.00	899.76	TRUE
J-2024	250.57	943.19	TRUE
J-2025	250.71	866.22	TRUE
J-2026	167.73	490.27	TRUE
J-2027	250.80	775.59	TRUE
J-2028	167.62	373.17	TRUE
J-2029	250.64	643.63	TRUE
J-2031	250.68	581.63	TRUE
J-2032	250.12	510.59	TRUE
J-2033	250.53	562.91	TRUE
J-2034	250.49	671.61	TRUE
J-2035	250.49	616.33	TRUE
J-2036	250.51	693.23	TRUE
J-2037	250.27	937.45	TRUE
J-2039	250.55	1009.70	TRUE
J-2040	290.48	907.10	TRUE
J-2041	250.49	748.31	TRUE
J-2042	250.57	570.19	TRUE
J-2043	167.68	547.43	TRUE
J-2044	167.65	549.84	TRUE
J-2045	167.81	362.97	TRUE
J-2047	278.07	1073.47	TRUE
J-2049	250.00	1125.43	TRUE

MIN	362.97
MAX	1519.95

2026 Fire Flows



2031 Conditions
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Node Table					Pipe Table							
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness (C)	Flow (ML/d)	Velocity (m/s)
J-2000	0.17	175.07	222.97	68.09	P-1000	J-2000	J-2001	103.88	300	130	-0.03	0.01
J-2001	0.18	176.49	222.97	66.07	P-1001	J-2001	J-2002	84.68	300	130	-0.05	0.01
J-2002	0.18	176.10	222.97	66.62	P-1002	J-2002	J-2003	79.51	300	130	-0.10	0.02
J-2003	0.19	176.30	222.97	66.34	P-1003	J-2003	J-2004	38.74	300	130	-0.13	0.02
J-2004	0.00	176.53	222.97	66.01	P-1004	J-2002	J-2005	74.38	200	130	0.03	0.01
J-2005	0.22	176.43	222.97	66.15	P-1005	J-2005	J-2006	72.26	200	130	0.01	0.00
J-2006	0.12	177.27	222.97	64.96	P-1006	J-2006	J-2007	49.93	200	130	0.00	0.00
J-2007	0.47	178.41	222.97	63.34	P-1007	J-2008	J-2007	55.00	200	130	0.03	0.01
J-2008	0.05	179.63	222.97	61.61	P-1011	J-2008	J-2011	158.37	300	130	0.05	0.01
J-2011	0.26	179.62	222.97	61.62	P-1012	J-2011	J-2007	117.76	200	130	0.01	0.00
J-2012	0.16	178.35	222.97	63.43	P-1013	J-2012	J-2011	50.35	300	130	-0.02	0.00
J-2013	0.24	176.32	222.97	66.31	P-1014	J-2006	J-2012	129.18	200	130	0.00	0.00
J-2014	0.25	175.51	222.97	67.46	P-1015	J-2013	J-2005	156.59	200	130	0.00	0.00
J-2015	0.00	181.00	222.97	59.66	P-1016	J-2013	J-2000	76.16	300	130	-0.02	0.00
J-2016	1.85	182.11	252.21	99.65	P-1017	J-2012	J-2013	77.70	300	130	0.00	0.00
J-2017	0.11	176.19	222.97	66.50	P-1018	J-2008	J-2015	132.41	300	130	-0.09	0.01
J-2018	0.38	175.70	222.97	67.19	P-1019	J-2001	J-2014	195.49	150	130	0.00	0.00
J-2019	0.24	175.53	222.97	67.43	P-1020	J-2014	J-2003	189.34	150	130	-0.01	0.01
J-2020	0.28	177.83	222.97	64.17	P-1021	J-2002	J-2014	119.01	150	130	0.01	0.00
J-2021	0.29	178.91	222.97	62.63	P-1022	J-2004	J-2017	31.08	300	130	-0.13	0.02
J-2022	0.00	179.57	222.97	61.69	P-1023	J-2017	J-2023	146.05	300	130	-0.13	0.02
J-2023	0.00	177.77	222.97	64.25	P-1024	J-2023	J-2024	71.26	300	130	-0.13	0.02
J-2024	0.25	178.33	222.97	63.46	P-1025	J-2024	J-2025	71.04	300	130	-0.08	0.01
J-2025	0.32	178.38	222.97	63.38	P-1026	J-2017	J-2018	67.45	200	130	-0.01	0.00
J-2026	0.32	179.30	222.97	62.08	P-1027	J-2018	J-2019	135.68	200	130	-0.01	0.00
J-2027	0.35	179.17	222.97	62.26	P-1028	J-2018	J-2020	190.95	200	130	-0.03	0.01
J-2028	0.28	179.80	222.97	61.37	P-1029	J-2019	J-2020	148.34	200	130	-0.03	0.01
J-2029	0.28	180.12	222.97	60.91	P-1030	J-2022	J-2021	102.00	300	130	0.26	0.04
J-2030	0.00	180.59	222.97	60.25	P-1031	J-2020	J-2021	72.19	200	130	-0.09	0.03
J-2031	0.30	180.01	222.97	61.07	P-1032	J-2024	J-2021	85.75	300	130	-0.18	0.03
J-2032	0.05	181.15	222.97	59.45	P-1033	J-2021	J-2043	86.71	200	130	-0.03	0.01
J-2033	0.23	180.69	222.97	60.10	P-1034	J-2043	J-2044	116.08	200	130	-0.02	0.01
J-2034	0.22	180.27	222.97	60.70	P-1035	J-2045	J-2044	181.91	200	130	0.05	0.02
J-2035	0.22	179.70	222.97	61.51	P-1036	J-2043	J-2028	147.05	200	130	-0.03	0.01
J-2036	0.23	179.98	222.97	61.11	P-1037	J-2045	J-2046	37.84	200	130	-0.14	0.05
J-2037	0.12	179.03	222.97	62.46	P-1038	J-2025	J-2027	143.46	300	130	-0.15	0.03
J-2038	0.00	180.90	222.97	59.80	P-1039	J-2026	J-2027	73.98	150	130	-0.05	0.03
J-2039	0.25	179.83	222.97	61.32	P-1040	J-2027	J-2029	139.96	300	130	-0.23	0.04
J-2040	7.77	182.88	252.19	98.53	P-1041	J-2027	J-2044	74.62	200	130	0.00	0.00
J-2041	0.22	180.58	222.97	60.26	P-1042	J-2028	J-2045	130.13	200	130	-0.06	0.02
J-2042	0.25	182.76	222.97	57.16	P-1043	J-2029	J-2030	32.64	300	130	-0.34	0.06
J-2043	0.30	179.07	222.97	62.40	P-1044	J-2029	J-2031	194.07	200	130	0.09	0.03
J-2044	0.29	179.59	222.97	61.66	P-1045	J-2033	J-2026	186.08	150	130	0.00	0.00
J-2045	0.36	180.53	222.97	60.33	P-1046	J-2024	J-2037	163.02	300	130	0.11	0.02
J-2046	0.00	180.80	222.97	59.95	P-1047	J-2037	J-2039	78.77	300	130	0.10	0.02
J-2047	2.26	185.29	251.88	94.66	P-1048	J-2036	J-2037	70.91	200	130	0.00	0.00
J-2049	0.00	184.65	251.84	95.51	P-1049	J-2035	J-2036	65.40	200	130	-0.02	0.01
WFT258766	0.20	180.75	252.21	101.59	P-1050	J-2035	J-2034	78.02	200	130	0.01	0.00
WFT258768	0.56	183.58	251.96	97.21	P-1051	J-2034	J-2033	84.94	200	130	-0.02	0.01
WFT258771	0.09	184.96	251.79	95.00	P-1052	J-2032	J-2031	73.42	200	130	-0.03	0.01
WFT263878	0.01	173.37	252.39	112.33	P-1053	J-2025	J-2036	163.53	200	130	0.04	0.02
					P-1054	J-2035	J-2026	166.97	150	130	-0.01	0.00
					P-1055	J-2015	J-2038	29.17	300	130	-0.09	0.01
					P-1056	J-2038	J-2039	185.66	300	130	-0.09	0.01
					P-1059	J-2039	J-2041	208.07	300	130	-0.01	0.00
					P-1060	J-2041	J-2042	253.77	300	130	-0.01	0.00
					P-1078	J-2042	J-2032	77.61	200	130	-0.03	0.01
					P-1080	WFT258766	J-2016	99.13	300	130	0.83	0.14
					P-1084	J-2049	WFT258771	135.72	300	130	1.77	0.29
					P-1177	J-2047	J-2049	120.71	300	130	1.77	0.29
					P-1178	WFT258768	J-2047	196.45	300	130	1.97	0.32
					P-1179	J-2040	J-2016	343.23	300	130	-0.67	0.11
					P-1199	J-2031	J-2033	79.24	200	130	0.03	0.01
					P-1204	J-2041	J-2034	76.86	200	130	-0.02	0.01
					P-1205	J-2034	J-2026	104.70	150	130	-0.01	0.01
223 MIN		175.07		57.16								
223 MAX		182.76		68.09								
250 MIN		182.11		94.66								
250 MAX		185.29		99.65								

2031 Conditions
 Sherborne & Eno Developments, Oakville On
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Node Table					Pipe Table							
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness (C)	Flow (ML/d)	Velocity (m/s)
J-2000	0.67	175.07	215.25	57.12	P-1000	J-2000	J-2001	103.88	300	130	-0.12	0.02
J-2001	0.72	176.49	215.25	55.10	P-1001	J-2001	J-2002	84.68	300	130	-0.19	0.03
J-2002	0.72	176.10	215.25	55.66	P-1002	J-2002	J-2003	79.51	300	130	-0.38	0.06
J-2003	0.77	176.30	215.25	55.38	P-1003	J-2003	J-2004	38.74	300	130	-0.49	0.08
J-2004	0.00	176.53	215.25	55.05	P-1004	J-2002	J-2005	74.38	200	130	0.09	0.03
J-2005	0.87	176.43	215.25	55.19	P-1005	J-2005	J-2006	72.26	200	130	0.01	0.00
J-2006	0.47	177.27	215.25	53.99	P-1006	J-2006	J-2007	49.93	200	130	-0.02	0.01
J-2007	1.27	178.41	215.25	52.37	P-1007	J-2008	J-2007	55.00	200	130	0.12	0.04
J-2008	0.22	179.63	215.25	50.64	P-1011	J-2008	J-2011	158.37	300	130	0.19	0.03
J-2011	1.05	179.62	215.25	50.65	P-1012	J-2011	J-2007	117.76	200	130	0.01	0.01
J-2012	0.65	178.35	215.25	52.46	P-1013	J-2012	J-2011	50.35	300	130	-0.08	0.01
J-2013	0.94	176.32	215.25	55.34	P-1014	J-2006	J-2012	129.18	200	130	-0.01	0.00
J-2014	1.01	175.51	215.25	56.50	P-1015	J-2013	J-2005	156.59	200	130	0.00	0.00
J-2015	0.00	181.00	215.25	48.69	P-1016	J-2013	J-2000	76.16	300	130	-0.06	0.01
J-2016	6.89	182.11	241.70	84.71	P-1017	J-2012	J-2013	77.70	300	130	0.02	0.00
J-2017	0.46	176.19	215.26	55.54	P-1018	J-2008	J-2015	132.41	300	130	-0.32	0.05
J-2018	1.54	175.70	215.26	56.23	P-1019	J-2001	J-2014	195.49	150	130	0.01	0.01
J-2019	0.96	175.53	215.26	56.47	P-1020	J-2014	J-2003	189.34	150	130	-0.05	0.03
J-2020	1.10	177.83	215.26	53.21	P-1021	J-2002	J-2014	119.01	150	130	0.03	0.02
J-2021	1.15	178.91	215.27	51.69	P-1022	J-2004	J-2017	31.08	300	130	-0.49	0.08
J-2022	0.00	179.57	215.28	50.76	P-1023	J-2017	J-2023	146.05	300	130	-0.49	0.08
J-2023	0.00	177.77	215.26	53.30	P-1024	J-2023	J-2024	71.26	300	130	-0.49	0.08
J-2024	1.02	178.33	215.26	52.50	P-1025	J-2024	J-2025	71.04	300	130	-0.34	0.05
J-2025	1.27	178.38	215.26	52.43	P-1026	J-2017	J-2018	67.45	200	130	-0.03	0.01
J-2026	1.30	179.30	215.26	51.12	P-1027	J-2018	J-2019	135.68	200	130	-0.05	0.02
J-2027	1.42	179.17	215.27	51.32	P-1028	J-2018	J-2020	190.95	200	130	-0.12	0.04
J-2028	1.10	179.80	215.27	50.43	P-1029	J-2019	J-2020	148.34	200	130	-0.13	0.05
J-2029	1.13	180.12	215.29	49.99	P-1030	J-2022	J-2021	102.00	300	130	1.00	0.16
J-2030	0.00	180.59	215.29	49.33	P-1031	J-2020	J-2021	72.19	200	130	-0.34	0.13
J-2031	1.22	180.01	215.26	50.11	P-1032	J-2024	J-2021	85.75	300	130	-0.68	0.11
J-2032	0.22	181.15	215.26	48.49	P-1033	J-2021	J-2043	86.71	200	130	-0.12	0.05
J-2033	0.94	180.69	215.26	49.14	P-1034	J-2043	J-2044	116.08	200	130	-0.11	0.04
J-2034	0.87	180.27	215.26	49.74	P-1035	J-2045	J-2044	181.91	200	130	0.19	0.07
J-2035	0.87	179.70	215.26	50.55	P-1036	J-2043	J-2028	147.05	200	130	-0.12	0.04
J-2036	0.91	179.98	215.26	50.15	P-1037	J-2045	J-2046	37.84	200	130	-0.53	0.20
J-2037	0.47	179.03	215.26	51.50	P-1038	J-2025	J-2027	143.46	300	130	-0.61	0.10
J-2038	0.00	180.90	215.25	48.84	P-1039	J-2026	J-2027	73.98	150	130	-0.19	0.13
J-2039	0.98	179.83	215.26	50.36	P-1040	J-2027	J-2029	139.96	300	130	-0.94	0.15
J-2040	30.38	182.88	241.46	83.27	P-1041	J-2027	J-2044	74.62	200	130	0.01	0.00
J-2041	0.87	180.58	215.26	49.30	P-1042	J-2028	J-2045	130.13	200	130	-0.22	0.08
J-2042	1.02	182.76	215.26	46.20	P-1043	J-2029	J-2030	32.64	300	130	-1.40	0.23
J-2043	1.20	179.07	215.27	51.46	P-1044	J-2029	J-2031	194.07	200	130	0.37	0.13
J-2044	1.15	179.59	215.27	50.72	P-1045	J-2033	J-2026	186.08	150	130	-0.02	0.01
J-2045	1.44	180.53	215.28	49.40	P-1046	J-2024	J-2037	163.02	300	130	0.43	0.07
J-2046	0.00	180.80	215.29	49.03	P-1047	J-2037	J-2039	78.77	300	130	0.38	0.06
J-2047	9.02	185.29	241.09	79.33	P-1048	J-2036	J-2037	70.91	200	130	-0.01	0.00
J-2049	0.00	184.65	241.02	80.14	P-1049	J-2035	J-2036	65.40	200	130	-0.10	0.04
WFT258766	0.60	180.75	241.80	86.79	P-1050	J-2035	J-2034	78.02	200	130	0.05	0.02
WFT258768	1.67	183.58	241.28	82.03	P-1051	J-2034	J-2033	84.94	200	130	-0.07	0.02
WFT258771	0.26	184.96	240.94	79.58	P-1052	J-2032	J-2031	73.42	200	130	-0.13	0.05
WFT263878	0.02	173.37	242.16	97.79	P-1053	J-2025	J-2036	163.53	200	130	0.17	0.06
					P-1054	J-2035	J-2026	166.97	150	130	-0.02	0.02
					P-1055	J-2015	J-2038	29.17	300	130	-0.32	0.05
					P-1056	J-2038	J-2039	185.66	300	130	-0.32	0.05
					P-1059	J-2039	J-2041	208.07	300	130	-0.02	0.00
					P-1060	J-2041	J-2042	253.77	300	130	-0.02	0.00
					P-1078	J-2042	J-2032	77.61	200	130	-0.11	0.04
					P-1080	WFT258766	J-2016	99.13	300	130	3.22	0.53
					P-1084	J-2049	WFT258771	135.72	300	130	2.36	0.39
					P-1177	J-2047	J-2049	120.71	300	130	2.36	0.39
					P-1178	WFT258768	J-2047	196.45	300	130	3.14	0.51
					P-1179	J-2040	J-2016	343.23	300	130	-2.62	0.43
					P-1199	J-2031	J-2033	79.24	200	130	0.13	0.05
					P-1204	J-2041	J-2034	76.86	200	130	-0.08	0.03
					P-1205	J-2034	J-2026	104.70	150	130	-0.04	0.02
223 MIN		175.07		46.20								
223 MAX		182.76		57.12								
250 MIN		182.11		79.33								
250 MAX		185.29		84.71								

**2031 Conditions
 Sherborne & Eno Developments, Oakville On
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Fire Flow Table			
ID	Total Demand	Available Flow	Fire Flow Met?
	(L/s)	(L/s)	
J-2000	250.38	327.27	TRUE
J-2001	167.41	321.25	TRUE
J-2002	167.41	333.74	TRUE
J-2003	167.43	340.04	TRUE
J-2004	167.00	343.69	TRUE
J-2005	250.49	299.22	TRUE
J-2006	283.27	293.05	TRUE
J-2007	284.07	289.28	TRUE
J-2008	283.12	299.21	TRUE
J-2011	283.59	296.39	TRUE
J-2012	283.37	306.49	TRUE
J-2013	250.53	321.05	TRUE
J-2014	167.57	207.50	TRUE
J-2016	277.16	944.09	TRUE
J-2017	250.26	352.40	TRUE
J-2018	167.86	301.09	TRUE
J-2019	167.54	246.51	TRUE
J-2020	167.62	289.49	TRUE
J-2021	250.64	368.98	TRUE
J-2022	250.00	356.00	TRUE
J-2023	250.00	354.16	TRUE
J-2024	250.57	371.43	TRUE
J-2025	250.71	366.12	TRUE
J-2026	167.73	252.27	TRUE
J-2027	250.80	366.80	TRUE
J-2028	167.62	240.71	TRUE
J-2029	250.64	361.79	TRUE
J-2031	250.68	280.43	TRUE
J-2032	250.12	247.22	FALSE
J-2033	250.53	267.24	TRUE
J-2034	250.49	296.32	TRUE
J-2035	250.49	285.11	TRUE
J-2036	250.51	302.41	TRUE
J-2037	250.27	344.38	TRUE
J-2039	250.55	331.87	TRUE
J-2040	290.48	467.76	TRUE
J-2041	250.49	304.14	TRUE
J-2042	250.57	252.62	TRUE
J-2043	167.68	305.77	TRUE
J-2044	167.65	308.84	TRUE
J-2045	167.81	280.05	TRUE
J-2047	278.07	1136.34	TRUE
J-2049	250.00	1196.39	TRUE

233 MIN	207.50
223 MAX	371.43

250 MIN	467.76
2503 MAX	1196.39

2031 Fire Flows

