

FUNCTIONAL SERVICING REPORT
40 WILSON AVENUE SUBDIVISION PHASE 2
ROMSPEN INVESTMENT CORPORATION

Revised:

2026-03-16

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TABLE OF CONTENTS

1	BACKGROUND	1
1.1	EXISTING USE AND DESCRIPTION	2
1.2	PROPOSED DEVELOPMENT	2
2	WATER DISTRIBUTION SYSTEM	3
2.1	DESIGN CRITERIA	3
2.2	EXISTING CONDITIONS.....	3
2.3	WATER DEMAND FLOW SCENARIOS.....	4
2.4	PROPOSED DEVELOPMENT SERVICING	8
2.5	WATER MODEL RESULTS	10
2.6	WATER SERVICING CONCLUSIONS	10
3	SANITARY SEWER SYSTEM	11
3.1	EXISTING CONDITIONS.....	11
3.2	DESIGN CRITERIA	11
3.3	SANITARY SEWER DESIGN	12
3.4	SANITARY SERVICING CONCLUSIONS.....	13
4	CONCLUSIONS	14
4.1	WATER DISTRIBUTION SYSTEM	14
4.2	SANITARY SEWER SYSTEM	14
5	REFERENCES.....	15

TABLE OF FIGURES

FIGURE 1-1: PHASE 2 SITE IN RELATION TO SURROUNDING AREA AND DEVELOPMENT (GOOGLE, MAXAR TECH 2025)	1
FIGURE 1-2: PHASE 2 CONCEPT PLAN	2
FIGURE 2-1: MUNICIPAL WATERMAIN NETWORK IN THE SITE VICINITY (CITY OF BELLEVILLE, EPANET 2019)	4
FIGURE 2-2: DEMAND PATTERN 2 (CITY OF BELLEVILLE, EPANET 2019)	5
FIGURE 2-3: DEMAND PATTERN 7 (CITY OF BELLEVILLE, EPANET 2019)	6
FIGURE 2-4: PROPOSED DEVELOPMENT SERVICING (CITY OF BELLEVILLE, EPANET 2019)	9
FIGURE 3-1: PHASE 2 SANITARY SERVICING SOLUTIONS	13

TABLE OF TABLES

TABLE 2-1: TABLE 10 CITY MODELS AND HOURS TO USE FOR EACH DEMAND SCENARIO EXCERPT (2020 EPANET MEMO, PG. 29)	5
TABLE 2-2: 40 WILSON AVENUE SUBDIVISION DEVELOPMENT DENSITY	5
TABLE 2-3: TABLE 7 SIMPLE METHOD FOR ONE AND TWO FAMILY DWELLINGS UP TO 450 SQ. M (2020 FIRE UNDERWRITERS SURVEY, PG. 33)	8
TABLE 2-4: PROPOSED DEVELOPMENT SERVICING - PHASE 2 JUNCTION DEMANDS	9
TABLE 2-5: WATER MODEL PHASE 2 JUNCTION PRESSURE RESULTS	10

APPENDICES

APPENDIX A: DEVELOPMENT CONCEPT PLAN

APPENDIX B: WATER DISTRIBUTION SYSTEM CALCULATIONS

APPENDIX C: EPANET MODEL RESULTS

APPENDIX D: SANITARY SEWER SYSTEM CALCULATIONS

1 Background

Jewell Engineering Inc. (Jewell) has been retained by Romspen Investment Corporation to complete a servicing study to review the feasibility of servicing Phase 2 of the proposed 40 Wilson Avenue Subdivision development. This report has been prepared in support of the Zoning By-Law Amendment and Draft Plan of Subdivision applications for the development.

The proposed development will be a residential subdivision, and is located at 40 Wilson Ave in Belleville, ON. The Phase 2 lands are 4.60 ha in area, and are bounded by Moira St W, Sidney St, Bridge St W, and Palmer Rd (Figure 1-1). The concept plan is included in Appendix A.



Figure 1-1: Phase 2 site in relation to surrounding area and development (Google, Maxar Tech 2025)

Water and sanitary servicing have been considered in this report. Stormwater management and traffic analysis have been evaluated under separate covers.

1.1 Existing Use and Description

The Phase 2 lands include the former Pre-Con facility which produced concrete products. The topography of the Phase 2 site is generally flat and at-grade with the neighbouring lands, with a slight incline from the north towards the south.

The surrounding land uses are:

- North: residential
- East: residential
- South: commercial, industrial, educational
- West: vacant (future residential)

1.2 Proposed Development

Phase 2 of the proposed 40 Wilson Ave Subdivision development will be a residential development. 109 units are currently proposed, comprising 78 street townhouse, 22 semi-detached, and 9 single-detached units. Tripp Ave and Elgin St will be extended to Wilson Ave, and a new street (and cul-de-sac) is proposed with access via Wilson Ave (Figure 1-2).

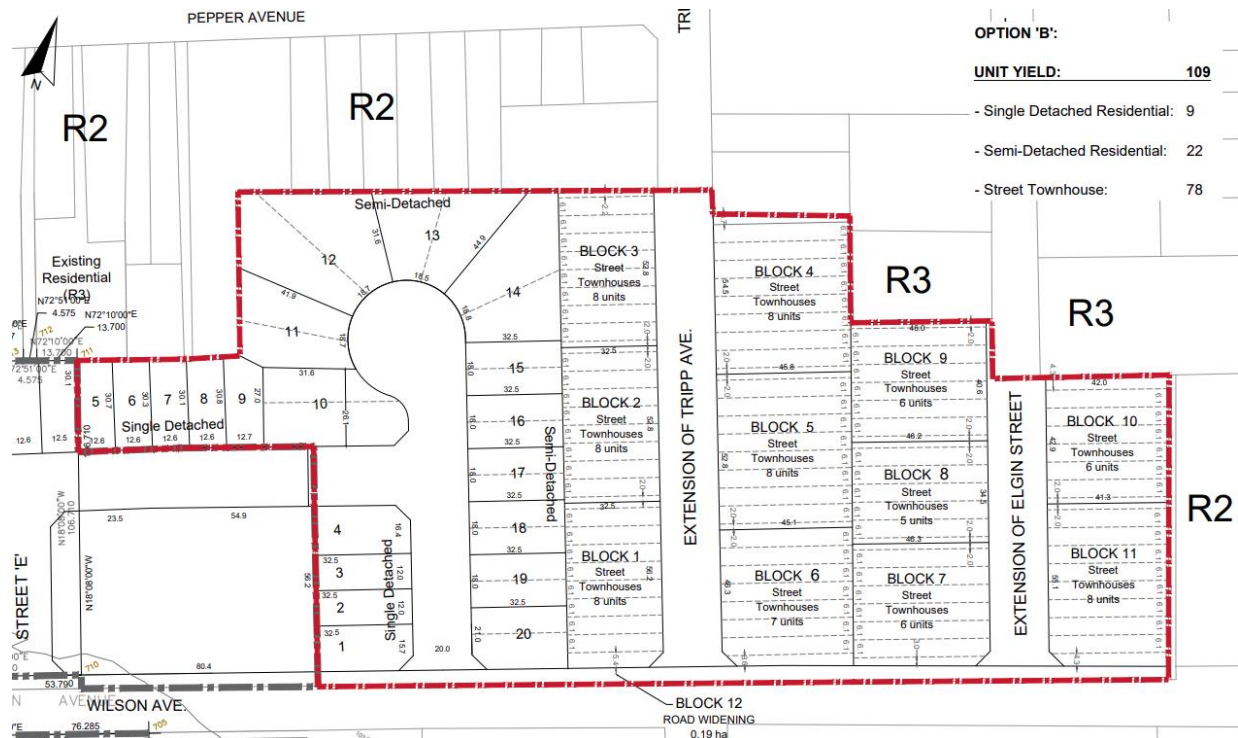


Figure 1-2: Phase 2 Concept Plan

2 Water Distribution System

Jewell used the City of Belleville (the City) EPANET water model for this design. The model was originally received following the most recent update by GHD Group in 2019, and contained all watermains constructed up to and including 2018. Jewell has since used this model in the design of several projects (e.g. Black Bear Ridge Golf Course), the servicing of which has been included in the model used in this design. This model is a more accurate reflection of current conditions.

Proper use of the City's EPANET water model is detailed by GHD's memorandum *EPANET 2.0 Water Model Update for 2016, 2017, and 2018*, dated May 13, 2020 (2020 EPANET Memo). It should be noted that Base Demand in Model A of the City water model is understood as the Maximum Day Demand.

Jewell updated the model to include the water servicing for the proposed 40 Wilson Avenue Subdivision development, adhering to the methods specified in the 2020 EPANET Memo.

2.1 Design Criteria

The watermain design criteria used are based on the City of Belleville and Ministry of Environment, Conservation and Parks (MECP) guidelines, which are summarized below.

- Population Factors:
 - Single-unit dwelling: 3.0 persons/unit
 - Multi-unit dwelling: 2.5 persons/unit
- Average Residential Daily Demand: 350 L/d*ca
- Minimum Watermain Diameter Size: 200 mm
- Roughness Coefficient: 110 (200mm-250mm)
- Minimum Pressure: 40 psi
- Minimum Pressure (Max. Day Flow + Fire Demand): 20 psi
- Maximum Pressure: 100 psi

2.2 Existing Conditions

There are three segments of the municipal watermain network directly adjacent to the Phase 2 site.

- Wilson Ave: 150 mm and 200 mm watermains
 - Looping between the 200 mm and 600 mm watermains on Sidney St
- Tripp Ave: 150 mm watermain
- Elgin St: 150 mm watermain

The municipal watermain network in the vicinity of the development is shown in Figure 2-1.



Figure 2-1: Municipal watermain network in the site vicinity (City of Belleville, EPANET 2019)

2.3 Water Demand Flow Scenarios

As specified in the 2020 EPANET Memo, Jewell developed two flow scenarios for analysis:

- Peak Hour Flow (PHF); and
- Maximum Day Flow + Fire Demand (MDF+Fire).

Detailed demand calculations are provided in Appendix B.

The 2020 EPANET Memo specifies the City model and analysis hour to be used for each flow scenario (Table 2-1).

Table 2-1: Table 10 City Models and Hours to Use for Each Demand Scenario Excerpt
(2020 EPANET Memo, pg. 29)

Flow Scenario to be Evaluated	City Model	Hour to be Analyzed
Peak Hour Flow (PHF)	Model A	11:00 AM – 12:00 PM
Max Day Flow + Fire Demand (MDF + Fire)	Model A	7:00 AM – 8:00 AM

The City model also specifies peaking factors based on the Demand Pattern of the development. There are Demand Patterns for low-, medium-, and high-density residential, as well as industrial, commercial, fire flow, and other use cases. Residential Demand Patterns are based on unit density; the unit density of the development is summarized in Table 2-2.

Table 2-2: 40 Wilson Avenue Subdivision Development Density

Phase	Area (ha)	Total Units	Density (Units/ha)
1	8.43	162	19.2
2	4.60	109	23.7

As the density of both phases is higher than 13 units/ha but less than 66 units/ha, analysis will be completed with Demand Pattern 2 (medium-density residential, 13 units/ha) assigned to Base Demands (Figure 2-2). Demand Pattern 7 (Fire Flow) will be assigned to Fire Flow Demands (Figure 2-3). Hour (h) 0 is 12:00 AM.

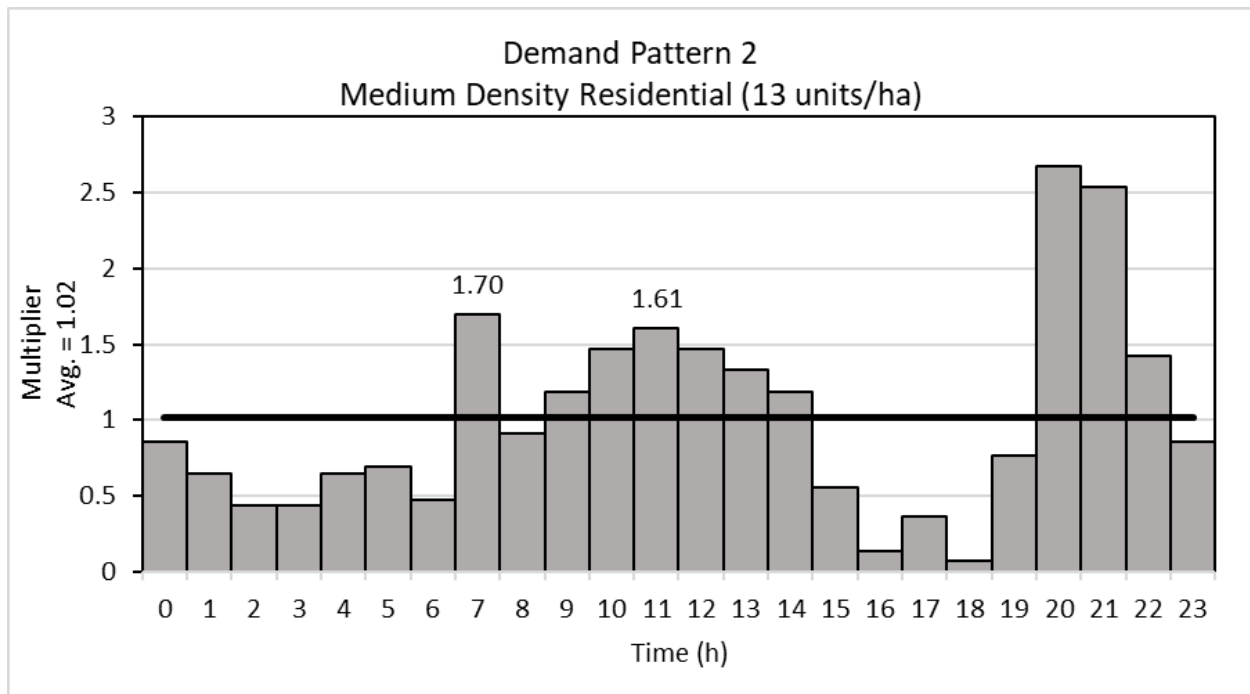


Figure 2-2: Demand Pattern 2 (City of Belleville, EPANET 2019)

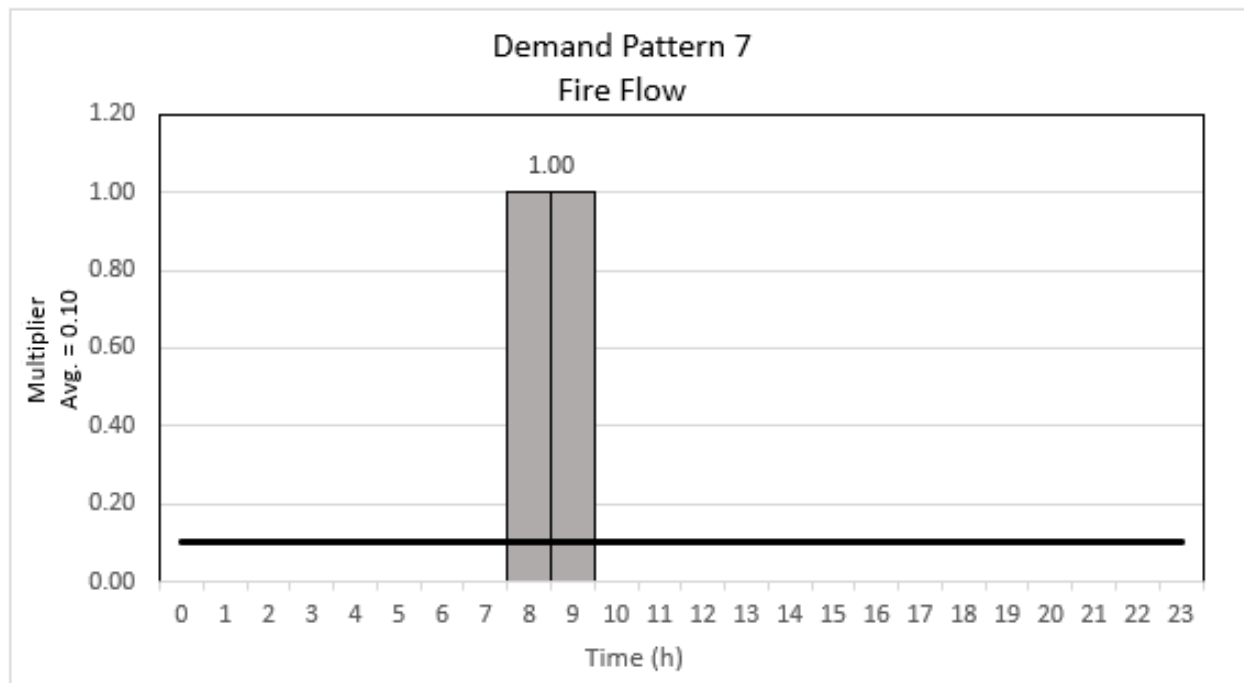


Figure 2-3: Demand Pattern 7 (City of Belleville, EPANET 2019)

2.3.1 Base Residential Water Demand

Base demand for the development was calculated according to the method specified by the 2020 EPANET Memo.

Population was determined based on the same factors specified for sanitary servicing demand calculations: 3 persons/unit (single-unit dwellings), and 2.5 persons/unit (multi-unit dwellings). Average day demand was calculated using the Average Residential Daily Demand of 350 L/d*ca. A system-wide Maximum Day peaking factor of 1.8 (as recommended by the MECP Design Guidelines) was then applied. The Maximum Day Demand was then multiplied by a system-wide correction factor of 0.955, to align with observed flows from the Belleville Water Treatment Plant and distribution system SCADA data. This final calculation results in the development's Base Demand for water servicing.

The Base Demands calculated are summarized below:

- | | |
|---|------------|
| • Single-Unit Dwelling Demand (Per Unit): | 0.0209 L/s |
| • Multi-Unit Dwelling Demand (Per Unit): | 0.0174 L/s |
| • Total Phase 2 Demand: | 2.0055 L/s |

2.3.2 Peak Hour Demand

The Peak Hour is specified as 11:00 AM to 12:00 PM. The City model automatically calculates Peak Hour Demand by applying the peaking factor of 1.61 for this period to the Base Demand.

It should be noted that the overall factor applied to the Average Residential Daily Demand to obtain the Peak Hour Demand is 2.77 ($1.8 * 0.955 * 1.61$).

The Peak Hour Demands were calculated as follows:

- Single-Unit Dwelling Demand (Per Unit): 0.0336 L/s
- Multi-Unit Dwelling Demand (Per Unit): 0.0296 L/s
- Total Phase 2 Demand: 3.2289 L/s

2.3.3 Maximum Day Demand

Maximum Day Demand is specified to occur between 7:00 AM to 8:00 AM. The City model automatically calculates Maximum Day Demand by applying the peaking factor of 1.70 for this period to the Base Demand.

It should be noted that the overall factor applied to the Average Residential Daily Demand to obtain the Maximum Day Demand is 2.92 ($1.80 * 0.955 * 1.70$).

The Maximum Day Demands were calculated as follows:

- Single-Unit Dwelling Demand (Per Unit): 0.0355 L/s
- Multi-Unit Dwelling Demand (Per Unit): 0.0296 L/s
- Total Phase 2 Demand: 3.4094 L/s

2.3.4 Fire Flow Demand

Fire Flow Demand for the development was calculated per the 2020 Fire Underwriter's Survey (FUS) Water Supply for Public Fire Protection.

Design of Fire Flow Demand according to the FUS is conservative. The minimum requirement for fire flow is specified by the Ontario Building Code (OBC). Design according to OBC provides fire protection sufficient for a fire department to extinguish typical building fires, if responders are well-trained and timely. Design according to the FUS provides a higher standard of fire protection, typically for insurance purposes, which results in higher flows than the OBC.

The FUS provides two simplified methods for determining required fire flow, the first for 1-2 family dwellings ($\leq 450 \text{ m}^2$), and the second for 1-2 family dwellings and row housing ($> 450 \text{ m}^2$).

The development includes row housing, and one-two family dwellings both greater and less than 450 m^2 . Fire walls can be implemented as required to limit total effective area to $\leq 450 \text{ m}^2$. There is potential for dwellings to have an exposure distance $< 3 \text{ m}$, as the minimum side yard setback is 1.2 m (2.4 m in total). All dwellings can be expected to be wood-framed.

The maximum Fire Flow Demand was determined as 8,000 L/min (133.33 L/s) (Table 2-3).

Table 2-3: Table 7 Simple Method for One and Two Family Dwellings up To 450 sq. m
(2020 Fire Underwriters Survey, pg. 33)

Exposure distances	Suggested Required Fire Flow (L/min)	
	Wood Frame	Masonry or Brick
Less than 3 m	8,000	6,000
3 to 10 m	4,000	4,000
10.1 to 30 m	3,000	3,000
Over 30 m	2,000	2,000

2.4 Proposed Development Servicing

The proposed water servicing for the 40 Wilson Avenue Subdivision is as follows:

- **200 mm PVC watermains**
- **Connections at:**
 - **Palmer Rd (300 mm main)**
 - **Tripp Ave (150 mm main)**
 - **Elgin St (150 mm main)**
 - **Wilson Ave (Upsized main: 150 mm to 200 mm)**
(Upsized from current termination to future intersection with Elgin St, ~225 m)

It should be noted that while the function of this report is to show the feasibility of servicing Phase 2 of the development, the Phase 1 network also had to be modelled to accurately reflect conditions. Junctions were modelled at intersections, or near the development boundary if no internal intersection was planned (extensions of Tripp Ave and Elgin St).

The servicing additions and changes made to the City model for the proposed development are shown in Figure 2-4.

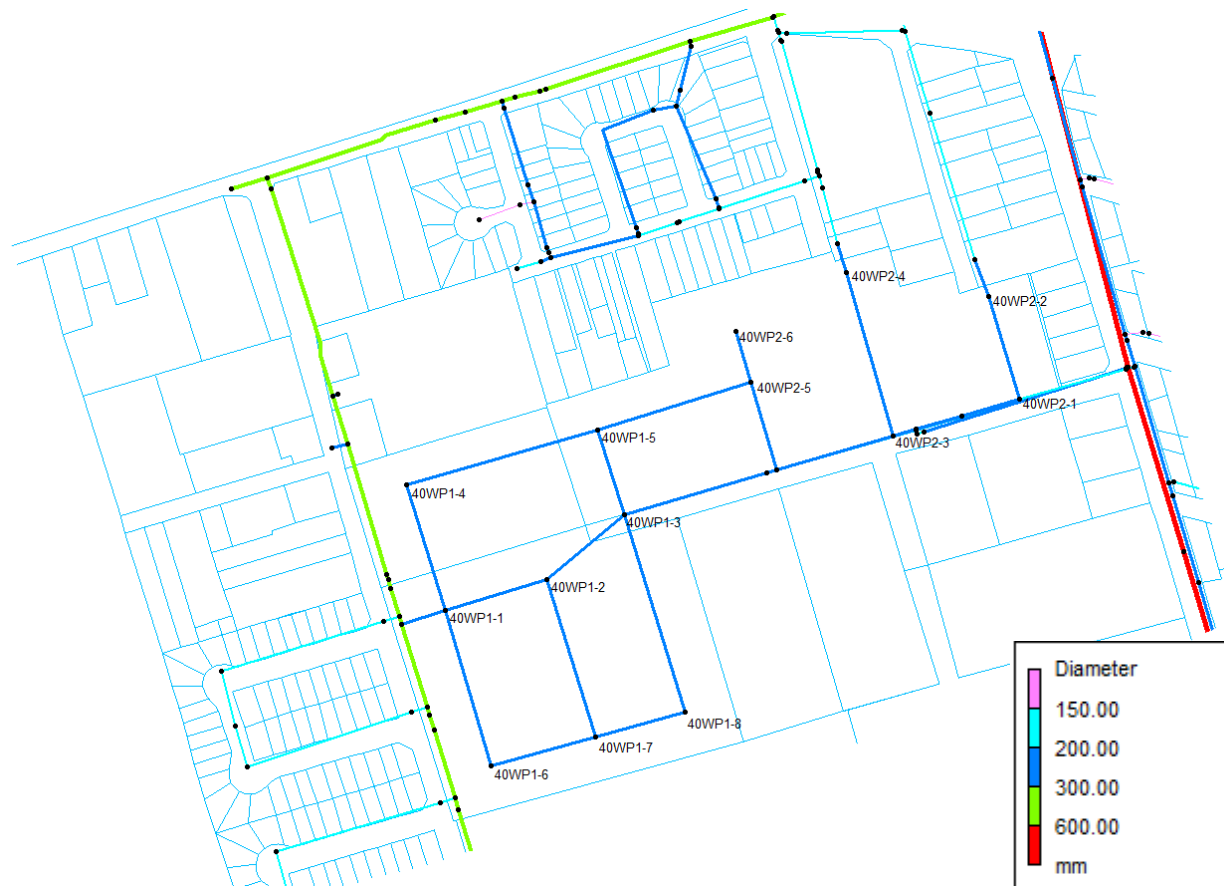


Figure 2-4: Proposed Development Servicing (City of Belleville, EPANET 2019)

Servicing demand was allocated to junctions based on the nearby units shown on the development concept plan. However, as 40WP2-1 and 40WP2-3 represent tee connections to the existing main, they do not represent a consumption point and no demand was allocated. The demands for the Phase 2 junctions are summarized in Table 2-4. Detailed demand calculations (including those for Phase 1) are shown in Appendix B.

Table 2-4: Proposed Development Servicing - Phase 2 Junction Demands

Junction ID	Base Flow (L/s)	Peak Hour Flow (L/s)	Max. Day Flow (L/s)
40WP2-1	—	—	—
40WP2-2	0.5397	0.8689	0.9174
40WP2-3	—	—	—
40WP2-4	0.8182	1.3173	1.3910
40WP2-5	0.4387	0.7063	0.7458
40WP2-6	0.2089	0.3363	0.3551

The 133.33 L/s Fire Flow Demand was added to the Maximum Day Demand for each junction (one at a time) to determine the worst-case fire scenario. This was determined to be for a fire occurring at 40WP2-2, and was used to analyze servicing capacity under the MDF+Fire scenario.

2.5 Water Model Results

The water modelling results for Phase 2 of the 40 Wilson Avenue Subdivision are summarized in Table 2-5. Figures displaying the EPANET model for each scenario are included in Appendix C.

Table 2-5: Water Model Phase 2 Junction Pressure Results

40 Wilson Ave Phase 2 Servicing - Modelling Pressure Results							
Junction ID	Elevation (m)	Peak Hour			Max. Day + Fire Flow		
		Demand (L/s)	Pressure (m)	Pressure (psi)	Demand (L/s)	Pressure (m)	Pressure (psi)
40WP2-1	102.7	-	32.87	46.74	-	23.77	33.80
40WP2-2	103.6	0.8689	31.97	45.46	0.9174	16.67	23.70
40WP2-3	103.4	-	32.17	45.74	-	27.32	38.85
40WP2-4	104.8	1.3173	30.77	43.75	1.3910	26.18	37.23
40WP2-5	104.0	0.7063	31.55	44.86	0.7458	27.72	39.42
40WP2-6	104.2	0.3363	31.35	44.58	0.3551	27.52	39.13

The proposed servicing scheme achieves pressures within the 20 psi (MDF+Fire) and 40 psi (PHF) minimums and 100 psi maximum specified by the City of Belleville and MECP guidelines, under the demand scenarios specified by the 2020 EPANET Memo.

There is sufficient pressure and flow to provide servicing to the proposed development.

2.6 Water Servicing Conclusions

The proposed water distribution system achieves sufficient pressure, flow, and fire protection to provide servicing to Phase 2 of the 40 Wilson Avenue Subdivision development.

The servicing design requires:

- Connection to the existing municipal network as specified in Section 2.4
- Construction/upgrades of watermains as specified in Section 2.4
- Dwelling total effective area $\leq 450 \text{ m}^2$

3 Sanitary Sewer System

3.1 Existing Conditions

There are three main segments of the municipal sanitary sewer network in the site vicinity.

- Moira St W system
 - Moira St W Sanitary Pumping Station (SPS) at Butler Ln
 - 150 mm forcemain from Butler Ln to Elgin St
 - 200 mm gravity sewer from Elgin St to Sidney St
 - 250 mm gravity sewer east of Sidney St
 - 200 mm gravity sewer servicing the subdivision to the south (Butler Ln, Pepper Ave, Elgin St, etc.), contributing to the Moira St W sanitary network
- Palmer Rd system
 - Sherwood Cres SPS at Sherwood Cres (north leg)
 - 100 mm forcemain from Sherwood Cres (north leg) to south of Boyce Ct
 - 200 mm gravity sewer from south of Boyce Ct to Bridge St W
 - 200 mm gravity sewer servicing the subdivision to the east and west (Boyce Ct, Bogart Cres, Benson Ct, etc.), contributing to the Palmer Rd sanitary network
- Wilson Ave system
 - 200 mm combined sanitary sewer from current termination to Sidney St

It should be noted that the Moira St W SPS has a remaining capacity of 8.18 L/s, and the 200 mm segment of the Moira St W gravity sewer is at capacity.

3.2 Design Criteria

The sanitary design criteria used are based on the City of Belleville and MECP guidelines, which are summarized below.

- Population Factors:
 - Single-unit dwelling: 3.0 persons/unit
 - Multi-unit dwelling: 2.5 persons/unit
- Average Daily Residential Domestic Flows: 350 L/d*cap
- Extraneous Flow Allowance: 0.28 L/s*ha
- Full Flow Velocities:
 - Minimum: 0.6 m/s
 - Maximum: 3.0 m/s
- Minimum Sanitary Sewer Diameter: 200 mm

3.3 Sanitary Sewer Design

Jewell calculated the peak Phase 2 sanitary servicing demands to be 6.05 L/s. A 200 mm internal sanitary sewer system with minimum slopes of 0.4% will provide sufficient capacity. These calculations are provided in Appendix D.

3.3.1 Future Servicing Conditions

Phase 2 sanitary connection will depend on the timing of Phase 1 construction and planned municipal improvements. Servicing of Phase 1 will be provided via connection to the Moira St W SPS, occupying its remaining capacity (see Jewell Memo dated Feb 26, 2026). The City also plans to retire the numerous small SPS's in favor of a central SPS in the foreseeable future, which will include upgrades to the gravity sewers as required to convey flows. This will remove the existing capacity constraint at the Moira St W SPS.

3.3.2 Phase 2 Servicing

Jewell has determined two potential solutions for connection to the municipal system:

- **Solution A:** Assuming municipal upgrades are completed, Phase 2 flows can be conveyed to the Moira St W gravity sewer via the Phase 1 sanitary sewer connection.
- **Solution B:** If municipal upgrades are not completed, Phase 2 flows can be conveyed to the Moira St W gravity sewer via connection to the Elgin St gravity sewer.

Solution A

The Phase 1 servicing will connect to the 200 mm municipal gravity sewer on Butler Ln at Lake Ct. Following planned municipal upgrades, flows will drain directly to the Moira St W gravity sewer. Phase 2 flows can then be conveyed to the municipal system via the Phase 1 connection.

The connecting segment of the Phase 1 sanitary sewer will extend north through a drainage easement to Pepper Ave, then run parallel to the existing municipal sewer along Butler Ln up to the connection point at Lake Ct. This sanitary sewer is designed to accommodate the Phase 2 peak flows, to be confirmed in detailed design of Phase 1.

Solution B

A 200 mm sanitary sewer at a minimum slope of 0.4% will allow connection to the 200 mm municipal gravity sewer on Elgin St at the first manhole south of Moira St W. This will convey flows to the Moira St W gravity sewer.

The 200 mm segment of gravity sewer between Elgin St and Sidney St has slopes below the minimum 0.4% (0.29% and 0.33%) and is at capacity. This segment will need to be upgraded to 250 mm to accept the new flows from the Phase 2 site. The sewer east of Sidney St is 250 mm. The City has stated that upgrading this segment is acceptable. Approximately 250 m of road reconstruction will be required.

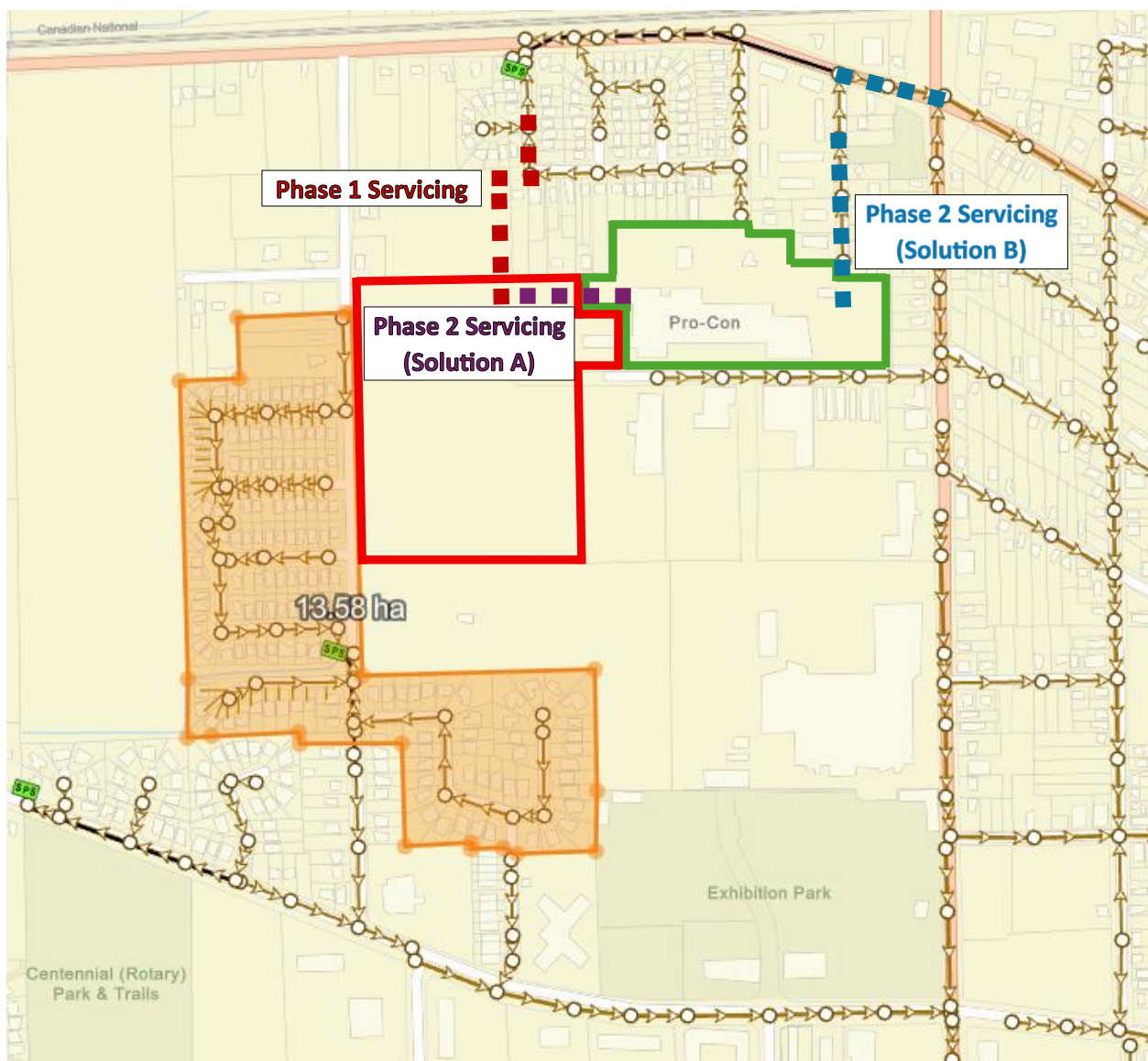


Figure 3-1: Phase 2 Sanitary Servicing Solutions

3.4 Sanitary Servicing Conclusions

A 200 mm internal sanitary sewer system with minimum slopes of 0.4% will be sufficient to provide servicing for Phase 2 of the 40 Wilson Avenue Subdivision development.

Connection to the municipal system will be via the Moira St W gravity sewer. This can be achieved via two potential solutions:

- Conveyance via the Phase 1 sewer following planned municipal upgrades
- Conveyance via the Elgin St sewer with upgrades to the Moira St W sewer (Upsizing ~250 m of 200 mm sewer to 250 mm)

4 Conclusions

Jewell has made the following conclusions regarding servicing of Phase 2 of the 40 Wilson Avenue Subdivision development:

4.1 Water Distribution System

1. Water distribution pipes will be 200 mm PVC watermains throughout the proposed development. This includes ~225 m of upgrades to the 150 mm Wilson Ave watermain.
2. Connection to the municipal system will be made to the existing watermains on Palmer Rd, Wilson Ave, Tripp Ave, and Elgin St.
3. The proposed water system can achieve pressures > 20 psi under the MDF+Fire scenario with an 8,000 L/min supply for fire flow.
4. The proposed water system can achieve pressures > 40 psi under the PHF scenario.

4.2 Sanitary Sewer System

1. Internal servicing will be via 200 mm gravity sewer with minimum slopes of 0.4%.
2. Connection to the municipal system will be to the Moira St W gravity sewer, via either:
 - a. Conveyance via the Phase 1 sewer following planned municipal upgrades.
 - b. Conveyance via the Elgin St sewer with upgrades to the Moira St W sewer.

The proposed development is serviceable and meets the guidelines of the City and MECP.

Prepared by:



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Jewell Engineering Inc.

Reviewed by:



Bryon Keene, P.Eng.
Jewell Engineering Inc.

5 References

City of Belleville. (2024). *Development Manual*.

City of Belleville. (2012). *Environmental Services Manual of Standard Specifications*.

Ontario Ministry of the Environment, Conservation and Parks. (2024). *Design Guidelines for Sewage Works*.

Ontario Ministry of the Environment, Conservation and Parks. (2023). *Design Guidelines for Drinking-Water Systems*.

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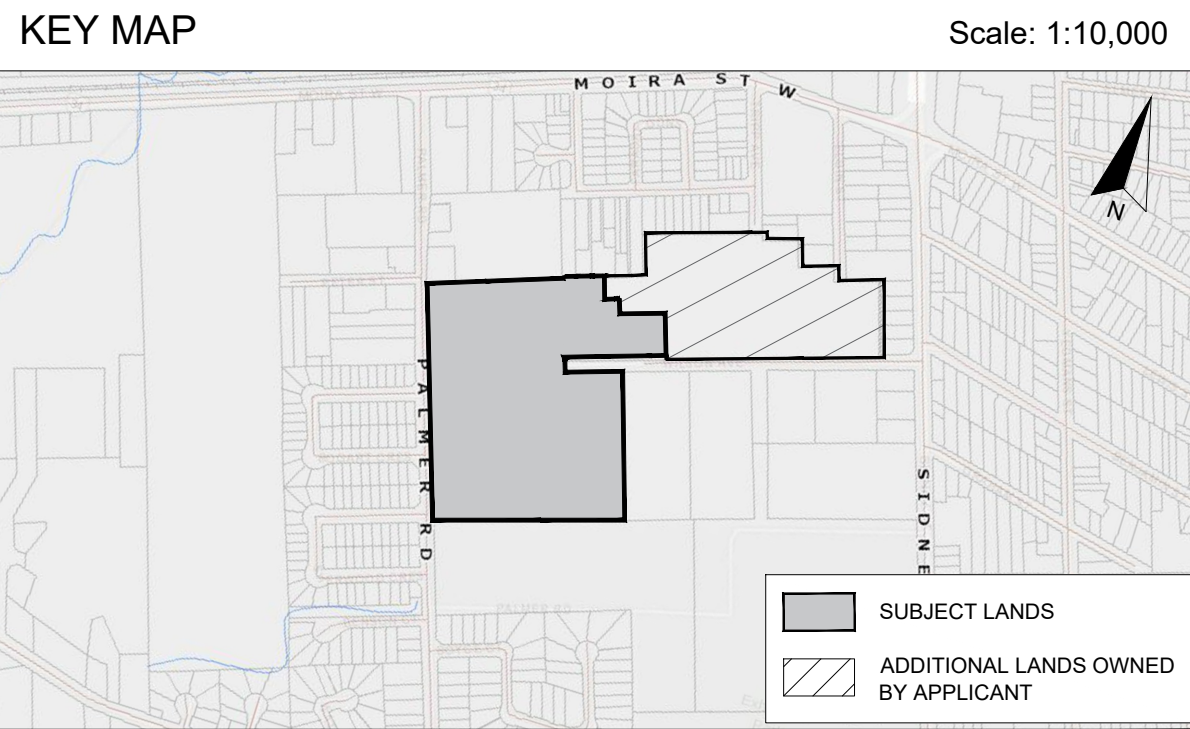
APPENDIX A:
DEVELOPMENT CONCEPT PLAN



METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO
FEET BY DIVIDING BY 0.3048

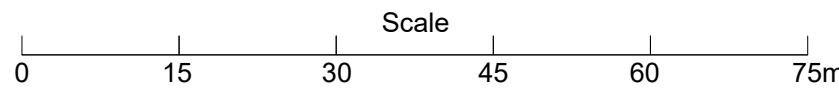
SCHEDULE OF REVISIONS

No.	Date	Description	By
1	June 1, 2022	Updated Legal description and OLS boundary	BH
2	Aug. 10, 2023	Expand site boundary; Revise lotting;	A.S.
3	March 2, 2026	Adjust Boundary; Revise lotting;	A.S.



DRAFT PLAN
OF SUBDIVISION

Part of Lots 15, 16, 17, 26 & 27, Plan 135,
Part of Lots 6 & 7, Plan 1819
In the City of Belleville,
County of Hastings



LEGEND

- SUBJECT SITE (82,738.31m² / 8.27 ha.)
- PHASE 1 (65,830.05m² / 6.58 ha.)
- PHASE 2 (16,908.26m² / 1.69 ha.)
- ADDITIONAL LANDS OWNED BY APPLICANT (47,253.91m² / 4.73 ha.)

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE
THIS DRAFT PLAN OF SUBDIVISION AND SUBMIT THIS DRAFT PLAN OF
SUBDIVISION FOR APPROVAL.

DATE

RIC (MIDLAND LAND) INC.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND
THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND
CORRECTLY SHOWN.

DATE

KEITH WATSON, ONTARIO LAND SURVEYOR
WATSON LAND SURVEYORS LTD.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE
PLANNING ACT

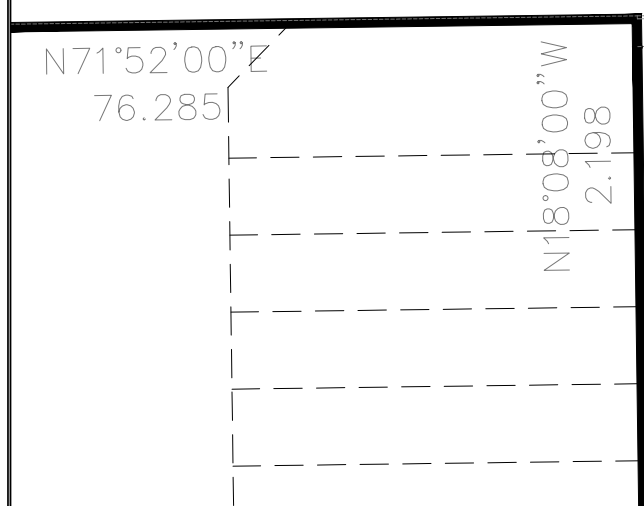
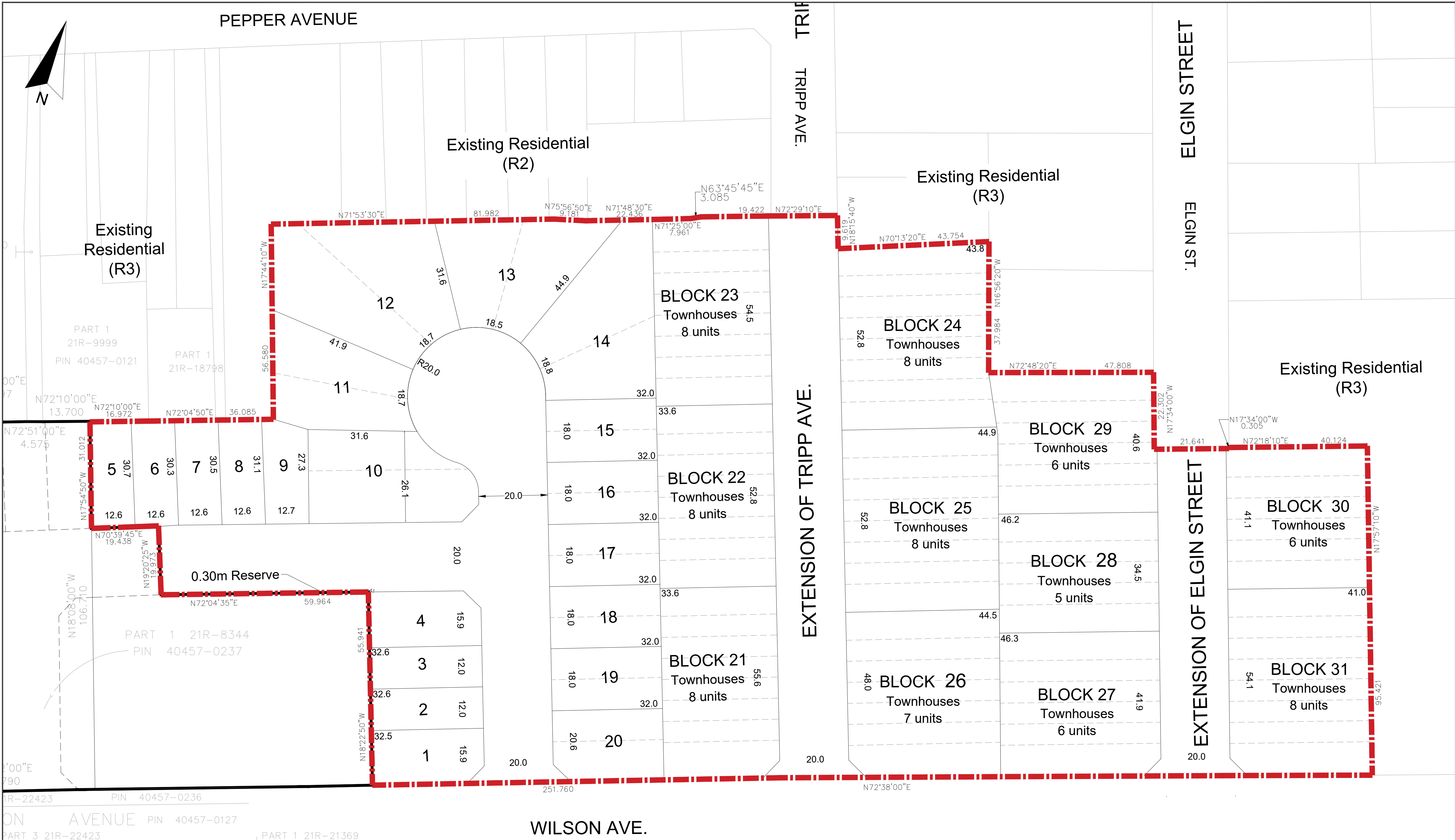
- | | |
|---------------------------------|----------------------------|
| A) SEE SURVEYORS
CERTIFICATE | I) AS SHOWN ON PLAN |
| B) AS SHOWN ON PLAN | J) AS SHOWN ON PLAN |
| C) AS SHOWN ON KEY PLAN | K) FULL MUNICIPAL SERVICES |
| D) SEE LOTTING SUMMARY | L) AS SHOWN ON PLAN |
| E) AS SHOWN OF PLAN | |
| F) AS SHOWN OF PLAN | |
| G) AS SHOWN ON PLAN | |
| H) FULL MUNICIPAL SERVICE | |

LAND USE STATISTICS

LAND USE	LOT / BLK. NO.	UNITS	AREA (ha)
Single Detached Lots (R4 - 12m / 370.9m ²)	5 - 63	59	2.61
Semi - Detached Lots (R4 - 18m / 582.8m ²)	1 - 4, 64 - 74	30	0.97
Street Townhouse Units (R5 - 6.1m)	75 - 85	71	1.63
Cell Tower	86		0.05
Park	87		0.50
SWM Facilities	88		0.22
Road Widening	89 - 90		0.11
0.3m Reserves	91		0.00
20.0m ROW			2.1900
TOTAL	91	160	8.27

INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELHAM RD., UNIT 9, BARRIE, ONTARIO, L4N 0B7
tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date:	December 14, 2020	Drawn By:	BH
File:	20-908	Checked:	KT

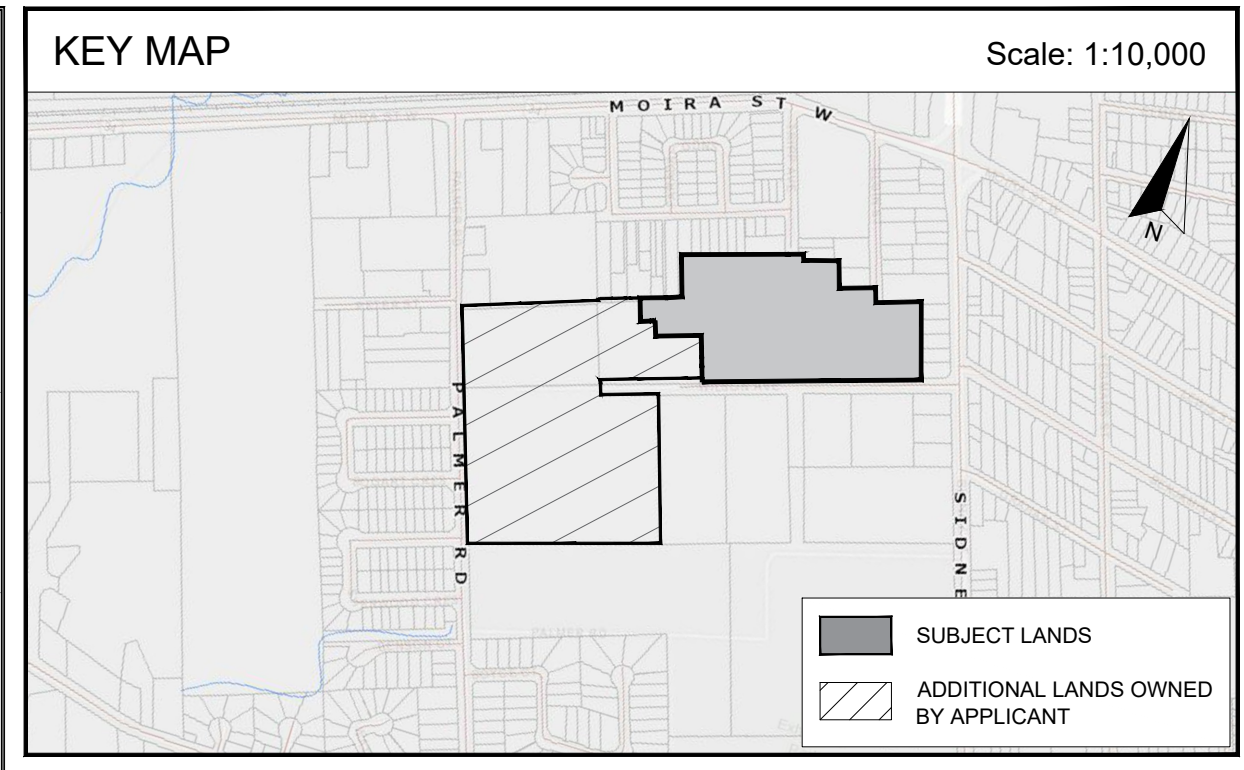


RESIDENTIAL TYPE 2 (R2) ZONE		
(SINGLE DETACHED RESIDENTIAL)		
Provisions	Required	Provided
Permitted Uses:	Permitted	Permitted
One-Unit Detached Dwelling		
Min. Lot Area	340.00m ²	376.83m ²
Min. Lot Frontage	11.00m	12.00m
Max. Height	11.00m	< 11.00m
Max. Lot Coverage	40%	50%
Min. Landscape Area	40%	> 40%
Min. Front Yard Depth	3.60m	> = 3.60m
Min. Interior Side Yard Width	1.20m	1.20m
Min. Exterior Side Yard Width		3.00m
Min. Rear Yard Depth	7.50m	> = 7.50m

RESIDENTIAL TYPE 2 (R2) ZONE		
(SEMI-DETACHED RESIDENTIAL)		
Provisions	Required	Provided
Permitted Uses:	Permitted	Permitted
One-Unit Semi-Detached Dwelling		
Min. Lot Area	275.00m ²	288.00m ²
Min. Lot Frontage	8.00m	9.00m / unit
Max. Height	11.00m	< 11.00m
Max. Lot Coverage	45%	56%
Min. Landscape Area	40%	38%
Min. Front Yard Depth	3.60m	> = 3.60m
Min. Interior Side Yard Width	1.20m	1.20m
Min. Exterior Side Yard Width		3.00m
Min. Rear Yard Depth	7.50m	> = 7.50m

RESIDENTIAL TYPE 2 (R2) ZONE		
(STREET TOWNHOUSE DWELLINGS)		
Provisions	Required	Provided
Permitted Uses:	Permitted	Permitted
One-Unit Townhouse Dwelling		
Min. Lot Area	200.00m ² / dwelling	205.24m ²
Min. Lot Frontage	6.00m	6.10m
Max. Height	12.00m	< 12.00m
Max. Lot Coverage	60%	60%
Min. Landscape Area	25%	> 25%
Min. Front Yard Depth	3.60m	> = 3.60m
Min. Interior Side Yard Width	1.20m	1.20m
Min. Exterior Side Yard Width		3.00m
Min. Rear Yard Depth	7.50m	> = 7.50m

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



DRAFT PLAN OF SUBDIVISION

Part of Lots 15, 16, 17, 26 & 27, Plan 135,
Part of Lots 6 & 7, Plan 1819
In the City of Belleville,
County of Hastings

Scale
0 15 30 45 60 75m

LEGEND
SUBJECT SITE (45,668.43m²/4.57 ha.)

OWNER'S CERTIFICATE
I HEREBY AUTHORIZE INNOVATIVE PLANNING SOLUTIONS TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

DATE _____ RIC (MIDLAND LAND) INC.

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE _____ KEITH WATSON, ONTARIO LAND SURVEYOR
WATSON LAND SURVEYORS LTD.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT
A) SEE SURVEYORS CERTIFICATE
B) AS SHOWN ON PLAN
C) AS SHOWN ON KEY PLAN
D) SEE LOTTING SUMMARY
E) AS SHOWN OF PLAN
F) AS SHOWN OF PLAN
G) AS SHOWN ON PLAN
H) FULL MUNICIPAL SERVICE
I) AS SHOWN ON PLAN
J) AS SHOWN ON PLAN
K) FULL MUNICIPAL SERVICES
L) AS SHOWN ON PLAN

WILSON SUBDIVISION			
LAND USE	LOT / BLK. NO.	UNITS	AREA (ha)
Single Detached Lots	1 - 9	9	0.37
Semi Detached Units	10 - 20	22	1.01
Street Townhouse Units	21 - 31	78	2.16
20.0m ROW			1.03
TOTAL	31	109	4.57

SCHEDULE OF REVISIONS			
No.	Date	Description	By

**INNOVATIVE PLANNING SOLUTIONS**
PLANNERS • PROJECT MANAGERS • LAND DEVELOPMENT
647 WELHAM ROAD, UNIT 9, BARRIE, ON, L4N 0B7
3800 STEELES AVE. W., SUITE 200W, VAUGHAN, ON, L4L 4G9
8920 WOODBINE AVE., SUITE 405, MARKHAM ON L3R 9W9
info@ipsconsultinginc.com www.ipsconsultinginc.com
Tel: 705-812-3281
Tel: 905-291-7525
Tel: 905-595-9008

Date:	June 11, 2026	Drawn By:	A.S.
File:	20 - 908	Checked:	K.B. / J.A.

APPENDIX B:
WATER DISTRIBUTION SYSTEM CALCULATIONS

Project: 40 Wilson Avenue Subdivision (Phase 2)
Designer: Duncan Burgess, BASc
Date: 3/4/2026

40 Wilson Ave Phase 2 - Base Servicing Demand	
<u>City of Belleville Design Criteria</u>	
Population Factor (Single-unit)	3
Population Factor (Multi-unit)	2.5
Average Residential Daily Demand	350 L/d*ca
<u>Average Demand Calculation</u>	
Single-unit Dwellings (Phase 2)	31
Multi-unit Dwellings (Phase 2)	78
Total Population (Phase 2)	288 ca
Single-unit Demand (Per Unit)	1,050 L/d
	0.012 L/s
Multi-unit Demand (Per Unit)	875 L/d
	0.010 L/s
Total Phase 2 Demand	100,800 L/d
	1.167 L/s
<u>Base Demand Calculation</u>	
System Wide Maximum Day Factor	1.8
System Wide Correction Factor	0.955
Single-unit Demand (Per Unit)	1,805 L/d
	0.0209 L/s
Multi-unit Demand (Per Unit)	1,504 L/d
	0.0174 L/s
Total Phase 2 Demand	173,275 L/d
	2.0055 L/s

40 Wilson Ave Phase 2 - Scenario Servicing Demand	
<u>City of Belleville Design Criteria - Medium Density Residential</u>	
Peak Hour Peaking Factor	1.61
Maximum Day Peaking Factor	1.70
<u>Peak Hour Demand Calculation</u>	
Single-unit Demand (Per Unit)	2,906 L/d
	0.0336 L/s
Multi-unit Demand (Per Unit)	2,422 L/d
	0.0280 L/s
Total Phase 2 Demand	278,973 L/d
	3.2289 L/s
<u>Maximum Day Demand Calculation</u>	
Single-unit Demand (Per Unit)	3,068 L/d
	0.0355 L/s
Multi-unit Demand (Per Unit)	2,557 L/d
	0.0296 L/s
Total Phase 2 Demand	294,568 L/d
	3.4094 L/s

Project: 40 Wilson Avenue Subdivision (Phase 2)
Designer: Duncan Burgess, BASc
Date: 3/6/2026

40 Wilson Ave Phase 2 Servicing - Phase 2 Junction Demand						
Junction ID	Contributing Blocks/Lots	Total Units (Multi)	Total Units (Single)	Demand (L/s)		
				Base	Peak Hour	Max Day
40WP2-1	-	-	-	-	-	-
40WP2-2	Block 7-11	31	0	0.5397	0.8689	0.9174
40WP2-3	-	-	-	-	-	-
40WP2-4	Block 1-6	47	0	0.8182	1.3173	1.3910
40WP2-5	Lot 1-10,16-20	0	21	0.4387	0.7063	0.7458
40WP2-6	Lot 11-15	0	10	0.2089	0.3363	0.3551

40 Wilson Ave Phase 2 Servicing - Phase 1 Junction Demand						
Junction ID	Contributing Blocks/Lots	Total Units (Multi)	Total Units (Single)	Demand (L/s)		
				Base	Peak Hour	Max Day
40WP1-1	Lot 1,2,35-37,65-70	0	19	0.3969	0.6390	0.6748
40WP1-2	Lot 38-49, 60-62	0	15	0.3134	0.5045	0.5327
40WP1-3	Lot 24,25, Block 81,82	16	2	0.3203	0.5157	0.5445
40WP1-4	Lot 3-13, 29-34	0	22	0.4596	0.7399	0.7813
40WP1-5	Lot 14-23, 26-28	0	13	0.2716	0.4372	0.4617
40WP1-6	Lot 63,64,71-73, Block 74	4	10	0.2785	0.4485	0.4735
40WP1-7	Lot 50-59, Block 75,76	12	10	0.4178	0.6727	0.7103
40WP1-8	Block 77-80,83,84	39	0	0.6789	1.0931	1.1542

Project: 40 Wilson Avenue Subdivision (Phase 2)
Designer: Duncan Burgess, BASc
Date: 3/9/2026

40 Wilson Ave Phase 2 Servicing - Modelling Pressure Results							
Junction ID	Elevation (m)	Peak Hour			Max. Day + Fire Flow		
		Demand (L/s)	Pressure (m)	Pressure (psi)	Demand (L/s)	Pressure (m)	Pressure (psi)
40WP2-1	102.7	-	32.87	46.74	-	23.77	33.80
40WP2-2	103.6	0.8689	31.97	45.46	0.9174	16.67	23.70
40WP2-3	103.4	-	32.17	45.74	-	27.32	38.85
40WP2-4	104.8	1.3173	30.77	43.75	1.3910	26.18	37.23
40WP2-5	104.0	0.7063	31.55	44.86	0.7458	27.72	39.42
40WP2-6	104.2	0.3363	31.35	44.58	0.3551	27.52	39.13

APPENDIX C:
EPANET MODEL RESULTS

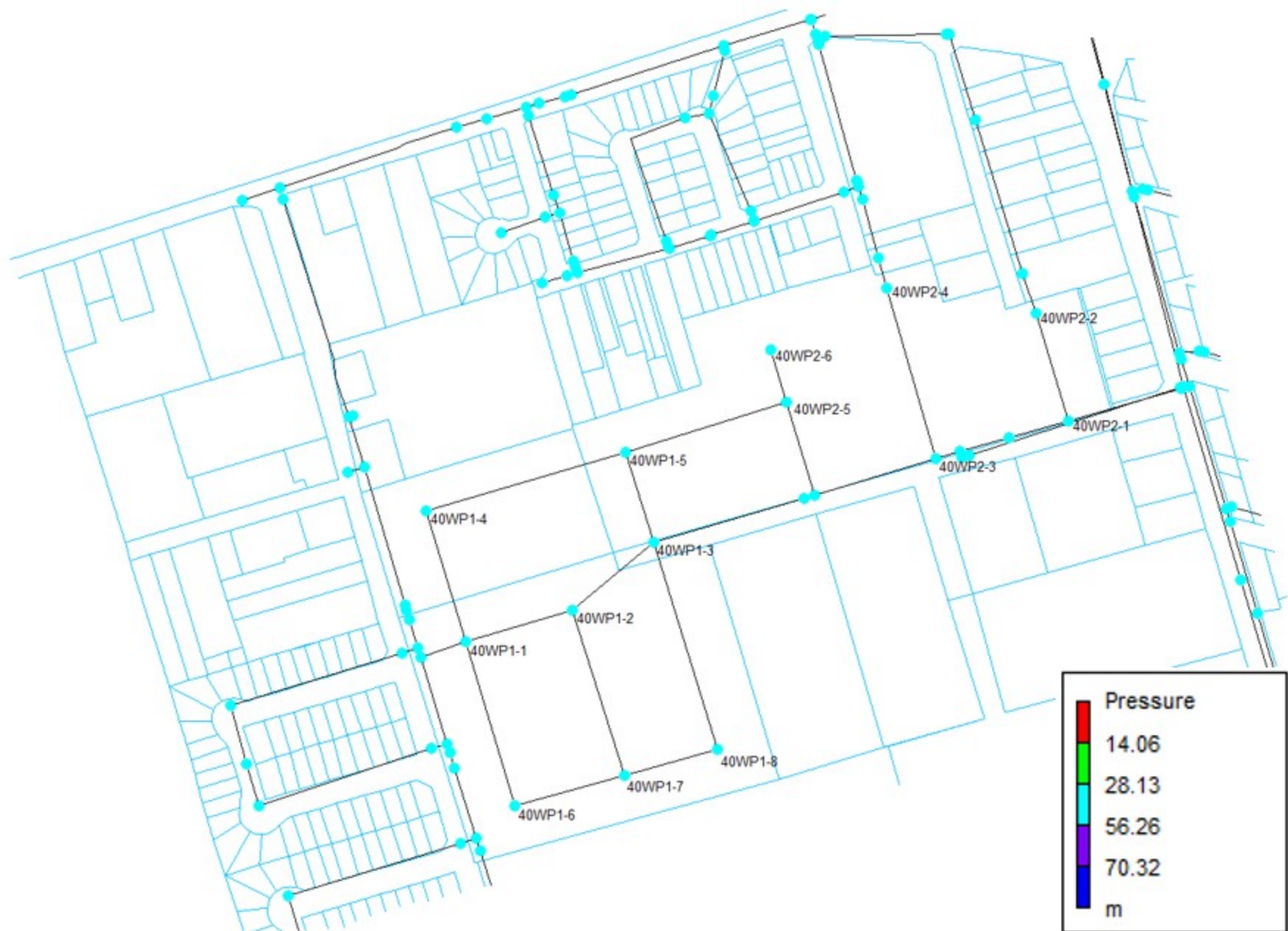


Figure 1: EPANET Peak Hour Demand Model Junction Pressure Results (City of Belleville, EPANET 2019)

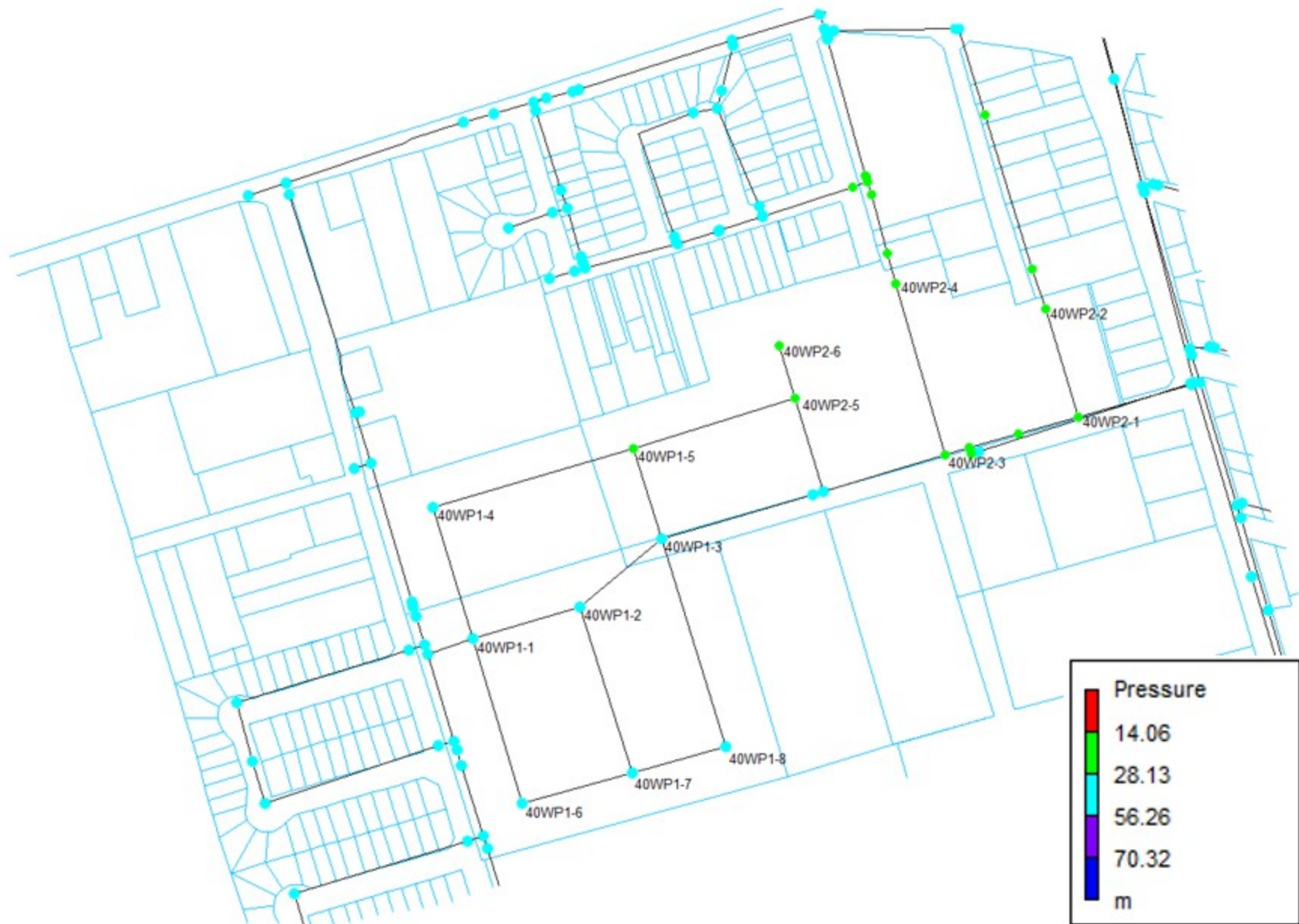


Figure 1: EPANET Maximum Day Demand + Fire Flow Demand Model Junction Pressure Results (City of Belleville, EPANET 2019)

APPENDIX D:
SANITARY SEWER SYSTEM CALCULATIONS

Project: 40 Wilson Avenue Subdivision (Phase 2)
Designer: Duncan Burgess, BAsC
Date: 2/23/2026

40 Wilson Ave Phase 2 - Sanitary Servicing Demand	
<u>City of Belleville Design Criteria</u>	
Population Factor (Single-unit)	3
Population Factor (Multi-unit)	2.5
Residential Flow Rate (q)	350 L/d*ca
Inflow+Infiltration (I)	0.28 L/s*ha
$\text{Harmon Factor (H)} = 1 + \frac{14}{4 + \sqrt{ca/1000}}$	
$\text{Peak Flow (Qd)} = \frac{ca}{1000} * \frac{qH}{86.4} + I * A$	
<u>Peak Flow Calculation</u>	
Area (A)	4.6 ha
Single-unit Dwellings	31
Multi-unit Dwellings	78
Population	288 ca
Harmon Factor	4.0860
Qd (Total)	6.05 L/s
(I+I)	1.29 L/s
(People)	4.77 L/s

40 Wilson Ave Phase 2 - Sanitary Servicing Capacity	
<u>City of Belleville Design Criteria</u>	
Minimum Pipe Size:	200 mm
Minimum Pipe Slope (Initial Leg) (S):	0.7 %
Minimum Pipe Slope (200 mm) (S):	0.4 %
Manning's Roughness Coefficient (n):	0.013
Minimum Pipe Velocity (Full):	0.6 m/s
Maximum Pipe Velocity (Full):	3 m/s
$\text{Pipe Capacity (Q)} = \frac{1}{n} A R^{2/3} S^{1/2}$	
$\text{Pipe Velocity (Full) (V)} = \frac{Q}{A}$	
<u>Common Pipe Properties (200 mm)</u>	
Area (A)	0.031 m ²
Wetted Perimeter (Full) (P)	0.628 m
Hydraulic Radius (A/P)	0.05 m
<u>Capacity Calculation (Initial Leg)</u>	
Q	0.027 m ³ /s
V	0.87 m/s
<u>Capacity Calculation (Standard Leg)</u>	
Q	0.021 m ³ /s
V	0.66 m/s
Depth of flow confirmed > 0.3, full flow calculations allowable	
Per MTO 1997 Drainage Manual Design Chart 2.30	