



February 26, 2026

Attn: City of Belleville Engineering & Development Services

**RE: Sanitary Sewer Capacity Analysis - WSP 2022 FSR Addendum
40 Wilson Ave Subdivision – 40 Wilson Ave, Belleville, ON
Jewell Engineering Inc. File No. 250-5897**

This Sanitary Servicing Memo has been prepared by Jewell Engineering Inc. (Jewell) to demonstrate that servicing of the 40 Wilson Ave Subdivision development is feasible with municipal sanitary sewer.

The memo will provide a sanitary servicing design for Phase 1 of the development, to be addended to the 2022 Wilson Avenue Subdivision Functional Servicing Report prepared by WSP Canada Inc. (WSP). Preliminary alternatives for servicing of Phase 2 will also be discussed.

Development Background

The proposed subdivision is located in Belleville Ontario, bounded by Moira St W, Sidney St, Bridge St W, and Palmer Rd. The development will be low-density residential, comprising single family, semi-detached, and townhouse unit types. The Developer is currently pursuing Zoning Bylaw Amendment and Draft Plan of Subdivision approval to permit the use of the site, formerly industrial lands, for this purpose. The current concept plan is provided in Appendix A.

The Phase 1 lands are 8.43 ha, located west of the current termination of Wilson Ave and north and south of the planned extension. The Phase 2 lands are 4.60 ha, and will be located along the north side of Wilson Ave east of the Phase 1 lands. The Phase 1 lands are undeveloped with sparse tree coverage, and the Phase 2 lands have been developed. The lands are generally gently sloped towards the southwestern corner of the site.

The development site is at grade with the lands immediately adjacent, which consist of residential dwellings to the west and north, and industrial developments to the east and south. A small residential subdivision to be located north of the Phase 1 lands and south of Moira St W has also begun development.

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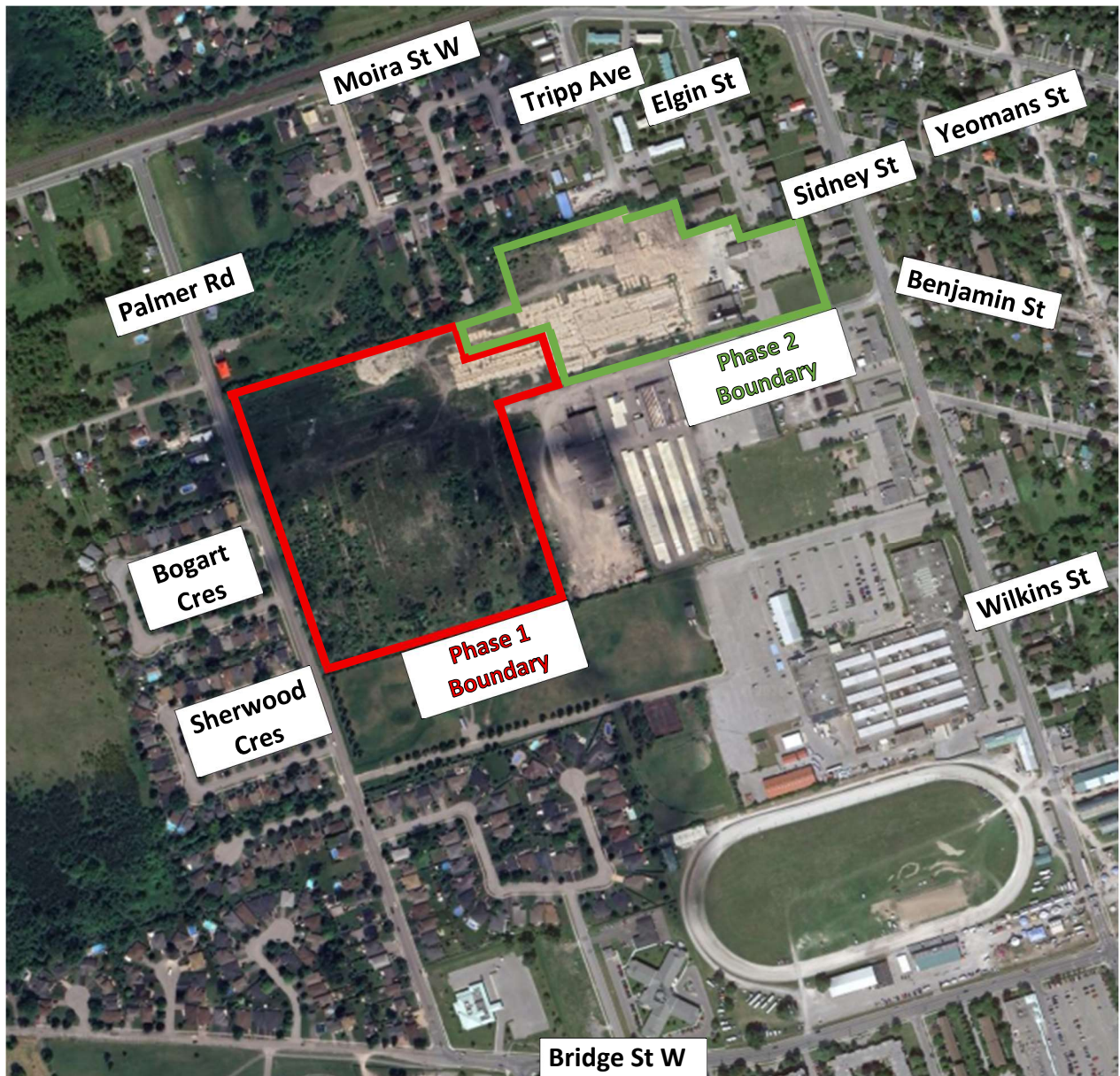


Figure 1: Development site boundaries, and surrounding area and road network (Google, Maxar Tech 2025).

Existing Sanitary Sewer Network

The existing municipal sanitary sewer network has 3 segments in the vicinity of the site:

- Moira St W Sanitary Pumping Station (SPS) and gravity sewer
- Sherwood Cres SPS and Palmer Rd gravity sewer
- Wilson Ave combined gravity sewer

There is an existing 200 mm sanitary sewer system servicing the subdivision immediately south of Moira St W, which contributes to the Moira St W SPS. Flows from the SPS are then conveyed by a 150 mm forcemain to the intersection of Elgin St with Moira St W, where the 200-250 mm gravity sewer which continues east along Moira St W begins.

The subdivision immediately west of Palmer Rd is serviced by a 200 mm sanitary sewer system which contributes to the Sherwood Cres SPS. Flows from the SPS are then conveyed by a 100 mm forcemain to a 200 mm gravity sewer along Palmer Rd, which contributes to the 200-250 mm sanitary sewer along Bridge St W.

The Wilson Ave combined sanitary sewer is 200 mm and contributes to the 200-250 mm sanitary sewer along Benjamin St.

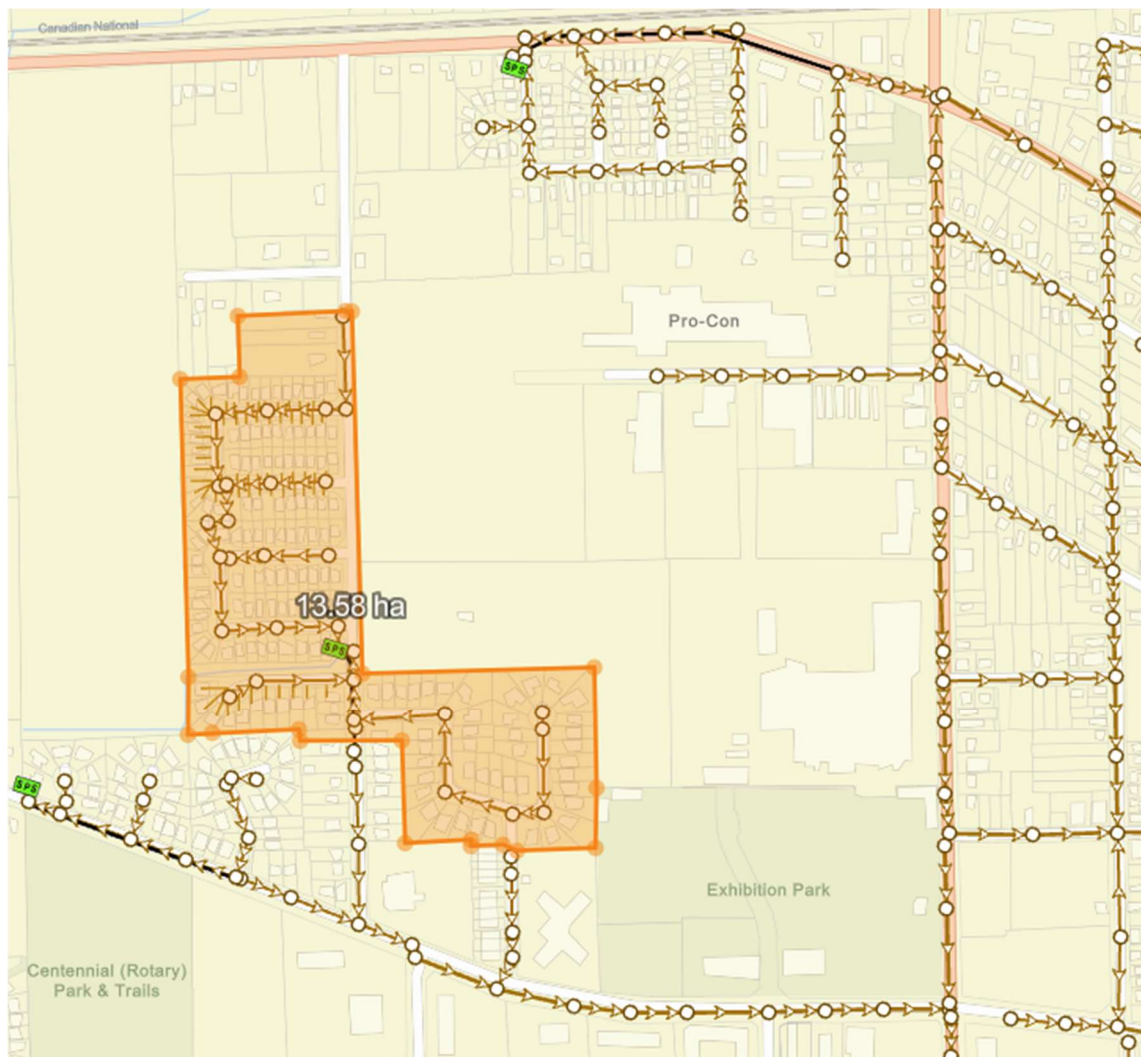


Figure 2: Existing municipal sanitary sewer network in the vicinity of the development (City of Belleville, 2026).

Phase 1 Servicing Background

Servicing of Phase 1 of the development site was initially prepared by WSP in the 2022 Wilson Avenue Subdivision Functional Servicing Report as follows:

- **Water servicing via connection to the municipal system on Wilson Ave and Palmer Rd**
- **Sanitary servicing via connection to the Sherwood Cres SPS**

WSP proposed water servicing of the development via a 200 mm watermain network, with connection to the municipal system via the 150 mm watermain along Wilson Ave and the 300 mm watermain at the intersection of Palmer Rd and Bogart Cres. Servicing demand was calculated per MECP and City of Kingston criteria as 1.46 L/s, 4.02 L/s, and 6.22 L/s respectively for Average Day, Maximum Day, and Peak Hour Demand. Fire flow demand was determined to be 4000 L/min for single-family lots and 8000 L/min for row housing lots per the 2020 Fire Underwriters Survey criteria. A WaterGEMS steady-state hydrologic model was developed to size the servicing infrastructure and ensure pressure and demand requirements were satisfied.

The City of Belleville (the City) accepted the WSP water servicing design.

WSP proposed sanitary servicing via a 200 mm gravity sewer network, with connection to the municipal system at the Sherwood Cres (south leg) 200 mm sanitary sewer. Sanitary flows would then contribute to the Sherwood Cres SPS. Servicing demand was calculated per MECP and City of Kingston criteria as 6.94 L/s under Peak Daily Flow conditions. A Sanitary Sewer Design Sheet was prepared to size the servicing infrastructure and ensure velocities remained within the 0.6-3.0 m/s acceptable range. WSP specified that prior to development of the site, the City should complete a capacity review of the Sherwood Cres sanitary sewer and SPS.

The City retained T.Y. Lin International Canada Group Ltd. (T.Y. Lin) to complete the capacity review. T.Y. Lin recalculated the peak design flow of the site per City of Belleville design criteria as 9.08 L/s. This demand was used to assess the municipal system up to the connection of Bridge St W to Sidney St. The Sherwood Cres SPS was designed with a maximum capacity of 17.8 L/s, and remaining capacity was determined as 6.4 L/s. A segment of the 250 mm Bridge St W sanitary sewer was found to be over capacity in its current state. With the development flow of 9.08 L/s, the Sherwood Cres SPS would be over capacity and multiple segments of the Palmer Rd and Bridge St W sewer would become surcharged, requiring upgrades.

The City would accept the WSP sanitary servicing design conditional on the Sherwood Cres SPS and downstream sewer system being upgraded prior to development. However, the Developer did not find this acceptable.

Phase 1 Sanitary Servicing Design

The Developer retained Jewell to develop an alternate sanitary servicing design for the Phase 1 lands. As servicing via the Sherwood Cres SPS is not an acceptable option, the alternative routes are via the municipal systems along Wilson Ave or Moira St W.

The 200 mm sanitary sewer Wilson Ave is combined and does not meet current cover requirements. As such, the City will not accept additional contributions. The installation of a new sanitary sewer would be required; however, proper cover depth would not allow connection to the municipal system at its current location. The City specified that additional sanitary sewer would need to be installed on Sidney St to connect at Wilkins St, or along Benjamin St to connect at Yeomans St. This option is possible, but not financially feasible.

Alternatively, sanitary flows could be routed via Moira St W. Direct connection to the gravity system is not possible due to the low elevation of the Phase 1 lands, and as the initial 200 mm segment of sanitary sewer is already at capacity. Thus, Phase 1 servicing would have to connect to the Moira St W SPS, which controls discharge to capacity of the receiving gravity sewer. This could be achieved by extending a sanitary sewer north of the development site to connect to the 200 mm sewer on Bulter Lane at Lake Court, which contributes to the SPS. This would require obtainment of a drainage easement and a small amount of road reconstruction.

The Moira St W SPS has a remaining capacity of 8.18 L/s, accounting for existing demands and the allocation to the subdivision north of the site. The Phase 1 demand of 9.08 L/s exceeds this capacity, however, this remains the most feasible option for servicing of the Phase 1 lands. Jewell calculated, per City of Belleville criteria, that the 8.18 L/s capacity could support a maximum population of 366 people. The calculations are provided in Appendix B.

Two solutions for Phase 1 servicing can be achieved via connection to the Moira St W SPS:

- **Solution A:** The Developer can revise the concept plan to increase single family units and decrease other unit types, until the population constraint of 366 is satisfied.
- **Solution B:** The Developer can segment the current concept plan into Phase 1A and 1B. Phase 1A would comprise units with a population up to the current maximum and could immediately be approved. Phase 1B would comprise the remaining units, and approval could be applied for at a later date following planned upgrades of the municipal system.

It should be noted that if Solution B is pursued, the maximum population supportable by Phase 1A will be slightly higher than 366 due to the decrease in land area and extraneous flows. This would need to be calculated based on the Developer's desired Phase 1A.

Phase 2 Servicing Discussion

The Developer has also retained Jewell to develop a sanitary servicing design for the Phase 2 lands. This will be provided under a separate cover, however, discussion of this has been included to show that servicing of Phase 1 has been developed with consideration of subsequent servicing requirements.

Jewell calculated the sanitary servicing demand of Phase 2 to be 6.05 L/s. The calculations are provided in Appendix C. This is within the capacity of the Sherwood Cres SPS; however, the downstream system remains a constraint. The constraints to servicing via Wilson Ave (as detailed in the previous section) also remain. Additionally, the Moira St W SPS will be at capacity following servicing of Phase 1. These options are infeasible. As such, and as the Phase 2 lands are at sufficient elevation, servicing of Phase 2 via the Moira St W gravity system is left as the most suitable alternative.

Two solutions for Phase 2 servicing via connection to the Moira St W gravity sewer were investigated:

- **Solution A:** Development of Phase 2 can be postponed until the planned upgrades to the sanitary network, to retire minor SPS's in favor of a central SPS, occur. Once the Moira St W SPS is retired, Phase 2 flows can be conveyed to the Moira St W gravity sewer via direct connection to the Phase 1 sanitary sewer system.
- **Solution B:** Phase 2 flows can be conveyed to the Moira St W gravity sewer via connection to the Elgin St sanitary sewer at the first manhole south of Moira St W. However, the 200 mm segment of the Moira St W gravity sewer between Elgin St and Sidney St is shallow (0.29-0.33%) and at capacity, requiring upsizing to 250 mm. Road reconstruction would also be required: ~120 m on Moira St W and ~134 m on Elgin St.

Servicing Summary

Sanitary servicing of Phase 1 can be provided, for a maximum population of ~366, via the Moira St W Sanitary Pumping Station and downstream gravity sewer. Connection to the Butler Lane sanitary sewer at Lake Court can be achieved to convey flows to the station.

Sanitary servicing of Phase 2 can be provided via the Moira St W gravity system, with 2 alternatives. Flows can be conveyed via the Phase 1 sanitary sewer following planned municipal upgrades, or via Elgin St following upsizing of the 200 mm Moira St W sanitary sewer to 250 mm.

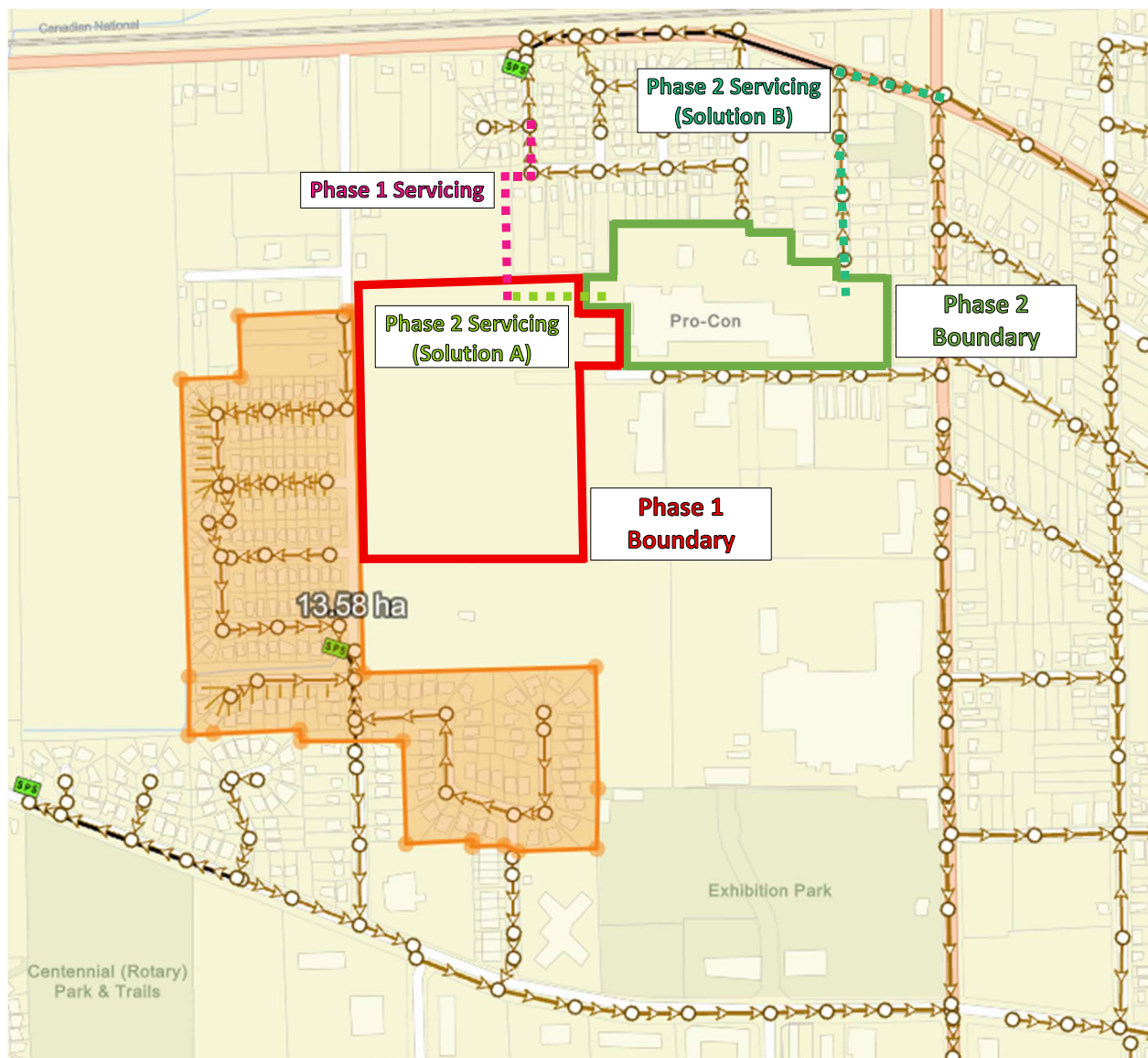


Figure 3: Development servicing solutions (City of Belleville, 2026)

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

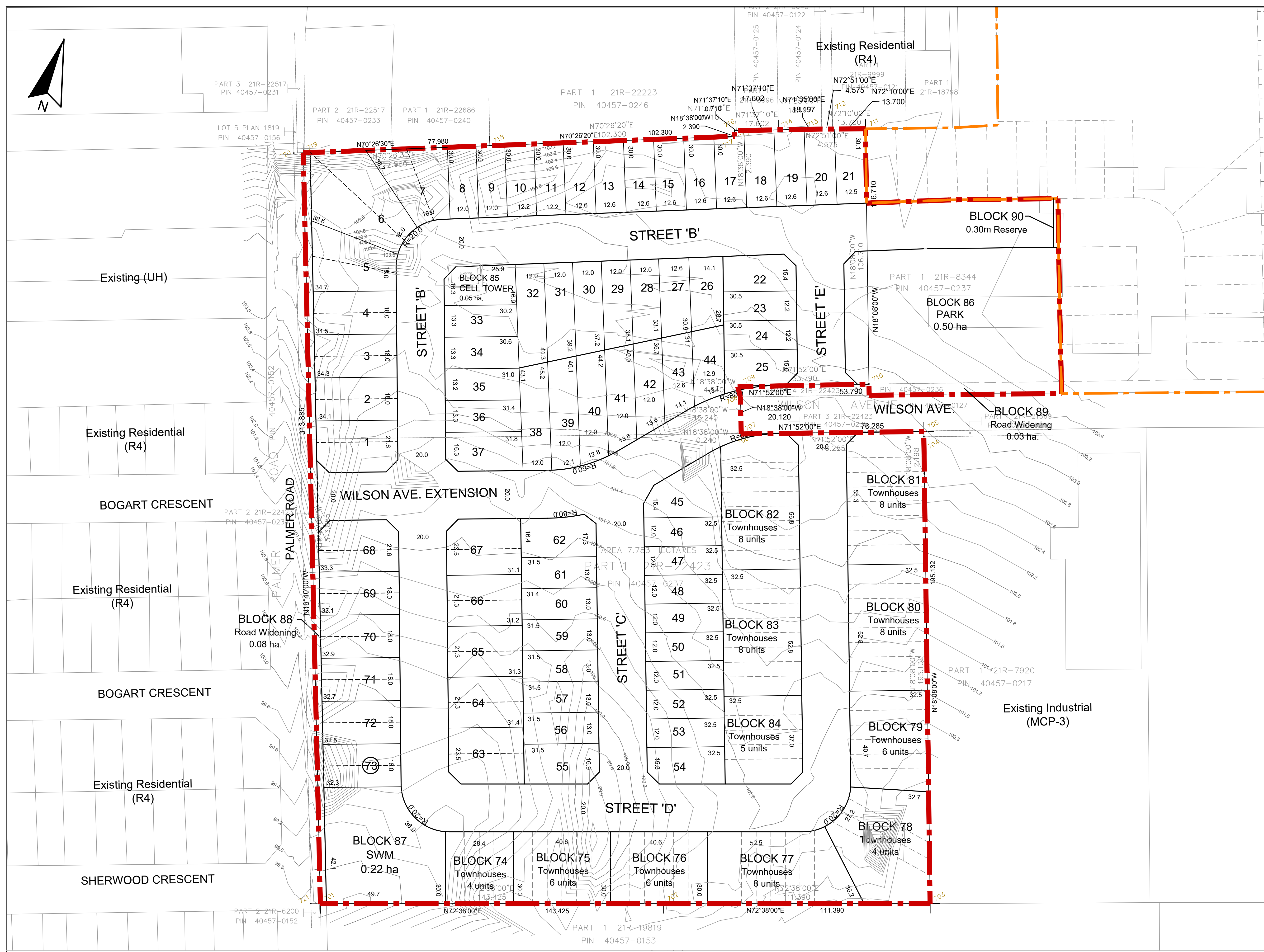
Sincerely,



Bryon Keene, P.Eng.
Jewell Engineering Inc.

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. 11, 2023	Expand site boundary; Revise lotting;	A.S.

KEY MAP

Scale: 1:10,000

SUBJECT LANDS

ADDITIONAL LANDS OWNED BY APPLICANT

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

01530456075m

LEGEND

SUBJECT SITE (84,352.47m² / 8.43ha)

ADDITIONAL LANDS OWNED BY APPLICANT (46,031.70m² / 4.60ha)

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

J) AS SHOWN ON PLAN

B) AS SHOWN ON PLAN

K) AS SHOWN ON PLAN

C) AS SHOWN ON KEY PLAN

L) AS SHOWN ON PLAN

D) SEE LOTTING SUMMARY

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)	1 - 7, 63 - 73	55	2.33
Semi - Detached Lots (R4 - 18m / 582.8m ²)	8 - 62	36	1.25
Street Townhouse Units (R5 - 6.1m)	74 - 84	71	1.63
Cell Tower	85		0.05
Park	86		0.50
SWM Facilities	87		0.22
Road Widening	88 - 89		0.11
0.3m Reserves	90		0.00
20.0m ROW			2.35
TOTAL		162	8.43

IPS

INNOVATIVE PLANNING SOLUTIONS

PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS

647 WELHAM RD., UNIT 9, BARRIE, ONTARIO, L4N 0B7

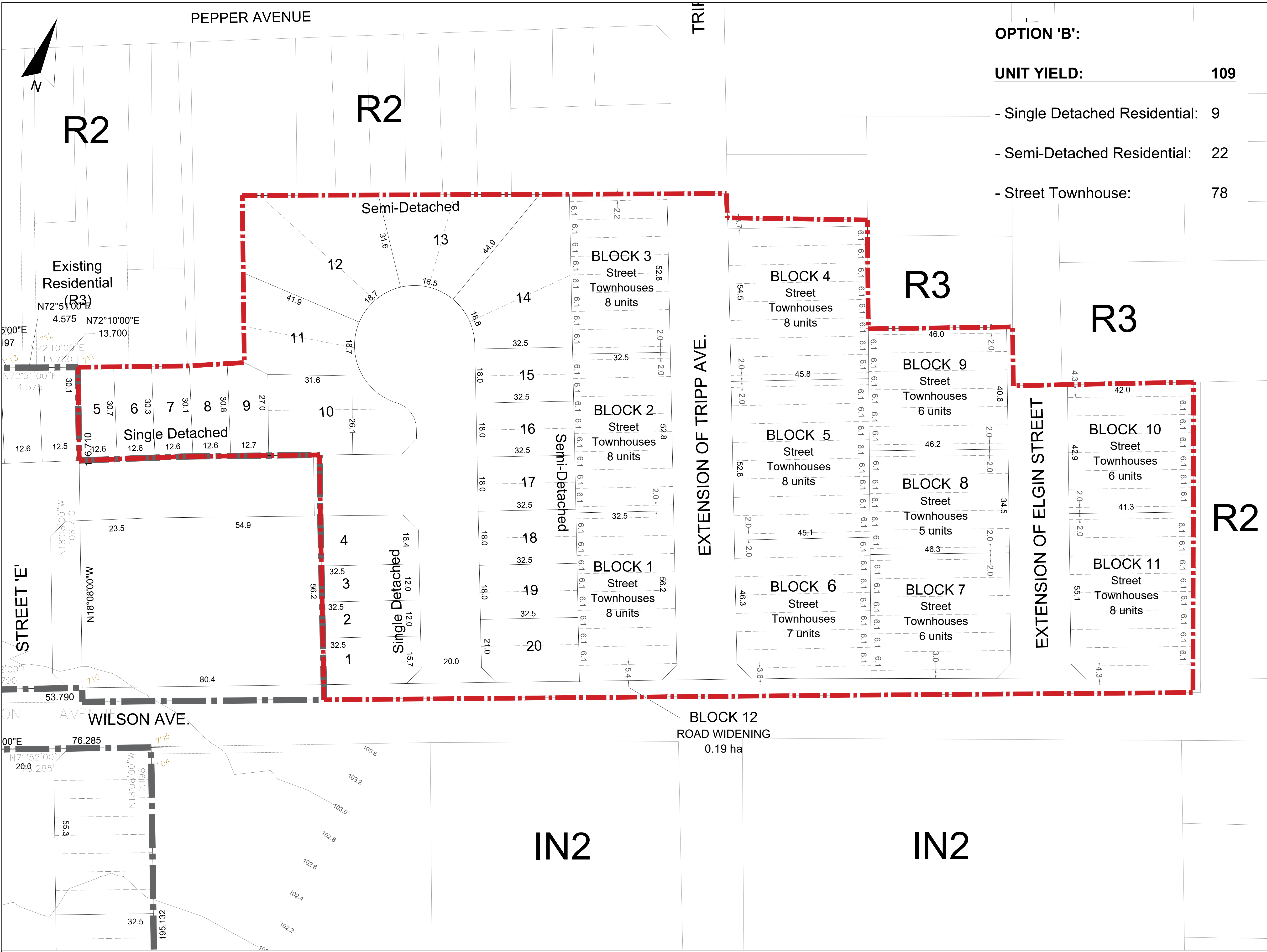
tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date: December 14, 2020

Drawn By: BH

File: 20-908

Checked: KT



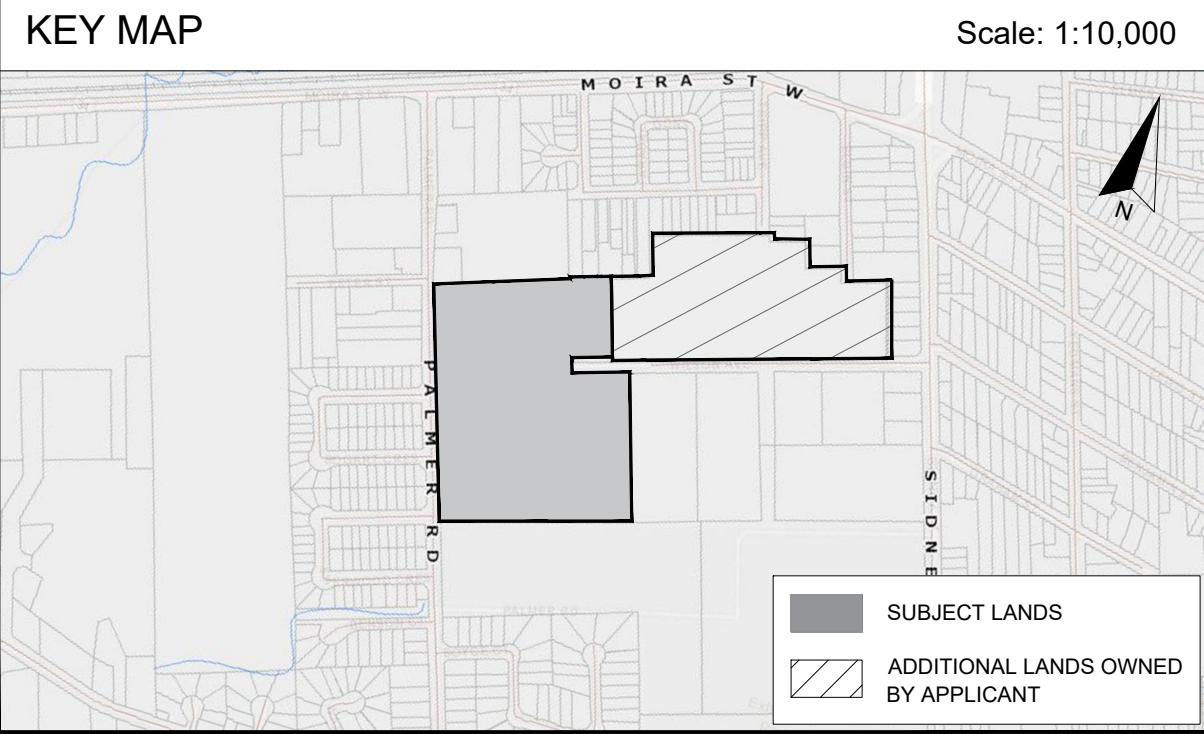
OPTION 'B':

UNIT YIELD: 109

- Single Detached Residential: 9

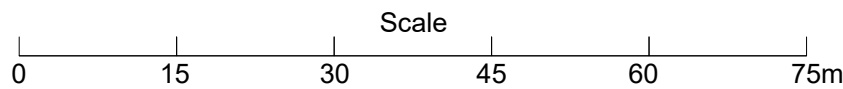
- Semi-Detached Residential: 22

- Street Townhouse: 78



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 (46,031.70m2/4.60ha)

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 NAME, POSITION
NAME OF FIRM

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 J) 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 2

LAND USE	LOT / BLK. NO.	UNITS	AREA (ha)
Single Detached Lots	1-9	9	0.37
Semi Detached Units	10-20	22	0.99
Street Townhouse Units	1-11	78	2.15
Road Widening	12		0.19
20.0m ROW			0.90
TOTAL		109	4.60

Street Length (Street B, Extension of Tripp Ave. & Elgin Street) = 444.2m

SCHEDULE OF REVISIONS

No.	Date	Description	By
1	May 25, 2022	Updated Legal description and OLS boundary	BH
2	Aug. 10, 2023	Expand site boundary; Revise lotting;	A.S.
3	Feb. 28, 2025	Update surrounding zoning and Statistic table	A.G.

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



INNOVATIVE PLANNING SOLUTIONS
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tel: 705 • 812 • 3281 fax: 705 • 812 • 3438 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

Date: February 28, 2025 Drawn By: BH/ A.G.
File: 20 - 908 Checked: KT

APPENDIX B

Phase 1 Maximum Population Calculations

40 Wilson Ave Phase 1 Maximum Population

Required Information - City of Belleville Criteria

Residential Flow Rate	350 L/d*cap
Population Factor (single/semi)	3.0
Population Factor (town)	2.5
Maximum Density (single/semi)	50 ca/ha
Maximum Density (town)	115 ca/ha
Inflow+Infiltration	0.28 L/s*ha

$$\text{Harmon Factor (H)} = 1 + \frac{14}{4 + \sqrt{ca/1000}}$$

$$\text{Peak Flow (Qd)} = \frac{ca}{1000} * \frac{350H}{86.4} + 0.28 * \text{Area}$$

Max Population: 8.18 L/s Capacity, Total Residential Area

Area	7.79 ha
Population	366.56 ca
Harmon Factor	4.0399
Qd (total)	8.18 L/s
(I+I)	2.18 L/s
(People)	6.00 L/s

Phase 1A Max Population Examples: 8.18 L/s Capacity, Varied Area

Example Area	6 ha
Population	398.88 ca
Harmon Factor	4.0227
Qd (total)	8.18 L/s
(I+I)	1.68 L/s
(People)	6.50 L/s

Example Area	5 ha
Population	416.97 ca
Harmon Factor	4.0135
Qd (total)	8.18 L/s
(I+I)	1.40 L/s
(People)	6.78 L/s

APPENDIX C

Phase 2 Servicing Demand Calculations

40 Wilson Ave Phase 2 Servicing Demand

Required Information - City of Belleville Criteria

Residential Flow Rate	350 L/d*cap
Population Factor (single/semi)	3.0
Population Factor (town)	2.5
Maximum Density (single/semi)	50 ca/ha
Maximum Density (town)	115 ca/ha
Inflow+Infiltration	0.28 L/s*ha

$$\text{Harmon Factor } (H) = 1 + \frac{14}{4 + \sqrt{ca/1000}}$$

$$\text{Peak Flow } (Qd) = \frac{ca}{1000} * \frac{350H}{86.4} + 0.28 * \text{Area}$$

Peak Flow - Total Residential Area

Area	4.6 ha
Population	288.00 ca
Harmon Factor	4.0860
Qd (total)	6.05 L/s
(I+I)	1.29 L/s
(People)	4.77 L/s