

May 2026

Sanitary Sewer Capacity Assessment

For

Proposed Mixed-Use Development

2415 Cabana Road E, 2385 Cabana Road E, 2375 Cabana Road E, 4040
Walker Rd, Pt. of 4096-4128 Walker Rd, 0 Cabana Rd and 0 Cabana Rd E
Windsor, Ontario

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1 Executive Summary

This Sanitary Sewer Capacity Assessment has been prepared to evaluate whether the existing municipal sanitary sewer system has sufficient capacity to accommodate the proposed mixed-use redevelopment located at 2415 Cabana Road E, 2385 Cabana Road E, 2375 Cabana Road E, 4040 Walker Road, portions of 4096–4128 Walker Road, 0 Cabana Road, and 0 Cabana Road East, at the intersection of Cabana Road and Walker Road in the City of Windsor, Ontario.

The assessment has been completed in accordance with the City of Windsor Development Manual (Revised November 2015). Sanitary flows were developed using the City's Ultimate Flow Factor method. An Ultimate Flow Factor of 5.20 was applied to the ultimate population served.

The analysis confirms that the existing 250 mm diameter sanitary sewer has adequate residual capacity to accommodate the proposed development. The combined ultimate loading utilizes approximately 74% of the available sewer capacity, and no off-site sanitary sewer upgrades are required.

2 Introduction

This report presents the findings of a Sanitary Sewer Capacity Assessment prepared in support of the proposed redevelopment of a mixed-use development located at 2415 Cabana Road E, 2385 Cabana Road E, 2375 Cabana Road E, 4040 Walker Road, portions of 4096–4128 Walker Road, 0 Cabana Road, and 0 Cabana Road East, at the intersection of Cabana Road and Walker Road in the City of Windsor, Ontario. The purpose is to quantify sanitary flows and confirm system capacity.

3 Design Criteria

This sanitary sewer capacity assessment has been prepared in accordance with the City of Windsor Development Manual (Revised November 2015) and City of Windsor Sewer Atlas data.

4 Site Description

The subject lands are located at the southeast corner of Walker Road and Cabana Road East in the City of Windsor. The development area consists of multiple parcels with a combined site area of approximately 7.30 hectares. The site is currently occupied by a combination of commercial, industrial, and vacant lands.

5 Proposed Development Summary

The proposed development consists of a mixed-use commercial and residential project comprising seven (7) buildings, summarized as follows:

- Residential: 74 apartment dwelling units
- Commercial Gross Floor Area: 17,654 m²

The development includes surface parking areas, internal drive aisles, landscaped areas, and associated municipal servicing connections.

6 Existing Sanitary Sewer Infrastructure

Under existing conditions, the parcels 2375 Cabana Road East and 4040 Walker Road are serviced by a 250mm diameter sanitary sewer located along Walker Road. The parcels 2415 Cabana Road East and 2385 Cabana Road East are serviced by a separate 250mm diameter sanitary sewer located along Cabana Road East. Both sewers ultimately discharge into a 375mm diameter sanitary main along Ledyard Avenue, which conveys all flows to the Grand Marais Road East Trunk Sewer.

An assessment of existing flows within the 375 mm diameter sanitary main on Ledyard Avenue was completed using the City of Windsor's recommended population density values for various land uses. Detailed calculations and assumptions are provided in **Appendix A**.

7 Population Assumptions

Sanitary flows for the proposed development were calculated using planning-level population assumptions consistent with the City of Windsor Development Manual and Design Guidelines for Sewage Work (MOE, 2008).

Residential Population: 74 dwelling units $\times$ 2.5 persons/unit = 185 persons

Commercial Population: 77.19 persons/ha = 564 persons

Total Population (sanitary loading basis): 749 persons

8 Proposed Sanitary Servicing

It is proposed that the sanitary flows from the subject site will be conveyed to the 250mm diameter sanitary main located along Cabana Road E via an internal sewer network which will ultimately discharge into the existing 375mm diameter sewer main along Ledyard Ave.

The proposed redevelopment strategy involves converting the existing commercial site into a mixed-use development which will supply 74 residential units and approx. 17654 m² of commercial area. To verify that the proposed redevelopment will not overburden the downstream municipal sanitary sewer, an analysis was completed to evaluate the sanitary sewer system from MH 7S2639 to MH 7S2215. The following design criteria were used for the analysis.

Hydraulic Sewer Sizing: Manning's Equation

Average Daily Flow: 363 L/capita/day (0.0042 L/s/capita)

Peaking Factor: 6.0 (Based on City of Windsor's Development Manual)

Peak Extraneous Flow: 0.28 L/ha/s

Sanitary flows generated by the proposed development were estimated using the peaking factor specified in the City of Windsor Development Manual, consistent with the City's design requirements for new developments. Existing sanitary flows within the contributing drainage area were estimated using the Harmon Formula. The combined peak sanitary flows were then assessed against the hydraulic capacity of the downstream municipal sanitary sewer system, determined using Manning's Equation. This approach is best practice for assessing impacts of a new development on an existing system.

The sanitary sewer analysis calculations for the existing and proposed conditions are provided in **Appendix B**. With the additional increase in population, the capacity of the existing sewer system remains within an acceptable range. Therefore, an increase in total population is not expected to negatively impact the existing sewer system.

9 Ultimate Design Flow Calculation

Ultimate sanitary flows were calculated in accordance with City of Windsor Development Manual Section 9.1.2, using the City's ultimate flow equation:

Ultimate = $(0.0042 \times \text{Ultimate Population} \times \text{Ultimate Flow Factor}) + \text{Infiltration}$

Average Sanitary Flow : $749 \times 0.0042 = 3.14 \text{ L/s}$

Peak Sanitary Flow : $3.14 \times 6.0 = 18.84 \text{ L/s}$ Ultimate Flow Factor= 6.0

Infiltration Allowance: $0.28 \text{ L/s/ha} \times 7.30 \text{ ha} = 2.04 \text{ L/s}$

Ultimate Development Flow (Incremental): Qult, development = $18.84 + 2.04 = \mathbf{20.88 \text{ L/s}}$

10 Conclusions

Based on the results of this Sanitary Sewer Capacity Assessment, the following conclusions are provided:

1. Sanitary flows were calculated in accordance with the City of Windsor Development Manual using the City's Ultimate Flow Factor method.
2. The ultimate design sanitary flow from the proposed development is **20.88 L/s**.
3. The existing municipal sanitary sewer system has sufficient capacity to accommodate the proposed development at this planning stage.
4. No off-site sanitary sewer upgrades are anticipated, subject to detailed design review and approval by the City of Windsor.
5. This sanitary sewer capacity assessment has been prepared at a planning level using available City Sewer Atlas data. Detailed design-stage review may require confirmation of sewer slopes, roughness coefficients, and downstream system conditions.

Prepared by:

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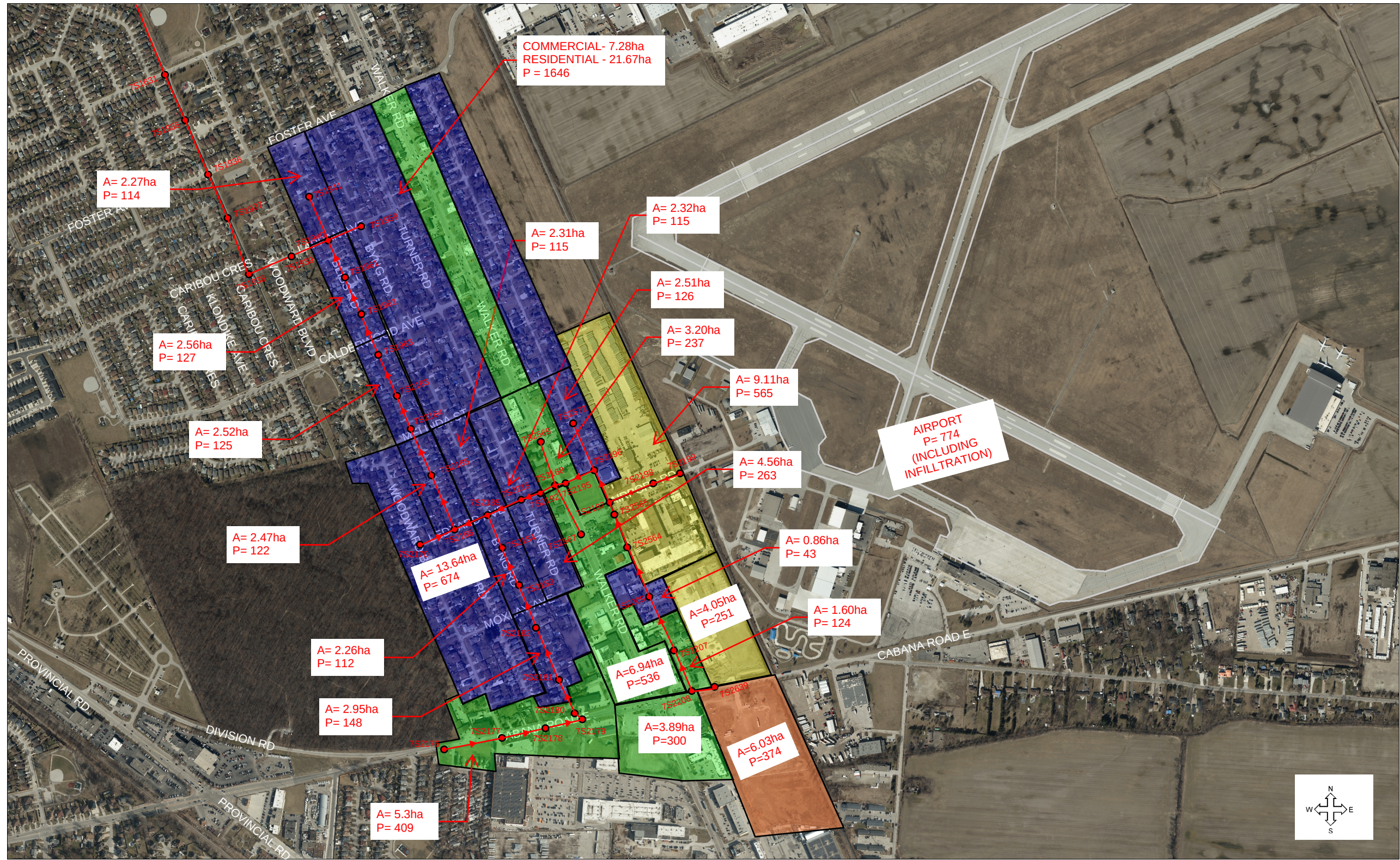
Consulting Engineer



Valdez Engineering Ltd.

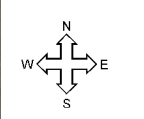
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Legend

- Windsor Airport
- Greenway Trail
 - Chrysler Canada Greenway
 - Cypher Systems Greenway
 - Rotary (1918) Centennial Hub
- Property Parcels
- Sanitary Sewer Manholes
- Sanitary Sewers
- EXISTING INSTITUTIONAL - 22 PERSONS/ha
- EXISTING RESIDENTIAL - 50 PERSONS/ha
- EXISTING COMMERCIAL - 77.19 PERSONS/ha
- EXISTING INDUSTRIAL - 62 PERSONS/ha
- SUBJECT SITE - EXISTING INDUSTRIAL ZONE



0 166.69 333.4 Meters

1: 10,000 6/23/2026

Notes

Enter Map Description

THIS MAP IS NOT TO BE USED FOR NAVIGATION
Data herein is provided by the Corporation of the County of Essex on an 'as is' basis. Assessment parcel provided by Teranet Enterprises Inc. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

2415 DIVISION ROAD EAST
SANITARY SEWER DESIGN SHEET - EXISTING FLOWS

Project Name: 2415 Division Rd E
Project No:

The Peaking Factor was derived:
Using Harmon Formula= Y (Y or N)
From a Table= N
Value from table=

Residential Average Daily Flow= 363 L/Cap.D
Peak Extraneous Flow= 0.280 L/Ha.S

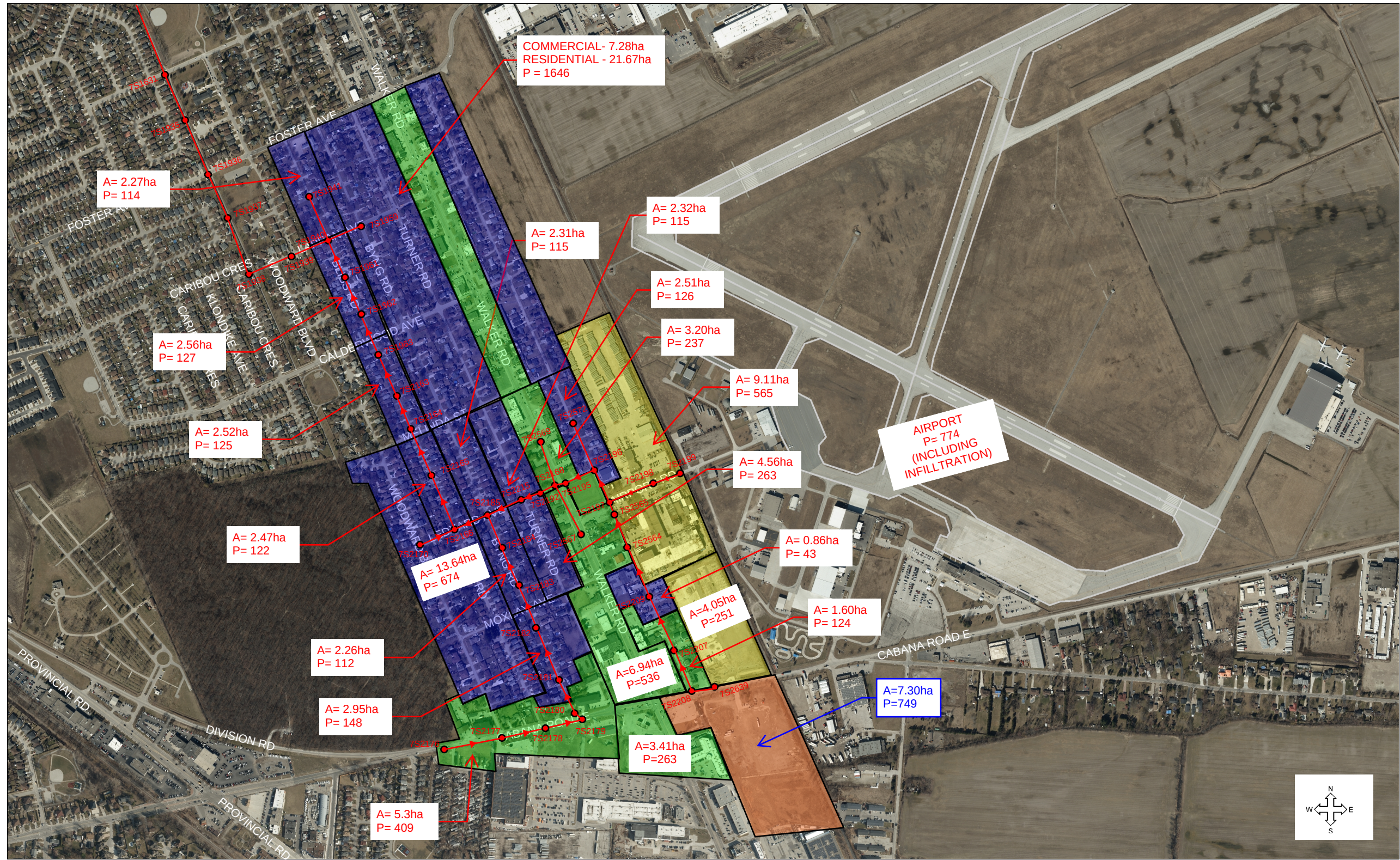
Outlet Invert Elevation= 180.970

Mannings 'n'= 0.013

Total Area= 120.830

City of Windsor

Location			Flow Characteristics								Sewer Design/Profile									
ROAD/STN	LOCATION		INDIVIDUAL		CUMULATIVE		PEAKING FACTOR M	POP FLOW Q(p) (L/s)	PEAK EXTR. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE DIA. (mm)	Wall Thickness (mm)	SLOPE (%)	UPPER INVERT (m)	LOWER INVERT (m)	FALL (m)	VELOCITY (m/s)	Q/Qfull
	FROM MH	TO MH	POP	AREA (ha.)	POP	AREA (ha.)														
RIBERDY RD	7S2639	7S2208	625.0	10.08	625	10.08	3.922	10.300	2.822	13.12	30.90	54.6	250		0.27	185.223	185.076	0.147	0.63	42.47%
RIBERDY RD	7S2208	7S2207	124.0	1.60	749	11.68	3.877	12.202	3.270	15.47	30.90	125.3	250		0.27	185.076	184.738	0.338	0.63	50.07%
RIBERDY RD	7S2207	7S2209	43.0	0.86	792	12.54	3.863	12.854	3.511	16.37	31.47	127.8	250		0.28	184.738	184.380	0.358	0.64	52.01%
RIBERDY RD	7S2209	7S2564	0.0	0.00	792	12.54	3.863	12.854	3.511	16.37	52.97	131.5	300		0.30	184.380	183.985	0.394	0.75	30.90%
RIBERDY RD	7S2564	7S2565	0.0	0.00	792	12.54	3.863	12.854	3.511	16.37	53.84	95.0	300		0.31	183.985	183.691	0.295	0.76	30.40%
RIBERDY RD	7S2565	7S2197	0.0	0.00	792	12.54	3.863	12.854	3.511	16.37	58.02	33.4	300		0.36	183.691	183.571	0.120	0.82	28.21%
RIBERDY RD	7S2197	7S2196	1339.0	9.60	2131	22.14	3.564	31.911	6.199	38.11	54.70	75.9	300		0.32	183.571	183.328	0.243	0.77	69.67%
RIBERDY RD	7S2572	7S2196	126.0	2.51	126	2.51	4.215	2.231	0.703	2.93	31.47	120.9	250		0.28	183.666	183.328	0.339	0.64	9.32%
LEDYARD AVE	7S2196	7S2195	0.0	0.00	2257	24.65	3.544	33.610	6.902	40.51	52.97	67.3	300		0.30	183.328	183.126	0.202	0.75	76.49%
LEDYARD AVE	7S2195	7S2568	0.0	0.00	2257	24.65	3.544	33.610	6.902	40.51	79.89	10.2	350		0.30	183.126	183.095	0.031	0.83	50.71%
WALKER RD	7S2569	7S2568	237.0	3.20	237	3.20	4.120	4.103	0.896	5.00	31.47	126.3	250		0.28	183.449	183.095	0.354	0.64	15.89%
WALKER RD	7S2567	7S2568	836.0	10.83	836	10.83	3.849	13.518	3.032	16.55	31.47	107.7	250		0.28	183.397	183.095	0.302	0.64	52.60%
LEDYARD AVE	7S2568	7S2192	0.0	0.00	3330	38.68	3.404	47.617	10.830	58.45	104.17	25.6	350		0.51	183.095	182.965	0.130	1.08	56.11%
LEDYARD AVE	7S2192	7S2215	0.0	0.00	3330	38.68	3.404	47.617	10.830	58.45	78.41	74.9	375		0.20	182.965	182.815	0.150	0.71	74.54%
LEDYARD AVE	7S2215	7S2185	378.0	6.88	3708	45.56	3.363	52.385	12.757	65.14	94.42	97.3	375		0.29	182.815	182.533	0.282	0.85	68.99%
LEDYARD AVE	7S2185	7S2166	906.0	22.86	4614	68.42	3.277	63.528	19.158	82.69	106.68	86.1	450		0.14	182.533	182.412	0.120	0.67	77.51%
BLISS RD	7S2166	7S2165	674.0	13.64	5288	82.06	3.222	71.591	22.977	94.57	142.55	121.6	450		0.25	182.412	182.108	0.304	0.90	66.34%
BLISS RD	7S2165	7S2164	122.0	2.47	5410	84.53	3.213	73.032	23.668	96.70	130.65	131.6	450		0.21	182.108	181.832	0.276	0.82	74.01%
BLISS RD	7S2164	7S2163	0.0	0.00	5410	84.53	3.213	73.032	23.668	96.70	127.50	95.0	450		0.20	181.832	181.642	0.190	0.80	75.84%
BLISS RD	7S2163	7S1963	125.0	2.52	5535	87.05	3.204	74.503	24.374	98.88	130.65	90.6	450		0.21	181.807	181.617	0.190	0.82	75.68%
BLISS RD	7S1963	7S1962	0.0	0.00	5535	87.05	3.204	74.503	24.374	98.88	130.65	107.0	450		0.21	181.642	181.418	0.225	0.82	75.68%
BLISS RD	7S1962	7S1961	0.0	0.00	5535	87.05	3.204	74.503	24.374	98.88	127.50	122.1	450		0.20	181.617	181.372	0.244	0.80	77.55%
BLISS RD	7S1961	7S1940	127.0	2.56	5662	89.61	3.195	75.992	25.091	101.08	130.65	99.3	450		0.21	181.418	181.209	0.208	0.82	77.37%
LAPPAN AVE	7S1959	7S1940	1646.0	28.95	1646	28.95	3.650	25.242	8.106	33.35	76.42	85.9	375		0.19	181.372	181.209	0.163	0.69	43.63%
BLISS RD	7S1941	7S1940	114.0	2.27	114	2.27	4.228	2.025	0.636	2.66	33.64	73.9	250		0.32	181.445	181.209	0.236	0.69	7.91%
LAPPAN AVE	7S1940	7S1939	0.0	0.00	7422	120.83	3.082	96.105	33.832	129.94	212.44	98.0	525		0.24	181.209	180.970	0.239	0.98	61.17%



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- EXISTING RESIDENTIAL - 50 PERSONS/ha
- EXISTING COMMERCIAL - 77.19 PERSONS/ha
- EXISTING INDUSTRIAL - 62 PERSONS/ha
- PROPOSED MIXED USE (TOTAL = 749 PERSONS)
 - 74 RESIDENTIAL UNITS - 185 PERSONS @ 2.5 PERSONS/UNIT 17654 SQ.M.
 - COMMERCIAL - 564 PERSONS @ 77.19 PERSONS/HA)

0 166.69 333.4 Meters

1: 10,000 6/23/2026

Notes

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City of Windsor

Location			Flow Characteristics								Sewer Design/Profile									
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	FROM MH	TO MH	POP	AREA (ha.)	POP	AREA (ha.)														
RIBERDY RD	7S2639	7S2208	1000.0	11.35	1000	11.35	6.000	25.208	3.178	28.39	30.90	54.6	250		0.27	185.223	185.076	0.147	0.63	91.86%
RIBERDY RD	7S2208	7S2207	124.0	1.60	1124	12.95	3.767	17.788	3.626	21.41	30.90	125.3	250		0.27	185.076	184.738	0.338	0.63	69.30%
RIBERDY RD	7S2207	7S2209	43.0	0.86	1167	13.81	3.756	18.415	3.867	22.28	31.47	127.8	250		0.28	184.738	184.380	0.358	0.64	70.81%
RIBERDY RD	7S2209	7S2564	0.0	0.00	1167	13.81	3.756	18.415	3.867	22.28	52.97	131.5	300		0.30	184.380	183.985	0.394	0.75	42.07%
RIBERDY RD	7S2564	7S2565	0.0	0.00	1167	13.81	3.756	18.415	3.867	22.28	53.84	95.0	300		0.31	183.985	183.691	0.295	0.76	41.38%
RIBERDY RD	7S2565	7S2197	0.0	0.00	1167	13.81	3.756	18.415	3.867	22.28	58.02	33.4	300		0.36	183.691	183.571	0.120	0.82	38.40%
RIBERDY RD	7S2197	7S2196	1339.0	9.60	2506	23.41	3.508	36.930	6.555	43.49	54.70	75.9	300		0.32	183.571	183.328	0.243	0.77	79.49%
RIBERDY RD	7S2572	7S2196	126.0	2.51	126	2.51	4.215	2.231	0.703	2.93	31.47	120.9	250		0.28	183.666	183.328	0.339	0.64	9.32%
LEDYARD AVE	7S2196	7S2195	0.0	0.00	2632	25.92	3.490	38.593	7.258	45.85	52.97	67.3	300		0.30	183.328	183.126	0.202	0.75	86.57%
LEDYARD AVE	7S2195	7S2568	0.0	0.00	2632	25.92	3.490	38.593	7.258	45.85	79.89	10.2	350		0.30	183.126	183.095	0.031	0.83	57.39%
WALKER RD	7S2569	7S2568	237.0	3.20	237	3.20	4.120	4.103	0.896	5.00	31.47	126.3	250		0.28	183.449	183.095	0.354	0.64	15.89%
WALKER RD	7S2567	7S2568	799.0	10.35	799	10.35	3.861	12.960	2.898	15.86	31.47	107.7	250		0.28	183.397	183.095	0.302	0.64	50.40%
LEDYARD AVE	7S2568	7S2192	0.0	0.00	3668	39.47	3.367	51.884	11.052	62.94	104.17	25.6	350		0.51	183.095	182.965	0.130	1.08	60.42%
LEDYARD AVE	7S2192	7S2215	0.0	0.00	3668	39.47	3.367	51.884	11.052	62.94	78.41	74.9	375		0.20	182.965	182.815	0.150	0.71	80.27%
LEDYARD AVE	7S2215	7S2185	378.0	6.88	4046	46.35	3.329	56.587	12.978	69.57	94.42	97.3	375		0.29	182.815	182.533	0.282	0.85	73.68%
LEDYARD AVE	7S2185	7S2166	906.0	22.86	4952	69.21	3.249	67.594	19.379	86.97	106.68	86.1	450		0.14	182.533	182.412	0.120	0.67	81.53%
BLISS RD	7S2166	7S2165	674.0	13.64	5626	82.85	3.197	75.571	23.198	98.77	142.55	121.6	450		0.25	182.412	182.108	0.304	0.90	69.29%
BLISS RD	7S2165	7S2164	122.0	2.47	5748	85.32	3.188	76.997	23.890	100.89	130.65	131.6	450		0.21	182.108	181.832	0.276	0.82	77.22%
BLISS RD	7S2164	7S2163	0.0	0.00	5748	85.32	3.188	76.997	23.890	100.89	127.50	95.0	450		0.20	181.832	181.642	0.190	0.80	79.12%
BLISS RD	7S2163	7S1963	125.0	2.52	5873	87.84	3.180	78.454	24.595	103.05	130.65	90.6	450		0.21	181.807	181.617	0.190	0.82	78.87%
BLISS RD	7S1963	7S1962	0.0	0.00	5873	87.84	3.180	78.454	24.595	103.05	130.65	107.0	450		0.21	181.642	181.418	0.225	0.82	78.87%
BLISS RD	7S1962	7S1961	0.0	0.00	5873	87.84	3.180	78.454	24.595	103.05	127.50	122.1	450		0.20	181.617	181.372	0.244	0.80	80.82%
BLISS RD	7S1961	7S1940	127.0	2.56	6000	90.40	3.171	79.928	25.312	105.24	130.65	99.3	450		0.21	181.418	181.209	0.208	0.82	80.55%
LAPPAN AVE	7S1959	7S1940	1646.0	28.95	1646	28.95	3.650	25.242	8.106	33.35	76.42	85.9	375		0.19	181.372	181.209	0.163	0.69	43.63%
BLISS RD	7S1941	7S1940	114.0	2.27	114	2.27	4.228	2.025	0.636	2.66	33.64	73.9	250		0.32	181.445	181.209	0.236	0.69	7.91%
LAPPAN AVE	7S1940	7S1939	0.0	0.00	7760	121.62	3.063	99.868	34.054	133.92	212.44	98.0	525		0.24	181.209	180.970	0.239	0.98	63.04%