



ALEO ASSOCIATES INC.

CONSULTING ENGINEERS

8782_SanitarySewerStudy.docx

September 25, 2024

Corporation of the City of Windsor
Engineering – Development & Geomatics Division
350 City Hall Square West, Suite 210
Windsor, Ontario, N9A 6S1

ATT: MR. ROBERT PERISSINOTTI, DEVELOPMENT ENGINEER
RE: SANITARY SEWER STUDY FOR THE PROPOSED APARTMENT BUILDING AT
8380 WYANDOTTE STREET EAST, WINDSOR, ONTARIO

Dear Mr. Perissinotti,

We have completed an assessment of the existing 450 mm municipal sanitary sewer within the Wyandotte Street East right-of-way for the purpose of determining the capacity available to accept the increased sewage flow as a result of the proposed apartment building development located at the north east corner of Wyandotte Street East and Watson Avenue.

The tributary drainage area of the existing 450 mm sanitary sewer is approximately 39.5 hectares and currently consists of single family residential, apartments, an elementary school and commercial land uses. Please see the drainage area plan drawings for both the existing and proposed conditions enclosed.

Based on the existing condition, it was determined that the total peak sewage flow rate including infiltration is approximately 45.9 L/s. The existing 450 mm diameter sanitary sewer has a capacity of 98.8 L/s. This sewer has 46.5% of its capacity utilized and therefore there is plenty of capacity available to support future development.

The proposed six storey apartment building will have 86 units for a total a population 215 persons based on a 2.5 person per unit population density. This corresponds to a peak domestic sewage flow rate of 3.7 L/s. Based on the proposed condition for the sanitary sewer drainage area which takes the proposed apartment building development into consideration as well as a planned future apartment building located at 8380 Wyandotte Street East, the total peak sewage flow rate including infiltration will be approximately 52.0 L/s.

This is a small increase in the total peak sewage flow rate and the existing sanitary sewer will have 52.7% of its capacity utilized. Therefore, there is sufficient capacity available in the municipal sanitary sewer to support the proposed apartment building development.

If you have any questions or concerns please contact me.






Yours Very Truly,

John-Paul Aleo, P.Eng.

ALEO ASSOCIATES INC.



LEGEND:

-  Sanitary Sewer Drainage Area (39.5 Ha.)
-  Residential (31.5 Ha.)
-  Commercial (6.3 Ha.)
-  Existing Apartments (0.8 Ha.)
-  Existing Elementary School (0.9 Ha.)



**SANITARY SEWER
DRAINAGE AREA PLAN**

EXISTING CONDITION

EX. 600 mm SAN. SEWER

MH 6S3835
EX. 450 mm SAN. SEWER

MH 6S3848

ALEO ASSOCIATES INC.
 Consulting Engineers

Prepared By: J.P.A.
 Project Name: 0 Wyandotte St. E. (NE corner of Wyandotte St. E. & Watson Ave.)
 Project No.: 8782
 Date: September 24, 2024








SANITARY SEWER CAPACITY ASSESSMENT
450 mm DIAMETER SANITARY SEWER ON WYANDOTTE STREET EAST (FROM MH 6S3848 TO MH 6S3835)
ASSESSMENT OF EXISTING CONDITION

LOCATION			POPULATION			SEWAGE FLOW			SEWER DESIGN					
Area No.	DEVELOPMENT TYPE	AREA (HEC.)	PER HEC.	POP.	PEAKING FACT.	INFIL. l/sec	SEW. l/sec	TOTAL l/sec	SIZE (mm)	n	SLOPE (%)	CAP. l/sec	VEL. m/s	CAPACITY UTILIZED (%)
1	RESIDENTIAL	31.5	50	1575	3.66	4.91	24.24	29.15	-	-	-	-	-	-
2	COMMERCIAL	6.3	74	466	3.99	0.98	1.8	2.8	-	-	-	-	-	-
3	APARTMENTS	0.8	-	382	4.03	0.12	6.5	6.6						
4	ELEMENTARY SCHOOL	0.9	-	430	4.01	0.14	7.2	7.4						
	TOTAL	39.5	-	2041	-	6.2	39.7	45.9	450	0.013	0.12	98.8	0.62	46.5

Design Criteria:

- 1) Residential/Domestic Sewage Flow = 0.0042 l/sec/cap
- 2) Commercial Sewage Flow = 0.286 l/ha/s
- 3) Infiltration = 0.1560 l/s/ha
- 4) Peak Wastewater Flow Factor, M = $1+14/(4+P^{0.5})$
- 5) Manning's Coefficient = 0.013
- 6) Minimum Velocity = 0.60 m/s
- 7) Maximum Velocity = 3.0 m/s
- 8) Student population of school is 430 students.
- 9) Population for existing apartments estimated based on number of parking stalls. 1 parking stall per residential unit. 182 parking stalls = 182 units. Assumed two bedrooms per unit. Total population is 382 persons based on 2.1 persons/unit.

LEGEND:

-  Sanitary Sewer Drainage Area (39.5 Ha.)
-  Single Family Residential (31.5 Ha.)
-  Commercial (4.9 Ha.)
-  Future Multi-Storey Residential Development By Others (0.6 Ha.)
-  Proposed Multi-Storey Residential Development (0.8 Ha.)
-  Existing Apartments (0.8 Ha.)
-  Existing Elementary School (0.9 Ha.)



**SANITARY SEWER
DRAINAGE AREA PLAN**

PROPOSED CONDITION

EX. 600 mm SAN. SEWER

MH 6S3835
EX. 450 mm SAN. SEWER

MH 6S3848

SANITARY SEWER CAPACITY ASSESSMENT
450 mm DIAMETER SANITARY SEWER ON WYANDOTTE STREET EAST (FROM MH 6S3848 TO MH 6S3835)
ASSESSMENT OF PROPOSED CONDITION

LOCATION			POPULATION					SEWAGE FLOW			SEWER DESIGN					
Area No.	DEVELOPMENT TYPE	AREA (HEC.)	PER HEC.	PERS. PER UNIT	NO. OF UNITS	POP.	PEAKING FACT.	INFIL. l/sec	SEW. l/sec	TOTAL l/sec	SIZE (mm)	n	SLOPE (%)	CAP. l/sec	VEL. m/s	CAPACITY UTILIZED (%)
1	RESIDENTIAL	31.5	50	-	-	1575	3.66	4.91	24.2	29.2	-	-	-	-	-	-
2	COMMERCIAL	4.9	74	-	-	363	4.04	0.76	1.4	2.2	-	-	-	-	-	-
3	FUTURE MULTI-STOREY RESIDENTIAL DEVELOPMENT BY OTHERS	0.6	-	2.5	63	158	4.18	0.09	2.8	2.9	-	-	-	-	-	-
4	PROPOSED MULTI-STOREY RESIDENTIAL DEVELOPMENT	0.8	-	2.5	86	215	4.14	0.12	3.7	3.9	-	-	-	-	-	-
5	EXISTING APARTMENTS	0.8	-	2.1	182	382	4.03	0.12	6.5	6.6						
6	EXISTING ELEMENTARY SCHOOL	0.9	-	-	-	430	4.01	0.14	7.2	7.4						
TOTAL		39.5	-	-	-	3122	-	6.2	45.9	52.0	450	0.013	0.12	98.8	0.62	52.7

Design Criteria:

- 1) Residential/Domestic Sewage Flow = 0.0042 l/sec/cap
- 2) Commercial Sewage Flow = 0.286 l/ha/s
- 3) Infiltration = 0.1560 l/s/ha
- 4) Peak Wastewater Flow Factor, M = $1+14/(4+P^{0.5})$
- 5) Manning's Coefficient = 0.013
- 6) Minimum Velocity = 0.75 m/s
- 7) Maximum Velocity = 3.0 m/s
- 8) Population equivalents based on type of housing (From City of Toronto Design Criteria for Sewers & Watermains):
 - 1 Bedroom Condo/Apartment = 1.4 person per unit
 - 2 Bedroom Condo/Apartment = 2.1 person per unit
 - 3 Bedroom Condo/Apartment = 3.0 person per unit

Proposed are 11-3 bedroom units, 51-2 bedroom units, and 24-1 bedroom units. Therefore, the residential development has a 2 person per unit population density on average. However, a population density of 2.5 persons per unit will be used to be more conservative.