



ALEO ASSOCIATES INC.

CONSULTING ENGINEERS

June 26, 2024

Corporation of the City of Windsor
Engineering Department – Development Division
350 City Hall Square West, Room 210
Windsor, Ontario, N9A 6S1

ATT: MR. ROBERT PERISSINOTTI, DEVELOPMENT ENGINEER
RE: SANITARY SEWER STUDY FOR THE PROPOSED MULTI-UNIT RESIDENTIAL DEVELOPMENT AT 4088 & 4096 SIXTH CONCESSION ROAD, WINDSOR, ONTARIO

Dear Mr. Perissinotti,

We were retained by Architectural Design Associates Inc. to conduct a sanitary sewer study for the proposed multi-unit residential development at 4088 & 4096 Sixth Concession Road which is required at this time for a zoning by-law amendment.

The two properties are currently undeveloped single family residential lots. The properties will be merged for the proposed multi-unit residential development. The building will have four-one bedroom units, and seventeen-two bedroom units for a total of twenty-one units.

The existing municipal sanitary sewer system has been assessed to determine if there is capacity available to accept the increased sewage flow from the proposed medium density residential development. The sewer analyzed is the 250 mm diameter PVC sanitary sewer along Sixth Concession from manhole no. 7S7904 to manhole no. 7S10157. This sanitary sewer transitions to a 750 mm diameter sanitary trunk sewer at the intersection of Sixth Concession Road & Morand Street.

The gradient of the existing 250 mm diameter sanitary sewer along Sixth Concession is not known but the minimum required slope for a 250 mm diameter sanitary sewer has been used in the assessment. The sewer has been assumed to have a 0.38% minimum slope which provides a capacity of 37 L/s. The sewer currently provides drainage solely for twenty-one (21) single family dwellings along Sixth Concession Road.

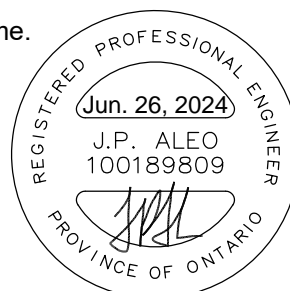
The peak sewage flow rate from these existing single family dwellings to the municipal sewer is approximately 1.8 L/s based on a population density of 3.5 persons per household. The proposed medium density residential development will have 21 units for a total population of 42 persons based on a 2.0 person per unit population density. This corresponds to a peak domestic sewage flow rate of 0.8 L/s. Therefore, the total peak sewage flow rate in the proposed condition would be approximately 2.6 L/s.

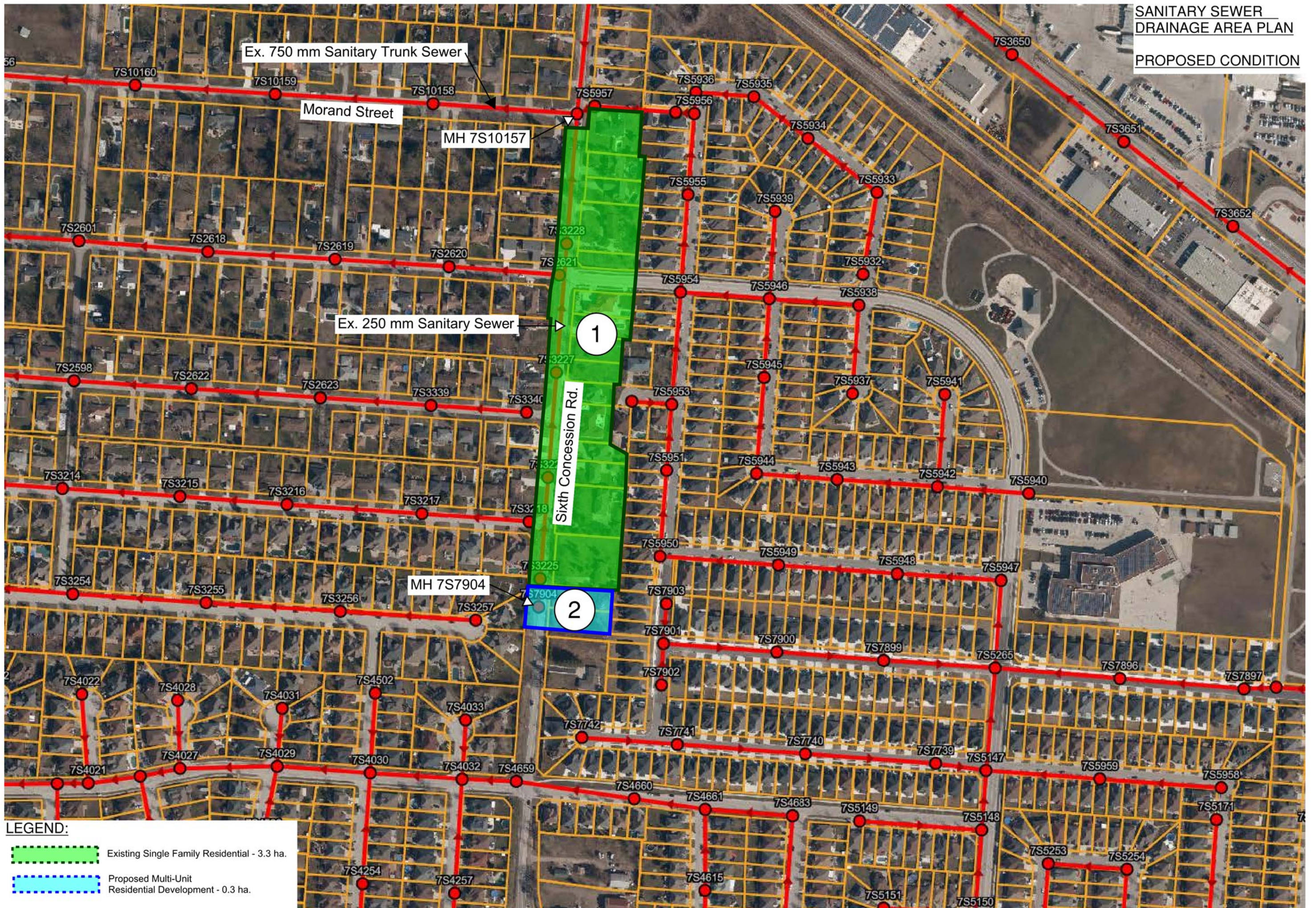
As indicated, the existing municipal sanitary sewer has a capacity of 37 L/s and will therefore only have 7% of its capacity utilized. Please refer to the sanitary sewer capacity assessment enclosed. The assessed municipal sanitary sewer has substantial capacity available to support the proposed development.

If you have any questions or concerns, please contact me.

Yours Very Truly

John-Paul Aleo, P.Eng.
ALEO ASSOCIATES INC.





LEGEND:

- Existing Single Family Residential - 3.3 ha.
- Proposed Multi-Unit Residential Development - 0.3 ha.

**SANITARY SEWER CAPACITY ASSESSMENT
250 mm DIAMETER SANITARY SEWER ON SIXTH CONCESSION ROAD (FROM MH 7S7904 TO MH 7S10157)
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 | Existing Residential Single Family Dwellings | 3.3 | - | 3.5 | 21 | 74 | 4.28 | 0.5 | 1.3 | 1.8 | - | - | - | - | - | - |
| 2 | Proposed Multi-Unit Residential Development | 0.3 | - | 2.0 | 21 | 42 | 4.33 | 0.05 | 0.8 | 0.8 | - | - | - | - | - | - |
| | TOTAL | 3.6 | - | | | 116 | - | 0.6 | 2.1 | 2.6 | 250 | 0.013 | 0.38 | 37 | 0.75 | 7.2 |

Design Criteria:

- 1) Residential Sewage Flow Rates: 0.0042 l/sec/cap
- 2) Infiltration = 0.1560 l/s/ha
- 3) Peak Wastewater Flow Factor, $M = 1 + 14 / (4 + P^{0.5})$
- 4) Manning's Coefficient = 0.013
- 5) Minimum Velocity = 0.75 m/s
- 6) Maximum Velocity = 3.0 m/s
- 7) Twenty-one single family dwellings are discharging to the 250 mm sanitary sewer. Based on a population density of 3.5 person/unit, the total population is 74 persons.
- 8) Proposed Multi-Unit Residential Development is 21 units with a 2.0 person per unit population density for a total population of 42.
4-one bedroom units (1.4 person per unit) and 17-two bedroom units (2.1 person per unit) for an average of 2.0 person per unit.
Population equivalents based on housing type taken from City of Toronto design criteria for sewers & water mains.