STRIK BALDINELLI MONIZ
PLANNING • CIVIL • STRUCTURAL • MECHANICAL • ELECTRICAL

LONDON LOCATION
1599 Adelaide St. N., Units 301 & 203
London, ON N5X 4E8
P: 519-471-6667

KITCHENER LOCATION
1415 Huron Rd., Unit 225
Kitchener, ON N2R 0L3
P: 519-725-8093

www.sbmltd.ca

sbm@sbmltd.ca

1000585742 Ontario Inc.
69 Hunt Club Drive
London, Ontario, N6H 3Y4

23 January 2024
SBM-23-2453

Attn: Todd Bond

Re: **Servicing Feasibility Study**
Proposed Stacked Townhouse Development
24546 Adelaide Road, Strathroy, Ontario

1. INTRODUCTION

This Servicing Feasibility Study (Study) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 1000585742 Ontario Inc. to address the servicing feasibility for the proposed 0.43 ha stacked townhouse development located at 24546 Adelaide Road, Strathroy.

The site abuts residential lands to the north, a low-density residential dwelling and agriculture lands to the east, Adelaide Road Right-Of-Way (ROW) to the south, and commercial lands to the west. It is our understanding that the proposed development is to include two (2) three and a half storey townhouse buildings (32 units total) with associated parking areas and common amenity spaces. See the proposed Concept Plan by Siv-ik Planning & Design Inc. dated January 16, 2024, enclosed with this Study.

This Study is to determine the adequacy of the existing Municipality of Strathroy-Caradoc services in support of Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) application for the proposed development.

Design requirements have been based on the Municipality of Strathroy-Caradoc Servicing Standards (MSCSS), dated October 2021, the Ministry of the Environment, Conservation and Parks (MECP) design guidelines, and the current edition of the Ontario Building Code (OBC).

2. WATER SERVICING

According to the Municipality's record drawing "Adelaide Road from 0+680.183N to 1+050.183N", prepared by Development Engineering dated April 13, 1999, there is an existing 400 mm PVC watermain in the Adelaide Road ROW. There is one existing 25 mm water service to the proposed site shown on the record drawing, which will not be adequate to service the proposed 32 units therefore it will need to be decommissioned and replaced with a larger service to be designed as part of the Site Plan Approval process.

2.1 Domestic Water Supply

The maximum hour domestic demand, as per the MSCSS for a population of 77 people (32 units at 2.4 people per unit per Section 4.3.2 of the MSCSS) is 1.74 L/s. See the attached domestic water demand calculations.

2.2 Water Supply for Fire Protection

Section 4.3.2 of the MSCSS requires the minimal residual pressure during Maximum Day plus Fire scenario to be not less than 140 kPa (20 psi) at any location in the water distribution system.

Since the proposed buildings are Part 9 per the OBC, a sprinkler system is not required for the proposed buildings and therefore fire-fighting demand is determined as per OBC Vol-2, Section A-3.2.5.7. The calculations, attached to this Study, were based on the most conservative building (20-unit stacked townhouse) and result in a required fire flow rate of 3600 L/min which was combined with the maximum day domestic demand of 46.8 L/min to obtain the required supply fire flow + maximum day demand of 3647 L/min.

Fire hydrant flow test results were provided by the Municipality and are attached to this Study. The nearest test was at the municipal hydrant located at the corner of Caradoc St. and Carroll St. The flow test results show that the static pressure of the water distribution system in the area is 379.21 kPa (55 psi) and the residual pressure is 344.74 kPa (50 psi) at a test flow rate of 6598 L/min (1743 USGPM).

Upon review of the hydrant flow test results and using linear interpolation of the residual pressure readings at the provided flow rates from the hydrant at the corner of Caradoc Street and Carroll Street, there is sufficient pressure within the system. At the required maximum day plus fire-flow demand rate of 3647 L/min, the residual pressure in the system would be approximately 52.24 psi (360.16 kPa) which exceeds the minimum required pressure of 20 psi (140 kPa) in fire-flow scenarios. Please refer to the calculations attached to this Study.

According to the Municipality's record drawing "Adelaide Road from 0+680.183N to 1+050.183N", prepared by Development Engineering dated April 13, 1999, there is an existing hydrant fronting the property available to provide fire flows to the proposed development.

2.3 Water Supply Conclusions

Since there is sufficient water supply for the fire-flow plus maximum day demand of 60.8 L/s (3647 L/min) with residual pressure greater than 40 psi, as demonstrated in Section 2.2, and the peak hour domestic demand of 1.74 L/s is less than the fire-flow plus maximum day demand, it can be concluded that adequate water supply for the proposed development is available from the municipal system.

3. SANITARY SERVICING

As per the Municipality's record drawing "Plan and Profile of Adelaide Road from Sta. 2+590 to Sta. 2+740", prepared by B. M. Ross and Associates Limited dated July 30, 2008, the site is tributary to the 250 mm sanitary sewer in the Adelaide Road ROW with a sanitary PDC (size unknown) currently servicing the site. The existing sanitary PDC will need to be investigated to determine size, invert elevations, and slope so that it can be evaluated to determine suitability to service the proposed development. If found to be inadequate, it will be required to be capped at the property line and a new sanitary PDC shall be installed.

The proposed flows from the subject property are shown on the Sanitary Sewer Design Sheet appended to this Study. Using a flow of 300 L/capita/day and a population of 77 people (32 units at 2.4 people per unit) as per the MSCSS results in an anticipated peak sanitary flow of 1.26 L/s. When combined with infiltration, this results in a total peak flow of 1.29 L/s. A private drain connection of a minimum diameter of 200 mm with a minimum slope of 1% is required which has sufficient capacity of 32.82 L/s to convey the proposed flows.

4. STORM SERVICING AND STORMWATER MANAGEMENT

As per the email received from Maria F. Camacho (Municipality of Strathroy-Caradoc) on November 20, 2023, there is no existing storm sewer in the Adelaide Road ROW.

As shown on the Runoff Coefficient Calculations attached, the post development runoff coefficient is 0.62 for the proposed development which is greater than the pre-development runoff coefficient of 0.23. The Phase I&II Environmental Site Assessment (Project No.: LON-00016790-EN) prepared by EXP Services Inc., dated February 1, 2019 (provided separately) concludes that the site's subsurface generally consists of sand and gravel fill and/or sand fill, overlying native sand with a groundwater depth ranging between 2.46m and 2.73m as measured in January 2019. Additional measurements may be required to determine seasonal high groundwater elevations. Per the MECP Stormwater Management Planning and Design Manual, the water table is required to be a minimum of 1m below the bottom of the infiltration trench, therefore, the site

appears to be conducive to at-source infiltration. Therefore, SWM quantity controls (i.e. Low Impact Development (LID) controls) will be designed to control post-development flows for the 2-year through 100-year storm events to the pre-development levels. The 250-year storm event will be safely conveyed overland generally matching the existing conditions of the site.

5. SUMMARY

Based on the above, the existing municipal infrastructure and proposed site services have sufficient capacity to accommodate the proposed townhouse development of the 0.43 ha subject site located at 24546 Adelaide Road, Strathroy.

6. LIMITATIONS

This Study was prepared by SBM for 1000585742 Ontario Inc. (owner), the Municipality of Strathroy-Caradoc, and the County of Middlesex. Use of this Study by any third party, or any reliance upon its findings, is solely the responsibility of that party. SBM accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions undertaken as a result of this Study. Third party use of this Study, without the express written consent of the Consultant, denies any claims, whether in contract, tort, and/or any other cause of action in law, against the Consultant.

All findings and conclusions presented in this Study are based on site conditions as they appeared in the information presented to SBM and related to in this document. This Study is not intended to be exhaustive in scope, or to imply a risk-free development. It should be recognized that the passage of time may alter the opinions, conclusions, and recommendations provided herein, as well as any changes in the layout of the development.

The design was limited to the documents referenced herein and SBM accepts no responsibility for the accuracy of the information provided by others. All designs and recommendations presented in this Study are based on the information available at the time of the review.

7. CLOSURE

We trust this Study meets your satisfaction. Should you have any questions or require further information, please do not hesitate to contact us.

Respectfully submitted,

Strik, Baldinelli, Moniz Ltd.

Planning • Civil • Structural • Mechanical • Electrical

Ben Hyland, P.Eng., PMP
Civil Project & Team Lead, Eng. III
Associate I

Cloe Maw, EIT
Civil Engineering Trainee I

Encl:
- Concept Plan by Siv-ik Planning & Design Inc. dated January 16, 2024
- Municipality record drawing “Adelaide Road from 0+680.183N to 1+050.183N”
- Domestic Water Demand Calculations
- Fire Hydrant Flow Test Results
- Fire Flow Calculations (as per OBC Div. B A-3.2.5.7.)
- Municipality record drawing “Plan and Profile of Adelaide Road from Sta. 2+590 to Sta. 2+740”,
- Sanitary Service Design Sheet
- Runoff Coefficient Calculations

CONCEPT PLAN

01 DWG

PROJECT SITE
24546 Adelaide Road

SITE DATA

R3 ZONE

Regulations	Required	Proposed
Permitted Uses:	Section 7.2	Multiple-unit Dwelling
	100 m^2 for first 6 units & 15 m^2 for each unit thereafter (min.)	
Lot Area (per unit):	Total Required: 990m^2	4,252.68m^2
Lot Frontage (per unit):	20.0m (min.)	69.8m
Front Yard:	4.5m (min.)	4.5m
Side Yard:	2.0m (min.)	West: 2.0m East: 34.5m
Rear Yard:	10.0m (min.)	6.0m*
Landscape OS:	30% (min.)	40%
Lot Coverage:	45% (max.)	17.4%
Height:	N/A	12.0m
Density:	N/A	75.25uph
Parking:	Multiple Unit: 1.5/unit Visitor Parking: 0.15/unit Total Required: 55	1.53/unit (49 total)*
Parking Coverage:	25% (max.)	36.5%*
Outdoor Common Amenity Area	20m^2 per unit (min.) Total Required: 640m^2	700m^2

* - Requires Special Provision

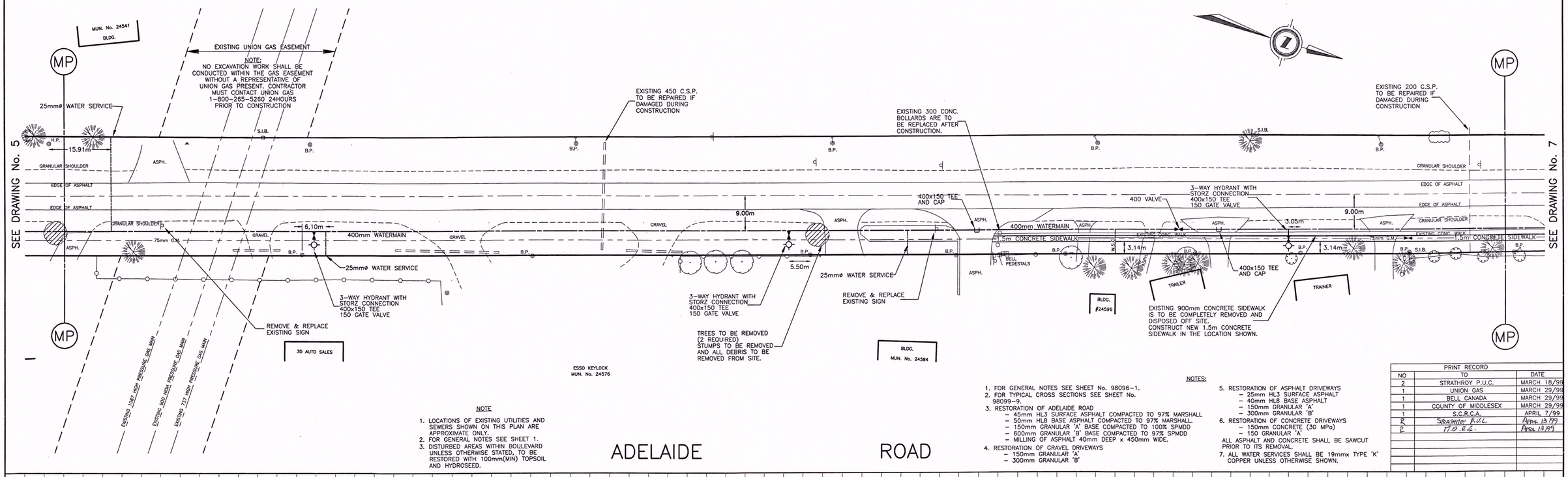
Client:	Todd Bond & Ashraf Ghadban
Date:	01/16/2024
Drawn By:	D. Murphy
Plan Scale:	nts
File No:	245646A
Version	2.0

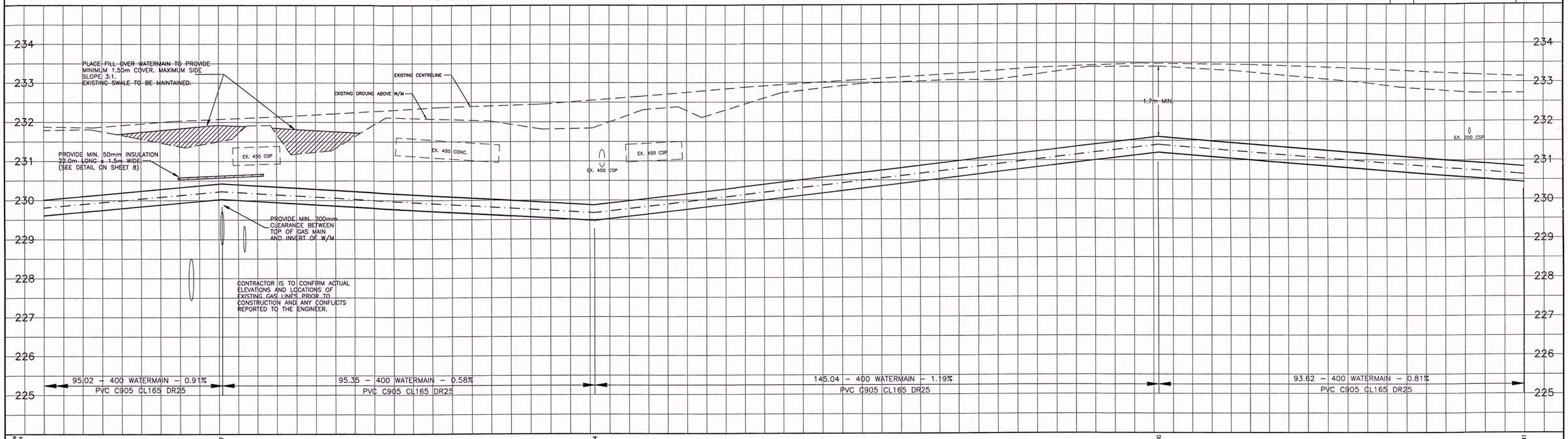
N

[siv-ik] PLANNING / DESIGN

Contact Us
www.siv-ik.ca
info@siv-ik.ca
905.921.9029

Lot Boundary Disclaimer: *Site dimensions have been assumed based on a survey completed by Farncomb & Kirkpatrick OLS (dated 01/23/1963). Siv-ik planning and design inc. makes no warranties or guarantees regarding the accuracy of the lot boundaries.*





NOTE

1. LOCATIONS OF EXISTING UTILITIES AND SEWERS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY.
2. FOR GENERAL NOTES SEE SHEET 1.
3. DISTURBED AREAS WITHIN BOULEVARD UNLESS OTHERWISE STATED, TO BE RESTORED WITH 100mm(MIN) TOPSOIL AND HYDROSEED.

NOTES:

1. FOR GENERAL NOTES SEE SHEET No. 98096-1.
2. FOR TYPICAL CROSS SECTIONS SEE SHEET No. 98099-9.
3. RESTORATION OF ADELAIDE ROAD
   - 45mm HL3 SURFACE ASPHALT COMPACTED TO 97% MARSHALL
   - 50mm HL8 BASE ASPHALT COMPACTED TO 97% MARSHALL.
   - 150mm GRANULAR 'A' BASE COMPACTED TO 100% SPMDD
   - 600mm GRANULAR 'B' BASE COMPACTED TO 97% SPMDD
   - MILLING OF ASPHALT 40mm DEEP x 450mm WIDE.
4. RESTORATION OF GRAVEL DRIVEWAYS
   - 150mm GRANULAR 'A'
   - 300mm GRANULAR 'B'
5. RESTORATION OF ASPHALT DRIVEWAYS
   - 25mm HL3 SURFACE ASPHALT
   - 40mm HL8 BASE ASPHALT
   - 150mm GRANULAR 'A'
   - 300mm GRANULAR 'B'
6. RESTORATION OF CONCRETE DRIVEWAYS
   - 150mm CONCRETE (30 MPa)
   - 150 GRANULAR 'A'

   ALL ASPHALT AND CONCRETE SHALL BE SAWCUT PRIOR TO ITS REMOVAL.
7. ALL WATER SERVICES SHALL BE 19mmx TYPE 'K' COPPER UNLESS OTHERWISE SHOWN.

PRINT RECORD

NO	TO	DATE
2	STRATHROY P.U.C.	MARCH 18/99
1	UNION GAS	MARCH 29/99
1	BELL CANADA	MARCH 29/99
1	COUNTY OF MIDDLESEX	MARCH 29/99
1	S.C.R.C.A.	APRIL 7/99
2	STRATHROY P.U.C.	APRIL 13/99
2	M.O.E.E.	APRIL 13/99

PRINTED
APR 1 3 1999

Tue Apr 13 10:15:27 1999

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION			No.	REVISIONS	DATE	BY
1 SEE DRAWING NO. FOR FURTHER DETAIL			DESIGN	TDM	1	FOR APPROVAL	APR. 1/99	TDM
2 SEWER DESIGN; TRANSITION WIDTH OR AS NOTED			DRAWN	TDM, CAO				
3 REFERENCE B.M. ELEVATION			CHECKED	RWC				
			APPROVED					
			DATE	JAN. 13/99				
			98096-6					
			FB 719					

CONSULTANT OR DIVISION

Consulting Civil Engineers
and Planners
361 Dufferin Avenue
London , Ontario N6B 1Z5
Phone (519)672-8310
Fax (519)672-4182
e-mail: deveng@wwdc.com

development engineering
(London) Limited

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
R.W. CLARK
13/4/99
PROVINCE OF ONTARIO

STRATHROY
P.U.C.

STRATHROY PUBLIC
UTILITIES COMMISSION

351 Frances Street
Strathroy, Ontario
N7G 2L7

Tel: (519) 245-2010
Fax: (519) 245-5384

SCALE
1 : 500
5 0 10m
HORIZONTAL
1 : 50
0.5 0 1m
VERTICAL

TITLE
ADELAIDE ROAD WATERMAIN

ADELAIDE ROAD
From 0+680.183N. to 1+050.183N.

PROJECT No. 98096
SHEET No. 6 of 9
PLAN FILE No.

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DOMESTIC WATER DEMAND, VELOCITY, AND TURNOVER CALCULATION

DATE:	January 22, 2024
JOB No.:	SBM-23-2453

Client:	**1000585742 Ontario Inc.**
Project:	**Proposed Stacked Townhouse Development**
Location:	**24546 Adelaide Road, Strathroy, ON**

DEMAND CALCULATION

Avg. Day Demand =	250	L/day/cap
Avg. Day Demand =	0.002893519	L/s/cap
Max. Day Peaking Factor =	3.5	
Max. Hour Peaking Factor =	7.8	
Medium Density Residential =	2.4	p/unit

	Units/Area (ha)	Population	Avg. Day (L/s)	Max. Hour (L/s)	Max. Day (L/s)
Medium Density Residential	32	77	0.22	1.74	0.78
Total			**0.22**	**1.74**	**0.78**

VELOCITY CALCULATION

Diameter (mm)	Demand (L/s)	Velocity (m/s)
150	1.74	0.098

Maximum allowable velocity of 1.5 m/s under maximum hour domestic flow conditions as per Section 4.3.2 of the Municipality of Strathroy-Caradoc Servicing Standards.

Fire Hydrant Flow Test Results
MADY DEVELOPMENT

1. Corner of Queen St. and Carroll St. as taken from Hydrant off of 250 mm watermain on Queen St.

Static	59 psi
Residual	45 psi
Flow	2652 USGPM

2. Corner of Caradoc St. and Carroll St. as taken from Hydrant off of 250 mm watermain on Carroll St.

Static	55 psi
Residual	50 psi
Flow	1743 USGPM

3. Corner of Frances St. and Carroll St. as taken from Hydrant of 150 mm watermain on Frances St.

Static	56 psi
Residual	50 psi
Flow	1426 USGPM

Please note, we have put a call in A1 Fire Hydrants inquiring on the status of a Flow Test that was performed in the summer of 2004. At the time, staff from MPDC were requested to assist in performing a hydrant flow test. We believed that the test was required for the 40 acre commercial development.

Please feel free to contact me at 519-245-2010 ext 224 should you have any questions.

Mark Harris
Director of Environmental Services

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Fire-Fighting Flow (OBC A-3.2.5.7.)

	For data entry
	Calculated, not for data entry

DATE:	January 22, 2024
JOB N0.:	SBM-23-2453

Client:	**1000585742 Ontario Inc.**
Project:	**Proposed Stacked Townhouse Development**
Location:	**24546 Adelaide Road, Strathroy, ON**

$Q=K*V*S_{Tot}$

Building Classification (3.1.2.1):	C
Type of Construction:	Combustible
K (Table 1):	**23**

Building Area, m^2:	480.00
Building Height, m:	12.00
Building Volume, m^3:	**5760.00**

$S_{Tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + S_{side4})$

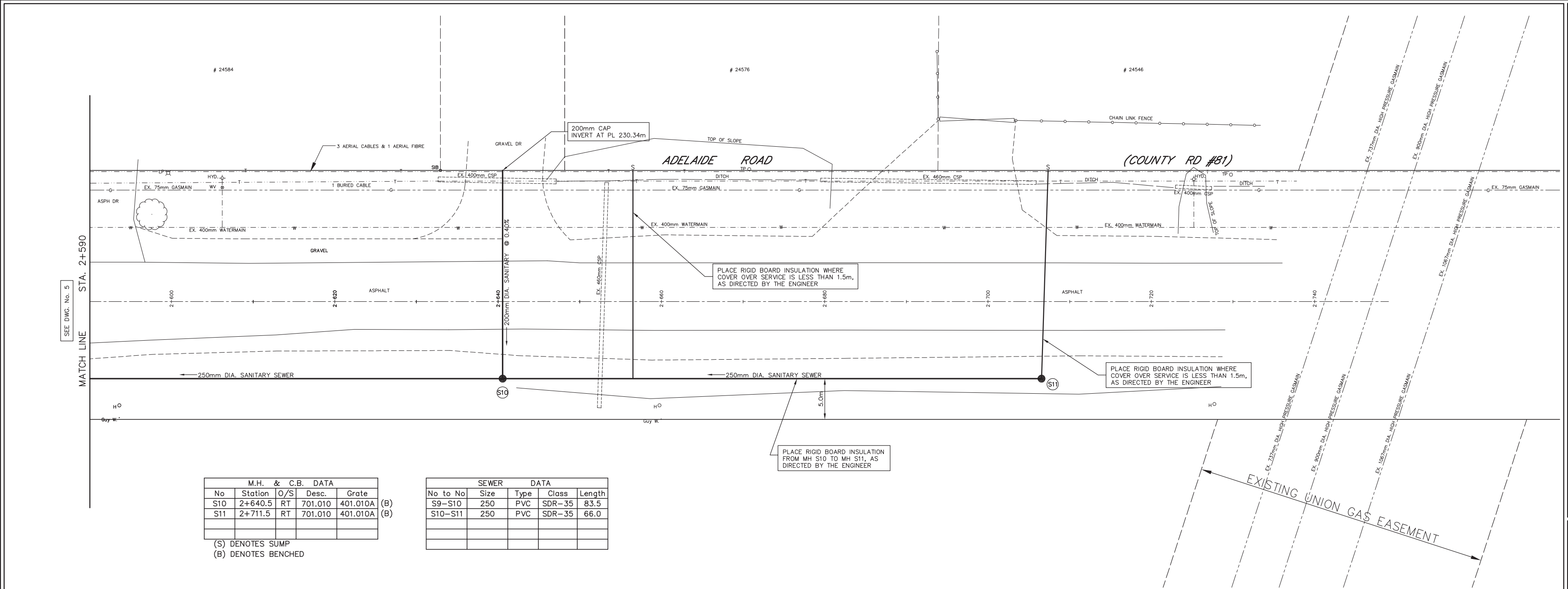
S_{side1} (Figure 1) =	0.00	(North)
S_{side2} (Figure 1) =	0.00	(East)
S_{side3} (Figure 1) =	0.00	(South)
S_{side4} (Figure 1) =	0.00	(West)
S_{Tot} =	1.00	
S_{Tot} < or = 2, therefore S_{Tot} =	**1.00**	

Q, L =	**132480**

Required Supply Flow Rate, L/min (Table 2) =	3600	
Maximum day domestic demand (as per separate calculation sheet)	0.78	L/sec
	46.80	L/min
Required Supply Fire Flow + Maximum Day Demand, L/min =	**3647**	

Provided Supply Flow Rate @	**55.00**	*psi (379.21 kPa) =	**0**	*L/min (0 USGPM)
	50.00	*psi (344.74 kPa) =	**6598**	*L/min (1743 USGPM)
Using linear interpolation, residual pressure at hydrant =	**52.24**	*psi (360.16 kPa) =	**3647**	*L/min (963 USGPM)

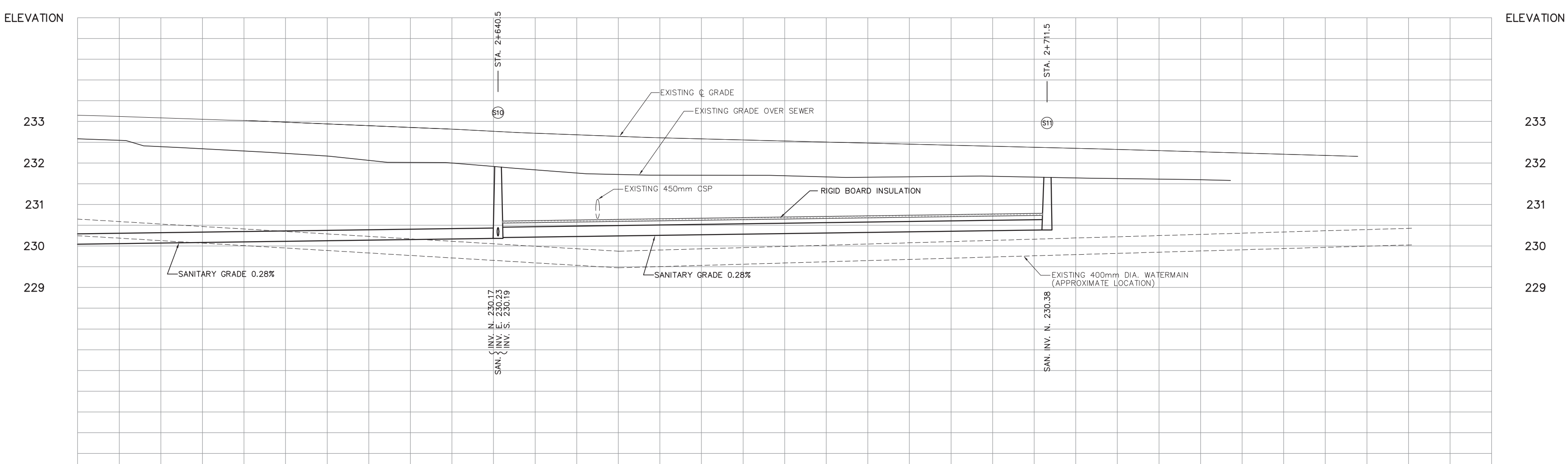
*Refer to the Hydrant Flow Test at the corner of Caradoc St. and Carroll St., received July 24, 2017



M.H. & C.B. DATA					
No	Station	O/S	Desc.	Grate	
S10	2+640.5	RT	701.010	401.010A	(B)
S11	2+711.5	RT	701.010	401.010A	(B)

(S) DENOTES SUMP
(B) DENOTES BENCHED

SEWER DATA				
No to No	Size	Type	Class	Length
S9–S10	250	PVC	SDR–35	83.5
S10–S11	250	PVC	SDR–35	66.0



FINISHED ASPHALT GRADE	232.581	232.394	232.289	232.167	232.013	231.918	231.759	231.706	231.704	231.666	231.667	231.679	231.640	231.611		
EXISTING ℄ GRADE	233.151	233.089	233.024	232.942	232.858	232.765	232.680	232.608	232.557	232.506	232.456	232.405	232.354	232.297	232.239	232.182
STATION		2+600		2+620		2+640		2+660		2+680		2+700		2+720		2+740

LEGEND

SAN. or STM.	EXISTING SEWERS, SANITARY or STORM
MH. CB.	MANHOLE and CATCHBASIN
—W—	WATERMAIN, FIRE HYDRANT
—G—	GASMAIN
—T—	UNDERGROUND TELEPHONE
—H—	UNDERGROUND HYDRO
—TV—	UNDERGROUND T.V. CABLE
H B T H–B LT	UTILITY POLES
	GRUBBING
	REMOVE EXISTING CONC. SIDEWALK AND DRIVES
	REMOVE AND PLACE CONC. SIDEWALK AND DRIVES
	PLACE CONC. SIDEWALK AND DRIVES
	REMOVE EXISTING ASPHALT PAV'T
	PLACE HOT MIX ASPHALT (DRIVES 50mm HL-3 HOT MIX MISC.)
	REMOVE EXISTING CONC. CURB

N

NOTE

The locations of existing underground utilities are shown in an approximate way only and have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work and agrees to be fully responsible for any damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.

BENCHMARK INFORMATION
B.M. Elev. 233.576
CST nail and flag in north-east face of HP on sout-west side of Adelaide Road (Cty Rd 81) @ Sta. 2+525.5±

BENCHMARK INFORMATION
B.M. Elev. 232.630
Top of south bolt at the base of Traffic Signal - Light Pole at the east corner of the Canadian Tire entrance (Sta. 2+310±)

Design By: R.R.R. Checked By: R.M.C.

No.	DATE	REVISION
1.	March 5, 2008	Issued for MOE Approval
2.	May 21, 2008	Issued for Tender
3.	July 30, 2008	Issued for Construction

BMROSS
engineering better communities

Goderich (519) 524-2641 Mount Forest (519) 323-2945

STRATHROY-CARADOC
URBAN OPPORTUNITY · RURAL HOSPITALITY

Municipality of Strathroy-Caradoc
Adelaide Road (Cty Rd 81)

Plan and Profile of Adelaide Road from Sta. 2+590 to Sta. 2+740

Contract No. 07143
Project No. 07143

Scale
Horizontal : 1 : 250
Vertical : 1 : 50

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Sanitary Sewer Design Sheet

Residential Population Densities

(A) Area Basis

Low Density Residential	= 30 Units/hectare @ 2.4 people/unit
Medium Density Residential	**=75 Units/hectare @ 2.4 people/unit**
High Density Residential	=150-300 Units/hectare @ 1.6 people/unit

Design Parameters

Daily Flow (L/cap/day) =	300
Sewage Infiltration (Litres/hectare/day) =	6740
Harmon Formula (Peaking Factor)	
M = (1 + 14/(4+P^0.5))	
Uncertainty Factor	1.1

Date: January 23, 2024
Job Number: SBM-23-2453
Client: 1000585742 Ontario Inc.
Project: Proposed Stacked Townhouse Development
Location: 24546 Adelaide Road, Strathroy, ON
Designed By: CM
Reviewed By: BH

Location			Area						Sewage Flows				Sewer design				
Area No.	From MH	To MH	Delta Hectare	Total Hectare	People Per Unit	No. of Units	*Delta Pop.	Total Pop.	**Harmon Peaking Factor	Infilt L/S	Sewage L/S	Total L/S	n	Pipe Slope %	Dia. mm	Capacity L/S	Velocity m/s
Proposed Conditions																	
24546 Adelaide Road, Strathroy, ON	Site	Ex. Sewer	0.418	0.418	2.4	32	77	77	4.27	0.03	1.26	1.29	0.013	1.00%	200	32.82	1.04

Design Parameters per the Municipality of Strathroy-Caradoc Servicing Standards Section 2.3 dated October 2021

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'C' Coefficient Calculations

DATE:	January 22, 2024
JOB No.:	SBM-23-2453
Client:	**1000585742 Ontario Inc.**
Project:	**Proposed Stacked Townhouse Development**
Location:	**24546 Adelaide Road, Strathroy, ON**

PRE-DEVELOPMENT CONDITIONS*

PRE-DEVELOPMENT OVERALL SITE

	Area (m^2)	C	A*C
Total Area:	4252.68		
Building Area:	0.00	0.9	0.000
Asphalt:	0.00	0.9	0.000
Gravel:	252.08	0.7	176.456
Landscaped/Open:	4000.60	0.2	800.120
Totals:	4252.68		976.576
C_{eq} = Sum(A*C)/Sum(A) =	0.23		

POST-DEVELOPMENT CONDITIONS**

PRE-DEVELOPMENT OVERALL SITE

	Area (m^2)	C	A*C
Total Area:	4252.68		
Building Area:	739.97	0.9	665.970
Asphalt:	1811.64	0.9	1630.478
Gravel:	0.00	0.7	0.000
Landscaped/Open:	1701.07	0.2	340.214
Totals:	4252.68		2636.662
C_{eq} = Sum(A*C)/Sum(A) =	0.62		

* Pre-Development Conditions were obtained from the Phase I & II ESA - Site Plan prepared by EXP Services Inc. dated February 2019
** Post-Development Conditions were obtained from the Concept Site Plan prepared by Siv-ik Planning & Design Inc. dated January 16, 2024