

2430680 Ontario Ltd.
8 Front Street East
Strathroy, ON, N7G 1Y4

21 November 2024
SBM-24-2460

Attn: Dr. Tyler Damen

**Re: Servicing Feasibility Study
Proposed 8-unit Townhome Development
450 Head Street, Strathroy, Ontario**

1. INTRODUCTION

This Servicing Feasibility Study (Study) has been prepared by Strik, Baldinelli, Moniz Ltd. (SBM) for 2430680 Ontario Ltd. to address the servicing feasibility for the proposed 0.164 ha 8-unit townhome development located at 450 Head Street, Strathroy, ON.

The existing site is currently occupied by a single-family dwelling with a detached garage and a large driveway with access from both Head Street and Abigail Street. There is a roughly 40-meter-long stone brick retaining wall that sits parallel with the Abigail Street sidewalk. The site abuts low-density residential dwellings to the north and west, the Abigail Street Right-Of-Way (ROW) to the south, and the Head Street ROW to the east. It is our understanding that the proposed development is to include four (4) two-storey townhome blocks (8 units total) with associated parking areas, access from Abigail Street, and common amenity spaces. See the Concept Site Plan provided in Appendix A.

This Study is to determine the adequacy of the existing Municipality of Strathroy-Caradoc services in support of the 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, and the current edition of the Ontario Building Code (OBC).

2. WATER SERVICING

According to the Municipality's record drawing "Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350" (Appendix A), prepared by Spriet Associates Limited dated January 2000, there is an existing 300 mm diameter watermain in the Head Street ROW, along with a 200 mm diameter watermain in the Abigail Street ROW. Since the Concept Site Plan has the new site access located off Abigail Street, it is proposed to service the site with a new connection from the existing 200 mm diameter watermain in the Abigail Street ROW.

2.1 Domestic Water Supply

The maximum hour domestic demand, as per the MSCSS for a population of 20 people (8 units at 2.4 people per unit per Section 4.3.2 of the MSCSS) is 0.45 L/s. See the domestic water demand calculations provided in Appendix C.

2.2 Water Supply for Fire Protection

Since the proposed townhomes are Part 9 per the OBC, a sprinkler system is not required for the proposed townhomes and therefore fire-fighting demand is determined as per OBC Vol-2, Section A-3.2.5.7. A fire hydrant flow test was deemed

unnecessary and not performed. The calculations, provided in Appendix C, were based on a 4-unit townhome and result in a required fire flow rate of 2700 L/min which was combined with the maximum day domestic demand of 12.00 L/min to obtain the required supply fire flow + maximum day demand of 2712 L/min.

According to the Municipality's record drawing "Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350", prepared by Spriet Associates Limited dated January 2000, there is an existing fire hydrant two properties to the north (roughly 35m) along Head Street that is available to provide fire flows to the proposed development.

3. SANITARY SERVICING

According to the Municipality's record drawing "Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350", prepared by Spriet Associates Limited dated January 2000, the site currently drains to a 600 mm diameter sanitary sewer in the Head Street ROW with two (2) sanitary PDCs (sizes unknown) currently servicing the site. There is also a 200 mm diameter sanitary sewer located in the Abigail Street ROW. Since the proposed site plan has the new site access located off Abigail Street, a new 150 mm diameter sanitary PDC service is proposed to connect to the existing 200 mm diameter sanitary sewer in the Abigail Street ROW and the two existing sanitary PDCs from Head Street will be capped at the property line.

The proposed flows from the subject property are shown on the Sanitary Sewer Design Sheet provided in Appendix D. Using a flow of 300 L/capita/day as per the MSCSS dated October 2021, and a population of 20 people (8 units at 2.4 people results in an anticipated peak sanitary flow of 0.33 L/s. When combined with infiltration, this results in a total peak flow of 0.35 L/s. A private drain connection with a minimum diameter of 150 mm and a minimum slope of 1.5% is required which has sufficient capacity (18.66 L/s) to convey the proposed flows.

4. STORM SERVICING AND STORMWATER MANAGEMENT

According to the Municipality's record drawing "Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350", prepared by Spriet Associates Limited dated January 2000, the site is tributary to the 1500 mm diameter storm sewer in the Head Street ROW and the 600 mm diameter storm sewer in the Abigail Street ROW.

As outlined in the attached stormwater calculations (Appendix E), the proposed development is expected to experience increased stormwater runoff due to an increase in impervious surfaces, primarily from the larger development footprint. Pre-development area parameters were approximated using satellite imagery and post-development area parameters were approximated using the Concept Site Plan (Appendix A).

The Preliminary Site Servicing Schematic (Appendix B) illustrates the proposed stormwater management system. This system will feature centrally located catch basin(s) in the private drive aisle, which will connect to the existing 600 mm diameter storm sewer in the Abigail Street ROW, via a new private connection. Detailed stormwater management calculations and grading design will be prepared during the detailed design phase as part of the building permit process.

Stormwater quality controls will be designed to meet the SWM criteria and environmental targets identified for the site. These controls will comply with the standards set by the Ministry of the Environment, Conservation and Parks (MECP) and will be assessed at the time of the building permit process.

5. SUMMARY

A maximum hour domestic water demand of 0.45 L/s was calculated as per the attached water servicing calculations. It is recommended that a new 100 mm diameter water line services the proposed 8-unit townhome development via the existing 200 mm diameter watermain located in the Abigail Street ROW.

A sanitary design flow of 0.35 L/s was calculated as per the attached sanitary servicing calculations. It is recommended that a new 150 mm diameter sanitary service, with a minimum slope of 1.5%, be installed to convey sanitary flows from the proposed 8-unit townhome development to the existing 200 mm diameter sanitary sewer in the Abigail Street ROW. Subsequently the existing sanitary PDCs will be capped at the property line.

The site's SWM will be conveyed to the 600 mm diameter storm sewer on Abigail Street and calculations will be prepared during the detailed design phase of the project.

Based on the above, the existing municipal infrastructure and proposed site services have sufficient capacity to accommodate the proposed 8-unit townhome development of the 0.16 ha subject site located at 450 Head Street, Strathroy, Ontario.

6. LIMITATIONS

This Study was prepared by SBM for 2430680 Ontario Ltd. (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.

This document is deemed to be the intellectual property of SBM in accordance with Canadian copyright law.

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



Murali Gnanasekar, P. Eng
Civil Project Lead, Eng I



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List of Appendices

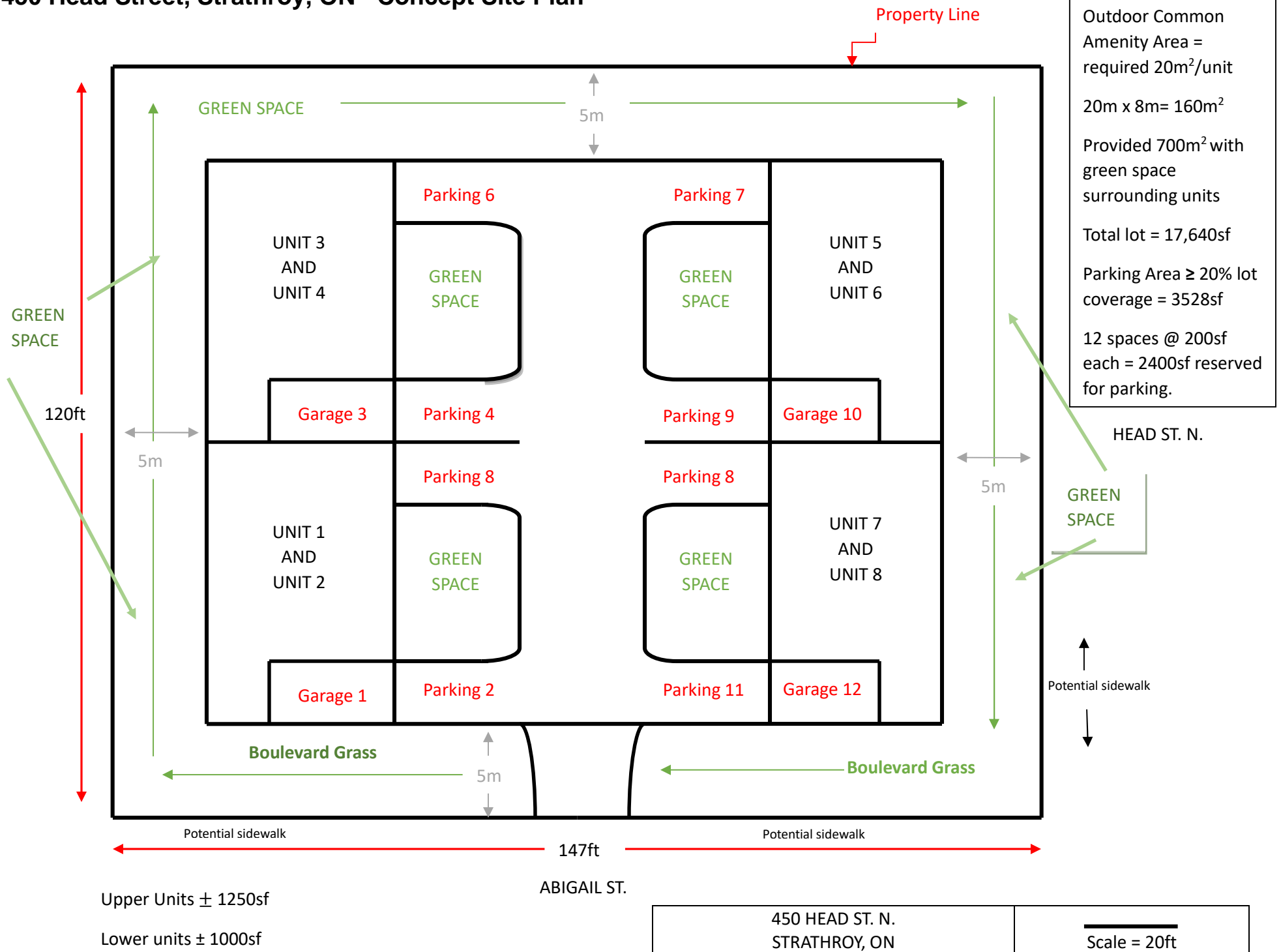
- Appendix A: Concept Site Plan
 Municipality record drawing "Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350"
- Appendix B: Preliminary Site Servicing Schematic
- Appendix C: Domestic Water Demand Calculations
 Fire Flow Calculations (as per OBC Div. B A-3.2.5.7.)
- Appendix D: Sanitary Service Design Sheet
- Appendix E: Stormwater Management Imperviousness Calculations

APPENDIX A

Concept Site Plan

Municipality record drawing “Head Street Sidewalk Construction from Sta. 0+000 to Sta. 0+350”

450 Head Street, Strathroy, ON - Concept Site Plan

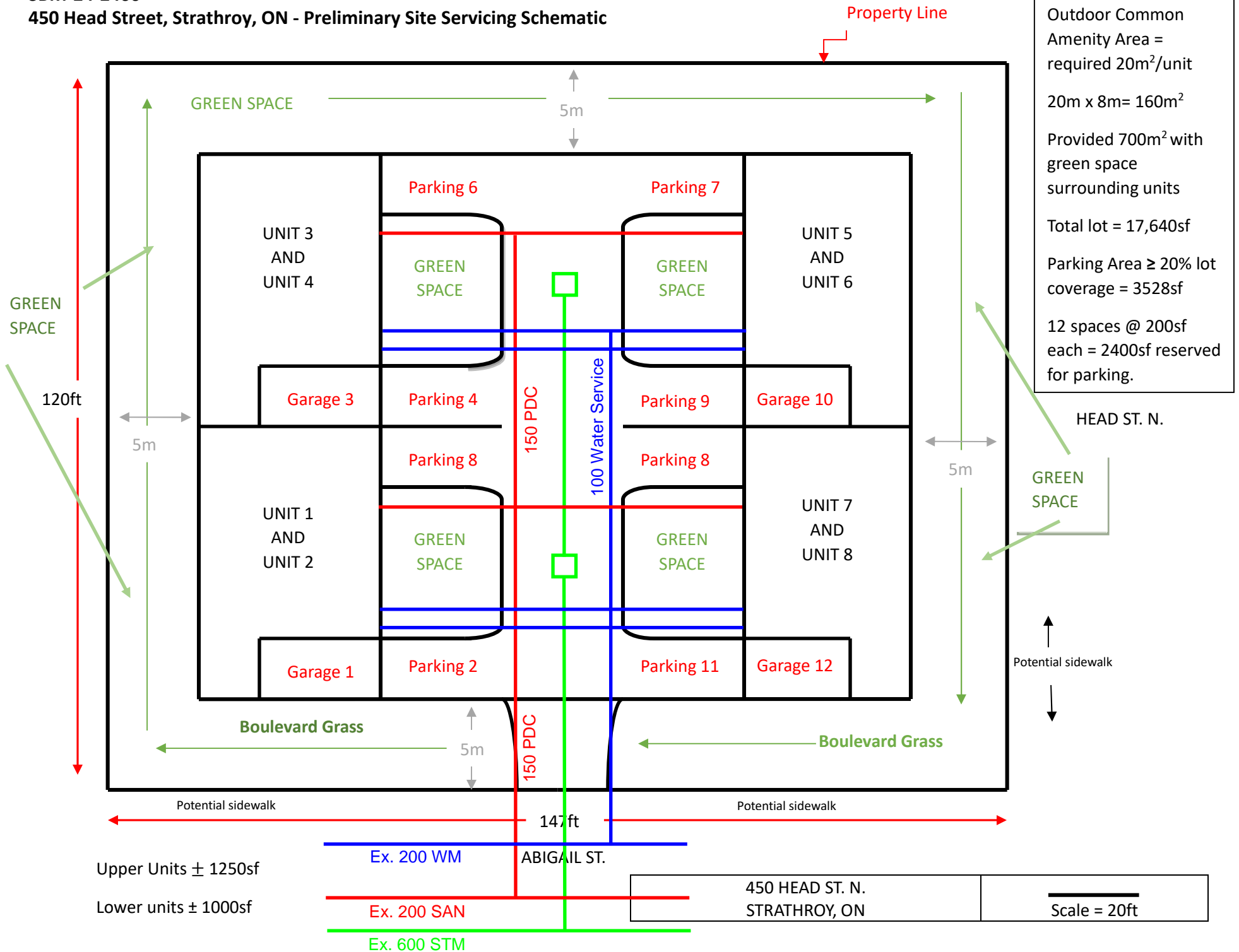


APPENDIX B

Preliminary Site Servicing Schematic

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450 Head Street, Strathroy, ON - Preliminary Site Servicing Schematic



APPENDIX C

Domestic Water Demand Calculations

Fire Flow Calculations (as per OBC Div. B A-3.2.5.7.)

DOMESTIC WATER DEMAND, AND VELOCITY CALCULATION

DATE: November 18, 2024
JOB No.: SBM-24-2460

Client: 2430680 Ontario Ltd.
Project: Proposed 8-unit Townhome Development
Location: 450 Head Street, 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	Population	Avg. Day (L/s)	Max. Hour (L/s)	Max. Day (L/s)
Medium Density Residential	8	20	0.06	0.45	0.20
Total			0.06	0.45	0.20

VELOCITY CALCULATION

Diameter (mm)	Demand (L/s)	Velocity (m/s)
100	0.45	0.057

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-Fighting Flow (OBC A-3.2.5.7.)

	For data entry
	Calculated, not for data entry

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

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

Building Area, m ² :	224.00
Building Height, m:	7.00
Building Volume, m ³ :	1568.00

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

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	
$S_{Tot} < \text{or} = 2$, therefore S_{Tot} =	1.00	

$$Q, L = 36064$$

$$\text{Required Supply Flow Rate, L/min (Table 2)} = 2700$$

$$\text{Maximum day domestic demand (as per separate calculation sheet)} = \begin{matrix} 0.20 & \text{L/sec} \\ 12.00 & \text{L/min} \end{matrix}$$

$$\text{Required Supply Fire Flow + Maximum Day Demand, L/min} = 2712$$

APPENDIX D

Sanitary Service Design Sheet

Sanitary Service Design Sheet

Residential Population Densities

(A) Area Basis

Low Density Residential

Medium Density Residential

High Density Residential

= 30 Units/hectare @ 2.4 people/unit

= **75 Units/hectare @ 2.4 people/unit**

=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: November 18, 2024

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Client: 2430680 Ontario Ltd.

Project: Proposed 8-unit Townhome Development

Location: 450 Head Street, Strathroy, ON

Designed By: SG

Reviewed By: MGn

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	Infiltr L/S	Sewage L/S	Total L/S	n	Pipe Slope %	Dia. mm	Capacity L/S	Velocity m/s
Proposed Conditions																	
450 Head Street, Strathroy, ON	Site	Ex. Sewer	0.164	0.164	2.4	8	20	20	4.38	0.01	0.33	0.35	0.013	1.50%	150	18.66	1.06

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

APPENDIX E

Stormwater Management Imperviousness Calculations

IMPERVIOUSNESS CALCULATIONS

DATE: November 18, 2024
JOB NO.: SBM-24-2460

Client: 2430680 Ontario Ltd.
Project: Proposed 8-unit Townhome Development
Location: 450 Head Street, Strathroy, ON

PRE-DEVELOPMENT

	Area (m2)	C	A*C
Total Area:	1639.00		
Building Area:	200.00	0.9	180.00
Concrete/Asphalt:	377.00	0.9	339.30
Gravel:	0.00	0.7	0.00
Landscaped/Open:	1062.00	0.2	212.40
Totals:	1639.00		731.70
$C_{eq} = \text{Sum}(A * C) / \text{Sum}(A) =$	0.45		
Imperviousness (%)	35.2		

POST-DEVELOPMENT

	Area (m2)	C	A*C
Total Area:	1639.00		
Building Area:	448.00	0.9	403.20
Concrete/Asphalt/Amenity:	330.00	0.9	297.00
Gravel:	0.00	0.9	0.00
Landscaped/Open:	861.00	0.2	172.20
Totals:	1639.00		872.40
$C_{eq} = \text{Sum}(A * C) / \text{Sum}(A) =$	0.53		
Imperviousness (%)	47.5		