

PROPOSED MEDIUM DENSITY
APARTMENT BUILDING &
TOWNHOUSE DEVELOPMENT

31 EARLE STREET
TILLSONBURG, ONTARIO

PRELIMINARY FUNCTIONAL
SERVICING REPORT

CJDL
Consulting Engineers

25004
25 April 2025

PROPOSED MEDIUM DENSITY APARTMENT BUILDING & TOWNHOUSE DEVELOPMENT

31 EARLE STREET

TILLSONBURG, ONTARIO

PRELIMINARY FUNCTIONAL SERVICING REPORT

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PROPOSED MEDIUM DENSITY APARTMENT BUILDING & TOWNHOUSE DEVELOPMENT

31 EARLE STREET

TILLSONBURG, ONTARIO

PRELIMINARY FUNCTIONAL SERVICING REPORT

1.0 INTRODUCTION

This Preliminary Functional Servicing Report has been prepared in support of a Zoning By-Law Amendment Application. This application is to be filed to allow for the development of a 4-storey, 47-unit apartment building and 24-unit townhouse development. The Town's objective for the lands is to work in conjunction with Oxford County's Human and Social Services division to attract Affordable/Attainable Housing projects for the property, with a focus on providing attainable ownership options.

The subject site is situated on the south side of Earle Street between Cedar Street and Pine Avenue. The site is legally described as Lot 25 & 26 of Registered Plan 966 in the Town of Tillsonburg, and is known municipally as 31 Earle Street. Lot 25 contains the former Elliot Fairbairn Public School and vacant land area south of the school, while Lot 26 contains a woodlot which connects to the adjacent property at 39 Cedar Street. The school building occupies Parts 1, 2 & 3 of Lot 25 with an approximate area of 0.68 ha (1.68 ac), the vacant land occupies Parts 4, 5, 7 & 8 of Lot 25 with an approximate area of 0.54 ha (1.33 ac), and the woodlot occupies Parts 6 & 9 of Lot 26 and has an approximate area of 0.67 ha (1.66 ac).

The Zoning By-Law Amendment Application addresses the Town's ultimate plan to re-zone the former school area and the vacant lands as medium density residential. Thus, the net density of the proposed 47-unit apartment building on the vacant lands along with the proposed 24-unit townhouse development on the former school lands will be in compliance with the medium density residential requirements.

2.0 TRANSPORTATION

The proposed apartment building on the vacant lands includes one (1) proposed access off of Cedar Street. The proposed development will provide 74 parking spaces which meets the requirements set out by the Town of Tillsonburg Zoning By-law. One (1) type A and two (2) type B accessible parking space will be included on this site.

The former school lands currently has two (2) entrances to the site with main access provided from Earle Street and secondary access provided from Cedar Street. The proposed townhouse development will allow for individual driveways to each unit. Twelve (12) units will front Earle Street; therefore twelve (12) separate driveways are proposed on the south side of the Earle Street, and twelve (12) units will be accessed via an internal private driveway that is accessible off Cedar Street.

Each entrance/access route to the respective developments, as well as all travel lanes through the parking lot, will be designed to ensure adequate fire access to the primary entrance of the building. Paradigm Transportation Solutions Ltd. has been retained by the client to complete a Traffic Impact Study for the proposed residential developments on site.

3.0 WATER SERVICING

Water service will be provided to the proposed apartment building on the vacant lands through an existing 150mm \varnothing watermain that runs along the east side of Cedar Street. It is expected that there will be adequate capacity within this watermain to service the proposed development. A new fire hydrant will be required to provide fire flow to the apartment building, connected to the Cedar Street watermain, to achieve maximum separation of 45m from the hydrant to the fire department connection on the building, as outlined in the Ontario Building Code (OBC). Detailed design calculations will be included at the time of Site Plan Application.

Individual water services will be provided to each unit in the proposed townhouse development. Twelve (12) townhouse units fronting Earle Street will be serviced through an existing 100mm diameter watermain that runs along the south side of Earle Street. The remaining twelve (12) units, which are accessed from the proposed internal driveway, will be serviced with a proposed water service that will loop the 150mm diameter watermain on the east side of Cedar Street to the 200mm diameter watermain on the east side of Pine Ave. The watermain loop will run within the proposed internal driveway. The existing fire hydrants on the corner of Earle Street and Cedar Street and the corner of Earle Street and Pine Ave are anticipated to be sufficient to service the proposed townhouse development as they cover all units within the maximum separation of 90m from the hydrant to the residential dwelling, as outlined in the OBC. Detailed design calculations will be included at the time of Site Plan Application.

The Town of Tillsonburg Water Department provided hydrant flow testing data collected from the existing hydrant at the intersection of Cedar Street and Earle Street (Hydrant #233) to assess the available fire flow in the water supply system. The flow testing results indicated the hydrant is capable of supplying a fire flow of 162.3 L/s. A preliminary assessment for fire flow requirements for the proposed apartment building and one middle unit not fronting Earle Street in the townhouse development was completed under the assumption the developments are built using ordinary construction materials and contains combustible hazards. Based on the OBC, the required fire flow for the proposed apartment building is approximately 150 L/s while the required fire flow for a unit in the proposed townhouse development is 45 L/s. Based on the Fire Underwriters Survey (FUS), the required fire flow for the proposed apartment building is approximately 250 L/s while the required fire flow for a unit in the proposed townhouse development is 100 L/s. Therefore, the available fire flow from the watermain system feeding hydrant #233 has sufficient flow to meet the fire flow demand requirements set out by the OBC and FUS for the proposed townhouse development. Hydrant #233 has sufficient flow to meet the fire flow demand required by the OBC for the proposed apartment building, however, not the FUS fire flow demand. In order to be in compliance with the OBC and FUS fire flow demands with ordinary construction materials, an automatic sprinkler system is required. The addition of an automatic sprinkler system in the proposed apartment building will reduce the FUS fire flow demand to 150 L/s and bring the development into compliance with fire flow requirements under both fire flow demands. Detailed fire flow calculations will be completed at time of Site Plan Application once more details related to the construction of the proposed developments are available.

4.0 SANITARY SERVICING

Sanitary servicing will be provided for the proposed apartment building through an existing 350mm diameter sanitary mainline which runs along Pine Ave. The Pine Ave sanitary sewer conveys sewage south towards a manhole at the intersection of Cedar Street and Elm Street where the sewers ultimately outlet to the Tillsonburg Wastewater Treatment System (WWTS). A new sanitary service will be required

to service the proposed apartment building and will connect into an existing sanitary manhole on Pine Ave.

Individual sanitary private drain connections will be provided to each unit in the proposed townhouse development. Twelve (12) townhouse units fronting Earle Street will be serviced from an existing 200mm \varnothing sanitary sewer that runs along Earle Street. The remaining twelve (12) units will be serviced internally with a sanitary sewer which runs within the proposed internal driveway and outlets to an existing sanitary manhole on Pine Ave.

The Town of Tillsonburg has provided CJDLE with flow data collected in 2022 for the Earle Street sanitary sewer. The 200mm diameter sewer was designed to accommodate a maximum design capacity of 17.9 L/s and the flow data indicates the sewer experienced a maximum flow of 1.8 L/s. Therefore, there remains sufficient capacity in the Earle Street sewer to accommodate flows from the twelve (12) proposed townhouse units fronting Earle Street. The Town was not able to provide flow data for the sanitary sewer which runs south on Pine Ave past the Earle Street intersection, however, they anticipate there is sufficient capacity in the sanitary sewer to accommodate flows from the proposed apartment building and twelve (12) townhouse units. Detailed calculations will be completed at the time of Site Plan Application to ensure adequate capacity for both development areas.

The 2024 Oxford County Water and Wastewater Master Plan indicates the Tillsonburg WWTS is projected to reach 85% of its design capacity by 2041, at which point expansion will be required to accommodate future growth. As such, it is anticipated the existing sanitary network and treatment system has sufficient capacity to receive flows from the proposed development on the vacant lands and the former school lands.

5.0 STORM DRAINAGE & STORMWATER MANAGEMENT

The majority of the site is currently tributary to a 900mm diameter storm pipe which crosses Cedar Street and runs along an easement between 25 & 23 Cedar Street to outlet to a ravine. An existing 675mm \varnothing storm sewer runs along an easement at the south end of the property adjacent to the woodlot area and connects to the Cedar Street outlet. The northeast corner of the site is tributary to a 300mm \varnothing culvert which outlets at Simcoe Street to a ravine and ultimately to Otter Creek. An existing 300mm diameter storm sewer conveys flows north along Pine Ave from the intersection of Earle Street and Pine Ave to the outlet.

The site currently experiences overland sheet flow towards existing catch basins on Cedar Street and existing catch basins on Pine Ave. The site will be graded such that stormwater flows experienced by the proposed apartment building lands will be tributary to the Cedar Street outlet and stormwater flows from the proposed townhouse development will be tributary to the Simcoe Street outlet. The ultimate stormwater management design for the respective proposed developments will not impact the surrounding properties as the post-development stormwater flows off site will be controlled to match the pre-development flows. A combination of underground and surface storage of stormwater will be utilised in the stormwater management design to provide both quantity and quality control on site. The stormwater management design of this development will be done in accordance with the Town of Tillsonburg's design standards. The Detailed calculations will be conducted upon Site Plan Application.

6.0 ELECTRICAL AND UTILITIES

There is currently an overhead power line with 3-phase power which runs along the west side of Cedar Street directly across from the site. Tillsonburg Hydro Inc. anticipates some improvements to the current infrastructure will be required to service the proposed apartment building via the Cedar Street 3-phase overhead power lines. The anticipated improvements include installation of a 3-phase high voltage duct bank to facilitate a road crossing under Cedar Street, a new pad mount transformer and a new metering configuration with an estimated cost of \$100,000. Additional provisions could be made to facilitate an

upgrade to the existing hydro service to the proposed townhouse development, such as installing a duct bank with 2 service lines with the required road crossing and pad mount step down transformer, at an additional fee.

The Town has confirmed fibre optic utilities were installed along Cedar Street as part of the Town's Rural Connections Broadband project in 2012. It is anticipated the fibre optic utilities have the capacity to provide service connections for the east side of Cedar Street to facilitate service to the proposed developments. Contact with utility companies will continue concurrently with the submission of the Site Plan and Zoning By-law Amendment applications.

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All of which is respectfully submitted by,

Reagan Campbell, EIT

Peter J. Penner, P. Eng.

RC/kc

DRAFT

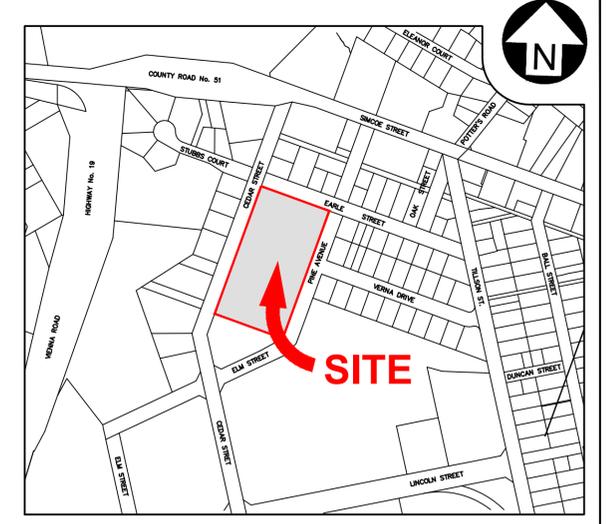
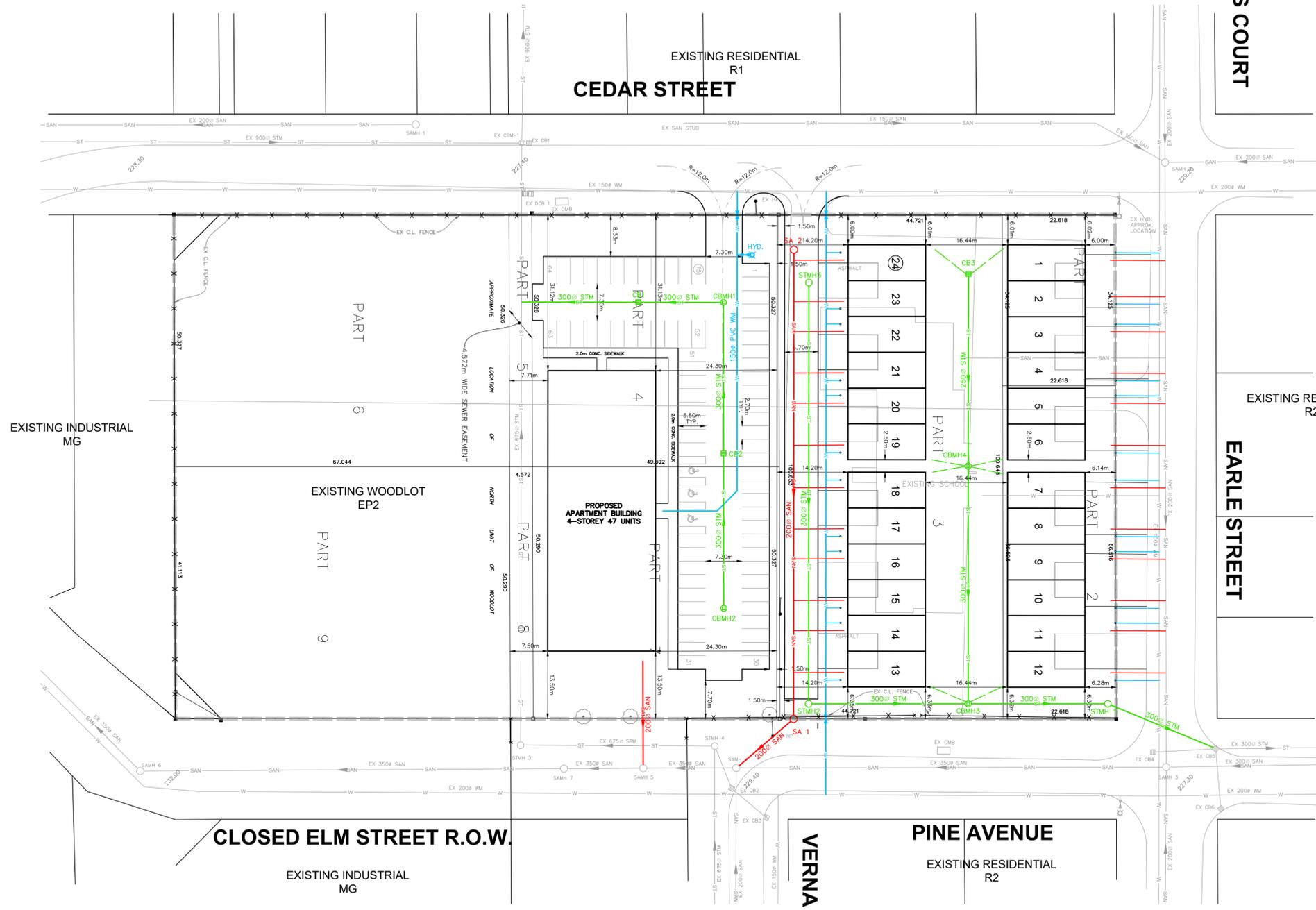
APPENDIX 'A'

- PRELIMINARY SERVICING PLAN

DRAFT



STUBBS COURT



KEY PLAN
SCALE: 1:5,000

**PARTS 4, 5, 7 & 8
TOWN OF TILLSONBURG
ZONING COMPLIANCE TABLE**

ZONING	RM	
	REQUIRED	PROVIDED
LOT AREA PER UNIT (MIN.)	160 m ²	114.6 m ²
LOT AREA PER UNIT (MAX.)	320 m ²	114.6 m ²
LOT FRONTAGE (MIN.)	20 m	53.7 m
LOT DEPTH (MIN.)	30 m	100.6 m
COVERAGE (MAX.)	40%	22%
OPEN SPACE (MIN.)	30%	39%
FRONT YARD DEPTH	7.5 m	31.12 m
REAR YARD DEPTH	10.5 m	13.5 m
SIDE YARD DEPTH (INT.)	7.5 m	7.5 m
HEIGHT (MAX.)	15 m	17 m
PARKING	71 SPACES	75 SPACES

**PARTS 1, 2 & 3
TOWN OF TILLSONBURG
ZONING COMPLIANCE TABLE**

ZONING	RM	
	REQUIRED	PROVIDED
DWELLING UNITS (MAX.)	8	6
LOT AREA PER UNIT (MIN.)	150 m ²	283.7 m ²
LOT AREA PER UNIT (MAX.)	320 m ²	283.7 m ²
LOT FRONTAGE (MIN.)	5 m	100.6 m
LOT DEPTH (MIN.)	30 m	67.6 m
COVERAGE (MAX.)	40%	39%
OPEN SPACE (MIN.)	30%	39%
FRONT YARD DEPTH	6 m	6 m
REAR YARD DEPTH	7.5 m	14.2 m
SIDE YARD DEPTH (EXT.)	6 m	6 m
HEIGHT (MAX.)	11 m	11 m

LEGEND

— SAN	SANITARY SEWER	— T	UNDERGROUND BELL LINE	— MH	MAINTENANCE HOLE	— GP	GUY WIRE, UTILITY POLE	— TR	TRANSFORMER
— F	FORCEMAIN	— C	UNDERGROUND CABLE LINE	— CO	CLEAN OUT	— LS	LIGHT STANDARD, STREET LIGHT	— RIB	SURVEY BARS
— ST	STORM SEWER	— D	DITCH/SWALE	— CB	CATCH BASIN	— TS	TRAFFIC SIGNAL	— C	CONIFEROUS, DECIDUOUS TREE
— W	WATERMAIN	— TOS	TOE OF SLOPE, TOP OF BANK	— V	WATER VALVE	— S	SIGN	— SH	SHRUB
— WS	WATER SERVICE	— F	FENCE	— WCS	WATER SERVICE CURB STOP	— G	GAS VALVE	— E	EDGE OF BUSH/DRIP LINE
— G	NATURAL GAS LINE	— EG	EDGE OF GRAVEL	— H	HYDRANT	— U	UTILITY PEDESTAL	— G	GEOTECHNICAL BORE HOLE
— U	UNDERGROUND POWER LINE	— CD	CURB, DROPPED CURB	— RCP	RAISED COVERED PORCH	— P	TACTILE PLATE	— A	ADJUST, REMOVE
— OH	OVERHEAD POWER LINE	— EP	EDGE OF PAVEMENT	— CB	'BARRIER FREE' SIGN	— (A),(R)		— P	PRIMARY ACCESS
— FO	UNDERGROUND FIBRE OPTIC LINE			— CB	'NO PARKING - FIRE ROUTE' SIGN				
—	BOUNDARY LIMITS								

STAMP:
PRELIMINARY

METRIC H. SCALE 1:500

No.	REVISION	DATE	BY

TOWN OF TILLSONBURG

Cyril J. Demeyere Limited
P.O. Box 460, 261 Broadway
Tillsonburg, Ontario, N4G 4H8
Tel: 519-688-1000
866-302-9886
cjd@cjdeng.com

31 EARLE STREET
TOWN OF TILLSONBURG
PRELIMINARY SERVICING PLAN

DESIGN BY: RC	DRAWN BY: AH	CHECKED BY: PJP
PROJECT NO. 25004	SURVEY BY:	DATE: 25 APR. 2025
DRAWING No.		1

APPENDIX 'B'

- FIRE FLOW FROM TOWN & CALCULATIONS

DRAFT

AVAILABLE FIRE FLOW

Hydrant Flow Test at Cedar St & Earle St (Hyd #233)

31 Earle Street - Proposed Residential Developments

<input type="text" value="76"/> psi	System Static Pressure
<input type="text" value="48"/> psi	System Residual Pressure
<input type="text" value="28"/> psi	Pitot Pressure Reading Port 1
<input type="text" value="4.0"/> in	Diameter of Port 1
<input type="text" value="0.9"/>	Discharge Coefficient Port 1
<input type="text" value="0.0"/> psi	Pitot Pressure Reading Port 2
<input type="text" value="0.0"/> in	Diameter of Port 2
<input type="text" value="0.0"/>	Discharge Coefficient Port 2

Total Hydrant Testing Flow	1769	USGPM
	111.6	L/s

Total Available Fire Flow	2572.0	USGPM	Flow @ System Pressure of 20 psi
	162.3	L/s	

No.	REVISION	DATE	BY

DOMESTIC WATER DEMAND CALCULATIONS

31 Earle Street 47-Unit Apartment - Preliminary Functional Servicing Report

Average Daily Demand Determination

Area	47.0	Units
Population Per Unit:	3.0	People/unit
Design Population:	141.0	Cap.
Average Daily Demand	345.0	L/cap./day
Design Demand:	48645.0	L/day
Average Daily Demand:	0.56	L/s

Peak Hour Demand Determination:

Average Daily Demand:	0.56	L/s
Peak Hour Factor:	7.8	
Peak Hour Demand:	4.39	L/s

Max. Day Demand Determination:

Average Daily Demand:	0.56	L/s
Max. Day Factor:	3.5	
Max. Day Demand:	1.97	L/s

AVERAGE DAILY DEMAND:	0.56	L/s
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PEAK HOUR DEMAND:	4.39	L/s
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MAX. DAY DEMAND:	1.97	L/s
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No.	REVISION	BY	DATE
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ONTARIO BUILDING CODE FIRE DEMAND CALCULATIONS

31 Earle Street 47-Unit Apartment - Preliminary Functional Servicing Report

Building Volume Determination

Average Floor Area:	1001.0	m ²
No. Storeys:	4.0	(Including Below Grade Storeys)
Height Per Storey:	3.8	m

Building Volume (V): 15215.2 m³

Water Supply Coefficient Determination

Building Class: C (Per OBC Section 3.1.2.1.)

Construction Type: Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

Water Supply Coefficient (K): 18

Spatial Coefficient Determination

Front:	0.00	(Distance = 24.6 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Rear:	0.20	(Distance = 7.5 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Left:	0.00	(Distance = 51.2 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Right:	0.00	(Distance = 33.6 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))

Spatial Coefficient Total (S_{sp}): 1.20

Fire Flow Determination

$$Q = KVS_{Tot}$$

Water Supply Coefficient (K):	18	
Building Volume (V):	15215.2	m ³
Spatial Coefficient Total (S _{sp}):	1.20	
Minimum Supply of Water (Q):	328648.3	L

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m ² (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) ⁽¹⁾
	3600 (If Q > 108,000L and ≤ 135,000L) ⁽¹⁾
	4500 (If Q > 135,000L and ≤ 162,000L) ⁽¹⁾
	5400 (If Q > 162,000L and ≤ 190,000L) ⁽¹⁾
	6300 (If Q > 190,000L and ≤ 270,000L) ⁽¹⁾
	9000 (If Q > 270,000L) ⁽¹⁾

Required Minimum Water Supply Flow Rate:	9000.0	L/min
Minimum Volume of Water Supply:	270000	L (Based on 30 min. minimum supply duration)

REQUIRED FIRE FLOW: 150.00 L/s

No.	REVISION	BY	DATE

FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS - WITHOUT SPRINKLERS

31 Earle Street 47-Unit Apartment - Preliminary Functional Servicing Report

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours

Construction Description: Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.

Construction Type (FUS, 2020):	Type III
Construction Coefficient (C):	1.0

Total Floor Area Determination

Largest Floor Area:	1003	m ² (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	4	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)
Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)
Total Floor Area (A):	4012	m² 100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C
Contents Hazard:	Limited Combustible Contents

Occupancy & Contents Adjustment: -15%

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	No	(Per NFPA 13)
Standard Water Supply:	Yes	(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:	No	(Per NFPA 25)
Community Level Sprinkler Protection:	No	(Fully sprinklered/fire protected communities)

Automatic Sprinkler Adjustment: 0%

Exposure Adjustment Charge

Front:	5.4%	(Distance = 24.6 m (FUS 2020)	(Sprinklered = No)
Rear:	16.8%	(Distance = 7.5 m (FUS 2020)	(Sprinklered = No)
Left:	0.0%	(Distance = 51.2 m (FUS 2020)	(Sprinklered = No)
Right:	0.0%	(Distance = 33.6 m (FUS 2020)	(Sprinklered = No)

Exposure Adjustment: 22.2%

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	4012	m ²
C.	Base Fire Flow (RFF) :	14000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment:	-15%	
	O & C Fire Flow Adjustment:	-2100	L/m
E.	Automatic Sprinkler Adjustment:	0%	
	Sprinkler Fire Flow Adjustment:	0	L/m
F.	Exposure Adjustment:	22.2%	
	Exposure Fire Flow Adjustment:	3106	L/m
G.	Required Fire Flow:	15000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW:	250.00	L/s
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No.	REVISION	BY	DATE
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FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS - WITH SPRINKLERS

31 Earle Street 47-Unit Apartment - Preliminary Functional Servicing Report

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours
Construction Description:	Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.	
Construction Type (FUS, 2020):	Type III	
Construction Coefficient (C):	1.0	

Total Floor Area Determination

Largest Floor Area:	1003	m ² (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	4	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)
Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)
Total Floor Area (A):	4012	m² 100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C
Contents Hazard:	Limited Combustible Contents
Occupancy & Contents Adjustment:	-15%

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	Yes	(Per NFPA 13)
Standard Water Supply:	Yes	(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:	No	(Per NFPA 25)
Community Level Sprinkler Protection:	No	(Fully sprinklered/fire protected communities)
Automatic Sprinkler Adjustment:	-40%	

Exposure Adjustment Charge

Front:	5.4%	(Distance = 24.6 m (FUS 2020)	(Sprinklered = No)
Rear:	16.8%	(Distance = 7.5 m (FUS 2020)	(Sprinklered = No)
Left:	0.0%	(Distance = 51.2 m (FUS 2020)	(Sprinklered = No)
Right:	0.0%	(Distance = 33.6 m (FUS 2020)	(Sprinklered = No)

Exposure Adjustment: 22.2%

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	4012	m ²
C.	Base Fire Flow (RFF) :	14000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment:	-15%	
	O & C Fire Flow Adjustment:	-2100	L/m
E.	Automatic Sprinkler Adjustment:	-40%	
	Sprinkler Fire Flow Adjustment:	-5600	L/m
F.	Exposure Adjustment:	22.2%	
	Exposure Fire Flow Adjustment:	3106	L/m
G.	Required Fire Flow:	9000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW: 150.00 L/s

No.	REVISION	BY	DATE
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DOMESTIC WATER DEMAND CALCULATIONS

31 Earle Street 24-Unit Townhouse - Preliminary Functional Servicing Report

Average Daily Demand Determination

Area	24.0	Units
Population Per Unit:	3.0	People/unit
Design Population:	72.0	Cap.
Average Daily Demand	345.0	L/cap./day
Design Demand:	24840.0	L/day
Average Daily Demand:	0.29	L/s

Peak Hour Demand Determination:

Average Daily Demand:	0.29	L/s
Peak Hour Factor:	7.8	
Peak Hour Demand:	2.24	L/s

Max. Day Demand Determination:

Average Daily Demand:	0.29	L/s
Max. Day Factor:	3.5	
Max. Day Demand:	1.01	L/s

AVERAGE DAILY DEMAND:	0.29	L/s
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PEAK HOUR DEMAND:	2.24	L/s
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MAX. DAY DEMAND:	1.01	L/s
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No.	REVISION	BY	DATE
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ONTARIO BUILDING CODE FIRE DEMAND CALCULATIONS

31 Earle Street 24-Unit Townhouse - Preliminary Functional Servicing Report

Building Volume Determination

Average Floor Area:	200.0	m ²
No. Storeys:	2.0	(Including Below Grade Storeys)
Height Per Storey:	4.0	m

Building Volume (V): 1600.0 m³

Water Supply Coefficient Determination

Building Class: C (Per OBC Section 3.1.2.1.)

Construction Type: Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.

TYPE OF CONSTRUCTION	Classification by Group or Division in Accordance with Table 3.1.2.1 of the Ontario Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2. of the OBC.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

Water Supply Coefficient (K): 18

Spatial Coefficient Determination

Front:	0.00	(Distance = 14.3 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Rear:	0.00	(Distance = 15.8 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Left:	0.50	(Distance = 0 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))
Right:	0.50	(Distance = 0 m (Figure 1: Spatial Separation) (OFM TG-03-1999 Section 6.3))

Spatial Coefficient Total (S_{sp}): 2.00

Fire Flow Determination

$$Q = KVS_{Tot}$$

Water Supply Coefficient (K):	18	
Building Volume (V):	1600.0	m ³
Spatial Coefficient Total (S _{sp}):	2.00	
Minimum Supply of Water (Q):	57600.0	L

Building Code, Part 3 Buildings	Required Minimum Water Supply Flow Rate (L/min.)
One-storey building with building area not exceeding 600m ² (excluding F-1 occupancies)	1800
All other buildings	2700 (If Q ≤ 108,000L) ⁽¹⁾
	3600 (If Q > 108,000L and ≤ 135,000L) ⁽¹⁾
	4500 (If Q > 135,000L and ≤ 162,000L) ⁽¹⁾
	5400 (If Q > 162,000L and ≤ 190,000L) ⁽¹⁾
	6300 (If Q > 190,000L and ≤ 270,000L) ⁽¹⁾
	9000 (If Q > 270,000L) ⁽¹⁾

Required Minimum Water Supply Flow Rate: 2700.0 L/min

Minimum Volume of Water Supply: 81000 L (Based on 30 min. minimum supply duration)

REQUIRED FIRE FLOW: 45.00 L/s

No.	REVISION	BY	DATE

FIRE UNDERWRITERS SURVEY FIRE DEMAND CALCULATIONS

Hayhoe Homes Head Office - Functional Servicing Report

Construction Coefficient Determination

Construction Material:	Ordinary Construction	
Fire Resistance Rating:	1.0	hours
Construction Description: Exterior walls are of masonry construction (or other approved material) with a minimum 1-hour fire resistance rating, but other elements such as interior walls, arches, floors, and/or roof do not have a minimum 1-hour fire resistance rating.		
Construction Type (FUS, 2020):	Type III	
Construction Coefficient (C):	1.0	

Total Floor Area Determination

Largest Floor Area:	150	m ² (Subdivided floor area if vertical firewalls have minimum 2-hour fire rating)
Storey of Largest Floor Area:	1	
Vertical Opening Protection:	Unprotected	(Only applies for buildings with Construction Coefficient (C) less than 1.0)
Number of Storeys:	2	(Excluding basements 50% or more below grade)
Vertical Firewall Separation:	No	(Only applies if vertical firewall has a minimum 2-hour fire rating)
Vertical Firewall Protection:		(Only applies if there is vertical firewall separation)
Vertical Firewall Separation Risk:		(Indicates if there is severe risk of fire on other side of vertical firewall)
Vertical Firewall Factor:	0%	(0% if there is no vertical firewall separation)
Total Floor Area (A):	300	m² 100% of all floor areas

Occupancy & Contents Adjustment Factor

Building Class:	C
Contents Hazard:	Limited Combustible Contents
Occupancy & Contents Adjustment:	-15%

Automatic Sprinkler Protection Adjustment

Automatic Sprinkler System:	No	(Per NFPA 13)
Standard Water Supply:	Yes	(Pressurized water supply, public or private, designed to handle Max Day +Fire Flow)
Fully Supervised System:	No	(Per NFPA 25)
Community Level Sprinkler Protection:	No	(Fully sprinklered/fire protected communities)
Automatic Sprinkler Adjustment:	0%	

Exposure Adjustment Charge

Front:	12.9%	(Distance = 14.3 m (FUS 2020)	(Sprinklered = No)
Rear:	12.1%	(Distance = 15.8 m (FUS 2020)	(Sprinklered = No)
Left:	25.0%	(Distance = 0 m (FUS 2020)	(Sprinklered = No)
Right:	25.0%	(Distance = 0 m (FUS 2020)	(Sprinklered = No)

Exposure Adjustment: 75.0%

Fire Flow Determination

$$RFF = 220C\sqrt{A}$$

A.	Construction Coefficient (C) :	1.0	
B.	Total Effective Floor Area (A) :	300	m ²
C.	Base Fire Flow (RFF) :	4000	L/m (Rounded to nearest 1,000 L/m)
D.	Occupancy & Contents Adjustment: O & C Fire Flow Adjustment:	-15% -600	L/m
E.	Automatic Sprinkler Adjustment: Sprinkler Fire Flow Adjustment:	0% 0	L/m
F.	Exposure Adjustment: Exposure Fire Flow Adjustment:	75.0% 2998	L/m
G.	Required Fire Flow:	6000	L/m (Rounded to nearest 1,000 L/m)

REQUIRED FIRE FLOW:	100.00	L/s
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