Servant, Dunbrack, McKenzie & MacDonald Ltd.
NOVA SCOTIA LAND SURVEYORS & CONSULTING ENGINEERS

36 Oland Crescent
Bayers Lake Business Park
Halifax, Nova Scotia B3S 1C6

Phone (902) 455-1537
Fax (902) 455-8479
Web sdmm.ca

RAYMOND A. LANDRY
MASc., P.Eng., LEED Green Associate
CHRISTOPHER J. FORAN
P.Eng.
GEOFFREY K. MacLEAN
P.Eng.
RACHAEL W. KYTE
P.Eng., LEED Green Associate
ALEXANDER W. PULSIFER
P.Eng.
MICHAEL S. TANNER
NSLS (Ret)
DANIEL S. GERARD
P.Eng., NSLS
H. JAMES McINTOSH
P.Eng., NSLS, CLS
KEVIN A. ROBB
NSLS
BLAKE H. TRASK
P.Eng., NSLS
ADAM J. PATTERSON
P.Eng., NSLS

March 19, 2020

Halifax Water
450 Cowie Hill Road
Halifax, NS

From: Ray Landry, P.Eng. File No. 1-7-23 (34993)

Re: Commercial Residential Building, 15 Canal Street, Dartmouth, NS – Sanitary Lateral Size Confirmation

Project Summary:

	Residential (Multi-Unit)
Building	221 Units
Commercial	4725 ft^2 (439m^2)
Values from client	

References:

1. Halifax Water (HW) Design & Construction Specifications (2018 Edition), Section 4.2.2:
   - Q = [1.25 x (a x M)] + b Where;

     Q = Sanitary sewer flow.
     1.25 = Safety factor.
     a = Average dry weather flow.
     M = Peaking factor using Harmon Formula; M = 1 + [14 / (4 + $P^{0.5}$)]
     b = Long-term infiltration/inflow allowance.
     P = Population in thousands
   - Multi-Unit Dwelling Population: 2.25 people per unit
   - Infiltration allowance: 0.28 L/ha_{gross}/s

Calculation Summary:

Population Estimate (P)

Reference: P: HW Section 4.2.1 Residential (Multi-Unit): 2.25 people per unit

P = 2.25 people per unit x 221 Units = **498 people (or 0.498)**

Reference:

ACWG Page 2-4 2.3.4.2: Commercial Flow Equivalent: 85 persons/ha
Commercial Area = 0.0439 ha

P = 85 persons/ha x 0.04 ha = **4 people (or 0.004)**

Total P = 498 people + 4 people = **502 people (or 0.502)**

Dry Weather Flow (a)

Reference:

ACWG Section 2.3.4.3, Table 2.1: Stores, shopping centers and office: 6 L/m^2
HW Section 4.2.2: Residential: 300 L/day per person

a residential = 300 L/day per person x 498 people= **149,400 L/day (or 1.73 L/s)**

a commercial = 6 L/day per m^2 x 439 m^2 =**2,634 L/day (or 0.030 L/s)**

Total a = 149,400 + 2,634= **152,034 L/day (or 1.76 L/s)**

Infiltration (b)

Reference:

HW Section 4.2.2: Infiltration allowance: 0.28 L/ha_{gross}/s
Lot Area = 0.40 ha

b: 0.28 L/ha_{gross}/s x 0.40 ha = **0.112 L/s**

Peaking Factor (M)

$M = 1 + [14 / (4 + P^{0.5})]$

$M = 1 + [14 / (4 + (0.502)^{0.5})]$ = **3.97**

Sanitary Sewer Flow (Q)

$Q = [1.25 \times (a \times M)] + b$

$Q = [1.25 \times (1.76 \text{ L/s} \times 3.97)] + 0.112 \text{ L/s}$ = **8.85 L/s**

Sanitary Lateral Size Confirmation:

A 200 mm diameter PVC lateral at 2.00% slope has a capacity of 60 L/s. With Q = 8.85 L/s, the proposed lateral will have sufficient flow capacity. For additional information or discussion regarding these findings please contact the undersigned.

Regards,

Servant, Dunbrack, McKenzie & MacDonald Ltd.

Original Signed

Ray Landry, MASc., P.Eng.
Project Engineer

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