SINCE 1950
J.E. ANDERSON & ASSOCIATES
SURVEYORS - ENGINEERS

April 3, 2017

File No. 30335

City of Victoria
#1 Centennial Square
Victoria BC V8W 1P6

Attention: Craig Stenberg
Engineering and Public Works Department

Dear Sir:

Re: 345 Quebec St – Harbour Towers
Sewage Flow Calculations

This report compares the calculated sewage flow of the proposed development to the existing development to see if sewage attenuation is required.

Background

The proposed development will rezone the existing Harbour Towers Hotel from T-1 Zone, Limited Transient Accommodation District to CD zoning specific to the development.

The proposed development will repurpose the existing hotel suites and facilities into residential units.

Existing Layout

The existing development consists of 192 hotel suites, 1,850 m^2 of meeting/convention space, a restaurant, and a lounge. As per the attached calculations in appendix A, the existing daily flow is expected to be 217,750 L/day, which equates to a peak flow of 14.36 L/s.

Proposed Development

The proposed development will consist of:

- 68 - studio units
- 102 - 1 bedroom units
- 10 - 1.5 bedroom units
- 24 - 2 bedroom units
- 15 - penthouse units (2 bedroom)
-

As per the attached calculations in Appendix A, the estimated daily flow for the proposed development is expected to be 120,600 L/day, which also equates to a peak flow of 8.81 L/s.

Summary
The calculated peak sewage flow for the proposed development is less than the current sewage flows. Therefore, no sewage attenuation should be required for the proposed development.

Yours truly,

J.E. Anderson and Associates

Mike Puszka, EIT

Reviewed by: Ross Tuck, P.Eng
Principal
2017-04-03

APPENDIX A

J.E. ANDERSON & ASSOCIATES
SURVEYORS - ENGINEERS

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345 QUEBEC STREET - PROPOSED DEVELOPMENT

ASSUMPTIONS:

- OCCUPANCY LOAD WAS CALCULATED BASED ON 3.1.17 OF BCBC 2012 (PROVIDED BY THE DEVELOPER)
- NON-RESIDENTIAL AVERAGE DAILY FLOW RATES BASED ON SEWERAGE SYSTEM STANDARD PRACTICE MANUAL (SEE ATTACHED)
- PEAK FLOW WAS CALCULATED AS PER THE ALBERTA ENVIRONMENT PEAKING FACTOR AS SUGGESTED BY THE CITY FOR PREVIOUS REPORTS (SEE ATTACHED)
- 225 L/CAP/UNIT

EXISTING LAYOUT

	OCCUPANCY	OCCUPANCY LOAD
192 GUEST SUITES	2	384
1850 m² MEETING/CONVENTION SPACE	1 PERSON/0.95 m²	1947
RESTAURANT	121 SEATS	
LOUNGE	26 SEATS	

ADF

GUEST SUITES = 384 × 225 L/CAP/DAY = 86,400 L/DAY

CONVENTION SPACE = 1947 × 60 L/CAP/DAY = 116,820 L/DAY

RESTAURANT = 121 × 90 L/SEAT/DAY = 10,890 L/DAY

LOUNGE = 26 × 140 L/SEAT/DAY = 3,640 L/DAY

217,750 L/DAY

= 2.52 L/s

$PF = 6.659\left(2.52^{-0.168}\right) = 5.70$

PEAK FLOW = 2.52 L/s × 5.70 = 14.36 L/s

PROPOSED LAYOUT

UNIT		OCCUPANCY	OCCUPANCY LOAD
68	STUDIO	2	136
102	1 BEDROOM	2	204
10	1.5 BEDROOM	4	40
24	2 BEDROOM	4	96
15	PENTHOUSE	4	60
			536

ADF

536 × 225 L/CAP/DAY = 120,600 L/DAY

= 1.40 L/s

$PF = 6.659\left(1.40^{-0.168}\right) = 6.29$

PEAK FLOW = 1.40 L/s × 6.29 = 8.81 L/s

Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems

Part 4
Wastewater Systems Guidelines for Design, Operating and Monitoring of a Total of 5 Parts

March 2013

Alberta Government

Table 4.1 continued

Place	Estimated Sewage Flow Litres (gallons) Per Day
Schools	
Elementary	70 (15) per student
Junior High	70 (15) per student
High School	90 (20) per student
Boarding	290 (65) per student
Service Stations	
(exclusive of cafe)	560 (125) per fuel outlet
Swimming Pools (Public)	
based on design bathing load	23 (5) per person

* Reproduced from the Alberta Private Sewage Treatment and Disposal Regulations, Table 8.5.B.

2. Average Flow Generation Estimates for Planning

For system planning purposes, when specific land uses and zoning are unknown and the requirements of 4.1.1.2 (1) cannot be defined, the recommended lower limits for estimation of average flow generation (to be used for preliminary planning unless the use of other values is justified with more specific or reliable information) are as follows:

a. Commercial and Institutional Land Uses

The lower limit for Average Flow Generation should be 40 m^3/day/ha (0.46 L/s/ha).

b. Industrial Land Uses

The lower limit for average flow generation should be 30 m^3/day/ha (0.35 L/s/ha).

3. Determination of Peak Dry Weather Flow Rate

Peak dry weather flow rates for specific design areas are to be determined by application of a peaking factor (Pf), related to the average flow rate (Q_{AVG} in L/s) in accordance with the following expression to a maximum value of 5.0:

$$Pf = 6.659 (Q_{AVG}^{-0.168})$$

Following from this, the peak dry weather flow rate (Q_{PDW} in L/s) may be determined as follows:

$$Q_{PDW} = \frac{Pf.Q_{AVG}}{6.659 (Q_{AVG}^{0.832})}$$

Table III- 11. Non-residential Average Daily Flow Rate guide

DESCRIPTION	UNIT (PER)	AVERAGE FLOW (L/DAY PER UNIT)	AVERAGE DAY BOD (GRAMS/DAY PER UNIT) AND NOTES
Industrial, commercial (domestic and food service waste only)			Risk of wax strippers and cleaning chemicals, risk of cold water and high ammonia
Office/factory without cafeteria	person	50 to 75	30
Office/factory without cafeteria and with showers	person	75 to 125	35
Office/factory with cafeteria	person	100	38
Open site (e.g. quarry) without canteen	person	60	25
Full time day staff (staff figures apply to all applications)	person	50 to 75	38
4 hour shift day staff (staff figures apply to all applications)	person	45	25
Dental or medical office	practitioner	1000	(risk of antibiotics and drugs)
Beauty salon (without staff)	Seat	1000	(risk of chemicals and hair)
Store, washroom flow only	square metre	5	
Shopping center, per toilet room	toilet room	1700	380
Shopping center, per parking space	parking space	10	
Accommodation			Risk of wax strippers and cleaning chemicals
Hotel or motel, bed and breakfast, per guest, except for luxury hotels	person	200	90
	bedroom unit	250 to 400	180
Housekeeping unit, no meals	bedroom unit	450	130
Guest bedrooms only, no meals	person	80	50
Non-residential conference guest or day camp, including meals	person	60	25
Resident staff	person	170	60
Cabin resort	person	225	90 (risk of high strength wastes from food service)
Residential or work camps, flush toilets, no meals	person	140	90
Residential or work camps, flush toilets and meals	person	225	90 (risk of high strength wastes from food service)
Residential camps, no flush toilets	person	60	
Dormitory bunkhouse	person	140	90
Nursing Home or retirement home	person	475	110 (risk of antibiotics and drugs)
Laundromat (e.g. in apartment building)	machine	1200 to 2400	260 to 530

DESCRIPTION	UNIT (PER)	AVERAGE FLOW (L/DAY PER UNIT)	AVERAGE DAY BOD (GRAMS/DAY PER UNIT) AND NOTES
Food service and bars			Risk of wax strippers and cleaning chemicals, risk of cold water and high ammonia, risk of oils and greases
Restaurant	meal	12	15
Restaurant (fast food, paper service)	meal	12	12
	seat	60	
Restaurant (full service)	meal	30	38
	seat	90	120
Open more than 16 hours a day	seat	190	250
Restaurant (pre prepared catering)	meal	25	30
Institutional meals	meal	20	20
Function rooms, buffets	meal	30	20
Snack bar or bar meals	person	15	20
Bar/lounge/pub	person	12	15
	seat	140	180
Coffee shop	patron	20	20
	seat	400	
Amenity sites			Risk of wax strippers and cleaning chemicals, RV holding tank chemicals, risk of cold water and high ammonia
Toilet and shower blocks			
Shower	use	40	6
Toilet urinal	use	5	1.5
Toilet (WC)	use	10	12
Visitor center or Day use site, with flush toilets	person	20	15
Tent or trailer sites (central comfort station, no sani dump facility)	person	75 to 150	45 at low end of range
	site	180 to 360	108 at low end of range
Camp Trailer site fully serviced (with hook up)	person	70	75 (risk from RV holding tank wastes and high strength)
	site	170	170 (risk from RV holding tank wastes and high strength)
Assembly hall	person	15	12

From: Jim Handy
Sent: April 6, 2017 8:50 AM
To: Miko Betanzo
Subject: FW: 345 Quebec Street - Sewage attenuation review
Attachments: 20170403 - 30335 - L - Sewage Attenuation Report - sealed.pdf

For your records

From: Randy Chang
Sent: April 5, 2017 9:46 AM
To: [redacted]
Cc: 'Ross Tuck' <[redacted]>; Nina Sutic-Bata <NSutic-Bata@victoria.ca>; Jas Paul <JPaul@victoria.ca>; Craig Stenberg <cstenberg@victoria.ca>; Jim Handy <JHandy@victoria.ca>; Rich Allen <rallen@victoria.ca>
Subject: 345 Quebec Street - Sewage attenuation review

Hello Mr. Mike Puszka,

The City has reviewed JE Anderson's (JEA) sewage attenuation report for 345 Quebec Street in respect to the existing facility that presently has 192-hotel suites with a restaurant, meeting /convention space and a lounge, zoned as "T-1", which generates a peak flow of 14.36 litres per second, as addressed from your report attached. In comparison to the proposed development, which is rezoned to be a "CD", specific to this development, the developer would like to have the existing hotel suites and facilities repurposed into 219-residential units. JEA has estimated its daily flow for the proposed development to be 8.81 litres per second.

As addressed in the report, JEA has calculated the peak sanitary flow for the proposed development to be is less that the existing sewage flow. Therefore, the City may conclude that No sanitary sewer attenuation is required.

If you require further discussion, please do not hesitate in contacting the undersigned.

Yours truly,

Randy K. Chang, AScT.
Supervisor, Infrastructure Planning UG Utilities
Engineering and Public Works
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CITY OF VICTORIA