FUNCTIONAL SERVICING REPORT
HIGHER LIVING DEVELOPMENT INC.
c/o YYZED PROJECT MANAGEMENT
DUNDAS STREET HIGH RISE CONDOMINIUM
86-90 DUNDAS STREET EAST
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

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Our File No. **212-M107**
Dated: **May 25, 2016**
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Revised: **January 23, 2018**
Revised: **January 30, 2018**

TABLE OF CONTENTS

LIST OF FIGURES

FIGURE NO.

1.0 INTRODUCTION

The purpose of this report is to define the existing and proposed servicing scheme in support of the Proposed 29-storey High Rise Condominium Apartments consisting of 150m² commercial space and 289 condominium units.

The existing parcel of land is part of Block 15, Conc. 1 SDS in Mississauga. The site is located at the south side of Dundas Street East, east of Hurontario Street. **Refer to Figure No. 1.**

It is intended that this Functional Servicing Report will be sufficient to support amendments to the Official Plan and Zoning Bylaw and will result in an "approval in principle", of the design proposal by the City of Mississauga, Region of Peel and any other relevant Authorities. Detailed design for a Servicing Agreement will be undertaken in conjunction with the Site Plan Application at a later date.

2.0 STUDY AREA INFORMATION

The subject property is known legally as Part of Lot 15, Conc. 1 SDS in the City of Mississauga, Regional Municipality of Peel.

The site area is 0.42 Ha and is bounded by Dundas Street on the north, Cooksville Creek on the west, and existing residential on to the east. **Refer to Figure No. 1.**

The site is relatively flat with a gentle slope from north to south with grade differential of approximately 1.00m. Presently, the subject site is developed. The existing building is scheduled for demolition prior to construction start. **Refer to Dwg. 212-M107-1.**

The majority of the site will be developed with a high rise condominium building, surface parking, driveways, loading areas, and landscape areas.

3.0 TRANSPORATION SYSTEM

The subject site is located at the southeast corner of Dundas Street East, east of Hurontario Street.

Access to the proposed high rise condominium will be from Dundas Street East.

The existing road system will provide good access to major arterial roads being Hurontario Street and Cawthra Road. Both Cawthra Road and Hurontario Street connect to nearby Highway 403, 401, and Queen Elizabeth Way.

Also, the existing road pattern will provide good access to nearby commercial districts, employment districts, municipal offices, community centres, and parks.

Road widening for Dundas Street will be required.

4.0 STORM DRAINAGE SYSTEM

Currently, the site is developed. Existing site drains surface and through a 300mm storm outlet to Cooksville Creek. Existing building and parking surface area will be demolished prior to construction.

The proposed high rise condominium will be provided a new 300mm diameter storm connection located at the southwest end of the site, discharging directly into Cooksville Creek. The existing 300 dia. storm connection at the north end will be removed.

The proposed 300 dia. storm outlet is approximately 106.19m elevation. New headwall will be constructed at the outlet of 300mm pipe to the creek, at the 25-yr water level elevation provided by AMEC. Therefore, surface drainage and roof runoff will be by gravity.

The connection will provide sufficient depth and capacity for post-development storm water runoff. The underground parking foundations drains will require sump pumps to be pumped to the storm connections.
Refer to Dwg. 212-M107-1.

Onsite stormwater management will be provided to restrict 100-yr post-development flows of proposed development to 2-yr pre-development level at 0.25 runoff co-efficient.

4.1 Pre-development Conditions

Required volume will be stored in the underground storage tanks. Location details and final volumes will be established at design stage of the project.

A	= 0.42 Ha		
C	= 0.25	Q	= CIA / 360
T_c	= 15.00 min		
I_{2yr}	= 59.89 mm/hr	Q_{2yr}	= 0.017

Maximum allowable discharge from the site is **0.017 m^3/s**.

Maximum allowable discharge from controlled area is as follows:

YEAR
STORM
100 year
CITY
Mississauga

C = **0.950**
A (ha) = **0.42000**
Allow. Discharge Qa (m3/s) = **0.01700**
Safety Factor Sf = **0%**

Max. Required Detention (m3) = ***163.00***

RAINFALL DURATION *Tc (min)*	**RAINFALL INTENSITY** *I (mm/hr)*	**TOTAL UNCONTROLLED RUNOFF** *Q=CIA/360 (m3/sec)*	**INFLOW VOLUME Vi (m3)**	**OUTFLOW VOLUME Vo (m3)**	**REQUIRED DETENTION VOLUME (m3)** *D=(Vi-Vo)*Sf*
5	242.53	0.2688	80.64	5.22	75.42
10	176.31	0.1954	117.25	10.20	107.05
15	140.69	0.1559	140.34	15.19	125.15
20	118.12	0.1309	157.10	20.18	136.92
25	102.41	0.1135	170.26	25.18	145.08
30	90.77	0.1006	181.10	30.18	150.91
35	81.77	0.0906	190.33	35.19	155.14
40	74.58	0.0827	198.38	40.19	158.19
45	68.68	0.0761	205.53	45.20	160.33
50	63.75	0.0707	211.98	50.22	161.76
55	59.56	0.0660	217.85	55.23	162.62
60	55.95	0.0620	223.25	60.25	**163.00**
65	52.81	0.0585	228.25	65.26	162.99
70	50.03	0.0555	232.91	70.28	162.63

4.2 Water Balance Consideration

The latest City of Mississauga Water Balance Management Plan contains a water balance target/criteria that requires the site to retain 5mm of every rainfall and allow it to infiltrate back into the ground or use for irrigation purposes.

The required volume is as follows:

Area = 0.42 hectares
V_{5mm} = 200m² x 0.005m = **21.0 m³** per rainfall

4.2.1 Irrigation / Grey Water Recycling Chamber

The proposed retention chamber will be extended (1.0 m (depth)) below the outlet invert to provide storage for the 5mm rainfall. Stored volume 21.0 m³ will be used for irrigation water use of the landscape area.

4.3 Quality Control

Roof runoff of the proposed building is considered a clean water source and is proposed to discharge where possible over landscaped areas. Sodded swales promote natural filtration of rainfall runoff. Introduction of irrigation chamber with 1.0 m depth will increase removal of TSS, similar to oil grit interceptor settlement principle. The enlarged sump pump will act as a settling chamber.

In addition to the BPMs provided, an oil grit interceptor STC 100 will be provided to complete treatment train for the site.

4.4 Orifice Control

The allowable discharge rate from the development will be controlled by the means of an orifice restrictor plate installed at the outlet pipe located at the south side of the site. The orifice late will be installed over the outlet pipe installed inside the control MH 1. The orifice discharge rate was calculated using FlowMaster computer program developed by Haestad Methods Inc. (USA) and an output report is attached. The size of the orifice restrictor plate is 75mm dia. due to clogging possibility.

4.5 Overland Flow Route

Existing overland flow route is directed south westerly towards Cooksville Creek. Our proposed grading will continue having escape route in the same direction (in excess of 100-yr storm). As such, we are not modifying existing conditions.

5.0 SANITARY SEWER SYSTEM

The proposed high rise condominium tower will be serviced to the existing 825 dia. sanitary sewer trunk located on Region easement on the east side of the property.

The existing 825 mm dia. sanitary sewer connection has sufficient depth to accept the sanitary flows from the high rise condominium building. New 250 mm sanitary connection will be provided to service development. The proposed 250 mm dia. sanitary invert is approximately 106.40. The proposed lowest finished main floor is approximately 111.40. Therefore, the building main floor and above will have gravity sewage flows. The basement and underground parking drains will require sanitary ejection pumps. **Refer to Dwg. 212-M107.**

Sanitary Flow Calculations

A. Residential Condominium Development:
- One Bedroom – 174 units x 1.68 PPU = 292.32
- Two Bedrooms or more – 115 units x 2.54 PPU = 292.10

B. Retail Area – 0.015 floor hectares x 50p/hectares = 0.80 population
Total Population = 292.32 + 292.10 + 0.80 = **585.22 ≈ 585**

$$\text{Peak Factor} = 1 + \frac{14}{4 + P^{0.5}}$$

Where, P = population in thousands

$$= 1 + \frac{14}{4 + 0.585^{0.5}}$$

$$= 1 + 2.94 = \mathbf{3.94}$$

Expected Peak Flow Rate = 302.8 x 585 x 3.94

= 697,923 l/day = 8.08 L/s

6.0 WATER DISTRIBUTION SYSTEM

The proposed high rise condominium apartment will be serviced to the existing 300 mm dia. watermain located on Dundas Street East.

The 300 mm dia. watermain connection will be utilized to provide external fire coverage for the building. New fire hydrant is required to be constructed on the 300 mm watermain.

Proposed new 200 mm dia. watermain connection will be constructed for fire and 100 mm water service for domestic used of the proposed condominium.

Water Demand Calculations

A. Proposed Unit (Residential 289) (585 population) as per previous calculations

Total Expected Peak Flow = (280 x 585 x 3.0)

= 491,400 L/day = 5.69 l/s

Total Expected Maximum Daily Flow = 280 x 585 x 2.0

= 327,600 L/day = 3.79 l/s

Based on Fire Underwriter Survey 1999, the fire flow is calculated on the area of 2 largest floors + 50% of **8** floors using the following formula:

$F = 200\ C\sqrt{A}$

Where, C = coefficient of fire resistance construction == 0.60
A = area = 3,555 (where, floor area is 710 m²)
F = fire flow in l/m

F = 220 x 0.60 x √3,555 = 7,870 l/min = **131.17 l/s**

Calculated value can be reduced by 50% if automatic sprinkler system is included.
Therefore, F = 131.17 x 50 = **65.58 l/s**

B. Commercial Units

Total Expected Peak Flow = 300 x 1 x 3.0

= 900 L/day = 0.01 l/day

Total Expected Maximum Daily Flow = 300 x 1 x 1.40

= 420 L/day = 0.005 l/s

Maximum Peak Flow = 5.69 (Res.) + 0.01 (Com.) + 65.58 (Fire)

= **71.28 l/s**

Maximum Daily Flow = 3.79 (Res.) + 0.005 (Com.)

= **3.80 l/s**

The fire flow was conducted on the existing watermain and confirms that the existing system can provide sufficient domestic and fire flows. **See attached report.**

9.0 SUMMARY

The proposed high rise development can be fully serviced by connection to existing services, which have been designed to accommodate the proposed development and therefore have sufficient capacity.

a. 825 sanitary sewer is available on municipal easement to Cooksville Valley.
b. Storm sewer outlet is to the existing Cooksville Creek.
c. Watermain is available on Dundas Street East.
d. Dundas Street East will provide access to major road network.

The findings and recommendations were prepared in accordance with accepted professional engineering principles and practices. Based on the above, the proposed development can be adequately serviced in accordance with the City's and Region's Standards. The findings of this report are global and are related to the servicing functionality of this application. These findings by no means are final and are not to replace the detail review of this application which shall take place upon submission of Site Plan or Servicing Agreement. In no case is the proposed development expected to negatively impact the existing infrastructure system.

Trusting that the above information will be satisfactory to your review and approval.

Yours truly,

SKIRA & ASSOCIATES LTD.

Michael Jozwik, P. Eng.
MJ:ak

NOTE: Limitation of Report

This report was prepared by **Skira & Associates Ltd.** for **Higher Living Development Inc. c/o YYZed Project Management**, for review and approvals by government agencies only.

In light of the information available at the time of preparation of this report, any use by a **Third Party** of this report are solely the responsibility of such **Third Party** and **Skira & Associates Ltd.** accepts no responsibility for any damages, if any, suffered by the **Third Party.**

Applied
Fire Technology Inc.
Since 1987

Design • Consulting • Testing • Inspection

WATER SUPPLY TEST

Name of risk: ..... File No.: .....

Address: 120 DUNDAS STREET EAST Test by: AFTI

Municipality: MISSISSAUGA, ONT Date: JUNE 2, 2016

SYSTEM DATA:

Size of Main: 12" Dead End: ..... Two Ways: ✓ Loop: ✓

Source Reliable: YES If not explain: .....

Comments: .....

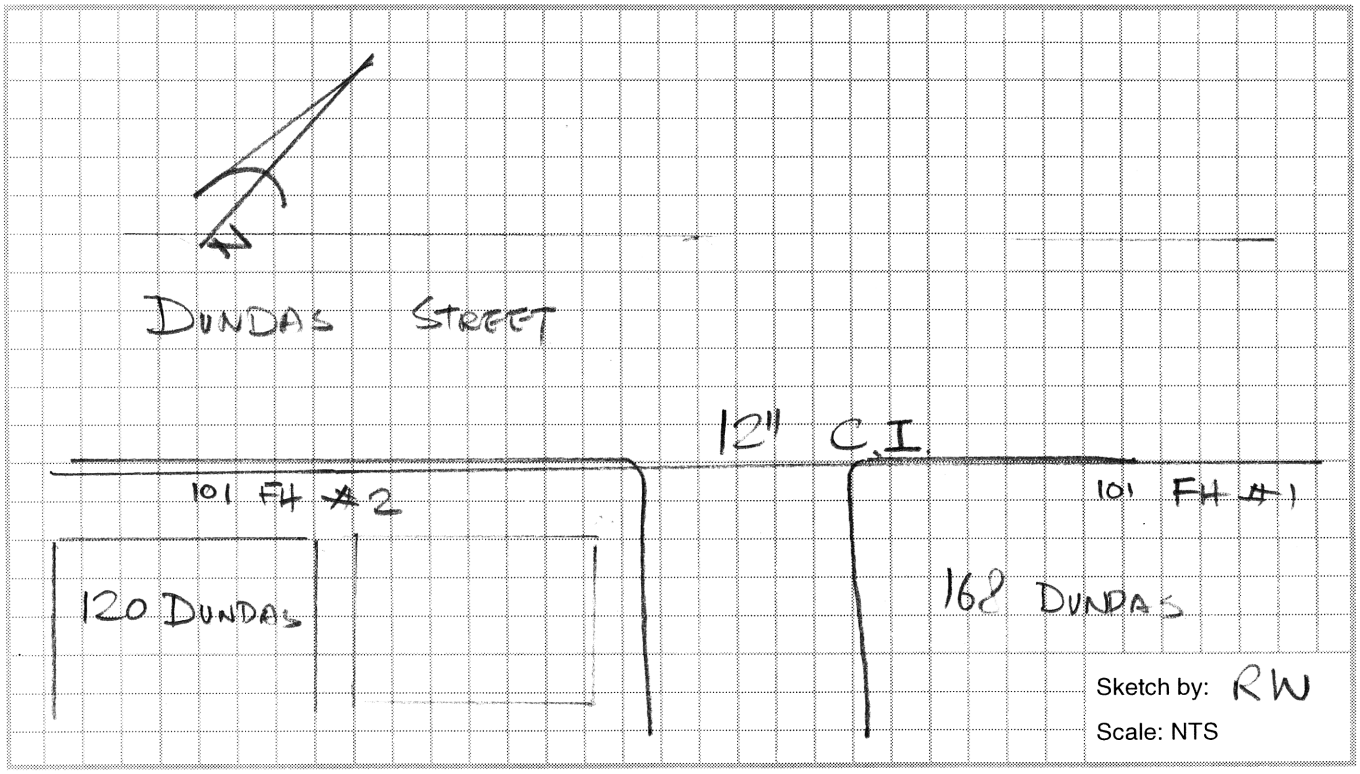
TEST DATA:

Location of test fire hydrants; Residual: #1 168 DUNDAS STREET EAST MISSISSAUGA

Flow: #2 120 DUNDAS STREET EAST MISSISSAUGA

Static pressure 74 psi Time: 10⁰⁰ A.M. — P.M.

Test No.	No. of Outlets	Orifice Size (in.)	Pitot Reading (psi)	Equivalent Flow gpm (U.S.)	Total Flow gpm (U.S.)	Residual Pressure (psi)	Comments
1	1	1¾	64	731	729	70	0.997
2	1	2½	62	1470	1323	68	0.9
3	2	2½	46	1265, 1265	2277	64	0.9
4							



Name and address of municipal authority who should receive a copy.

.....

STATIC: 74 PSI

(1) 729 USGPM@ 70 PSI

(2) 1323 USGPM@ 68 PSI

(3) 2277 USGPM@ 64 PSI

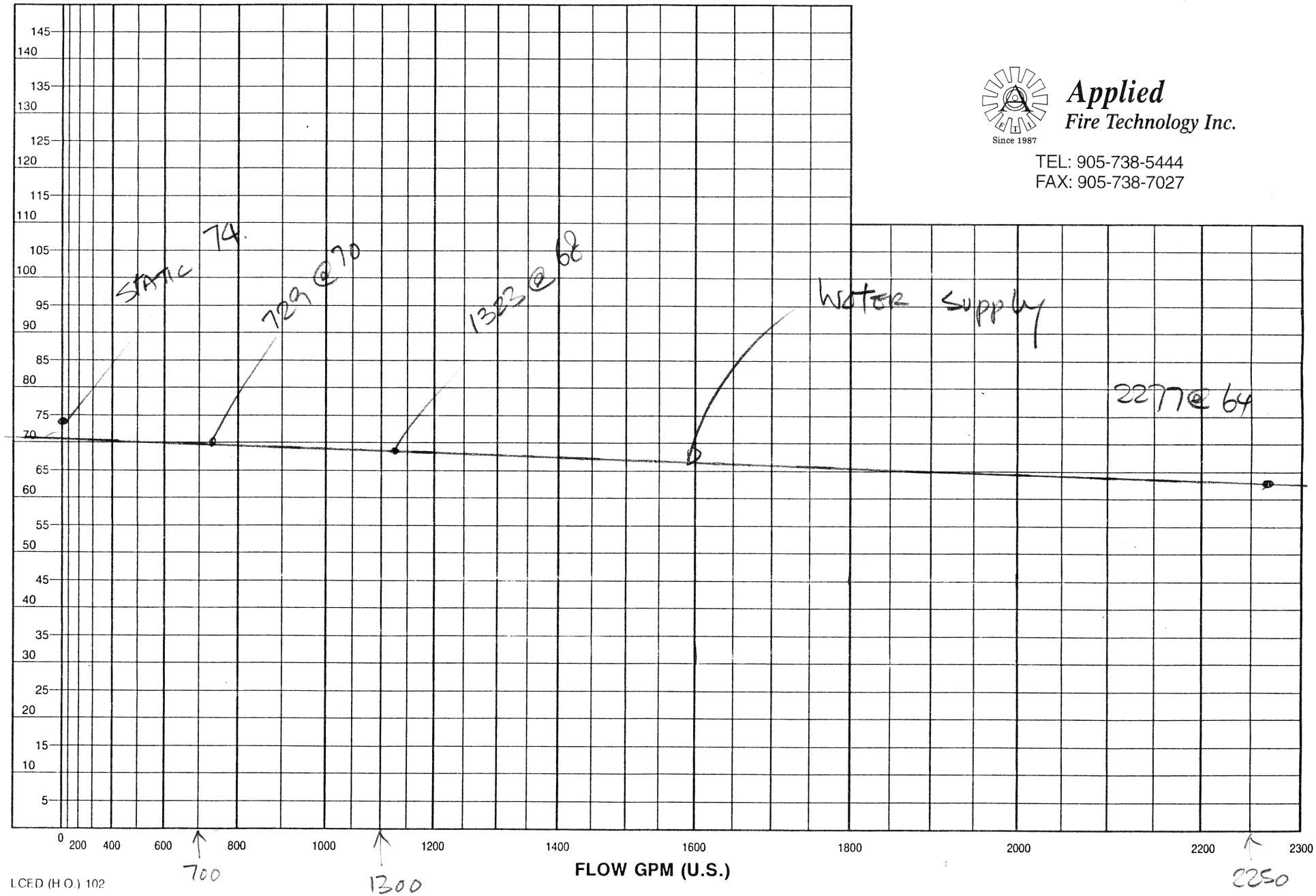
NAME OF RISK: _____ FILE NO.: _____

STREET: 120 DUNDAS STREET EAST

CITY: MISSISSAUGA, ONT.

DATE: JUNE 2. 2016 BY: AFT1

Applied
Fire Technology Inc.
Since 1987
TEL: 905-738-5444
FAX: 905-738-7027



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Connection Multi Use Demand Table

WATER CONNECTION

Connection point [3]	DUNDAS STREET E			
Pressure zone of connection point				
Total equivalent population to be serviced [1]			565	
Total lands to be serviced			0.42	
Hydrant flow test				
Hydrant flow test location			DUNDAS . 300.	
		Pressure (kPa)	Flow (in l/s)	Time
Minimum water pressure		441	43.65	
Maximum water pressure		482	46.00	

No.	Water demands			
		Demand (in l/s)		
	Demand type	Use 1 [5]	Use 2 [5]	Total
1	Average day flow	1.83		1.83
2	Maximum day flow	3.66	0.005	3.665
3	Peak hour flow	5.49	0.01	5.50
4	Fire flow [2]	65.58		65.58
Analysis				
5	Maximum day plus fire flow			71.08

WASTEWATER CONNECTION

				Total
Connection point [4]				825mm
Total equivalent population to be serviced [1]		564	1	
Total lands to be serviced				0.42
6	Wastewater sewer effluent (in l/s)			7.80

[1] The calculations should be based on the development estimated population (employment and/or residential).

[2] Please reference the Fire Underwriters Survey Document

[3] Please specify the connection point ID

[4] Please specify the connection point (wastewater line or manhole ID)
Also, the "total equivalent popopulation to be serviced" and the "total lands to be serviced" should reference the connection point. (The FSR should contain one copy of Site Servicing Plan)

[5] Please complete as many uses are necessary for the development.
(Please specify the use)

Please include the graphs associated with the hydrant flow test information table
Please provide Professional Engineer's signature and stamp on the demand table
All required calculations must be submitted with the demand table submission.