

**FUNCTIONAL SERVICING REPORT  
EMBLEM DEVELOPMENTS  
MISSISSAUGA II HIGH RISE CONDOMINIUM  
89-95 DUNDAS STREET WEST  
CITY OF MISSISSAUGA  
REGIONAL MUNICIPALITY OF PEEL**



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Our File: 219-M14  
Dated: October 2019

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**FIGURE NO.**

1 - KEY PLAN

**DRAWING NO.**

219-M14-1 - CONCEPT SITE SERVICING PLAN

219-M14-2 - CONCEPT SITE GRADING PLAN

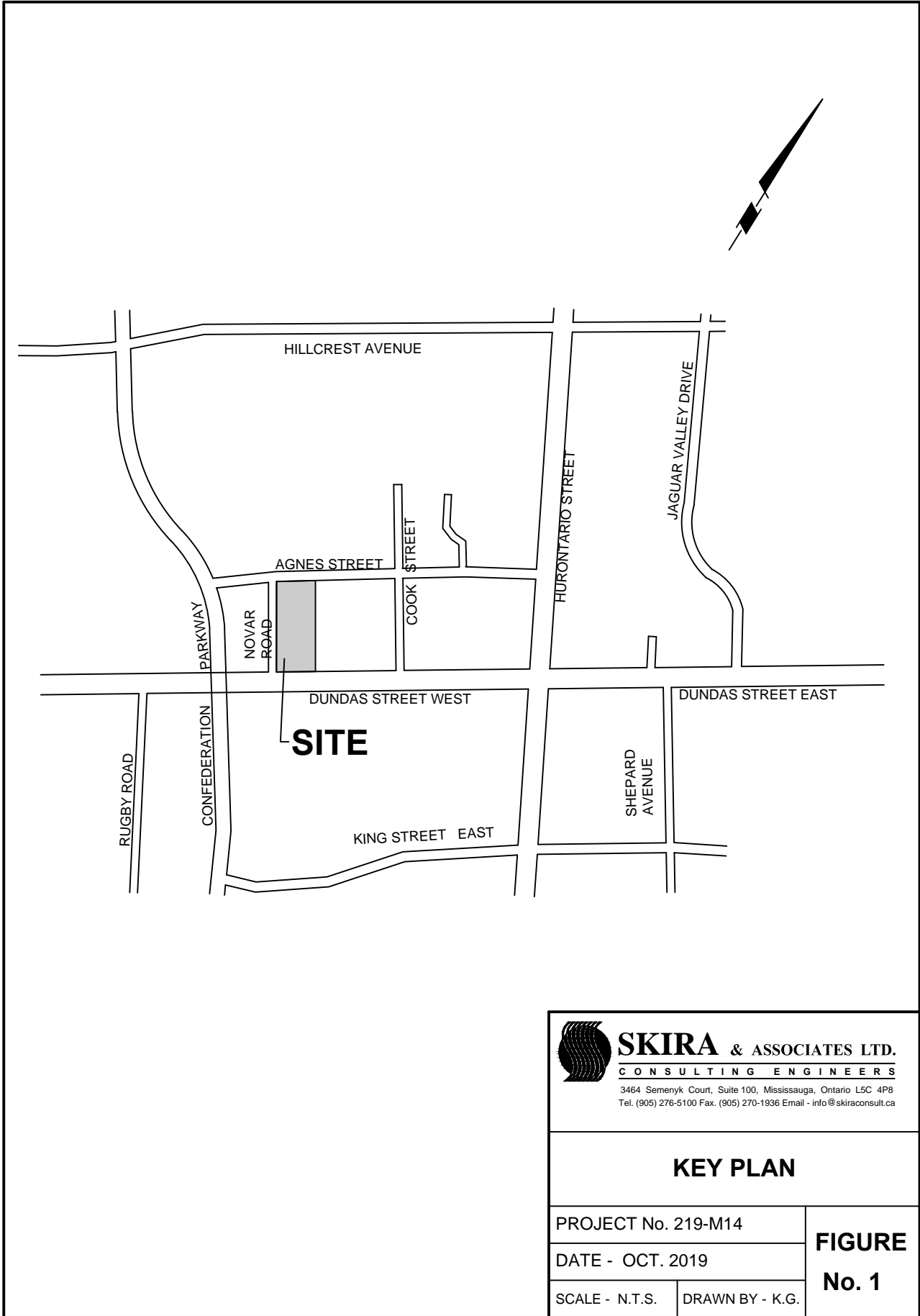
219-M14-3 - COMPOSITE UTILITY PLAN

## **1.0 INTRODUCTION**

The purpose of this report is to define the existing and proposed servicing scheme in support of the Proposed 16-storey High Rise Condominium Apartments consisting of 510.0m<sup>2</sup> commercial space and 405 condominium units, including urban townhomes.

The existing parcel of land includes Lots 14, 15, 31, 32 and part of Lot 13, Registered Plan TOR-12, west of Hurontario Street in Mississauga. The site is located on the north side of Dundas Street West, west 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 will be provided as part of the Site Plan Application.




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**KEY PLAN**

PROJECT No. 219-M14	<b>FIGURE No. 1</b>
DATE - OCT. 2019	
SCALE - N.T.S.      DRAWN BY - K.G.	

## 2.0 **STUDY AREA INFORMATION**

The subject property is known legally as Lots 14, 15, 31, 32 and part of Lot 13, Registered Plan TOR-12, west of Hurontario Street in the City of Mississauga, Regional Municipality of Peel.

The site is bound by Dundas Street on the south, Novar Road on the west, Agnes Street on the north, and existing commercial buildings on the east. **Refer to Figure No. 1.**

The site is located on 89 and 95 Dundas Street West and is presently developed with a building and a parking lot. The existing building and parking surface is scheduled for demolition prior to construction start.

The total site area is 0.42 Ha. An area of 0.08Ha will be dedicated to the City of Mississauga for the road widening of Novar Road and Dundas Street West.

The site is relatively flat with a gentle slope from north to south, with a grade differential of approximately 2.0m. **Refer to Dwg. 212-M107-2.**

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

### 3.0 **TRANSPORATION SYSTEM**

The subject site is located on the northeast corner of Dundas Street West and Novar Road, west of Hurontario Street.

Access to the proposed high rise condominium will be from Novar Road.

Novar Road is currently constructed without curbs, and with a varying roadway width. As such, Novar Road will be redesigned to the standard local residential road of 8.0m road on 20.0m right-of-way (ROW), as per City of Mississauga Standard 2211.070, to provide up to standard access to the condominium for emergency vehicles, trucks, and vehicles.

A 4.97m widening on the east side of Novar Road will be provided to extend the existing 10.05m ROW, providing a proposed 15.02m ROW. A future 4.98m ROW widening will be required for the property to the west to provide the full 20.0m ROW. An 8.0m roadway will be constructed, with full curb and gutter. **Refer to Dwg. 219-M14-3.**

Road widening on the north side of Dundas Street West will be required for the planned City of Mississauga's Dundas Connects.

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 Highways 403, 401, and Queen Elizabeth Way.

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

#### 4.0 **STORM DRAINAGE SYSTEM**

Currently, the site is developed. The existing building and parking surface area will be demolished prior to construction.

The existing site drains surface to the existing storm sewer system on Dundas Street West.

The proposed high rise condominium will be provided with a new 300mm diameter storm connection located at the northwest corner of the site, to Novar Road. The storm sewer on Novar Road will be extended to capture drainage from the site and road.

The connection will provide sufficient depth and capacity for post-development storm water runoff. The underground parking foundation drains will require sump pumps to be pumped to the storm connection.

Onsite stormwater management will be provided to restrict 100-yr post-development flows of proposed development to 2-yr pre-development levels at 0.25 runoff co-efficient. **Refer to Dwg. 219-M14-1.**

Maximum required storage volumes for the site was arrived at using Modified Rational Method.

#### 4.1 **Pre-development Conditions**

Onsite stormwater management will be required to restrict 100-yr post-development flows to the 2-yr pre-development levels:

$$\begin{aligned} A &= 0.3405 \text{ Ha} \\ C &= 0.25 \\ T_c &= 15.00 \text{ min} \\ I_{2\text{yr}} &= 59.89 \text{ mm/hr} \\ Q &= CIA / 360 \\ Q_{2\text{yr}} &= 0.0127 \end{aligned}$$

Therefore, maximum allowable discharge from the site is **0.0127 m<sup>3</sup>/s**.

#### 4.2 **Post-development Conditions**

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

$$\begin{aligned} A &= 0.3405 \text{ Ha} \\ C &= 0.95 \end{aligned}$$



Maximum storage required is as follows:

**YEAR STORM**

100 year

**CITY**

Mississauga

C = **0.950**

A (ha) = **0.3405**

Allow. Discharge Qa (m3/s) = **0.0127**

Safety Factor Sf = **0%**

Max. Required

Detention (m3) = **136.26**

RAINFALL DURATION <i>Tc (min)</i>	RAINFALL INTENSITY <i>I (mm/hr)</i>	TOTAL UNCONTROLLED RUNOFF <i>Q=CIA/360 (m3/sec)</i>	INFLOW VOLUME <i>Vi (m3)</i>	OUTFLOW VOLUME <i>Vo (m3)</i>	REQUIRED DETENTION VOLUME (m3) <i>D=(Vi-Vo)*Sf</i>
5	242.53	0.2179	65.38	3.89	61.48
10	176.31	0.1584	95.05	7.62	87.43
15	140.69	0.1264	113.77	11.35	102.42
20	118.12	0.1061	127.37	15.09	112.28
25	102.41	0.0920	138.03	18.83	119.20
30	90.77	0.0816	146.82	22.57	124.24
35	81.77	0.0735	154.30	26.32	127.98
40	74.58	0.0670	160.83	30.06	130.77
45	68.68	0.0617	166.63	33.81	132.82
50	63.75	0.0573	171.85	37.56	134.29
55	59.56	0.0535	176.61	41.31	135.30
60	55.95	0.0503	180.99	45.06	135.93
65	52.81	0.0474	185.05	48.82	136.23
70	50.03	0.0450	188.83	52.57	<b>136.26</b>
75	47.58	0.0427	192.37	56.32	136.04
80	45.38	0.0408	195.70	60.08	135.63

**4.3 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:

$$\begin{aligned} \text{Area} &= 0.3405 \text{ hectares} \\ V_{5\text{mm}} &= 3405\text{m}^2 \times 0.005\text{m} = \mathbf{17.0 \text{ m}^3} \text{ per rainfall} \end{aligned}$$

Green roofs and irrigation/grey water re-use systems will be implemented to retain the 5mm rainfall. Detailed calculations will be provided during detailed design.

**4.4 Quality Control**

The proposed development will utilize a treatment train approach that includes clean roof runoff from green roofs, landscaped areas, irrigation system and a holding tank.

Roof runoff from the green roof is considered a clean water source. The chamber provided for irrigation will act as a settling chamber, similar to the oil/girt interceptor's settlement principle. The irrigation system itself will be outfitted with a filtering system.

The runoff from the asphalt drive aisle will be diluted in the underground storage tank by the green roof runoff. Further, captured runoff will be directed back to the site for irrigation, providing further quality and TSS removal.

#### **4.5 Orifice Control**

The allowable discharge rate from the development will be controlled by means of an orifice restrictor plate installed at the outlet pipe located at the southwest corner of the site. The orifice plate will be installed over the outlet pipe inside the stormwater management tank. 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 diameter due to clogging possibility.

#### **4.6 Overland Flow Route**

Existing overland flow route is directed south westerly towards Dundas Street West. Our proposed grading will continue to have the 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 250mm diameter sanitary sewer, located on Novar Road, running south to Dundas Street West.

Proposed sanitary manhole and 250mm sanitary connection will be provided to service the development to the existing sanitary sewer. **Refer to Dwg. 219-M14-1.**

The existing 250mm diameter sanitary sewer has sufficient depth to accept the sanitary flows from the high rise condominium building.

The proposed sanitary invert at property line is approximately 110.35m. The proposed lowest finished main floor is approximately 113.75m. Therefore, the building main floor and above will have gravity sewage flows. The basement and underground parking drains will require sanitary ejection pumps.

### Sanitary Flow Calculations

- A. Residential Condominium Development:
- One Bedroom – 359 units x 1.68 PPU = 603.12
  - Two Bedrooms or more – 46 units x 2.54 PPU = 116.84
- B. Retail Area – 0.0510 floor hectares x 50p/hectares = 2.55 population

$$\text{Total Population} = 603.12 + 116.84 + 2.55 = \mathbf{722.51} \approx \mathbf{723}$$

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

Where, P = population in thousands

$$= 1 + \frac{14}{4 + 0.723^{0.5}}$$

$$= 1 + 2.89 = \mathbf{3.89}$$

$$\begin{aligned} \text{Expected Peak Flow Rate} &= 302.8 \times 723 \times 3.89 \\ &= 851,616 \text{ L/day} = 9.86 \text{ L/s} \end{aligned}$$

## 6.0 WATER DISTRIBUTION SYSTEM

The proposed high rise condominium apartment will be serviced to the existing 400mm diameter watermain located on Novar Road.

There is an existing 400mm watermain on Novar Road, an existing 400mm watermain on Agnes Street, and existing 300mm on Dundas Road. The existing fire hydrant on Agnes Street will be utilized to provide external fire coverage for the building. **Refer to Dwg. 219-M14-1.**

Proposed 200mm diameter watermain connection will be constructed for fire and 100 mm water service for domestic use for the proposed condominium.

### Water Demand Calculations

A. Proposed Unit (Residential 405) (719.96  $\approx$  720 population, as per previous calculations)

$$\begin{aligned}\text{Total Expected Peak Flow} &= 280 \times 720 \times 3.0 \\ &= 604,800 \text{ L/day} = 7.00 \text{ L/s}\end{aligned}$$

$$\begin{aligned}\text{Total Expected Maximum Daily Flow} &= 280 \times 720 \times 2.0 \\ &= 403,200 \text{ L/day} = 4.67 \text{ L/s}\end{aligned}$$

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:

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

$$\begin{aligned}\text{Where, } C &= \text{coefficient of fire resistance construction} = 0.60 \\ A &= \text{area} = 11,315 \\ F &= \text{fire flow in L/min}\end{aligned}$$

$$F = 220 \times 0.60 \times \sqrt{11,300} = 14,041 \text{ L/min} = \mathbf{234.02 \text{ L/s}}$$

Calculated value can be reduced by 50% if automatic sprinkler system is included.

$$\text{Therefore, } F = 233.86 \times 0.50 = \mathbf{117.01 \text{ L/s}}$$

B. Commercial Units

$$\begin{aligned}\text{Total Expected Peak Flow} &= 300 \times 3 \times 3.0 \\ &= 2,700 \text{ L/day} = 0.03 \text{ L/s}\end{aligned}$$

$$\begin{aligned}\text{Total Expected Maximum Daily Flow} &= 300 \times 3 \times 1.40 \\ &= 1,260 \text{ L/day} = 0.01 \text{ L/s}\end{aligned}$$

$$\begin{aligned}\text{Maximum Peak Flow} &= 7.00 \text{ (Res.)} + 0.03 \text{ (Com.)} + 117.01 \text{ (Fire)} \\ &= \mathbf{124.04 \text{ L/s}}\end{aligned}$$

$$\begin{aligned}\text{Maximum Daily Flow} &= 4.67 \text{ (Res.)} + 0.01 \text{ (Com.)} \\ &= \mathbf{4.68 \text{ L/s}}\end{aligned}$$

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.**

**7.0 SUMMARY**

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

- a. Novar Road will be reconstructed and provide access to the site.
- b. Storm sewer outlet will be to Novar Road.
- c. Sanitary sewer is available on Novar Road.
- d. Watermain is available on Novar Road with fire protection from Agnes Street.

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:kg



**NOTE: Limitation of Report**

This report was prepared by **Skira & Associates Ltd.** for **Emblem Developments** and 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**.

# Worksheet

## Worksheet for Circular Orifice

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### Project Description

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Worksheet	Orifice - 1
Type	Circular Orifice
Solve For	Diameter

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### Input Data

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Discharge	1.0127	m <sup>3</sup> /s
Headwater Elevation	14.00	m
Centroid Elevation	12.03	m
Tailwater Elevation	11.52	m
Discharge Coefficient	0.60	

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### Results

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Diameter	66	mm
Headwater Height Above Orifice	1.97	m
Tailwater Height Above Centroid	-0.51	m
Flow Area	3.4e-3	m <sup>2</sup>
Velocity	3.73	m/s

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**Applied**  
**Fire Technology Inc.**  
 Design • Consulting • Testing • Inspection

**WATER SUPPLY TEST**

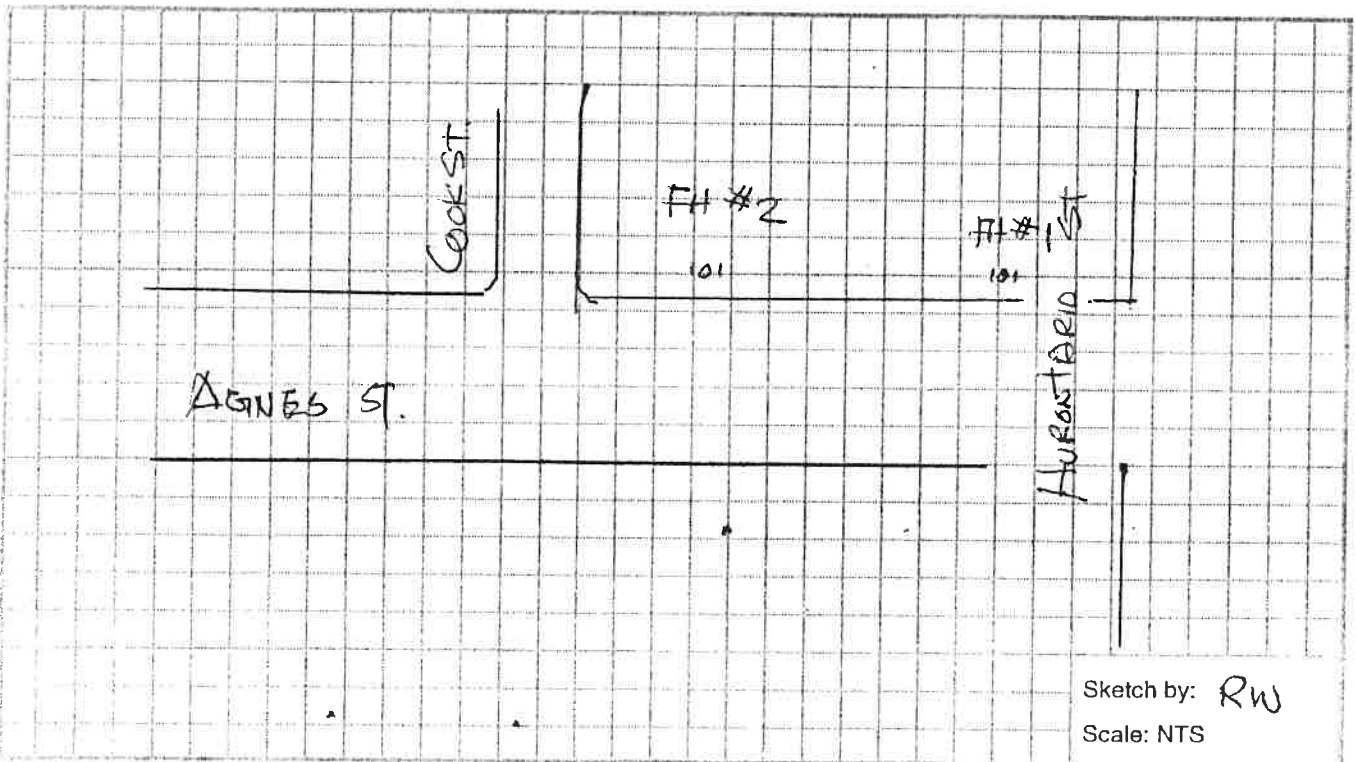
Name of risk: ..... File No.: .....  
 Address: 45 AGNES ST. Test by: AFTI  
 Municipality: MISSISSAUGA ONT. Date: OCT. 14. 2015

**SYSTEM DATA:**  
 Size of Main: 16" Dead End: ..... Two Ways:  Loop:   
 Source Reliable: YES If not explain: .....

Comments: .....

**TEST DATA:**  
 Location of test fire hydrants; Residual: #1 AGNES ST. / HURONTARIO ST. 2038  
 Flow: #2 45 AGNES ST. / COOK STREET  
 Static pressure 89 psi Time: 9:15 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	<u>1 1/4</u>	<u>72</u>	<u>776</u>	<u>774</u>	<u>85</u>	<u>0.997</u>
2	1	<u>1/2</u>	<u>72</u>	<u>1582</u>	<u>1266</u>	<u>84</u>	<u>0.8</u>
3	2	<u>1/2</u>	<u>48, 48</u>	<u>1293, 1293</u>	<u>2067</u>	<u>83</u>	<u>0.8</u>
4							



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

Pue.

STATIC: 89 PSI  
 (1) 774 USGPM @ 85 PSI  
 (2) 1266 USGPM @ 84 PSI  
 (3) 2067 USGPM @ 83 PSI

NAME OF RISK: \_\_\_\_\_ FILE NO.: \_\_\_\_\_

STREET: 45 Agness St.

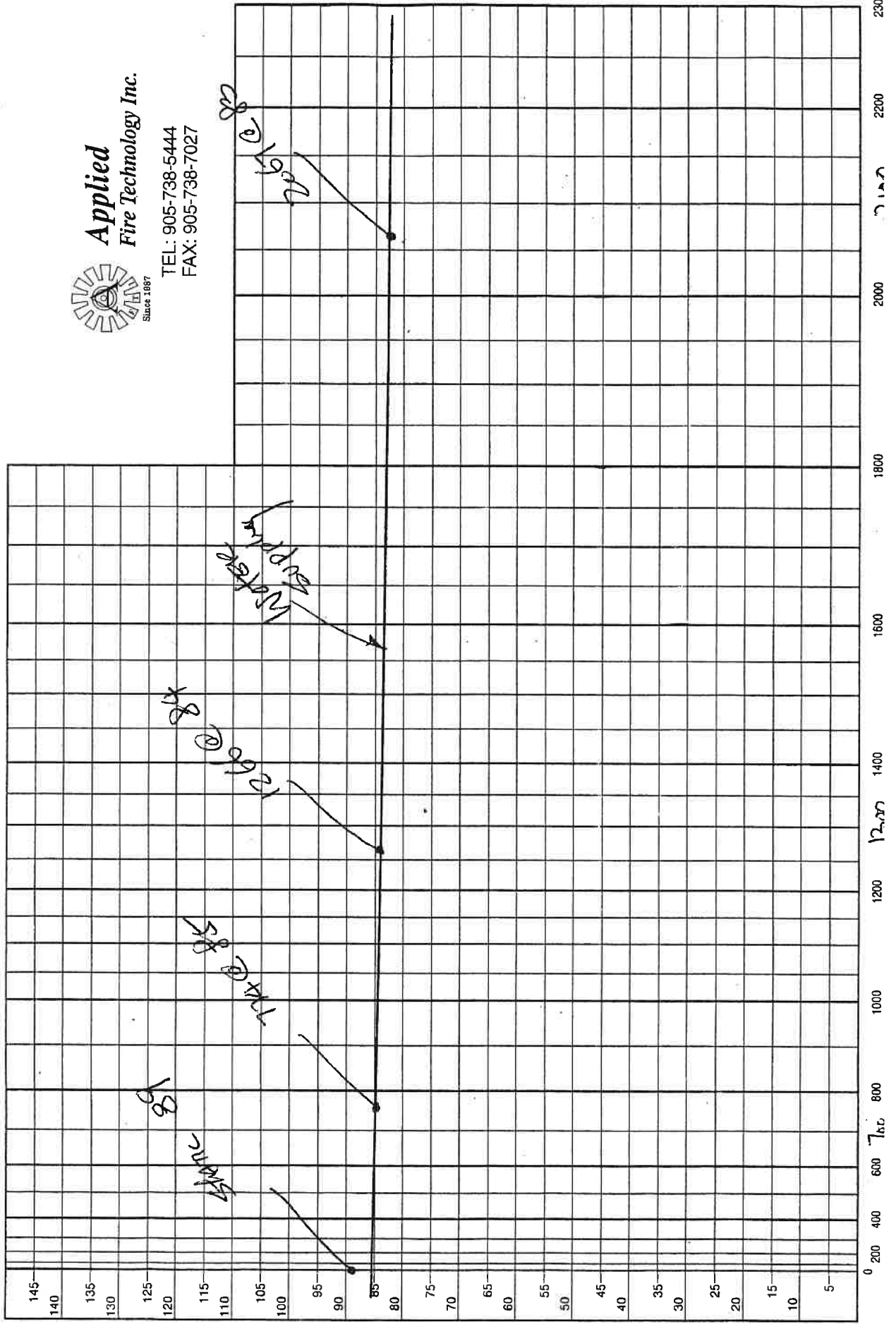
CITY: MISSISSAUGA, ONT.

DATE: Oct. 14, 2015 BY: AFTI



Applied  
Fire Technology Inc.

TEL: 905-738-5444  
 FAX: 905-738-7027



0 200 400 600 700 800 1000 1200 1400 1600 1800 2000 2200 2300



# Connection Multi Use Demand Table

## WATER CONNECTION

Connection point <sup>3)</sup> NOVAR ROAD			
Pressure zone of connection point			
Total equivalent population to be serviced <sup>1)</sup>		723	
Total lands to be serviced		0.34 Ha	
Hydrant flow test			
Hydrant flow test location		AGNES ST.	
	Pressure (kPa)	Flow (in l/s)	Time
Minimum water pressure	572	130.41	
Maximum water pressure	586	48.83	

No.	Water demands			
	Demand type	Demand (in l/s)		
		Use 1 <sup>5)</sup>	Use 2 <sup>5)</sup>	Total
1	Average day flow	2.33	0.01	2.34
2	Maximum day flow	4.67	0.01	4.68
3	Peak hour flow	7.00	0.03	7.03
4	Fire flow <sup>2)</sup>	117.01	—	117.01
<b>Analysis</b>				
5	Maximum day plus fire flow			121.69



## WASTEWATER CONNECTION

			Total
Connection point <sup>4)</sup>			
Total equivalent population to be serviced <sup>1)</sup>		720	3
Total lands to be serviced			0.34 Ha
6	Wastewater sewer effluent (in l/s)		9.86

<sup>1)</sup> The calculations should be based on the development estimated population (employment and/or residential).

<sup>2)</sup> Please reference the Fire Underwriters Survey Document

<sup>3)</sup> Please specify the connection point ID

<sup>4)</sup> Please specify the connection point (wastewater line or manhole ID)  
Also, the "total equivalent population 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)

<sup>5)</sup> 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.