S. LLEWELLYN & ASSOCIATES LIMITED
CONSULTING ENGINEERS

April 26, 2018
File: 18007

City of Hamilton
71 Main St. West
Hamilton, Ontario L8P 4Y5

RE: Fire Flow Estimate
264 Governor's Road, Dundas Development, Hamilton

The proposed development consists of constructing a six (6) block townhouse development and associated parking and access ways as per the attached Concept Site Plan prepared by Urban Solutions.

Fire flow demands for development are governed by a number of guidelines and criteria, such as the Water Supply for Public Fire Protection (Fire Underwriters Survey, 1999), Ontario Building Code (OBC), and various codes and standards published by the National Fire Protection Association (NFPA).

An existing municipal hydrant is located across the site on the north side of Governor's Road. It is anticipated that a private on-site fire hydrant will be added to the site with the future site servicing and will be within the required 90m separation from each building face adjacent to a street (as per Sentence 3.2.5.7 of the 2012 Ontario Building Code),

Defining a worst case scenario, the proposed townhouse blocks have been analyzed with wood frame construction (C=1.5), limited combustible occupancy (-15% correction) and the exposure corrections as noted on the attached Required Fire Flow work sheets and Concept Plan illustrating the proposed spatial separations.

The following hydrant flow test data for the public fire hydrants in closest proximity to the proposed development has been analysed to determine if the municipal system adjacent to the subject site is adequate to provide the required fire flow, with a minimum pressure of 20 psi. Table 1 below summarizes the hydrant flow data made available from the City of Hamilton.

Table 1 – Hydrant Flow Data	
Hydrant ID	DM11H144
Location	Governor's Road
Test Date	08/10/2016 9:52:59 PM
Static Pressure	40 psi
Residual Pressure During Test Flow	38 psi
Test Flow Rate	820 IGPM (62 l/s)
Theoretical Flow @ 20 psi	**2843 IGPM (215 l/s)**

3228 South Service Road, Suite 105, East Wing Burlington, Ontario L7N 3H8
Tel. (905) 631-6978 Fax (905) 631-8927

The attached Fire Flow Demand work sheets reveal that Block D would require the highest fire flow (233 l/sec) which is above the available fire flow noted above. As such, it is proposed that a two (2) hour fire wall be constructed midway of Block D, reducing the footprint area to 485m^2 and the corresponding required fire flow to 167 l/sec.

Table 2 below summarizes the required fire flow for each townhouse block in accordance with the Fire Underwriters Survey - 1999 Water Supply for Public Fire Protection, along with the available fire flow at Hydrant ID DM11H144.

Table 2 – Required Fire Flow Summary

Townhouse Block ID	Required Fire Flow (l/sec)	Available Fire Flow @ Governor's Road Hydrant
A	183	215
B	167	215
C	183	215
D	167	215
E	200	215
F	200	215

Based on the available hydrant flow test data, the theoretical maximum available flow rate from the municipal hydrant is **215 l/s**, while the maximum required fire flow for the proposed development is **200 l/s.**

We trust that the information provided addresses the City of Hamilton requirements.

Prepared by:

S.LLEWELLYN & ASSOCIATES LIMITED

S.Frankovich, P.Eng.

FIRE FLOW DEMAND REQUIREMENTS - FIRE UNDERWRITERS SURVEY (FUS GUIDELINES)

Project Number: 18007
Project Name: 264 Governor's Road, Dundas
Date: 09-Apr-18

Fire flow demands for the FUS method is based on information and guidance provided in "Water Supply for Public Protection" (Fire Underwriters Survey, 1999).

An estimate of the fire flow required is given by the following formula:

$$F = 220\,C\sqrt{A} \qquad (1)$$

where:

F = the required fire flow in litres per minute
C = coefficient related to the type of construction
= 1.5 for wood frame construction (structure essentially all combustible).
= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)
= 0.6 for fire-resistive construction (fully protected frame, floors, roof)
A = Total floor area in square metres

	Building Area				(1)		(2)			(3)		(4)		Final Adjusted Fire Flow	
Building / Location	Footprint Area (m^2)	# of Storeys	**Total GFA (m^2)**	Type of Construction	***Fire Flow "F"*** (l/min)	(l/s)	***Occupancy*** %	Adjustment (l/min)	**Adjusted Fire Flow (l/min)**	***Sprinkler*** %	Adjustment (l/min)	***Exposure*** %	Adjustment (l/min)	**(l/min)**	**(l/s)**
Townhouse Block A	**275**	**3**	**825**	**1.5**	9000	150.0	**-15**	-1350.0	**7650.0**	**0**	0.0	35	2677.5	**10000**	**167**

(2) Occupancy

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

Minimum credit for systems designed to NFPA 13 is 30%.

If the domestic and fire services are supplied by the same municipal water system, then take an additional 10%.

If the sprinkler system is fully supervised (ie. annunciator panel that alerts the Fire Dept., such as a school), then an additional 10% can be taken. Maximum credit = 50%.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all
10.1 to 20m	15%	sides. Maximum
20.1 to 30m	10%	charge shall not
30.1 to 45m	5%	exceed 75%

Side	Exposure (m)	Charge (%)
North =	**>45**	**0**
South =	**10.1 to 20.0**	**15**
East =	**3.1 to 10.0**	**20**
West =	**>45**	**0**
Total Exposure =		***35***

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Townhouse Block B	**220**	**3**	**660**	**1.5**	8000	133.3	**-15**	-1200.0	**6800.0**	**0**	0.0	45	3060.0	**10000**	**167**

(2) Occupancy

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

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10.1 to 20m	15%	sides. Maximum
20.1 to 30m	10%	charge shall not
30.1 to 45m	5%	exceed 75%

Side	Exposure (m)	Charge (%)
North =	**>45**	**0**
South =	**10.1 to 20.0**	**15**
East =	**20.1 to 30.0**	**10**
West =	**3.1 to 10**	**20**
Total Exposure =		***45***

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Townhouse Block C	**275**	**3**	**825**	**1.5**	9000	150.0	**-15**	-1350.0	**7650.0**	**0**	0.0	45	3442.5	**11000**	**183**

(2) Occupancy

Non-Combustible	-25%
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Combustible	No charge
Free Burning	15%
Rapid Burning	25%

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North =	**>45**	**0**
South =	**10.1 to 20.0**	**15**
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West =	**20.1 to 30**	**10**
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Townhouse Block D	**485**	**1**	**485**	**1.5**	7000	116.7	**-15**	-1050.0	**5950.0**	**0**	0.0	65	3867.5	**10000**	**167**

$$\frac{Block\ Floor\ Area\ x\ 2}{2\ (firewll)} = \frac{970m^2}{2} = 485m^2$$

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Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No charge
Free Burning	15%
Rapid Burning	25%

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North =	**10.1 to 20.0**	**15**
South =	**10.1 to 20.0**	**15**
East =	**3.1 to 10.0**	**20**
West =	**10.1 to 20.0**	**15**
Total Expoure =		***65***

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Townhouse Block E	**325**	**2**	**650**	**1.5**	8000	133.3	**-15**	-1200.0	**6800.0**	**0**	0.0	70	4760.0	**12000**	**200**

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North =	**10.1 to 20.0**	**15**
South =	**10.1 to 20.0**	**15**
East =	**3.1 to 10.0**	**20**
West =	**3.1 to 10.0**	**20**
Total Expoure =		***70***

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Townhouse Block F	**405**	**2**	**810**	**1.5**	9000	150.0	**-15**	-1350.0	**7650.0**	**0**	0.0	60	4590.0	**12000**	**200**

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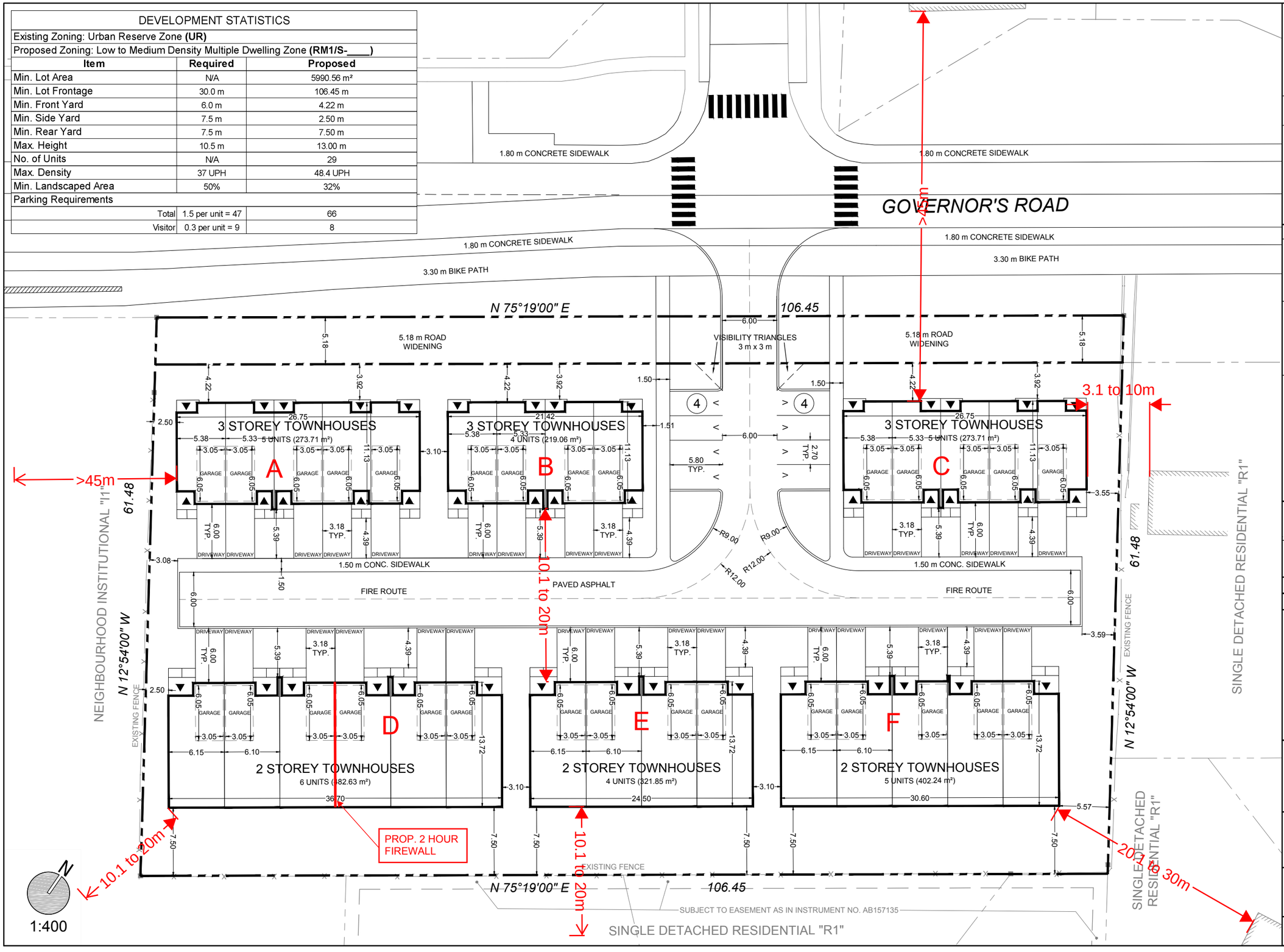
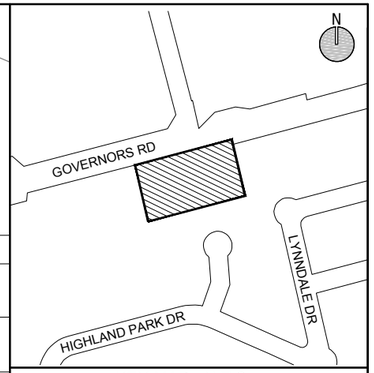
West =	**3.1 to 10.0**	**20**
Total Expoure =		***60***

DEVELOPMENT STATISTICS		
Existing Zoning: Urban Reserve Zone **(UR)**		
Proposed Zoning: Low to Medium Density Multiple Dwelling Zone **(RM1/S-____)**		
Item	**Required**	**Proposed**
Min. Lot Area	N/A	5990.56 m²
Min. Lot Frontage	30.0 m	106.45 m
Min. Front Yard	6.0 m	4.22 m
Min. Side Yard	7.5 m	2.50 m
Min. Rear Yard	7.5 m	7.50 m
Max. Height	10.5 m	13.00 m
No. of Units	N/A	29
Max. Density	37 UPH	48.4 UPH
Min. Landscaped Area	50%	32%
Parking Requirements		
Total	1.5 per unit = 47	66
Visitor	0.3 per unit = 9	8





KEY MAP - N.T.S.

SCALE 1:400

METRES

0 5 10 15 20

PART OF LOT 48 CONCESSION 1
IN THE GEOGRAPHIC TOWNSHIP OF ANCASTER
NOW IN THE CITY OF HAMILTON

LEGEND:

- SUBJECT LANDS
- EXISTING PROPERTY LINE
- PROPOSED BUILDING
- ENTRANCE

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW & COMMENTS ONLY

NOTES:
ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DESIGN BY: S. McKay	CHECKED BY: M. Johnston
DRAWN BY: S. McKay	DATE: APR. 20, 2018

UrbanSolutions
Planning & Land Development Consultants Inc.
105 MAIN STREET EAST, SUITE 501
HAMILTON, ON L8N 1G6
905-546-1087 - urbansolutions.info

PROJECT:
264 Governors Road
DUNDAS
CITY OF HAMILTON

CLIENT:
Intero Development Group Inc.

TITLE:
CONCEPT PLAN

U/S FILE NUMBER:	SHEET NUMBER:
240-17	1