



S. LLEWELLYN & ASSOCIATES LIMITED  
CONSULTING ENGINEERS

# Functional Servicing Brief

**1 LEGION ROAD**

MUNICIPALITY OF MEAFORD

WESTFIELD INVESTMENT GROUP INC.

SEPTEMBER 2020

SLA File: 20047

## Introduction

S. Llewellyn & Associates Limited has been retained by Westfield Investment Group Inc. to provide Consulting Engineering services for the proposed development at 1 Legion Road in the Municipality of Meaford. This report will outline the functional servicing strategy for the proposed development.

The proposed development consists of demolishing an existing two-storey commercial building and constructing a five-storey residential building including an asphalt parking lot, concrete curb, concrete walkways, landscaped areas and one level of underground parking.

This Functional Servicing Brief will provide detailed information of the proposed servicing scheme for this development. Please refer to the site engineering plans prepared by S. Llewellyn and Associates Limited and the site plan prepared by Andre Sherman Architect for additional information.

## Sanitary Sewer Servicing

An existing 350mm $\varnothing$  sanitary sewer flows east along Legion Road. The proposed development will be serviced by a private 200mm $\varnothing$  sanitary sewer system which connects to the existing 350mm $\varnothing$  sanitary sewer along Legion Road. This sanitary sewer system will be designed and constructed in accordance with the Municipality of Meaford standards.

Sanitary demand for the site was estimated in accordance with Ministry of Environment Guidelines for the Design of Sanitary Works. Table 1 below summarizes the peak sanitary discharge.

Population <sup>1</sup>	Peaking Factor <sup>2</sup>	Site Area (ha)	Average Demand (Lcpd)	Infiltration (l/s)	<b>Peak Flow<sup>3</sup> (l/s)</b>
216 persons	4.1	0.67	450	0.2	<b>4.75</b>
<sup>1</sup> Population (P) = 20 1-bedroom units x 2 persons/unit + 44 2-bedroom units x 4 persons/unit = 216 persons <sup>2</sup> Peaking Factor (M) = $(1+(14/(4+P^{0.5})))$ with P expressed in thousands <sup>3</sup> Peak Flow=MQP/86.4 + IA					

The grade of the proposed 200mm $\varnothing$  sanitary sewer will be 0.5%. At this grade, the proposed sanitary sewer will have a capacity of 0.023 m<sup>3</sup>/s (23 l/s). Therefore, the proposed 200mm $\varnothing$  sanitary sewer is adequately sized to service the proposed development.

## Domestic Water Demand

There is currently no existing municipal distribution system fronting the site. A proposed municipal watermain along Legion Road is required in order to service the proposed development. The proposed water servicing for the subject lands consists of installing a 200mm watermain to connect into the proposed municipal watermain along Legion Road.

Water demand for the site was estimated in accordance with the Ministry of the Environment Design Guidelines for Drinking-Water Systems. Table 2 below summarizes the domestic water demand requirements for the Average Daily, Maximum Daily and Peaking Hourly demand scenarios.

<b>Table 2 - Post-Development Domestic Water Demand</b>					
Population <sup>A</sup>	Average Daily Demand <sup>B</sup> (l/s)	Max. Daily Peaking Factor <sup>C</sup>	Max. Hourly Peaking Factor <sup>D</sup>	Max. Daily Demand <sup>E</sup> (l/s)	Max. Hourly Demand <sup>F</sup> (l/s)
216 persons	0.90	4.9	7.4	<b>4.41</b>	<b>6.66</b>
<sup>A</sup> Population (P) = 20 1-bedroom units x 2 persons/unit + 44 2-bedroom units x 4 persons/unit = 216 persons <sup>B</sup> Average Daily Demand = (270 l/cap/day + 450 l/cap/day)/2 = 360 l/cap/day x population <sup>C</sup> Max. Daily Peaking Factor = 4.9 (refer to Table 3-3 from MOE Manual) <sup>D</sup> Max. Hourly Peaking Factor = 7.4 (refer to Table 3-3 from MOE Manual) <sup>E</sup> Max. Daily Demand = Average Daily Demand x Max. Daily Peaking Factor <sup>F</sup> Max. Hourly Demand = Average Daily Demand x Max. Hourly Peaking Factor					

## Fire Flow Demand

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).

There is an existing fire hydrant located east of the subject lands on Berry Street. An additional private fire hydrant is proposed to meet the required 90m separation to the building face of the proposed building (as per Sentence 3.2.5.7 of the 2012 Ontario Building Code).

The proposed building will be constructed of non-combustible construction (C=0.8), with limited combustible occupancy (-15% correction) and a fully supervised sprinkler system. Exposure corrections are based on the following:

North Face: 15% correction (10.1m to 20m)  
 South Face: 0% correction (>45m)  
 East Face: 10% correction (20.1m to 30m)  
 West Face: 15% correction (10.1m to 20m)  
 Total: 40%

Attached is an estimate of the required flow rate for the proposed development. The flow rate was determined in accordance with the Fire underwriters Survey – 1999 Water Supply for Public Fire Protection. It has been determined that the required fire flow for the proposed development is **15000 l/min (250 l/s)**. See the attached Fire Flow Demand Requirements for details.

There are currently no hydrant flow tests available. Flow tests will be completed at a later date to determine if the existing municipal system has sufficient capacity to service the proposed development.

We trust the information enclosed herein is satisfactory. Should you have any questions please do not hesitate to contact our office.

Prepared by:

**S. LLEWELLYN & ASSOCIATES LIMITED**

*Scott Nelson*

S. Nelson, EIT



S. Frankovich, P.Eng.

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

**Project Number:** 20047  
**Project Name:** 1 Legion Road  
**Date:** 27-Aug-20

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:

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

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 / Location	Building Area			Type of Construction	(1)		(2)			(3)		(4)		Final Adjusted Fire Flow	
	Footprint Area (m <sup>2</sup> )	# of Storeys	Total GFA (m <sup>2</sup> )		Fire Flow "F"		Occupancy			Sprinkler		Exposure		(l/min)	(l/s)
					(l/min)	(l/s)	%	Adjustment (l/min)	Adjusted Fire Flow (l/min)	%	Adjustment (l/min)	%	Adjustment (l/min)		
<b>5-Storey Building</b>	<b>13040.0</b>	<b>1</b>	<b>13040</b>	<b>0.8</b>	20000	333.3	<b>-15</b>	-3000.0	<b>17000.0</b>	<b>-50</b>	-8500.0	40	6800.0	<b>15000</b>	<b>250</b>

Floor	Area	Tot. Area	Cumm. Area
1	1136	1136	1136
2-5	2976	2976	13040

**(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%.

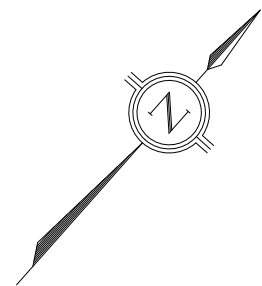
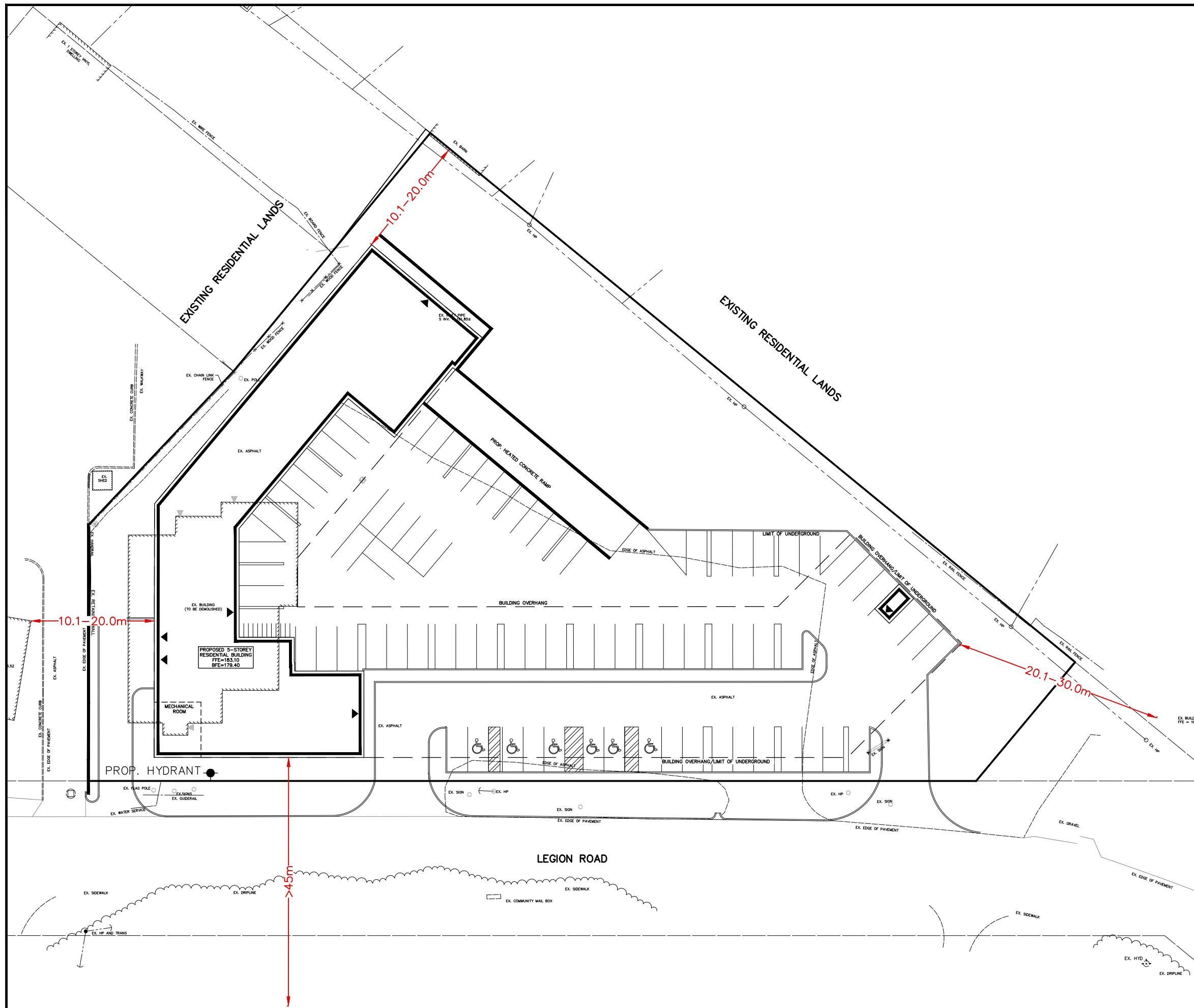
If the domestic and fire services are supplied by the same municipal water system, then take an additional 10%.

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

Side	Exposure (m)	Charge (%)
North =	<b>10.1 to 20m</b>	<b>15</b>
South =	<b>&gt;45</b>	<b>0</b>
East =	<b>20.1 to 30m</b>	<b>10</b>
West =	<b>10.1 to 20m</b>	<b>15</b>
<b>Total Expoure =</b>		<b>40</b>



**FUS PARAMETERS PLAN**  
 SCALE: 1:500  
 PROJECT: 1 LEGION ROAD, MEAFORD, ON  
 PROJECT No.: 20047



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