October 29, 2021

MTE File No.: C49791-100

Shophan Daniel City of Guelph 1 Carden Street Guelph, Ontario N1H 3A1

RE: 601 Scottsdale Drive

Functional Servicing and Stormwater Management Brief

Background and Existing Conditions

MTE Consultants Inc. was retained by FEP Real Estate Development Ltd. to prepare a Site Grading Plan and Functional Servicing and Stormwater Management Brief in support of the zoning by-law amendment application to convert an existing hotel into student housing at 601 Scottsdale Drive in the City of Guelph.

The subject lands comprise a total of approximately 2.2 hectares, and currently contains a hotel, recently operated as a Holiday Inn. The lands are located at the intersection of Stone Road West and Scottsdale Drive, in an area that contains a wide range of commercial uses, including the Stone Road Mall. Stone Road is a major road within the City, linking the Hanlon Parkway and the west side of Guelph, with the University of Guelph and Gordon Street and the City's downtown area.

The development proposal includes the repurposing of the existing hotel building, including internal renovations, for the future use of the building as a student residence.

The existing hotel contains 136 suites, as well as conference rooms that were previously used to host events. The hotel contains a large surface parking area (261 spaces) that generally surrounds the existing building on all sides, with the majority of parking located to the northwest of the building. The site has two entrances from Scottsdale Drive, with internal driveways providing access to the rear of the building, as well as a drop off area along the Stone Road frontage. The building is 4-storeys (facing Scottsdale Drive), with the height sloping towards the west. A small playground is located on the northwest side of the building.

The internal renovations will result in the creation of 164 suites (with 177 beds), which will include the repurposing of the existing hotel suites and the conference/meetings room for student residence suites. The majority of the suites will be studios, however there will be a limited number of 1 and 2 bedroom suites. The existing surface parking lot contains 261 parking spaces – minor reductions in parking supply are planned to accommodate the renovations to the building on the east side (e.g. installation of window wells for lower floor units) and additional landscaping on the east and west sides. After the renovations and additional landscaping is added to the site, the supply of parking will be reduced to 205 spaces. The renovations will also result in the creation of dedicated common amenity areas for the future residents, including:

- Meeting rooms;
- Laundry room;
- Fitness room;

- Prep kitchen (where students can create some of their own meals);
- Games room; and
- A BBQ area.

Minor changes to the building elevations are proposed to accommodate additional windows that provide more natural light, to improve accessibility and other than minor cosmetic colour changes to the exterior.

Servicing

Please refer to Figure 1.0, appended to this brief, for an overview of the existing site servicing layout.

Sanitary

The existing building is currently serviced by a 200mm diameter sanitary sewer which drains towards the west corner of the site. The sewer then upsizes to 250mm diameter as it traverses through an easement towards Torch Lane. It is noted the existing sanitary sewer from the TD Bank, located at the corner of Scottsdale Drive and Janefield Avenue, ties into the aforementioned 250mm diameter sanitary sewer in the easement. It is unclear who retains ownership of the 250mm diameter sanitary sewer at this time.

In the proposed condition there will be 177 beds (164 units), which is 41 more beds than in the existing condition (136 units and assuming 1 bed per unit). Utilizing the average daily flow rate for apartments (150 units/ha) as provided in the City of Guelph Development Engineering Manual (2019) and adjusting the area to represent the actual number of units, the proposed sanitary flow is calculated as 7.08 L/s which is approximately 30% higher than the existing condition rate of 5.46 L/s. Refer to Appendix A for the sanitary flow rate analysis. Please note the above flows are substantially larger compared to the flows calculated when utilizing Section 8.2.1.3. – Sewage System Design Flows (OBC) and therefore may not accurately reflect the actual flow.

The existing 200mm diameter sanitary service has a slope of approximately 1.0%. The full flow capacity of a 200mm diameter sewer at 1.0% is 32.8 L/s which is greater than the anticipated demand. Therefore, it will continue to have sufficient capacity to convey the sanitary flow from the site. Refer to the sanitary sewer design sheet for the pipe run connecting from the site to the sewer located within the easement in Appendix A.

Storm

Numerous existing catchbasins are located throughout the property and there is one storm sewer connection to the building. The storm sewer also drains towards the west corner of the property via a 450mm diameter sewer which upsizes to a 600mm diameter storm sewer through the easement and towards Torch Lane.

There are no changes proposed to the on-site storm sewer system. Further, the proposed site plan modifications result in a slight reduction in imperviousness of the site (due to the removal of some parking areas). Therefore, the on-site storm sewers will continue to function as originally designed. Please note details regarding the site plan modifications will be submitted with a Site Plan application at a future date.

Stormwater Management

As previously mentioned, the only proposed exterior work is the removal of parking spaces which are to be replaced with landscaping. Therefore, the overall imperviousness of the site will decrease resulting in slightly reduced runoff rates and slightly improved water quality. Because of this, no stormwater management quantity or quality controls are proposed.

Water

The site is currently serviced by a 250mm diameter service which is connected to the existing 200mm diameter watermain located within the Scottsdale Drive right-of-way. Based on the original design drawings for the Site, the 250mm diameter service splits into a 200mm diameter fire main and a 100mm diameter domestic service before entering the east corner of the building. With respect to firefighting, the building is currently sprinklered and will continue as such, however it is understood there will be some updates to the interior sprinkler system (to be completed by others). The existing fire department connection is located near the east corner of the building while an existing municipal hydrant is located at the west corner of the intersection of Stone Road West and Scottsdale Drive. The hydrant is located 46.5m from the fire department connection. While this exceeds the typical allowable distance of 45.0m, we respectfully ask the City of Guelph Engineering Department, in conjunction with the City of Guelph Fire Department, to review and comment on the acceptability of the existing fire department connection to hydrant distance.

Detailed water demand calculations for the proposed building use have been completed and are included in Appendix B. The maximum day domestic demand for the site under the proposed condition was determined to be 1.05 L/s, which is approximately 30% higher than the existing demand of 0.81 L/s.

The building was analyzed for fire water supply requirements using the OBC 2012 and FUS. It was determined the required minimum water supply flow rate for the existing building is 9,000 L/min and 23,000 L/min based on OBC and FUS requirements, respectively. The existing building construction type was assumed to be the most conservative option for the purposes of OBC and FUS calculations. Refer to Appendix B for calculations.

The pressures and flows must also be sufficient for firefighting conditions as established by the Ontario Building Code (2012). The minimum residual pressure permitted under fire fighting conditions is 140.0 kPa (20.3 psi) per OBC 2012 A-3.2.5.7 3(b).

Section A-3.2.5.7.2 of the OBC relates to water supply for firefighting in sprinklered buildings. For sprinklered buildings, water supply additional to that required by the sprinkler systems should be provided for firefighting using fire hoses in accordance with the hose stream demands and water supply durations for different hazard classifications as specified in National Fire Protection Association's (NFPA) NFPA 13, "Standard for the Installation of Sprinkler Systems".

Information obtained by Spira Fire Protection Ltd. on September 7, 2021 from the municipal hydrants located at the corner of Stone Road West and Scottsdale Avenue, and the corner of Janefield Avenue and Scottsdale Avenue has been used to support the fire flow analysis. The test results are included within Appendix B.

The site specific system demand for the sprinkler system is 1800 L/min (475 gpm, as provided by Classic Fire Protection Inc.). However, the existing municipal hydrant was analyzed for a flow rate of 9,000 L/min, the maximum as required by the OBC, as a worst case scenario. The residual pressure at the existing municipal hydrant was calculated to be 256.0 kPa for a flow rate of 9,000 L/min, which is greater than the minimum allowable pressure of 140 kPa per OBC 2012. The minimum required flow to meet the FUS demand of 23,000 L/min cannot be achieved by the existing system. Please refer to Appendix B for calculations.

Conclusions

Based on the foregoing analysis, it is concluded that:

- The existing on-site water, sanitary and storm infrastructure will continue to function as originally designed;
- ii) The minor site plan changes (replacing parking areas with landscaping) result in reduced imperviousness and therefore no stormwater quantity or quality controls are proposed;
- iii) The anticipated peak sanitary flow rate is 7.08 L/s;
- iv) The anticipated domestic water demand is 1.05 L/s;
- v) The anticipated OBC and FUS firefighting demand is 9,000 L/min and 23,000 L/min, respectively; and,
- vi) The maximum required OBC water supply flow rate of 9,000 L/min can be provided to the existing municipal hydrant with a residual pressure under firefighting conditions of 256.0 kPa for 9,000 L/min, thus meeting the minimum requirements of the Ontario Building Code (2012).

Recommendations

It is recommended that:

- i) The minor site grading alterations be undertaken according to the proposed layout, elevations and details shown on the separately submitted engineering drawing GP-1; and,
- ii) The proposed civil works be inspected by MTE Consultants Inc., during construction, and certified to the City of Guelph upon completion.

We trust that this information is satisfactory. Please contact the undersigned if you have any questions.

Yours truly,

MTE Consultants Inc.

Adam Slawich, E.I.T.
Designer
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aslawich@mte85.com

Lynn Ingram, P.Eng. Design Engineer 519-743-6500 ext. 1381 lingram@mte85.com

AJS:scm Encl.

cc: Steven Pink/Dayna Gilbert, Forum Equity Partners Tina Omrani, MTE Consultants Inc.

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Appendix A

Sanitary Servicing



601 Scottsdale D	rive									Des	ign Param	eters				
CITY OF GUELPH				SA	NITARY SEV	WER DE	SIGN SI	HEET	Average Daily FI	ow ³						
									Residential	1.00	L/s/ha	Manning's "n"	0.013		AA	
					ENGINEE	RING SE	RVICES		Commercial		L/s/ha				M	
	49791-100 October 28, 2	2021							Industrial School/Mult Fam		L/s/ha L/s/ha	<u>Velocity</u> Minimum	(<u>m/s</u>) 0.6			
Design By:	AJS								Apt (150upha)	6.00	L/s/ha	Maximum	3.0			
,	LEI Q:\49791\100\Sa	anitary Sewer De	sign Sheet.xls						Apt (295upha)	7.00	L/s/ha					
LOCATION					SAN	ITARY FLC	w						DESIGN			
STREET	AREA NUMBER	MANHOLE FROM MH	TO MH	AREA (A) ²	CONTRIBUTING UNIT TYPE	SANITARY COEFF.	SANITARY FLOW	CUMULATIVE FLOW	PIPE SIZE	PIPE TYPE	LENGTH	SLOPE	CAPACITY	FULL FLOW VELOCITY	ACTUAL FLOW VELOCITY	% PIPE FULL
				ha		L/s/ha	L/s	L/s	mm		m	%	L/s	m/s	m/s	%
Existing Use (137 beds) ¹ Proposed Use (177 beds)	1			0.91	Apartment (150upha) Apartment	6.00	5.4600 7.0800	5.4600 7.0800	200	PVC	5.0	1.00	32.7818 32.7818	1.0440	0.7737 0.8325	16.7% 21.6%
Proposed USE (177 beds)				1.16	(150upha)	6.00	7.0800	7.0800	200	FVC	5.0	1.00	32.7818	1.0440	0.0323	21.0%

^{*} All sanitary design flows include an allowance for peaking and 10.0 cm/ha/day for infiltration.

- Notes:

 1. Unit/bed counts based on information provided by Forum Equity Partners.

 2. Equivalent area based on actual unit/bed count.

 3. Average daily flow values taken from City of Guelph Development Engineering Manual (2019).

Appendix B

Water Servicing





601 Scottsdale Drive FIRE FLOW DEMANDS

Guelph, Ontario

Project #: 49791-100

Date: September 30, 2021
Date Printed: 10/1/2021

By: AJS

															F	ire Fl	ow²							Dome	stic Flo	w ^{3,4}		
		Developm	ent Info	rmation ¹					Ont	ario B	uilding C	ode					Fire Underv	writers S	urvey									
Node ID Area ID Building	/ F.F.E.	Description	# of Beds	Population	Bldg Area (1st Floor)	Total Bldg Area	Building Volume	к	v	S _{tot}	Q	F	F	С	Α	F	(2) Occupancy Reduction	(3) Sprinkler Protection	(4) Building Exposure	F	F	Fire Flow (Max OBC/FUS)	MOE Guidelines	Average Day	Max Day	Peak Hour	Minimum Hour	Max Day + Fire Flow
				# of people	m ²	m ²	m ³		m³		L	L/min	L/s		m ²	L/min				L/min	L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s
			177	212	3,253	8,642	32,435	23	32,435	1.00	746,005	9,000	150	1.50	8,642	30,678	-15%	-50%	40%	23,000	383	383	0.383	0.383	1.053	1.581	0.153	384
		TOTALS FOR SITE	177	212	3253	8642	32435				Max Fire	Flow =	150						Max Fir	e Flow =	383	383	0.38	0.38	1.05	1.58	0.15	384

Sum of Maximum Day Flows + Largest Fire Flow (L/s) =

384

Assumptions:

- 1 All building areas based on the Site Plan by Comn Architects. Bed counts and population based on information provided by Forum Equity Partners.
- 2 All buildings are classified as occupancy group C (Residential Occupancy) and building construction type assumed to be the 'worst case' classification.
- 3 Average Daily Demand is taken from guelph.ca/living/environment/water

Residential = 156 L/cap/day

4 Peaking Factors based on "Design Guidelines for Drinking-Water Systems" (MOE, 2008):

Average Day = 1

Maximum Day = 2.75

Peak Hour = 4.13

Minimum Hour = 0.4

601 Scottsdale Drive

Guelph, Ontario
Project No: 49791-100
Date: 30-Sep-21
Designer: AJS



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

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:

$$F = 220 C \sqrt{A}$$

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

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures.

The table below summarizes the adjustments made to the basic fire flow demand.

			(1	(1)		(2)		(3)		(4)	Final Adjusted				
	Area "A"	С	Fire Flo	Fire Flow "F"		upancy	Sp	rinkler	Exp	osure	Fire Flow				
Building	(m ²)		(l/min)	(l/s)	%	Adjusted Fire Flow (L/min)	%	Adjustme nt (L/min)	%	Adjustme nt (L/min)	(L/min)	Rounded(L/min)	(L/s)		
Student Residence	8,642	1.5	30,678	511.3	-15	26,076	-50	-13,038	40	10,430	23,468	23,000	383		

alculate for all
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narge shall not
ceed 75%
(



601 Scottsdale Drive FIRE FLOW ANALYSIS

Guelph, Ontario

Project Number: 49791-100

Date: September 20, 2021

Design By: AJS

File: Q:\49791\100\Fire Flow Analysis.xlsx

Step 1: Determining Water Supply Coefficient

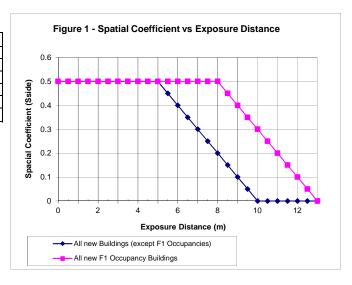
	Table 1 from OB														
			Cla	ssi	fica	tion	by	grou	o or	divis	ion in	Αc	cord	and	се
	Type of Construction		W	th	Tab	le 3	1.2.	1 of t			rio Bui	_		ode	;
		Α	2 E	31	B2	B3	С	D	A4	F3	A1 A	3	E F	2	F1
	Building is of Noncombustible construction with fire														
	separation and fire-resistance ratings provided in														
	accordance with Subsection 3.2.2 of the OBC, including														
1	loadbearing walls, columns and arches							10		12	1	4		17	23
	Building is of Noncombustible construction or of heavy														
	timber construction conforming to Article 3.1.4.6 of the														
	OBC. Floor assemblies are fire separations but no fire-														
	resistance rating. Roof assemblies, mezzanines,														
	loadbearing walls, columns and arches do not have a fire-														
2	resistance rating.							16		19	2	22		27	37
	Building is of Combustible Construction with fire														
	separations and fire-resistance ratings provided in														
	accordance with Subsection 3.2.2 of the OBC, including														
	loadbearing walls, columns and arches. Noncombustible														
	construction may be used in lieu of fire resistance rating														
3	where permitted in subsection 3.2.2 of the OBC							18		22	2	25		31	41
	Building is of combustible construction. Floor assemblies														
	are fire separations but with no fire-resistance rating.														
	Roof assemblies, mezzanines, loadbearing walls,											J			
4	columns and arches do not have a fire-resistance rating.							23		28	3	32		39	53

Type of	Building	Water Supply
Construction	Classification	Coefficient (K)
4	C	23

Note: 'Worst case' building construction has been utilized for these calculations.

Step 2: Determine the Spacial Coefficient

	Distance	S _{side}
Exposure Distance 1 (m)	24.00	0.00
Exposure Distance 2 (m)	19.00	0.00
Exposure Distance 3 (m)	16.00	0.00
Exposure Distance 4 (m)	140.00	0.00
Exposure Distance 5 (m)		
	S	1 00





Step 3: Determine Volume of Building

Building Length(m)	Building Width (m)	Building Height to the underside of roof deck (m)	Volume (m³)
55.00	40.00	15.00	32435.00

Number of Stories

Step 4: Calculate Minimum Water Supply

$$Q = KVS_{tot}$$

Minimum Water Supply (L) 746005.00

Step 5: Calculate Minimum Supply Flow Rate

Table 2 from C	DBC 2012 A3.2	2.5.7	
Minimum Water	Supply Flow	Rates	
Building Code, Part 3 Buildings	•	Minimum Wat ow Rate (L/mi	,
One Storey Building with building area not exceeding 600 m2 (excluding F1 occupancy)		1800	
All Other Buildings	if Q> and	Q<=	
		108000	2700
	108000	135000	3600
	135000	162000	4500
	162000	190000	5400
	190000	270000	6300
	270000		9000

Minimum Water Supply Flow Rate (L/min) 9000

Step 6: Is a private fire reservoir required? No



601 Scottsdale FIRE FLOW ANALYSIS

Guelph, Ontario

Project Number: 49791-100

Date: September 20, 2021

Design By: AJS

File: Q:\49791\100\Fire Flow Analysis.xlsx

CALCULATION OF RESIDUAL PRESSURE AT MUNICIPAL HYDRANT

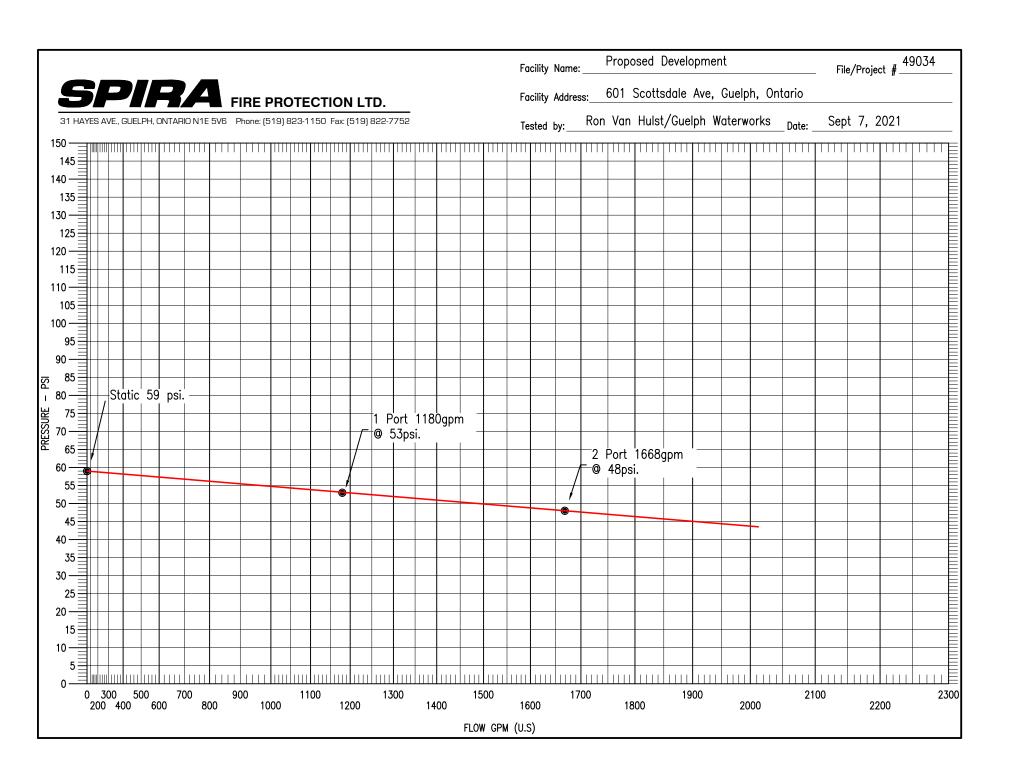
1. Boundary Conditions (Based of	on Fire Flow Test Results):	
	Metric	Imperial	
P0 - Starting Pressure	41.49 <i>m</i>	59 psi	
P1 - Pressure at Q1	37.27 m	53 psi	
Q1 - From Fire Flow Test	4467 L/min	1180 U.S. gal/min	
Q2 - Required Flow	9000 <i>L/min</i>	2378 U.S. gal/min	From: Water Demand calculations by MTE
P-loss 1	4.22 <i>m</i>	6 psi	
P-loss 2	15.44 <i>m</i>	22 psi	
P2 - Residual Pressure	26.05 m	37 psi	Extrapolated from Fire Flow Test Results

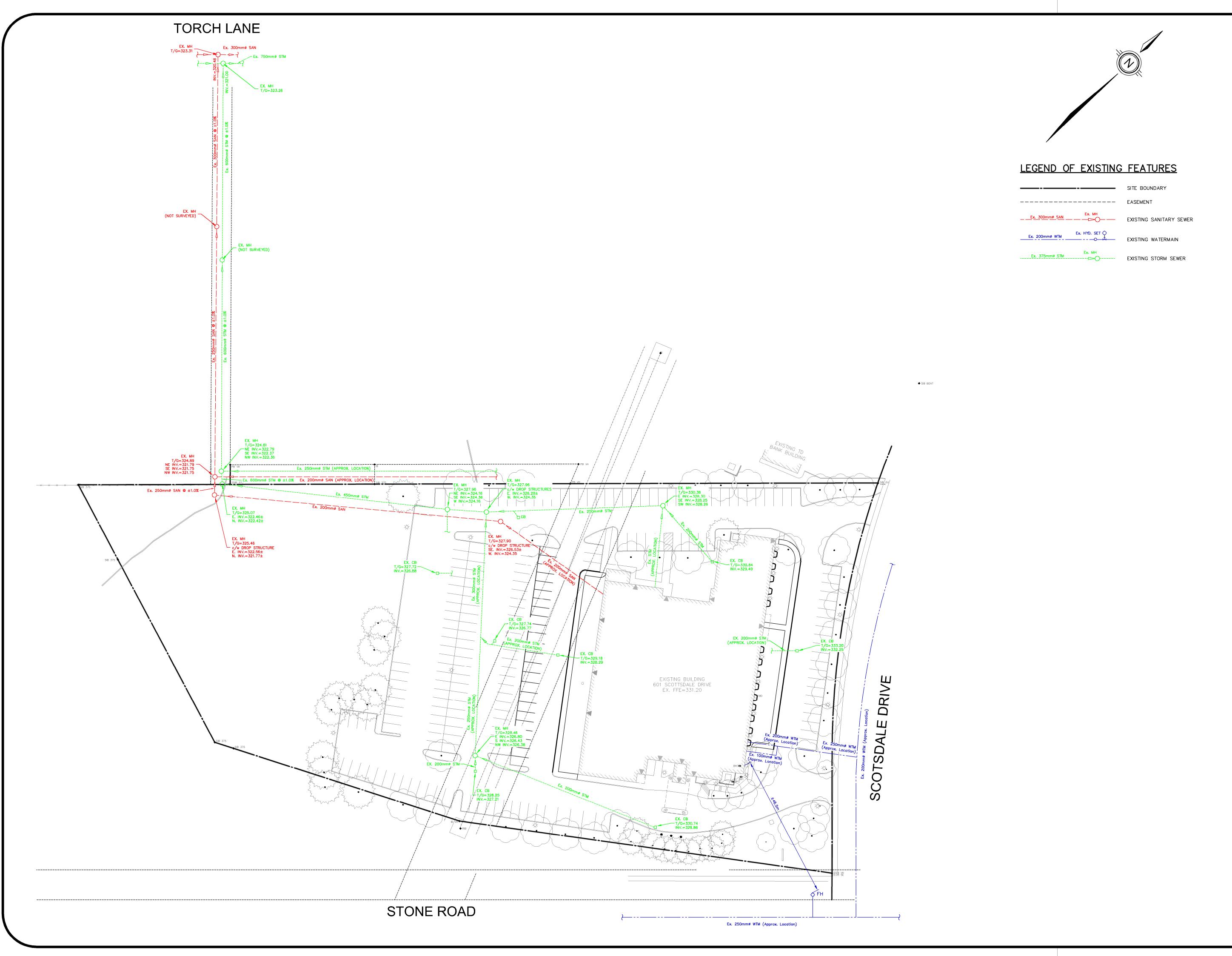
ANALYSIS SUMMARY			
Total Losses	0.000 m		
	0.00 kPa	0.0 psi	
Residual Pressure after Losses	26.05 m		
	256 kPa	37.1 psi	PASS
Allowable Residual Pressure	140 kPa	20.3 psi	

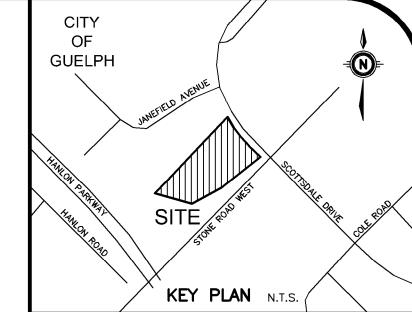
					\	VATE	R SU	PPL	/ TES	Τ						
Facilit	y Name:	Proposed	Develop	ment								File/Proj	ect #:	490	34	
Facilit	y Address	: 601 Scot	tsdale A	ve, Guelpł	n, Ontario)										
Tested	d by:	Ron Van	Hulst					Witnes	sed by:	Guelph	Waterwo	rks				
	of Main:	C	omments:													
	ø8"															
□ Τι ⊠ Lα	ead End wo Ways oop															
low l	Hydrant Lo	ocation:	Hydrant	Located	On West	Side C	of Sco	ttsdal	e Ave N	lorth Co	rner Of	Janefield .	Ave			
Residu	ıal Hydrar	nt Location:	Hydrant	Located	On West	Side C	of Sco	ottsdal	e Ave N	lorth Co	rner Of	Stone Rd	West			
Static	Pressure	:	59	psi	Date:	ept 7,	2021				Time	8:00			AM	ı 🖂 i
Test No.	No. of Outlets	Orifice Size (in.)		itot Reading osi)		ralent Flor (U.S.)		Total Flo gpm (U.		Residuo (psi)	Pressure	Comments	ı			
1	1	2½"		40	- 1	1180			180		53					
2	2	2½"		2(20))	2(834)	,	16	668	4	ŀ8					
3																
4																
Site N	lap:						<u> </u>					1				
								7								
														NI		
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		-														
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Name and Address of authority who should recieve a copy.

City Of Guelph Waterworks Dept. Att: Jim Hill







GEODETIC BM ELEV. = ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM WITH HEIGHTS CONVERTED ON THE CVGD28 (1978) DATUM WITH GEOID MODEL HTV2.0.

SITE BENCHMARK SEE ABOVE.

ELEV. =

NOTE TO CONTRACTOR:

DO NOT SCALE DRAWINGS.

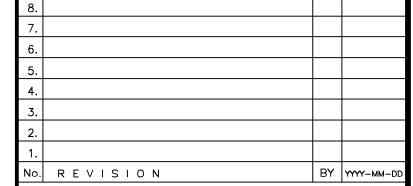
CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.

THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

1. PROPERTY-LINE IS APPROXIMATE ONLY.

- 2. EXISTING TOPOGRAPHICAL INFORMATION PROVIDED BY VAN HARTEN SURVEYING INC. ON OCTOBER 7,
- 3. EXISTING WATERMAIN INFORMATION TAKEN FROM AS-RECORDED PLAN AND PROFILE DRAWING 2H-019 COMPLETED BY THE CITY OF GUELPH DATED AUGUST 2004. INVERTS DENOTED WITH ± ARE TAKEN FROM AS-DESIGNED SITE DRAWINGS PROVIDED BY THE CITY OF GUELPH, AND ARE CONSIDERED APPROXIMATE ONLY.





519-743-6500

FEP REAL ESTATE DEVELOPMENT LTD.

181 BAY STREET SUITE EP210

601 SCOTTSDALE DRIVE

EXISTING SERVICING FIGURE

Project Manager		Project No.	
	T. OMRANI	4	9791-100
Design By	AJS	Checked By	LEI
Drawn By	GLC	Checked By	AJS
Surveyed By OTHERS		Drawing No.	
Date	Oct.01/21	F1	1.0
Scale	1:500	Sheet 1 of	1