



Owen Sound Hampton Inn

Servicing Feasibility Report

Project Location:

1750 16th Avenue East
Owen Sound, ON N4K 5N3

Prepared for:

Groupe Sterling
1395 Rue De l'Eglise
Saint-Laurent, Quebec H4L 2H1

Prepared by:

MTE Consultants Inc.
520 Bingemans Centre Drive
Kitchener, ON N2B 3X9

November 5, 2024

MTE File No.: 55873-100





Contents

1.0	Introduction	1
2.0	Criteria.....	1
2.1	Existing Topography	1
2.2	Existing Servicing.....	3
2.2.1	Water	3
2.2.2	Sanitary	3
2.2.3	Storm.....	3
3.0	Methodology.....	4
3.1	Proposed Grading.....	4
3.2	Proposed Servicing.....	4
3.2.1	Water	4
3.2.2	Sanitary	5
3.2.3	Storm.....	5
4.0	Conclusions and Recommendations	7

Figures

Figure 1.0 – Site Location Plan	2
---------------------------------------	---

Appendices

- Appendix A Fire Flow Analysis and Water Demand
- Appendix B Sanitary Design Sheet

Drawing

Functional Site Grading Plan MTE Drawing No. C2.1	Appended
Functional Site Servicing Plan MTE Drawing No. C2.2	Appended

1.0 INTRODUCTION

MTE Consultants Inc. was retained to complete a Servicing Feasibility Report for Phase 1 of the development at 1750 16th Avenue East (herein referred to as 'the Site') in the City of Owen Sound in support of the Official Plan Amendment and Zoning By-Law Amendment Application.

The Site is bounded to the north by an entrance to the Heritage Place Mall, to the east by 16th Avenue East right-of-way, to the south by an existing building on the property (to be severed), and to the west by the Heritage Place Mall. For the exact location of the Site refer to Figure 1.0. The proposed development for the Site is the construction of a 6-storey hotel building with associated driveway and parking areas.

The purpose of this study is to support the Official Plan Amendment and Zoning By-Law Amendment Applications. This will be accomplished by reviewing the opportunities and constraints for the subject property with respect to servicing and grading; reviewing the requirements of the reviewing agencies; describing the development concept; and demonstrating the functional serviceability of the property. Pending approval of the Amendment application, detailed design of the site will commence and be submitted to the City in support of Site Plan Approval.

2.0 CRITERIA

2.1 Existing Topography

The Site encompasses a developable area of 0.826ha and is currently vacant. In the existing condition, the surface runoff from the Site drains from west to east to an existing ditch along 16th Avenue East. There is an elevation difference of approximately 0.5m between the west and east property line. The Site is pervious in the existing conditions.

CITY OF OWEN SOUND



Engineers, Scientists, Surveyors

PROJECT
**HAMPTON INN OWEN SOUND
CIVIL WORKS**

TITLE
SITE LOCATION PLAN

Drawn	TXT	Scale	N.T.S.	Figure
Checked	JHN	Project No.	55873-100	
Date	2024-11-03	Rev No.	0	

FIGURE 1.0

2.2 Existing Servicing

2.2.1 Water

There is an existing 250mm diameter municipal watermain along the 16th Avenue East right-of-way, located on the opposite side of the right-of-way. There is an existing abandoned 250mm diameter municipal watermain along the ditch, adjacent to the Site. The closest municipal fire hydrant is located on the other side of 16th Avenue East near the northeast corner of the Site. There is no existing water connection for the Site.

A flow test was performed at the fire hydrant on 16th Avenue East by Northern Sprinkler on October 30, 2024. Refer to Table 2.1 below for a summary of flow test results.

Table 2.1 – Results of Flow Tests

Results of Flow Tests Completed October 30, 2024 by Northern Sprinkler					
Test #	Outlet Inside Diameter (in)	Number of Outlets	Pitot Pressure (psi)	Residual Pressure (psi)	Flow @ Residual (gal/min)
1	n/a	n/a	n/a	80	0
2	2.5	1	58	65	1,278
3	2.5	2	36+37	60	2,028

Refer to Appendix A for further details.

2.2.2 Sanitary

There is an existing 250mm diameter sanitary sewer along 16th Avenue East right-of-way which drains toward the north. The closest manholes are located at the northwest and southwest corners of the Site. and is approximately 2.97m and 3.5m deep. There is no existing sanitary connection for the Site.

2.2.3 Storm

There is an existing municipal ditch along 16th Avenue East right-of-way. There is an existing 900mm diameter culvert located at the northeast corner of the Site that drains towards the north, capturing drainage from the ditch. The closest existing manhole is located at the northeast corner of the Site and is approximately 2.14m deep. Surface runoff from a majority of the site is conveyed overland to the existing ditch along 16th Avenue East of the site where it enters the existing culvert and storm sewer.

3.0 METHODOLOGY

Preliminary grading and servicing strategies for the proposed development have been developed based on the topographic survey, plan and profile information, and Conceptual Site Plan prepared by Mataj Architects, dated October 24, 2024.

3.1 Proposed Grading

The proposed development will have one 6-storey hotel building, complete with associated parking areas and driveway off 16th Avenue East. The proposed grading strategy will respect the existing grades along the north, south, and west property line. Regrading will involve directing runoff generated from the development to the proposed on-site storm structures, as well as filling in the existing ditch and maintaining positive flow for the proposed multi-use trail within the 16th Avenue East right-of-way.

3.2 Proposed Servicing

3.2.1 Water

A new connection to the 250mm diameter municipal watermain on the far side of 16th Avenue East will be required in order to service the proposed building. The required private water service size will be determined during detailed design but will likely be 200mm diameter.

Water Demand

The expected domestic water demand for the proposed building was calculated using OBC, MOE and City of Owen Sound design criteria.

Table 3.1 summarizes the expected domestic water demands for the Average Day, Maximum Day and Peak Hour demand scenarios. Detailed calculations are provided in Appendix A.

Table 3.2 – Domestic Water Demands

Building Demands		
Commercial Equivalent Population (CEP)	86 persons/ha x 0.826ha	72 persons
Average Day Demand	450L/person/day x 72 persons =	32,400L/s (0.375L/s) or 32.4m ³ /day
Peak Hour Demand	4.13 x 0.375L/s =	1.031L/s
Maximum Day Demand	2.75 x 0.375L/s =	1.549L/s
Max Day + Fire Flow(OBC)	105L/s + 1.5L/s	106.5L/s

Fire flow demands for the proposed Building were determined using the City of Owen Sound Engineering Standards and the OBC. The fire demands are summarized in Table 2.2 and detailed calculations are provided in Appendix A.

Table 3.3 – Fire Flow Requirements

Building	Required Fire Flow Rate
6-Storey Hotel Building	6,300L/min (105L/s)

One new on-site hydrant is required to provide fire protection for the building. The location of the proposed hydrant will be finalized once the locations of building's fire department connections are determined.

The residual pressure at the existing hydrant was calculated to be 338.0kPa for a flow rate of 6,300L/min, which is greater than the minimum allowable pressure of 140kPa per OBC 2012.

The proposed building will be sprinklered and will have a fire department connection located near the entrance fronting 16th Avenue East. The fire department connection will be within 45m of the existing hydrant, which satisfies the Ontario Building Code requirement (see OBC Section 3.2.5.16, provided in Appendix C). Therefore, the proposed watermain configuration is expected to be sufficient.

3.2.2 Sanitary

The anticipated sanitary sewer discharge rate from the proposed development is summarized in **Table 2.4**. Average sanitary loading per person is based on the City of Owen Sound Engineering Standards of 450L/cap/day.

Table 2.4 – Sanitary Sewer Discharge from Building

Population (Residents)	Flow (L/day)	Average Flow (L/s)	Peak Flow (L/s)
72 Persons	450L/person/day x 72 persons = 32,400L/day	0.375	1.88
Total Sanitary Demand		0.375	1.88

A sanitary flow design sheet has been prepared to determine the flows anticipated to be generated by the proposed development. With a site area of 0.826ha and calculated commercial equivalent population of 86person/ha, the resulting flow is expected to be 2.04L/s including infiltration from the Site.

It is proposed that the site will be serviced by a new 200mm diameter sanitary sewer complete with new manhole at the municipal sewer on 16th Avenue East. The private sanitary sewer is to be installed at a slope that provides depth for the servicing of the buildings while maintaining adequate capacity. Refer to Appendix B for the sanitary design sheet.

3.2.3 Storm

The municipal ditch along 16th Avenue East, adjacent to the east property line of the Site is proposed to be filled in as part of the urbanization of 16th Avenue East. The existing 900mm diameter culvert and storm sewer along 16th Avenue East right-of-way at the northeast corner of the Site will be replaced with new 900mm diameter storm sewer and new storm manhole. A 600mm diameter storm sewer with associated structures are proposed to convey existing runoff from the right-of-way to the new 900mm diameter storm sewer. A 600mm diameter culvert is

proposed at the southeast corner of the Site to capture the existing runoff from the southern right-of-way ditch.

A private storm sewer system will be installed on-site to collect rooftop runoff from the building and runoff from the common driveway and parking areas. The runoff collected in the storm sewers will be directed to the OGS unit located in the parking area near the northeast corner of the Site and on to the proposed storm sewer in the 16th Avenue East right-of-way, complete with new manhole. Runoff from the frontage of the property and dedicated amenity space and green space will flow towards the 16th Avenue East right-of-way.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing analysis, it is concluded that:

- i) The proposed grading design will respect the natural topography of the site to achieve a reasonable cut/fill balance where possible.
- ii) Existing municipal infrastructure for water, sanitary and storm is available along 16th Avenue Street.
- iii) Additional grading, servicing and stormwater management details will be provided during detailed design.

All of which is respectfully submitted,

MTE Consultants Inc.



Jolie Nguyen, B.Eng.
Designer
519-743-6500 ext. 1362
jnguyen@mte85.com

JPL:dlb

M:\55873\100\Reports\rpt_2024-11-05_FSR.docx



Jeff Lerch, P.Eng.
Design Engineer
519-743-6500 ext. 1307
jlerch@mte85.com

Appendix A

Fire Flow Analysis and Water Demand



**280 ALBERT STREET
FIRE FLOW DEMANDS**

Waterloo, ON
 Project #: 47185-200
 Date:
 Date Printed: 11/4/2024
 By: JHN

Development Information ¹							Fire Flow ²					Domestic Flow ^{3,4}							
Node ID / Area ID / Building #	F.F.E. (m.a.s.l.)	Description	# of Units	Population # of people	Bldg Area (1 st Floor) m ²	Total Bldg Area m ²	Building Volume m ³	Ontario Building Code					MOE Guidelines L/s	Average Day L/s	Max Day L/s	Peak Hour L/s	Minimum Hour L/s	Max Day + Fire Flow L/s	
								K	V	S _{tot}	Q	F							F
1	216.75	Building		72	1,150	6,900	24,150	10	24,150	1.00	241,500	6,300	105	0.375	0.375	1.031	1.549	0.150	106
TOTALS FOR SITE			0	72	1150	6900	24150	Max Fire Flow = 105					0.38	0.38	1.03	1.55	0.15	106	

Assumptions:

- All building area and population are based on the Site Plan by Mataj Architect.
 - The building is assumed to be classified as occupancy group C (Residential Occupancy) and has Type 1 Construction
 - Average daily demand per person taken from Owen Sound Engineering Standard:
 Commercial = 450 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



Hampton Inn Owen Sound FIRE FLOW ANALYSIS

Owen Sound, ON

Project Number: 55873-100

Date: November 4, 2024

Design By: JHN

File: Q:\55873\100\Fire Flow Demand - JHN.xlsx

CALCULATION OF RESIDUAL PRESSURE

1. Boundary Conditions (Based on Fire Flow Test Results):			
	Metric	Imperial	
P0 - Starting Pressure	56.26 m	80 psi	
P1 - Pressure at Q1	45.71 m	65 psi	
Q1 - From Fire Flow Test	4838 L/min	1278 U.S. gal/min	
Q2 - Required Flow	6300 L/min	1664 U.S. gal/min	From: Water Demand calculations by MTE
P-loss 1	10.55 m	15 psi	
P-loss 2	17.20 m	24 psi	
P2 - Residual Pressure	39.06 m	56 psi	Extrapolated from Fire Flow Test Results

2. Friction Losses Through Water Service:			
<u>Hazen-Williams Equation</u>			
	Metric	Imperial	
C _{hw} = Pipe Friction Factor	150	150	
k = conversion factor	10.675	4.727	
n = constant	1.852	1.852	
m = constant	4.8704	4.8704	
Q = Flow	6300 L/min		
Q = Flow	0.105 m ³ /s	1664 U.S. gal/min	
d = Pipe Diameter	200 mm	7.87 in	
	0.2 m		
p = Loss/Length	0.0389 m/m	0.0169 psi/ft	
Length	63 m	207 ft	
Loss	2.45 m	3.5 psi	
	24 kPa		
<u>Hazen-Williams Equation</u>			
	Metric	Imperial	
C _{hw} = Pipe Friction Factor	150	150	
k = conversion factor	10.675	4.727	
n = constant	1.852	1.852	
m = constant	4.8704	4.8704	
Q = Flow	6300 L/min		
Q = Flow	0.105 m ³ /s	8 U.S. gal/min	
d = Pipe Diameter	150 mm	5.91 in	
	0.15 m		
p = Loss/Length	0.1579 m/m	0.0684 psi/ft	
Length	4 m	13 ft	
Loss	0.63 m	0.9 psi	
	6 kPa		

3. Friction Losses Through Apurtenances:						
Apurtenances	Number	K	Velocity	Head Loss	Total Loss	
			m/s	m	m	psi
200mm Tee (branch)	1	0.840	3.342	0.478	0.478	0.680
150mm Tee (branch)	1	0.900	3.342	0.512	0.512	0.729
Valve - 200mm dia.	2	0.112	3.342	0.064	0.128	0.181
Valve - 150mm dia.	1	0.12	3.342	0.068	0.068	0.097
Total Minor Losses					1.187	1.687

2. Elevation - Elevational differences from existing hydrant to proposed hydrant (Approximate Only)		
	Metric	Imperial
Elevation at Boundary (i.e. Residual Hydrant):	216 m	709 ft
Elevation at Site Hydrant:	216.35 m	710 ft
Elevation Difference = Loss/Gain	0.35 m	0.5 psi

ANALYSIS SUMMARY

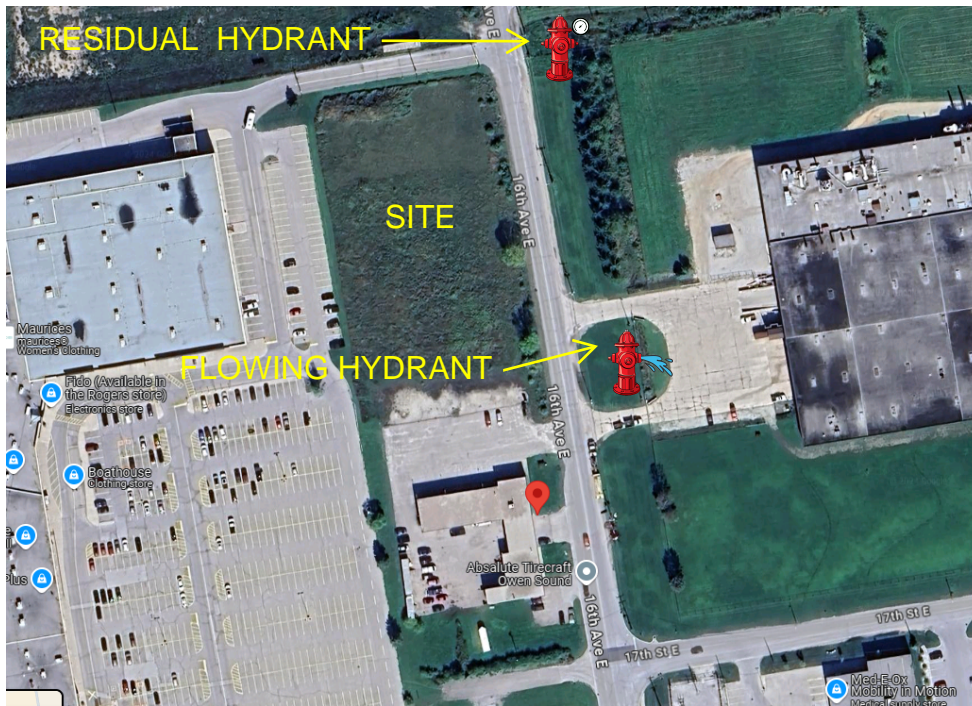
Total Losses	4.618 m		
	45.30 kPa	6.6 psi	
Residual Pressure after Losses	34.44 m		
	338 kPa	49.0 psi	PASS
<i>Allowable Residual Pressure</i>	<i>140 kPa</i>	<i>20.3 psi</i>	



PROJECT INFORMATION			
Project Name:	1750 16th Ave E Flow Test	Design Project #:	2024-NSD-102
Site Address:	1750 16th Ave E Owen Sound ON	Const. Project #:	NA
City Contact:	Mark Hill ext. 3401	Phone #:	519-376-4440
Flow Tester:	Andy Coghlin	Phone #:	519-476-0761
Technical Contact:	Andy Coghlin	Phone #:	519-476-0761

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
<input checked="" type="checkbox"/> Static / Residual & Flow Hydrants	<input checked="" type="checkbox"/> City Hydrant(s)	City:
<input type="checkbox"/> Flow Direction (if the main is dead end)	<input type="checkbox"/> Site Hydrant(s)	Site:

SITE NOTES



TEST INFORMATION

Minimum Required Flow:	NA	Min Ports:	2
Personnel Present:	Andy Coghlin	Test Date:	2024-10-30
City / External Company:	Owen Sound Utilities	Test Time:	9:30am

TEST EQUIPMENT

<input type="checkbox"/> Hose Monsters with built in Pitot	Hose length used:
<input type="checkbox"/> Hand held pitot gauge	<input checked="" type="checkbox"/> Pollard diffuser elbow with built in Pitot
<input type="checkbox"/> Other:	

TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)		Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports						80
1 Port	2.5	0.9	58		1,278	65
2 Ports	2.5	0.9	36	37	2,028	60
3 Ports	2.5	0.9			0	
4 Ports	2.5	0.9			0	
0 Ports	STATIC RE-CHECK					80

TEST NOTES

--	--	--	--	--	--	--

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)

ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)

Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	0

OTHER HYDRAULIC ADJUSTMENTS

Other adjustment as required by the City / AHJ:	
---	--

Appendix B

Sanitary Design Sheets

9075 Airport Road West

55873-100
 Date: November 4, 2024
 Design By: JHN

Manning's "n" 0.013



Velocity (m/s)
 Minimum 0.6
 Maximum 3.0

Sanitary Discharge Calculations

Location	Residential		Total Residential		Design					
	Population	Average Discharge (L/s)	Peak Flow (excluding infiltration) (L/s)	Total Sanitary Discharge + Infiltration (L/s)	Pipe Size (mm)	Length (m)	Slope (%)	Capacity (L/s)	Full Flow Velocity (m/s)	% Pipe Full (%)
Proposed Building - MH1A	72	0.375	1.88	2.04	200	20	2	46.360	1.476	4.4%
MH1A - MH2A				2.04	200	9.8	0.5	23.180	0.738	8.8%
MH2A - Ex. MH				2.04	250	38.2	0.34	34.658	0.706	5.9%
Proposed Totals	0	0.375	1.88	2.04	300	68	2.84	162.880	2.305	1.3%

Sanitary Demand		
Commercial	450	L/ca/day
	0.0052	L/ca/sec
Harmon Peaking Factor (M)	4.27	
Site Area	0.83	ha
Infiltration Allowance	0.2	L/s/ha
	0.165	L/s

- a. Residential Demand based on City of Owen Sound Engineering Standards.
- b. Harmon Peaking Factor $F = 1 + 14/(4 + P^{0.5}) = 1 + 14/(4 + (72/1000)^{0.5}) = 4.27$