

File 123014

May 16, 2023

Ardy Nikzad
Blue Sky Capital
199 Bay Street, Suite 2900, PO Box 459
Toronto, Ontario M5L 1G4
anikzad@armelcorp.com

Re: 58 St. Paul Street, Collingwood
Water and Sewer Demands Servicing Brief

Dear Ardy:

The following is provided to address the sanitary and water servicing for the proposed three-storey residential development located at 58 St. Paul Street, Collingwood. This letter will quantify the water and sanitary demands for the proposed site and demonstrate the existing service laterals can convey the increased flows resulting from the development.

PROPOSED DEVELOPMENT

The proposed development will demolish the existing single-family residence and construct a three-storey residential building with a total of three units, consisting of a one-bedroom unit in the basement, a one-bedroom unit on the first floor, and a three-bedroom unit using the second and third floors.

EXISTING SERVICING

Municipal servicing is located on St. Paul Street in the form of a 400 mm diameter sanitary sewer and a 100 mm diameter watermain. An existing 125 mm diameter sanitary service and a 19 mm diameter water service extend to the existing building. The locations of the sanitary sewer and watermain along with the existing services were confirmed by reviewing As-Built drawings provided by the Town of Collingwood, along with completion of a topographic survey by Tatham Engineering. The Site Servicing Plan (SS-1) has been appended to this letter for reference.

WATER SUPPLY & DISTRIBUTION

The Collingwood Water Treatment Plant has a rated capacity of 31,140 m³/day during the summer and 24,019 m³/day during the winter per the Town of Collingwood Semi-Annual Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update (September 2022). The 2022 Capacity Update showed an average maximum day demand of 15,279 m³/day during the summer and 9,707 m³/day during the

winter, along with 10,750 m³/day of municipally committed flow during the summer and winter. This results in a hydraulic reserve capacity of 5,111 m³/day during the summer and 3,562 m³/day during the winter. When factoring in Planning Applications, Committed Servicing Capacity Allocation and a Factor of Safety, the remaining uncommitted hydraulic reserve capacity was determined to be 1,830 m³/day during the summer and 1,263 m³/day during the winter.

Water Demands Assessment

The Town of Collingwood Development Standards (2007) and Town of Collingwood Semi-Annual Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update (September 2022) were used to determine the water consumption demand for the site. The average water demand is assumed at 260 L/cap/day and the persons per unit (PPU) has been assumed at 1.90 PPU. Peak usage factors for maximum day demand and peak hour demand were determined to be 1.77 and 4.5, respectively. The maximum daily demand was calculated to be 0.03 L/s and the peak hour demand is 0.08 L/s. The maximum daily demand equates to 2 SDU using the Town's single detached unit equivalent calculation.

It is estimated that the existing 19 mm water service has the capacity to provide 1.26 L/s of potable water to the site. As the peak hour demand for the site with the proposed building will be 0.08 L/s, it is expected that the existing service will provide sufficient pressure to service the proposed building. The proposed water system should be added to the Town's overall water model to ensure the demands can be provided. Supporting calculations are attached for reference.

An existing fire hydrant is located at the northeast corner of 48 St. Paul Street. Most of the proposed building is within the 45 m radius of this fire hydrant (refer to the Site Servicing Plan SS-1). It is anticipated that this hydrant will continue to provide the requisite fire flow for the new building.

SANITARY SERVICING

The sewage treatment plant has an average day flow rated capacity of 24,548 m³/day and a maximum day flow rate capacity of 17,706 m³/day based on a review of the Town of Collingwood Semi-Annual Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update (September 2022). The Capacity Update notes the Hydraulic Reserve Capacity of 6,842 m³/day. When factoring in Planning Applications, Committed Servicing Capacity Allocation and a Factor of Safety, the remaining uncommitted hydraulic reserve capacity was determined to be 4,427 m³/day.

Sanitary Demands Assessment

The average daily sewage expected to be generated by the proposed site was calculated to be 0.02 L/s using the attached sanitary design sheet. The peak extraneous infiltration of 0.23 L/ha/s was used in accordance with the Town of Collingwood Development Standards. The peak flow was calculated to be 0.09 L/s. Supporting calculations are attached for reference.



The existing building is serviced by a 125 mm diameter sanitary lateral. It is proposed to use the existing service lateral for the proposed building. Based on the sanitary design sheet (attached for reference) it is estimated that the full flow capacity of the existing 125 mm diameter sanitary service is 13.24 L/s. As the anticipated peak flow for the proposed building will be 0.09 L/s, it is expected that the existing service will provide sufficient capacity.

FLOOD HAZARD STUDY

A flood hazard study was completed under separate cover and determined that due to the proximity of the subject property to Georgian Bay, the peak flows from the site are expected to occur well before the peak flows from the Pretty River spill. As such, the increased imperviousness of the subject property is expected to have negligible impacts to the peak flows used in the hydraulic.

The results of the HEC-RAS hydraulic model demonstrate the existing grade across the subject property is generally within the flood hazard limits. Fill is proposed to raise the site (which will not impact flooding in the surrounding area), and the lowest opening elevations of the proposed building have been set a minimum of 0.30 m above the Regulatory flood level of 179.97 m.

Refer to the flood hazard study for additional information.

SUMMARY

Based on the preceding analysis, the development has adequate water and sanitary servicing available to support the proposed site. The site will be serviced by the existing 125 mm sanitary service and the existing 19 mm diameter water service on St. Paul Street. The flood hazard study confirmed the subject property can be filled to adequately floodproof the proposed dwelling without having a negative impact on the flood levels in the area.

Yours truly,

Tatham Engineering Limited



Andrew Schoof, M.A.Sc.
Engineering Intern
AS:df



Doris Casullo, P.Eng.
Senior Engineer, Project Manager





Project: 58 St. Paul Street

Date: April 2023

File No.: 123014

Designed: AS

Subject: Water Supply Calculations - ICBL

Checked: JPA

Town and MECP Standards Water Supply Calculation

Sewage Generation for Domestic Water Demand: 260 L/cap/day As per Town of Collingwood Semi-Annual Water and Wastewater
 High Density Persons Per Unit: 1.90 PPU Uncommitted Hydraulic Reserve Capacity Update (September 2022)

Multi-Storey High Density Residential Building (3 units)

Total Units = 3
 Number of Persons = 6
 Average Daily Flow = 1482 L/day
 Average Daily Flow = 1.5 m³/day
 Maximum Day Factor = 1.77 As per Town of Collingwood Semi-Annual Water and Wastewater
 Uncommitted Hydraulic Reserve Capacity Update
 Peak Hour Factor = 4.50 As per MOE Design Guidelines for Drinking Water Systems (2008)

Maximum Day Demand: 0.03 L/s = 2.6 m³/day / 1.33 = **2.0 SDU**
 Peak Hour Demand: 0.08 L/s

Town of Collingwood Semi-Annual Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update (September 2022) - Appendix A

Assumptions:

ADD/ Capita Consumption (L/day): 260
 Residential Peaking Factor (ADD:MDD Ratio): 1.77
 ICI Peaking Factor (ADD:MDD Ratio): 2.5

Commercial Area ADD (m³/ha/day) 28
 Industrial Area ADD (m³/ha/day) 35
 Institutional Area ADD (m³/ha/day) 28

Residential Types Legend MDD (m³/d)

Residential - Single Detached Home (2.9 ppl/unit)	1.33
Residential - Semi Detached (2.7 ppl/unit)	1.24
Residential - Townhouse/ Row-House (2.4 ppl/unit)	1.10
Residential - Condo/ Apartment (1.9 ppl/unit)	0.87

Residential Types Legend SDU-E

Residential - Single Detached Home (2.9 ppl/unit)	1.00
Residential - Semi Detached (2.7 ppl/unit)	0.93
Residential - Townhouse/ Row-House (2.4 ppl/unit)	0.83
Residential - Condo/ Apartment (1.9 ppl/unit)	0.66



Project: 58 St. Paul Street
File No.: 123014
Date: April 2023
Design: AS
Checked: RS
Revision: 1

DOMESTIC SERVICE CAPACITY

Calculation of Water Flow Rates for Different Pipe Sizes
(Hazen Williams Formula - S.I. units)

Pipe Material: Copper
 Hazen Williams Coefficient, **C** = 130
 Minimum acceptable pressure in pipe = 275 kN/m²
 Assumed acceptable residual pressure = 140 kN/m²
Pressure drop over the pipe length, DP = 135 kN/m²

Building	Pipe Length (m)	Water Flow Rate (L/s)								
		Pipe Diameter (mm)								
		19	40	50	75	100	130	150	200	250
58 St. Paul	10.3	1.26	8.9	16.0	46.6	99.2	197.8	288.2	614.2	1104.6

Required Peak Flow

58 St. Paul: $Q_{req} = 0.08$ L/s < $Q_{pr} = 1.26$ L/s **Acceptable**

Hazen Williams Equation as used in this spreadsheet:

$$Q = (3.763 \times 10^{-6}) C D^{2.63} (DP/L)^{0.54}$$

where Q is the water flow rate in m³/hr
 D is the pipe diameter in mm
 L is the pipe length in m
 DP is the pressure difference across pipe length L in kN/m²

Project Information

58 St. Paul	123014
-------------	--------

Drawing Reference

Site Servicing Plan	SS-1
---------------------	------

Prepared By

Andrew Schoof	April 2023
---------------	------------

Reviewed By

Randy Simpson	April 2023
---------------	------------

Municipality

Town of Collingwood

Population Density

Capita per Unit	Low	Medium	High
	-	-	1.90

Infiltration

Infiltration (L/s/ha)	0.23
-----------------------	------

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	260	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1)

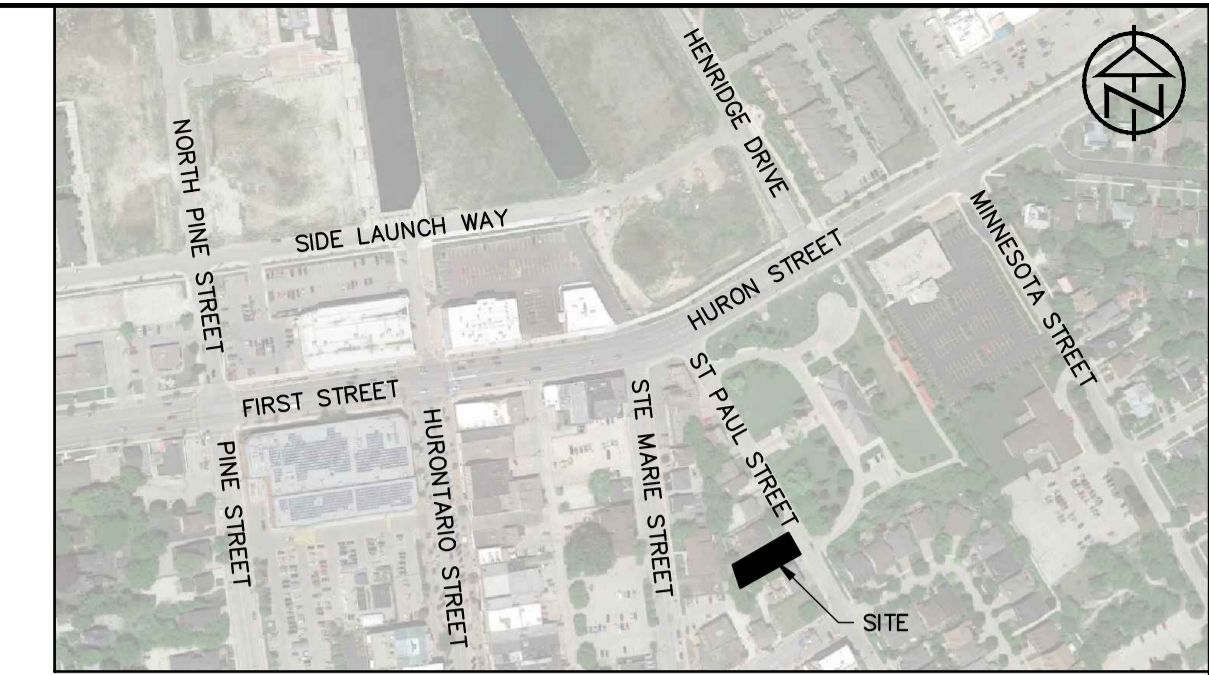
Version Date: April 2023

Version Number: 1

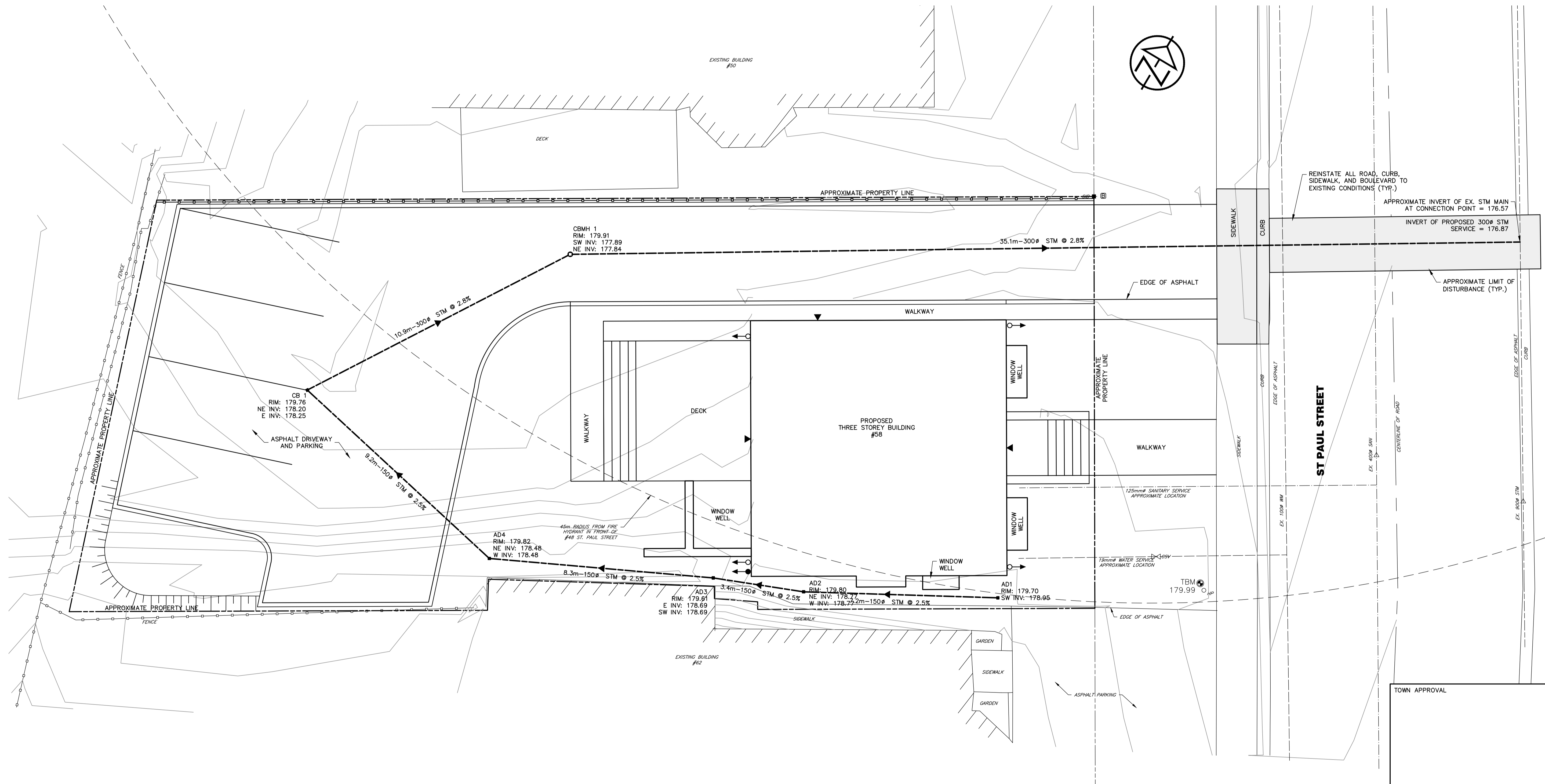
Engineers Seal

--

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s)			Peak Flow (L/s)			Proposed Sanitary Sewer									
												Development	Infiltration	Total	Development	Infiltration	Total	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)		
St. Paul Street		58 St. Paul	Sanitary Sewer	Residential	High	3	5.7	5.7	4.44	0.05	0.05	0.02	0.01	0.03	0.08	0.01	0.09	13.7	2.0%	125	1.08	13.24	0.32	19	0.7%		



KEY PLAN



TOWN APPROVAL

DISCLAIMER AND COPYRIGHT
 CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.
 TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS
 TBM1 - ELEVATION 179.99m
 NAIL SPIKE IN HYDROPOLE ON EAST PROPERTY CORNER
 SURVEY GEODETIC; COORDINATES ARE NAD83 UTM17N; ELEVATIONS ARE CGVD28 LOCALIZED TO VCM 0011926U1669

NOTES
 LEGAL SURVEY AND LOT DIMENSIONS DONE BY ZUBEC, EMO AND PATTEN LTD, DATED OCT 27, 1980 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.
 TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY TATHAM ENGINEERING DATED JAN 19, 2023.

No.	REVISION DESCRIPTION	DATE
1.	1ST SUBMISSION	MAY 16/23

ENGINEER STAMP

 D. M. CASILKO
 2023.05.16
 PROVINCE OF ONTARIO

58 ST PAUL STREET
TOWN OF COLLINGWOOD
SITE SERVICING

TATHAM ENGINEERING
 DESIGN: AP/MM FILE: 123014 DWG:
 DRAWN: AP/MM DATE: JAN 2023 **SS-1**
 CHECK: JPA/RS SCALE: 1:75