



Functional Servicing Report 217 Dunlop Street East Condominium Development

PBM Realty Holdings Inc.

P/N 20-3315 | December 15, 2020

City of Barrie
217 Dunlop Street East

SBA Skelton Brumwell
& Associates Inc.
ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS

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Vipond Flow Test Results, June 16, 2020

Functional Servicing Report
PBM Realty Holdings Inc.
217 Dunlop Street East Condominium Development

P/N 20–3315

December 15, 2020

1.0 Introduction

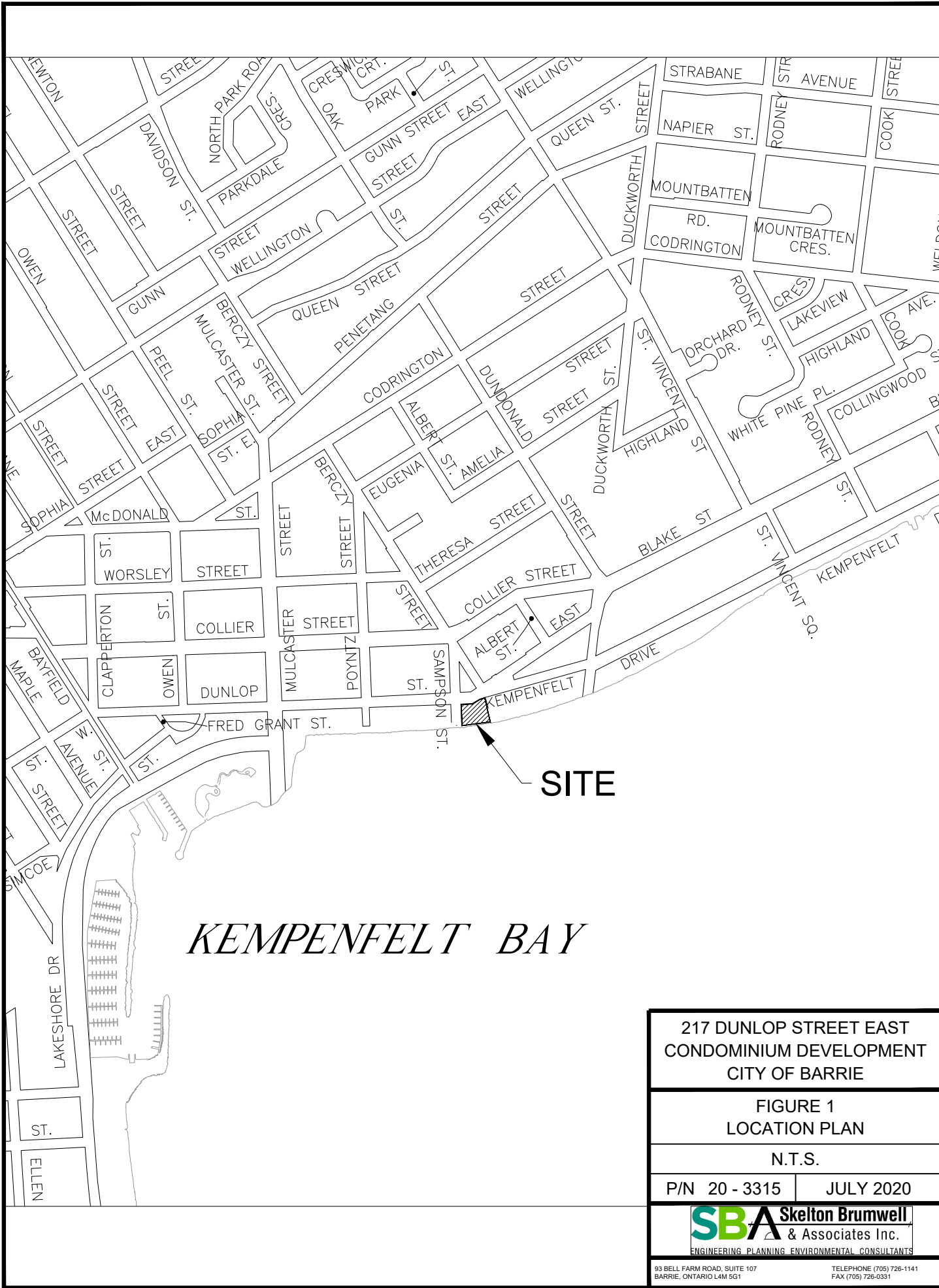
PBM Realty Holdings Inc. (PBM) is proposing to develop an existing vacant lot located at 217 Dunlop Street East in the City of Barrie into a fifteen (15) storey, forty-one (41) unit residential condominium building, complete with three (3) levels of indoor parking and commercial space. The subject property is located on the south side of Dunlop Street East at the intersection of Dunlop Street East and Sampson Street in the City of Barrie.

The property is irregular in shape and comprises an area of approximately 2,008 m² (0.201 ha). The proposed building has a footprint area of approximately 1,161 m², which provides about 57.8% lot coverage. The building includes 401.5 m² of commercial space, and one hundred and fourteen (114) parking stalls are proposed.

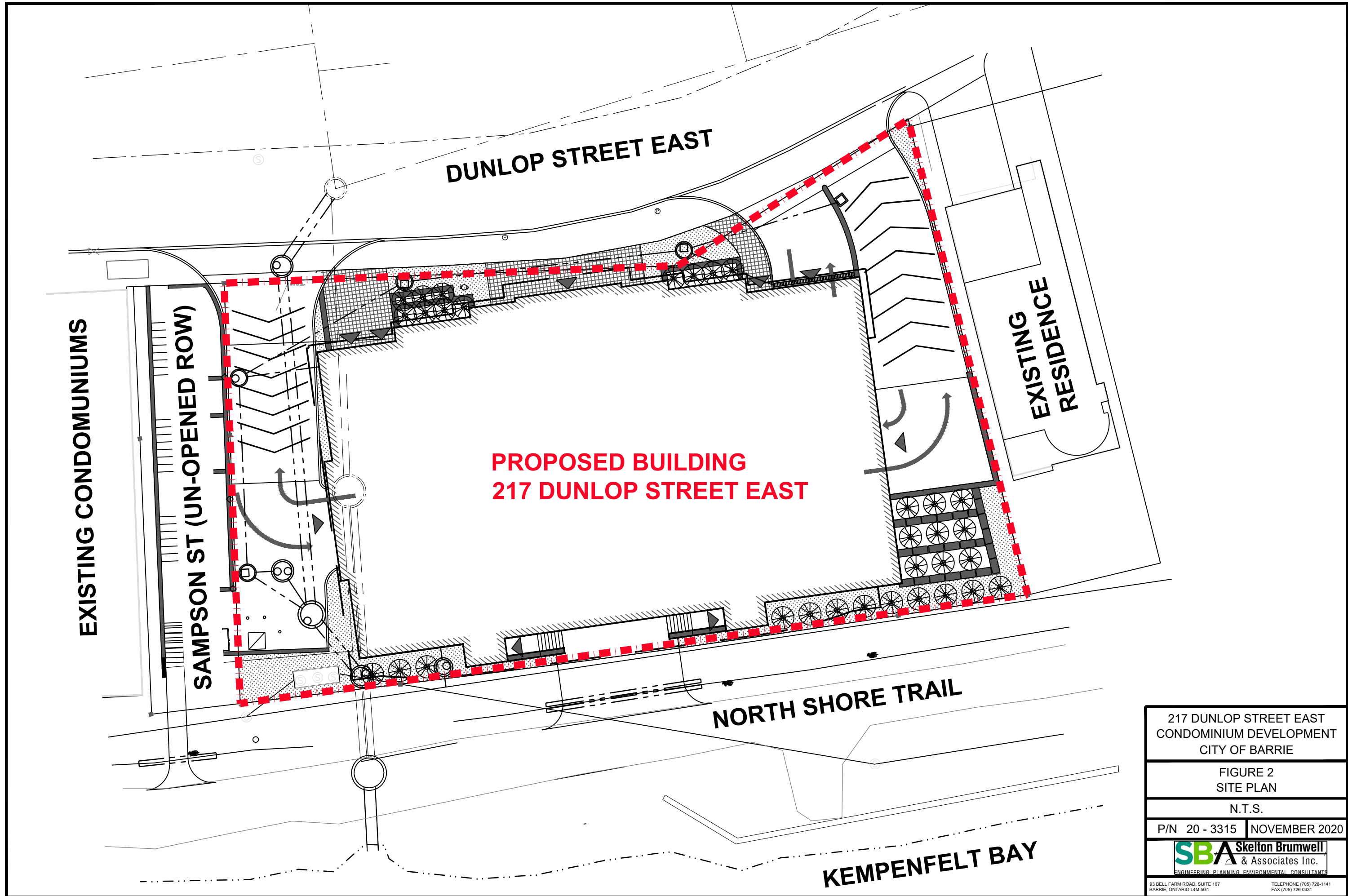
The subject property is legally described as Part of Lot 24, Concession 4, Geographic Township of Vespra, County of Simcoe, now in the City of Barrie. It is further described as Broken Lots 33, 135 and 136 on the south side of Dunlop Street, and Part of Water Lots 33, 135 and 136 Lying in Front of the Broken Lots in Front of Registered Plan 2, in the City of Barrie, County of Simcoe. The location is shown on Figure 1 – Location Plan.

The property is bounded by Dunlop Street East to the north, existing high-rise condominiums know as the Flamenco Condos to the west, a single detached dwelling to the east, and the City of Barrie walkway and trail system along Kempenfelt Bay to the south, which is the former Canadian National Railway line.

Skelton, Brumwell & Associates Inc. (SBA) has been retained to provide consulting engineering services in support of the redevelopment of the subject property. In support of the proposed Rezoning and Site Plan Approval, a Functional Servicing Report for the property has been completed as summarized herein.



217 DUNLOP STREET EAST CONDOMINIUM DEVELOPMENT CITY OF BARRIE	
FIGURE 1 LOCATION PLAN	
N.T.S.	
P/N 20 - 3315	JULY 2020
SBA Skelton Brumwell & Associates Inc. ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS	
93 BELL FARM ROAD, SUITE 107 BARRIE, ONTARIO L4M 5G1	
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217 DUNLOP STREET EAST CONDOMINIUM DEVELOPMENT CITY OF BARRIE	
FIGURE 2 SITE PLAN	
N.T.S.	
P/N 20 - 3315	NOVEMBER 2020
SBA Skelton Brumwell & Associates Inc. ENGINEERING PLANNING ENVIRONMENTAL CONSULTANTS	
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2.0 Existing Site Conditions

The existing site is currently vacant; however, there was formerly a dry-cleaning business on the subject lands. Topographic information for the site was compiled by Rudy Mak Surveying Ltd. in May and June 2020, and shows total relief on the site to be in the order of 5.7 metres, generally falling from north to south towards Kempenfelt Bay.

The existing site is accessed via two (2) driveways off of Dunlop Street East, which has a two-lane cross section with on street parking and a width of about 15 metres. Sidewalks are present on both sides of the roadway. Dunlop Street East is defined as an Arterial Road in the City of Barrie's Official Plan.

3.0 Sanitary Sewage System

3.1 Existing Conditions

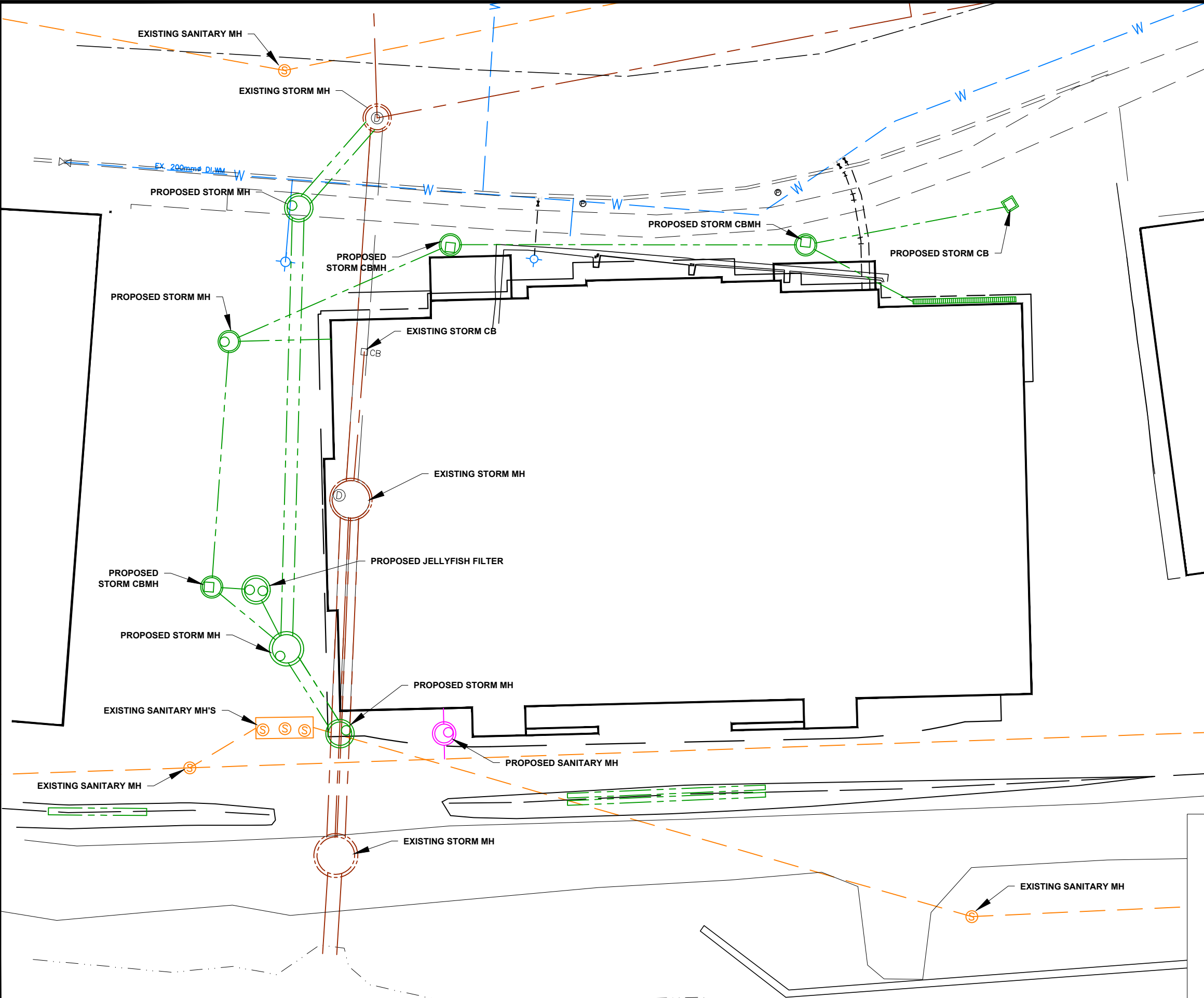
There is an existing 350 mm diameter asbestos cement sanitary sewer at installed along Dunlop Street East at 0.4%, which has a full flow capacity of about 92.25 L/s. There is also an 825 mm diameter concrete sanitary sewer south of the property. The concrete sanitary sewer south of the property is part of the City of Barrie Lakeshore Trunk Sanitary Sewer, which has a capacity of about 454 L/s in the area of the proposed development, as shown on City of Barrie Drawing "Lakeshore Trunk Sanitary Sewer Reconstruction, Duckworth St. to Mulcaster St.", Sanitary Drainage Plan, Drawing No. 94-09-SAN1, dated April 1995. The subject property and sanitary sewers are located within the Barrie North Sanitary Drainage Area. Refer to Figure 3 – Servicing Sketch, for illustration of the existing sanitary services in this area.

3.2 Sanitary Sewage Design Flow

The Site Plan for the proposed development, prepared by Salter Pilon Architecture (SPA), shows the development to consist of forty-one (41) residential units and 401.5 m² of commercial space.

The City of Barrie Sanitary Sewage Collection System Policies and Design Guidelines (2017) defines a design population for various residential uses based on a population density. The guidelines define "high-density" as developments such as apartment dwellings having 54–300 units per hectare. The City of Barrie Guidelines note that the population density for a high-density use would be 1.67 persons per unit (ppu).

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LEGEND

- | | |
|--------------|---|
| — — — — — | EXISTING LOT |
| — — — — — | EXISTING BUILDINGS |
| — — — — — | EXISTING SIDEWALK |
| — — — — — | EXISTING TREE LINE |
| — — — — — | EXISTING CURB |
| □ CB | EXISTING STORM CATCH BASIN |
| ○ | EXISTING STORM MAINTENANCE HOLE |
| — — — — — | EXISTING STORM SEWER |
| ⊙ | EXISTING SANITARY MAINTENANCE HOLE |
| — — — — — | EXISTING SANITARY SEWER |
| — — — — — W | EXISTING WATER MAIN |
| — — — — — WS | EXISTING WATER SERVICE |
| □ | PROPOSED STORM CATCH BASIN |
| ○ | PROPOSED STORM MAINTENANCE HOLE |
| ⊙ | PROPOSED STORM CATCH BASIN MAINTENANCE HOLE |
| — — — — — | PROPOSED STORM MAIN |
| ○ | PROPOSED SANITARY MAINTENANCE HOLE |
| — — — — — | PROPOSED SANITARY MAIN |
| — — — — — | PROPOSED WATER MAIN |

217 DUNLOP STREET EAST
CONDOMINIUM DEVELOPMENT
CITY OF BARRIE

FIGURE 3
SERVICING SKETCH

N.T.S.

P/N 20 - 3315 | NOVEMBER 2020

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Utilizing this information, the design population for the development would be:

$$\text{Design Population} = 1.67 \text{ persons per unit} \times 41 \text{ units} = 69 \text{ people}$$

The City of Barrie guidelines recommend that the sanitary flow for residential uses be calculated using a rate of 225 litres/day/person, while for commercial uses the average daily flow is generally calculated based on the Ministry of the Environment Guideline of 28 m³/day/ha. Based on this information, the average daily flow for the development would be:

$$\begin{aligned} Q_{\text{avg}} &= (69 \text{ people} \times 225 \text{ litres/day/person}) + (28 \text{ m}^3/\text{day/ha} \times 0.20 \text{ ha} \times 1000 \text{ L/m}^3) \\ Q_{\text{avg}} &= 15,525 \text{ L/day} + 5,600 \text{ L/day} = 21,125 \text{ L/day} = 0.24 \text{ L/s} \end{aligned}$$

The peak factor can be calculated using the Harmon Formula, which provides peaking factors that are representative of peak hourly flows. Based on a design population of 69 people, the peak factor, M, can be calculated as:

$$M = 1 + 14/(4 + P^{0.5}) = 1 + 14/(4 + (0.069)^{0.5}) = 4.28$$

Based on a peaking factor 4.28, and applying an extraneous flow rate of 0.1 L/s/ha, the peak residential sewage flow can be calculated using the formula:

$$Q_p = \frac{PqM}{86.4} + IA$$

where Q_p is the peak domestic sewage flow in L/s;
P is the design population, in thousands;
q is the average daily per capita domestic flow, in L/cap/day;
M is the peaking factor, calculated using the Harmon formula;
I is the unit of peak extraneous flow, in L/ha/s; and,
A is the gross tributary area, in ha.

The peak domestic residential sewage flow is therefore calculated as:

$$Q_{pR} = \frac{(0.069 \text{ people}) (225 \text{ L/person/day})(4.28)}{86.4} + (0.1 \text{ L/ha/s})(0.20 \text{ ha}) = 0.79 \text{ L/s.}$$

The building sewer size will need to be confirmed by the project mechanical engineer as part of the detailed design of the building.

The peak commercial sewage flow is calculated using a peak factor of 2.0, which is permissible where more specific information is not known. As such, the peak commercial sewage flow is:

$$Q_{pC} = 5,600 \text{ L/day} \times 2.0 = 11,200 \text{ L/day} = 0.13 \text{ L/s}$$

The peak sewage flow for the site is:

$$Q_p = Q_{pR} + Q_{pC} = 0.79 \text{ L/s} + 0.13 \text{ L/s} = 0.92 \text{ L/s}$$

3.3 Sanitary Sewer Requirements

The City of Barrie Sanitary Sewage Collection System Policies and Design Guidelines note that the minimum pipe diameter for sanitary services for residential units shall have a diameter no less than 100 mm, and for commercial uses shall be no less than 150 mm. The site sanitary sewer is also required to provide sewage velocities of 0.6 m/s–3.0 m/s.

Based on this requirement the development will require a 150 mm diameter sanitary sewer (minimum) to service the building at a minimum slope of 0.4% in order to provide full flow velocity and full capacity. The building sanitary invert and discharge location will be confirmed by the project mechanical consultant.

3.4 Proposed Sanitary Service

The building sanitary service is proposed to consist of a 150 mm diameter pipe near the southwest corner of the building connected to a proposed manhole 1.0 m south of the building. The sanitary manhole then outlets via a 0.9 m long, 150 mm diameter sanitary sewer connected to the 825 mm diameter trunk sewer.

As noted previously, the existing 825 mm diameter concrete Lakeshore Trunk Sanitary Sewer south of the subject lands has a capacity of about 454 L/s, and a design flow of 290 L/s. Based on the calculated peak flow rate of 0.92 L/s, the Lakeshore Trunk sanitary sewer has sufficient capacity to accommodate the proposed development. Refer to Figure 3 – Servicing Sketch, for illustration of the proposed sanitary service for this development.

4.0 Water Supply and Distribution

4.1 Existing Conditions

There is an existing 250 mm diameter watermain along the frontage of the property on Dunlop Street East. There was formerly a 50 mm diameter water service for the property; however, we understand from review of water service records for the site provided by City of Barrie staff that

this service was cut off from the watermain on August 1, 2006. Refer to Figure 3 – Servicing Sketch, for illustration of the existing water services in this area.

4.2 Hydrant Pressure Test

A hydrant pressure test was undertaken by Vipond on June 16, 2020. The test was completed on the existing fire hydrant on the north side of Dunlop Street East, at the east of the intersection of Dunlop Street East and Sampson Street. The purpose of the hydrant test was to determine the available water supply flow rate and pressure. The results are summarized as follows:

Test	Nozzle Diameter (inches)	Residual Pressure (PSI)	Pitot Pressure (PSI)	Discharge (USGPM)	Discharge (L/s)
1	1.75	76	50	630	39.8
2	2.5	74	28	893	56.3
3	2.5	68	22	1582	99.8

The complete results of the hydrant test are included as Appendix A to this report.

4.3 Water Demand

The water demand for the proposed development was calculated in part based on the proposed use of the building, including the 41 residential units with a building population calculated at 69 people. The City of Barrie Water Transmission and Distribution Policies and Design Guidelines specify that all water systems are required to have operating pressures of 50–90 PSI, and a fire flow pressure of at least 20 PSI during the maximum day plus fire flow condition. It is also assumed based on the location of the proposed development that the fire flow rate will have to meet the requirements of Downtown Commercial, which is 136 L/s minimum and 189 L/s preferred.

The maximum daily demand was determined using an applicable maximum day factor and peak hour factor from the MOE Design Guidelines for Drinking Water Systems 2008, Table 3–3, Peaking Factors for Drinking–Water Systems Serving Fewer than 500 People. Based on a design population of 96 people, the maximum day factor was calculated to be 6.97 and the peak hour factor was calculated to be 10.5.

The daily flow was calculated similar to the sanitary flow assuming a per capita flow rate of 225 L/person/day, which provides a total flow of 21,600 L/day, or 0.25 L/s. Incorporating the peak factors noted previously the maximum daily flow would be in the order of 1.74 L/s and the peak hourly flow would be in the order of 2.63 L/s.

4.4 Fire Demand

The City of Barrie Water Transmission and Distribution Policies and Design Guidelines specify that the available fire flow at 20 PSI be calculated as follows:

$$QA = QT \times (ha/ht)^{0.5}$$

where QA is the flow at 20 PSI
QT is the flow at test
ha is the available pressure drop
ht is the pressure drop at test

Based on this, the available fire flow is calculated as:

$$QA = 1582 \text{ USGPM} \times ((80 \text{ PSI} - 20 \text{ PSI}) / (80 \text{ PSI} - 68 \text{ PSI}))^{0.5}$$
$$QA = 3,537 \text{ USGPM} = 223 \text{ L/s}$$

Utilizing the Water Supply for Public Fire Protection 1999, prepared by the Fire Underwriters Survey (FUS), we have estimated the required fire fighting flow for the building to be:

$$F = 220 \times C \times A^{0.5}$$

where F is the required fire flow in litres per minute
C is the coefficient related to the type of construction (0.8 for non-combustible construction)
A is the total floor area in m²

The fire fighting flow required the building would be:

$$F = 220 \times 0.8 \times (11,882 \text{ m}^2)^{0.5} = 19,185 \text{ L/min} = 320 \text{ L/s}$$

As per Note 2 of the FUS, the fire fighting flow can be reduced by 25% for non-combustible occupancies. As such:

$$F = 19,185 \text{ L/min} - (19,185 \text{ L/min} \times 0.25) = 14,389 \text{ L/min} = 240 \text{ L/s}$$

The building is proposed to have a sprinkler system throughout the entirety of the building. As such, Note 3 of the FUS permits the fire flow value obtained per Note 2 to be further reduced by 30 – 50% “depending upon the adequacy of the system”. In order to be conservative, it is assumed that the fire flow can be reduced by 30%, which results in a required fire flow of:

$$F = 14,389 \text{ L/min} - (14,389 \text{ L/min} \times 0.3) = 10,072 \text{ L/min} = 167.9 \text{ L/s}$$

The required fire flow of 167.9 L/s is less than the available fire flow of 223 L/s, and as such, meets the requirements of the City of Barrie Water Transmission and Distribution Policies and Design Standards.

Based on the hydrant test that was undertaken, it appears that there is sufficient domestic and fire flow available to meet the requirements of the proposed development.

4.5 Proposed Water Servicing

The proposed water servicing will include a 100 mm diameter domestic water service with a curb stop at the property line and a 200 mm diameter fire service. Both connections will be to the existing 250 mm diameter watermain on Dunlop Street East. The size of the domestic water service within the building will need to be confirmed by the project mechanical consultant.

Given the anticipated height of the proposed building, booster pumps may be required to provide the required operating pressure to the upper floors. The need for (and design of) booster pumps will need to be confirmed by the project mechanical consultant as part of the building permit application. Refer to Figure 3 – Servicing Sketch, for illustration of the proposed water services in this area.

5.0 Stormwater Management

5.1 Existing Conditions

There is an existing 750 mm diameter storm sewer running from north to south through the subject property, from storm manhole DDML00021 at Dunlop Street East to storm manhole DDML00011 on the property. Stormwater is then conveyed via twin 525 mm diameter storm sewers running from north to south storm manhole DDML00271. The storm sewers eventually outlet south of the property directly into Kempenfelt Bay. Existing topography for the site also directs flow overland generally from north to south across the trail system and into Kempenfelt Bay. Refer to Figure 3 – Servicing Sketch, for illustration of the existing stormwater services in this area.

5.2 Stormwater Management Requirements

Further details on the existing storm drainage infrastructure in the area, as well as the detailed stormwater management requirements of the proposed development, are included in a separate Stormwater Management Report prepared by SBA (December 2020). Refer to Figure 3 – Servicing Sketch, for illustration of the proposed stormwater services in this area.

6.0 Traffic

Details on the existing traffic within the area of the proposed development, as well as future traffic volumes and traffic mitigation measures for the proposed development are included in a separate Traffic Impact Study prepared by SBA (December 2020).

7.0 Utilities

Alectra Utilities Inc. (Alectra) provided preliminary review and comments on May 9, 2019, and noted that they have no objections to the proposed development. The detailed design work for the project will need to include circulation to Alectra in order to coordinate the design and installation of electrical services to the proposed development.

We also reviewed a report prepared by Pinestone Engineering Ltd., entitled *"185 Dunlop Street East, Functional Servicing & SWM Report, ALLTO Development Inc., City of Barrie"*, dated June 5, 2019, which was prepared in support of an adjacent development known as "Lakehouse". That document included correspondence from Alectra which noted that there is an existing 4.16 kV line and 44 kV circuit in the vicinity of the proposed development, which should be sufficient to service the proposed development. A pad mounted transformer would also likely be required, and be fed underground from the nearest 4.16 kV line. The site electrical requirements will need to be confirmed by the project electrical engineer.

The Pinestone Engineering Ltd. report also included correspondence from Enbridge Gas, which noted that natural gas is available in the area of Dunlop Street East to service the proposed development.

No information was readily available from either Bell Canada (Bell) or Rogers Communications (Rogers); however, given the centralized location of the development within the City of Barrie, there are no issues anticipated with provided Bell and/or Rogers service.

As part of the detailed design work for the project, the Site Plan will need to be circulated to Alectra, Enbridge, Bell, and Rogers for their review, comment, and respective designs.

8.0 Conclusions and Recommendations

Based on the preceding analysis, it is our opinion that the proposed condominium development can be established on the existing property on the south side of Dunlop Street East at the intersection of Dunlop Street East and Sampson Street in the City of Barrie. The existing municipal and utility services are sufficient to meet the requirements of the proposed project.

Any requirements for a building fire suppression system and Siamese connections will need to be determined at the detailed design stage by the project architect, mechanical consultant and City of Barrie Staff.

The electrical engineer for the building will need to determine the power requirements in order to confirm that the project can be serviced from the existing electrical infrastructure on Dunlop Street East. Development plans should be provided to Bell Canada, Enbridge Gas, Rogers, and Alectra, so that they can confirm their servicing requirements, prepare their utility designs and prepare the necessary servicing agreements. The detailed design and construction of site services should be coordinated with the utility companies.

9.0 Disclaimer of Responsibilities to Third Parties

This report was prepared by Skelton, Brumwell & Associates Inc. for the account of PBM Realty Holdings Inc.

The material in it reflects Skelton, Brumwell & Associates Inc.'s best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

Skelton, Brumwell & Associates Inc. accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

All of which is respectfully submitted,
SKELTON, BRUMWELL & ASSOCIATES INC.

Per:



Matt Bertram, P. Eng.
Senior Project Engineer



Appendix A

Vipond Flow Test Results, June 16, 2020

FLOW TEST RESULTS



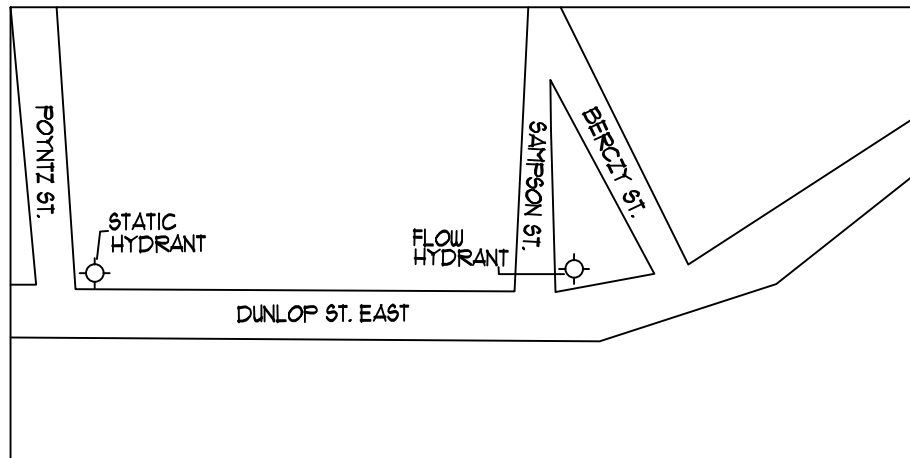
DATE : JUNE 16, 2020 TIME : 9:45 AM

LOCATION : 211 DUNLOP STREET EAST

BARRIE

ONTARIO

TEST BY : VIPOND FIRE PROTECTION AND LOCAL PUC



STATIC PRESSURE : 80 PSI UNDERGROUND TYPE & SIZE : N/A

TEST NO.	NO. OF NOZZLES	NOZZLE DIAMETER (INCHES)	DISCHARGE CO-EFFICIENT	RESIDUAL PRESSURE (PSI)	PITOT PRESSURE (PSI)	DISCHARGE (U.S.GPM)
1	1	1 3/4"	0.995	76	50	630
2	1	2 1/2"	0.90	74	28	893
3	2	2 1/2"	0.90	68	22	1582



217 DUNLOP STREET EAST	BY :	LEN K.
BARRIE	VIPOND OFFICE :	BARRIE
ONTARIO	TEST BY :	VIPOND & PUC
	DATE :	JUNE 16, 2020

STATIC:		RESIDUAL:		FLOW:
<u>80</u> PSI	TEST#1	<u>76</u> PSI	@	<u>630</u> GPM
	TEST#2	<u>74</u> PSI	@	<u>893</u> GPM
	TEST#3	<u>68</u> PSI	@	<u>1582</u> GPM

