J+B ENGINEERING INC.
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FUNCTIONAL SERVICING REPORT
FOR THE PROPERTY LOCATED AT

623 YONGE STREET & 515 BIG BAY POINT RD, BARRIE, ONTARIO

Prepared By:

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Markham, Ontario
L3R 5N8

Revised February 14, 2024

Functional Servicing Report

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Functional Servicing Report

1. INTRODUCTION

1.1 Study Area

The study area is located on the southeast quadrant of Big Bay Point Road and Yonge Street in Barrie, Ontario. The address for this property is 623 Yonge Street, Barrie, Ontario.

The study area is an existing gas station with a proposed redevelopment scope which includes replacement of the underground tanks, associated pumps, canopy and A&W restaurant. The existing carwash will remain.

1.2 Background

This study addresses the servicing requirements for the proposed development which includes water, sanitary and stormwater servicing.

2. WATER SERVICE

2.1 Water Service – Existing

The site is serviced by an existing 50mm Ø water service connected to the existing 300mm diameter watermain located on Yonge Street. The water service connects to a water meter at the Car Wash building then it connects to the existing service centre.

2.2 Water Service – Proposed

To calculate the peak flow water demand, the following design criteria have been utilized:

- $28m^3$/ha/d average water demand for Commercial as per City of Barrie *Water Transmission and Distribution Policies and Design Standard* section 4.3.1
- 3.78L/s average water demand for the carwash (historical data)
- Peaking factor 1.5 for non-residential use, 2.2 for the carwash (historical data)
- Based on the above parameters the peak flow demand for domestic purposes =8.33L/s (refer to Appendix A for calculation)

The old 50mm Ø watermain will be capped and abandoned to City standards. A new 100mm Ø watermain from the municipal line will connect to a new water meter at the

carwash, which will then connect using a 50mm Ø type "K" copper water pipe to the new service station. For connection locations and details refer to the Site Servicing Plan P-301 in Appendix C.

2.3 Water service Appurtenances

The development is serviced by 3 fire hydrants, one located north across Big Bay Point Road, and two located south across Yonge Street. The Contractor is to chlorinate, swab, and test the water quality and pressure prior to occupancy.

A fire flow calculation by the Fire Underwriters Survey method has been provided in Appendix A. Considering ordinary construction and an automatic, standard water supply, the required fire flow is estimated to be 4,000 L/minute. However, according to City of Barrie *Water Transmission and Distribution Policies and Design Standard* Section 4.3.1 Flow Calculations, the minimum required fire flow shall be 283L/s (16980L/min) for a commercial development. Therefore, the fire flow for the site must at minimum meet this flow.

A flow test will be carried out during the building permit phase to confirm water pressure and flow for firefighting purposes.

For the details of proposed water connections see attached Servicing Drawing P-301 in the Appendix C.

3. SANITARY

3.1 Sanitary - Existing

Under existing conditions, the site is serviced by 150mm Ø Sanitary sewer pipes connected to a sanitary manhole on the southern driveway entrance, connected via a lateral to the 300mm Ø Municipal Sanitary Sewer on Yonge St.

3.2 Sanitary - Proposed

The proposed commercial development will maintain the existing lateral to the City's Sanitary Sewers. The line from the carwash to the manhole on the property line will be maintained as is. The Sanitary line from the existing service station along with associated manhole will be removed.

The proposed service station + restaurant will have a sanitary sewer connection to the same manhole. Please refer to the servicing plan in the appendix for details.

The Peak Flow for this site will be 8.47L/s. This is based on the follow design criteria and assumptions:

- Average Sanitary flow assumed 28m^3/day/ha for the Service station + restaurant as per City of Barrie Sanitary Infrastructure Design Standard section 3.3.2
- Infiltration to be 0.1L/s/ha as per City of Barrie Sanitary Infrastructure Design Standard section 3.3.4
- Peaking factor of 2 as suggested by City of Barrie Sanitary Infrastructure Design Standard section 3.3.2.2
- Peak Discharge from Carwash to be 8.19L/s based on historical data

Please see Appendix B: Sanitary Sewer Design Sheet for more details.

4. STORM

4.1 Pre-Development Conditions

The subject area is approximately 0.64ha in size and is captured by five catch-basins that convey runoff to a Stormceptor® (STC) Oil Water Separator. The runoff is then discharged towards the north into a municipal 675mm Ø diameter storm sewer lying under Big Bay Point Road. There is no existing quantity control in place.

4.2 Post-Development Conditions

The post development drainage conditions are expected to change due to an increase in impervious surfaces. The proposed site will include quality and quantity control for storm run-off.

The SWM for this site has been addressed under a separate cover as part of the Site Plan Approval package.

5. SUMMARY AND CONCLUSION

In summary, all required conditions for the City of Barrie and the Lake Simcoe Region Conservation Authority (LSRCA) have been satisfied as follows: In summary, all required conditions for the City of Barrie have been satisfied regardin

- Water service
- Sanitary service
- Stormwater management

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Appendix A – Domestic Water Usage/Fire Flow Calculation

Functional Servicing Report

CITY OF Barrie

THEORETICAL DOMESTIC WATER DEMAND CALCULATION

623 Yonge St

Existing condition

Unit Type	Gross Floor Area	Average Water Demand		Peaking Factor[3]	**Peak flow Demand**
	(m^2)	(L/s)	(m^3/day)	(L/s)	**(L/s)**
Commercial[1]	132.1	0.0428	3.70	1.5	**0.064**
Car Wash[2]	123.6	3.78	326.6	2.2	**8.19**
				Total Peak Flow Demand	8.254

Proposed condition

Unit Type	Gross Floor Area	Average Water Demand		Peaking Factor[3]	**Peak flow Demand**
	(m^2)	(L/s)	(m^3/day)	(L/s)	**(L/s)**
Commercial[1]	287.4	0.0931	8.05	1.5	**0.140**
Car Wash[2]	123.6	3.78	326.6	2.2	**8.19**
				Total Peak Flow Demand	8.330

Flow increase L/s	**0.075**
Flow increase %	**0.91**

Note 1	Water demand for Retail/Commercial as per city of Barrie Water Specification 4.3.1 ($28m^3$/ha/dy)
Note 2	Typical Water Flow demand for carwash Average 3.78
Note 3	Daily peaking factor 1.5 for non residential use as per city of Barrie Design Criteria, 2.2 for carwash

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Telephone:

Project: **623 Yonge St**
Date: 15-Jan-24

Fire Flow Calculation - FUS method

Coefficient	**Ordinary construction (Brick and other Masonry walls)**	C=	1		
Total Floor Area		A=	**411.00**	sqm	
Fire flow		**F=**	**220 C √A**	l/m	
		=	4460.09	l/m	
		≈	**4000.00**	l/m	*Rounded to nearest 1,000*
Occupancy Hazard	**Combustible**	Surcharge	0.00	%	
		F=	**4000.00**	l/m	
Automatic Sprinkler System	**No**	Reduction	0.00	%	
		F=	**4000.00**	l/m	
Separation with adjacent buildings	**Greater than 45m**	Surcharge	0.00	%	
		F=	**4000.00**	l/m	
	Greater than 45m	Surcharge	0.00	%	
		F=	**4000.00**		
	Fire Flow	≈	**4,000.00**	l/m	*Rounded to nearest 1,000*
			66.67	l/s	

FIRE FLOW DEMAND – the following minimum fire flow demands shall be used in hydraulic network analysis unless FUS calculations require a higher fire flow:

Fire Flow Requirements

Description	Minimum Required Fire Flow (L/s)[1]
Large Residential Lots [2]	70
Residential	100
Townhouse	155
Apartment	200
High Rise Residential / Downtown / Mixed Use	- [3]
Institutional	200
Commercial	283
Industrial	333

Note 1: Subject to requirements of the Ontario Building Code
2: Refers to Buildings having a minimum of 3.0 meters of separation between buildings
3: Applicant will need to provide their own calculations

Specific fire flow demand shall be calculated according to the latest published requirements of the Water Supply for Public Fire Protection; Fire Underwriters Survey (FUS 1999). Proposed Fire Flows less than minimums indicated would be subject to recommendation by a qualified Professional Engineer and approval by the City on a case by case basis.

Appendix B – Sanitary Design Sheet

City of Barrie

SANITARY SEWER DESIGN SHEET - THEORETICAL DESIGN FLOWS

623 Yonge St, Barrie

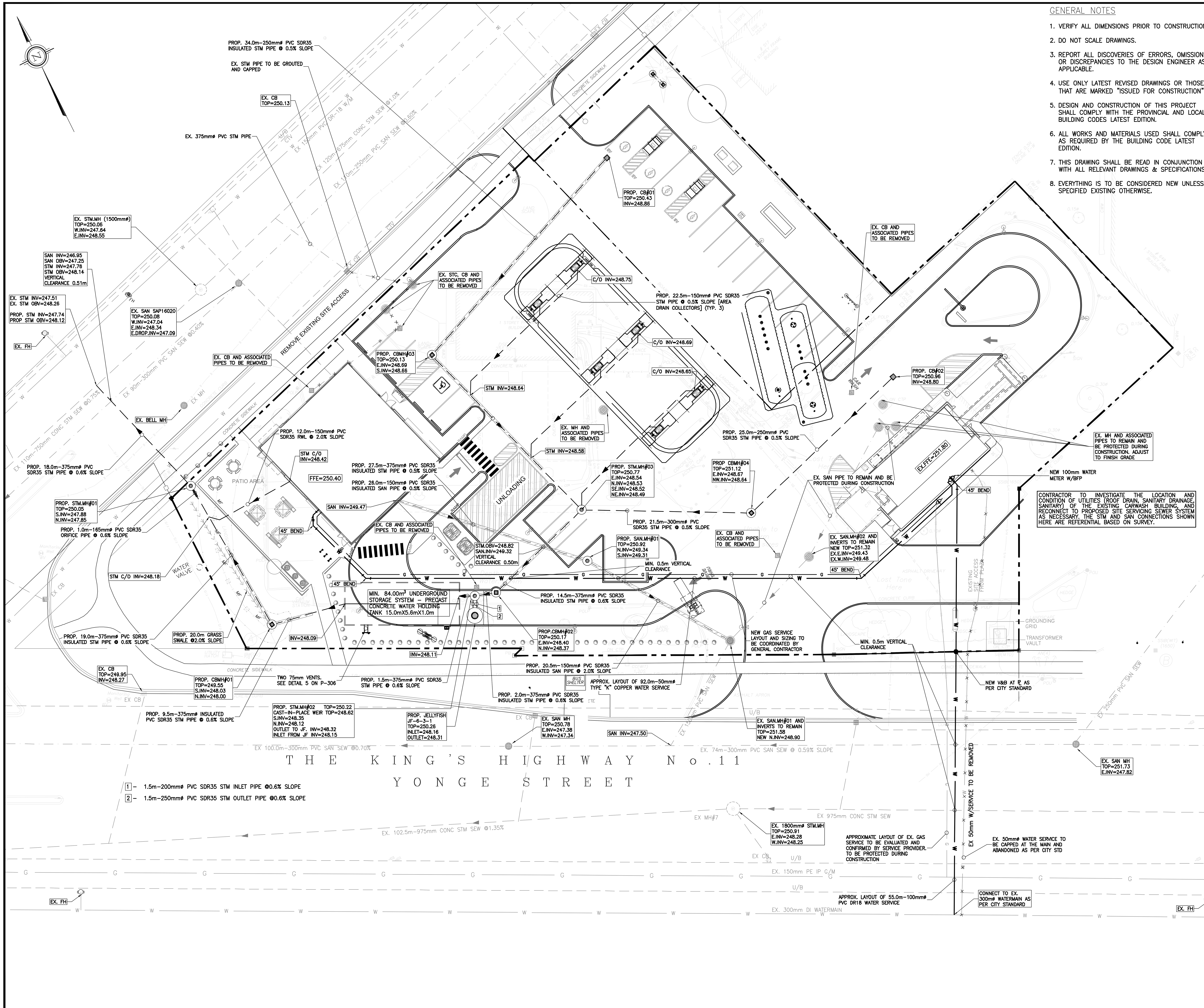
Unit Type	Gross Floor Area	Site Area	Average Design Flow	Peaking Factor[4]	Peak Flow		Infiltration[2] (Assume 0.1 L/ha/sec)	Peak Discharge from Car Wash[3]	**Total Peak Flow**
	(m^2)	(ha)	(L/s)	(-)	(L/s)	(m^3/day)	(L/s)	(L/s)	**(L/s)**
Commercial[1]	287.4	0.6577	0.009314	2	0.0186278	1.60944	0.26	8.19	**8.472**

Note 1 Average Sanitary flow assumed 28m^3/day/ha as per City of Barrie Sanitary Infrastructure Design Standard section 3.3.2
Note 2 Infiltration to be based on 0.1 l/sec/ha, per City of Barrie Sanitary Infrastrucutre Design Standard section 3.3.4
Note 3 As per historical data for similar type of car washes
Note 4 Peaking Factor Used as per City of Barrie Sanitary Infrastructure Design Standard 3.3.2.2

Pipe Sizing Calculation

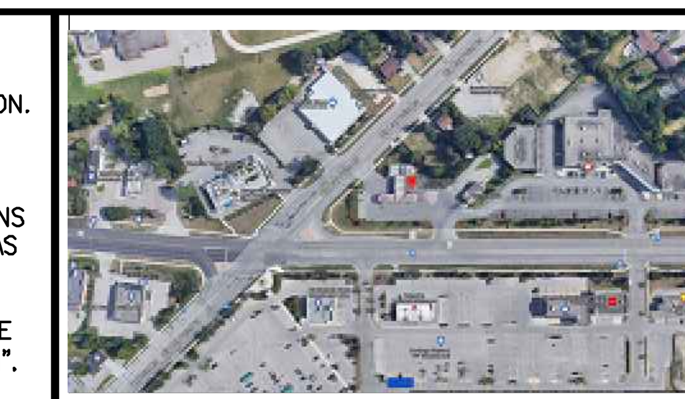
Pipe ID	Pipe Dia. (m)	Area (m^2)	Perimeter (m)	Hydraulic Radius (m)	Slope (m/m)	Roughness Coefficient	Velocity (m/s)	Max. Pipe Flow (M) (m^3/s)	Actual Pipe Flow (A) (m^3/s)	A/M	Servicing area
1S	0.150	0.018	0.471	0.038	0.005	0.013	0.609	0.011	**0.000019**	0.0017	C-Store
2S	0.150	0.018	0.471	0.038	0.020	0.013	1.219	0.022	**0.000019**	0.0009	C-store
3S	0.150	0.018	0.471	0.038	0.084	0.013	2.498	0.044	**0.008199**	0.1858	C-Store + Carwash

Appendix C – Site Servicing Plan



GENERAL NOTES

1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. DO NOT SCALE DRAWINGS.
3. REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGN ENGINEER AS APPLICABLE.
4. USE ONLY LATEST REVISED DRAWINGS OR THOSE THAT ARE MARKED "ISSUED FOR CONSTRUCTION".
5. DESIGN AND CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE PROVINCIAL AND LOCAL BUILDING CODES LATEST EDITION.
6. ALL WORKS AND MATERIALS USED SHALL COMPLY AS REQUIRED BY THE BUILDING CODE LATEST EDITION.
7. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS & SPECIFICATIONS.
8. EVERYTHING IS TO BE CONSIDERED NEW UNLESS SPECIFIED EXISTING OTHERWISE.



KEY PLAN
NTS

PLAN OF SURVEY WITH TOPOGRAPHIC DETAIL OF
PART OF NORTH HALF LOT 13, CONCESSION 12
GEOGRAPHIC TOWNSHIP OF INNISFIL
CITY OF BARRIE
COUNTY OF SIMCOE

BEARING NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CSRS)(2010).

FOR BEARING COMPARISONS, THE FOLLOWING ROTATIONS WERE APPLIED:

P2,P3 – 0°57'50" COUNTER-CLOCKWISE

DISTANCE NOTES – METRIC

DISTANCES AND COORDINATES ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999709.

CAUTION

THE WORK AND DRAWINGS HEREIN WERE COMPLETED FOR THE EXCLUSIVE USE OF OUR CLIENT AND NO LIABILITY IS ASSUMED TO ANY THIRD PARTIES OR SUBSEQUENT OWNERS.

ELEVATIONS

ELEVATIONS ARE GEODETIC AND REFERRED TO COSINE BENCHMARK 03120030007 AND HAVING A GEODETIC ELEVATION OF 244.787 METRES.

COORDINATES

COORDINATE VALUES AND DIGITAL FILE ARE IN GRID SYSTEM, UTM ZONE 17 (81° WEST LONGITUDE), NAD83(CSRS)(2010).

COMBINED SCALE FACTOR = 0.999709

CONTOURS

CONTOURS SHOWN HEREON ARE DRAWN AT 0.20 METRE INTERVALS.

LEGEND

- EXISTING CATCHBASIN
- EXISTING MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED CBMH
- PROPOSED MANHOLE
- PROPOSED JELLYFISH
- PROPERTY LINE
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING WATER LINE
- EXISTING GAS LINE
- PROPOSED SANITARY LINE
- PROPOSED STORM LINE
- PROPOSED WATER LINE
- NEW GAS LINE
- INSULATED PIPE
- GRASSED SWALE
- REMOVALS

REVISION TABLE

REV.	DESCRIPTION	DRAWN	APP'D.	DATE
1.	REVISED PER NEW SITE LAYOUT	JG	JS	14 FEB '24

ISSUE TABLE

TO	FOR	DATE
SUNCOR	ISSUED FOR REVIEW	22 JAN '24
SUNCOR	ISSUED FOR REVIEW	14 FEB '24

METRIC

ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.. CONTRACTOR TO CHECK/VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK. ALL DESCREPANCIES TO BE REPORTED TO THE PROJECT DESIGNER. DO NOT SCALE DRAWINGS.

SEAL

LICENSED PROFESSIONAL ENGINEER
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Feb 16 2024
PROVINCE OF ONTARIO

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PETRO-CANADA
A Suncor Energy Business

DRAWING TITLE:

SITE SERVICING PLAN

PROJECT:

623 YONGE STREET
@ BIG BAY POINT
BARRIE, ON

DRAWN BY: EM	CAD INFO.: SHEET SIZE D (559 x 864)
DRAWING SCALE: 1:250	PETRO-CANADA 35226 SP1
DATE DRAWN: 29 NOV '23	CONSULTANT 230278P-300
CHECKED BY: JS	PLOT SCALE 1:1
APPROVED BY: JK	PLOT DATE
	PLOT CONFIGURATION
STD No./OUTLET No. 33659	SHEET No. P301