Functional Servicing and Preliminary Stormwater Management Report

Site B – North Barrie Crossing
303 Cundles Road, City of Barrie

June 2022
WMI File # 07-007 Site B

Prepared by

WMI & Associates Limited
119 Collier Street, Barrie Ontario L4M 1H5

Table of Contents

Appendices

1.0 Background

1.1 General

WMI & Associates Limited has been retained by Penady (North Barrie) Limited to prepare a Functional Servicing Report in support of a proposed Condominium Development located at 303 Cundles Road, City of Barrie. This site is part of the North Barrie Crossing Master Plan.

For reference, please see the North Barrie Crossing Master Site Servicing Plan in **Appendix A**, updated with the proposed Site Plan for the subject site.

1.2 Site Description

The Subject Site (Site) comprises 1.93ha and is located at 303 Cundles Road in the City of Barrie. Currently the Site contains a small temporary stormwater management basin and associated drainage swales, two earth piles (one is the topsoil from the Site, one is the spoils from the temporary SWM pond). The Site has been pre-graded based on the Master Site Plan conceptual commercial plaza and associated surface parking. The Site is bound by Cundles Road to the north (with residential development on the north side of the road), Highway 400 to the south, the Junction Condominiums to the west as well as institutional to the west (elementary school), and North Barrie Crossing commercial development to the east (the nearest buildings are Cineplex, Boston Pizza, TD Bank and a strip plaza).

The proposed development of the Site will include three condominium towers. Specifically, Tower B1 which is a 250 unit 12 storey building, Tower B2 which is an 81 unit 7 storey building and Tower B3 which is a 174 unit 10 storey building. This report is based upon a Conceptual Site Plan prepared by SRN Architects (SRN).

This report demonstrates how the proposed Condominium Development could be serviced by existing internal infrastructure and how storm drainage will function per the North Barrie Crossing Master Site Plan. The level of detail presented is sufficient to support planning level approvals and will serve as the basis for detailed design. Refer to Location Plan, Conceptual Site Plan, and the Conceptual Site Servicing and Grading Plans contained in **Appendix A** for preliminary designs which are discussed throughout this report.

1.3 Background

The subject lands are part of the North Barrie Crossing Master Site Plan (NBC). The design of NBC included Master Site Servicing and Grading and Stormwater Management. Each Site within NBC is serviced via common access roads and infrastructure.

Due to extensive NBC Master Site Plan earthworks requirements, the Site is currently in a pre-graded state with a temporary SWM Pond. The Site does not have sanitary sewer or storm sewer servicing stubs but there are existing manholes for connections, while the watermain servicing does include two stubs.

In regard to Stormwater Management, it is important to understand that the stormwater management facility has already been constructed. The SWM Facility was constructed as part of the Duckworth Street – Highway 400 Interchange Improvements and is located on the north side of Cundles Road at the intersection of Cundles Road and J.C. Massie Way.

2.0 Site Grading

The conceptual grading for the proposed development meets the requirements of the site layout and is in General Conformance with the Master Site Grading Plan. The grading also supports the continuation of the Master Servicing Plan as it relates to Stormwater Management, overland flow and storm sewer designs.

The following are highlights of the proposed preliminary grading design:

- Internal road grades / top of parking structure will be in the order of 1.0% to 3.0%; with localized entrance slopes of up to 6.0% to coordinate site access and minimize earthworks.
- All perimeter elevations will be maintained; which will necessitate retaining walls along the south property line adjacent to Highway 400, and there could be 3:1 (H:V) slopes along some of the perimeter landscaping areas of the development adjacent to the existing condos and Cundles Road. Retaining walls and steep slope areas will be reviewed in greater detail during detailed design with the intent to minimize.

Refer to **Drawing LGR** for the Conceptual Grading Plan contained in **Appendix A**.

3.0 Sanitary Servicing

The existing sanitary servicing for NBC has been constructed per the approved Master Servicing Plan. There is an existing 250mm diameter sanitary trunk sewer installed across the Site (located between proposed Tower B2 and Tower B3) which provides sanitary servicing for The Junction Condominiums to the west and is also intended to service the Subject Site.

Based on conceptual built form of the Site, it is proposed to connect into the above noted existing sanitary sewer in two locations; one for Tower B1/B2 and one connection for Tower B1. Internal building design specifics will need to be reviewed by the building design team during detailed design to conform to applicable requirements and codes.

The proposed Condominium development includes 505 units and with a design population of 843 people it will generate a peak sanitary flow of 7.69L/s. Based on this peak flow there is adequate reserve capacity in the existing on-site sanitary sewer to accommodate this flow.

Refer to **Appendix B** for an updated Master Site Plan Sanitary Sewer Design sheet which is updated to include the proposed condominium development.

4.0 Water Servicing

The NBC watermain construction included a 200mm diameter main looped through the Master Site Plan connecting the Cundles Road watermain and the Duckworth Street watermain. This extensively looped system is noted on the Master Site Servicing Plan.

Please note that The Junction Condominiums have separate watermain connections directly to the Cundles Road watermain.

To confirm available fire flow within the NBC Master Site Plan a fire hydrant flow test was completed on the nearest fire hydrant. Results are included in **Appendix B** for the flow test completed on the fire hydrant in front of the Cineplex building.

The Fire Underwrites Survey (FUS) was used in assessing the required fire flow. The FUS calculations have been completed using the 12 storey Tower 1 as it is the largest of buildings. Per the water servicing calculations included in **Appendix B**, the FUS calculates a required fire flow of 176.9 L/s and the fire hydrant flow test results in an available flow of 192.2 L/s at 20psi. Based on these calculations the existing watermain is capable providing the flow per the FUS requirements.

5.0 Stormwater Management

5.1 Development Design Criteria & Supporting Documents

A regional stormwater management (SWM) facility has been constructed north of Cundles Road adjacent to J. C. Massie Way. The SWM facility was designed by Morrison Hershfield, on behalf of the City of Barrie, to accommodate the runoff generated by the Cundles Road/Duckworth Street Widening project and the North Barrie Crossing Master Site Plan. Based on the proposed Conceptual Site Plan for the Subject Site, this area of the site for the NBC Master Site Plan the run-off coefficient remains unchanged.

All stormwater management calculations completed for the NBC Master Site Plan were provided to Morrison Hershfield for the design of the off-site Regional Stormwater Management Facility.

In the below sections are some of the relevant information regarding the stormwater management design for the NBC Master Site Plan. This information is provided to

illustrate that the downstream regional SWM facility was designed and constructed based on the relevant framework for approvals at that time.

5.2 Stormwater Management Design Criteria

The stormwater management design for the NBC Master Site Plan incorporated the policies and criteria of a number of agencies, including the Ministry of the Environment (MOE), Nottawasaga Valley Conservation Authority (NVCA) and City of Barrie (City). The agency stormwater design criteria are summarized below:

- Stormwater quality controls will be provided based on the guidelines described in the Ministry of the Environment Stormwater Management Planning and Design Manual dated March 2003. Following the MOE Guidelines, the stormwater management design utilized for the NBC site incorporated an integrated treatment train approach to aid in providing water quality control at an Enhanced Level of Protection where possible.
- The City of Barrie Design Guidelines were used as a reference for the design of the stormwater conveyance system.
- The storm sewer system was designed to convey as a minimum the minor system flows (up to and including the 5-year storm).
- The internal road network provides conveyance for the less frequent major system flows (i.e. greater of the 100-year and Regional storm peak flows).
- The Orillia (City of Barrie) rainfall Intensity-Duration-Frequency (IDF) data was used to determine the peak design flows and runoff volumes for each of the design storm events (2, 5, 25 and 100-year storm events).
- Post-development peak flows are controlled to pre-development levels for each of the design storm events (2, 5, 25 and 100-year storm events) via the use of the off-site SWM facility designed by Morrison Hershfield. The Regional storm flows from the site are provided with a safe overland flow route/outlet from the site to the off-site SWM Facility.

5.3 Development Drainage

Under the previous design scenarios for which the off-site wet pond was constructed, the Subject Site was proposed to be a parking lot. As such, design parameters are essentially unchanged and no on-site stormwater management treatment is being proposed and no downstream system changes or upgrades are required to facilitate the Subject Site being developed as currently proposed.

The post-development drainage patterns as described for NBC Master Site Plan approval will remain unchanged (and remain generally consistent with that of the pre-NBC development condition).

Except for The Junction Condominium Site Plan, the NBC Master Site Plan area drains to J.C. Massie Way via both overland sheet flow (major system flows) and the storm sewer system (minor system flows). Both the minor and major system flows (up to and including the greater of the 100-year and Regional storm flows) is conveyed via a section of storm sewer pipe which was designed based on the 100-year storm event, under Cundles Road to the inlet of the offsite regional wet pond facility.

5.4 Quantity / Quality Control Measures

The approved SWM plan for the North Barrie Crossing Master Site Plan included some on-site control measures, such as roof top controls for the Zehrs building and the LAF building, an OGS for The Junction Condominiums and an OGS for the Fuel Station, as such there is no additional measure proposed for the Subject Site.

The Subject Site is to drain to the 100 year storm sewer pipe constructed with in the common access road.

It is perhaps worth noting that The Junction Condominiums stormwater discharges into the external bi-pass storm sewer along the Cundles Road frontage. The bi-pass storm sewer was constructed in 2010 and collects the external drainage from south of Highway 400, portions of the lands west of The Junction Condominiums and The Junction Condominiums.

Based on design guidelines described in the MOE Stormwater Management Planning and Design Manual dated March 2003, an integrated treatment train approach was used to design the proposed storm drainage system, which helps minimize any impact that the development may have on existing stormwater quality conditions. The integrated treatment train approach is premised on providing (i) Lot Level, (ii) Conveyance, and (iii) End-of-pipe controls.

i) Lot Level Control: Sumps have been provided in the catchbasins to capture the solids and heavy debris that may be suspended in the stormwater runoff. Also, oil/grit separators have been incorporated into the design of the Fuel Station and The Junction Condominiums.

ii) Conveyance Control: Due to the nature of the proposed development, opportunity for conveyance control features such as grassed swales, vegetated buffers, etc. was very limited.

iii) End-of-Pipe Control: The final element of the proposed treatment train approach to stormwater quality control is the regional wet pond facility located off-site on the north side of Cundles Road. The end-of-pipe wet pond facility was designed by Morrison Hershfield to provide stormwater quality and quality control. Refer to the Cundles Road/Duckworth Street Widening Stormwater Management Report prepared by Morrison Hershfield for additional detail pertaining to the regional wet pond facility.

6.0 Sediment and Erosion Controls

Effective erosion and sediment control must be established prior to construction commencement and maintained until the site has been stabilized. Pro-active measures will be required to limit the amount of sediment travelling downstream. Where site grading is required, exposure of the soil during construction should be minimized to avoid erosion and sedimentation.

Silt Fence: Silt fence will be placed on the down slope of all excavated material to prevent sediment transport onto adjacent properties and the municipal roadways. Periodic inspections and repairs to the silt fence should be performed regularly, as well as after every rainfall event.

Storm Sewer Inlets: Filter cloth complete with clear stone cover at storm sewer inlet structures (i.e. catchbasins), will ensure sediment laden overland runoff during construction is cleansed before entering the municipal storm sewer system.

Vegetated Buffers: Existing grassland vegetation/woodlot areas along the development limits are to be maintained wherever possible. These areas will provide a natural barrier to filter potentially sediment-laden overland flow.

Monitoring & Inspection: Erosion monitoring and sediment removal should be undertaken every week, and after every rainfall event. All damaged or clogged control devices or fencing must be repaired immediately.

7.0 Utilities

Existing hydro, gas and telecom infrastructure is present within the existing NBC development and along Cundles Road. Each utility provider will be circulated the conceptual development plans for their use in determining possible service connections / upgrades which h might be required.

Based on the presence of the existing utility services within the surrounding development it is not anticipated that there will be issues with providing utility servicing for the proposed development. Specific utility servicing requirements will be confirmed at the detailed design stage.

8.0 Summary

This Functional Servicing Report demonstrates the preliminary servicing design for the Subject Site, while also being in General Conformance with the North Barrie Crossing Master Site Servicing and Grading Plans.

Specifically:

- Stormwater quantity and Quality control is provided by the existing off-site regional wet pond.

- The use of silt fence, clear stone & filter cloth inlet protection, and vegetated buffers will provide adequate sediment and erosion controls during construction.
- The site grading design generally resembles that of the existing site topography with possible changes resulting from minimizing perimeter slopes and retaining walls.
- Sanitary servicing will be provided by the internal sewer system connecting to the existing sanitary sewer within the common access road network of North Barrie Crossing.
- Fire and potable water servicing will be provided by the existing internal watermain which is located in the common access roads of North Barrie Crossing.
- Utility servicing specifics are to be determined during detailed design but given the existing services adjacent to the site there are no known servicing concerns.

Should you have any questions or require additional information, please contact the undersigned.

Prepared by:

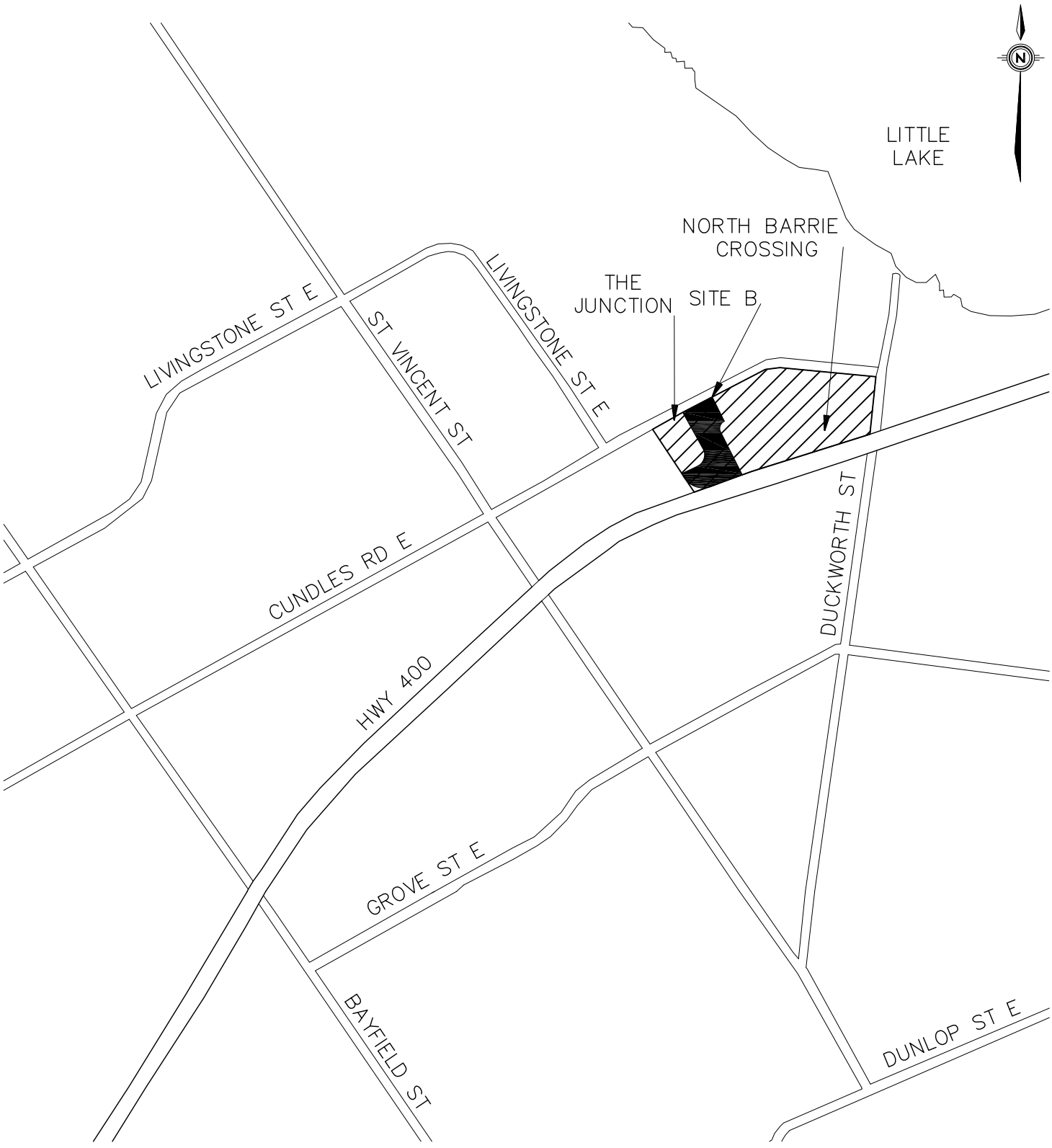
WMI & Associates Limited

Dean A. Ives, P. Eng.

Z:\Projects\2007\07-007\Reports\220527(07-007)_FSR_SiteB.docx

APPENDIX A

FIGURES/DRAWINGS



Drawing Title

Site Location Plan

Project Title

Site B – North Barrie Crossing

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Figure No.
AB	DAI	FIG1
Scale	Project No.	
N.T.S.	07–007	

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT

DATE : Oct. 11, 2016

RUDY MAK
ONTARIO LAND SURVEYOR

PLAN 51R- 40672
RECEIVED AND DEPOSITED.

DATE : OCT 11 2016

REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF SIMCOE (No. 51)

DISTANCES

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999703.

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD 83 (ORIGINAL), COORDINATES TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10

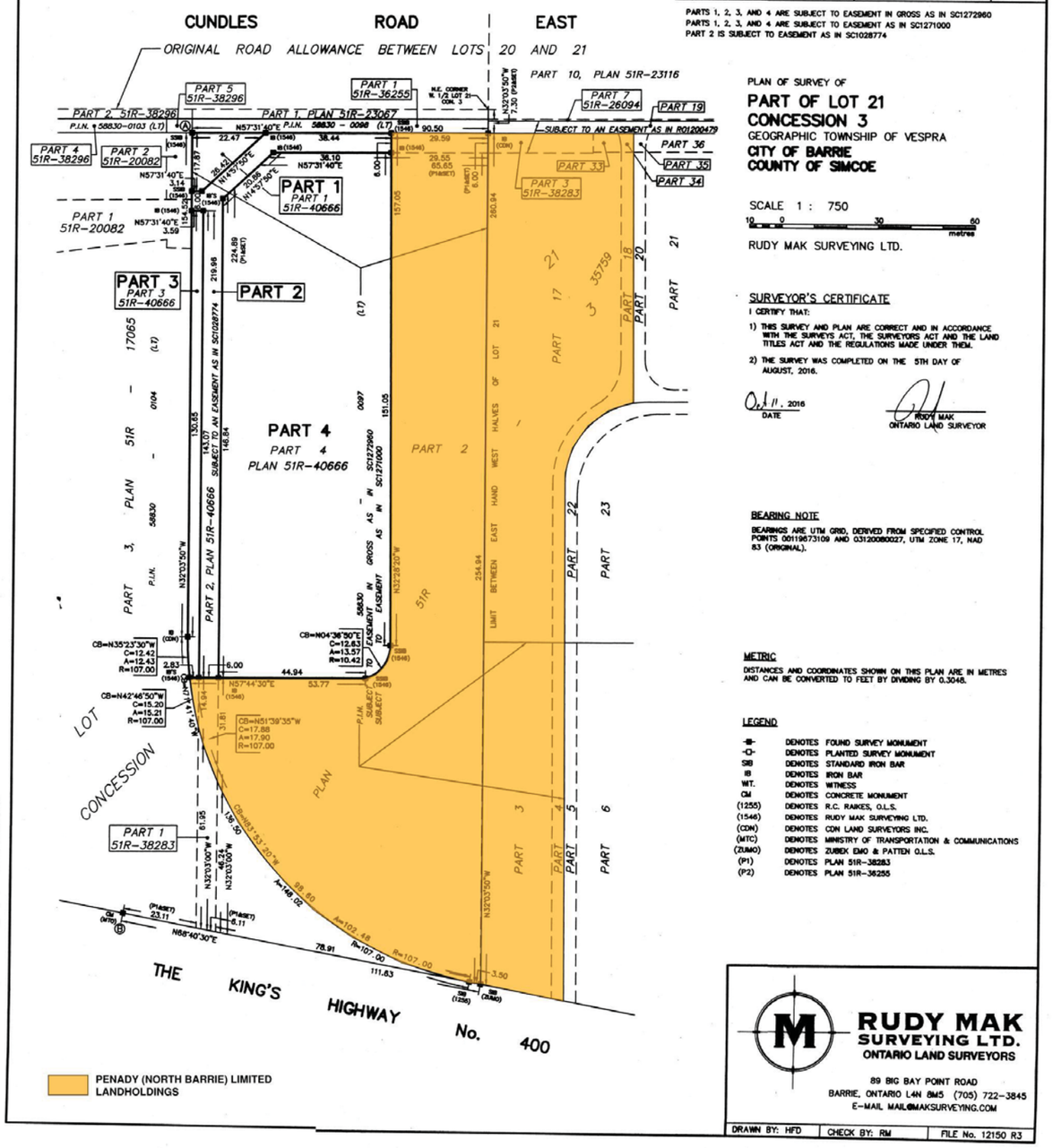
POINT ID	NORTHING	EASTING
SCP 00119673109	4915700.133	604482.056
SCP 03120080027	4917932.874	602243.437
ORP A	4918720.620	604892.968
ORP B	4918507.541	605003.836

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THE PLAN.

SCHEDULE

PART	LOT	CONCESSION	P.I.N.	AREA (SQ.M.)
1	PART OF LOT 21	3	PART OF P.I.N. 58830-0097 (LT)	229
2				1274
3				507
4				8241

PARTS 1, 2, 3, AND 4 ARE SUBJECT TO EASEMENT IN GROSS AS IN SC1272960
PARTS 1, 2, 3, AND 4 ARE SUBJECT TO EASEMENT AS IN SC1271000
PART 2 IS SUBJECT TO EASEMENT AS IN SC1028774



PLAN OF SURVEY OF
PART OF LOT 21
CONCESSION 3
GEOGRAPHIC TOWNSHIP OF VESPRA
CITY OF BARRIE
COUNTY OF SIMCOE

SCALE 1 : 750

10 0 30 60 metres

RUDY MAK SURVEYING LTD.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1) THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

2) THE SURVEY WAS COMPLETED ON THE 5TH DAY OF AUGUST, 2016.

Oct 11, 2016
DATE

RUDY MAK
ONTARIO LAND SURVEYOR

BEARING NOTE

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 00119673109 AND 03120080027, UTM ZONE 17, NAD 83 (ORIGINAL).

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

LEGEND

-■-	DENOTES FOUND SURVEY MONUMENT
-○-	DENOTES PLANTED SURVEY MONUMENT
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
WIT.	DENOTES WITNESS
CM	DENOTES CONCRETE MONUMENT
(1255)	DENOTES R.C. RAIKES, O.L.S.
(1546)	DENOTES RUDY MAK SURVEYING LTD.
(CDN)	DENOTES CDN LAND SURVEYORS INC.
(MTC)	DENOTES MINISTRY OF TRANSPORTATION & COMMUNICATIONS
(ZUMO)	DENOTES ZUBEK EMO & PATTEN O.L.S.
(P1)	DENOTES PLAN 51R-38283
(P2)	DENOTES PLAN 51R-36255

RUDY MAK SURVEYING LTD.
ONTARIO LAND SURVEYORS
89 BIG BAY POINT ROAD
BARRIE, ONTARIO L4N 8M5 (705) 722-3845
E-MAIL MAIL@MAKSURVEYING.COM

DRAWN BY: HFD | CHECK BY: RM | FILE No. 12150 R3

I:\MakCad\S-12100\12150\AutoCad Drawings\12150R3.dwg, 10/11/2016 8:22:59 AM, HONG

C:\Users\emadm\OneDrive - The Plus Group\Documents\S20035PH10-Cundles Barrie-Concept_RVT2022_emadmEZH3R.rvt

THESE DRAWINGS ARE NOT TO BE SCALED:
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

ADDITIONAL NOTES:

NO:	DATE:	ISSUED FOR:

SRN ARCHITECTS INC SHALL NOT BE RESPONSIBLE FOR:

1. ERRORS, OMISSIONS, INCOMPLETENESS DUE TO LOSS OF INFORMATION IN WHOLE OR PART WHEN INFORMATION IS TRANSFERRED.

2. TRANSMISSIONS OF ANY VIRUS OR DAMAGE TO RECEIVING ELECTRONIC SYSTEM WHEN INFORMATION IS TRANSFERRED

SRN ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

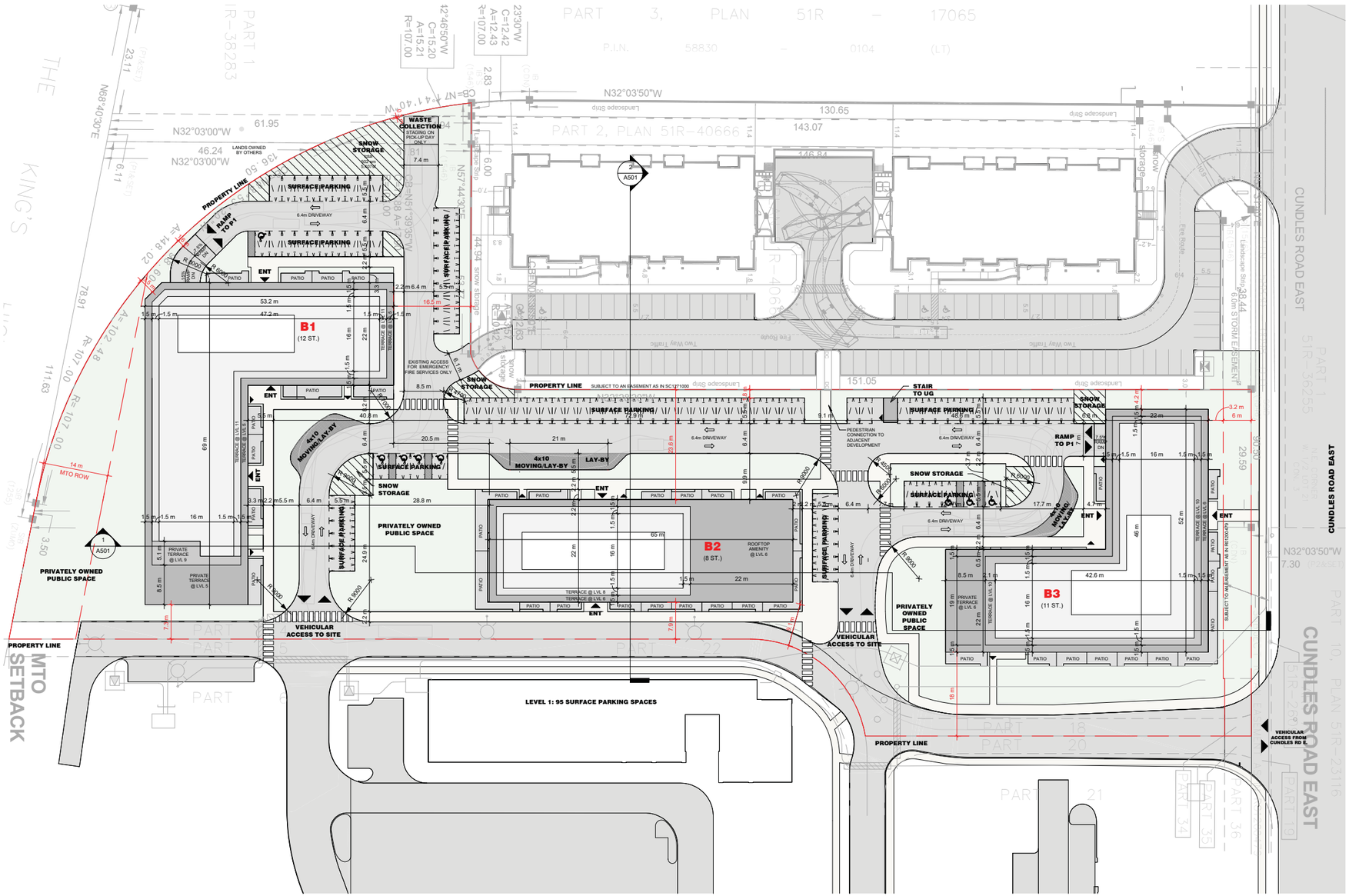
CLIENT:
PENEQUITY

PROJECT:
RESIDENTIAL RENTAL / CONDO
CUNDLES ROAD EAST
BARRIE, ON

DRAWING TITLE:
PROJECT SURVEY

DATE:	01/19/22	SCALE:	1 : 25
DRAWN BY:	Author	CHECKED BY:	Checker
PROJECT NUMBER:	S20035	DRAWING NUMBER:	A102

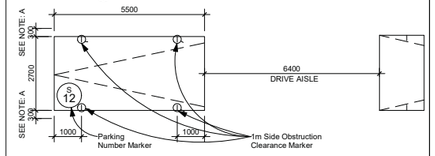
SITE SURVEY
NTS
1
A102



OVERALL SITE PLAN (1 / A110)
Scale: 1 : 450

TYPICAL PARKING SPACE:

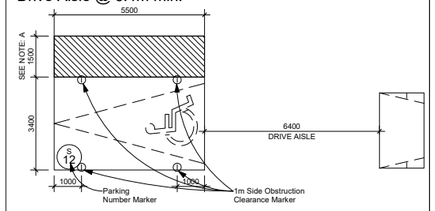
Drive Aisle @ 6.4m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

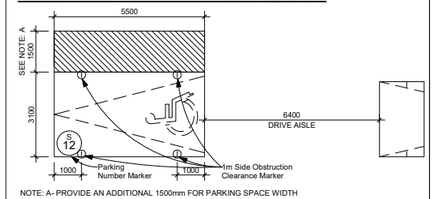
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6.4m min.



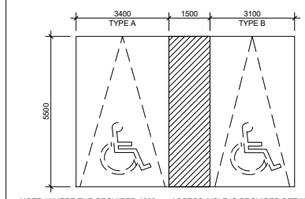
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:



NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

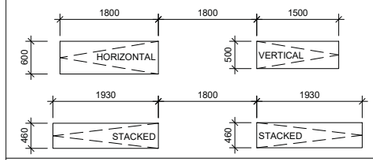
BARRIER-FREE PARKING SPACE TYPE A & B:



NOTE: WHERE THE REQUIRED 1500mm ACCESS AISLE IS PROVIDED BETWEEN TWO BARRIER-FREE PARKING SPACES, THE AISLE WIDTH CAN BE SHARED.

TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1500mm (L) x 500mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



THESE DRAWINGS ARE NOT TO BE SCALED:
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

ADDITIONAL NOTES:

THE DRAWING, AS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF SRN ARCHITECTS INC. THE CONTRACTOR MUST VERIFY AND ACCEPT RESPONSIBILITY FOR ALL DIMENSIONS AND CONDITIONS ON SITE AND MUST NOTIFY SRN ARCHITECTS INC. OF ANY VARIATIONS FROM THE SUPPLIED INFORMATION. SRN ARCHITECTS INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC. ENGINEERING INFORMATION SHOWN ON THIS DRAWING REFER TO APPROPRIATE ENGINEERS DRAWINGS BEFORE PROCEEDING WITH ANY WORK. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (UNDERTAKEN OTHERWISE NOTED). NO INVESTIGATION HAS BEEN OR REPORTED ON BY THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITION OF THIS SITE.

CONDITIONS FOR ELECTRONIC INFORMATION TRANSFER:

ELECTRONIC INFORMATION IS SUPPLIED TO THE OTHER ASSOCIATED FIRMS TO ASSIST THEM IN THE ERECTION OF THEIR WORK/REVIEW. THE RECIPIENT FIRMS MUST DETERMINE THE COMPLETENESS/APPROPRIATENESS/ RELEVANCE OF THE INFORMATION IN RESPECT TO THEIR PARTICULAR RESPONSIBILITY.

NO:	DATE:	ISSUED FOR:

SRN ARCHITECTS INC SHALL NOT BE RESPONSIBLE FOR:

1. ERRORS, OMISSIONS, INCOMPLETENESS DUE TO LOSS OF INFORMATION IN WHOLE OR PART WHEN INFORMATION IS TRANSFERRED.

2. TRANSMISSIONS OF ANY VIRUS OR DAMAGE TO RECEIVING ELECTRONIC SYSTEM WHEN INFORMATION IS TRANSFERRED

SRN ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

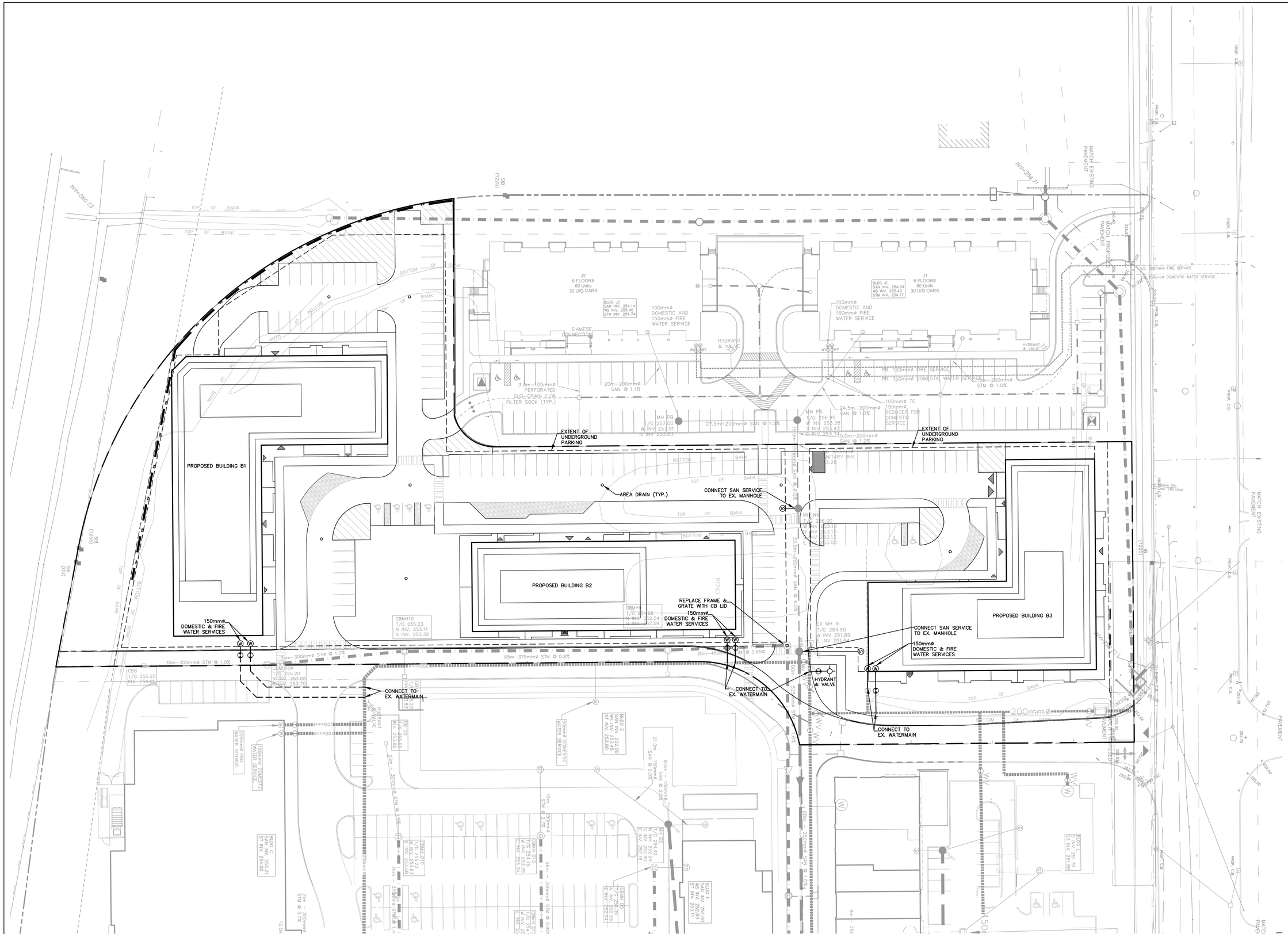
CLIENT:
PENEQUITY

PROJECT:
RESIDENTIAL RENTAL / CONDO
CUNDLES ROAD EAST
BARRIE, ON

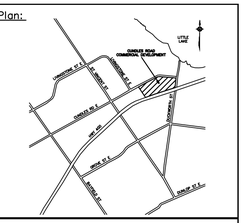
DRAWING TITLE:
SITE PLAN

DATE:	01/19/22	SCALE:	As indicated
DRAWN BY:	Author	CHECKED BY:	Checker
PROJECT NUMBER:	S20035	DRAWING NUMBER:	A110

C:\Users\emadm\OneDrive - The Plus Group\Documents\S20035PH10-Cundles Barrie-Concept_RVT2022_emadmEZH3R.rvt



Key Plan:



Notes:

1. Unless noted otherwise, the measurements and distances shown on this drawing are shown in meters.

2. Do not scale drawings.

3. It is the contractor's responsibility to verify all dimensions, levels and datums on site and report any discrepancies or omissions to WMI & Associates Limited prior to construction.

4. This drawing is to be read and understood in conjunction with all other relevant documents applicable to this project.

5. It is the contractor's responsibility to establish the location of all existing utilities on site.

6. This drawing is the exclusive property of WMI & Associates Limited and the reproduction of any part of this document without prior written consent is strictly prohibited.

Legend:

EXISTING FEATURES (EX)

EX SIB / EX STD IRON BAR	EX WS / EX WATER SERVICE
EX IB / EX IRON BAR	EX HYD / EX FIRE HYD.
EX UP / EX UTILITY POLE	NS / EX ST NAME SIGN
EX BELL PED	SS / EX STOP SIGN
	123.45 / EX ELEVATION
	EX FENCE
GAS	EX U/G GASMAIN
	EX U/G BELL
EX WV	EX WATERMAIN & VALVE
0m-00mmø SAN @ 0.0%	EX SAN SEWER & MH
0m-00mmø STM @ 0.0%	EX STM SEWER & MH

PROPOSED FEATURES (PR)

NS	PR STREET NAME SIGN
SS	PR STOP SIGN
	PR FENCE
L	PR STREET LIGHT
	PR HYDRO TRANSFORMER
	PR FIRE HYDRANT
	PR WATER VALVE
MH K	PR SANITARY MANHOLE
MH 4	PR CATCHBASIN MANHOLE
MH 4	PR MANHOLE
	PR CATCHBASIN
000.00	PROPOSED ELEVATION
000.00	PROPOSED ELEVATION (by others)
000.00	PROPOSED ELEVATION (matching existing)
	PR SWALE
RW	PR RETAINING WALL

No.	Issue / Revision	Date
1	FUNCTIONAL SERVICING REPORT	MAY 27, 2022

Drawing Name:

SITE B – CONCEPTUAL SITE SERVICING PLAN

Project Name:

NORTH BARRIE CROSSING

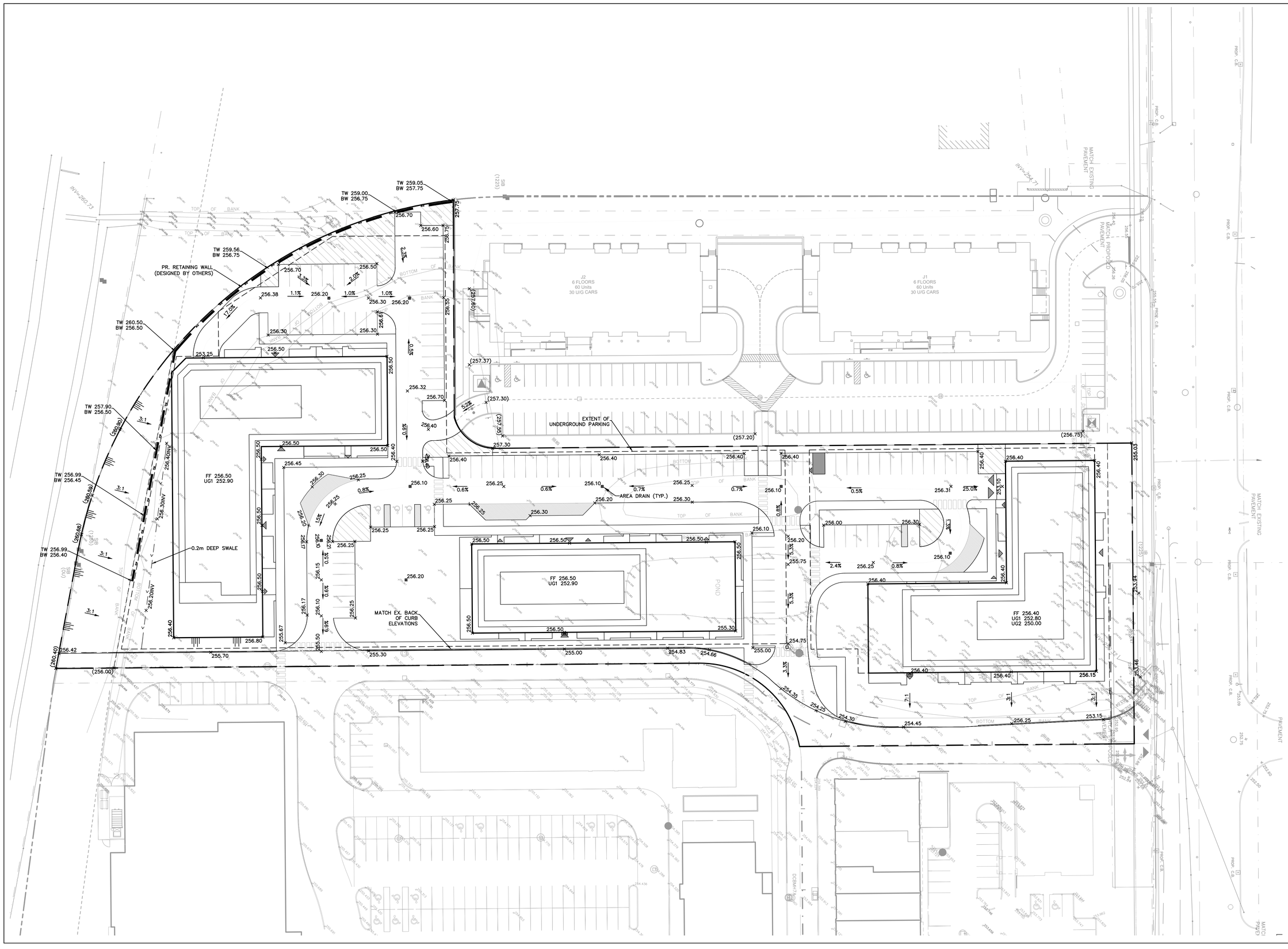
Client:

PENADY (BARRIE) Ltd.

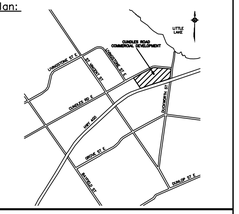
33 Yonge Street, Suite 901
Toronto, Ontario
M5E 1G4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Drawing No.
AW/AB	DAI	GEN
Scale 1:400	Project No. 07-007	



Key Plan:



Notes:

1. Unless noted otherwise, the measurements and distances shown on this drawing are shown in meters.
2. Do not scale drawings.
3. It is the contractor's responsibility to verify all dimensions, levels and datums on site and report any discrepancies or omissions to WMI & Associates Limited prior to construction.
4. This drawing is to be read and understood in conjunction with all other relevant documents applicable to this project.
5. It is the contractor's responsibility to establish the location of all existing utilities on site.
6. This drawing is the exclusive property of WMI & Associates Limited and the reproduction of any part of this document without prior written consent is strictly prohibited.

Legend:

EXISTING FEATURES (EX)

EX SIB / EX IB	EX STD IRON BAR / EX IRON BAR
EX UP	EX UTILITY POLE
	EX BELL PED
EX WS	EX WATER SERVICE
EX HYD	EX FIRE HYD.
NS	EX ST NAME SIGN
SS	EX STOP SIGN
123.45	EX ELEVATION
	EX FENCE
GAS	EX U/G GASMAIN
	EX U/G BELL
EX WV	EX WATERMAIN & VALVE
0m–00mmø SAN @ 0.0%	EX SAN SEWER & MH
0m–00mmø STM @ 0.0%	EX STM SEWER & MH

PROPOSED FEATURES (PR)

NS	PR STREET NAME SIGN
SS	PR STOP SIGN
	PR FENCE
L	PR STREET LIGHT
	PR HYDRO TRANSFORMER
	PR FIRE HYDRANT
	PR WATER VALVE
MH K	PR SANITARY MANHOLE
MH 4	PR CATCHBASIN MANHOLE
MH 4	PR MANHOLE
	PR CATCHBASIN
000.00	PROPOSED ELEVATION
000.00	PROPOSED ELEVATION (by others)
000.00	PROPOSED ELEVATION (matching existing)
	PR SWALE
RW	PR RETAINING WALL

No.	Issue / Revision	Date
1	FUNCTIONAL SERVICING REPORT	MAY 27, 2022

Drawing Name:

SITE B – PRELIMINARY GRADING PLAN

Project Name:

NORTH BARRIE CROSSING

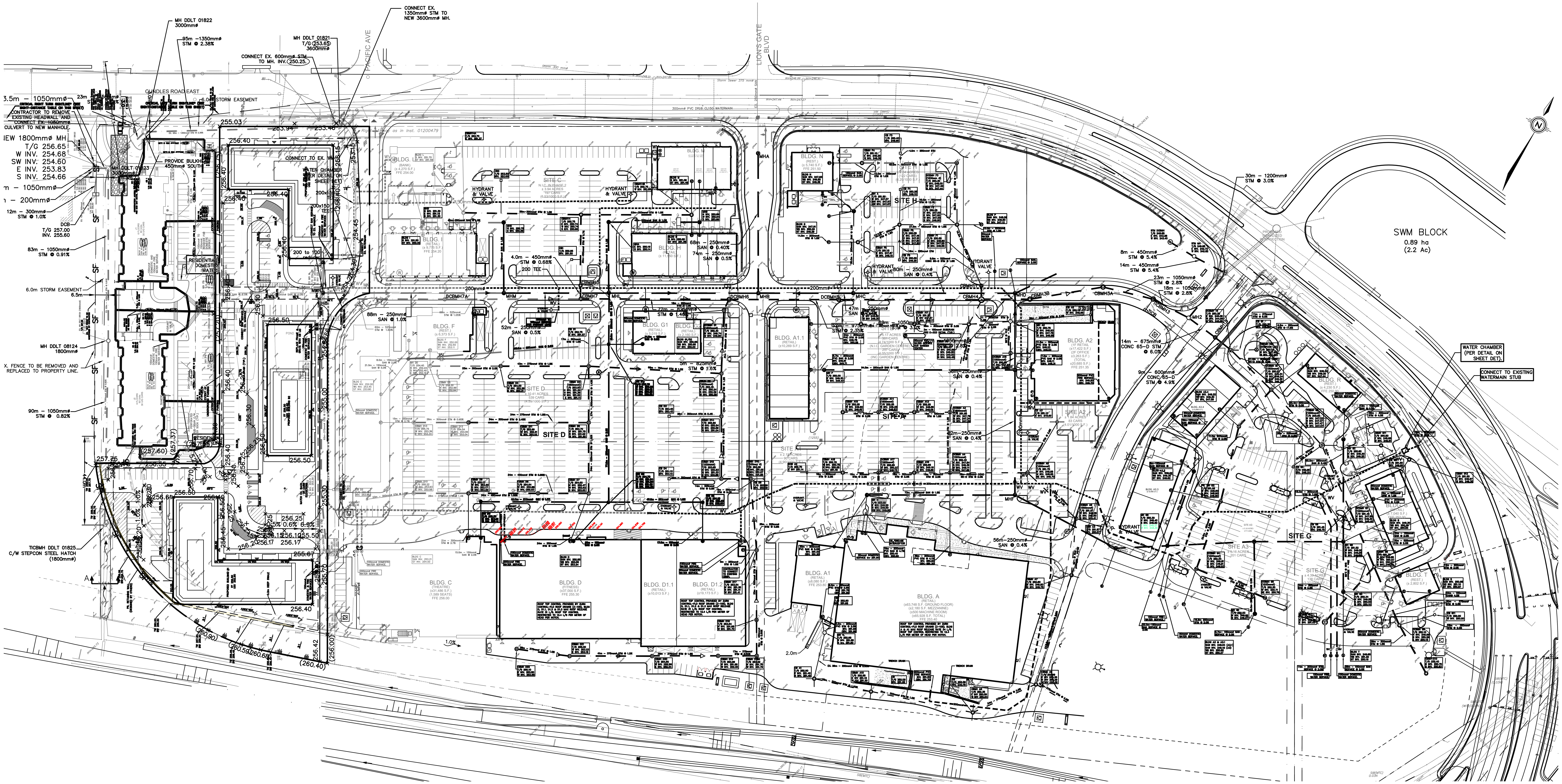
Client:

PENADY (BARRIE) Ltd.

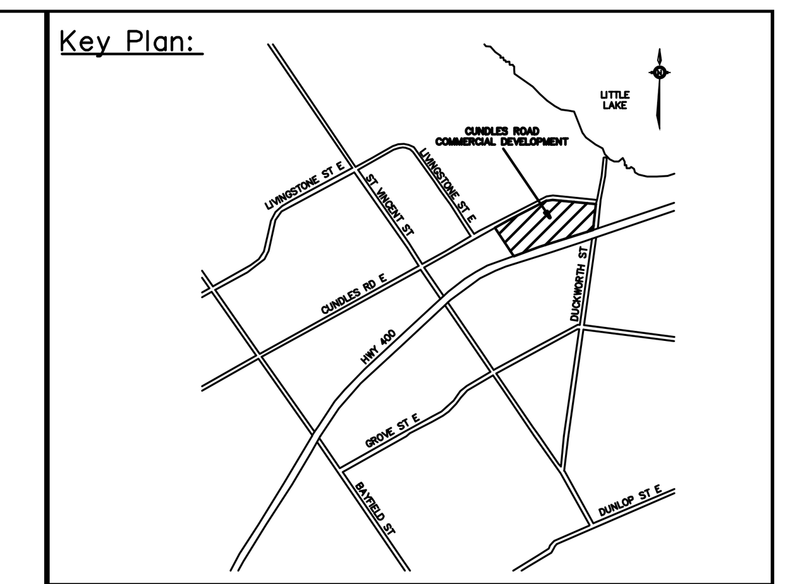
33 Yonge Street, Suite 901
Toronto, Ontario
M5E 1G4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Drawing No.
AW/AB	DAI	LGR
Scale 1: 400	Project No. 07–007	



Key Plan:



Notes:

1. Unless noted otherwise, the measurements and distances shown on this drawing are shown in meters.

2. Do not scale drawings.

3. It is the contractor's responsibility to verify all dimensions, levels and datums on site and report any discrepancies or omissions to WMI & Associates Limited prior to construction.

4. This drawing is to be read and understood in conjunction with all other relevant documents applicable to this project.

5. It is the contractor's responsibility to establish the location of all existing utilities on site.

6. This drawing is the exclusive property of WMI & Associates Limited and the reproduction of any part of this document without prior written consent is strictly prohibited.

Legend:

EXISTING FEATURES (EX)

- EX SIB — EX STD IRON BAR
- EX IB — EX IRON BAR
- EX UP — EX UTILITY POLE
- EX BELL PED
- EX WS — EX WATER SERVICE
- EX HYD — EX FIRE HYD.
- NS — EX ST NAME SIGN
- SS — EX STOP SIGN
- 123.45 — EX ELEVATION
- EX FENCE
- GAS — EX U/G GASMAIN
- EX U/G BELL
- EX WV — EX WATERMAIN & VALVE
- 0m–00mmø SAN @ 0.0% — EX SAN SEWER & MH
- 0m–00mmø STM @ 0.0% — EX STM SEWER & MH

PROPOSED FEATURES (PR)

- NS — PR STREET NAME SIGN
- SS — PR STOP SIGN
- PR FENCE
- PR STREET LIGHT
- PR WATER SERVICE
- PR SAN SERVICE
- PR HYDRO TRANSFORMER
- 150 00mmø W/M — PR WATERMAIN & VALVE
- PR FIRE HYDRANT
- PR WATER VALVE
- 0m–00mmø SAN @ 0.0% — PR SAN SEWER
- MH K — PR SANITARY MANHOLE
- 0m–00mmø STM @ 0.0% — PR STM SEWER & MH
- MH 4 — PR CATCHBASIN MANHOLE
- MH 4 — PR MANHOLE
- PR CATCHBASIN
- 000.00 — PROPOSED ELEVATION
- PR SWALE

No.	Issue / Revision	Date
1	FUNCTIONAL SERVICING REPORT	MAY 27, 2022

Drawing Name:

MASTER SITE SERVICING PLAN

Project Name:

CUNDLES ROAD COMMERCIAL

Client:

PENADY (BARRIE) Ltd.

33 Yonge Street, Suite 901
Toronto, Ontario
M5E 1G4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Drawing No.
RDW	DAI	SS1
Scale 1:1000	Project No. 07-007	

APPENDIX B

SANITARY & WATER CALCULATIONS

WMI & Associates Limited
119 Collier Street, Barrie, Ontario L4M 1H5
p (705) 797-2027 f (705) 797-2028

Sanitary Sewer Design Sheet
Cundles Road Commercial

q = average daily per capita flow (L/cap. day)
I = unit of peak extraneous flow (L/ha. s)
M = Ultimate Flow Factor (peaking factor)
Q_p = peak population flow (L/s)
Q_i = peak extraneous flow (L/s)
Q_d = peak design flow (L/s)

Sewage Flow:
OBC : Restaurant (l/seat) 125
MOE : Residential (L/day): 225
OBC : Retail (l/day/sm) 5

Peaking Factor
City Standard 3.5
where, P is population in 1000's
Infiltration: 0.12 (L/s/ha)
Mannings Coefficient, 'n': 0.013

$Q_p = (P*q*M)/86400$ (L/s)
$Q_i = I*A$ (L/s) where, A = Area (ha)
$Q_d = Q_p + Q_i$ (L/s)

Population Density: 3.5

Date: May 24, 2022
Project No: 07-007
Prepared by: AW

Location			No. of Units	People per Unit	Individual	Cumulative	Peaking	Sanitary	Infiltration			Total	Sewer Design					Sewer Profile					
Street	Upstream MH	Downstream MH	OR Area (sm)	OR People per ha	Number of People	Number of People	Factor (City)	Flow (L/s)	Individual Area (ha)	Cumulative Area (ha)	Flow (L/s)	Flow (L/s)	Dia. (mm)	Slope (%)	Capacity (L/s)	Velocity (m/s)	Length (m)	Loss in MH	Fall in Sewer (m)	Top of Grate Elevation (m) US	Top of Grate Elevation (m) DS	Invert Elevation (m) US	Invert Elevation (m) DS
		restaurant	364				2.00	1.05															
		restaurant	152				2.00	0.44															
								1.49	0.000	0.00	0.00	1.49	250	0.50	42.05	0.86			0.00	250.80	250.90		
	GC	GB					2	0.00	0.250	0.25	0.03	0.03	250	0.40	37.61	0.77	50		0.20	250.75	251.52	249.25	249.05
retail+tims	GD	GB	1165				2.00	3.37	0.250	0.25	0.03	3.40	250	0.40	37.61	0.77	25		0.10	252.34	251.52	249.15	249.05
	GB	GA	622				2.00	0.07	0.250	0.25	0.03	0.10	250	0.40	37.61	0.77	39		0.16	251.52	251.53	249.00	248.84
	GF	GA	0				2.00	4.93	0.250	0.75	0.09	5.02	250	0.40	37.61	0.77	42		0.17	252.75	251.53	249.01	248.84
retail	GF	G	1145				2.00	0.13	0.250	0.25	0.03	0.16	250	1.00	59.47	1.21	43		0.43	251.35	252.30	248.55	248.12
retail	GA	G	1145				2.00	0.13	0.250	0.25	0.03	0.16	250	1.00	59.47	1.21	67		0.67	251.53	252.30	248.79	248.12
	G	F	0				2.00	5.07	0.050	1.30	0.16	5.22	250	0.40	37.61	0.77	52		0.21	252.30	252.50	248.07	247.86
LPL	F1	F	9600				2.00	7.00	1.800	1.80		7.00	250	2.00	84.10	1.71	80		1.60	253.20	252.50	249.91	248.31
	F	E	0				2.00	12.07	0.050	3.15	0.38	12.44	250	0.40	37.61	0.77	72		0.29	252.50	251.60	247.81	247.52
	E	D	0				2.00	19.07	0.050	3.20	0.38	19.45	250	0.40	37.61	0.77	36		0.14	251.60	250.45	247.47	247.33
FUEL	STUB	D	64				2.00	0.01	0.500	0.50	0.06	0.07	150	1.00	15.23	0.86	52		0.52	248.50	250.45	247.85	247.33
	D	C	0				2.00	12.07	0.700	4.40	0.53	12.60	250	0.40	37.61	0.77	80		0.32	250.45	251.56	247.28	246.96
retail	STUB	C	1675				2.00	0.19	0.200	0.20	0.02	0.22	250	1.00	59.47	1.21	40		0.40	250.70	251.56	247.36	246.96
	C	B	0				2.00	12.27	0.100	4.70	0.56	12.83	250	0.40	37.61	0.77	47		0.19	251.56	251.71	246.91	246.72
		resident	196	1.67	327.32	327.32	3.50	2.98															
Subject Site		resident	505	1.67	843.35	843.35	3.50	7.69															
	stub	N						10.67	1.850	1.85	0.22	10.89	250	1.00	59.47	1.21	50		0.50	256.00	254.90	252.18	251.68
	N	M					2.00	10.67	0.330	2.18	0.26	10.93	250	1.00	59.47	1.21	88		0.88	254.90	253.81	251.63	250.75
		retail	820				2.00	0.09															
		bank	472				2.00	0.05															
	P	M						0.15	0.260	0.26	0.03	0.18	250	0.50	42.05	0.86	45		0.23	253.50	253.81	250.13	249.90
	M	L	0				2.00	10.82	0.070	2.51	0.30	11.12	250	0.50	42.05	0.86	52		0.26	253.81	252.87	249.85	249.59
retail	STUB	L	1675				2.00	0.19	0.600	0.60	0.07	0.27	250	1.00	59.47	1.21	40		0.40	252.90	252.87	249.99	249.59
	stub	L	9150				2.00	1.06	4.080	4.15		1.06	250	1.00	59.47	1.21	100		1.00	252.90	252.87	250.59	249.59
	L	B	0				2.00	12.07	0.110	7.37	0.88	12.96	250	0.50	42.05	0.86	74		0.37	252.87	251.71	249.54	249.17
	B	A					2.00	24.34	0.000	12.07	1.45	25.79	250	0.40	37.61	0.77	68		0.27	251.71	249.00	246.67	246.40
	A	ex	0				2.00	24.34	0.000	12.07	1.45	25.79	250	0.40	37.61	0.77	17		0.07	249.00	248.63	246.35	

Notes:

WMI & Associates Limited
119 Collier Street, Barrie, Ontario L4M 1H5
p (705) 797-2027 f (705) 797-2028

FIRE UNDERWRITERS SURVEY
DESIGN CALCULATIONS

Date: 25-May-22 **Project No.:** 07-007

Project: NBC **Prepared By:** AW

<<< **Elements Requiring Input Information**

Reference: Part II Water Supply for Public Fire Protection, Fire Underwriters Survey, 1999

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

where F=the required fire flow in litre per minute

C=coefficient related to type of construction

1.5 for wood frame construction

1.0 for ordinary construction - brick or other masonry wall, combustible floor and interior

0.8 for non-combustible construction - unprotected metal structure components masonry or metals walls

0.6 for fire resistive - fully protected frame floors, roof

A= the total floor area in square metres (refer to guide for requirements).

1 Fire Flow

C=	0.8		
A=	17952		
F=	23581	litres/min	

Wood Frame	1.5
Ordinary Construction	1
Non-Combustible	0.8
Fire-Resistive	0.6

2 Occupancy Reduction:

Apply reduction or surcharge

	-25	%	
F=	17686	litres/min	

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0
Free Burning	15%
Rapid Buring	25%

3 Sprinkler Reduction

Apply reduction for automatic sprinklers

	50	%	
F=	8843	litres/min	

NFPA 13 Sprinkler	30%
Standard Water Supply	10%
Fully Supervised	10%

4 Separation Charge

Add to flow for separation per side where separation is less than 45m. Max increase is 75%

	20	%	
F=	**10611.6**	litres/min	

North Side	10%
East Side	10%
South Side	0%
West Side	0%

5 Required FUS Flow

F=	**10611.6**	litres/min	
F=	**176.9**	**litres/sec**	

Rounding up	**11000.0**	litres/min
	183.3	litres/sec

-Floor areas from Site Plan as prepared by SRN Architects.

WMI & Associates Limited
119 Collier Street, Barrie, Ontario L4M 1H5
p (705) 797-2027 f (705) 797-2028

FIRE FLOW ANALYSIS CALCULATIONS
North Barrie Crossing

Date: 25-May-22 **Project No.:** 07-007

Project: NBC **Prepared By:** CJ

<<< **Elements Requiring Input Information**

Fire Flow Calculations

Flow test data from Vipond Inc. at the municipal hydrant located on Collier Street at Bayfield Street dated MAY 17, 2022.

Static Pressure	**95**	**psi**	655 kPa
Residual Pressure (residual during single port test flow)	**85**	**psi**	586 kPa
Flow (single port test flow on hydrant)	**1026**	**USGPM**	65 L/s

Hydrant Flow Calculations

$$Q_A = Q_T*(h_a^{0.54}/h_t^{0.54})$$

where,

Q_A = Flow at 20 psi (138kpa)
Q_T = Flow at Test
h_a = Pressure Drop Available (static - min. allowable)
h_t = Pressure Drop at Test (static - residual at tested flow)

Q_A = 1026 ((95 - 20) / (95 - 85))
Q_A = 3046 USGPM @ 20 psi
Q_A = 192.2 L/s @ 20 psi

Z:\Projects\2007\07-007\Spreadsheets\WaterCalcs\[220527(07-007SITEB)_City_of_Barrie_Fire Flow_Calcs.xlsx]Fire Flow Test

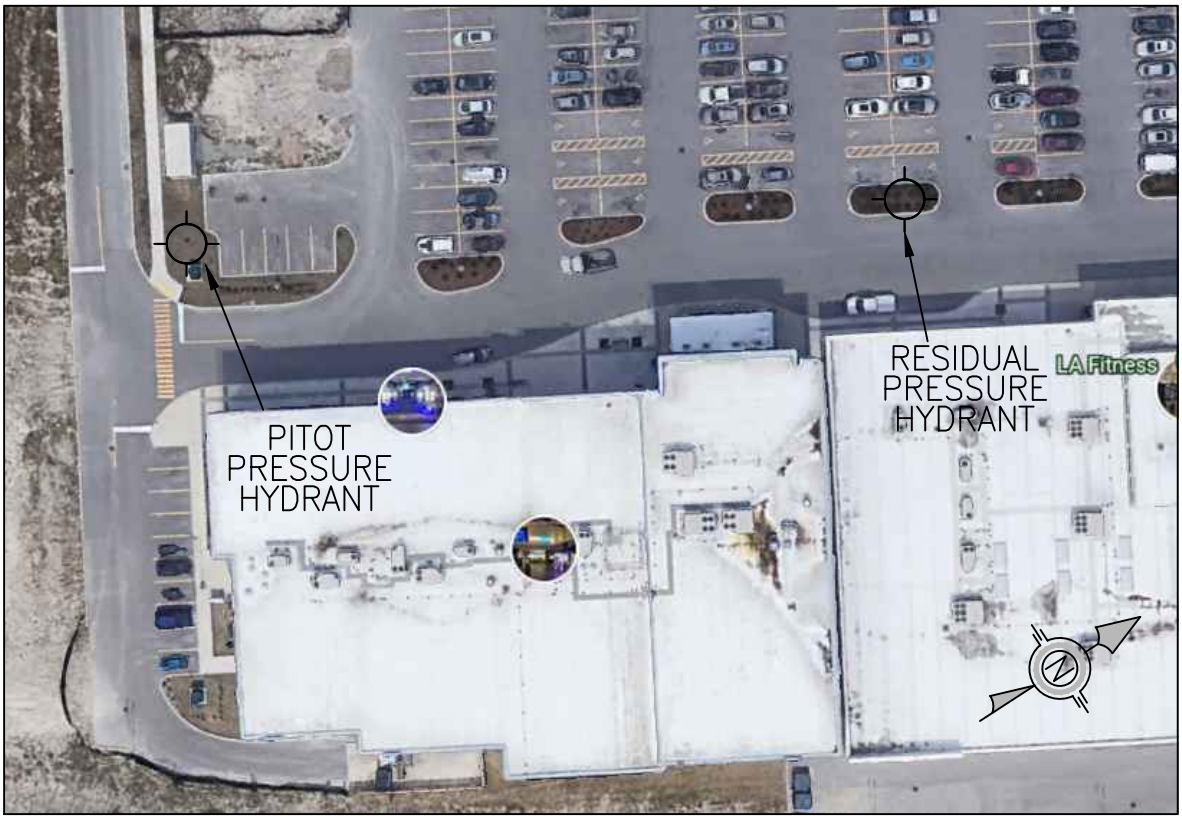
FLOW TEST RESULTS

FIRST FOR FIRE, LIFE SAFETY & SECURITY
VIPOND INC
est. 1945

DATE : MAY 17, 2022 TIME : 7:30 AM

LOCATION : 507 CUNDLES ROAD EAST
BARRIE
ONTARIO

TEST BY : MIKE.P, KRYSTIAN.K, ETHAN.B



STATIC PRESSURE : 95 PSI

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	87	64	712
2	1	2-1/2	0.90	85	37	1026
3	2	2-1/2	0.90	80	31	1878

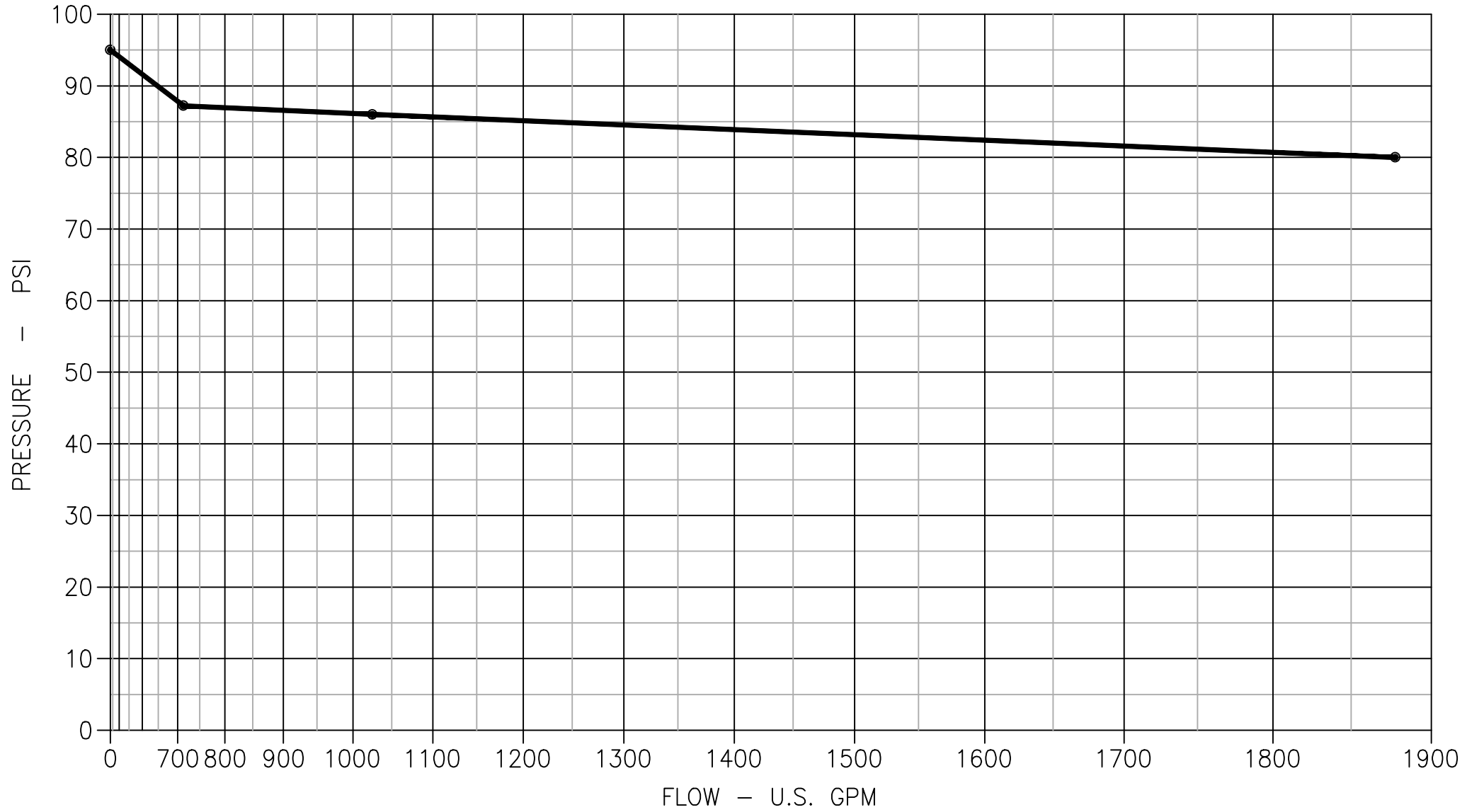
FIRST FOR FIRE, LIFE SAFETY & SECURITY

VIPOND INC

est. 1945

507 CUNDLES ROAD EAST	BY: MIKE.P, KRYSTIAN.K ETHAN.B
BARRIE	OFFICE : BARRIE
ONTARIO	TEST BY : VIPOND & PUC
	DATE : MAY 17, 2022

STATIC:		RESIDUAL:		FLOW:
95 PSI	TEST#1	87 PSI	@	712 GPM
	TEST#2	85 PSI	@	1026 GPM
	TEST#3	80 PSI	@	1878 GPM



APPENDIX C

GEOTECHNICAL REPORT