

FUNCTIONAL SERVICING REPORT

FOR

PREVIN COURT HOMES

PROPOSED

**RESIDENTIAL/COMMERCIAL DEVELOPMENT
180 AND 190 FERNDAL DRIVE NORTH**

**CITY OF BARRIE
COUNTY OF SIMCOE**

07002.100
November 15, 2019

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 SITE DESCRIPTION AND LOCATION	3
3.0 OTHER STUDIES AND REPORTS	5
4.0 WATER SUPPLY AND DISTRIBUTION	6
5.0 SANITARY SEWER SYSTEM	9
6.0 STORM SEWER SYSTEM	12
7.0 STORMWATER MANAGEMENT SYSTEM	15
8.0 STREETSCAPING AND ROAD GRADING	18
9.0 EROSION AND SEDIMENT CONTROL	19
10.0 CONCLUSION AND RECOMMENDATIONS	20

FIGURES

Figure 1 – Site Location	2
Figure 2 – Draft Plan of Subdivision	4
Figure 3 – Water Servicing Plan	8
Figure 4 – Sanitary Servicing Plan	10
Figure 5 – Sanitary Drainage Area Plan	11
Figure 6 – Storm Servicing Plan	13
Figure 7 – Storm Drainage Area Plan	14
Figure 8 – Stormwater Management Pond	17

TABLE OF CONTENTS (Cont'd)

APPENDICES

Appendix 1 – Sanitary Sewer Design Sheet

Appendix 2 – Storm Sewer Design Sheet

Appendix 3 – Water Servicing Calculations

Appendix 4 – Sanitary Servicing Calculations

REAR POCKET

Pocket 1 – Cover Sheet

Pocket 2 – Preliminary Grading Plan (GR-1)

Pocket 3 – Preliminary Grading Plan (GR-2)

Pocket 4 – Preliminary Servicing Plan (S-1)

Pocket 5 – Preliminary-Composite-Servicing-Grading Plan (SG-1)

Pocket 6 – SWM Facility (SWM-1)

Pocket 7 – SWM Facility Details and Cross Sections (SWM-2)

Pocket 8 – Pre-Development Drainage Scenario 2.1 (SWM-3)

Pocket 9 – Post-Development Drainage Scenario 2.2 (SWM-4)

Pocket 10 – Erosion Control Plans (ESC-1 to ESC-4)

Pocket 11 – Topographic Survey - Dino Astri Surveying (TOPO-1)

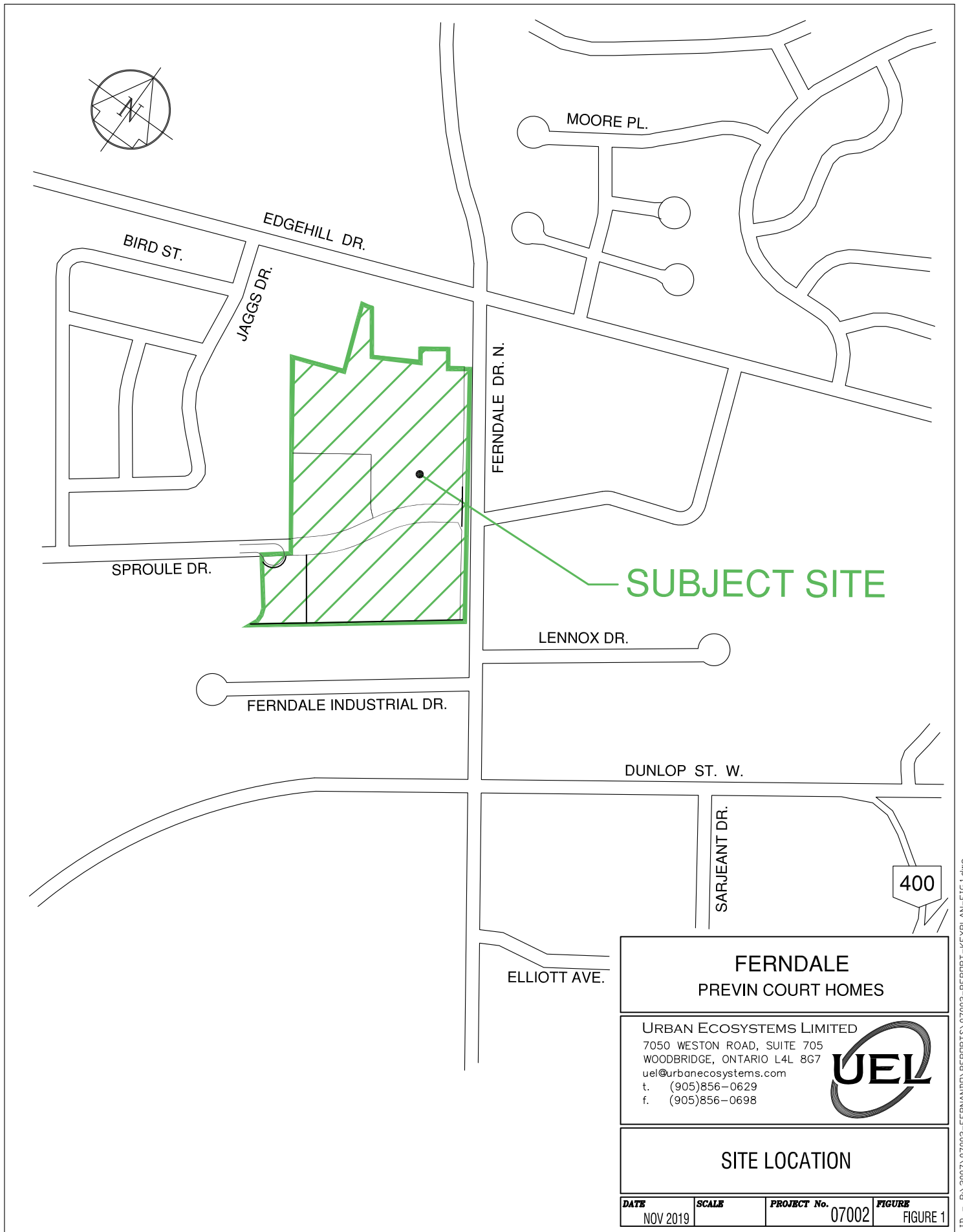
1.0 INTRODUCTION

Urban Ecosystems Limited, on behalf of Previn Court Homes, has prepared this Functional Servicing Report (FSR) for the subject lands (approximately 8Ha), located west of Ferndale Drive North, between Dunlop Street and Edgehill Drive in the City of Barrie, County of Simcoe. The development is bisected by a proposed extension of the existing Sproule Drive to Ferndale Drive. Refer to *Figure 1 – Site Location*.

A detailed topographic survey prepared by Dino Astri Surveying Ltd. Job No. 18166 is provided for use in this Functional Servicing Report.

This Report summarizes the development scheme proposal with respect to the following:

- Demonstrate that the proposed development can be serviced with municipal sanitary sewers, storm sewers, water distribution system, stormwater management facilities and utilities.
- Ensure that the development is compatible with existing downstream servicing presently available and/or currently proposed by the City.
- Establish the design criteria and standards to which the development infrastructure is to be developed.
- Review the existing topography, existing road network and existing adjacent developments external to the site with respect to the anticipated site grading concept.

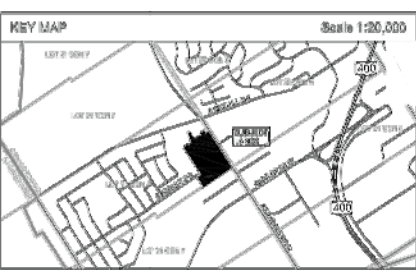
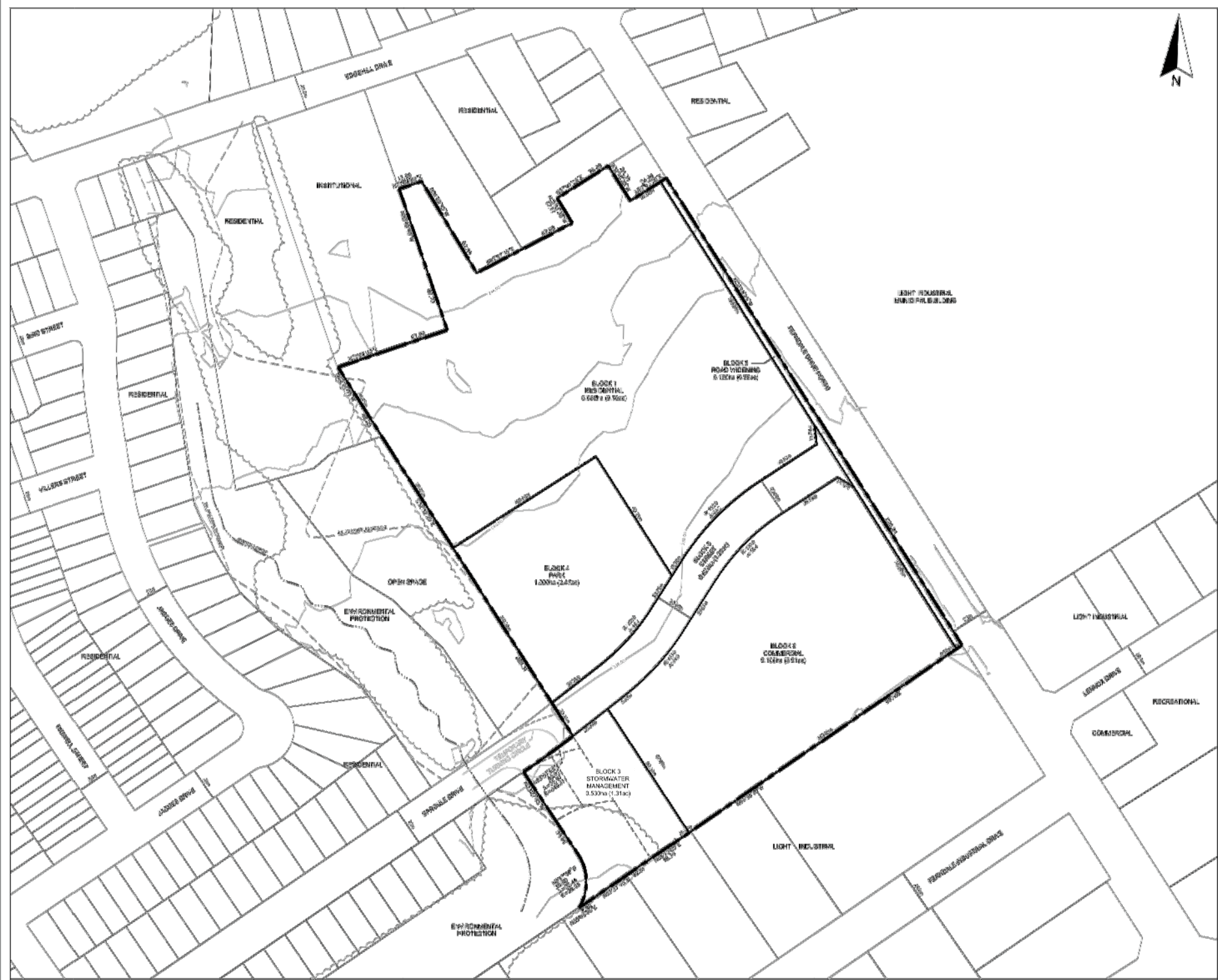


2.0 SITE DESCRIPTION AND LOCATION

This proposed urban residential/commercial development site is comprised of multi-storey residential north Sproule Drive, a municipal park north of Sproule Drive and commercial lands south of Sproule Drive. Refer to **Figure 2 – Draft Plan of Subdivision**. The residential block will have a total of 336 units. The total projected population based on 1.67 persons per unit will be 561 persons.

The lands generally drain in a southerly direction with a grade differential of approximately 7 vertical metres. Bordering the west side of the development is an existing watercourse which is part of Dyments Creek. Multiple culverts were installed as part of the Sproule Drive Creek crossing. The existing cul de sac at the east end of Sproule Drive will be removed and the road will be extended eastward to Ferndale Drive North. As part of the Ferndale Drive road reconstruction storm, sanitary and water services were provided to the site as well as curb returns to match the entrance to the City of Barrie Operations Centre on the east side of Ferndale Drive North.

An existing sanitary sewer flows southward on Ferndale Drive. The existing watermain system will be extended into the development area to provide water supply and fire protection. A stormwater conveyance system and stormwater management facility will be constructed. Post development drainage flows will be controlled to pre-development levels for all storm events, including providing quality control. Sproule Drive will be extended to Ferndale Drive North including installation of pedestrian sidewalks.



DRAFT PLAN OF SUBDIVISION
FERNDAL DRIVE NORTH & SPROULE DRIVE
PART OF LOT 26, CONVEYANCE 7
CITY OF BARRIE

LAND USE SCHEDULE

	BLOCKS	ha	ac	%
RESIDENTIAL	1	3.333	8.36	46.96
COMMERCIAL	2	3.138	7.81	44.1
STORMWATER MANAGEMENT	3	3.550	8.84	48.8
PARK	4	1.666	4.14	22.84
ROAD WIDENING	5	2.120	5.32	28.8
STREET	6	0.004	0.01	0.02
TOTAL		7.813	19.48	100

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 61(17) OF THE PLANNING ACT

1. DRAFT PLAN OF SUBDIVISION	2. DRAFT PLAN OF SUBDIVISION	3. DRAFT PLAN OF SUBDIVISION	4. DRAFT PLAN OF SUBDIVISION
5. DRAFT PLAN OF SUBDIVISION	6. DRAFT PLAN OF SUBDIVISION	7. DRAFT PLAN OF SUBDIVISION	8. DRAFT PLAN OF SUBDIVISION

OWNER'S CERTIFICATE
I HEREBY AUTHORISE BARBARA'S PLANNING SOLUTIONS TO PREPARE THIS DRAFT PLAN OF SUBDIVISION AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION FOR APPROVAL.

DATE: _____ PRINCE COURT HOMES
SIGNATURE: _____

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE DIMENSIONS OF THE LANDS TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____ DAVID ASTR SURVEYING LTD.

SCHEDULE OF REVISIONS

No.	Date	Description	By

IPS INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
APPROVED FOR THE CITY OF BARRIE

Date: November 12, 2019
File: 17-292

Drawn By: JAB
Reviewed By: JAB

FERNDAL PREVIN COURT HOMES

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DRAFT PLAN OF SUBDIVISION

SCALE	DATE	PROJECT No.	FIGURE
N.T.S.	NOV 2019	07002	FIGURE 2

3.0 OTHER STUDIES AND REPORTS

Various studies have been prepared to support the approval of the development lands as follows;

- Stormwater Management Report authored by KSGS. (dated November 2019)
- Hydrogeological Study authored by Azimuth. (dated Oct 2, 2019 included in SWM Study)
- Geotechnical Investigation authored by Soil Eng Limited. (0304-S37 July 2003 included in SWM Study)

This FSR should be read in conjunction with the above reports in order to gain a thorough understanding of this development proposal. This FSR has been prepared in conjunction with the work of these firms to ensure that all municipal services will support their findings and recommendations.

4.0 WATER SUPPLY AND DISTRIBUTION

A 200mm diameter municipal watermain stub currently exists on the west side of Ferndale Drive which will be continued westward and connected to the existing 150mm diameter stub located within the existing cul de sac of Sproule Drive.

The site is to have a total population of 561 persons. Utilizing the Ministry of the Environment (MOE) Guidelines for domestic water use of 225 l/cap/day and commercial water use of 28,000 l/(ha/day), the required Average Day Demand (ADD) is 1.46 L/sec. A Peak Rate factor of 4.13 was used in calculating the Peak Hour Demand of 6.73 L/sec for the development. Calculations for the domestic water requirements for the site can be found in *Appendix A*.

The water system for this Project is intended for domestic and firefighting use. There is an existing 400 mm diameter municipal watermain located on the west side of Ferndale Drive North and an existing 150mm diameter watermain located on the south side of Sproule Drive. The site will be serviced by connecting a 200 mm diameter watermain from the existing watermain on Sproule Drive to the existing watermain on Ferndale Drive North. Water service stubs have been provided on the proposed watermain for future connection of the commercial and residential blocks. The proposed routing of the watermain is shown on *Figure 3*.

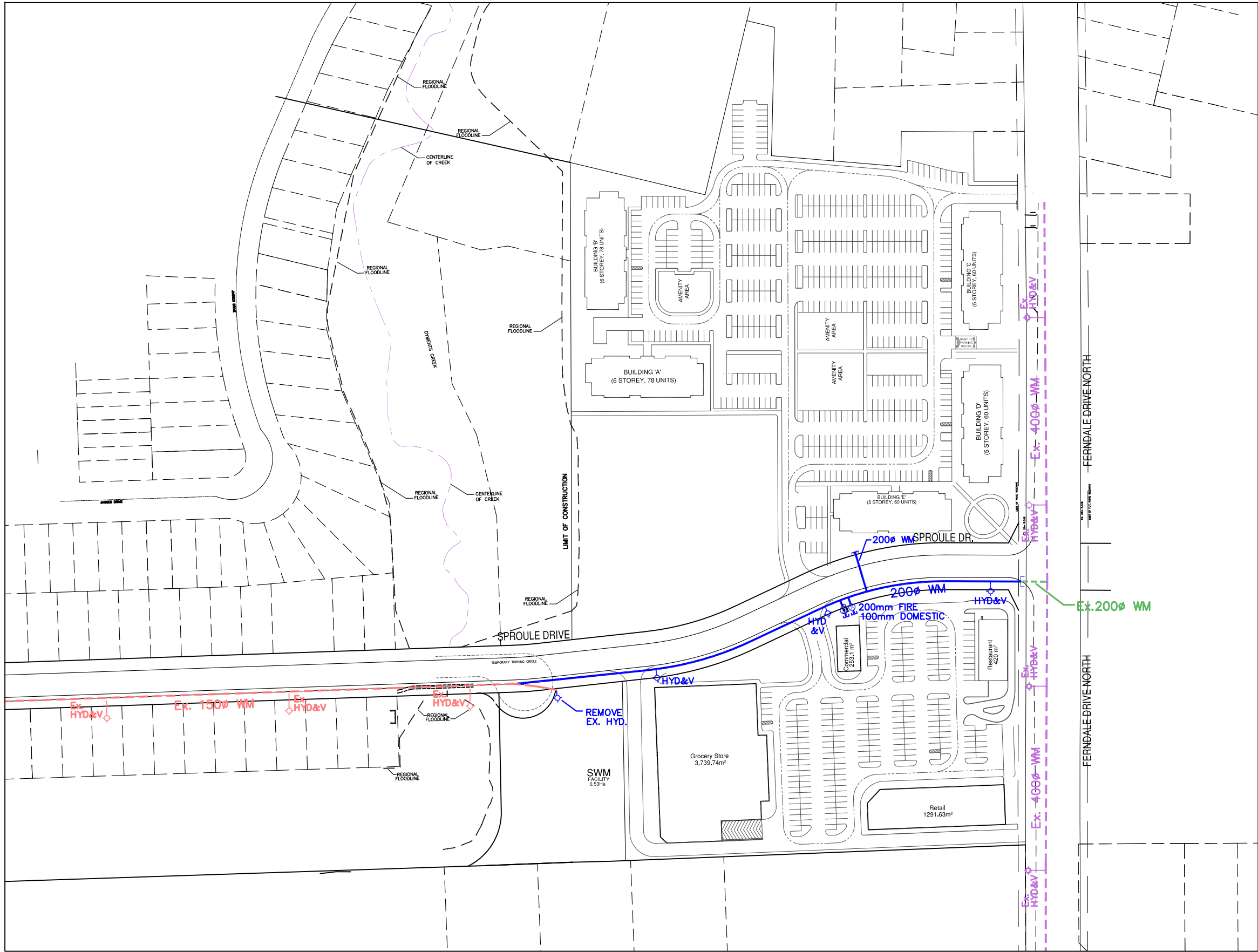
There is an existing fire hydrant located on the south side of Sproule Drive at the end of the existing cul-de-sac. A portion of the existing main on the cul de sac will be removed and the existing hydrant relocated to install the new watermain in the correct alignment to conform to City of Barrie standards. The proposed development will be serviced by the proposed watermain, which will be connected to the existing watermain on Sproule Drive and Ferndale Drive North. Roadway fire hydrants are proposed to provide adequate firefighting coverage and will be spaced at 152 m intervals in residential areas as per City of Barrie Standards.

4.0 WATER SUPPLY AND DISTRIBUTION

Cont'd...

City of Barrie's review of the existing watermain distribution system with respect to the City's water treatment and supply capacities for both domestic and fire service for this development will be required to confirm that capacity allocation is available. If required, a water pressure test on the hydrants can be completed at the detailed design stage to confirm existing pressure and flow.

Servicing Drawings *S-1* and *SG-1*, illustrating the water servicing strategy are provided in the rear pocket of this FSR.



LEGEND

- PROPOSED 200Ø WATERMAIN
- EXISTING 150Ø WATERMAIN
- EXISTING 200Ø WATERMAIN
- EXISTING 400Ø WATERMAIN
- FIRE HYDRANT

FERNDALE
PREVIN COURT HOMES

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UEL

WATER SERVICING
PLAN

SCALE	DATE	PROJECT No.	FIGURE
1:2000	NOV 2019	07002	FIGURE 3

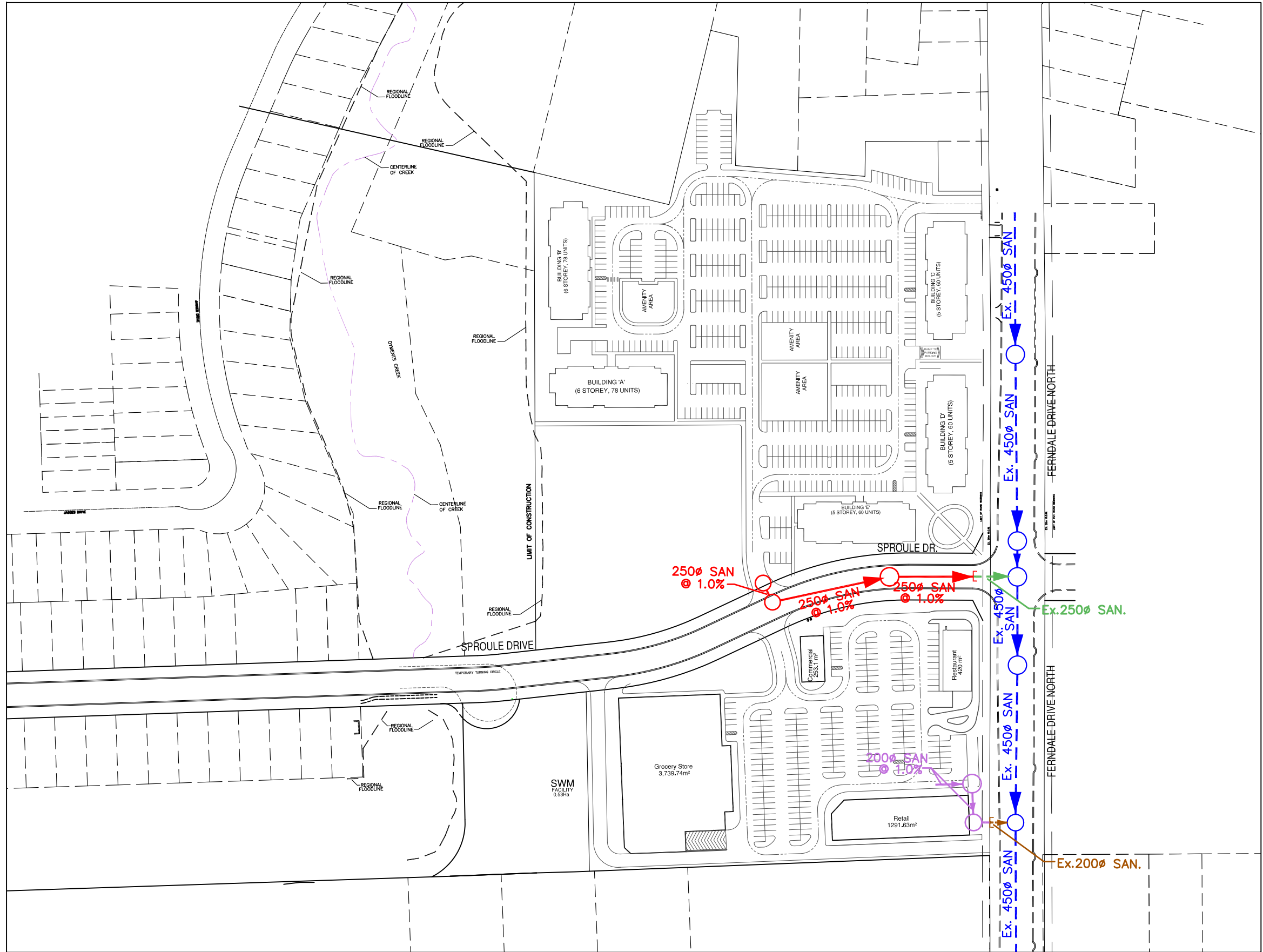
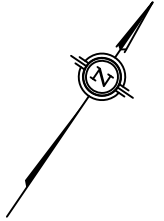
5.0 SANITARY SEWAGE SYSTEMS

As part of the road reconstruction of Ferndale Drive North, two sanitary sewer connection stubs were provided. One 250mm diameter connection was provided at the future intersection of Ferndale Drive North and Sproule Drive which will receive flows from the multi-residential block proposed north of Sproule Drive. The second 200 mm diameter connection was provided at the south east corner of the subject lands and will receive the sanitary drainage flows from the commercial block proposed south of Sproule Drive.

All sanitary flows from the multi-residential block will be conveyed via a 250mm diameter gravity sanitary sewer connected to the provided stub at Ferndale Drive North. The flows from the commercial block will be conveyed via a 200mm diameter gravity sewer connected to the provided stub at Ferndale Drive North. Both of these stubs are connected to the existing 450mm diameter sanitary sewer on Ferndale Drive North which flows north to south. The proposed sanitary sewer system is shown on **Figure 4** and the sanitary drainage areas are shown on **Figure 5**.

A detailed analysis of the sanitary sewage flows and sewer system was performed using the City of Barrie *Sanitary Sewage Collection System Policies And Design Guidelines* manual. The results of this analysis are summarized in **Appendix 1** as a sanitary sewer design sheet and **Appendix 4** as written calculations.

Servicing Drawings **S-1** and **SG-1**, illustrating the sanitary servicing strategy are provided in the rear pocket of this FSR.



LEGEND

- PROPOSED 250 $\emptyset$ SANITARY
- EXISTING 250 $\emptyset$ SANITARY
- EXISTING 450 $\emptyset$ SANITARY
- PROPOSED 200 $\emptyset$ SANITARY
- EXISTING 200 $\emptyset$ SANITARY

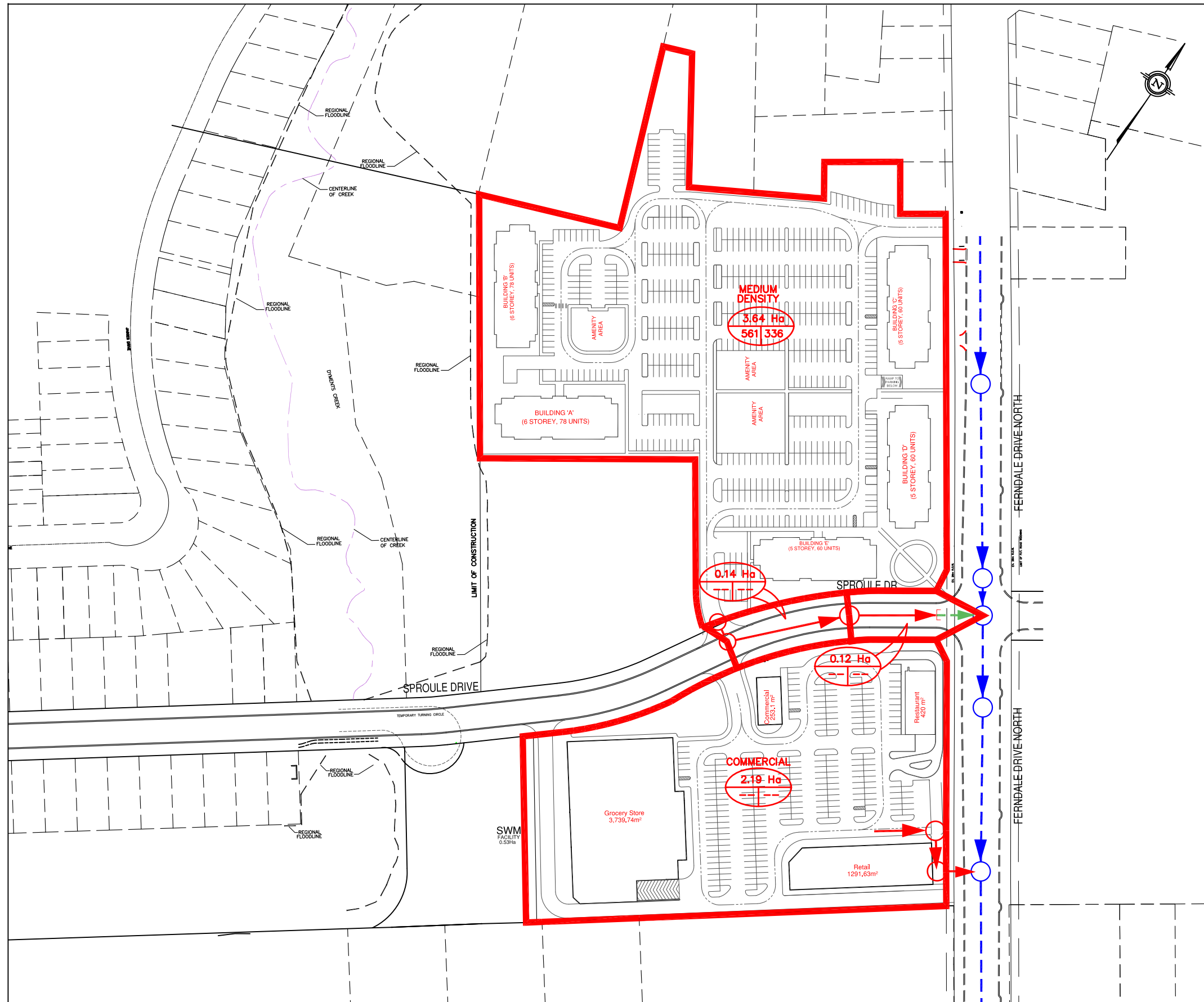
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SANITARY SERVICING
PLAN

SCALE	DATE	PROJECT No.	FIGURE
1:2000	NOV 2019	07002	FIGURE 4



LEGEND		
POPULATION	1.27 Ha	AREA
	19 6	UNITS

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SANITARY DRAINAGE AREA PLAN

SCALE	DATE	PROJECT No.	FIGURE
1:2000	NOV 2019	07002	FIGURE 5

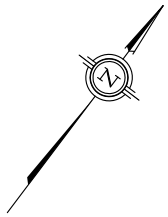
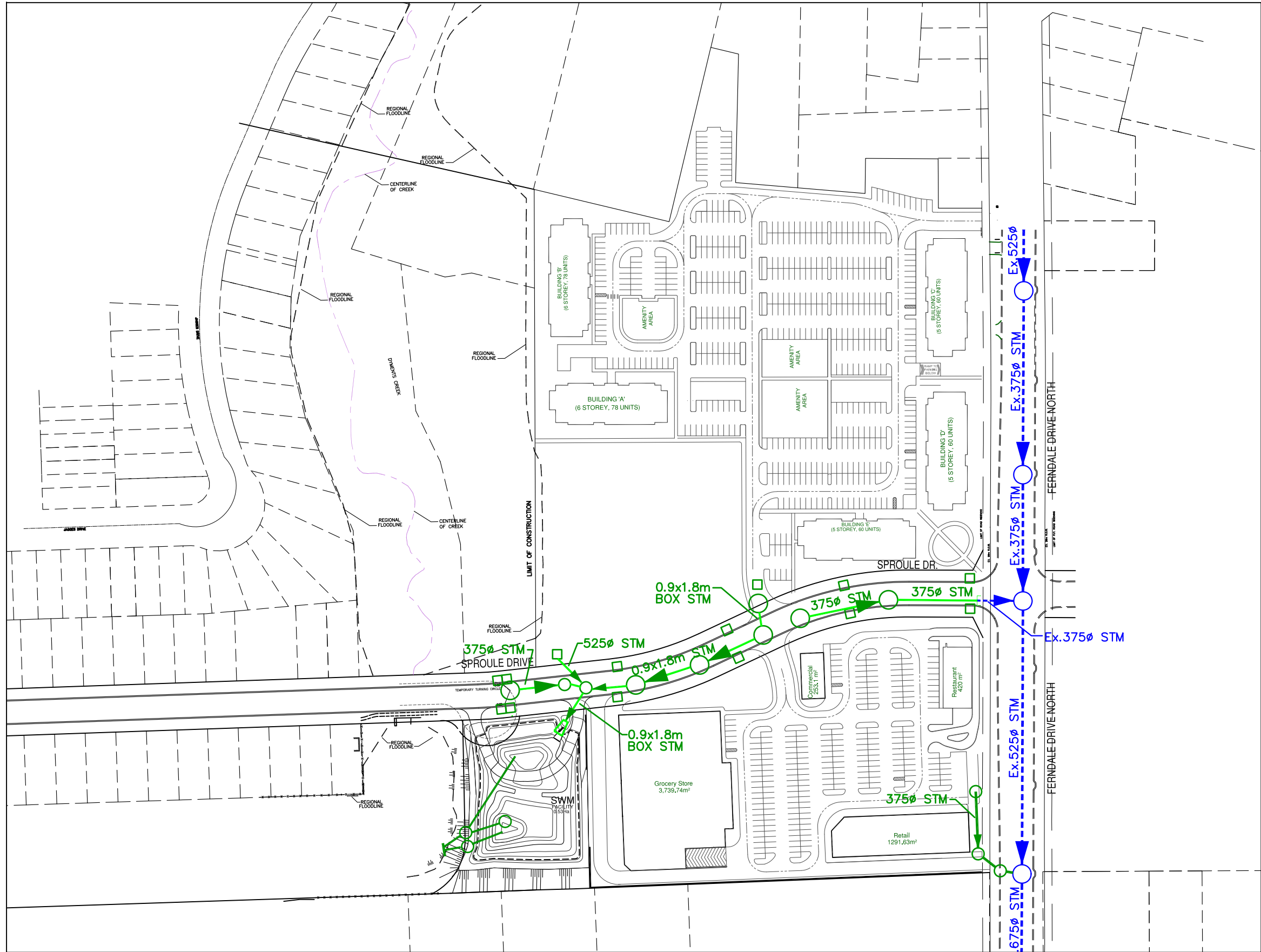
6.0 STORM SEWER SYSTEM

A storm sewer stub at the future intersection of Ferndale Drive North and Sproule Drive has been provided to drain approximately 100m of the most easterly portion of the right of way along Sproule Drive. The storm sewer system will be designed to convey the 5-year minor design storm in an underground piped network system, as illustrated in *Figure 6 – Storm Servicing Plan*. A preliminary storm design sheet is also included in *Appendix 2* of this FSR. Surface runoff along Sproule Drive will generally be conveyed via a roadside curb and gutter system and captured by a series of street catchbasins that are directed into an underground piped sewer system. The 5-year and 100-year storm events from the residential block will be directed to the SWM facility via the storm sewer system. The 5-year storm flow for the easterly portion of the Sproule right of way will be conveyed to the Ferndale Drive North 375mm diameter sewer connection provided as part of the Ferndale road reconstruction works. The drainage catchment areas are detailed on *Figure 7– Storm Drainage Area Plan* and drawing *SWM-4*.

The SWM Facility will be utilized to provide quantity and quality control for the residential block north of Sproule Drive. Due to the fact that the high point proposed on Sproule Drive had to be placed west of the driveway entrance to the residential block the 100-year flow will have to be directed to the SWM Facility via the storm sewer system. A box type storm sewer, due to cover constraints, is proposed to convey these flows.

The majority of the 5-year storm drainage from the Park Block will be directed to the storm sewer system and ultimately the SWM Facility. There is a small area on the west side of the park of uncontrolled drainage which discharges to Dyments Creek. Flows in excess of the 5-year storm from the Park will flow over Sproule Drive directly into the SWM Facility.

Servicing Drawings *S-1* and *SG-1*, illustrating the storm servicing strategy are provided in the rear pocket of this FSR.



LEGEND

- PROPOSED STM
- EXISTING STM

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STORM SERVICING
PLAN

SCALE	DATE	PROJECT No.	FIGURE
1:2000	NOV 2019	07002	FIGURE 6

7.0 STORMWATER MANAGEMENT SYSTEM

The details of stormwater management measures proposed for this development are provided in the Stormwater Management Report prepared by KSGS Engineering Corp. dated November 2019. A brief summary is provided below, with excerpts from the SWM Report, to give a basic understanding of the stormwater management measures proposed for this development.

7.1 Quantity Control

The Previn Court lands presently drain in two directions. Some of the lands drains towards Ferndale Drive and some of the lands towards Dymont's Creek. The Ferndale storm sewer eventually outlets into Dymont's Creek. The total flows from the site will not exceed pre-development rates. The anticipated design flows to Ferndale Drive from the site will not exceed the original design flow rates.

Due to the split drainage situation, runoff from the site will be directed to two outfall locations. The majority of the drainage area, as grading and servicing will allow, will be directed to the SWM facility located at the south west corner of the lands adjacent to Dymont's Creek. This includes all lands north of Sproule Road, a portion of Sproule Road and the runoff from the rooftop of a commercial building south of Sproule Road. The remaining commercial lands and a portion of Sproule Road will drain to Ferndale Drive.

The drainage area tributary to the SWM facility is 7.62 hectares. The west limit of the SWM facility was based on the discussions with LSRCA and the limits set out in the Scoped Environmental Impact Study, prepared by Orion Environmental Solutions, October 2018, updated to address comments from LSRCA in June 2019. The permanent pool has been set at elevation 237.8 m. The combination of a 125 mm orifice at elevation 237.8 m, a 350 mm wide and 150 mm high rectangular orifice at elevation 238.4 and a third rectangular orifice of 400 mm width and 250 mm height at elevation 238.65 m will be used to control the 2-year to 100-year flows from the SWM facility.

7.0 STORMWATER MANAGEMENT SYSTEM

Cont'd...

For the 1.68 hectare of commercial area out-letting to the existing 375 mm storm sewer to Ferndale Drive, onsite storage will be utilized to provide quantity control.

Section 2 of the SWM report deals with quantity control.

7.2 Quality Control

The stormwater management facility will provide quality control for the majority of flows. For the commercial area south of Sproule, quality control will be provided via a Stormceptor structure.

Section 2 of the SWM report deals with quality control.

7.3 Low Impact Development Stormwater Management

The following LIDs are being implemented on this project:

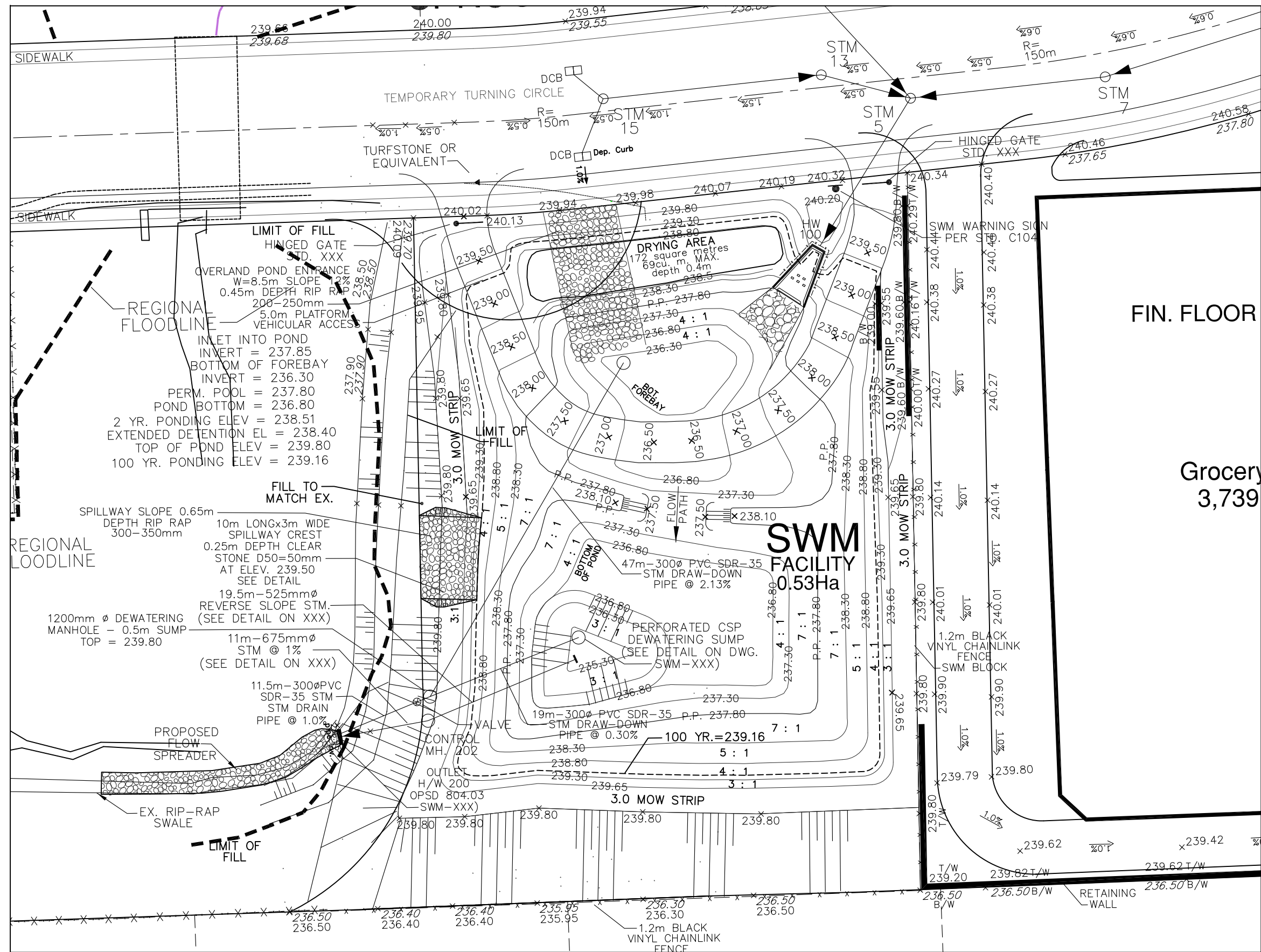
- Infiltration of most roof runoff
- Infiltration of runoff from vegetated areas
- Discharge of some roof runoff to vegetated filter strip

Section 3 of the SWM report deals with LIDs.

7.4 Water Balance

There is a deficit of 157 cubic metres which will be compensated by infiltration.

Section 3 of the SWM report deals with water balance.



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STORMWATER MANAGEMENT POND

SCALE	DATE	PROJECT No.	FIGURE
N.T.S.	NOV 2019	07002	FIGURE 8

8.0 STREETSCAPING AND ROAD GRADING

The extension of Sproule Drive will be fully urbanized with sodded boulevards, concrete curb and asphalt pavement. A preliminary investigation of the road profile design confirms that this extension can be designed to match closely with the existing topography and in conformity with the existing drainage pattern while providing sufficient cover for the storm and sanitary sewer systems compatible with the available outlet sewer depths.

A preliminary road design and overland flow strategy proposed for this development is illustrated on drawings **GR-1**, **GR-2** and **SG-1**.

9.0 EROSION AND SEDIMENT CONTROL

Detailed sediment and erosion control plans *ESC-1*, *ESC-2*, *ESC-3* and *ESC-4* have been included with this study. Two separate temporary sediment control ponds will be constructed, one north of Sproule Drive and one south of Sproule Drive. Prior to commencing any construction on site, all sediment control works shall be installed. In addition to the ponds, silt control barrier along the parameter of the site, an appropriately sized mud mat, concrete washout area and cut-off swales with rock check dams in strategic locations are also proposed. The works shall be inspected daily, as well as immediately following significant rainfall events, cleaned and maintained as required. Once Sproule Drive is extended eastward to Ferndale Drive North all roadway catch basin inlets will be covered during construction with a siltation control device and have sumps to trap the heavier sediment. Areas disturbed during construction will be restored using topsoil and hydroseed. The last manhole installed immediately upstream of the storm outlet will be constructed with a temporary half-bulkhead to trap further sediment in the storm sewer system during the construction activities.

10.0 CONCLUSIONS AND RECOMMENDATIONS

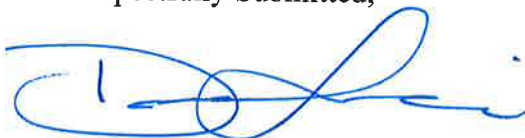
Based on the foregoing evaluation, it is the opinion of this firm that this development and the extension of Sproule Drive eastward to Ferndale Drive North can be effectively serviced from the existing municipal infrastructure in compliance with the latest City of Barrie design criteria and standards.

The existing sanitary sewers, storm sewers and water distribution system were designed in anticipation of this development.

The proposed grading, road extension, site servicing and storm water management design proposed for this development is compatible with the existing site conditions and characteristics and all available current City of Barrie municipal servicing information.

No adverse environmental impacts are anticipated as result of this development.

Respectfully Submitted,

A blue ink signature of Daniel Schembri, consisting of a series of loops and a long horizontal stroke.

Daniel Schembri, C.E.T.

A blue ink signature of Rosario Sacco, featuring a large, stylized 'R' and 'S'.

Rosario Sacco, P.Eng.



A P P E N D I X 1

SANITARY SEWER DESIGN SHEET

APPENDIX 1

PREVIN FERNDALDE DEVELOPMENT

PROJECT NUMBER:

PREPARED BY:

CHECKED BY:

DESIGN DATE:

SUBMISSION DATE:

07002

DJS

RS

OCT 2019

NOVEMBER 2019

CITY OF BARRIE

SANITARY SEWER DESIGN SHEET

Design Parameters

Residential Density =	1.67 cap/unit	Residential excl. infil. =	225 L/cap/day
Manning 'n' =	0.013	Industrial =	35 m ³ /ha*day
Extran. Flow =	0.1 L/s/ha	Institutional =	19.8 m ³ /ha*day
		Commercial =	28 m ³ /ha*day

Design Equations

$$M(r) = \frac{1 + \frac{.14}{4 + \sqrt{(P)}}}{4 + \sqrt{(P)}}$$

$$M(ind) = 6.6604 \cdot A^{-0.1992}$$

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Location			Individual Values							Cumulative Values							Flow Data						Sewer Data												
Street	From		To		Industrial Area	Commercial Area	Institutional Area	Residential Area	#	#	Residential Units cum.	Residential Population	Industrial P.F.	Industrial Area	Commercial Area	Institutional Area	Residential P.F.	Pre 2000 Residential Area	Residential Area Cumul.	Residential Population Cumul.	Industrial Peak Flow (L/s)	Q(ind)	Commercial Peak Flow (L/s)	Institutional Peak Flow (L/s)	Population Peak Flow (L/s)	Q(r)	Q(i)	Total Design Flow (L/s)	Length	Pipe Size	Type of Pipe	Grade	Full Flow Capacity	Full Flow Velocity	Actual velocity at design flow
	MH #	Inv	MH #	Inv																															
HIGH DENSITY RES.	3A			2A					336	336	561.1	cap.							3.64	561.1	P				5.77	0.36	6.13	9.5	200	PVC	1.00%	32.8	1.04	0.794	
SPROULE	2A			1A					336	336	561.1	561.1					3.95	3.64	561.1						5.77	0.36	6.13	58.5	200	PVC	1.00%	32.8	1.04	0.794	
SPROULE	1A			EX					336	336	561.1	561.1					3.95	3.64	561.1						5.77	0.36	6.13	63.0	200	PVC	1.00%	32.8	1.04	0.794	
COMMERCIAL	MH			EX		2.20									2.20						0.71								16.0	200	PVC	7.00%	86.8	2.76	0.635

A P P E N D I X 2

STORM SEWER DESIGN SHEET

APPENDIX 2

PREVIN FERNDALE DEVELOPMENT

PROJECT No.: 07002
 Prepared By: D.J.S.
 Checked By: R.S.
 Submission Date: 12-Nov-19
 Submission Number: 12-Nov-19
 Design Date:

CITY OF BARRIE

PREVIN COURT HOMES
 STORM SEWER DESIGN SHEET
 RESIDENTIAL SUBDIVISION

Frequency = 5 year
 Intensity (5yr) = $853.608 / ((t+4.699)^{0.766})$
 Intensity (10yr) = $975.865 / ((t+4.699)^{0.760})$
 Intensity (25yr) = $1146.275 / ((t+4.922)^{0.757})$
 Intensity (100yr) = $1426 / ((t+5.273)^{0.759})$

URBAN ECOSYSTEMS

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 FAX: (905) 856-6698

Flow Q = 2.778 A C I
 Inlet time = 10.00 min.
 Manning n = 0.013

STREET NAME	From	To	Area increment		Area x Coefficient		Intensity		Flow		Length (m)	Grade (%)	Dia (mm)	Capac. (l/s)	Veloc. (m/s)	Actual Vel (m/s)	Time (minutes)		
			ha.	(5yr)	Leg	Accum.	(5yr)	I(100yr) (mm/hr)	Q(5yr) (l/s)	Q(100yr) (l/s)							Leg	elapsed	
	MH	MH																	
5 year flow from residential	13	11	3.39	0.90	0.95		3.22	3.22	SEE SWM REPORT		16.0	0.30	0.9X1.8m	4520.0	3.04	2.313	0.14	10.00	
			0.05	0.75	0.88	0.04	0.04	108.1	178.9	840.3	1621.8	34.5	0.30	0.9X1.8m	4520.0	3.04	2.313	0.30	10.14
			0.07	0.75	0.88	0.05	0.09	106.5	176.3	855.6	1628.2	33.0	0.30	0.9X1.8m	4520.0	3.04	2.313	0.29	10.44
SPROULE DRIVE	7	5	0.08	0.75	0.88	0.06	0.15	105.0	173.9	872.7	1639.6	24.0	0.30	0.9X1.8m	4520.0	3.04	2.347	0.21	10.73
PARK	DICB	5	0.94	0.25	0.63	0.24	0.24	108.9	180.2	71.1		19.0	0.30	525	245.7	1.10	0.940	0.29	10.00
SPROULE DRIVE	15	13	0.11	0.75	0.88	0.08	0.08	108.9	180.2	25.0		27.0	0.30	375	100.2	0.88	0.718	0.51	10.00
SPROULE DRIVE	13	5	0.08	0.75	0.88	0.06	0.14	106.1	175.7	42.0	69.5	6.5	0.30	375	100.2	0.88	0.826	0.12	10.51
TO POND	5	HW	0.00	0.75	0.88	0.00	0.53	103.9	172.2	981.2	1983.8	21.0	0.30	0.9X1.8m	4520.0	3.04	2.408	0.16	10.94
5 year flow from commercial	S.E. STM	EX.	2.20	0.90	0.95				SEE SWM REPORT		13.5	2.00	375	258.7	2.27	2.416	0.10	10.00	

A P P E N D I X 3

WATER SERVICING CALCULATIONS

180 & 190 Ferndale Drive North Water Flow Calculations

Design Criteria

Demand per capita (Q):	225	L/cap/day
Max. Day Factor	2.75	(Table 3-1: Peaking Factors, MOE Design Guidelines for Drinking-Water Systems)
Peak Rate Factor (Max. Hour)	4.13	(Table 3-1: Peaking Factors, MOE Design Guidelines for Drinking-Water Systems)
		*From MOE Manual based on Population of 500 - 1,000

Site Data

Description	Density	Area	Flow Rate
Residential Space	1.67 ppu	3.6 ha	225 L/cap/d
Commercial Space		2.2 ha	28,000 L/ha*d

Calculate Population

Pop. Residential	= 1.67 X 336 units
Pop. Total	= 561 people

Calculate Average Day Demand (ADD) Res.

ADD	= 225 X 561
ADD	= 126,225 L/d
ADD	= 1.46 L/s

Calculate Commercial Demand.

ADD	= 28,000 X 2.2 ha
ADD	= 61,600 L/d
ADD	= 0.71 L/s

Calculate Peak Hour Demand

PHD	= 1.46 x 4.13
PHD	= 6.02 L/s + 0.71 L/s = 6.73L/s

A P P E N D I X 4

SANITARY SERVICING CALCULATIONS

180 & 190 Ferndale Drive North **Sanitary Flow Calculations**

Design Criteria

Flow per capita (Q): 225 L/cap/day
Peak Flow $Q_p = P * Q * M / 86400 + I * A$
Peaking Factor (Harmon Formula) $M = 1 + (14 / (4 + (P / 1000) ^ { 0.5 }))$
Where: $2 \leq "M" \leq 4$

Site Data

Description	Density	Area	Flow Rate
Residential Space	1.67 ppu	3.6 ha	225 L/cap/d
Commercial Space		2.2 ha	28,000 L/ha*d

Calculate Population

Pop. Residential = 1.67 X 336 units
Pop. Total = 561 people

Calculate Average Day Demand (ADD) Res.

ADD = 225 X 561
ADD = 126,225 L/d
ADD = 1.46 L/s

Calculate Commercial Demand.

ADD = 28,000 X 2.2 ha
ADD = 61,600 L/d
ADD = 0.71 L/s

Residential Peaking Factor

M = $1 + \frac{14}{4 + \frac{561^{0.5}}{1,000}}$
M = 3.95

Residential Infiltration Allowance

Q = 3.60 ha X 0.1 L/s/ha
Q = 0.36 L/s

Calculate Peak Flow

Qp = (1.46 L/s X 3.95) + 0.36 L/s + 0.71 L/s

Total Expected Flow (Com. & Res.) = 6.84 L/s

PROJECT

FERNDALE
PREVIN COURT HOMES

PROJECT No.

07002

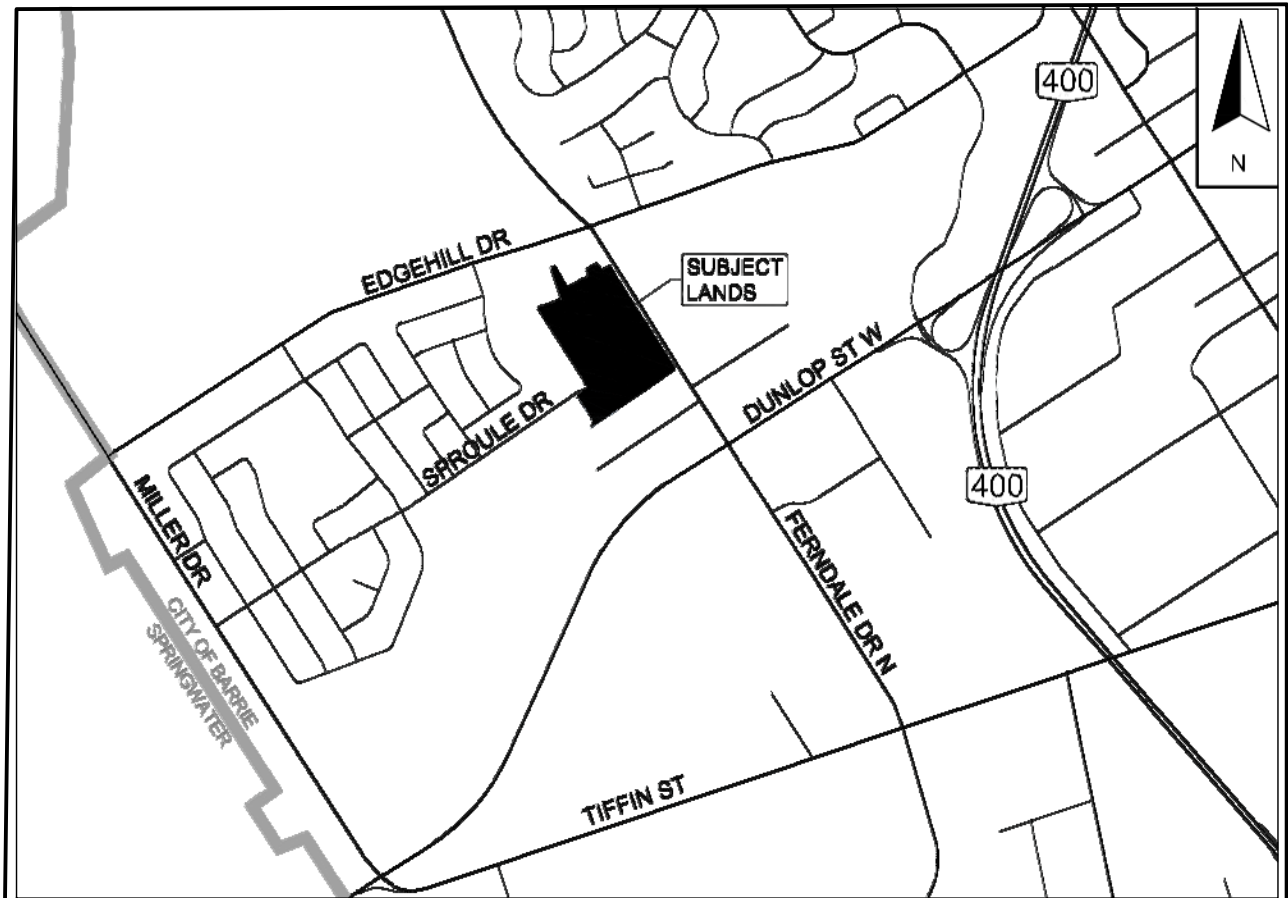
MUNICIPALITY



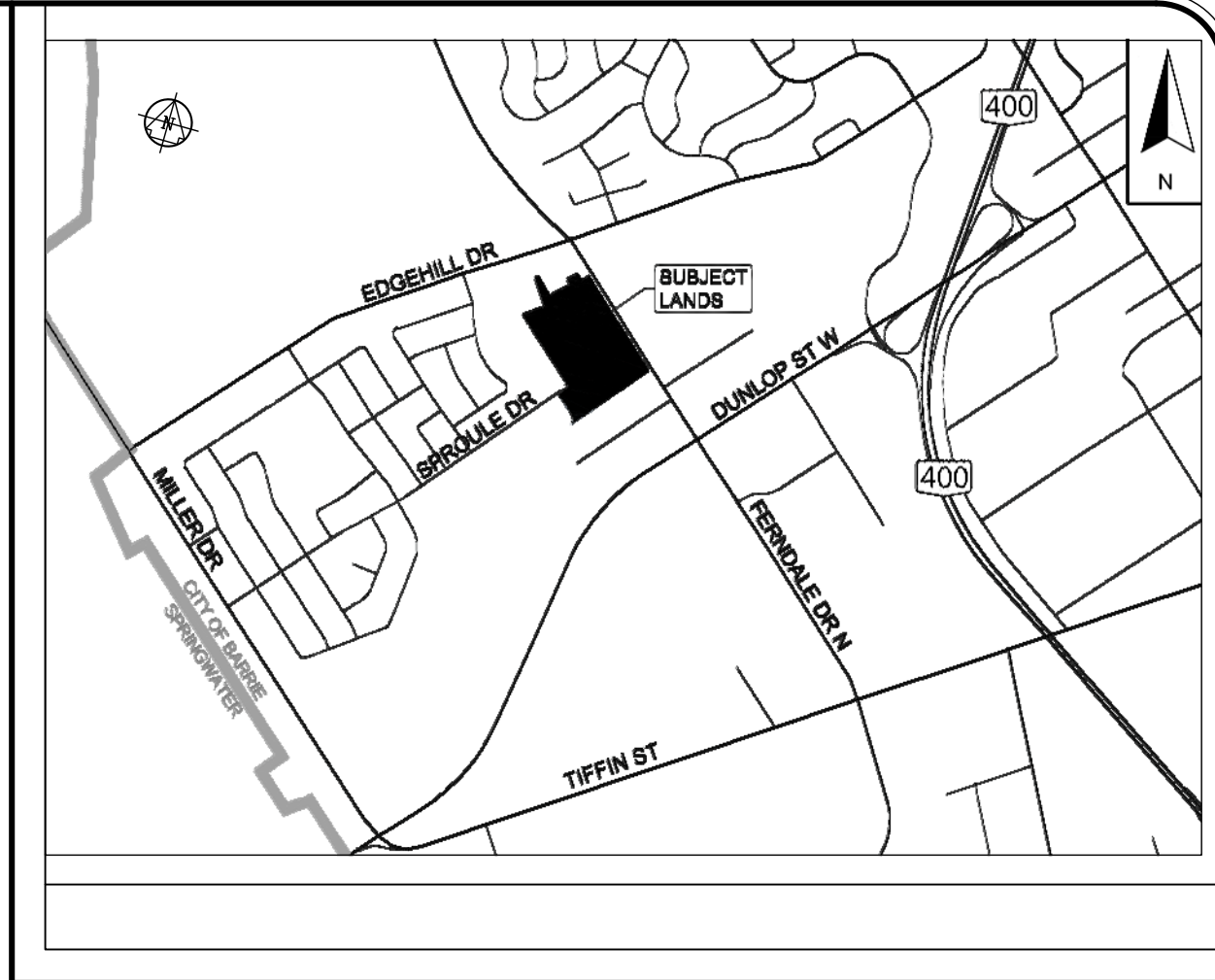
CONSULTANT

URBAN ECOSYSTEMS LIMITED
7050 WESTON ROAD, SUITE 705
WOODBIDGE, ONTARIO L4L 8G7
uel@urbanecosystems.com
t. (905)856-0629
f. (905)856-0698

The logo for Urban Ecosystems Limited (UEL), consisting of the letters "UEL" in a bold, black, sans-serif font, with a stylized circular graphic element to the right.



URBAN ECOSYSTEMS LIMITED		
DRAWING No.	DESCRIPTION	
GR-1	PRELIMINARY GRADING PLAN	
GR-2	PRELIMINARY GRADING PLAN	
S-1	PRELIMINARY SERVICING PLAN	
SG-1	PRELIMINARY COMPOSITE SERVICING-GRADING PLAN	
SWM-1	SWM FACILITY	
SWM-2	SWM FACILITY DETAILS AND CROSS-SECTIONS	
SWM-3	PRE-DEVELOPMENT DRAINAGE SCENARIO 2.1	
SWM-4	POST-DEVELOPMENT DRAINAGE SCENARIO 2.2	
ESC-1 to ESC-4	EROSION CONTROL PLAN AND DETAILS	
TOPO-1	TOPOGRAPHIC SURVEY PLAN	



LEGEND



No.	By	Date	Revision	Checked

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.

Director of Development Engineering

NOV 15, 2019

PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER

ROSARIO SACCIO

FERNDALE
PREVIN COURT HOMES

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ucl@urbanecosystems.com
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UCL

Barrie

HORIZONTAL

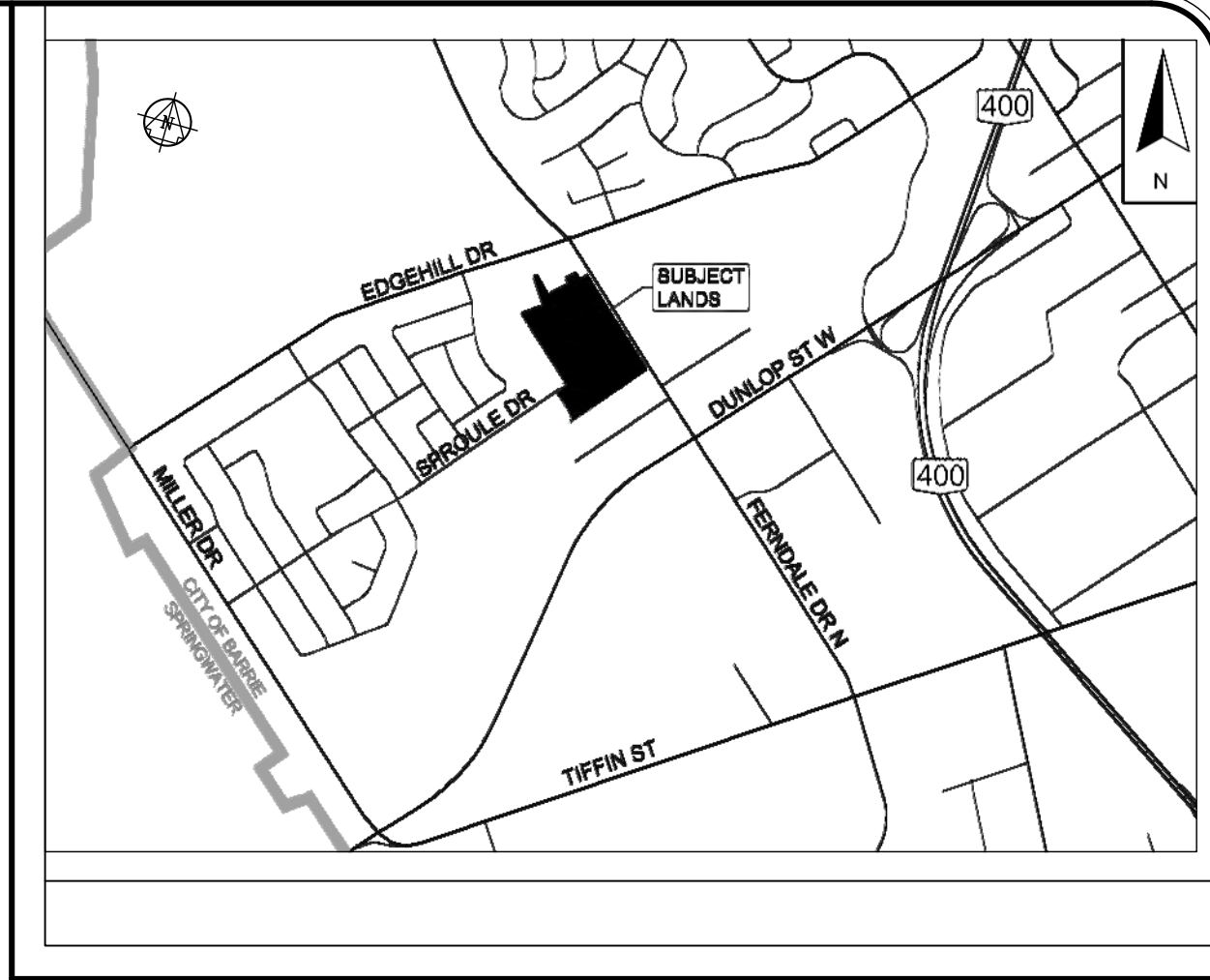
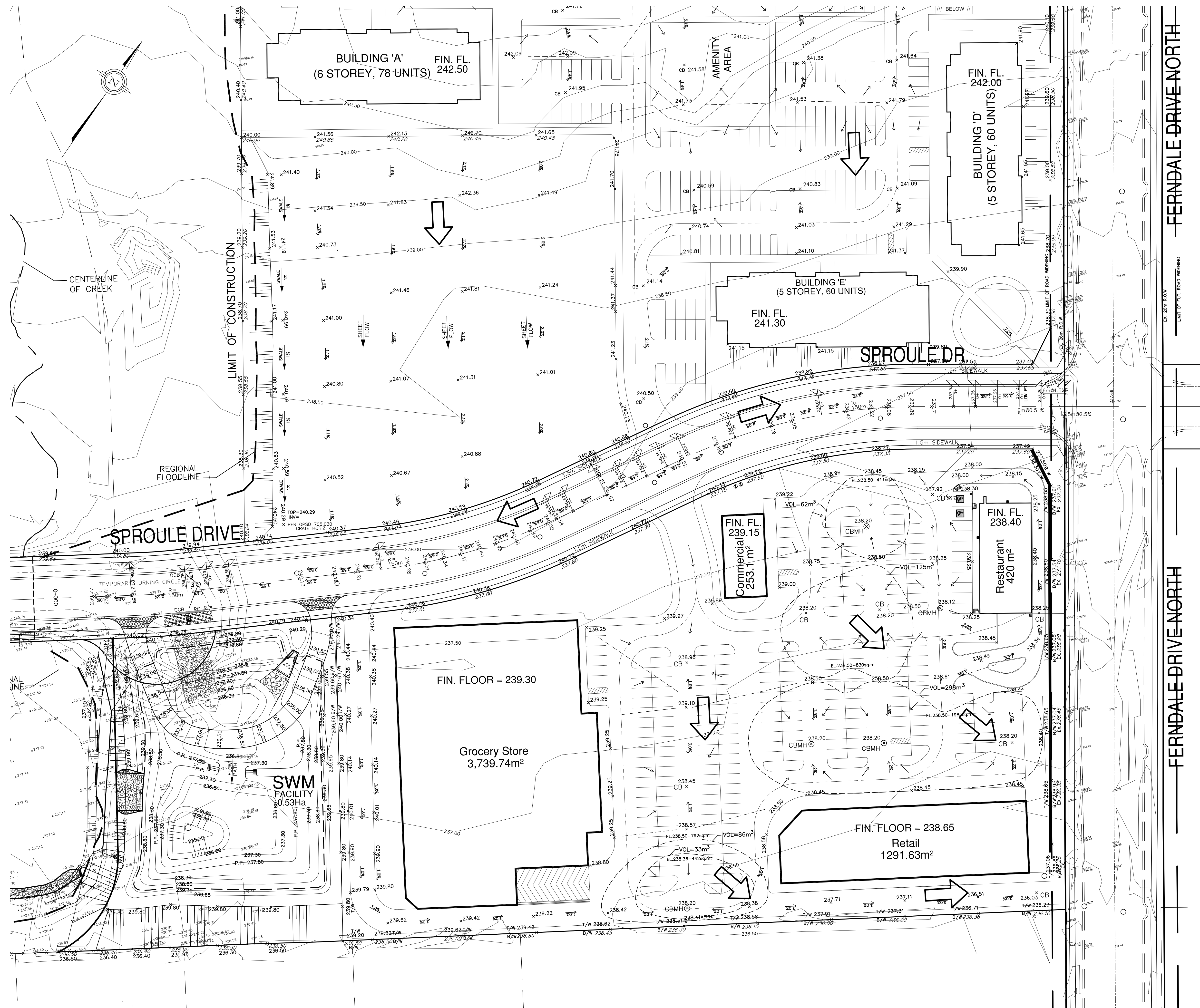
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CITY OF BARRIE
ENGINEERING DEPARTMENT

FILE No 19T-XXXXX

PRELIMINARY GRADING PLAN

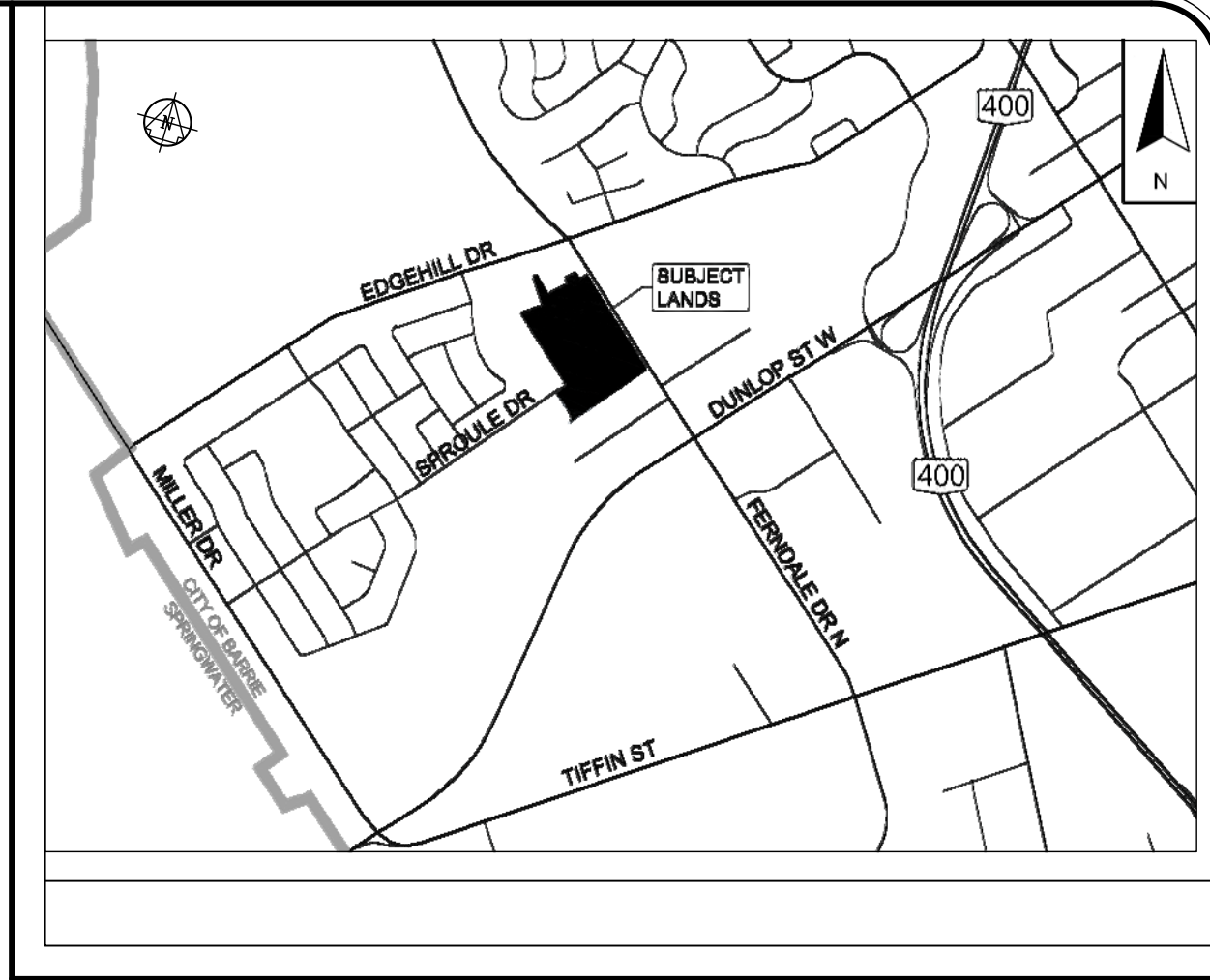
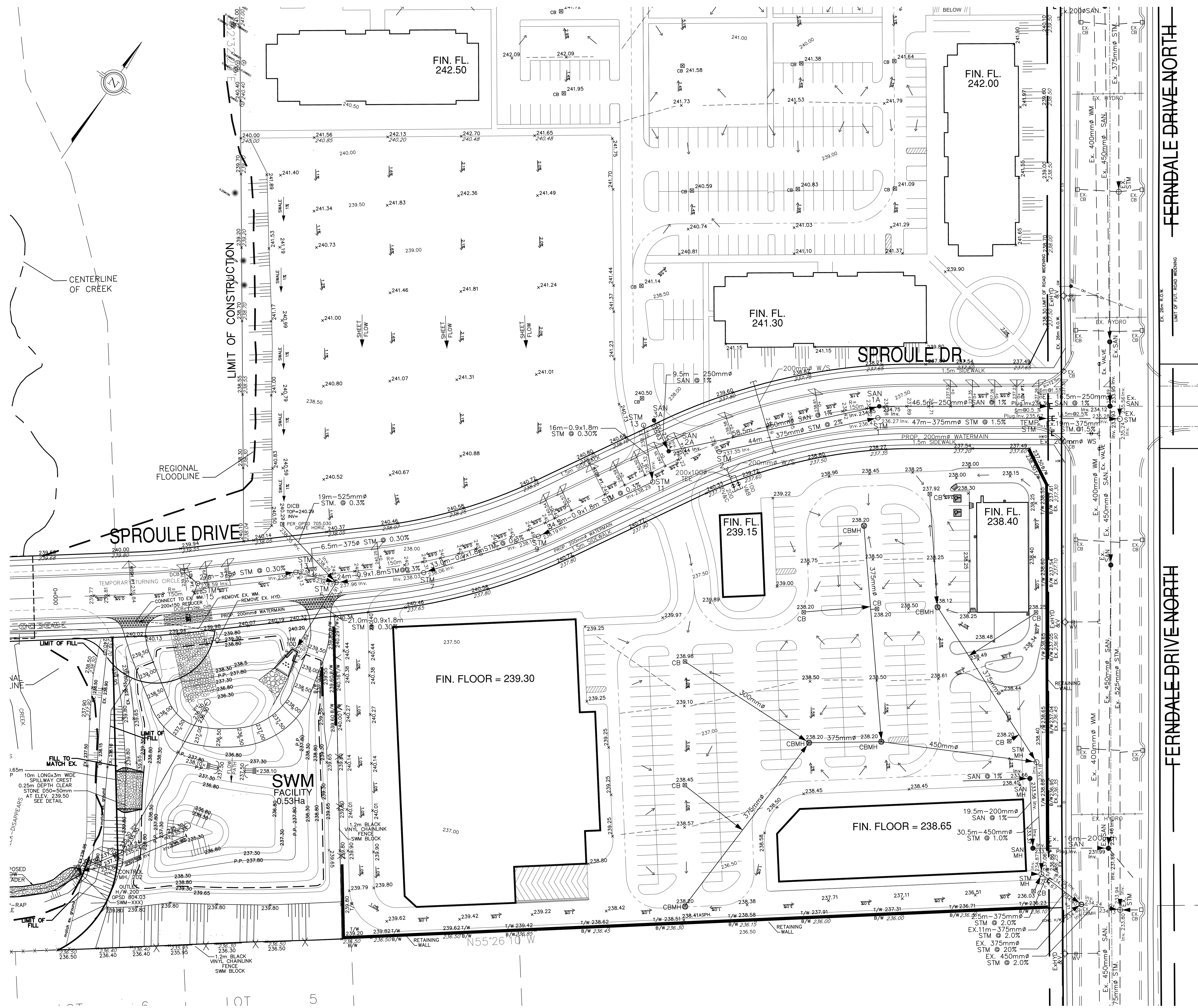
Designed By	D.J.S.	Date	NOV. 2019	Checked By	R.S.
Drawn By	V.T.	Project No.	07002	Approved By	
Scale:	1:500	Drawing No.	GR-1		



LEGEND

OVERLAND DRAINAGE DIRECTION

No.	By	Date	Revision	Checked	
APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.					
Director of Development Engineering			Date		
REGISTERED PROFESSIONAL ENGINEER ROSARIO SACCO NOV 15, 2019 PROVINCE OF ONTARIO					
FERNDALE PREVIN COURT HOMES					
URBAN ECOSYSTEMS LIMITED 7050 WESTON ROAD, SUITE 705 WOODBRIDGE, ONTARIO L4L 6G7 ucl@urbanecosystems.com t. (905)856-0629 f. (905)856-0698 UCL Barrie					
HORIZONTAL 10 0 10 20 30					
CITY OF BARRIE ENGINEERING DEPARTMENT					
FILE No 19T-XXXXX					
PRELIMINARY GRADING PLAN					
Designed By	D.J.S.	Date	NOV. 2019	Checked By	R.S.
Drawn By	V.T.	Project No.		07002	Approved By
Scale:	1:500	Drawing No.		GR-2	



LEGEND

- 232.55
 - 232.43
 - V&B
 - STM 640
 - CBMH 814
 - 620A SAN
 - 25m - 250mm
 - 200 DIA. PVC W/M
 - CB
 - DCB
 - HYD & V
 - 1.5m CONC. S/W
 - X — X —
- PROPOSED ELEVATION
EXISTING ELEVATION
VALVE & BOX
STORM MAINTENANCE HOLES
CATCHBASIN MAINTENANCE HOLES
SANITARY MAINTENANCE HOLES
SEWER
PROPOSED WATERMAIN
CATCHBASIN
DOUBLE CATCHBASIN
HYDRANT & VALVE
SIDEWALK
1.2m BLACK VINYL CHAINLINK FENCE

No.	By	Date	Revision	Checked

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.

Director of Development Engineering Date

REGISTERED PROFESSIONAL ENGINEER
ROSARIO SACCO
NOV 15, 2019
PROVINCE OF ONTARIO

FERNDALE
PREVIN COURT HOMES

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UEL Barrie

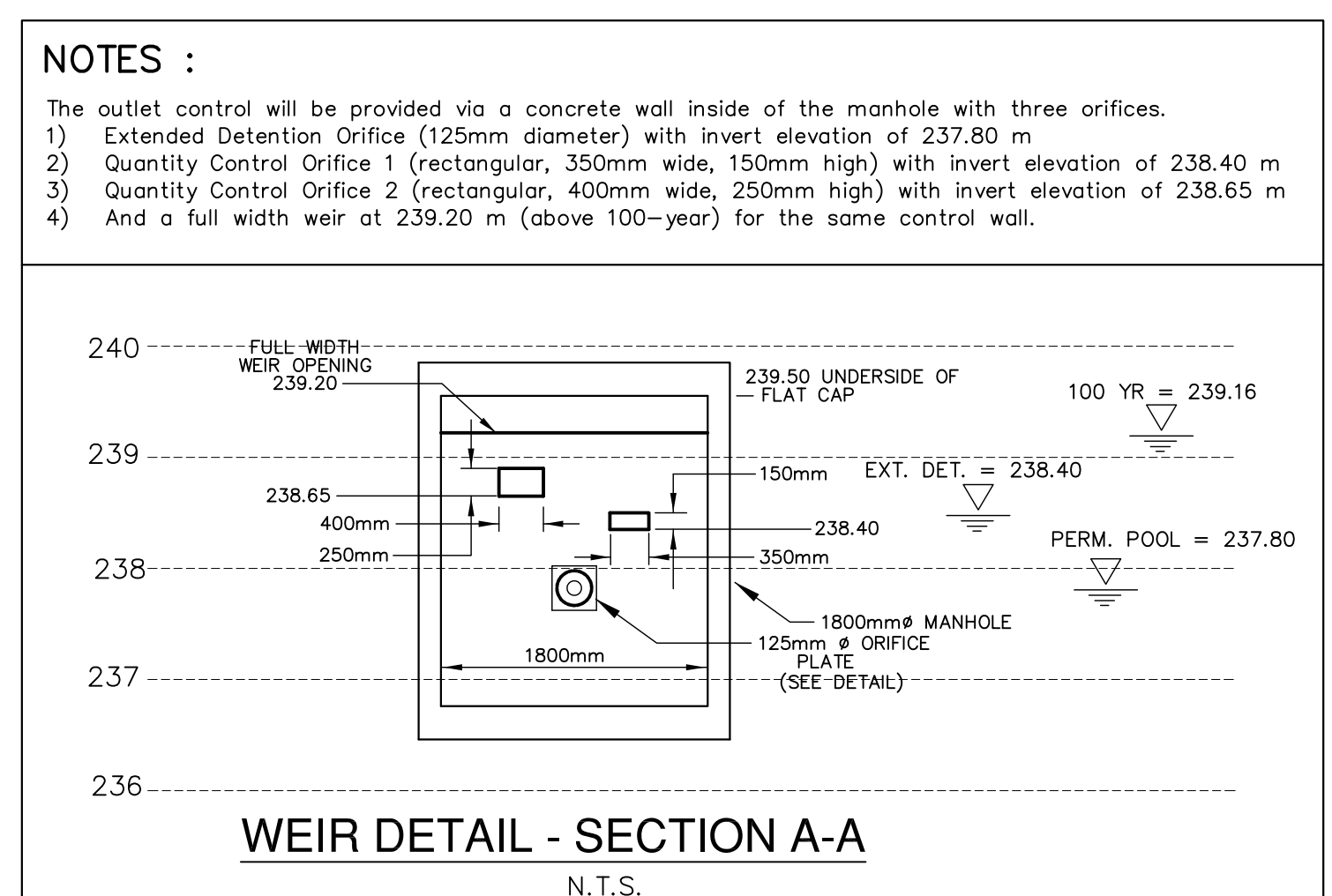
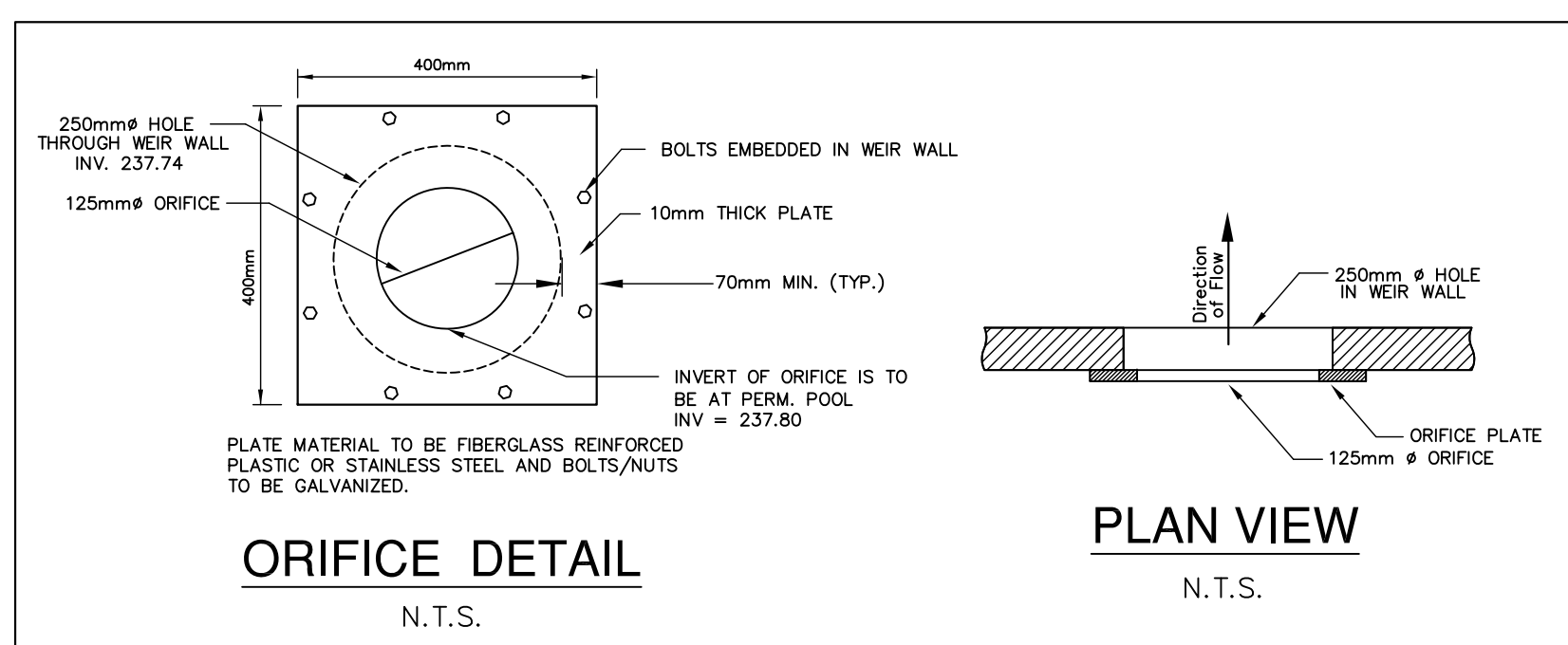
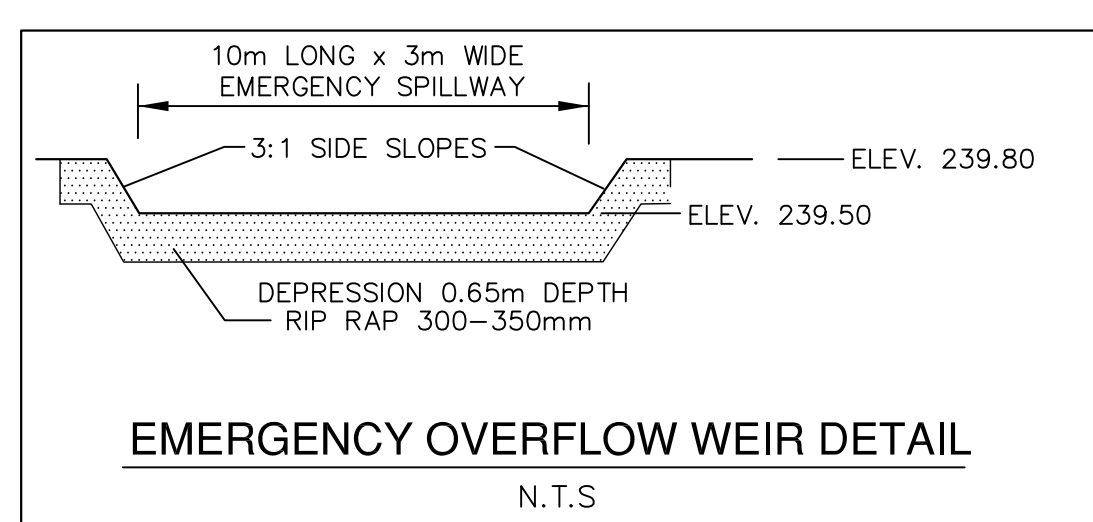
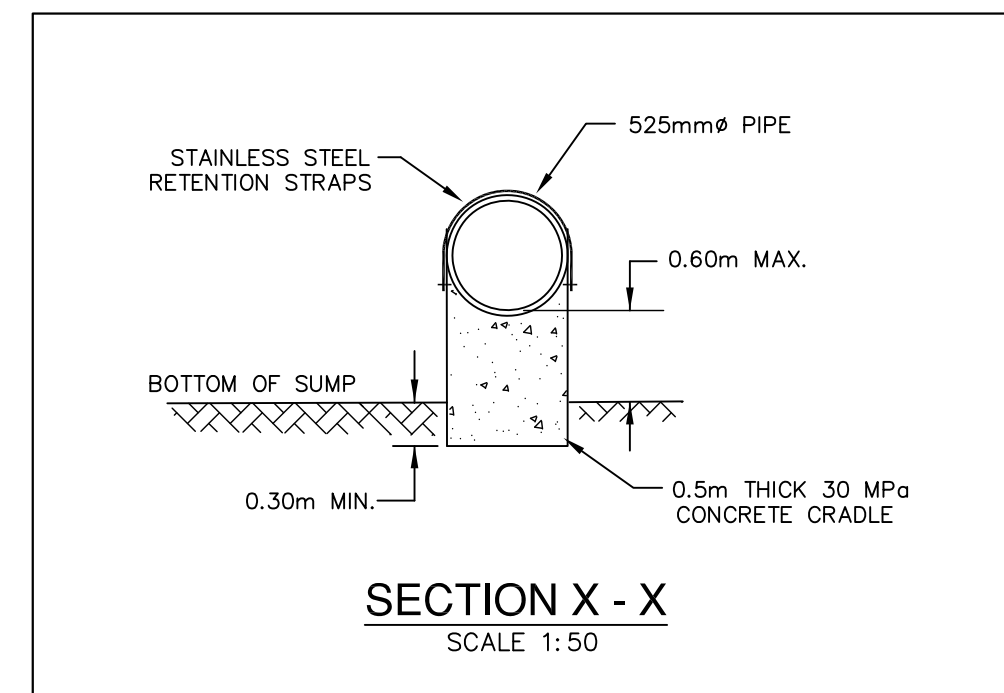
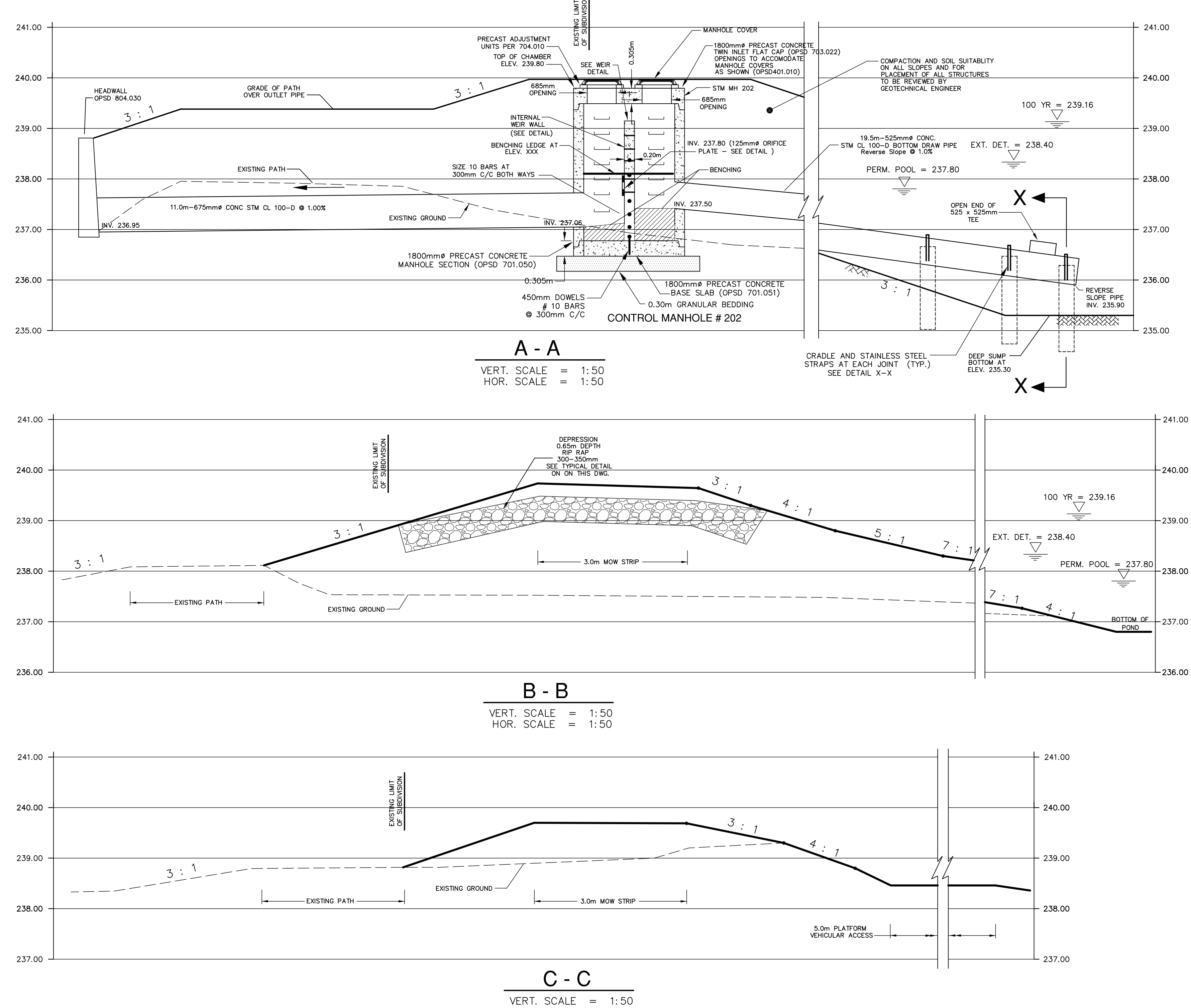
HORIZONTAL 10 0 10 20 30

CITY OF BARRIE
ENGINEERING DEPARTMENT

FILE No 19T-XXXXX

COMPOSITE SERVICING-GRADING PLAN

Designed By	D.J.S.	Date	NOV. 2019	Checked By	R.S.
Drawn By	V.T.	Project No.	07002	Approved By	
Scale:	1:500	Drawing No.	SG-1		



No.	By	Date	Revision				Checked		

APPROVED AS TO FORM IN RELIANCE UPON
THE PROFESSIONAL SKILL AND ABILITY OF
URBAN ECOSYSTEMS LIMITED AS TO DESIGN
AND SPECIFICATION.



Director of Development Engineering

Date

FERNDALE

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HORIZONTAL



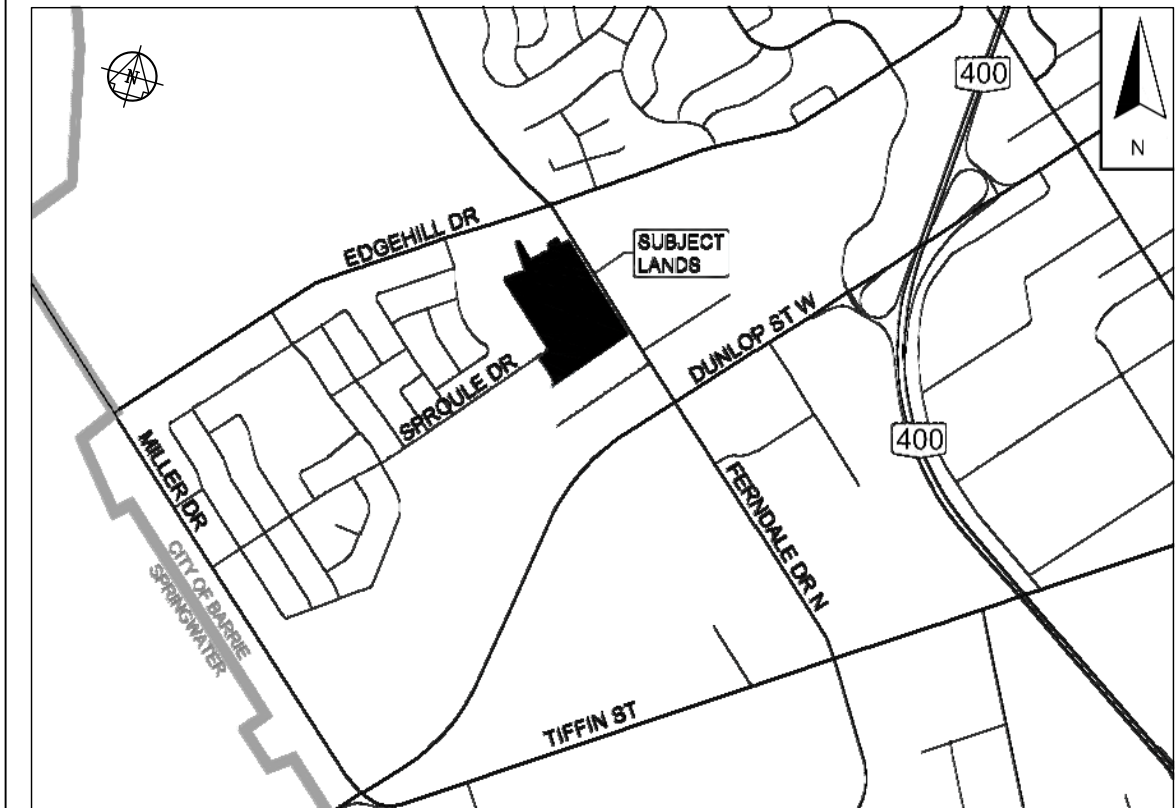
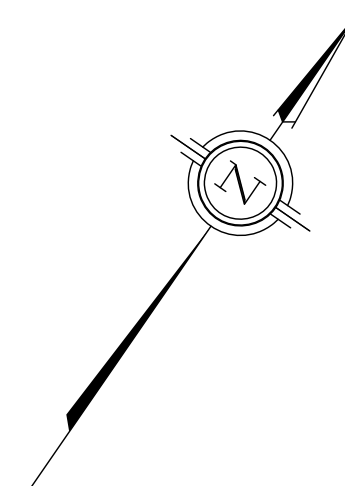
CITY OF BARRIE

ENGINEERING DEPARTMENT

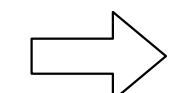
FILE No 19T-XXXXX

SWM FACILITY CROSS-SECTIONS

Drawn By	D.J.S.	Date	NOV. 2019	Checked By	R.S.
Scale:	V.T.	Project No.	07002	Drawing No.	SWM-2



LEGEND

-  SUB-CATCHMENT AREA ID No.
-  DRAINAGE AREA (Ha)
-  OVERLAND DRAINAGE DIRECTION

No.	By	Date	Revision	Checked

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.

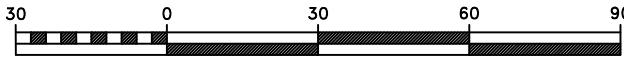


Director of Development Engineering Date

FERNDAL
PREVIN COURT HOMES

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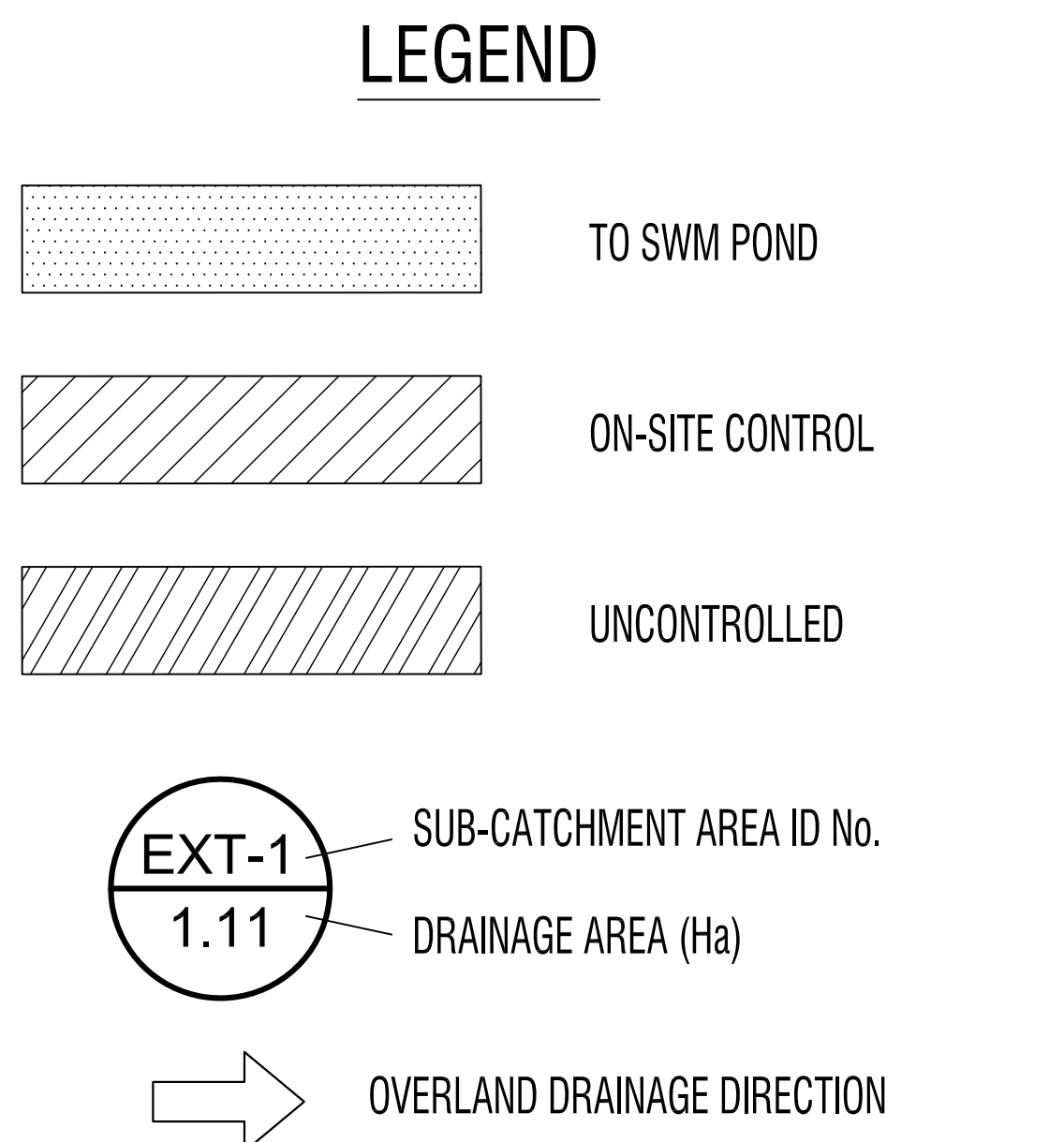
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CITY OF BARRIE
ENGINEERING DEPARTMENT

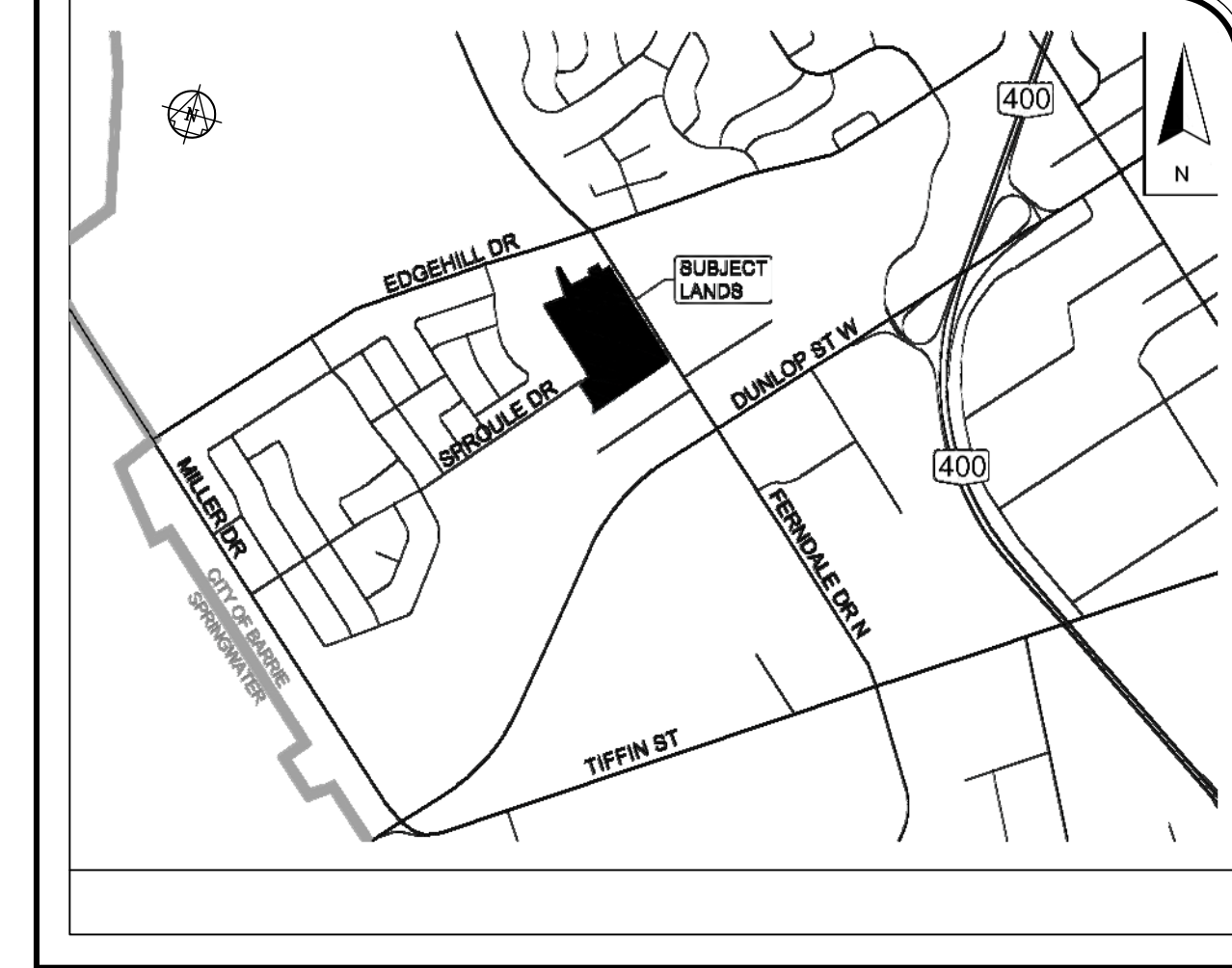
FILE No 19T-XXXXX

PRE-DEVELOPMENT DRAINAGE SCENARIO

Designed By	D.J.S.	Date	NOV. 2019	Checked By	R.S.
Drawn By	V.T.	Project No.	07002	Approved By	
Scale:	1:1500	Drawing No.	2.1 (SWM-3)		



Q. 2. The following are the marks obtained by 10 students in a test. Find the mean, median, mode and range of the marks.



	CONCRETE WASHOUT (SEE DETAIL)		DOUBLE ROW SILTATION CONTROL FENCE AS PER DETAIL LSRCA ESC-5
	CB SILTATION INSERT (SEE DETAIL)		SILT FENCE (AS PER CITY STD. BSD-1233)
			DIRECTION OF FLOW PRIOR TO GRADING SITE
			FILTER SOCK CHECK DAM (SEE DETAIL)
			CONSTRUCTION ENTRANCE MAT (SEE DETAIL)
			CUT-OFF SWALE

- LSRCA : REFER TO LSRCA ESC EVALUATION TOOL FOUND ON LSRCA WEBSITE FOR ANY FURTHER REQUIRED INFORMATION.

ID - P:\2007\07002-FERDALE\PRINTING\07002-REPORT-EROSION CONTROL-ESC-1 to ESC-4.dwg

NOTES FOR SEDIMENT & EROSION CONTROL

1. DISTURBED AREAS THAT HAVE FAILED TO HAVE STABLE GROUND COVER ESTABLISHED BY OCTOBER 30TH SHALL BE PROTECTED WITH A SILTATION CONTROL FENCE OR STRAW MUCUH ETC. AND MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION BECOMES ESTABLISHED IN THE SUBSEQUENT GROWING SEASON.
2. ANY DEWATERING WASTE SHALL BE DISCHARGED TO A VEGETATED AREA AT LEAST 30m FROM ANY WATERCOURSE AND FILTERED. FILTERING METHODS MUST BE APPROVED BY THE SITE ADMINISTRATOR.
3. SILT FENCE SHALL BE PUT IN PLACE PRIOR TO AND MAINTAINED DURING ALL GRADING. SILT FENCE TO BE INSPECTED PRIOR TO COMMENCEMENT OF EARTH GRADING ACTIVITIES. SILT FENCE TO BE INSPECTED AND REPAIRED OR REPLACED IF DAMAGED AS DIRECTED BY THE SITE ADMINISTRATOR. SILT CONTROLS TO BE INSPECTED ON A REGULAR BASIS AND AFTER EVERY RAIN EVENT. INSTALLATION SHALL BE TO THE MANUFACTURER'S SUGGESTED SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE PREPARED FOR UNEXPECTED CONDITIONS AND ACCORDINGLY HAVE STOCKPILED MATERIALS ON SITE FOR NECESSARY REPAIRS AS A RESULT OF FAILED OR INADEQUATE CONTROL MEASURES. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK, AND AFTER EVERY RAINFALL EVENT.
5. MUD MATS AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES THE SITE SHALL BE USED. MUD MATS SHALL BE CONSTRUCTED IN ACCORDANCE TO BSD 230.
6. CONTRACTOR SHALL OBTAIN A CURRENT COPY AND BECOME FAMILIAR WITH OPSS 577, CONSTRUCTION SPECIFICATION FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES, AS WELL AS ALL APPLICABLE MUNICIPAL AND LSRCA STANDARDS.
7. THE CONTRACTOR MAY CONSIDER ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES. SUCH MEASURES SHOULD BE PRESENTED IN WRITING FOR APPROVAL OF THE SITE ADMINISTRATOR AND MUST BE APPROVED IN WRITING BY THE CONSERVATION AUTHORITY.
8. THE TOPS OF ALL FILTER FABRIC MUST BE A MINIMUM OF 1.0 METERS ABOVE THE GROUND LEVEL AND ATTACHED TO THE FENCE WITH A CONTINUOUS STEEL WIRE. ALTERNATIVELY, THE FILTER FABRIC MUST BE FOLDED OVER THE TOP OF THE FENCE AND ATTACHED TO THE FENCE WITH WIRE LOOPED THROUGH THE FABRIC ON BOTH SIDES OF THE FENCE. FILTER FABRIC IS TO BE TERRAFIX 270R OR EQUIVALENT.
9. ALL DISTURBED GROUND LEFT INACTIVE SHALL BE STABILIZED BY SEEDING, SODDING, MULCHING OR COVERING OR OTHER EQUIVALENT CONTROL MEASURES. THIS PERIOD OF INACTIVITY SHALL BE AT THE DISCRETION OF THE CITY OF BARRIE'S DIRECTOR OF ENGINEERING BUT SHALL NOT EXCEED THIRTY DAYS OR SUCH LONGER PERIOD DEEMED ADVISABLE BY THE CITY OF BARRIE'S DIRECTOR OF ENGINEERING.
10. CONTRACTOR SHALL INSTALL AND MAINTAIN CATCHBASIN SEDIMENT BARRIERS THROUGHOUT THE SITE DURING ALL CONSTRUCTION ACTIVITIES IN ORDER TO TRAP SEDIMENT.
11. CONTRACTOR IS RESPONSIBLE FOR MUD TRACKING PREVENTION AND MAINTENANCE ON FERNDALE DR. N.
12. ANY NATIVE SOIL EXPOSED FOR MORE THAN 30 DAYS SHOULD BE SEEDED WITH NATIVE MIX.

NOTES FOR SEDIMENT & EROSION CONTROL

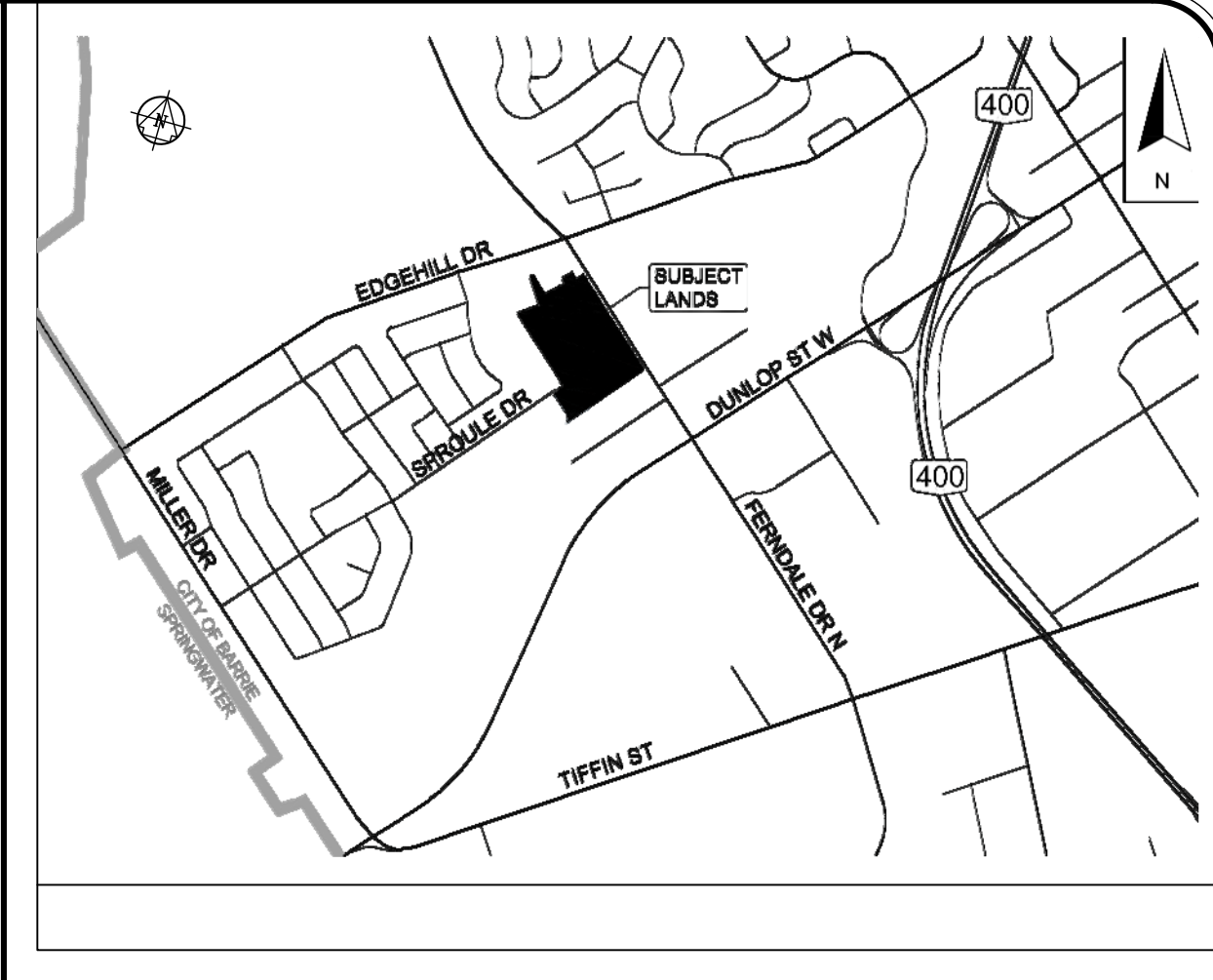
1. WITHIN AREAS WHERE EARTHWORKS AND/OR UNDERGROUND MUNICIPAL SERVICING IS ONGOING, WATER IS TO BE UTILIZED AT SUFFICIENT FREQUENCY AND QUANTITY TO REDUCE DUST AS MUCH AS POSSIBLE.
2. APPLY WATER TO HAUL ROADS AND STOCKPILE WHERE NECESSARY BY WAY OF WATER TRUCK.
3. DISTURB ONLY THOSE ABSOLUTELY REQUIRED. VEGETATION LEFT IN PLACE DURING SITE WORK REDUCES THE AREA SUBJECT TO WIND EROSION.
4. MUD MATS WILL BE INSTALLED AS PER TOWN STANDARD AT EACH SITE ENTRANCE.
5. ALL LOADS LEAVING SITE ARE TO BE COVERED.
6. MUD TRACKED ONTO EXISTING ROADS TO BE SCRAPPED AS REQUIRED ON A REGULAR BASIS.
7. AS REQUIRED AND/OR DIRECTED BY THE ENGINEER OR TOWN STAFF, SPILLAGE, EROSION OR MATERIALS TRACKED OUT ON A ROAD DURING EXPORTING OR IMPORTING OF EARTH MATERIAL OR ROAD BUILDING OPERATIONS TO BE CLEANED USING MECHANICAL STREET SWEEPERS OR FLUSHER TRUCK.
8. THE USE OF CALCIUM CHLORIDE APPLICATIONS ON HAUL ROUTES AND UNVEGETATED AREAS IN LIEU OF A WATER APPLICATION TO ENHANCE THE LONGEVITY OF DUST SUPPRESSION MAY BE UTILIZED.

GOOD HOUSEKEEPING MEASURES

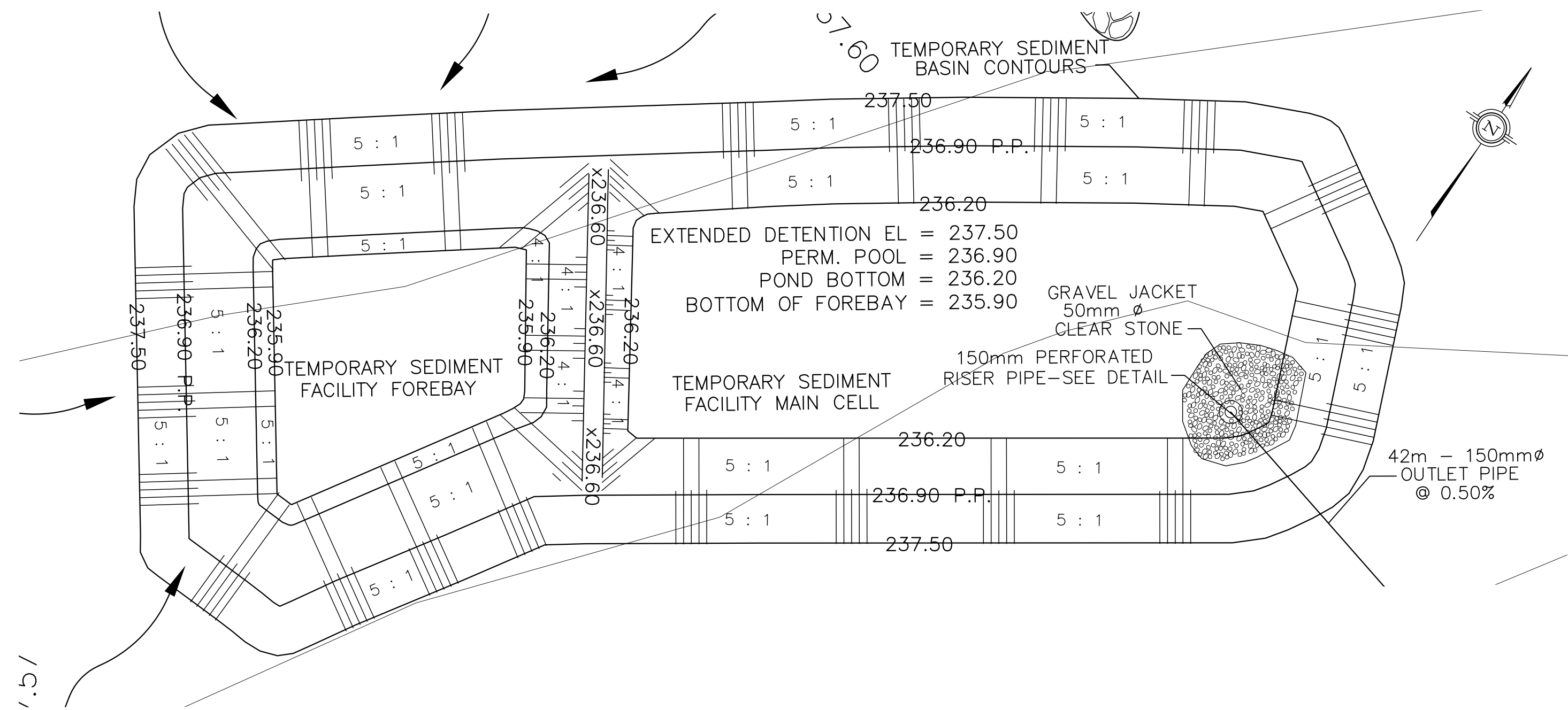
1. ALL CONSTRUCTION VEHICLES SHALL LEAVE THE SITE AT A DESIGNATED POINT PROVIDED WITH MUD MAT AS SPECIFIED ON THE DRAWING TO ENSURE THAT A MINIMUM AMOUNT OF MATERIAL IS TRACKED OFF THE SITE ONTO ADJACENT STREETS. (REFER TO THIS DRAWING FOR LOCATION)
2. ONCE THE CATCHBASINS HAVE BEEN INSTALLED AND CONNECTED TO THE SEWER SYSTEM, CATCHBASINS SHALL BE BUFFERED. AS PER UEL DETAIL. REGULAR INSPECTION AND MAINTAINANCE FOR SEDIMENT REMOVAL SHALL BE PERFORMED AS REQUIRED
3. ALL CATCHBASIN SUMPS SHALL BE INSPECTED FREQUENTLY, AND CLEANED FREQUENTLY AS DIRECTED BY THE ENGINEER.
4. ALL REGRADED AREAS WITHIN THE SUBDIVISION WHICH ARE NOT OCCUPIED BY DWELLINGS, ROADWAY OR DRIVEWAYS SHALL BE TOPSOILED AND SODDED/SEEDED (STABILIZED) IF LEFT UNDISTURBED FOR 30 DAYS. THIS APPLIES TO ALL REGRADED AREAS EVEN THOSE AFFECTED PRIOR TO ROAD BUILDING AND HOUSE CONSTRUCTION.
5. SILT FENCE SHALL BE PERIODICALLY INSPECTED AND REMOVED AFTER CONSTRUCTION & RESTORATION ACTIVITIES ARE COMPLETE.
6. SEDIMENTATION ACCUMULATION IN THE PONDS MUST BE MEASURED A MINIMUM OF ONCE EVERY SIX MONTHS. THE POND WILL REQUIRE CLEANING WHEN SEDIMENT ACCUMULATION REACHES 50% OF THE FOREBAY DESIGN CAPACITY.
7. CLEANING AND REPAIR SILT FENCE, MUD MATS AND OTHER TEMPORARY SEDIMENTATION CONTROL MEASURES SHALL BE DONE AS DEEMED NECESSARY THROUGH REGULAR INSPECTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER INSTALLATION.
9. ADDITIONAL EROSION AND SEDIMENT CONTROL MATERIALS (ie. SILT FENCE, CLEAR STONES ... ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS.
10. EROSION AND SEDIMENT CONTROLS METHODS ARE TO BE CONTINUOUSLY EVALUATED; AND UPGRADES ARE TO BE IMPLEMENTED, WHEN NECESSARY.
11. AN AFTER HOURS CONTACT NUMBER IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES.

MAINTENANCE AND STAGING OF CONSTRUCTION

1. INSTALL SILT FENCE (AS PER TOWN STD. 304)
2. INSTALL MUDMATS (SEE DETAIL ON THIS DRAWING)
3. CLEAR AND GRUB SITE.
4. CONSTRUCT SEDIMENT CONTROL PONDS, CUT-OFF SWALES, SEDIMENT CONTROL RISER/OUTLET.
5. ROUGH GRADE SITE TO SUBGRADE
6. INSTALL SEWER SYSTEM, WATER DISTRIBUTION SYSTEM AND ROADWORKS AND REMOVE MUD MAT.
7. ALL DISTURBED AREAS TO ARE TO BE STABILIZED BY SPREADING A THIN LAYER OF TOPSOIL AND SEEDING.
8. PROVIDE CATCHBASIN BUFFERS AS SHOWN ON DETAIL.
a) THE CATCHBASIN SUMPS SHALL BE MONITORED DURING THE CONSTRUCTION STAGES AND PERIODICALLY CLEANED AND/OR PUMPED AS DIRECTED BY THE ENGINEER.
9. UPON COMPLETION OF CONSTRUCTION
a) RESTORE ALL DISTURBED AREAS
b) LANDSCAPE
10. CLEANING AND REPAIR SILT FENCE, MUD MATS AND OTHER TEMPORARY SEDIMENTATION CONTROL MEASURES SHALL BE DONE AS DEEMED NECESSARY THROUGH REGULAR INSPECTION.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION.
11. ADDITIONAL EROSION AND SEDIMENT CONTROL MATERIALS (ie. SILT FENCE, STRAW BALES, CLEAR STONES ... ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES AND REPAIRS
12. EROSION AND SEDIMENT CONTROLS METHODS ARE TO BE CONTINUOUSLY EVALUATED; AND UPGRADES ARE TO BE IMPLEMENTED, WHEN NECESSARY.
13. AN AFTER HOURS CONTACT NUMBER IS TO BE VISIBLY POSTED ON-SITE FOR EMERGENCIES.



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APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.		REGISTERED PROFESSIONAL ENGINEER ROSARIO SACCO NOV 15, 2019 PROVINCE OF ONTARIO																																				
Director of Development Engineering		Date																																				
FERNDALE PREVIN COURT HOMES																																						
URBAN ECOSYSTEMS LIMITED 7050 WESTON ROAD, SUITE 705 WOODBRIE, ONTARIO L4L 8G7 uel@urbanecosystems.com t. (905)856-0629 f. (905)856-0698		UEL Barrie																																				
CITY OF BARRIE ENGINEERING DEPARTMENT																																						
FILE No 19T-XXXXX																																						
EROSION CONTROL NOTES and DETAILS																																						
Designed By	D.J.S.	Date	NOV. 2019	Checked By	R.S.																																	
Drawn By	V.T.			Approved By																																		
Scale:	Project No.		07002	Drawing No.		ESC-2																																



TEMPORARY SEDIMENT CONTROL FACILITY
NORTH OF SPROULE

SILTATION BASIN (NORTH)
VOLUME CALCULATION

TOTAL DRAINAG AREA = 6.7 ha
(INCLUDING EXTERNAL)

REQUIRED

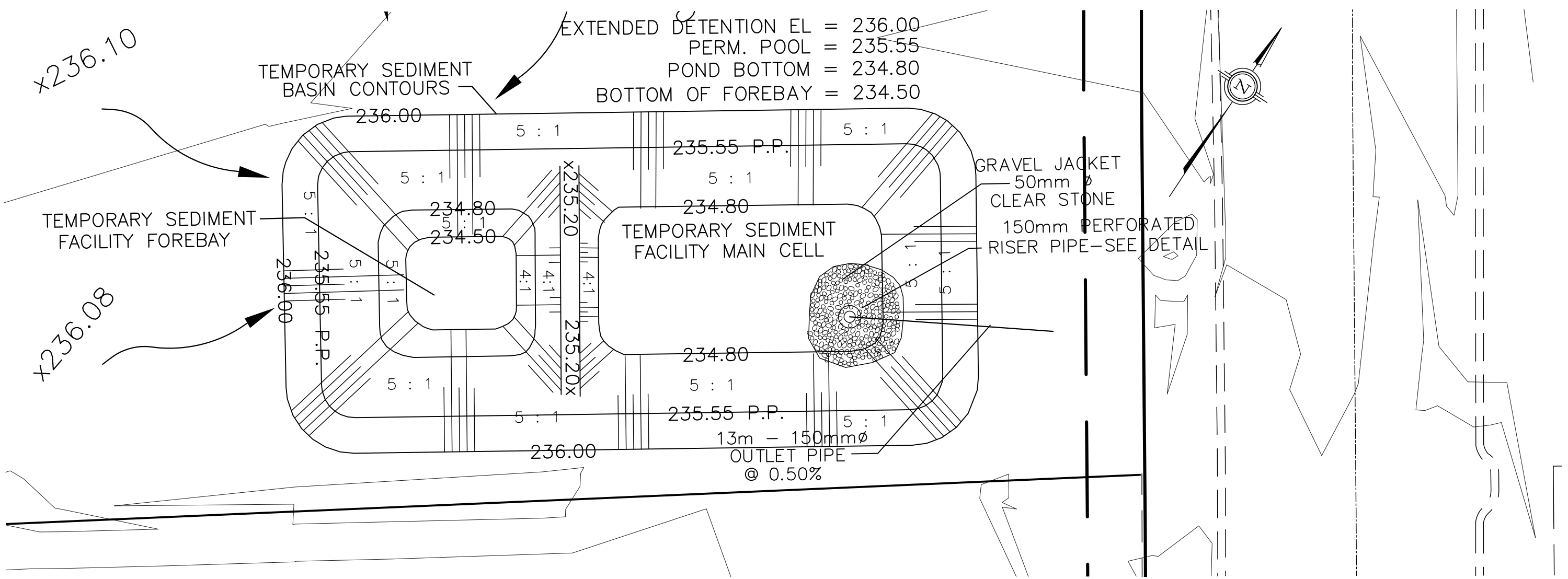
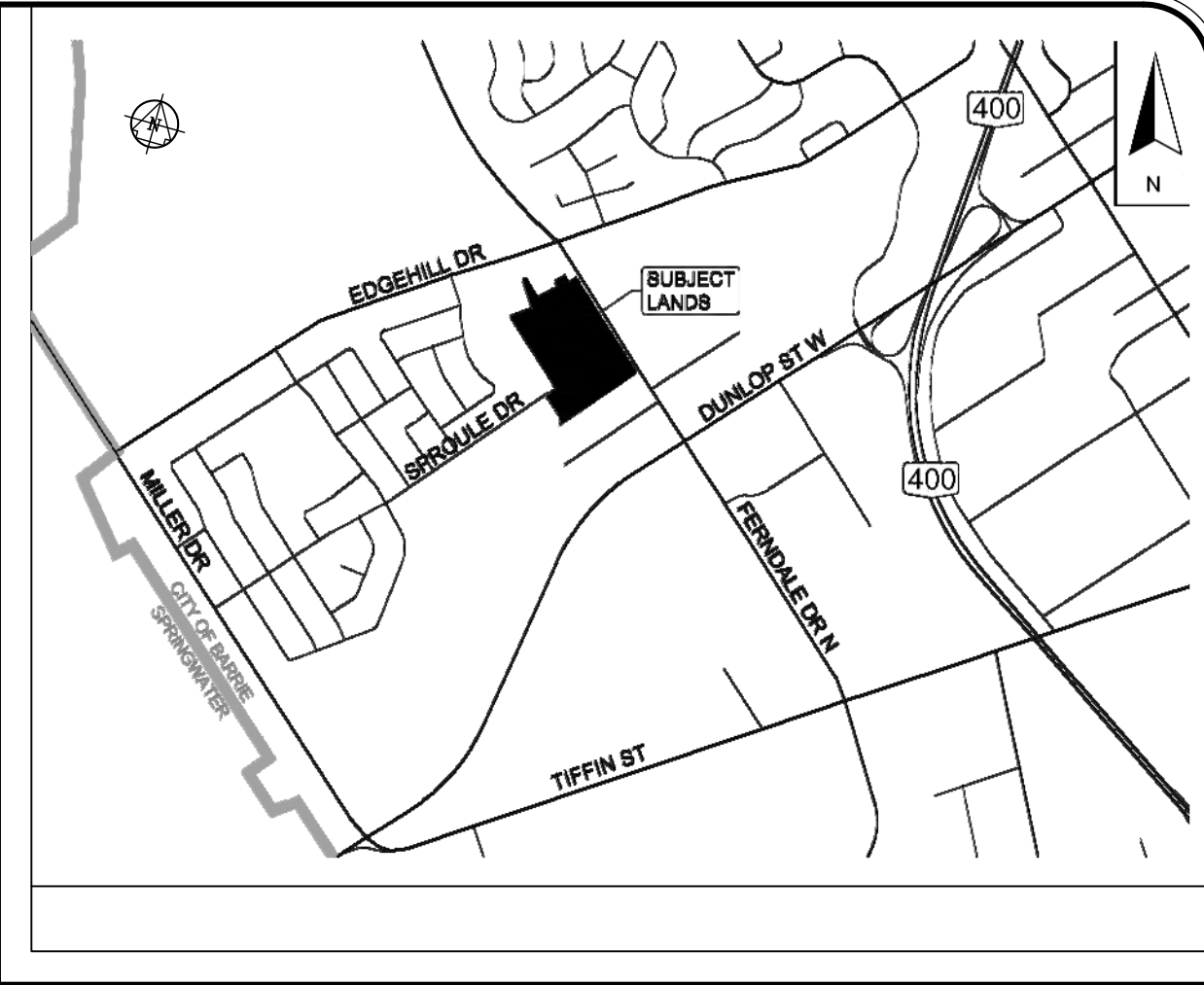
PERMANENT POOL
125 cu.m/ha x 6.7 ha = 838 cu.m.

ACTIVE STORAGE
125 cu.m/ha x 6.7 ha = 838 cu.m.

PROVIDED

PERMANENT POOL = 901 cu.m.
(@ ELEV. 236.90)

ACTIVE STORAGE = 1110 cu.m.
(@ELEV. 237.50)



TEMPORARY SEDIMENT CONTROL FACILITY
SOUTH OF SPROULE

SILTATION BASIN (SOUTH)
VOLUME CALCULATION

TOTAL DRAINAGE AREA = 2.19ha

REQUIRED

PERMANENT POOL
125 cu.m/ha x 2.19 ha = 274 cu.m.

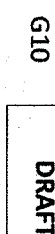
ACTIVE STORAGE
125 cu.m/ha x 2.19 ha = 274 cu.m.

PROVIDED

PERMANENT POOL = 353 cu.m.
(@ ELEV. 235.55)

ACTIVE STORAGE = 350 cu.m.
(@ELEV. 236.00)

No.	By	Date	Revision	Checked
APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF URBAN ECOSYSTEMS LIMITED AS TO DESIGN AND SPECIFICATION.				
Director of Development Engineering			Date	
FERNDALE PREVIN COURT HOMES				
URBAN ECOSYSTEMS LIMITED 7050 WESTON ROAD, SUITE 705 WOODBRIDGE, ONTARIO L4L 8G7 ucl@urbanecosystems.com t. (905)856-0629 f. (905)856-0698				
HORIZONTAL				
CITY OF BARRIE ENGINEERING DEPARTMENT				
FILE No 19T-XXXXX				
TEMPORARY SEDIMENT CONTROL FACILITIES				
Designed By	D.J.S.	Date	NOV. 2019	Checked By
Drawn By	V.T.			Approved By
Scale:	1:250	Project No.	07002	Drawing No.
				ESC-3



DRAFT

TOPOGRAPHIC SKETCH

PART OF

LOT 23

CONCESSION 7

GEOGRAPHIC TOWNSHIP OF VESPRE

NOW IN THE

CITY OF BARRIE

AND PART OF

BLOCK 183

PLAN 51M-751

CITY OF BARRIE

COUNTY OF SIMCOE



SCALE = 1:500

DINO R.S. ASTRI, O.L.S.

PLEASE NOTE- FOR PRESENTATION PURPOSE ONLY

NOTE

INFORMATION DERIVED FROM A TOPOGRAPHICAL SURVEY BY DINO ASTRI SURVEYING LTD. DATED JULY 3, 2019, A DRAFT PLAN OF SUBDIVISION BY INNOVATIVE PLANNING SOLUTIONS DATED AUGUST 1, 2018, PLAN 51R-20629 AND PLAN 51R-37516

METRIC

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

LEGEND

- OH- DENOTES OVERHEAD WIRES
- DENOTES FENCING
- BPED DENOTES BELL PEDESTAL
- HP DENOTES HYDRO POLE
- GW DENOTES GUY WIRE
- CB DENOTES CATCH BASIN
- HYD DENOTES HYDRANT
- WV DENOTES WATER VALVE
- DENOTES DECIDUOUS TREE
- DENOTES CONIFEROUS TREE
- ⊙ DENOTES MONITORING WELL

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED USING GPS TECHNOLOGY AND THE CAN-NET VRS NETWORK.

DATE

JAMES A. NICOL
ONTARIO LAND SURVEYOR



DINO ASTRI
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1-661 Wilham Road, Barrie, Ontario, L4N 3B7
Phone: 705-792-6780 Fax: 705-792-4164
www.astriurveying.com
Copies available @ www.landrecords.com

18166_TOPO_PREVIM COURT_COMBINED

DRAWING No. TOPO-1

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