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

September 26, 2024

Via: Email

The City of Barrie
70 Collier Street
P.O. Box 400
Barrie, Ontario
L4M 4T5

Attention: **Nadine Rush, Senior Development Services Technologist**

Re: **Stormwater Management Report Addendum**
642 Dunlop Street West Development
WMI File No.: 21-710
City File No.: D11-015-2022

Dear Nadine,

WMI & Associates Limited has completed calculation updates in response to the Development Services Department's 2nd Submission Review comments dated May 31, 2024, and which accounts for minor site plan updates. This addendum contains:

- Storm Sewer Design Sheet;
- Sanitary Sewer Design Sheet;
- Updated site plan (By N Architecture dated August 14, 2024);
- Updated Post-development storm drainage plan (Figure 3).

These documents shall form a part of the Stormwater Management Report prepared by WMI & Associates Limited for the 642 Dunlop Street West Development, dated March 2023.

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

Yours truly,

WMI & Associates Limited

Jonathan Reimer, P. Eng.

WMI & Associates Limited
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Storm Sewer Design Sheet
642 Dunlop St. West

<<< **Elements Requiring Input Information**

Rational Method Calculation:

$Q = 2.78*(C_F*C*I*A)$

where,

Q = peak flow rate (L/s)
C_F = runoff coefficient factor for storms **> 10-yr** (C_F = 1.0 for the 2, 5 & 10-yr storm events and C_F = 1.1, 1.2 & 1.25 for the 25, 50 & 100-yr storm events respectively)
C = runoff coefficient
I = rainfall intensity (mm/hr)
A = area (ha)

Manning's Formula Calculation:

$V = (k*R^{2/3}*S^{1/2}) / n$ $\quad Q = V*A$

MOE Velocity Requirements: 0.8m/s - 6.0m/s

where,

V = mean velocity (m/s)
k = 1.0 for SI units
R = hydraulic radius (m)
S = friction slope (m/s)
n = Mannings Coefficient **0.013**

Rainfall Intensity Calculation:

$I = \frac{A}{(T+B)^C}$

where,

I = Rainfall Intensity (mm/hr)
T = Time of Concentration (min.)
A = Rainfall IDF Coefficient
B = Rainfall IDF Coefficient
C = Rainfall IDF Coefficient

Rainfall IDF Data: **Barrie WPCC 1979-2003 adjusted for climate change**

	5-year	100-year
A =	**853.608**	**1426.408**
B =	**4.699**	**5.273**
C =	**0.766**	**0.759**
Runoff Coeff. Factors, C_F =	1.00	1.25

Date: **25-Sep-24**
Project No: **21-710**
Prepared by: **EC**

Location			Runoff Calculation Data									Sewer Calculation Data							Sewer Profile Data					
Street / Location I.D.	Upstream MH	Downstream MH	Drainage Areas (ha) C = 0.10	C = 0.40	C = 0.91	C = 0.95	Individual 2.78CA	Accumulated 2.78CA	Time of Concentration (mins)	Storm Event	Rainfall Intensity (mm/hr)	Peak Runoff Flow (L/s)	Diameter (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Pipe Flow Time (mins)	Pipe Storage Volume (m^3)	Fall in Sewer (m)	Drop in MH (m) DS	Top of Grate Elevation (m) US	Top of Grate Elevation (m) DS	Invert Elevation (m) US	Invert Elevation (m) DS
Dunlop St. W.	**CB11**	**Ditch**				**0.08**	0.21	0.21	10.00	**5-year**	108.92	23.01	**250**	**1.00**	**6.80**	62.04	1.22	0.09	0.3	0.07			**INPUT VALUE**		**INPUT VALUE**
Roof Outlet	**Rooftop**	**MH9**	***REFER TO NOTES BELOW**									56.00	**300**	**0.32**	**16.20**	57.07	0.78	0.35	1.2	0.05					
	MH9	**Ditch**										56.00	**300**	**0.40**	**10.90**	63.80	0.87	0.21	0.8	0.04			**INPUT VALUE**		**INPUT VALUE**
Parking Lot	**CB10**	**CBMH7**			**0.04**		0.10	0.10	10.00	**5-year**	108.92	11.02	**250**	**0.20**	**26.90**	27.74	0.55	0.82	1.4	0.05					
	CBMH7	**CBMH6**			**0.05**		0.13	0.23	10.82	**5-year**	104.49	23.79	**250**	**0.20**	**21.60**	27.74	0.55	0.66	1.1	0.04					
	CBMH6	**CBMH5**			**0.05**		0.13	0.35	11.48	**5-year**	101.22	35.85	**300**	**0.20**	**29.10**	45.12	0.62	0.78	2.1	0.06					
	CBMH5	**MH4**			**0.05**		0.13	0.48	12.26	**5-year**	97.62	46.92	**300**	**0.60**	**7.80**	78.14	1.07	0.12	0.6	0.05			**INPUT VALUE**		**INPUT VALUE**
Stormtech Outlet	**MH3**	**HW2**	**REFER TO STAGE-STORAGE-DISCHARGE CALCULATIONS**									26.30	***300***	***0.70***	***17.10***	84.40	1.16	0.25	1.2	0.12			**INPUT VALUE**		**INPUT VALUE**
Sum of Drainage Areas (ha):			0.00	0.00	0.19	0.08																			
Total Drainage Area (ha):			0.27																						

NOTES: *This pipe is to convey the catchment B2c (uncontrolled) 100-yr flow of 0.050m³/s, and the 100-year controlled flow of 0.003m³/s x 2 from catchments B2a + B2b. Total flow = of 0.056m³/s

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Sanitary Sewer Design Sheet
642 Dunlop Street West

<<< **Elements Requiring Input Information**

Peak Flow Formulaes:
Q_{pop} = (P*q*M)/86.4 (L/s)
$Q_{Comm/Inst}$ = Design Flow x Peaking Factor (L/s)
Q_{Ind} = Design Flow x Peaking Factor (L/s)

Q_{Infilt} = i*A (L/s), where A = Area (ha)

$Q_d = Q_{pop} + Q_{Comm/Inst} + Q_{Ind} + Q_{Infilt}$ (L/s)

MOE Velocity Requirements: 0.6m/s - 3.0m/s

where, P = population in 1000's
q = residential sewage unit flow rate
M = Ultimate Flow Factor (residential peaking factor)
(Harmon) $M=1+(14/(4+P^{0.5}))$
Q_{pop} = peak population flow (L/s)
$Q_{Comm/Inst}$ = peak commercial/institutional flow (L/s)
Q_{Ind} = peak industrial flow (L/s)

Q_{Infilt} = peak extraneous (i.e. infiltration) flow (L/s)
i = **peak** extraneous (i.e. infiltration) unit flow rate

Q_d = total peak design flow (L/s)

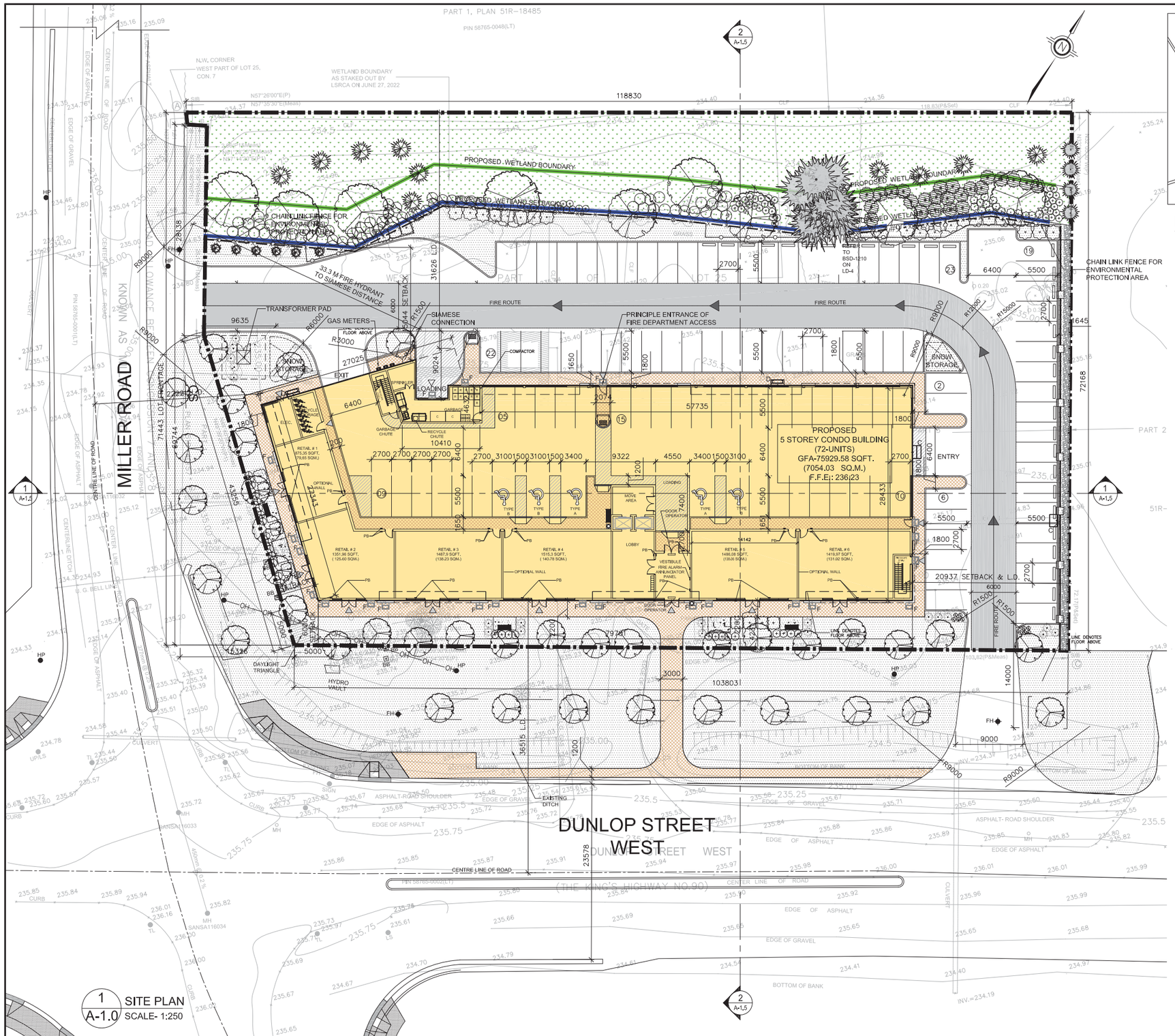
Comm/Inst Peaking Factor: **2**
Industrial Peaking Factor: **3**
Res - SFD Single Family Dwellings: q: **225** L/cap./day ppd = **3.13**
Res - MFD Multi-Family Dwellings: q: **225** L/cap./day ppu = **1.67**

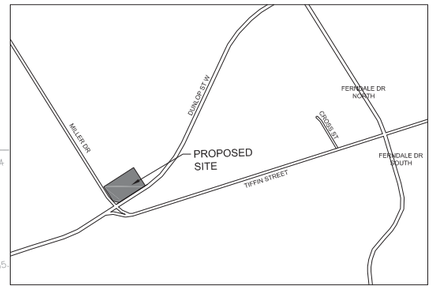
Infiltration
i: **0.1** L/s/ha
(as per MOE Guidelines use 0.19 for sewer design & 0.04 (avg) - 0.11 (peak) for PS/STS)
Mannings Coefficient
n: **0.013**

Date: **25-Sep-24**
Project No: **21-710**
Prepared by: **EC**

Location			Sewage Flow Calculation Data															Sewer Calculation Data					Sewer Profile Data					
Street	Upstream MH	Downstream MH	Res - SFD # of Units	Res - SFD # of People	Res - MFD # of Units	Res - MFD # of People	Comm/Inst Total Daily Flow (L/day)	Industrial Total Daily Flow (L/day)	Cum. Res - SFD # of People	Cum. Res - MFD # of People	Cum. Comm/Inst Total Daily Flow (L/day)	Cum. Industrial Total Daily Flow (L/day)	Residential Peaking Factor	Sewage Flow (L/s)	Infiltration			Total Flow (L/s)	Dia. (mm)	Slope (%)	Length (m)	Capacity (L/s)	Velocity (m/s)	Fall in Sewer (m)	Drop in MH (m)	Top of Grate Elevation (m)		Invert Elevation (m)	
															Individual Area (ha)	Cumulative Area (ha)	Flow (L/s)											
																									DS	US	DS	US	DS
Miller Drive	**MH A**	**EX MH16032**		0	**72**	120.24	**2114**		0	120.24	2114	0	4.22	1.37	**0.81**	0.81	0.08	1.45	**200**	**2.40**	**21.0**	53.01	1.63	0.50			**INPUT VALUE**		**INPUT VALUE**
		Individual Totals:		0		120.24	2114	0							0.81														
		Cumulative # of People (SFD + MFD):		120.24																									

NOTES: - Area utilized for the infiltration calculation is the entire site area (0.81ha)
- # of people for the Multi-Family Residential Dwellings (Townhouses, apartments, etc.) is calculated based on # of units x population density (people per unit = # of bedrooms x 2 people per bedroom).
- # of people for the Single-Family Residential Dwellings is calculated based on # of dwellings x population density (people per dwelling).
- Commercial Total Daily Flow calculated based on a 28m³/day/ha demand.





KEY PLAN

PROJECT STATISTICS

ADDRESS	642 DUNLOP STREET WEST, BARRIE, ON.	
ZONING	GENERAL COMMERCIAL (C4)	
	REQUIRED	PROPOSED
LOT(SITE) AREA (m^2)	450 SQ.M.	8084.59 SQ.M.
LOT FRONTAGE		71.44 M.
RETAIL		754.24 SQ.M.
RESIDENTIAL UNITS		6233.07 SQ.M.
AMENITY AREA		395.60 SQ.M.
TOTAL GFA.		7054.03 SQ.M.
COVERAGE	50% MAX	2420.23 SQ.M. (29.93%)
LANDSCAPE AREA		2767.57 SQ.M. (34.23%)
PAVED AREA		575.55 SQ.M. (7.12%)
BUILDING HEIGHT (MAX.)	14.0 M.	13.95 M.
TOTAL PARKING (MIN.)	126 CARS	111 CARS
BARRIER FREE PARKING (MIN.)	5 CARS	5 CARS
BICYCLE PARKING (MIN.)	4	7
LOADING SPACE (MIN.)	1	1
LOT FRONTAGE (MIN.) DUNLOP STREET WEST	15 M.	69.7 M.

BUILDING SETBACKS

	REQUIRED	PROPOSED
FRONT YARD (WEST)	6.0M	4.76 M.
EXTERIOR SIDE YARD (SOUTH)	5.0M	6.0 M.
INTERIOR SIDE YARD (NORTH)	3.0M	15.04 M.
REAR YARD (EAST)	7.0M	20.93 M.

PARKING CALCULATIONS

ITEM	AREA(SQM.)	RATE	REQUIRED	PROVIDED
RETAIL	754.24	1 PER 24 SQ.M.	31	16
RESIDENTIAL UNITS (72)	6233.07	1.25 PER DWELLING	90	90
H.C PARKING (OVER 100 – 1+3% OF REQ. PARKING)			5	5
TOTAL			126	111
CAR SPACE SIZE			2.7X5.5M	2.7X5.5M
H/C CAR SPACE SIZE (TYPE–A) (TYPE–B)			3.4X5.5M 3.1X5.5M	3.4X5.5M 3.1X5.5M

LEGEND

- NEW BUILDING
- ASPHALT
- LANDSCAPE
- CONC. PAVEMENT, 150MM RAISED
- HANDICAP PARKING
- MAIN ENTRANCE
- OVERHEAD DOOR
- TREE
- BARRIER CURB
- BARRIER FREE CURB
- PB BARRIER FREE PUSH BUTTON

MUNICIPAL ADDRESS & LEGAL DESCRIPTION:

PART 3 OF LOT 25 REGISTERED PLAN F45 CITY OF BARRIE COUNTY OF SIMCOE

APPLICANT:

IPS (INNOVATIVE PLANNING SOLUTIONS)
647 WELHAM RD, UNIT 9A
BARRIE,ON L4N 0B7

SURVEY INFORMATION TAKEN FROM:

OMARI MWINYI SURVEYING LTD.
1905 PINE GROVE AVENUE PICKERING
ONTARIO, L1V 6T1
Ph: (905) 728-8863
Fax:(905) 492 5485

OWNER:

2507517 ONTARIO INC.
12 CHIAVATTI DR., MARKHAM,
ON L3R 1E2

TOTAL UNITS:	
TWO BED ROOM UNITS	30
ONE BED ROOM UNITS	30
ACCESSIBLE ONE BED ROOM UNITS	06
ACCESSIBLE TWO BED ROOM UNITS	06
TOTAL	72

n Architecture Inc
PRINCIPAL: NITIN MALHOTRA, ARCHITECT.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario. L4B 3J9
T : 4 1 6 . 2 5 6 . 9 7 4 1
E: info@narchitecture.com
www.narchitecture.com

N
GEOGRETIC NORTH
PROJECT NORTH

14th AUGUST 2024
ISSUED FOR SPA-2

No.	Date	Version	Dwn.
4.	28-MAR-2023	ISSUED FOR SPA-2	EY
3.	21-APR-2022	ISSUED FOR SPA-1	SB
2.	13-JUN-2018	ISSUED FOR PRE-CONSULTATION	SB
1.	04-APR-2016	ISSUED FOR PRE-CONSULTATION	FK

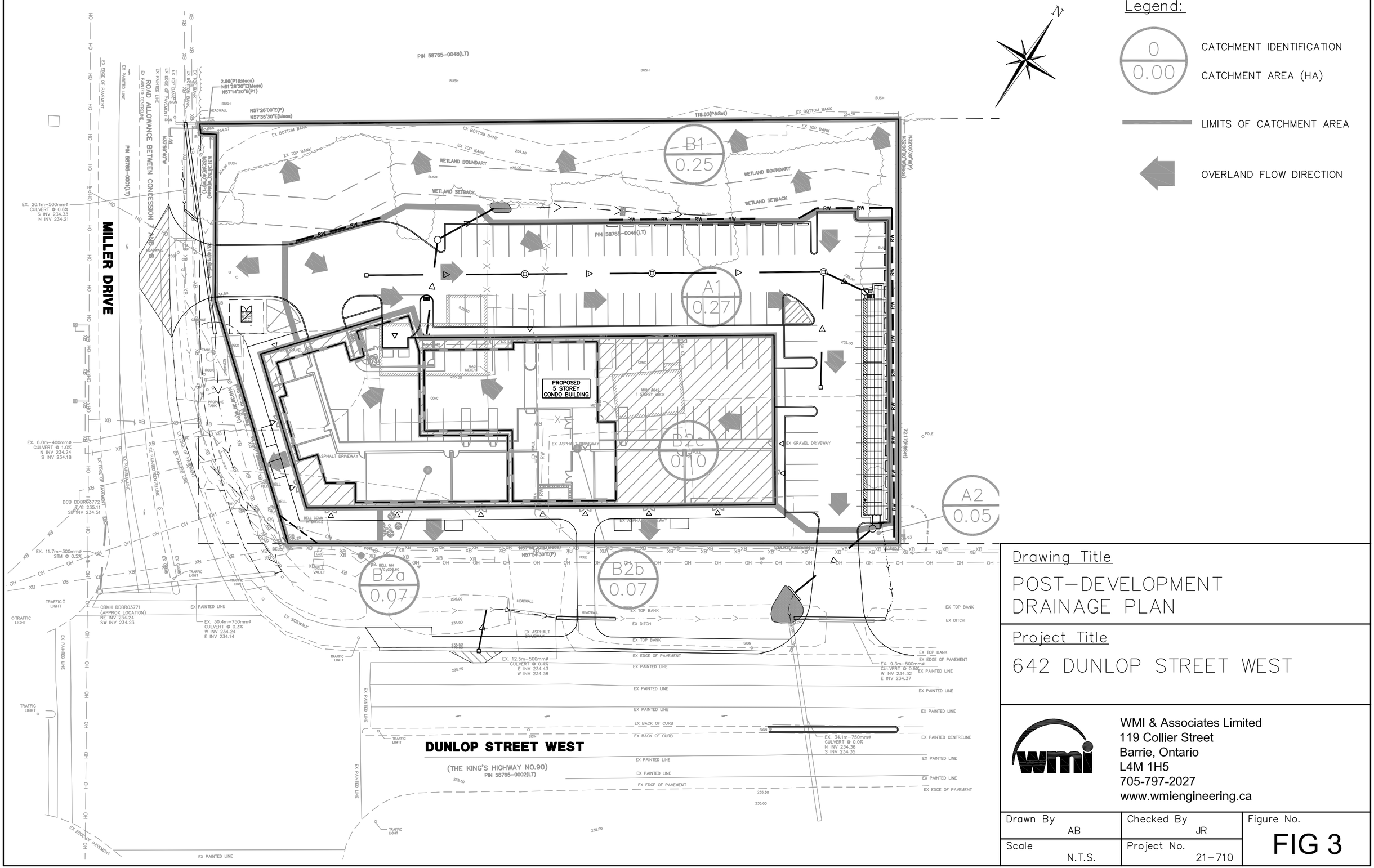
PROJECT:

PROPOSED 5-STOREY CONDO BUILDING 642 DUNLOP STREET W BARRIE, ON.

DRAWING TITLE:

SITE PLAN

DRAWN BY: FK	DATE: DEC 02 2015
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.: 15-48	DRAWING NO.: A-1.0



Drawing Title

POST-DEVELOPMENT DRAINAGE PLAN

Project Title

642 DUNLOP STREET WEST

WMI & Associates Limited
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L4M 1H5
705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Figure No.
AB	JR	FIG 3
Scale: N.T.S.	Project No.: 21-710	